RECORD OF DECISION

Ringwood Mines/Landfill Superfund Site
Operable Unit Three

Borough of Ringwood
Passaic County, New Jersey

September 29, 2020

PREPARED BY:

U.S. Environmental Protection Agency
Region II

615708

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Ringwood Mines/Landfill Superfund Site
Borough of Ringwood, Passaic County, New Jersey
Operable Unit Three (OU3)

Superfund Site Identification Number: NJD980529739

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected remedy to address contaminants in groundwater and mine water at the Ringwood Mines/Landfill Superfund Site (Site), located in the Borough of Ringwood, Passaic County, New Jersey. Groundwater and mine water comprise operable unit 3 (OU3) of the Site. The selected remedy was chosen by the U.S. Environmental Protection Agency (EPA) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§9601-9675, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record file for this Site (see Appendix IV).

The New Jersey Department of Environmental Protection (NJDEP) was consulted on the planned remedy for OU3 in accordance with CERCLA §121(f), 42 U.S.C. §9621(f), and it concurs with the selected remedy (see Appendix V).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response action described in this ROD addresses contaminants in Site-wide groundwater and mine water in the Peters Mine Pit (PMP) Airshaft of the Site, which is considered OU3. It represents the third of three planned remedial phases, or operable units, for the Site. A remedy for OU1 was originally intended to comprehensively address contamination at the Site. However, subsequent to the completion of the OU1 remedy and deletion of the Site from the National Priorities List (NPL), additional contamination was found that resulted in the need for further evaluation of conditions at the Site and implementation of OU2 and OU3. OU2 addresses waste, fill material and soil located in the PMP, Cannon Mine Pit (CMP) and the O'Connor Disposal Area (OCDA). The design of the OU2 remedy, which is detailed in the June 2014 OU2 ROD and April 2015 Explanation of Significant Differences (ESD), was completed in 2018.

The major components of the selected remedy for Site-wide groundwater and mine water in the PMP Airshaft include the following:

Site-wide Groundwater

- Installation of wells in the PMP Area/OCDA of the Site to allow for the in-situ treatment of groundwater contaminants;

- Implementation of a long-term groundwater monitoring plan to monitor contaminant concentrations and biogeochemical parameters from groundwater monitoring wells located in and downgradient of the PMP Area, CMP Area and the OCDA. In addition, a sentinel monitoring well network will be established to provide advanced warning of any movement of groundwater contamination toward any drinking water resources;

- Implementation of a long-term surface water monitoring plan which will provide for surface water monitoring in and downstream of the Site brooks to confirm that Site-related contaminants are not threatening downstream receptors, including the Wanaque Reservoir; and

- Establishment of a Classification Exception Area/Well Restriction Area (CEA/WRA) as an institutional control (IC) to restrict future withdrawal and use of Site groundwater which contains contaminants at concentrations in excess of New Jersey Groundwater Quality Standards.

Peters Mine Pit Airshaft

- The PMP Airshaft will be permanently closed using conventional mine shaft closure technology;

- Granular activated carbon (GAC) and resin will be introduced to the base of the airshaft prior to permanent closure to provide for the adsorption of organic contaminants; and

- Displaced water will be treated through filtration and GAC and then discharged to groundwater within the same general locations, pursuant to the substantive requirements of NJAC 7:14A-7.5.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in Section 121 of CERCLA, 42 U.S.C. § 9621. It is protective of human health and the environment, meets a level of control of the hazardous substances, pollutants and contaminants which meets the federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, is cost effective and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. The selected remedy will also satisfy the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment), as in-situ treatment technologies will be utilized to address contaminants in groundwater and mine water.

Because the selected remedy for OU3 will result in hazardous substances, pollutants, or contaminants remaining above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than once every five years to ensure that the remedial action remains protective of human health and the environment.

DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for this site.

- Chemicals of concern (COCs) and their respective concentrations may be found in the “Site Characteristics” section.

- Baseline risk represented by the COCs may be found in the “Summary of Operable Unit Three Risks” section.

- Cleanup levels established for COCs and the basis for these levels can be found in the “Remedial Action Objectives” section.

- Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and the ROD can be found in the “Current and Potential Future Site and Resource Uses” section.

- Estimated capital, operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected can be found in the “Description of Alternatives” section.

- Key factors that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decisions) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

AUTHORIZING SIGNATURE:

Evangelista, Pat

Digitally signed by Evangelista, Pat
Date: 2020.09.29 19:32:41 -04'00'

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Pat Evangelista, Director
Superfund & Emergency Management Division
U.S. Environmental Protection Agency, Region II

Date

RECORD OF DECISION

DECISION SUMMARY

Ringwood Mines/Landfill Superfund Site
Ringwood Borough, Passaic County
New Jersey

U.S. Environmental Protection Agency
Region II
New York, New York
September 2020

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SITE NAME, LOCATION AND BRIEF DESCRIPTION

The Ringwood Mines/Landfill Superfund Site (Site), EPA ID #NJD980529739, consists of approximately 500 acres in a historic iron mining district in the Borough of Ringwood (Borough), Passaic County, New Jersey (see Appendix I, Figure 1). The Site, which is approximately 1.5 miles long and 0.5 miles wide, includes forested areas, areas of overgrown vegetation, abandoned iron mine pits and shafts, and a closed municipal landfill. Portions of the Site are currently used as State of New Jersey parkland (Ringwood State Park), utility corridors (Public Service Electric & Gas and Rockland Electric Company), Borough of Ringwood facilities, including a recycling center and a public works yard, a power sub-station and open space (Borough of Ringwood property). In addition, the Site area includes approximately 48 residential properties. Residents living within the boundaries of the Site currently receive their drinking water from the municipal water supply, which obtains water from well fields located in a different subwatershed approximately two miles southeast of the Site. The Site is drained by four brooks that ultimately lead to the Wanaque Reservoir, located approximately one mile south of the Site. The Wanaque Reservoir serves as a source of drinking water for over two million New Jersey residents.

Approximately 866 people live within one mile of the Site. Furthermore, approximately 200 people are estimated to live within the Site boundaries. Many of the residents living within the boundaries of the Site are members of the Ramapough Lenape Indian Nation, which is recognized as a Native American tribe by the State of New Jersey. Members of this community have strong ties to the land and hunt game and consume vegetation gathered from the Site.

EPA has been designated as the lead agency for cleanup of the Site, with the New Jersey Department of Environmental Protection (NJDEP) functioning in a support role. Investigations and cleanup actions conducted at the Site have been primarily funded by the Ford Motor Company (Ford), which has been identified as a potentially responsible party (PRP).

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The land which comprises the Site was utilized for the mining of iron ore almost continuously from the mid-1700s to the early 1900s. Mining operations conducted at the Site consisted of the crushing and grinding of the iron ore, with magnetic separation of the iron from the other ore constituents (tailings). It has been reported that much of the mine tailings were sold off and used for road dressing. However, mine tailings are found throughout the Site, including in a former mining pit (PMP) and a former low-lying area (OCDA) which was utilized for the settlement of waste mine tailings from wet ore processing operations.

In January 1965, the Ringwood Realty Corporation (RRC), a wholly-owned subsidiary of Ford, purchased more than 400 acres at the Site. Records indicate that, in 1967, the RRC entered into a contract with the O'Connor Trucking and Haulage Corporation (O'Connor Trucking) for the disposal of wastes generated at the Ford factory located in Mahwah, New Jersey. EPA believes that O'Connor Trucking disposed of various wastes which it received from Ford, including plant

trash, paint sludge, drummed waste and other non-liquid plant wastes, at the PMP, the CMP and the OCDA at the Site (see Appendix I, Figure 2).

In 1969, the RRC began selling or donating portions of the Site. In 1970, 290 acres of the Site were donated to the Ringwood Solid Waste Management Authority. During the same year, additional acreage was sold to the Public Service Electric and Gas Company for use as a transmission line right of way. In 1973, 109 acres were donated to NJDEP and added to the Ringwood State Park. In that same year, Housing Operation with Training Opportunity (HOW TO), a New Jersey not-for-profit corporation, accepted the donation of over 35 acres of the Site. It is believed that by December 21, 1973, the RRC no longer owned any land at the Site.

The results of a July 1982 site inspection conducted by NJDEP identified elevated levels of benzene, ethylbenzene, and xylene in water samples collected from the PMP Airshaft. These results led to the Site's inclusion on the NPL in 1983, making it eligible for Superfund cleanup.

In March 1984, Ford entered into an Administrative Order on Consent (AOC) with EPA which required the performance of a Remedial Investigation (RI) to determine the nature and extent of contamination at the Site. The required RI was conducted by Ford's contractor in four phases between March 1984 and April 1988. In June 1987, the EPA issued Unilateral Administrative Orders (UAOs) to Ford which required 1) the removal and off-site disposal of paint sludge and associated soil and 2) the performance of a Feasibility Study (FS) to evaluate potential cleanup options for any contamination remaining at the Site. Pursuant to these UAOs, in 1988, Ford completed an FS and removed over 7,000 cubic yards of paint sludge and associated soil from the Site. As part of this removal, surficial deposits of paint sludge were removed from the northern portion of the Site, near the PMP and the OCDA, and from an area near the CMP.

In September 1988, the EPA issued a Record of Decision (ROD) which selected long-term monitoring of groundwater and surface water as the remedy for the Site. The ROD noted that the known areas of paint sludge had been previously removed from the Site.

Additional paint sludge deposits and drums were identified in the OCDA in 1989, prompting the removal of 600 cubic yards of paint sludge and 54 drum remnants in 1990. Some of the drum contents were reported to have contained polychlorinated biphenyls (PCBs) at concentrations in excess of 50 parts per million (ppm).

In 1994, EPA deleted the Site from the NPL, believing that all paint sludge and drums of hazardous substances had been removed from the Site. The deletion was further supported by the determination that groundwater at the Site did not pose an unacceptable threat to human health and the environment.

From 1990 through 1995, Ford conducted a five-year Environmental Monitoring Program which provided for the sampling of monitoring wells and potable wells in the area of the Site. The results of this program indicated that groundwater contaminant levels had been reduced since paint sludge had been removed from the Site.

In 1995, EPA was notified by a local resident that additional paint sludge was located in a utility right-of-way near the CMP Area. This finding prompted the removal of an additional five cubic yards of paint sludge by Ford. In 1998, another resident notified EPA of the presence of paint sludge in the OCDA, prompting the removal of an additional 100 cubic yards of paint sludge and soil.

In September 2003, representatives of the Upper Ringwood residents wrote to EPA regarding their concern over past exposures and paint sludge remaining at the Site but provided no details regarding the location of remaining paint sludge at that time. Additional paint sludge areas were subsequently identified during an April 2004 Site visit arranged by the residents' representatives.

In December 2004, Ford began the voluntary removal of these surficial pockets of paint sludge identified at the Site. The discoveries of additional significant quantities of paint sludge at the Site prompted EPA to restore the Site to the NPL in September 2006. Overall, since December 2004, Ford has removed over 53,500 tons of paint sludge and associated soil from 15 distinct areas of the Site, in addition to the OCDA and the PMP Area.

In September 2005, Ford signed an AOC which required the performance of an additional RI and risk assessment for the Site. In May 2010, Ford signed an AOC which specifically required the performance of RIs and FSs for the PMP Area, CMP Area and the OCDA of the Site, as well as Site-related groundwater contamination. The Borough of Ringwood, which has also been identified as a PRP for the Site, coordinated with Ford on the performance of the RI/FSs for the Site, pursuant to UAOs issued by EPA.

In June 2014, EPA issued the Operable Unit Two (OU2) ROD for the Site. The OU2 ROD selected a remedy to address waste located in the PMP Area, CMP Area and OCDA of the Site. In addition, the OU2 ROD identified a contingency capping remedy for the OCDA, which would facilitate the Borough of Ringwood's plan to construct a new recycling center in this area, if within six months of the OU2 ROD the Borough could provide: (1) detailed engineering plans for the new recycling center; (2) financial assurance(s) indicating sufficient funds will be available for the construction of the recycling center; and (3) assurances and supporting documentation indicating that the construction of the contingency remedy, including the recycling center, could and would be completed within either a shorter or comparable timeframe as the selected remedy. In April 2015, based upon information submitted by the Borough of Ringwood, the EPA issued an Explanation of Significant Differences (ESD) to select the contingency remedy as the remedy for the OCDA of the Site.

In October 2014, Ford signed an AOC which required the preparation of the remedial design (RD) for the OU2 remedy. The Borough of Ringwood coordinated with Ford during the preparation of the OU2 RD pursuant to a UAO issued by EPA. The final OU2 RD Report was approved by EPA in October 2018. A judicial Consent Decree (CD), requiring Ford and the Borough of Ringwood to implement the OU2 remedy, was lodged with the Court on May 6, 2019. The public comment period on this CD closed on July 29, 2019. The U.S. Department of Justice filed a Motion to Enter the CD with the Court on December 17, 2019, and the Court entered the CD on August 5, 2020.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI and Focused Feasibility Study (FFS) Reports for site-related groundwater, and EPA's Proposed Plan for cleanup of groundwater and mine water contamination were released for public comment on January 30, 2020. These documents were made available to the public in the administrative record file at the Ringwood Public Library, located at 30 Cannici Drive, Ringwood, New Jersey, in the EPA Region II Records Center at 290 Broadway, New York City and on EPA's webpage at http://www.epa.gov/superfund/ringwood-mines. A notice of availability of the above-referenced documents was published in The Record on January 30, 2020.

A public comment period on these documents was originally scheduled to extend from January 30, 2020 through March 2, 2020. However, EPA received a request from U.S. Senator Cory Booker to extend the public comment period further in order to allow additional time for public consideration of and comment on the Proposed Plan. In response to this request, EPA provided an extension to the public comment period. Subsequently, EPA received and granted three additional requests for extension of the public comment period, which resulted in a public comment period that extended from January 30, 2020 through August 3, 2020.

In addition, EPA held a public meeting on February 10, 2020 at 7:00 pm at the Martin J. Ryerson Middle School in Ringwood, New Jersey to present the findings of the RI/FFS and EPA's Proposed Plan to the community and local officials. At this meeting, representatives of EPA answered questions concerning the remedial alternatives developed as part of the RI/FFS. Responses to comments received by EPA at this public meeting and in writing during the public comment period are included in the Responsiveness Summary (see Appendix VI).

In order to foster community involvement at the Site, EPA facilitated the formation of a Community Advisory Group (CAG), comprised of community members, local officials and other Site stakeholders. Representatives of EPA and NJDEP routinely attend CAG meetings in order to share Site information with the community. Furthermore, EPA has provided the CAG with technical assistance through its Technical Assistance Services for Communities (TASC) program. Under the TASC program, an environmental consultant has provided the CAG with an independent review of the RI/FFS, as well as other Site-related documents.

SCOPE AND ROLE OF OPERABLE UNIT

EPA often segregates cleanup activities at a site into different phases or operable units (OUs) so that cleanup of environmental media or areas that have been characterized can occur while the nature and extent of contamination in other media or areas is being investigated. Such a phased approach provides for site contamination to be addressed in a more expeditious manner. In keeping with this approach, EPA is addressing cleanup of the Site through immediate actions to address imminent threats to human health in three phases or OUs of long-term cleanup.

The Site was originally intended to be addressed as a single OU, complemented by removal actions. In September 1988, EPA issued a ROD for the entire Site, now designated as OU1. The ROD selected long-term monitoring of groundwater and surface water as the remedy for the Site.

As mentioned above, the Site was deleted from the NPL in 1994. However, in 2006, with the identification of additional significant paint sludge areas, EPA was prompted to restore the Site to the NPL.

Subsequent to the restoration of the Site to the NPL, EPA created two additional OUs, OU2 and OU3. OU2 addresses waste, fill material and soil located in the PMP Area, CMP Area and the OCDA. The OU2 remedy, as detailed in the June 2014 OU2 ROD and April 2015 ESD, provides for the excavation of fill material down to the water table and containment of remaining fill in the PMP, as well as the consolidation and containment of fill material in the CMP and OCDA. Under the 2014 AOC, Ford completed the design of the OU2 remedy in 2018 and will begin implementation of the OU2 remedy under the CD.

OU3, which is the subject of this ROD, addresses contaminated Site-wide groundwater and mine water in the PMP Airshaft. Cleanup alternatives were evaluated in the OU3 FFS.

OUs 1, 2 and 3 have been complemented by removal actions. Paint sludge and associated soil contamination located on non-residential properties outside of the PMP Area, CMP Area and OCDA have been addressed by Ford. Ford has removed over 53,500 tons of paint sludge and associated soil from 15 distinct areas of the Site, in addition to the OCDA and the PMP Area, since December 2004.

In addition, under removal authority, investigation and cleanup of residential properties at the Site has been conducted by EPA and NJDEP. In 2010, NJDEP obtained access to 18 residential properties at the Site in order to conduct investigations for Site-related contamination. NJDEP conducted soils investigations on these properties in 2010 and 2011 which showed the presence of elevated levels of lead on some properties. In the Fall of 2011, EPA initiated a removal action to delineate any contamination on additional residential properties at the Site and to remove any lead contaminated soils and paint sludge identified on the residential properties. A total of 37 residential properties were assessed by the EPA as part of this removal action, and lead-contaminated soil or paint sludge was removed from 23 of these properties, allowing all of the properties to continue to be used without restrictions.

SUMMARY OF SITE CHARACTERISTICS

The 500-acre Site is located in the northern portion of the Borough of Ringwood, Passaic County, New Jersey. The Site terrain is mountainous with peaks up to 900 feet above sea level and valleys which are generally below 500 feet in elevation. Bedrock in the valleys and other topographically low areas is covered by overburden which consists of unconsolidated and reworked glacial deposits and weathered bedrock. Groundwater at the Site occurs in both the overburden and bedrock.

The PMP Area is located in the north central part of the Site and is bounded to the north by Park Brook. Most of the PMP Area lies within the Ringwood State Park and is expected to remain in use as part of the park in the future. From 1967 through 1971, the 375-foot long, 200-foot wide and 90-foot deep mine pit was filled with waste, including paint sludge, from Ford's Mahwah facility. Aerial photographs from 1973 indicate that the PMP had been filled to the level of the

surrounding ground surface and covered with soil. Since this time, settling of the fill in this area has occurred and a 300-foot long pond currently occupies what was once the deepest part of the mine pit. This pond is believed to be an expression of the water table. A 230-foot deep flooded airshaft (PMP Airshaft) which intersects adits of the abandoned Peters Mine is located northeast of the mine pit.

The CMP Area is located in the southwestern part of the Site near a cul-de-sac at the southern end of Van Dunk Lane. The CMP was reportedly 180 feet long, 140 feet wide and 200 feet deep when mining operations ceased. Attempts were made to blast the pit closed when Ford purchased the property, which resulted in reducing the depth of the pit to approximately 60 feet. During the period of Ford ownership, the pit was reportedly filled to the ground surface with waste from Ford's Mahwah facility. Only minimal settling of the fill material has been noted in this area. Records indicate that there was a shaft at the base of the pit, which connected to other smaller mining pits, and an elevator shaft which is located approximately 500 feet east of the actual CMP. The opening of the 500-foot deep elevator shaft is currently sealed with sections of railroad track and a concrete slab and is enclosed by a chain-link fence.

The 12-acre OCDA is located to the south of the PMP Area along the Peters Mine Road. During the period of active mine operations, this area was utilized for the settling of waste mine tailings from wet ore processing operations. Subsequently, during the period of Ford ownership, the OCDA was utilized for the disposal of waste from Ford's Mahwah facility. The results of investigations conducted in this area indicate that waste and fill materials are present to a maximum depth of approximately 20 feet below ground surface. In general, a layer of undisturbed mine tailings underlies waste materials disposed of by Ford's contractor and other fill materials. The OCDA generally slopes to the east toward the Park Brook.

Paint sludge and other drummed industrial wastes originating from Ford's former Mahwah facility are the primary sources of contamination at the Site. However, levels of arsenic above New Jersey background soil levels have been found in some samples of mine tailings collected from the Site. Given that arsenic has also been found at elevated levels in some paint sludge samples collected from the Site, EPA believes that paint sludge is also a source of arsenic in other media at the Site.

The Site is drained by four brooks which include the Mine Brook, Peters Mine Brook, Park Brook and the North Brook. The Peters Mine Brook joins the Mine Brook along the southern boundary of the Site. Mine Brook then flows into the Ringwood Creek, just upstream of the Wanaque Reservoir. Park Brook, which flows adjacent to the PMP Area and the OCDA, and the North Brook, each flow into Sally's Pond and, subsequently, to the Ringwood Creek, about one mile upstream of the Wanaque Reservoir.

Site-Related Groundwater Remedial Investigation

From 2004 through 2014, groundwater samples were collected from up to fifty-five monitoring wells located at the Site in order to characterize groundwater quality and the nature and extent of groundwater contamination. These wells are primarily located in proximity to the PMP, CMP and the OCDA, as well as downgradient of the Site. During these sampling events, mine water samples were also collected from the flooded PMP Airshaft and Cannon Mine Elevator Shaft.

Groundwater sampling was conducted twice a year from 2004 through 2009 and on an annual basis from 2010 through 2014. In addition, from 2005 through 2012, a surface water sampling program was implemented to assess surface water quality in surface water bodies at the Site. As part of the surface water sampling program, samples were collected from the Mine Brook, Peters Mine Brook, Park Brook, North Brook, a pond near the PMP and two groundwater seep locations. Furthermore, a sediment pore water investigation was conducted in August and September 2014 to better characterize the potential for discharge of contaminants from the PMP through sediment pore water beneath the Park Brook. Also, during this investigation, sediment pore water samples were collected from beneath Park Brook.

Sediment investigations were conducted in 2005 and 2011 in the Mine Brook, Peters Mine Brook, Park Brook, North Brook, the PMP pond and the PMP Airshaft. In 2005, 10 sediment samples were collected from the above-referenced brooks to determine whether contaminants are present at levels which may be of ecological concern. Similarly, in 2011, six sediment samples were collected from the PMP pond to determine whether contaminants are present at levels of ecological concern. In October 2011, an additional sediment sample was collected from the base of the PMP Airshaft to evaluate whether this sediment serves as a source of the benzene and other contaminants detected in mine water.

In April 2007, video logging was conducted of the PMP Airshaft to the base of the shaft, located 232 feet below the water surface. During this investigation, two horizontal shafts were identified at approximate depths of 180 feet and 200 to 232 feet below the water surface. A pile of sediment/leafy debris was observed at the base of the shaft, but no waste materials were identified. Video logging of the Cannon Mine Elevator Shaft was conducted in March 2010. The video equipment was advanced to a depth of 379 feet before remnant debris from mining operations prevented further progress. Waste materials were not observed during the video logging.

O'Connor Disposal Area

Groundwater

Groundwater sampling associated with the OCDA indicated that no volatile organic contaminants (VOCs) were detected at levels above applicable New Jersey Groundwater Quality Standards (NJGWQSs) with the exception of methyl tertiary butyl ether (MTBE), which was only detected in one well associated with the OCDA during one groundwater sampling event in July 2009 at 171 µg/L, which exceeded the applicable NJGWQS of 70 µg/L. The MTBE was determined to be not Site-related. Bis(2-ethylhexyl) phthalate was the only semivolatile organic contaminant (SVOC) which was detected above its NJGWQS of 3 micrograms per liter (µg/L) in samples collected from two wells during the April 2007 groundwater sampling event. Bis(2-ethylhexyl) phthalate was detected in these wells at concentrations of 6.6 µg/L and 3.7 µg/L, respectively. However, bis(2-ethylhexyl) phthalate was not detected in groundwater samples associated with the OCDA during subsequent sampling events. Pesticides and PCBs were not detected at levels above NJGWQSs in any groundwater sample associated with the OCDA.

Arsenic has been sporadically detected above its NJGWQS of 3 µg/L in groundwater samples collected from five monitoring wells located in and immediately upgradient of the OCDA. In well OB-25, which is located immediately upgradient of the OCDA, arsenic was detected at concentrations up to 23.1 µg/L. However, in well OB-18, which is located hydrologically downgradient of the OCDA, arsenic has not been detected above its NJGWQS. Lead has also been sporadically detected above its NJGWQS of 5 µg/L in monitoring wells located in the OCDA. However, since 2011, lead has only been detected above its NJGWQS of 5 µg/L in well OB-25, which is located hydrologically upgradient of the OCDA. Furthermore, lead has not been detected above its NJGWQS in well OB-18, which is located hydrologically downgradient of the OCDA.

Surface Water

From 2005 through 2012, the results of surface water samples collected from the Park Brook near the OCDA did not indicate the presence of VOCs, SVOCs, PCBs or pesticides at concentrations that exceed applicable Surface Water Quality Standards (SWQSs). However, arsenic was detected in two of the surface water samples, collected in 2012, from Park Brook at concentrations which exceeded the SWQS of 0.017 µg/L. Arsenic was detected in these samples at concentrations of 0.72 µg/L and 2.0 µg/L, respectively. In addition, during the Park Brook 2005 surface water sampling event, antimony was detected at 6.4 µg/L, in one sample, above its SWQS of 5.6 µg/L

Cannon Mine Pit

Groundwater

Groundwater sampling associated with the CMP indicated that no VOCs were detected at levels above applicable NJGWQSs with the exception of benzene and trichloroethene (TCE). Benzene was detected above its NJGWQS of 1 µg/L at RW-9 during 2008 but not during subsequent sampling events. Benzene has also been sporadically detected at concentrations above its NJGWQS in well RW-8. TCE was detected above its NJGWQS of 1 µg/L in groundwater samples collected from well OB-3 during 2008 and 2009. TCE was detected at concentrations up to 13.7 µg/L in samples collected from well OB-3. However, TCE was not detected in this well during subsequent sampling events. Bis(2-ethylhexyl) phthalate was the only SVOC which was sporadically detected above its NJGWQS of 3 ug/L during pre-2013 groundwater sampling events. Pesticides and PCBs were not detected in any groundwater sample associated with the Cannon Mine Pit. Arsenic and lead are detected sporadically above their respective NJGWQSs in the CMP with no consistent spatial pattern.

Surface Water

From 2005 through 2012, the results of surface water samples collected from the Mine Brook near the Cannon Mine Pit did not indicate the presence of VOCs, pesticides or PCBs. Bis(2-ethylhexyl) phthalate is the only SVOC detected at levels above the SWQS of 1.2 µg/L in two upstream surface water samples collected in 2012. Bis(2-ethylhexyl) phthalate was detected in these samples at concentrations of 5.0 µg/L and 3.5 µg/L, respectively. Lead was detected in one

surface water sample collected in 2012 at a concentration of 5.6 µg/L, which exceeded its SWQS of 5.0 µg/L. Arsenic was detected at concentrations from 0.32 µg/L to 1.2 µg/L, in excess of the 0.017 µg/L SWQS.

Peters Mine Pit

Groundwater

Prior to 2014, sampling conducted in and immediately downgradient of the PMP indicated the presence of benzene in this area at levels which slightly exceeded the NJGWQS of 1 µg/L. However, sampling conducted in September 2014 indicated the presence of increased levels of benzene at a concentration of 56 µg/L. In addition, groundwater concentrations of benzene in a monitoring well, adjacent to the PMP, increased to 88 µg/L during the September 2014 sampling event. Samples collected from the PMP and adjacent wells during October 2014 indicated the presence of benzene at levels less than 10 µg/L, which is consistent with historic sampling results for this area. Bis(2-ethylhexyl) phthalate was the only SVOC which was sporadically detected above its NJGWQS of 3 µg/L. During the 2014 sampling event, bis(2-ethylhexyl) phthalate was detected in two monitoring wells in this area at concentrations of 3.6 µg/L and 6.6 µg/L, respectively. Pesticides and PCBs were not detected in samples. From 2006 through 2013, samples indicated the presence of lead at concentrations from 5.4 µg/L to 9.9 µg/L, which exceeds the NJGWQS of 5 µg/L. In addition, lead and arsenic have been sporadically detected at concentrations in excess of their NJGWQSs in monitoring wells located hydrologically upgradient and downgradient of the PMP.

Mine Water

Water samples collected from the PMP Airshaft through 2014 indicated that benzene was the only VOC detected at concentrations above its NJGWQS. Benzene was detected at concentration up to 26.4 µg/L in samples collected from the 180 feet below ground surface (bgs) sampling depth, and up to 33.2 µg/L in samples collected from the 230 feet bgs sampling depth.

SVOCs were not detected above their applicable NJGWQSs with the exception of bis(2-ethylhexyl) phthalate, which was detected sporadically. Lead was detected above its NJGWQS in water samples collected during the May 2008 and September 2014 groundwater sampling events. Arsenic was only detected in the PMP Airshaft at a concentration which exceeds its NJGWQS of 3 µg/L in a sample collected during September 2014.

Surface Water

From 2005 through 2012, the results of surface water samples collected from the Park Brook and North Brook near the PMP did not indicate the presence of VOCs, SVOCs, PCBs or pesticides. Arsenic was consistently detected above the SWQS of 0.017 µg/L in all surface water samples, including samples collected upstream of the PMP, with concentrations ranging from 0.35 µg/L to 0.65 µg/L. Thallium was also detected above its SWQS of 0.24 µg/L in two surface water samples collected from the Park Brook. Surface water samples collected from the pond in the PMP did not indicate the presence of VOCs, pesticides or PCBs. In addition, lead and arsenic

were not detected in pond surface water samples at concentrations which exceed applicable SWQSs. During the 2010, 2011 and 2012 groundwater sampling events, benzene was also detected in samples collected from a groundwater seep near the PMP at concentrations of 1.2 µg/L, 0.48 µg/L, and 0.85 µg/L, respectively. EPA believes that the benzene in the seep may originate from groundwater in the PMP Area. However, the results of sediment pore water samples collected from beneath Park Brook in August and September 2014 did not indicate the presence of VOCs, which suggests that benzene in groundwater is not discharging to the Park Brook at these sample locations.

In order to verify whether or not microbially enhanced natural attenuation mechanisms have affected the benzene concentrations in groundwater within the PMP Area, a stable isotope probe study using Bio-Trap® samplers was performed as part of the groundwater RI. Bio-Trap® samplers containing benzene marked with Carbon-13 were installed in the PMP Airshaft and monitoring wells in the PMP Area where benzene was historically detected. After 33 days, the Bio-Trap® samplers were removed and analyzed for the presence of petroleum-degrading bacteria, percent mass loss of Carbon-13-labeled benzene as well as the presence of Carbon-13-labeled benzene in the microbial community. Carbon-13 was incorporated into the biomass at all sampling locations, indicating that microbial communities capable of degrading benzene exist in PMP Area groundwater.

Site-Related Groundwater Remedial Investigation Addendum

During March 2015, groundwater sampling conducted in the PMP once again indicated the presence of benzene; benzene was present at 150 µg/L in the PMP and one well adjacent to the PMP had a concentration of 344 µg/L. These levels were much higher than historical levels at these locations which prompted the need for additional groundwater sampling to evaluate these spikes in benzene concentrations. In April and June 2015, additional groundwater sampling events were conducted in the PMP Area. The results of these sampling events indicated that benzene levels in groundwater in the PMP and adjacent monitoring wells had returned to historic levels of less than 10 µg/L.

However, during the April 2015 sampling, a groundwater split sample collected by the Borough of Ringwood indicated the presence of an emerging contaminant, 1,4-dioxane, in a sample collected from the PMP Airshaft at an estimated concentration of 25 µg/L. As a result, 1,4-dioxane was added to the compounds to be analyzed for during the August 2015 annual groundwater and surface water sampling event. These results indicated the presence of 1,4-dioxane at levels greater than its recently established NJGWQS of 0.4 µg/L in water samples collected from the PMP Airshaft, as well as monitoring wells located primarily in the PMP Area of the Site. 1,4-dioxane was also detected in surface water samples collected from Site brooks and ponds, with the exception of the Mine Brook, North Brook and the PMP Pond.

As a result of the detection of 1,4-dioxane at the Site, additional groundwater monitoring wells were installed in and downgradient of the PMP Area to define the extent of 1,4-dioxane in groundwater. Subsequently, from December 2015 until August 2017, seven rounds of groundwater and/or surface water sampling events were conducted. The results indicate that 1,4-dioxane and benzene are detected at their greatest concentrations (146 µg/L and 33 µg/L,

respectively) in water samples collected from the PMP Airshaft at a depth of 230 feet bgs. Levels of these contaminants showed decreasing trends at shallower sampling intervals in the PMP Airshaft. However, the results of these sampling events do not indicate that 1,4-dioxane or benzene in groundwater is migrating off the Site property at concentration in excess of their applicable NJGWQSs of 0.4 µg/L and 1 µg/L, respectively.

Sampling results also indicate the presence of 1,4-dioxane in the Park Brook upstream of Sally's Pond and in the groundwater seeps near the PMP at concentrations up to 4.78 µg/L. However, 1,4-dioxane has consistently been detected at concentrations of less than 1 µg/L in surface water samples collected at the confluence of Park Brook and Sally's Pond and is undetected in surface water downstream of Sally's Pond. Furthermore, a numerical analysis conducted as part of the groundwater RI utilizing historic surface water flow data for the Wanaque Reservoir indicated that 1,4-dioxane would continue to be non-detect in surface water at the confluence of Ringwood Creek and the Wanaque Reservoir. Therefore, Site-related impacts on the Wanaque Reservoir are not anticipated.

While residents at and near the Site receive their potable water from the Borough of Ringwood's municipal water supply system, a private well search was conducted within a one-mile radius of the Site. The results identified five potable wells located at the Ringwood State Park and one potable well located at a nearby elementary school. In August 2018, water samples were collected from all of these potable wells and analyzed for VOCs, SVOCs, including 1,4-dioxane, PCBs and metals. 1,4-dioxane and benzene were not detected in any of samples collected from these potable wells. Furthermore, no compounds were detected at concentrations greater than their applicable NJGWQS or drinking water standard in any of the potable well samples.

Saint George's Pit Area Soil Investigation

In order to investigate the nature and extent of fill material located in a suspected disposal area near the center of the Site, in December 2010, a soil investigation was conducted in the Saint George's Pit Area which included the excavation of 1430 linear feet of test trenches and the installation of 15 soil borings to characterize the fill material. The results of this investigation indicated that the Saint George's Pit Area had been utilized for the disposal of common garbage. Paint sludge and other hazardous or industrial wastes were not identified in this area of the Site. Therefore, it was determined that this area did not warrant further action under the Superfund program.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Portions of the Site are currently used as State of New Jersey parkland (Ringwood State Park), utility corridors (Public Service Electric & Gas and Rockland Electric Company), Borough of Ringwood facilities, including a recycling renter and a public works yard, a power sub-station and open space (Borough of Ringwood property). In addition, 48 residential properties are located throughout the Site.

The land that comprises the PMP Area is currently used for recreational purposes as part of the Ringwood State Park and is expected to remain in use as part of the State Park after implementation of the OU2 remedy. The CMP Area of the Site is currently zoned for residential use. However, implementation of the OU2 remedy will result in the installation of a soil cap over the CMP Area and deed restrictions designed to protect the soil cap. Any future use of this area of the Site will need to be in compliance with these deed restrictions. Furthermore, the Borough of Ringwood has approved plans to relocate the Borough of Ringwood's recycling center to the OCDA after implementation of the OU2 remedy. The area which comprises the current Borough of Ringwood recycling center will be revegetated in accordance with an NJDEP-approved riparian zone restoration plan.

Groundwater beneath the Site has been designated as Class IIA groundwater by the State of New Jersey for the intended use as a potable water supply. However, residents at the Site currently obtain their drinking water from the public water supply, which draws its water from well fields located in a different subwatershed approximately two miles from the Site. During periods of high demand, the Borough of Ringwood may also obtain drinking water from the North Jersey District Water Supply Commission.

SUMMARY OF RISKS – OPERABLE UNIT THREE

As part of the RI/FFS for Site-related Groundwater, a baseline risk assessment was conducted to estimate the current and future effects of contaminants that currently exist in water at the Site on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land, groundwater and surface water/sediment uses. The baseline risk assessment includes a human health risk assessment (HHRA) and an ecological assessment.

Human Health Risk Assessment for Site-Related Groundwater

An HHRA is an analysis of the potential adverse human health effects caused by exposure to hazardous substances in the absence of any action to control or mitigate these exposures under current and future land uses. The HHRA provides the basis for taking an action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action.

A four-step process is utilized for assessing Site-related cancer risks and noncancer health hazards. The four-step process is comprised of:

Hazard Identification - uses the analytical data collected to identify chemicals of potential concern (COPCs) at a site for each medium, based on several factors such as toxicity, frequency of occurrence, and concentration;

Exposure Assessment - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed (i.e., ingesting contaminated groundwater) under both current and reasonably anticipated future land uses;

Toxicity Assessment - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of effect (response); and

Risk Characterization - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. The risk characterization identifies contaminants with concentrations which exceed acceptable levels, defined by the NCP as an excess lifetime cancer risk greater than 1×10^{-6} to 1×10^{-4}, for cancer, and a Hazard Index (HI) of greater than 1 for noncancer health hazards. Chemicals with concentrations that exceed these guidelines are considered chemicals of concern (COCs) for the Site and are typically those that will require remediation. The uncertainties associated with the risk calculations are also evaluated under this step.

Site-wide Groundwater

Hazard Identification

The identification of COPCs for OU3 groundwater was conducted in two phases. First, the frequency of detection of compounds in Site-wide data for groundwater was determined. Any compound in groundwater with a detection frequency of less than five percent was excluded from further analysis. Second, the remaining compounds were compared with risk-based screening criteria to identify COPCs for groundwater. Additionally, all compounds which have been determined to be known human carcinogens were retained as COPCs regardless of their detection frequency or comparison to risk-based screening criteria.

The maximum detected concentrations in groundwater samples were compared to EPA's Risk-based Screening Levels (RSLs) for Tap Water. If the maximum detected concentration of any compound exceeded the applicable RSL, it was retained as a COPC. COPCs identified for groundwater include VOCs, SVOCs and metals, including benzene, 1,4-dioxane, arsenic and lead. A comprehensive list of all Site COPC can be found in the Table 2 series of the May 2018 Addendum to the Baseline Human Health Risk Assessment Calculations for Site-Related Groundwater.

Exposure Assessment

Consistent with Superfund policy and guidance, the HHRA assumes no remediation or institutional controls are implemented to address any hazardous substances currently in groundwater at the Site. Furthermore, cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a site.

While the Upper Ringwood community does not currently use groundwater at the Site as a potable water source, the State of New Jersey classifies the aquifers at the Site as Class IIA, meaning that groundwater at the Site could theoretically be used for potable purposes in the

future. Therefore, a hypothetical future resident exposure scenario was evaluated for potential exposure to Site-related groundwater if used as a potable water source. A hypothetical future resident was assumed to be exposed to Site-related groundwater through ingestion as drinking water as well as through inhalation and dermal contact while showering or bathing. Three age categories were evaluated for this hypothetical resident scenario: an adult (age of 17 - 30 years), an older child (age of 7 - 16 years), and a young child (age of 1 - 6 years).

Typically, exposures are evaluated using a statistical estimate of the exposure point concentration (EPC), which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. For groundwater, the lower of the maximum concentration or the 95 percent upper confidence limit (UCL) of the average concentration was used as the EPC for each COPC, with the exception of lead. For lead, the average concentration was chosen as the EPC, which is consistent with national guidance for evaluating exposure to lead.

Toxicity Assessment

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to site-related chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, cancer risks and noncancer hazards associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer-Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values (OSWER Directive 9285.7-53, December 5, 2003). This information is presented in Appendix III, Table 2 (noncancer toxicity data summary for oral/dermal and inhalation) and Tables 3 (cancer toxicity data summary for oral/dermal and inhalation) for benzene, 1,4-dioxane and lead, which have been identified as COCs. Additional toxicity information for all COPCs is presented in the May 2018 Addendum to the Baseline Human Health Risk Assessment Calculations for Site-Related Groundwater.

EPA has not published conventional quantitative toxicity values for lead because available data suggests a very low or no threshold for adverse effects, even at background levels. However, the toxicokinetics of lead are well understood and, as a result, lead is regulated based on the blood lead concentration. In lieu of evaluating current and future risks using typical intake calculations and toxicity criteria, EPA developed models to evaluate lead exposure. For this HHRA, blood lead concentrations in young children were estimated using the Integrated Exposure Uptake Biokinetic (IEUBK) model. Currently, EPA's health-based goal for blood lead levels in children is no more than five percent of the population having greater than 5 micrograms per deciliter (µg/dL).

Risk Characterization

This step combined outputs of the exposure and toxicity assessments to provide a quantitative assessment of risks related to Site-wide groundwater. The potential risk of developing cancer and the potential for noncancer health hazards were determined.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the NCP, the acceptable risk range for site-related exposure is 10^{-4} to 10^{-6}, which corresponds to a one-in-ten-thousand to a one-in-a-million excess cancer risk.

Noncancer hazards were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated soil) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1 indicates that the potential

exists for noncancer health effects to occur as a result of Site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

The cumulative potential cancer risk for all COPCs calculated for the hypothetical future resident scenario with exposure to Site-related groundwater for the adult, older child (or youth), and young child is $2x10^{-4}$, which slightly exceeds EPA's target cancer risk range of $1x10^{-6}$ to $1x10^{-4}$, primarily due to the presence of arsenic, which is only detected sporadically in Site groundwater at levels which exceed its NJGWQS. However, the cumulative potential cancer risk calculated for benzene and 1,4-dioxane, which have been identified as COCs, falls within EPA's target cancer risk range of $1x10^{-6}$ to $1x10^{-4}$. Potential noncancer risks were also estimated by calculating hazard indices. Hazard indices assessed by target organ for the hypothetical future resident scenario for the adult, older child, and young child, are all at or below EPA's target hazard index limit of 1.

Anticipated blood lead levels in Site receptors were also evaluated to determine whether the potential exposure to lead, another site COC, in groundwater at the Site presents an unacceptable risk. Estimated blood lead levels following potential exposure to lead in Site-related groundwater for a young child resident are predicted to exceed 5 µg/dL blood lead level in 4% of the hypothetically exposed population, which is below EPA's risk reduction goal (no more than 5% exceeding 5 µg/dL).

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. The sampling locations may not accurately reflect the range, frequency and distribution of compounds at the Site. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a

mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site and is highly unlikely to underestimate actual risks related to the Site.

While the IEUBK model is capable of estimating potential risk to the young child from lead concentrations in all relevant media, the Adult Lead Model is limited to lead concentrations in soil. Therefore, potential risks from lead reported in Site-related groundwater could not be calculated for the adult and older child hypothetical future resident scenarios. This limitation results in a potential underestimation of risks associated with lead concentrations in Site-related groundwater to the adult and older child hypothetical future resident.

Peters Mine Pit Airshaft Mine Water

Hazard Identification

The identification and screening of COPCs for mine water in the PMP Airshaft was conducted as described above in the *Hazard Identification* section for Site-wide Groundwater. COPCs identified for mine water include VOCs, SVOCs and metals, including benzene, 1,4-dioxane, arsenic and lead. A comprehensive list of all Site COPC can be found in the Table 2 series of the May 2018 Addendum to the Baseline Human Health Risk Assessment Calculations for Site-Related Groundwater.

Exposure Assessment

For mine water in the PMP Airshaft, cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure expected to occur under current and future conditions at the Site.

Given the hydrologic connectivity of the mines to aquifers at the Site, a hypothetical future resident exposure scenario was evaluated for potential exposure to mine water in the PMP Airshaft if used as a potable water source. A hypothetical future resident was assumed to be exposed to mine water through ingestion as drinking water, as well as through inhalation and dermal contact while showering or bathing. Three age categories were evaluated for this hypothetical resident scenario: an adult (age of 17 - 30 years), an older child (age of 7 - 16 years), and a young child (age of 1 - 6 years).

Typically, exposures are evaluated using a statistical estimate of the EPC, which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. For mine water in the PMP Airshaft, the lower of the maximum concentration or the 95 percent UCL of the average concentration was used as the EPC for each COPC, with the exception of lead. For lead, the average concentration was chosen as the EPC, which is consistent with national guidance for evaluating exposure to lead.

Toxicity Assessment

Toxicity data for mine water COPCs were identified as discussed in the *Toxicity Assessment* section for Site-wide Groundwater. This information is presented in Appendix III, Table 2 (noncancer toxicity data summary for oral/dermal and inhalation) and Table 3 (cancer toxicity data summary for oral/dermal and inhalation) for benzene and 1,4-dioxane, which have been identified as COCs. Additional toxicity information for all COPCs is presented in the May 2018 Addendum to the Baseline Human Health Risk Assessment Calculations for Site-Related Groundwater.

Risk Characterization

Potential cancer risks and noncancer hazards related to exposure to mine water in the PMP Airshaft were quantified as discussed in the *Risk Characterization* section for Site-wide Groundwater. A summary of the potential cancer risks and noncancer health hazards for each exposure pathway for COCs is presented in Appendix III, Tables 5 and 4.

The cumulative potential cancer risk for all COPCs calculated for the hypothetical future resident scenario for exposure to mine water in the PMP Airshaft for the adult, older child (or youth), and young child is $4x10^{-4}$, which exceeds EPA's target cancer risk range of $1x10^{-6}$ to $1x10^{-4}$. Furthermore, the cumulative potential cancer risk calculated for the COCs benzene and 1,4-dioxane for the hypothetical future resident scenario for exposure to mine water is $2x10^{-4}$, which also exceeds EPA's target cancer risk range of $1x10^{-6}$ to $1x10^{-4}$. Potential noncancer risks were also estimated by calculating hazard indices. Hazard indices assessed by target organ for the COCs for the hypothetical future resident scenario for the adult, older child, and young child are all at or below the EPA's target hazard index limit of 1.

Anticipated blood lead levels in Site receptors were also evaluated to determine whether exposure to lead, another site COC, in mine water in the PMP Airshaft presents an unacceptable risk. Estimated blood lead levels following potential exposure to lead in PMP Airshaft mine water for a young child resident are predicted to exceed 5 µg/dL blood lead level in 26% of the hypothetically exposed population, which is above EPA's risk reduction goal (no more than 5% exceeding 5 µg/dL).

Uncertainties

The uncertainties associated with the procedures and inputs used to assess risks for mine water in the PMP Airshaft are the same as discussed in the *Uncertainties* section for Site-wide Groundwater.

Ecological Assessment

A Site-Related Groundwater Ecological Assessment (EA) was completed to evaluate the potential of risk to ecological receptors associated with exposure to contaminants in groundwater at the Site. However, because ecological receptors are not directly exposed to groundwater, constituents in groundwater at the Site were determined to only be of concern if they discharge to

surface water at concentrations of concern. Therefore, only constituents which were detected at concentrations above ecologically based screening levels (EBSLs) in both groundwater and surface water were identified as constituents of potential ecological concern. The results of this screening indicated that only total (unfiltered) aluminum, barium, copper, and manganese as well as dissolved (filtered) manganese were detected at maximum concentrations in groundwater and surface water which exceeded applicable EBSLs. Benzene and 1,4-dioxane were not detected at concentrations which exceeded their respective EBSLs. However, when potential risk under more realistic exposure assumptions (*e.g.*, 95% Upper Confidence Limit and dissolved metal concentrations) was evaluated, only dissolved manganese exceeded the applicable EBSL. It should be noted that manganese is naturally occuring at the Site and its presence in groundwater is likely associated with native soil and bedrock, as well as historic mining activities.

Potential ecological risk associated with exposure to sediment at the Site was also evaluated. There are no risks to ecological receptors from exposure to Site contaminants of potential ecological concern in sediment.

Basis for Remedial Action

The HHRA for Site-Related Groundwater demonstrates that unacceptable excess lifetime cancer risks may result if future residents were to use mine water in the PMP Airshaft as a potable water source, due to the presence of benzene and 1,4-dioxane. Furthermore, mine water in the PMP Airshaft has been determined to be hydraulically connected to the surrounding groundwater aquifer, which has also been contaminated with benzene and 1,4-dioxane.

The response action selected in this ROD is necessary to protect public health, welfare or the environment from actual or threatened releases of hazardous substances, pollutants or contaminants from the Site.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) were identified for groundwater and mine water at the Site in order to develop cleanup alternatives to address the human health risks presented by potential exposure. Groundwater beneath the Site is classified by the NJDEP as Class IIA, which means that it has the potential for use as a potable water source. Furthermore, data indicate that a hydrologic connection exists between groundwater and mine water at the Site. Based on the Class IIA aquifer designation, and the results of the risk assessments, the RAOs for Site-related groundwater include:

- Prevent exposure to groundwater and mine water containing contaminant concentrations above their respective NJGWQS.

- Restore the aquifer outside of the capped mine shaft area to Class IIA NJGWQSs.

- Reduce or eliminate the potential for migration of contamination above NJGWQSs.

Consistent with the identified RAOs, the remediation goals (RGs) for groundwater outside of the mine shaft area are the applicable Class IIA NJGWQSs for identified Site COCs. Therefore, the groundwater RGs are 1 µg/L and 0.4 µg/L for benzene and 1,4-dioxane, respectively. In addition to benzene and 1,4-dioxane, lead is considered a COC in mine water.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1) requires that each remedial alternative be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery technologies to the maximum extent practicable. In addition, Section 121(b)(1) establishes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility or volume of hazardous substances. CERCLA §121(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants which at least attains Applicable or Relevant and Appropriate Requirements (ARARs) under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Potential applicable technologies and process options were identified and screened using effectiveness, implementability and cost as the criteria, with the most emphasis on the effectiveness of the remedial technology. Those technologies and process options which passed the initial screening were assembled into remedial alternatives for Site-wide Groundwater and the PMP Airshaft.

The construction time for each of the alternatives for Site-wide Groundwater and the PMP Airshaft only reflects the time necessary to construct the alternative and does not include the time required to conduct pre-design investigations, design the remedy, negotiate the performance of the remedy with the PRPs or procure contracts for the design and construction of the remedy.

Site-wide Groundwater

Alternative 1 – No Action

The No Action alternative would not include implementation of any remedial action for groundwater. The No Action Alternative was retained, as required by the NCP, and provides a baseline for comparison with other alternatives.

Total Capital Cost	$0
Operation and Maintenance	$0 (Total)[1]
Total Present Worth	$0
Construction Duration	0 months

Alternative 2 – Monitoring with Institutional Controls

[1] Value represents total present net worth of Operation and Maintenance costs.

This alternative would include active monitoring of groundwater quality and the attenuation processes that are expected to continue to reduce the mobility, toxicity, and volume of Site contaminants in groundwater over time. A long-term groundwater monitoring plan would be implemented which would provide for the monitoring of contaminant concentrations and biogeochemical parameters from groundwater monitoring wells located in and downgradient of the PMP Area, CMP Area and OCDA. Groundwater elevations would be collected prior to sampling at each of the monitoring well locations in order to confirm groundwater contours for the sampling event. This alternative also provides for the installation of additional groundwater monitoring wells downgradient of the PMP Area, CMP Area and OCDA which, along with existing monitoring wells, would serve as a sentinel monitoring well network to provide advanced warning of any movement of groundwater contamination toward drinking water resources. In addition, surface water monitoring would be conducted in and downstream of the Site brooks to confirm that Site-related contaminants are not threatening downstream receptors, including the Wanaque Reservoir. Finally, a CEA/WRA would be established as an institutional control to restrict future withdrawal and use of Site groundwater which contains contaminants at concentrations in excess of NJGWQSs. A CEA/WRA is required pursuant to New Jersey regulations for groundwater to document the area where water quality standards cannot be met and limit installation of groundwater extraction wells. Sufficient groundwater sampling would be conducted to estimate the extent and duration of the CEA/WRA. Five-year reviews would be required until groundwater reaches remedial goals.

Total Capital Cost	$248,000
Operation and Maintenance	$1,191,000 (Total)
Total Present Worth	$1,439,000
Construction Duration	6 months

Alternative 3 – In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area

Under this alternative, in-situ treatment, likely oxidation, would be implemented to promote and support the degradation of groundwater contaminants through attenuation processes. Introduction of an oxygen release compound (ORC) to the aquifer may be accomplished through wells that EPA currently anticipates would be installed in a barrier-style configuration perpendicular to the direction of groundwater flow. The principal location for these wells would be in the overburden. The focus on the overburden is due to the difficulty of introducing any material into a low-yield fractured bedrock environment and the fact that groundwater flow within the area downgradient of the PMP is generally upward from the bedrock, into the overburden, and ultimately to surface water. Therefore, a portion of the bedrock groundwater would pass through an oxygen-enriched overburden aquifer. The radius of influence for diffusion of ORC varies with formation characteristics but is typically limited. Therefore, a well spacing of approximately 20 feet is assumed to estimate alternative costs. The recommended barrier arrangement of wells is situated adjacent to an existing gravel access road for ease of access and downgradient of the PMP and PMP Air Shaft where Site contaminants have typically been detected at their highest concentrations (see Figure 5).

Wells for introduction of oxygen into the bedrock aquifer may also be installed on a limited scale. These bedrock aquifer wells may be installed in key areas where contaminants have been detected at their highest concentrations (see Figure 6). Given the difficulty of promoting movement of any additives in the low-yield bedrock formation, these wells would be assessed during the initial period of enhancement; and, if diffusion of oxygen is not demonstrated, the use of the bedrock wells may be terminated. Specific details concerning well placement and ORC application would be determined during design of this alternative.

1,4-dioxane has been found at concentrations exceeding its NJGWQS in OCDA monitoring well OB-17. However, a focused investigation in the area upgradient of monitoring well OB-17 did not identify a source of 1,4-dioxane. 1,4-dioxane was not detected in paint sludge and soil samples collected during this investigation which suggests the possibility of some diffuse source of 1,4-dioxane in the area of well OB-17. Under this alternative, ORC may also be introduced into this monitoring well to promote biodegradation of 1,4-dioxane in this localized area.

This alternative would also provide for the implementation of the long-term groundwater monitoring plan and surface water monitoring plan, described in Alternative 2. Furthermore, a CEA/WRA would be established as an institutional control to restrict future withdrawal and use of Site groundwater which contains contaminants at concentrations in excess of NJGWQSs. Sufficient groundwater sampling would be conducted to estimate the extent and duration of the CEA/WRA. Five-year reviews would be required until groundwater reaches remedial goals.

Total Capital Cost	$631,000
Operation and Maintenance	$2,184,000 (Total)
Total Present Worth	$2,815,100
Construction Duration	12-18 months

Peters Mine Pit Airshaft

Alternative 1 – No Action

The No Action alternative would not include implementation of any remedial action in the Peters Mine Pit Airshaft. The No Action Alternative was retained, as required by the NCP, and provides a baseline for comparison with other alternatives.

Total Capital Cost	$0
Operation and Maintenance	$0 (Total)
Total Present Worth	$0
Construction Duration	0 months

Alternative 2 - Oxygen Diffusion in the Peters Mine Pit Airshaft

Under this alternative, canisters of ORC would be installed at various depths within the PMP Airshaft to enhance the aerobic biodegradation of organic contaminants contained in the mine water. The focus of the canisters would be on the lower portion of the airshaft where the concentrations of organic contaminants are highest and where the water is less oxygenated. To

promote aerobic conditions, it is assumed that the canisters of ORC would be installed horizontally and vertically across the lower part of the PMP Airshaft.

In order to implement this alternative, a concrete cap would be installed across the PMP Airshaft with locking sleeves installed through the cap from which ORC canisters would be suspended on cables. Existing sampling tubes would be extended through the cap to allow for the monitoring of mine water at various depths to assess the effects of aerobic conditions on organic contaminants in mine water. Replacement of the ORC canisters would occur as necessary to maintain appropriate aerobic conditions. Because contamination would remain above levels that allow for unlimited use and unrestricted exposure, five-year reviews would be required.

Total Capital Cost	$91,000
Operation and Maintenance	$261,000 (Total)
Total Present Worth	$352,000
Construction Duration	6-12 months

Alternative 3 - Treatment/Closure in the Peters Mine Pit Airshaft

Under this alternative, the PMP Airshaft would be closed using conventional mine shaft closure technology. In addition, prior to closure, GAC and resin would be introduced into the shaft to treat organic contaminants.

While details regarding the introduction of treatment materials and closure of the PMP Airshaft would be determined during the design of the alternative, it is anticipated that GAC and angular stone would first be introduced to the base of the PMP Airshaft. Resin would also be introduced in canisters or socks and lowered to the base of the shaft. Subsequent to this treatment step, fast-setting grout would be placed so that it would not flow into the GAC, resin and angular stone or the adjacent mine openings. Flowable flyash/concrete grout would then be placed above the fast-setting grout to the top of the PMP Airshaft, fully sealing the shaft. A poured concrete slab would then be placed above the grout to serve as a final closure surface.

It is estimated that closure of the shaft would result in the displacement of approximately 450,000 gallons of mine water which would need to be addressed. EPA currently assumes that the displaced water would be treated through filtration and GAC and then discharged to groundwater, in accordance with New Jersey requirements. Because contamination would remain above levels that allow for unlimited use and unrestricted exposure, five-year reviews would be required.

Total Capital Cost	$598,000
Operation and Maintenance	$0 (Total)
Total Present Worth	$598,000
Construction Duration	12-18 months

Alternative 4 – Peters Mine Pit Airshaft Closure

Under this alternative, the PMP Airshaft would be closed using conventional mine shaft closure technology. However, treatment of organic contaminants would not occur.

Angular stone or quick-setting grout could be used as a stabilizing course at the base of the shaft to prevent the movement of material into the adjacent mine openings. Flowable flyash/concrete grout would then be placed above the fast-setting grout to the top of the PMP Airshaft, fully sealing the shaft. Bentonite would be added to the grout in order to reduce its permeability. A poured concrete slab would then be placed above the grout to serve as a final closure surface.

It is estimated that closure of the shaft would result in the displacement of approximately 450,000 gallons of mine water which would need to be addressed. EPA currently assumes that the displaced water would be treated through filtration and GAC and then discharged to groundwater, in accordance with New Jersey requirements. Because contamination will remain above levels that allow for unlimited use and unrestricted exposure, five-year reviews would be required.

Total Capital Cost	$646,000
Operation and Maintenance	$0 (Total)
Total Present Worth	$646,000
Construction Duration	12-18 months

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting remedies for Sites, EPA considers the factors set out in CERCLA Section 121, 42 U.S.C. § 9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR § 300.430(e)(9), EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies,* and OSWER Directive 9355.3-01. The detailed analysis consists of an assessment of the individual alternatives against each of nine evaluation criteria at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against the criteria.

Threshold Criteria - The following two criteria are known as "threshold criteria" because they are the minimum requirements that each alternative must meet in order to be eligible for selection as a remedy:

1. *Overall Protection of Human Health and the Environment:* Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

2. *Compliance with applicable or relevant and appropriate requirements (ARARs):* Section 121 (d) of CERCLA and NCP § 300.430(f) (1) (ii) (B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively

referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the ARARs of other Federal and State environmental statutes or provides a basis for invoking a waiver.

Primary Balancing Criteria - The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions:

3. *Long-term effectiveness and permanence:* A similar degree of long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

4. *Reduction of toxicity, mobility, or volume through treatment:* Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

5. *Short-Term Effectiveness:* Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

6. *Implementability:* Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

7. *Cost*: Includes estimated capital and O&M costs and net present worth value of capital and O&M costs.

Modifying Criteria - The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred alternative or cause another response measure to be considered.

8. *State acceptance:* Indicates whether based on its review of the RI/FFS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected remedies.

9. *Community acceptance:* Summarizes the public's general response to the remedial alternatives described in the Proposed Plan and the FFS report. This assessment includes determining which of the remedial alternatives the community supports, opposes, and/or has reservations about.

A comparative analysis of the remedial alternatives considered for Site-wide groundwater and mine water in the PMP Airshaft, based upon the above evaluation criteria, follows.

Site-wide Groundwater

Overall Protection of Human Health and the Environment

Alternative 1 would not provide for protection of human health and the environment as no action would be taken to remediate impacted groundwater or to prevent the potential future use of this water as drinking water. Therefore, Alternative 1 would not meet the remedial goals.

Alternatives 2 and 3 provide for the establishment of a CEA/WRA, which is an institutional control which would serve to prevent the future use of impacted groundwater at the Site as drinking water. This documents the area where water quality standards cannot be met and also limits the installation of groundwater extraction wells. Furthermore, Alternatives 2 and 3 would use naturally occurring attenuation mechanisms to restore the aquifer to Class IIA NJGWQSs. Therefore, Alternatives 2 and 3 are expected to meet all of the RAOs over time and are considered protective of human health and the environment. However, it should be noted that the ability of Alternatives 2 or 3 to meet the RAO of restoring the aquifer to Class IIA NJGWQS is not certain because of the absence of a defined source, the natural presence of certain contaminants at the Site, and the potential presence of sources related to the historic mine workings.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Class IIA NJGWQSs are ARARs for Site-wide Groundwater. Alternative 1 would not comply with ARARs. In addition, because no remedial action would be taken under Alternative 1, this alternative would not meet the RAOs of restoring the aquifer to Class IIA NJGWQSs nor would it reduce or eliminate the potential for migration of contamination above NJGWQS.

Alternatives 2 and 3 provide for establishment of a CEA/WRA and would comply with State of New Jersey requirements for controlling use of groundwater by a CEA/WRA. In addition, Alternatives 2 and 3 are designed to meet the NJGWQS ARARs over time through the use of natural attenuation mechanisms. It should also be noted implementation of Alternatives 2 and 3 may require the installation of additional monitoring wells in wetland and flood plain areas which would be conducted in accordance with New Jersey requirements concerning disturbance of these areas. Therefore, Alternatives 2 and 3 are expected to comply with all ARARs.

Long-Term Effectiveness and Permanence

Alternative 1 does not include a CEA/WRA, and therefore, a mechanism to ensure protectiveness over the long term would not be in place. Therefore Alternative 1 would not be effective in the long-term.

Alternatives 2 and 3 would be effective in the long-term through maintenance of the institutional control provided by the CEA/WRA. As long as the CEA/WRA is in effect, these alternatives would be protective by preventing the use of impacted groundwater.

Alternatives 2 and 3 would be similar with respect to permanence as they both rely upon the use of natural attenuation mechanisms to reduce concentrations of contaminants in groundwater naturally, over the long-term, with the objective of achieving restoration of the aquifer. However, the ongoing addition of ORC and nutrients under Alternative 3 is intended to improve the effectiveness of the natural attenuation mechanisms and shorten the timeframe to restore the aquifer to Class IIA NJGWQSs.

Reduction of Toxicity, Mobility, or Volume Through Treatment

The No Action Alternative would not include any removal or treatment-based remedial actions to reduce toxicity, mobility, or volume of contaminants in groundwater.

Alternatives 2 and 3 would reduce the toxicity and mobility of contaminants present in groundwater through the natural attenuation mechanisms of biodegradation, advection, and dispersion. In addition, redox conditions within and downgradient of the PMP Area help to inhibit the mobility of soluble metals in the downgradient direction. Monitoring would be conducted to confirm these processes are maintained.

Alternative 3 is the only alternative that includes an active measure as it requires in-situ treatment of groundwater to support and enhance natural attenuation mechanisms, aiding the positive effects of redox conditions, and thus would enhance the reduction of toxicity and mobility of contaminants.

Short-Term Effectiveness

The No Action Alternative includes no construction or remedial activities and would have no short-term impacts. For Alternatives 2 and 3, remedial construction activities would be limited, would not have any significant short-term impacts and would occur over a relatively short

duration. Alternative 2 would involve the installation of additional groundwater monitoring wells and establishing compliance with the substantive requirements of state law and may take 6 months to implement. Alternative 3 would require the installation of additional wells downgradient of the PMP Area for in-situ treatment of groundwater and is estimated to take 12 to 18 months to implement. Health and safety of workers and the public would be maintained during the installation of these wells utilizing safeguards, as provided for in a Site-specific health and safety plan, to limit short-term exposure risks.

Implementability

Alternatives 1 does not have implementation components. The administrative task of setting up the CEA/WRA, a component of Alternatives 2 and 3, is readily accomplished through coordination with the NJDEP.

Alternatives 2 and 3 are readily implemented with conventional equipment and materials available in the marketplace. While Alternatives 2 and 3 may require consultation with NJDEP to reach compliance on substantive requirements for well installations and placement of ORC in the aquifer, impediments to establishing compliance are not anticipated.

Cost

Alternative 1 would have no cost as no action would be required.

Alternative 2, which provides for establishment of a CEA/WRA and long-term groundwater monitoring, has an estimated cost of $1,439,000. Alternative 3, which provides for the introduction of an ORC into the aquifer to enhance the degradation of organic contaminants in addition to establishment of a CEA/WRA and long-term monitoring, is estimated to cost $2,815,000.

The cost estimates included in this ROD are expected to be accurate within a range of +50 percent to -30 percent. Total present worth costs were calculated assuming a discount rate of seven percent.

State/Support Agency Acceptance

The State of New Jersey concurs with the selected remedy for Site-wide groundwater. A letter of concurrence is attached as Appendix V.

Community Acceptance

Community acceptance of the selected remedy for Site-wide groundwater was evaluated based upon the comments received during the public comment period. Many of the comments received from the public at the February 10, 2020 public meeting and in writing subsequent to this meeting expressed concern regarding the potential effectiveness of the selected remedy. Several commenters recommended that a groundwater extraction and treatment system be implemented to address groundwater contamination at the Site.

Peters Mine Pit Airshaft

Overall Protection of Human Health and the Environment

Alternative 1 would not provide for protection of human health and the environment because no action would be taken to address risks associated with the potential future potable use of mine water in the Peters Mine Pit Airshaft. Alternatives 2, 3 and 4 would be protective assuming a CEA/WRA would be put into place for the Site-wide groundwater alternatives and would also cover the area of and downgradient from the PMP Airshaft. In addition, Alternatives 3 and 4 would prevent future use of the mine water in the PMP Airshaft as a potable water supply because the airshaft would be permanently closed.

Given that Site-specific data indicate that the PMP Airshaft is hydrologically connected to the surrounding PMP Area aquifer, the treatment associated with Alternatives 2 and 3 would be potentially beneficial in reducing the contaminant concentrations which may result in meeting the RAO of restoring the aquifer to Class IIA NJGWQSs, within a reasonable timeframe. Alternatives 3 and 4 (both of which physically isolate the PMP Airshaft through closure) may also contribute to reducing contaminant concentrations in groundwater by eliminating the airshaft's connection to the aquifer, which may result in a shorter period of time to meet the RAO of restoring the aquifer to Class IIA NJGWQSs, within a reasonable timeframe. However, the timeframe for meeting this RAO is considered uncertain because of the absence of a defined source, the natural presence of certain contaminants at the Site, and the potential presence of sources related to the historic mine workings.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Alternative 1 would not comply with ARARs as no action would be taken.

N.J.A.C. 7:14A-7.5, which establishes state limitations on pollutants in discharges to groundwater, would be an ARAR for Alternatives 3 and 4. Alternatives 2, 3, and 4 would meet the substantive requirements for the actions to be implemented (*i.e.*, underground injection, dewatering of the airshaft) through consultation with NJDEP. Furthermore, Alternatives 3 and 4 may require the construction of stone access pads and roads in wetland and floodplain areas surrounding the PMP Airshaft. These alternatives would be conducted in accordance with New Jersey requirements concerning disturbance of these areas.

Long-Term Effectiveness and Permanence

Under Alternative 1, no action would be taken to address risks associated with the potential future potable use of mine water in the PMP Airshaft. In addition, under this alternative there would not be any mechanisms to monitor the concentrations of contaminants in mine water in the PMP Airshaft to determine whether concentrations change over time. Therefore, Alternative 1 would not be effective over the long-term.

Under Alternative 2, ORC could be placed in the PMP Airshaft indefinitely, and therefore, to the extent there are beneficial effects from oxygen diffusion, the effectiveness could be maintained for the long term. Furthermore, monitoring of the mine water quality to assess the performance of the oxygen diffusion would confirm that the concentrations of contaminants in the PMP Airshaft mine water decline over time.

Alternatives 3 and 4 are permanent remedies as the closure component would permanently seal the airshaft and isolate it from the surrounding environment. Furthermore, for Alternative 3, contaminants would remain adsorbed to the GAC and resin as there would not be a mechanism to regenerate the carbon or resin and release the contaminants. Being a permanent closure of the PMP Airshaft, Alternatives 3 and 4 would be effective for the long-term without any operation and maintenance.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 1 would not treat the contaminants in mine water and would not reduce their toxicity, mobility, or volume.

Alternative 2 would reduce contaminant toxicity and volume by introducing oxygen and essential nutrients into the base of the PMP Airshaft to promote aerobic biodegradation of contaminants in mine water.

Alternative 3 would reduce the mobility of contaminants within the PMP Airshaft through treatment with GAC and resin at the base of the airshaft to adsorb contaminants and bind them in the GAC and resin matrices. Isolating the airshaft from the surrounding aquifer through the closure process may also reduce the mobility of contaminants.

Alternative 4 would reduce the mobility of contaminants in the airshaft but only by isolating the airshaft from the surrounding aquifer through the closure process, not through treatment.

Short-Term Effectiveness

Under Alternative 1, no remedial or construction activities would occur. Therefore, no short-term impacts would be associated with implementation of this alternative.

Minimal short-term risks are associated with implementation of Alternatives 2, 3, and 4. The most significant construction element associated with Alternative 2 is the concrete cap on the PMP Airshaft, which would be completed in a relatively short period of time. The most significant construction element associated with Alternatives 3 and 4 is the grouting and closure of the PMP Air Shaft, which would also be completed in a relatively short period of time. Alternatives 2, 3, and 4 are not anticipated to have any significant short-term impacts as the health and safety of workers and the public would be maintained during construction of each of these alternatives. Safeguards, as provided for in a Site-specific health and safety plan, would be implemented to protect human health and the environment during implementation of these alternatives.

Construction of Alternatives 2, 3 and 4 is expected to be of short duration. The anticipated schedule to have Alternative 2 in place is on the order of six months to one year, and it is one year to 18 months for Alternatives 3 and 4.

As part of Alternatives 3 and 4, the placement of stone/grout or GAC and resin at the base of the Air Shaft has the potential to disturb sediments and debris, which could, in turn, alter the geochemistry in the base of the shaft on a short-term basis. Such a disturbance could potentially cause a short-term increase in contaminant concentrations in the bedrock aquifer adjacent to the PMP Airshaft. Alternative 3 may have the advantage of providing some additional mitigation of potential short-term groundwater quality impacts from disturbance of the sediments and debris in the airshaft because it includes the use of adsorbents to close the airshaft at the same time as the disturbance, whereas Alternative 4 does not.

Implementability

Alternative 1 does not require any remedial activity; and, therefore, implementability is not a consideration.

The implementability of Alternatives 2, 3, and 4 is similar in that they can all be implemented with conventional equipment, materials, means and methods available commercially. Therefore, all of these alternatives are readily implementable.

Cost

Alternative 1 would have no cost as no action would occur. Alternative 2, which includes installation of the airshaft cap, 30 years of mine water monitoring and reporting, and routine operation and maintenance activities, is estimated to cost $352,000. Alternative 3, which includes site preparation, installation of stone, GAC, resin, grouting the full depth of the airshaft, and a concrete cap, is estimated to cost $598,000. Alternative 4 is only slightly more costly than Alternative 3 because of the additional cost of using a bentonite additive as part of the closure grouting operation. Alternative 4 is estimated to cost $646,000.

The cost estimates included in this ROD are expected to be accurate within a range of +50 percent to -30 percent. Total present worth costs were calculated assuming a discount rate of seven percent.

State/Support Agency Acceptance

The State of New Jersey concurs with the selected remedy for the Peters Mine Pit Airshaft. A letter of concurrence is attached as Appendix V.

Community Acceptance

Community acceptance of the selected remedy for the Peters Mine Pit Airshaft was evaluated based upon the comments received during the public comment period. Several of the comments received from the public at the February 10, 2020 public meeting and in writing subsequent to

this meeting expressed a preference for the implementation of a groundwater extraction and treatment system in lieu of the selected remedy, while other commenters expressed support for the selected remedy for the PMP Airshaft.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). Principal threat wastes are source materials that include or contain hazardous substances, pollutants or contaminants that act as a reservoir of contaminants that can migrate to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. Non-principal threat wastes are those wastes that generally can be reliably contained and present only a low risk in the event of exposure.

The remedial alternatives that have been evaluated in this ROD address contaminated groundwater and mine water. Since contaminated groundwater and mine water generally is not considered to be a source material, no principal threat wastes have been identified for this OU of the Site.

SELECTED REMEDY

Site-wide Groundwater

Based upon the results of Site investigations, the detailed analysis of various remedial alternatives, and public comments, EPA has selected Alternative 3, In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area, as the remedy for Site-wide groundwater. This alternative includes the following components:

- Installation of wells in the PMP Area/OCDA of the Site to allow for the in-situ treatment (likely oxidation) of groundwater contaminants;

- Implementation of a long-term groundwater monitoring plan to monitor contaminant concentrations and biogeochemical parameters from groundwater monitoring wells located in and downgradient of the PMP Area, CMP Area and OCDA. A sentinel monitoring well network will also be established to provide advanced warning of any movement of groundwater contamination toward drinking water resources;

- Implementation of a long-term surface water monitoring plan which will provide for surface water monitoring in and downstream of the Site brooks to confirm that Site-related contaminants are not threatening downstream receptors, including the Wanaque Reservoir; and

- Establishment of a CEA/WRA as an institutional control to restrict future withdrawal and use of Site groundwater which contains contaminants at concentrations in excess of New Jersey Groundwater Quality Standards.

As part of this remedy, in-situ treatment, likely oxidation, will be conducted to promote and support the degradation of contaminants. Since the preferred biodegradation pathway for benzene and 1,4-dioxane is aerobic, this remedy will focus on using oxygen as the electron acceptor.

While subject to modification during the design, in concept, the introduction of ORC to the aquifer will be accomplished through wells that will be installed in a barrier-style configuration perpendicular to the direction of groundwater flow. The principal location for these wells will be in the overburden. The focus on the overburden is due to the difficulty of introducing any material into a low-yield fractured bedrock environment, and the fact that groundwater flow within the area downgradient of the PMP is generally upward from the bedrock, into the overburden, and ultimately to surface water. Therefore, a portion of the bedrock groundwater would pass through an oxygen enriched overburden aquifer. The radius of influence for diffusion of ORC varies with formation characteristics but is typically limited. Therefore, a well spacing of approximately 20 feet is assumed. The recommended barrier arrangement of wells is situated adjacent to an existing gravel access road for ease of access, and downgradient of the PMP and PMP Air Shaft where Site contaminants have typically been detected at their highest concentrations (see Figure 5).

Wells for introduction of oxygen into the bedrock aquifer may also be installed on a limited scale. These bedrock aquifer wells may be installed in key areas where contaminants have been detected at their highest concentrations (see Figure 6). Given the difficulty of promoting movement of any additives in the low-yield bedrock formation, these wells would be assessed during the initial period of enhancement, and, if diffusion of oxygen is not demonstrated, use of the bedrock wells may be terminated.

Furthermore, 1,4-dioxane has been found in concentrations exceeding the NJGWQS in OCDA well OB-17. However, a focused investigation in the area upgradient of well OB-17 did not identify a source of 1,4-dioxane and 1,4-dioxane was not detected in paint sludge and soil samples collected during this investigation. This suggests the possibility of some diffuse source of 1,4-dioxane in the area of well OB-17. Under the selected remedy, ORC may also be introduced into this monitoring well to promote biodegradation of 1,4-dioxane in this localized area.

Commercial ORC products are available that can be applied in socks/canisters within wells in a solid or granular form. These commercially available products can also be supplied with buffering compounds and essential inorganic nutrients to further support the microbial populations. This selected remedy assumes the use of a chemical, *i.e.*, a slow release source of oxygen, applied in the above-described array of wells, at a typical application rate in the range of 2-5 pounds of ORC per foot of saturated thickness within the treatment zone. Furthermore, it is assumed that ORC socks contained in reusable canisters will be suspended in each well to allow

for the replacement of ORC, once exhausted. However, the specific details concerning well placement and ORC application will be determined during design of the remedy.

The long-term groundwater and surface water monitoring program will include the sampling of groundwater monitoring wells in and downgradient of the PMP Area, CMP Area and the OCDA, and surface water monitoring in the four brooks which drain the Site. In addition, EPA currently assumes that at least three additional groundwater monitoring wells will be installed in bedrock downgradient of the PMP Area, CMP Area and the OCDA to serve as sentinel monitoring wells. These wells will be used to provide advanced warning of any movement of contaminants toward drinking water supplies. The specific details of the long-term groundwater and surface water monitoring program, including sampling location and frequency, will be determined during design of the selected remedy.

Finally, a CEA/WRA will be established, as required pursuant to New Jersey regulations for groundwater which does not meet applicable NJGWQSs. Sufficient groundwater sampling will be conducted to estimate the extent and duration of the CEA/WRA.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of the selected remedy for Site-wide Groundwater.

Summary of the Rationale for the Selected Remedy

The selection of a remedy for a Superfund site is accomplished through evaluation of each of the developed remedial alternatives against the above-referenced nine criteria, as specified in the NCP. Based upon an evaluation of the results of Site investigations, the detailed analysis of the various remedial alternatives, and public comments, EPA has determined that Alternative 3, In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area, satisfies the requirements of CERCLA Section 121, 42 U.S.C. §9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the nine evaluation criteria, set forth in 40 CFR §300.430(e)(9).

The selected remedy is expected to be protective of human health and the environment, once implemented, and will comply with ARARs. While Alternatives 2 and 3 for Site-wide groundwater would both be expected to reduce the levels of contaminants in groundwater at the Site through the attenuation processes of biodegradation, advection, and dispersion, Alternative 3 will enhance these processes through the introduction of oxygen and nutrients to the aquifer. Therefore, EPA expects that Alternative 3, In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area, may result in a greater likelihood and/or shorter timeframe to restore the aquifer to Class IIA NJGWQSs than Alternative 2.

Summary of the Estimated Cost of the Selected Remedy

The estimated capital, O&M and present worth costs for the selected remedy are detailed in the OU3 Site-Related Groundwater FFS Report. The cost estimates, which are based upon estimates developed for similar projects, engineering judgment and construction bids, are order of

magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost for implementation of the remedy. The estimated capital, O&M and total present worth costs, as well as construction time, are detailed below and in Appendix II, Table 5-1:

Total Capital Cost:	$631,000
Present Worth of O&M Cost:	$2,184,000
Total Present Worth Cost:	$2,815,100
Construction Duration:	12-18 months

Expected Outcomes of the Selected Remedy

The selected remedy, Alternative 3, will address risks associated with the potential potable use of contaminated groundwater at the Site. A CEA/WRA will be established which will serve to prevent the future use of impacted groundwater at the Site as drinking water by documenting the area where water quality standards cannot be met and limiting installation of groundwater extraction wells. Furthermore, surface water monitoring will be conducted in and downstream of Site brooks to ensure that downstream receptors, including the Wanaque Reservoir, are not impacted by Site contamination.

EPA expects that the in-situ treatment of groundwater contaminants provided for under the selected remedy will shorten the timeframe required to restore the aquifer to Class IIA NJGWQSs, which are 1 ug/L and 0.4 ug/L for benzene and 1,4-dioxane, respectively. Furthermore, by reducing contaminant levels in the Site aquifer, implementation of the selected remedy will also mitigate the potential for migration of contaminants at levels in excess of applicable NJGWQSs.

Peters Mine Pit Airshaft

Based upon the results of Site investigations, the detailed analysis of various remedial alternatives, and public comments, EPA has selected Alternative 3, Treatment/Closure in the Peters Mine Pit Airshaft, as the remedy for the Peters Mine Pit Airshaft. This alternative includes the following components:

- The PMP Airshaft will be permanently closed using conventional mine shaft closure technology;

- GAC and resin will be introduced to the base of the airshaft prior to permanent closure to provide for the adsorption of organic contaminants; and

- Displaced water will be treated through filtration and GAC and then discharged to groundwater within the same general locations, pursuant to the substantive requirements of NJAC 7:14A-7.5.

Implementation of the selected remedy will begin with the introduction of GAC and resin to the base of the PMP Airshaft, to adsorb organic contaminants. The amount of GAC and resin to be introduced to the airshaft will be determined during design of this remedy. Angular stone will be

interspersed with smaller sized GAC at the bottom of the shaft. The resin density is expected to be less than that of water. Therefore, the resin will be introduced in canisters or socks lowered to the base of the airshaft. The rock will provide bearing strength to temporarily support grout that will be placed above the rock. In addition, the angular shape of the rock will limit its movement within the mine workings toward the adjacent mine slope entry. Methods to mitigate the potential flow of mine water from the deeper mine workings to the PMP will also be considered during design of this remedy.

Subsequent to the treatment step of addition of stone, GAC and resin, measures will be taken to permanently close the PMP Airshaft. Fast-setting, low-slump grout mix will be placed on top of the stone and GAC/resin to a total thickness of approximately 10 feet. The fast setting grout will initially be placed so that the grout will not flow deeply into the rock and carbon and seal it from contacting the mine water. The fast-setting grout will also limit the potential for loss of grout into the adjacent mine slope entry.

Flowable flyash/concrete grout will then be placed using a tremie pipe above the fast setting grout, to the top of the airshaft, fully sealing the shaft. The flyash/concrete grout is a slower-setting, low-strength mix commonly used in mine shaft closures. The grout mix will be designed to have a strength of between 500 to 1000 pounds per square inch (at 28 days). The grout should encapsulate any remaining wood material and fill voids within the airshaft. Flyash grout mixtures are commonly available as a ready-mixed material. Therefore, material for the PMP Airshaft closure could be supplied by ready-mix vendors or a mixing plant could be used on site.

This grouting operation will displace the water in the airshaft. EPA assumes that the displaced water will be treated through filtration and GAC and then discharged to groundwater within the same general location, pursuant to the substantive requirements of NJAC 7:14A-7.5, which establishes state limitations on pollutants in discharges to groundwater. Based on the dimensions of the airshaft, the total volume of water that will be displaced is approximately 450,000 gallons. At a flow rate of 50 gallons per minute, the total quantity of displaced water will require approximately six days to treat and discharge.

Following placement of the low-strength grout fill, a concrete cap will be placed with a marker as a final closure and identification measure. The concrete cap will be a conventional poured slab that will provide a durable, final closure surface. Closure of the PMP Airshaft will be permanent and will isolate the shaft from the environment.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of the selected remedy for the PMP Airshaft.

Summary of the Rationale for the Selected Remedy

Based upon an evaluation of the results of Site investigations, the detailed analysis of the various remedial alternatives, and public comments, EPA has determined that Alternative 3 satisfies the requirements of CERCLA Section 121, 42 U.S.C. §9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the nine evaluation criteria, set forth in

40 CFR §300.430(e)(9). The selected remedy is expected to be protective of human health and the environment, once implemented, and will comply with ARARs.

For the PMP Airshaft, EPA believes that the treatment associated with Alternative 3 would be potentially beneficial to reducing contaminant concentrations in mine water and groundwater, which may result in a greater likelihood of restoring the surrounding aquifer to Class IIA NJGWQSs within a shorter time period. Furthermore, Alternative 3 would prevent the potential for future exposure to impacted mine water in the PMP Airshaft through permanent closure of the airshaft. Therefore, Alternative 3 provides the potential benefit of reducing contaminant levels through treatment, while preventing the potential for future exposure to impacted mine water in the airshaft through permanent closure.

Summary of the Estimated Cost of the Selected Remedy

The estimated capital, O&M and present worth costs for the selected remedy are detailed in the OU3 Site-Related Groundwater FFS Report. The cost estimates, which are based upon estimates developed for similar projects, engineering judgment and construction bids, are order of magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost for implementation of the remedy. The estimated capital, O&M and total present worth costs, as well as construction time are detailed below and in Appendix II, Table 5-2:

Total Capital Cost:	$598,000
Present Worth of O&M Cost:	$0
Total Present Worth Cost:	$598,000
Construction Duration:	12-18 months

Expected Outcomes of the Selected Remedy

The selected remedy, Alternative 3, will address risks associated with the potential potable use of contaminated mine water in the PMP Airshaft through closure of the airshaft. Furthermore, because Site-specific data indicate that the PMP Airshaft is hydraulically connected to the surrounding PMP Area aquifer, the treatment associated with the selected remedy will be beneficial through reduction of contaminant concentrations which may result in meeting the RAO of restoring the aquifer to Class IIA NJGWQSs, within a reasonable timeframe. The selected remedy will also physically isolate the PMP Airshaft through closure which may also contribute to reducing contaminant concentrations in groundwater by eliminating the airshaft's connection to the aquifer. Therefore, closure of the PMP Airshaft may result in a shorter period of time to meet the RAO of attempting to restore the aquifer to Class IIA NJGWQSs within a reasonable timeframe. However, the timeframe for meeting this RAO is considered uncertain because of the absence of a defined source, the natural presence of certain contaminants at the Site, and the potential presence of sources related to the historic mine workings.

STATUTORY DETERMINATIONS

As was previously noted, CERCLA Section 121(b)(1) mandates that a remedial action must be protective of human health and the environment, cost-effective, and utilize permanent solutions

and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA Section 121(d) further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4).

Protection of Human Health and the Environment

The selected remedy for Site-wide groundwater and the PMP Airshaft will be protective of human health and the environment, once implemented. The selected remedy for Site-wide groundwater, Alternative 3, will provide for the establishment of a CEA/WRA which is an institutional control which will serve to prevent the future use of impacted groundwater at the Site as drinking water by documenting the area where water quality standards cannot be met and limiting installation of groundwater extraction wells. Furthermore, the selected remedy will employ in-situ treatment to enhance naturally occurring attenuation mechanisms to restore the aquifer to Class IIA NJGWQSs. Therefore, the selected remedy for Site-wide groundwater is expected to provide for protection of human health and the environment by reducing contaminant levels in groundwater at the Site.

The selected remedy for the PMP Airshaft, Alternative 3, will provide for closure of the airshaft, which will reduce the potential for exposure to contaminated mine water in the airshaft. Furthermore, because Site-specific data indicate that the airshaft is hydraulically connected to the surrounding PMP Area aquifer, the treatment associated with the selected remedy as well as closure of the airshaft may serve to reduce contaminant concentrations in groundwater at the Site.

Compliance with ARARs

Section 121 (d) of CERCLA and NCP § 300.430(f) (1) (ii) (B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d) (4). Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site.

The selected remedy for Site-wide groundwater will provide for establishment of a CEA/WRA and will comply with State of New Jersey requirements for controlling use of groundwater by a

CEA/WRA. In addition, the selected remedy is designed to meet the NJGWQSs over time through the use of in-situ treatment to enhance natural attenuation mechanisms. This remedy may also require the installation of additional monitoring wells in wetland and flood plain areas. However, the installation of these wells will be conducted in accordance with New Jersey requirements concerning disturbance of these areas.

The selected remedy for the PMP Airshaft will comply with the requirements of N.J.A.C. 7:14A-7.5, which establishes state limitations on pollutants in discharges to groundwater. Implementation of this remedy may also result in minor disturbances in wetland and floodplain areas near the PMP Airshaft. However, these activities will be conducted in accordance with New Jersey requirements concerning disturbance of these areas. EPA expects that these remedies, once implemented, will comply with all ARARs. A complete list of the ARARs, and TBCs associated with the selected remedies are presented in Appendix II, Tables 2, 3 and 4.

Cost Effectiveness

EPA has determined that the selected remedies for Site-wide groundwater and the PMP Airshaft are cost-effective and represent reasonable values for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (40 CFR §300.430(f)(1)(ii)(D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness of a remedy. The relationship of the overall effectiveness of the selected remedy for each of these areas was determined to be proportional to costs and hence, these alternatives represent a reasonable value for the money to be spent.

The estimated present worth cost of the remedy for Site-wide groundwater is $2,815,100. While other alternatives may also provide for long term effectiveness and permanence by preventing exposure to impacted groundwater while contaminants attenuate through natural mechanisms, the selected remedy will employ active measures to improve the effectiveness of cleanup efforts and may shorten the timeframe for aquifer restoration. The selected remedy is cost-effective as it has been determined to provide the greatest overall protectiveness for its present-worth cost.

Alternative 2 and the selected remedy for Site-wide groundwater both provide for the establishment of a CEA/WRA as an institutional control and would be effective at protecting human health by preventing use of impacted groundwater. Furthermore, both Alternative 2 and the selected remedy for Site-wide groundwater would be similar with respect to permanence as they both would provide for the reduction of contaminant concentrations in groundwater through the use of natural attenuation mechanisms. However, only the selected remedy provides for in-situ treatment of groundwater to improve the effectiveness of cleanup efforts and to shorten the timeframe for aquifer restoration.

Alternative 2 and the selected remedy for Site-wide groundwater would also reduce the toxicity and mobility of contaminants in groundwater through natural attenuation mechanisms. However, the selected remedy will additionally provide for in-situ treatment which will support and enhance these natural attenuation mechanisms, and thus would enhance the reduction of toxicity and mobility of contaminants. Therefore, EPA believes that the additional cost of the selected remedy is outweighed by the higher degree of long-term effectiveness and reduction of toxicity and mobility of groundwater contaminants it provides, thereby satisfying the cost effectiveness criteria of Section 121 of CERCLA.

The estimated present worth cost of the remedy for the PMP Airshaft is $598,000. While other alternatives may provide for long-term effectiveness through in-situ treatment of mine water contaminants at a lower cost, only the selected remedy will provide for a reduction in the mobility of mine water contaminants while permanently eliminating the potential for exposure through closure of the airshaft. The selected remedy is cost-effective as it has been determined to provide the greatest overall protectiveness for its present-worth cost.

PMP Airshaft Alternative 2 could be effective in the long-term by introducing ORC to the airshaft mine water and enhancing aerobic degradation of contaminants. However, the potential for exposure to mine water contaminants would remain, as the airshaft would not be permanently sealed. Furthermore, the airshaft would remain as a potential pathway for migration of contaminants from mine water to the surrounding aquifer. Alternative 4 and the selected remedy for the PMP Airshaft would provide for permanent closure of the airshaft and would eliminate the potential for exposure to mine water contaminants as well as the potential for contaminants to migrate from mine water in the airshaft to the groundwater aquifer.

PMP Airshaft Alternative 2 would reduce contaminant toxicity and volume by introducing oxygen and essential nutrients into the base of the PMP Airshaft to promote aerobic biodegradation of contaminants in mine water. Alternative 4 would not provide for treatment of contaminants in mine water, but would reduce the mobility of contaminants in mine water by isolating the airshaft from the surrounding aquifer. The selected remedy for the PMP Airshaft will reduce the mobility of contaminants in mine water through treatment with GAC and resin as well as by isolating the airshaft from the surrounding aquifer.

Utilization of Permanent Solutions and Alternative Treatment Technologies

EPA has determined that the selected remedy utilizes permanent solutions and treatment technologies to the maximum extent that is practicable. The selected remedy for Site-Wide Groundwater will utilize in-situ treatment to permanently degrade groundwater contaminants at the Site. Furthermore, the selected remedy for the PMP Airshaft will permanently seal the PMP Airshaft and eliminate the potential for exposure to impacted mine water in the airshaft. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the selected remedy for Site-Wide Groundwater and the PMP Airshaft provides the best balance of tradeoffs in terms of the balancing criteria, while also considering state and community acceptance.

Preference for Treatment as a Principal Element

The statutory preference for the use of remedies that involve treatment as a principal element is satisfied by the selected remedy. The selected remedy for Site-Wide Groundwater will utilize in-situ treatment, likely oxidation, to permanently degrade groundwater contaminants at the Site. The selected remedy for the PMP Airshaft provides for the use of GAC and resin to treat contaminants in mine water at the bottom of the airshaft.

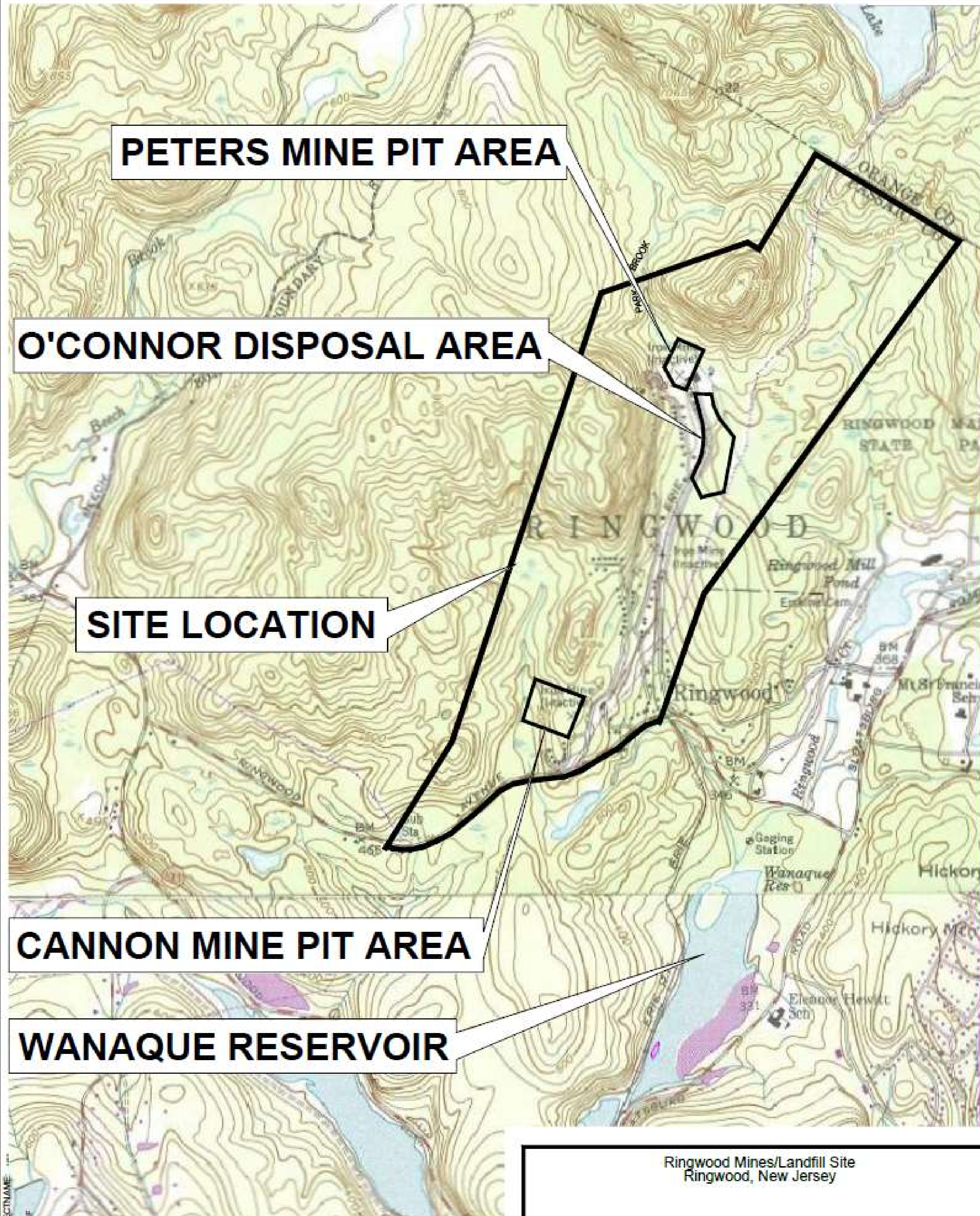
Five-Year Review Requirements

Because the selected remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

Upon review of all comments submitted, EPA has determined that no significant changes to the selected remedy, as presented in the Proposed Plan, are warranted.

APPENDIX I - Figures



REFERENCE: WANAQUE, NJ AND GREENWOOD LAKE, NY-NJ, USGS QUADRANGLE, 7.5 MINUTE SERIES, 1995 AND 1954.

0 2000
SCALE IN FEET

LEGEND:

SITE BOUNDARY

Ringwood Mines/Landfill Site
Ringwood, New Jersey

SITE LOCATION

FIGURE 1

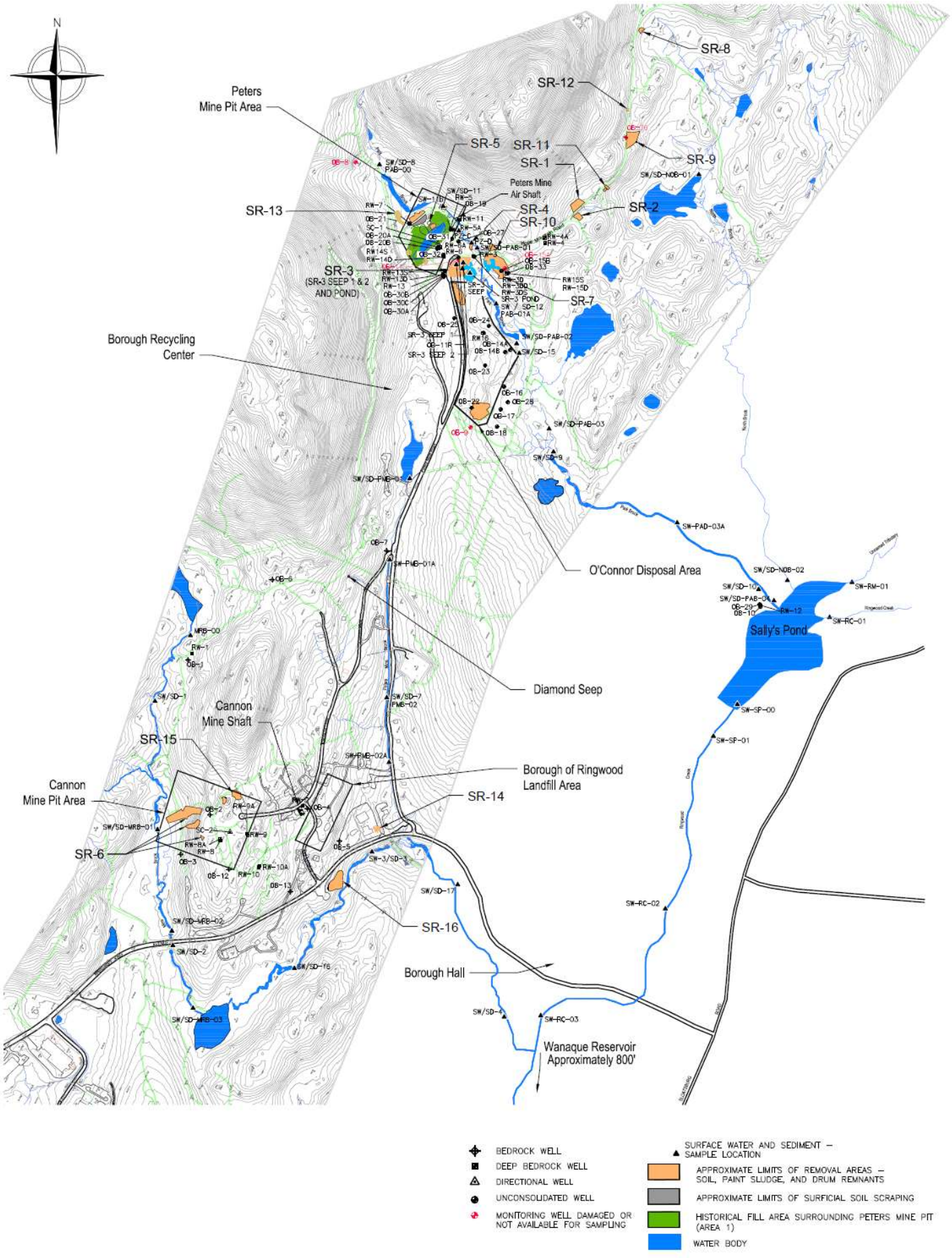


Figure 2 - Monitoring Well and Sampling Locations

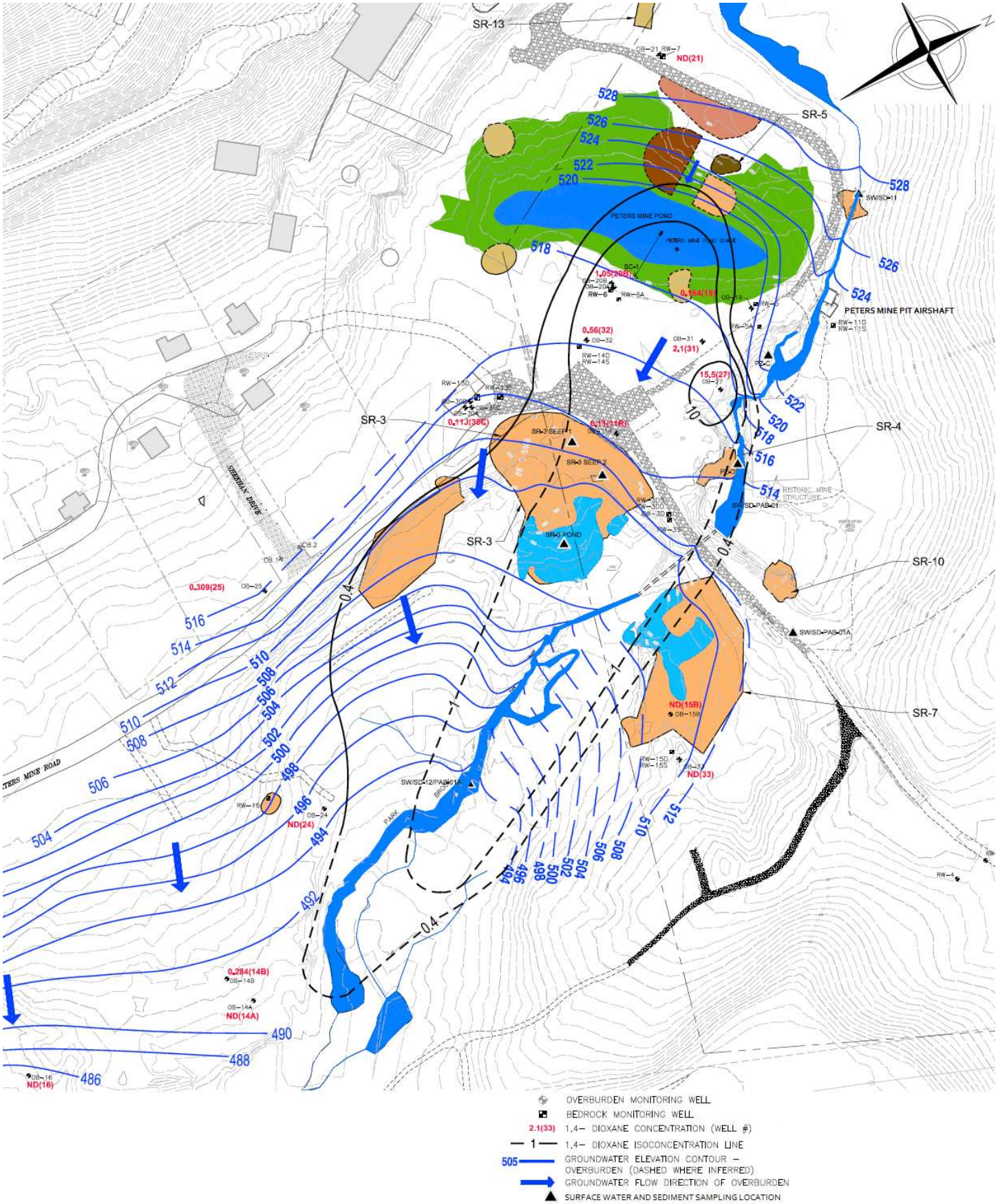


Figure 3 - 1,4-Dioxane Concentrations in Overburden Wells
August 2017 Data

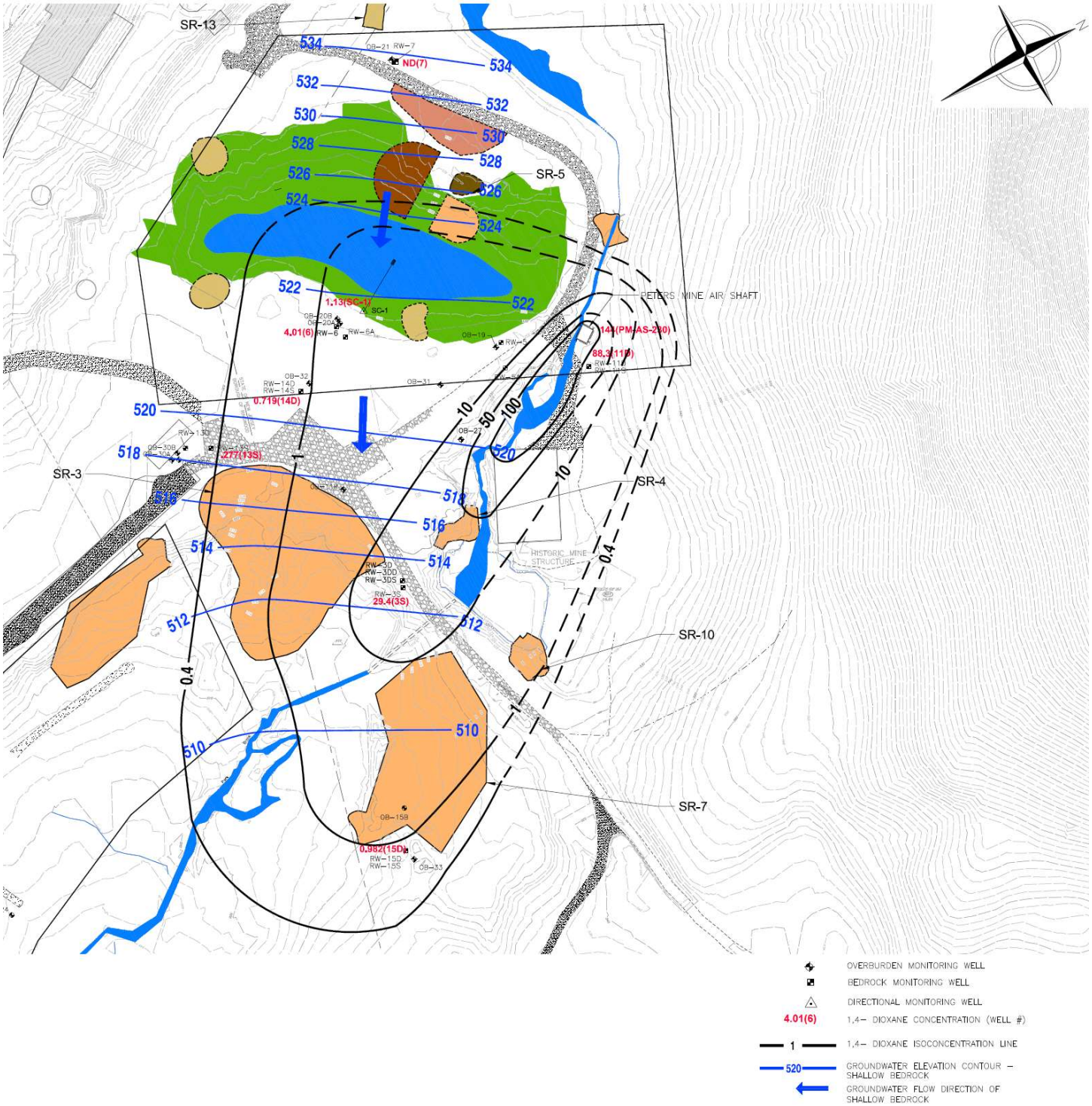


Figure 4 - 1,4-Dioxane Concentration in Bedrock Groundwater and Mine Water
August 2017 Data

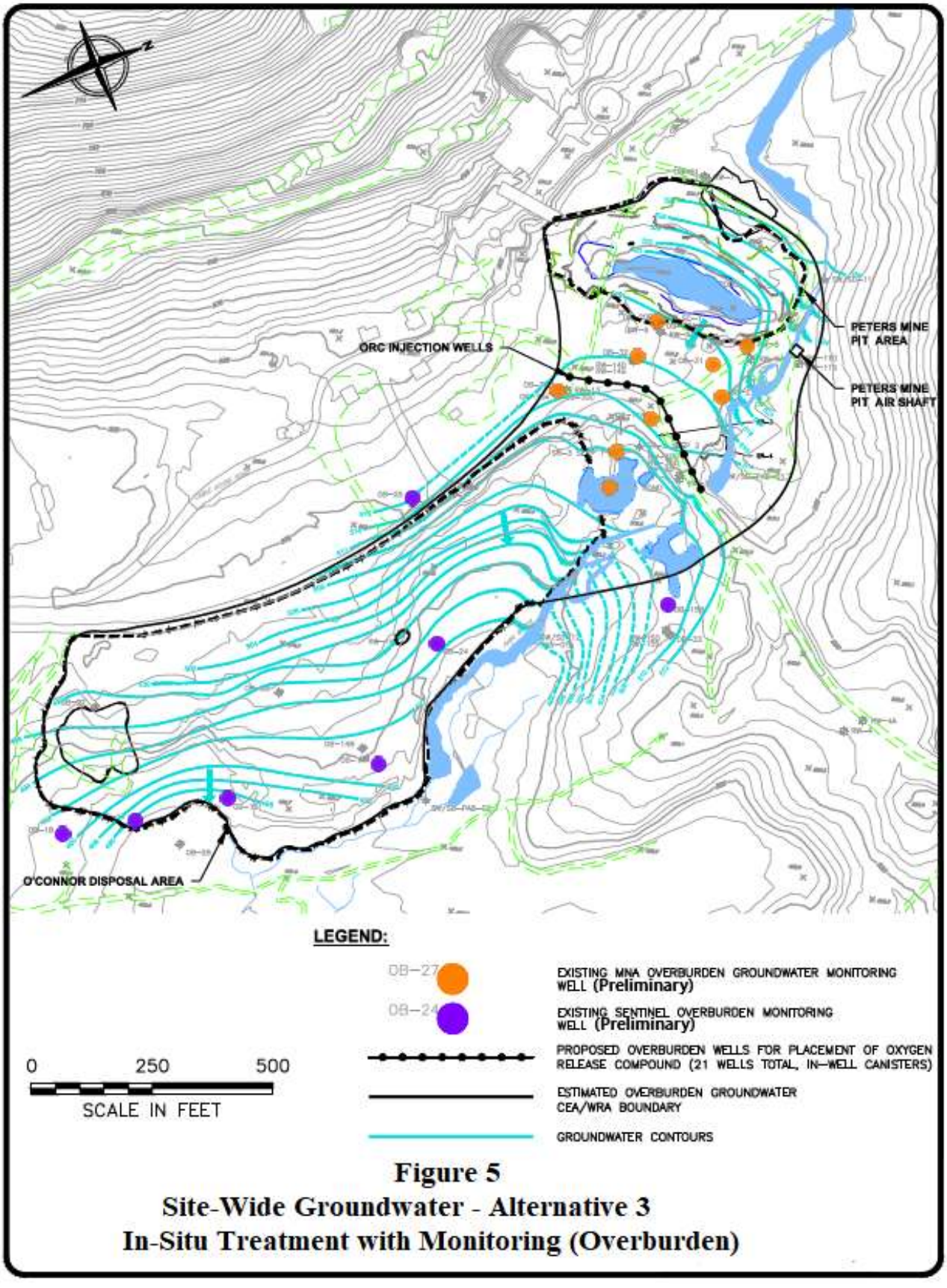


Figure 5
Site-Wide Groundwater - Alternative 3
In-Situ Treatment with Monitoring (Overburden)

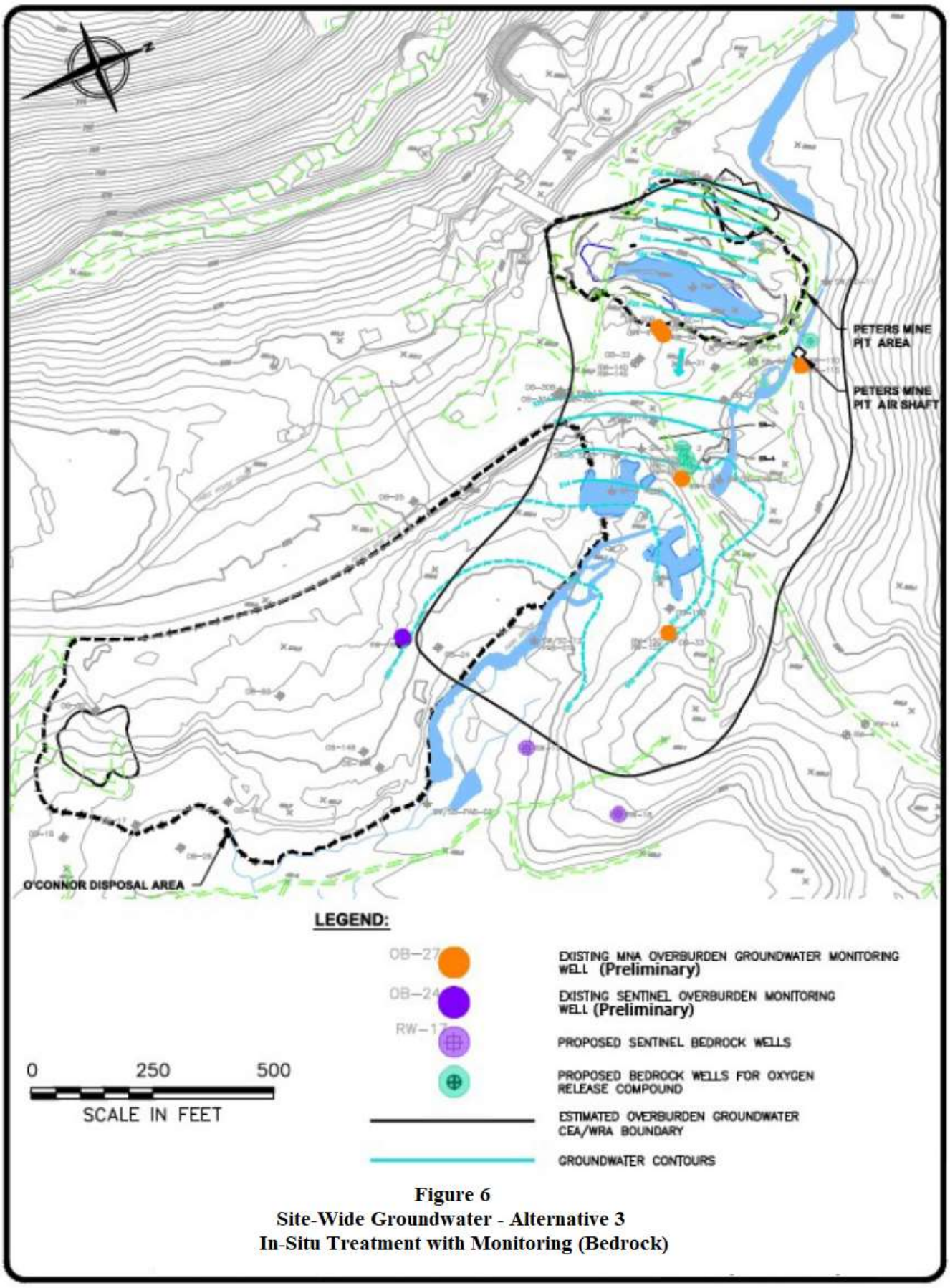


Figure 6
Site-Wide Groundwater - Alternative 3
In-Situ Treatment with Monitoring (Bedrock)

APPENDIX II - Tables

Table 1
Occurrence, Distribution and Selection of Chemicals of Potential Concern - Site-Wide Groundwater

Scenario Timeframe: Future
Medium: 2008-2017 Site-wide Annual Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source (3)	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
Tap Water	Polychlorinated Biphenyls (PCBs)														
	12672-29-6	Aroclor-1248	0.33	0.77	µg/L	RW-2(452-462)-082216	0.4%	0.015 - 2	0.77	0.0078	c	NA		N	FOD
	11097-69-1	Aroclor-1254	0.18	1.3	µg/L	RW-4A (113-123)-082415	0.4%	0.014 - 2	1.3	0.0078	c**	NA		N	FOD
	1336-36-3	Total PCBs	0.33	1.3	µg/L	RW-4A (113-123)-082415	0.4%	0.098 - 0.66	1.3			0.5	MCL	N	FOD
Tap Water	Volatile Organic Compounds (VOCs)														
	71-55-6	1,1,1-Trichloroethane	1.2	2.5	µg/L	OB-27(051811)	0.3%	0.2 - 1	2.5	800	n	200	MCL	N	FOD
	75-34-3	1,1-Dichloroethane	0.24	89.3	µg/L	OB-27(051811)	13.5%	0.16 - 1	89.3	2.8	c	NA		Y	ASL
	95-50-1	1,2-Dichlorobenzene	0.39	0.39	µg/L	RW-2(279-289)-082216	0.2%	0.15 - 1	0.39	30	n	600	MCL	N	FOD
	541-73-1	1,3-Dichlorobenzene	0.77	0.77	µg/L	RW-2(279-289)-082216	0.2%	0.19 - 1	0.77	NA		NA		N	FOD
	10061-01-5	cis-1,3-Dichloropropene	0	0	µg/L	0	0.0%	0.15 - 1	0	NA		NA		N	FOD
	106-46-7	1,4-Dichlorobenzene	0.2	1.5	µg/L	RW-2(279-289)-082216	1.2%	0.22 - 1	1.5	0.48	c	75	MCL	N	FOD
	78-93-3	2-Butanone (MEK)	2.4	29	µg/L	RW-11D (262-267)-082615	5.1%	1.6 - 50	29	560	n	NA		N	BSL
	591-78-6	2-Hexanone	0.75	3	µg/L	RW-15D(127-137)-081717	1.0%	0.72 - 10	3	3.8	n	NA		N	FOD
	108-10-1	4-methyl-2-pentanone (MIBK)	0.78	1	µg/L	RW-12 (55-65)-081715	0.4%	0.63 - 10	1	630	n	NA		N	FOD
	67-64-1	Acetone	1.6	95	µg/L	RW-2 (279-289)	21.7%	1.1 - 25	95	1400	n	NA		N	BSL
	71-43-2	Benzene	0.092	43.8	µg/L	RW-2 (103-133)	18.5%	0.05 - 6	43.8	0.46	c**	5	MCL	Y	ASL
	75-27-4	Bromodichloromethane	0.37	0.585	µg/L	RW-2(20-50)10/26/2009)(10/26/2009)	0.5%	0.14 - 1	0.585	0.13	c	80	MCL	N	FOD
	75-15-0	Carbon disulfide	0.26	63	µg/L	RW-11D (262-267)-082615	12.7%	0.13 - 1	63	81	n	NA		N	BSL
	108-90-7	Chlorobenzene	0.22	12	µg/L	RW-2(279-289)-082216	1.7%	0.14 - 1	12	7.8	n	100	MCL	N	FOD
	75-00-3	Chloroethane	0.39	208	µg/L	OB-27 (042512)	13.8%	0.22 - 1	208	2100	n	NA		N	BSL
	67-66-3	Chloroform	0.21	15.8	µg/L	RW-2(20-50)10/26/2009)(10/26/2009)	3.5%	0.14 - 1	15.8	0.22	c*	80	MCL	N	FOD
	74-87-3	Chloromethane	0.28	0.53	µg/L	RW-8 (204-214) (111413)	1.9%	0.22 - 1	0.53	19	n	NA		N	FOD
	156-59-2	cis-1,2-Dichloroethene	0.22	0.6	µg/L	OB-27 (042512)	2.6%	0.19 - 1	0.6	3.6	n	70	MCL	N	FOD
	110-82-7	Cyclohexane	0.14	4.1	µg/L	RW-6A-080415	8.9%	0.18 - 5	4.1	1300	n	NA		N	BSL
	75-71-8	Dichlorodifluoromethane	0.19	0.97	µg/L	RW-6 (111813)	0.3%	0.14 - 1	0.97	20	n	NA		N	FOD
	100-41-4	Ethylbenzene	0.245	2.7	µg/L	OB-27(051811)	1.9%	0.21 - 1	2.7	1.5	c*	700	MCL	N	FOD
	98-82-8	Isopropylbenzene	0.28	7.5	µg/L	RW-6A (110813)	7.3%	0.15 - 1	7.5	45	n	NA		N	BSL
	1634-04-4	Methyl tert butyl ether	0.17	171	µg/L	OB-25(070609)	6.6%	0.13 - 1	171	14	c*	NA		Y	ASL
	108-87-2	Methylcyclohexane	0.22	1.6	µg/L	OB-27-082217	7.0%	0.11 - 5	1.6	NA		NA		N	BSL
	75-09-2	Methylene chloride	0.22	2.1	µg/L	OB-24-081717	9.8%	0.16 - 5	2.1	11	n	5	MCL	N	BSL
	127-18-4	Tetrachloroethene	0.69	0.73	µg/L	W-2 (279-289) (111913),RW-2 (452-462) (11191	0.5%	0.12 - 6	0.73	4.1	n	5	MCL	N	FOD
	108-88-3	Toluene	0.2	72.4	µg/L	RW-2 (103-133)(5/1/2008)	14.8%	0.15 - 45	72.4	110	n	1000	MCL	N	BSL
	79-01-6	Trichloroethene	0.24	13.7	µg/L	OB-3(080909)	2.3%	0.18 - 1	13.7	0.28	n	5	MCL	N	FOD
	75-69-4	Trichlorofluoromethane	0.3	0.3	µg/L	OB-2(051611)	0.2%	0.15 - 1	0.3	520	n	NA		N	FOD
	75-01-4	Vinyl Chloride	0.11	0.24	µg/L	RW-8(204-214)-082516	0.8%	0.06 - 1	0.24	0.019	c	2	MCL	Y	CLA
	1330-20-7	Xylenes, Total	0.22	49.6	µg/L	RW-6A (080915)	5.6%	0.17 - 3	49.6	19	n	10000	MCL	Y	ASL

Table 1
Occurrence, Distribution and Selection of Chemicals of Potential Concern - Site-Wide Groundwater

Scenario Timeframe: Future
Medium: 2008-2017 Site-wide Annual Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source (3)	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
Tap Water	Semivolatile Organic Compounds (SVOCs)														
	123-91-1	1,4-Dioxane	0.079	201	µg/L	RW-13(71-91)-082516	45.6%	0.0735 - 80.65	201	0.46	c*	NA		Y	ASL
	51-28-5	2,4-Dinitrophenol	6.5	6.7	µg/L	RW-3DS (155-160)-082515(8/25/2015)	0.5%	0.74 - 170	6.7	3.9	n	NA		N	FOD
	91-57-6	2-Methylnaphthalene	0.43	1.3	µg/L	RW-6A-081816	1.8%	0.29 - 3.8	1.3	3.6	n	NA		N	FOD
	83-32-9	Acenaphthene	0.107	1.83	µg/L	OB-23(051911)	3.2%	0.014 - 2.5	1.83	53	n	NA		N	FOD
	208-96-8	Acenaphthylene	0.119	0.17	µg/L	RW-10 (120-130)(041912)	0.4%	0.007 - 2.5	0.17	NA		NA		N	FOD
	98-86-2	Acetophenone	0.47	3.4	µg/L	RW-2 (452-462)(6/29/2010)	4.9%	0.29 - 19.9	3.4	190	n	NA		N	FOD
	120-12-7	Anthracene	0.124	0.15	µg/L	OB-27(111113) & DUP(11/11/2013)	0.7%	0.01 - 2.5	0.15	180	n	NA		N	FOD
	1912-24-9	Atrazine	0.91	1.8	µg/L	RW-6A-081816	0.7%	0.28 - 13	1.8	0.3	c	3	MCL	N	FOD
	56-55-3	Benzo(a)anthracene	0.142	0.233	µg/L	RW-6 (042712)	0.4%	0.012 - 0.24	0.233	0.03	c	NA		N	FOD
	50-32-8	Benzo(a)pyrene	0.035	1.25	µg/L	RW-6 (042712)	0.4%	0.0049 - 0.27	1.25	0.025	c*	0.2	MCL	N	FOD
	205-99-2	Benzo(b)fluoranthene	0.025	0.714	µg/L	RW-6 (042712)	0.9%	0.01 - 0.25	0.714	0.25	c	NA		N	FOD
	191-24-2	Benzo(g,h,i)perylene	1.95	3.25	µg/L	RW-6 (042712)	0.4%	0.01 - 2.5	3.25	NA		NA		N	FOD
	207-08-9	Benzo(k)fluoranthene	0.283	1.24	µg/L	RW-6 (042712)	0.4%	0.013 - 2.5	1.24	2.5	c	NA		N	FOD
	111-44-4	bis(2-Chloroethyl)ether	0.033	3.4	µg/L	RW-6A-080415	0.7%	0.009 - 13	3.4	0.014	c	NA		N	FOD
	117-81-7	bis(2-Ethylhexyl)phthalate	0.84	156	µg/L	RW-10A (75-85)(060211)	9.7%	0.33 - 17.1	156	5.6	c**	6	MCL	Y	ASL
	105-60-2	Caprolactam	1.2	5.1	µg/L	RW-5A (110813)	0.5%	0.2 - 13	5.1	990	n	NA		N	FOD
	86-74-8	Carbazole	0.47	0.59	µg/L	OB-23(080502)	0.5%	0.17 - 13	0.59	NA		NA		N	FOD
	218-01-9	Chrysene	0.15	0.15	µg/L	RW-6 (042712)	0.2%	0.012 - 2.5	0.15	25	c	NA		N	FOD
	53-70-3	Dibenzo(a,h)anthracene	0.402	0.616	µg/L	RW-6 (042712)	0.4%	0.017 - 2.5	0.616	0.025	c	NA		N	FOD
	132-64-9	Dibenzofuran	0.69	0.86	µg/L	OB-23(051911)	0.4%	0.23 - 13	0.86	0.79	n	NA		N	FOD
	84-66-2	Diethyl phthalate	1.1	3.4	µg/L	OB-20B (110813)	0.4%	0.17 - 13	3.4	1500	n	NA		N	FOD
	131-11-3	Dimethyl phthalate	1.5	6.9	µg/L	RW-13(71-91) (090914) & DUP	0.4%	0.23 - 13	6.9	NA		NA		N	FOD
	84-74-2	di-n-butyl phthalate	1	4.7	µg/L	OB-4(091514)	3.1%	0.19 - 13	4.7	90	n	NA		N	FOD
	117-84-0	di-n-octylphthalate	0.98	1.1	µg/L	RW-4A (62-72)(052511)	0.4%	0.25 - 13	1.1	20	n	NA		N	FOD
	86-73-7	Fluorene	0.129	0.865	µg/L	OB-23(051911)	2.9%	0.015 - 2.5	0.865	29	n	NA		N	FOD
	118-74-1	Hexachlorobenzene	0.011	0.046	µg/L	OB-3-082117	0.7%	0.0052 - 0.51	0.046	0.0098	c	1	MCL	N	FOD
	193-39-5	Indeno(1,2,3-cd)pyrene	0.036	0.818	µg/L	RW-6 (042712)	0.7%	0.011 - 2.5	0.818	0.25	c	NA		N	FOD
	78-59-1	Isophorone	0.76	12.5	µg/L	RW-3D (140-165)(052411)	2.7%	0.25 - 13	12.5	78	c**	NA		N	FOD
	91-20-3	Naphthalene	0.128	9.1	µg/L	RW-6A (110813),RW-6A-081816	10.3%	0.014 - 6.9	9.1	0.17	c**	NA		Y	ASL
	86-30-6	N-Nitrosodiphenylamine	0.4	1.6	µg/L	OB-23(070809)	2.7%	0.21 - 13	1.6	12	c	NA		N	FOD
	87-86-5	Pentachlorophenol	0.1	1.47	µg/L	RW-10 (120-130)(041912)	1.6%	0.068 - 1.5	1.47	0.041	c*	1	MCL	N	FOD
	85-01-8	Phenanthrene	0.122	1.49	µg/L	RW-3DS (155-160)(043012)	7.6%	0.016 - 2.5	1.49	NA		NA		N	BSL
	108-95-2	Phenol	1.1	103	µg/L	RW-10 (70-90),RW-8(158-178)	7.9%	0.41 - 13	103	580	n	NA		N	BSL

Table 1
Occurrence, Distribution and Selection of Chemicals of Potential Concern - Site-Wide Groundwater

Scenario Timeframe: Future
Medium: 2008-2017 Site-wide Annual Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source (3)	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
Tap Water	Metals - Total														
	7429-90-5	Aluminum	9.6	43100	µg/L	OB-25(080918)	69.2%	7.2 - 254	43100	2000	n	NA		Y	ASL
	7440-36-0	Antimony	0.51	17.8	µg/L	RW-4 (56-77)	3.6%	0.62 - 6	17.8	0.78	n	6	MCL	N	FOD
	7440-38-2	Arsenic	0.59	36.8	µg/L	RW-15S(110-120)-081717	43.2%	0.64 - 5.9	36.8	0.052	c'	10	MCL	Y	ASL
	7440-39-3	Barium	2	1570	µg/L	RW-11D (262-267) (111413)	97.8%	7.7 - 200	1570	380	n	2000	MCL	Y	ASL
	7440-41-7	Beryllium	0.2	4.7	µg/L	RW-4(393-403) (111113)	2.5%	0.1 - 2	4.7	2.5	n	4	MCL	N	FOD
	7440-43-9	Cadmium	0.2	11.8	µg/L	RW-5 (102709)	9.7%	0.17 - 3	11.8	0.92	n	NA		Y	ASL
	7440-47-3	Chromium	0.55	191	µg/L	RW-13(100-120)(091614)	36.5%	0.53 - 20.8	191	0.035	c	100	MCL	Y	ASL
	7440-48-4	Cobalt	0.4	34.7	µg/L	RW-5 (102709)	26.0%	0.3 - 50	34.7	0.6	n	NA		Y	ASL
	7440-50-8	Copper	0.5	307	µg/L	RW-2(452-462)(092614)	42.9%	0.7 - 10	307	80	n	1300	MCL	Y	ASL
	7439-89-6	Iron	14	84500	µg/L	OB-11R-081717	90.1%	7.4 - 143	84500	1400	n	NA		Y	ASL
	7439-92-1	Lead	0.2	53.6	µg/L	OB-25(060110)	28.9%	0.38 - 4.2	53.6	15	L	15	MCL	Y	ASL
	7439-95-4	Magnesium	23.2	50200	µg/L	OB-5(080909)	93.2%	16 - 5000	50200	NA		NA		N	NTX
	7439-96-5	Manganese	0.3	16300	µg/L	OB-15B(061110)	85.8%	0.12 - 15	16300	43	n	NA		Y	ASL
	7439-97-6	Mercury	0.071	0.49	µg/L	RW-11S(236-241)-082316	2.9%	0.049 - 0.2	0.49	0.063	n	2	MCL	N	FOD
	7440-02-0	Nickel	0.57	104	µg/L	OB-15B(061110)	59.1%	0.41 - 40.9	104	39	n	NA		Y	ASL
	7782-49-2	Selenium	0.65	24	µg/L	RW-13(100-120)(091614)	19.7%	0.73 - 10	24	10	n	50	MCL	Y	ASL
	7440-22-4	Silver	0.6	10.2	µg/L	OB-11R (091114) & DUP	15.9%	0.53 - 10	10.2	9.4	n	NA		Y	ASL
	7440-28-0	Thallium	0.2	17.9	µg/L	RW-4(393-403) (111113)	4.1%	0.17 - 6.6	17.9	0.02	n	2	MCL	N	FOD
	7440-62-2	Vanadium	0.5	77.8	µg/L	OB-25(080918)	49.1%	0.43 - 50	77.8	8.6	n	NA		Y	ASL
	7440-66-6	Zinc	1.9	10700	µg/L	RW-2 (442-472)	47.3%	1.4 - 30	10700	600	n	NA		Y	ASL
Tap Water	Other														
	57-12-5	Cyanide	2.1	16	µg/L	RW-4A (113-123)-082415	23.2%	2 - 10	16	0.15	n	200	MCL	Y	ASL

General Notes:

1. Concentrations in micrograms per liter (µg/L).

2. All annual site-wide data (2008-2017) were used for COPC screening. Only constituents detected in one or more sample(s) are presented. Metals data are total (rather than dissolved) concentrations, assuming conservatively that groundwater used as drinking water is unfiltered.

Footnotes:

(1) Maximum detected concentration used for screening.

(2) USEPA Regional Screening Levels (RSLs) for tap water May 2016. RSLs based on noncarcinogenic effects were based on an THQ of 0.1. RSLs based on carcinogenic effects where the noncarcinogenic RSL is <10 times the carcinogenic RSL were represented by noncarcinogenic RSLs based on an THQ of 0.1. The following surrogates and assumptions regarding inorganic speciation were used for screening:

Chromium = Chromium VI

Codes used for "Screening Toxicity Value":

c = screening value is based on carcinogenic effects

L = lead (screening value is the Action Level in drinking water)

n = screening value is based on noncarcinogenic effects

(3) The following surrogates were used to identify potential Applicable or Relevant and Appropriate Requirement (ARAR)/To be Considered (TBC) values:

Bromodichloromethane, chloroform = Total Trihalomethanes

Chromium = Total Chromium

Codes used for "Potential ARAR/TBC Source":

MCL = Maximum Contaminant Level, http://water.epa.gov/drink/contaminants/index.cfm

(4) Codes used for the "Rationale for Selection or Deletion":

ASL = above screening level

BSL = below screening level

CLA = chemical is classified as a class A carcinogen by USEPA

FOD = frequency of detection below 5 percent

NTX = no toxicity data and no screening value; compound will be discussed qualitatively

NUT = essential nutrient

Acronyms and Abbreviations Not Defined Elsewhere:

ARAR = Applicable or Relevant and Appropriate Requirement
BHHRA = Baseline Human Health Risk Assessment
CAS = Chemical Abstract Service
COPC = constituent of potential concern
N = no
NA = not available or not applicable
TBC = to be considered
THQ = target hazard quotient
USEPA = U.S. Environmental Protection Agency
Y = yes

Table 2
Chemical-Specific ARARs and TBCs

Media	Authority	Requirement	Description
Groundwater	State of New Jersey	Groundwater Quality Standards (NJAC 7:9C)	Lists groundwater quality standards in New Jersey. Applicable to establishing groundwater remediation goals.

Table 3
Action-Specific ARARs and TBCs

Authority	Requirement	Description
Federal	Clean Air Act (42 USC 7401, Section 112)	Establishes limits on emissions to atmosphere from industrial and commercial activities.
	National Ambient Air Quality Standards (NAAQS), (40 CFR Part 50)	Establishes emissions limits for primary and secondary NAAQS.
	Standards of Performance for New Stationary Sources (40 CFR Part 60)	Establishes emissions requirements for new stationary sources.
	National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR Part 61)	Establishes limits on hazardous emissions to the atmosphere.
	Underground Injection Control Program (40 CFR Part 146)	Establishes technical criteria and standards for underground injection wells.
	General Hazardous Waste Management System Regulations (40 CFR Part 260)	Provides definitions of terms and general standards applicable to hazardous waste management system regulations.
	Transportation of Hazardous Wastes. (40 CFR 263 and 49 CFR 107, 171-180)	Established standards for the transportation of hazardous wastes and/or materials.
	National Pollutant Discharge Elimination System (40 CFR 122)	Requires permits for the discharge of pollutants from any point source into waters of the United States
	Identification and Listing of Hazardous Waste (40 CFR Part 261)	Defines those wastes, which are subject to regulation as hazardous wastes, and lists specific chemical and industry-source wastes.
	Generators of Hazardous Waste (40 CFR 262)	Establishes requirements for generators of hazardous waste (EPA ID numbers and manifests).
	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR 264)	Establishes the minimum standards for the management of hazardous waste and includes regulations for land disposal units.
	Land Disposal Restrictions (40 CFR 268)	Identifies hazardous wastes which are restricted from land disposal and identifies treatment requirements prior to disposal

Table 3
Action-Specific ARARs and TBCs

Authority	Requirement	Description
State of New Jersey	Transportation of Hazardous Materials (NJAC 16:49)	Regulates shipping/transport of hazardous materials.
	Solid Waste Regulations (NJAC 7:26)	Regulates non-hazardous waste management.
	Storm Water Management (NJAC 7:8)	Establishes requirements for managing and controlling storm water from the site.
	Soil Erosion and Sediment Control (NJAC 7:13-3.3, 3.4)	Requires controls for erosion and sediment transport.
	Noise Control (NJAC 7:29)	Limits the noise generated from any industrial, commercial, public service or community service facility.
	Technical Requirements for Site Remediation (NJAC 7:26E)	Specifies requirements for remedial activities pursuant to New Jersey authorities. Substantive requirements may be relevant and appropriate.
	Well Construction and Maintenance, Sealing of Abandoned Wells (NJAC 7:9D)	Specifies requirements for installation and abandonment of wells.
	Ambient Air Quality Standards (NJAC 7:27-13)	Establishes air quality standards for the protection of public health and the preservation of ambient air quality.
	Control and Prohibition of Air Pollution from Diesel-Powered Motor Vehicles, Gasoline-Powered Motor Vehicles, VOCs, Toxic Compounds (NJAC 7:27-14,15,16,17)	Establishes allowable emissions from general industrial process source categories.
	Control and Prohibition of Air Pollution from New or Altered Sources Affecting Ambient Air Quality (Emission Offset Rules) (NJAC 7:27-18)	Establishes air quality guidelines and standards for specific sources.
	New Jersey Pollutant Discharge Elimination System Rules (NJAC 7:14A)	Establishes standards for surface water discharge for site remediation projects. Takes precedence over National Pollutant Discharge Elimination System regulations (40 CFR 122 and 125)

Table 3
Action-Specific ARARs and TBCs

Authority	Requirement	Description
State of New Jersey	Permits and Certificates for Minor Facilities (NJAC 7:27-8)	Governs substantive requirements of for facilities classified as minor air emission sources.
	Operating Permits and Certificates (NJAC 7:27-22)	Describes substantive requirements and for major sources.
	Underground Injection Control Program (NJAC 7:14A-8)	Establishes controls for injection practices.
	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (NJAC 7:26G-8)	Establishes substantive requirements and construction and operations standards.
	Treatment Works Approval (NJAC 7:14A-22,23)	Regulates the construction and operation of industrial and domestic wastewater collection, conveyance, and treatment facilities.
	Identification and Listing of Hazardous Waste (NJAC 7:26G-5)	Describes methods for identifying hazardous wastes and lists known hazardous wastes.
	Land Disposal Restrictions (NJAC 7:26G-11)	Identifies hazardous wastes that are subject to land disposal restrictions.

Table 4
Location-Specific ARARs and TBCs

Authority	Requirement	Description
Federal	**Fish and Wildlife**	
	Fish and Wildlife Coordination Act (16 USC 661, 40 CFR 6.302(g))	Provides protection of fish and wildlife from actions resulting in the control or structural modification of natural streams and water bodies.
	Endangered Species Act (16 USC 1531(h) through 1543, 50 CFR 17,402, and 40 CFR 6.302(b))	Provides protection of endangered/threatened species and habitats.
	Migratory Bird Treaty Act (16 USC 703 et seq)	Requirements for not killing, hunting, taking, or capturing any migratory birds or nests or eggs.
	Wetlands	
	Executive Order No. 11990 - Protection of Wetlands (40 CFR 6.302(a) and Appendix A)	Requires Federal agencies to take action to avoid adversely impacting wetlands wherever possible and to minimize wetlands destruction.
	Executive Order No. 11988 - Floodplain Management (40 CFR 6.302(b) and Appendix A)	Requires Federal agencies to evaluate the potential effects of actions it may take in a floodplain to avoid adversely impacting floodplains wherever possible.
	Wetland Permits (40 CFR 230 – 233)	Provides wetland substantive requirements for actions in and around wetlands and waters of the United States.
State of New Jersey	**Fish and Wildlife**	
	Endangered and Threatened Species (NJAC 7:13-3.9)	Identifies endangered and threatened species and species of special concern.
	Wetlands	
	Flood Hazard Area Control (NJAC 7:13)	Controls and limits development in flood plains.
	Freshwater Wetland Protection Act Rules (NJAC 7:7A)	Establishes requirements for the protection of freshwater wetlands.
	Flood Hazard Area Control (NJAC 7:13)	Establishes requirements for work in a flood hazard area and protection of riparian zones.

Table 5-1
Cost Estimate for the Selected Remedy (Alternative 3) - Site-Wide Groundwater

Item	Unit	Unit Price	Quantity	Amount
Capital Costs				
Mobilization/Demobilization	LS	$5,000	--	$5,000
Miscellaneous (HASP, Survey, Well Permits, etc.)	LS	$15,000	--	$15,000
Site Preparation/Access	LS	$50,000	--	$50,000
Well Installations				
Site Access	LS	$40,000	--	$40,000
Bedrock Sentinel Wells	Ea	$22,000	3	$66,000
Bedrock Injection Wells	Ea	$22,000	4	$88,000
Overburden Injection Wells	Ea	$3,000	21	$63,000
IDW Classification and Disposal	LS	$20,000	--	$20,000
Well Installation FHA and FWW Permit Equivalents & Mitigation	LS	$50,000	--	$50,000
Institutional Controls (CEA/WRA, Deed Notice)	LS	$15,000	--	$15,000
Oxygen Release Compound	LS	$50,000		$50,000
Installion of ORC	LS	$5,000	--	$5,000
Subtotal Capital				*$467,000*
Engineering & Administration (10%)				$47,000
Contingencies (25%)				$117,000
Total Capital				*$631,000*
Annual Operation, Maintenance, and Monitoring Costs				
Groundwater/Surface Water Monitoring	LS	$50,000	--	$50,000
Institutional Controls, Biennial Certifications*	LS	$10,000	--	$10,000
Oxygen Release Compound (annual replacement)	LS	$50,000	--	$50,000
Annual Installation of ORC	LS	$5,000	--	$5,000
Reporting/Five-Year Reviews*	LS	$10,000	--	$10,000
Misc. Well Maintenance, Security, etc.	LS	$5,000	--	$5,000
Subtotal Annual OM&M				*$130,000*
Engineering & Administration (10%)				$13,000
Contingencies (25%)				$32,500
Total Annual OM&M				*$176,000*
Present Worth Annual OM&M (7%, 30 yrs)				*$2,184,000*
Total 30-Year Net Present Worth				*$2,815,000*
*Intermittent activities converted to estimated annual cost for calculation purposes.				

Table 5-2
Cost Estimate for the Selected Remedy (Alternative 3) - Peters Mine Pit Airshaft

Item	Unit	Unit Price	Quantity	Amount
Capital Costs				
Mobilization/Demobilization	LS	$15,000	--	$15,000
Miscellaneous (e.g., HASP)	LS	$3,000	--	$3,000
Site Preparation/Access				
Stone Pad and Accessway	LS	$50,000	--	$50,000
Geotextile, Mats, etc. for Equipment	LS	$15,000	--	$15,000
Air Shaft Closure/Treatment				
Granular Activated Carbon (GAC)	Lbs	$2	2,000	$4,000
Resin	Kgs	$160	100	$16,000
Installation of GAC and Resin (e.g., cable, socks, etc.)	LS	$10,000	--	$10,000
Coarse Angular Stone	Tons	$40	1,500	$60,000
Fast Setting, Low-Slump Grout	CY	$125	100	$12,500
Low-Strength Fly Ash Cement Grout	CY	$100	2,200	$220,000
Concrete Cap and Marker	LS	$5,000	--	$5,000
Treatment of Displaced Mine Shaft Water	Gals	$0.05	450,000	$22,500
Site Restoration	LS	$10,000	--	$10,000
Subtotal Capital				***$443,000***
Engineering & Administration (10%)				$44,000
Contingencies (25%)				$111,000
Total Capital				***$598,000***
Annual Operation, Maintenance, and Monitoring Costs				
Groundwater Monitoring Performed Under Site-Wide Groundwater				$0
Total Remedy Cost				***$598,000***

Table 6
New Jersey Groundwater Quality Standards for Chemicals of Concern

Chemical of Potential Concern	New Jersey Groundwater Quality Standard (ug/L)
Benzene	1
1,4-Dioxane	0.4
Lead	5

APPENDIX III – Risk Assessment Tables

TABLE 1
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Future
Medium: PMP Air Shaft Mine Water
Exposure Medium: Mine Water

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Tap Water	Benzene	0.6	33	ug/L	63%	24	ug/L	95% UCL
Tap Water	1,4-Dioxane	5.7	150	ug/L	75%	98	ug/L	95% UCL
Tap Water	Lead	0.0045	200	ug/L	50%	14	ug/L	Mean

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs in groundwater. The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived. A qualitative analysis also identified tetrachloroethene as a COC for the vapor intrusion pathway based on elevated soil gas concentrations beneath the building.

TABLE 2

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Benzene	Chronic	4E-03	mg/kg-day	1	4E-03	mg/kg-day	Immune	300	IRIS	04/20/18
1,4-Dioxane	Chronic	3E-02	mg/kg-day	1	3E-02	mg/kg-day	Hepatic/ Urinary	300	IRIS	04/20/18
Lead	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	NA	NA	NA	04/20/18

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Benzene	Chronic	3E-02	mg/m^3	-----	-----	Immune	100	IRIS	04/20/18
1,4-Dioxane	Chronic	3E-02	mg/m^3	-----	-----	CNS	1000	IRIS	04/20/18
Lead	Chronic	NA	mg/m^3	-----	-----	NA	NA	NA	04/20/18

Key

-----: No information available
CNS – Central Nervous System
IRIS: Integrated Risk Information System, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater and indoor air. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi). Note that toxicity data are not available lead; hazards from exposure to lead are estimated using the IEUBK model, rather than RfDs and RfCs.

TABLE 3

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Benzene	5.5E-02	$(mg/kg/day)^{-1}$	5.5E-02	$(mg/kg/day)^{-1}$	A: Known human carcinogen	IRIS	04/20/18
1,4-Dioxane	1.00E-01	$(mg/kg/day)^{-1}$	1.00E-01	$(mg/kg/day)^{-1}$	Likely to be carcinogenic to humans	IRIS	04/20/18
Lead	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	NA	NA	04/20/18

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Benzene	7.8E-06	$1/(ug/m^3)$	-----	-----	A	IRIS	04/20/18
1,4-Dioxane	5.0E-06	$1/(ug/m^3)$	-----	-----	Likely to be carcinogenic to humans	IRIS	04/20/18
Lead	NA	$1/(ug/m^3)$	-----	-----	NA	IRIS	04/20/18

Key:

IRIS: Integrated Risk Information System. U.S. EPA
-----: No information available

EPA Weight of Evidence:

A: Known Human Carcinogen

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater and indoor air. Toxicity data are provided for both the oral and inhalation routes of exposure. Note that toxicity data are not available lead; risk from exposure to lead is estimated using the IEUBK model, rather than slope factors and unit risks.

TABLE 4

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Youth/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk
					Exposure Routes Total
Mine Water	Mine Water	Tap water	Benzene	Immune	**0-9**
Mine Water	Mine Water	Tap water	1,4-Dioxane	Hepatic/ Urinary	**0-39**
Mine Water	Mine Water	Tap water	Lead	NA	**NA; See Note Below**
					Hazard Index Total= **< 1**

CNS – central nervous system

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for exposure to groundwater. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

Lead was evaluated using the IEUBK model. Estimated blood lead levels following potential exposure to lead in PMP Airshaft mine water for a young child resident are predicted to exceed 5 ug/dL blood lead level in 27% of the hypothetically exposed population, which is above EPA's regional target (no more than 5% exceeding 5 µg/dl).

TABLE 5

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Youth/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk
				Exposure Routes Total
Mine Water	Mine Water	Tap water	Benzene	**4E-05**
Mine Water	Mine Water	Tap water	1,4-Dioxane	**2E-04**
Mine Water	Mine Water	Tap water	Lead	**NA**
			Total Risk =	**2E-04**

Summary of Risk Characterization – Carcinogens

The table presents cancer risks for groundwater exposure. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}.

APPENDIX IV – Administrative Record Index

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

01/29/2020 **REGION ID: 02**

Site Name: RINGWOOD MINES/LANDFILL
CERCLIS ID: NJD980529739
OUID: 03
SSID: 0262
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
568979	01/29/2020	ADMINISTRATIVE RECORD INDEX FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	9	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
206801	10/25/2007	DRAFT TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER SAMPLING FOR 04/02/2007 - 04/18/2007 FOR THE RINGWOOD MINES/LANDFILL SITE	125	Memorandum	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ALBRIGHT,GREGORY,R (ARCADIS U.S. INCORPORATED)|ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
206806	02/20/2008	DRAFT TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER SAMPLING FOR 10/08/2007 - 10/17/2007 FOR THE RINGWOOD MINES/LANDFILL SITE	97	Memorandum	BUSSA,BRIAN (FORD MOTOR COMPANY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
206802	10/29/2008	DRAFT TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER SAMPLING FOR 04/28/2008 - 05/09/2008 FOR THE RINGWOOD MINES/LANDFILL SITE	54	Memorandum	BUSSA,BRIAN (FORD MOTOR COMPANY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
206807	01/14/2009	DRAFT TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER SAMPLING FOR 09/08/2008 - 09/22/2008 FOR THE RINGWOOD MINES/LANDFILL SITE	130	Memorandum	BUSSA,BRIAN (FORD MOTOR COMPANY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
206804	09/28/2009	DRAFT TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER SAMPLING FOR 06/30/2009 - 07/17/2009 FOR THE RINGWOOD MINES/LANDFILL SITE	209	Memorandum	BUSSA,BRIAN (FORD MOTOR COMPANY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
541555	02/19/2010	TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER SAMPLING FOR 10/19/2009 - 11/02/2009 FOR THE RINGWOOD MINES/LANDFILL SITE	134	Report	(US ENVIRONMENTAL PROTECTION AGENCY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(ARCADIS INCORPORATED)|ZIMMERMAN,ERICH (ARCADIS INCORPORATED)

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206805	09/28/2010	TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER SAMPLING FOR 05/25/2010 - 06/30/2010 FOR THE RINGWOOD MINES/LANDFILL SITE	147	Memorandum	BUSSA,BRIAN (FORD MOTOR COMPANY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
206803	12/07/2011	TECHNICAL MEMORANDUM FOR SITE-WIDE GROUNDWATER AND SURFACE WATER SAMPLING FOR 05/16/2011 - 06/10/2011 FOR THE RINGWOOD MINES/LANDFILL SITE	120	Memorandum	BUSSA,BRIAN (FORD MOTOR COMPANY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
212524	07/02/2012	REVISED REMEDIAL INVESTIGATION REPORT FOR THE PETERS MINE AREA AND FORD MOTOR COMPANY'S RESPONSES TO US EPA COMMENTS FOR THE RINGWOOD MINES/LANDFILL SITE	580	Letter	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	ZIMMERMAN,ERICH (ARCADIS U.S. INCORPORATED)
206782	06/01/2013	REVISED REMEDIAL INVESTIGATION REPORT FOR O'CONNOR DISPOSAL AREA FOR THE RINGWOOD MINES/LANDFILL SITE	725	Report	(FORD MOTOR COMPANY)	(ARCADIS U.S. INCORPORATED)
206792	06/01/2013	REVISED REMEDIAL INVESTIGATION REPORT FOR CANNON MINE PIT AREA FOR THE RINGWOOD MINES/LANDFILL SITE	457	Report	(FORD MOTOR COMPANY)	(ARCADIS U.S. INCORPORATED)
377398	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT, REVISED JANUARY 2015, VOLUME 1 OF 3, TEXT FOR THE RINGWOOD MINES/LANDFILL SITE	158	Report	(FORD MOTOR COMPANY)	(ARCADIS U.S. INCORPORATED)
377399	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT, REVISED JANUARY 2015, VOLUME 2 OF 3, FIGURES FOR THE RINGWOOD MINES/LANDFILL SITE	73	Report	(FORD MOTOR COMPANY)	(ARCADIS U.S. INCORPORATED)

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541560	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - TABLES, APPENDICES A-C FOR THE RINGWOOD MINES/LANDFILL SITE	3028	Report		(ARCADIS INCORPORATED)
541561	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - APPENDICES D-F FOR THE RINGWOOD MINES/LANDFILL SITE	785	Report		(ARCADIS INCORPORATED)
541562	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - APPENDIX G PART 1 FOR THE RINGWOOD MINES/LANDFILL SITE	5154	Report		(ARCADIS INCORPORATED)
541563	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - APPENDIX G PART 2 FOR THE RINGWOOD MINES/LANDFILL SITE	8269	Report		(ARCADIS INCORPORATED)
541564	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - APPENDIX G PART 3 FOR THE RINGWOOD MINES/LANDFILL SITE	5370	Report		(ARCADIS INCORPORATED)
541565	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - APPENDIX G PART 4 FOR THE RINGWOOD MINES/LANDFILL SITE	7045	Report		(ARCADIS INCORPORATED)
541566	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - APPENDIX G PART 5 FOR THE RINGWOOD MINES/LANDFILL SITE	7000	Report		(ARCADIS INCORPORATED)

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541567	01/01/2015	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT REVISED JANUARY 2015 - APPENDICES H-K FOR THE RINGWOOD MINES/LANDFILL SITE	108	Report		(ARCADIS INCORPORATED)
377397	05/01/2015	DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT FOR SITE-RELATED GROUNDWATER FOR THE RINGWOOD MINES/LANDFILL SITE	149	Report	(FORD MOTOR COMPANY)	(ARCADIS U.S. INCORPORATED)
377395	05/19/2015	SUPPLEMENTAL GROUNDWATER AND SURFACE WATER SAMPLING, APRIL 2015 FOR THE RINGWOOD MINES/LANDFILL SITE	309	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENGINEERING AND LAND SURVEYING, PLLC)
541553	06/24/2015	US EPA APPROVAL OF THE REMEDIAL INVESTIGATION REPORT FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	1	Letter	(FORD MOTOR COMPANY)|BUSSA,BRIAN (FORD MOTOR COMPANY)	(US ENVIRONMENTAL PROTECTION AGENCY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)
377396	06/25/2015	SUPPLEMENTAL GROUNDWATER AND SURFACE WATER SAMPLING, JUNE 2015 FOR THE RINGWOOD MINES/LANDFILL SITE	692	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENGINEERING AND LAND SURVEYING, PLLC)
377377	11/25/2015	AUGUST (ANNUAL) GROUNDWATER AND SURFACE WATER SAMPLING FOR THE RINGWOOD MINES/LANDFILL SITE	2272	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENGINEERING AND LAND SURVEYING, PLLC)
377376	02/18/2016	DECEMBER 2015 GROUNDWATER, MINE WATER, AND SURFACE WATER SAMPLING FOR THE RINGWOOD MINES/LANDFILL SITE	1464	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENGINEERING AND LAND SURVEYING, PLLC)

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396382	03/14/2016	ANALYTICAL RESULTS OF GROUNDWATER AND SURFACE WATER SAMPLES COLLECTED FOR THE RINGWOOD MINES/LANDFILL SITE	9	Report	GIGLIO,BILL (NORTH JERSEY DISTRICT WATER SUPPLY COMMISSION)	WOLFGANG,KELLI (ALS ENVIRONMENTAL)
395765	03/18/2016	SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT - ADDITIONAL PMP OVERBURDEN WELLS - FOR THE RINGWOOD MINES/LANDFILL SITE	176	Letter	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(CORNERSTONE ENVIRONMENTAL GROUP, LLC)
396430	04/15/2016	MARCH 2016 SURFACE WATER SAMPLING REPORT OU2 FOR THE RINGWOOD MINES/LANDFILL SITE	45	Letter	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY (CORNERSTONE ENGINEERING GROUP LLC)
436308	08/09/2016	MAY-JUNE 2016 GROUNDWATER, MINE WATER, AND SURFACE WATER SAMPLING REPORT WITH ATTACHMENT A FOR THE RINGWOOD MINES/LANDFILL SITE	91	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENGINEERING AND LAND SURVEYING, PLLC)
436309	08/09/2016	MAY-JUNE 2016 GROUNDWATER, MINE WATER, AND SURFACE WATER SAMPLING REPORT ATTACHMENT B FOR THE RINGWOOD MINES/LANDFILL SITE	3882	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENGINEERING AND LAND SURVEYING, PLLC)
436310	08/09/2016	MAY-JUNE 2016 GROUNDWATER, MINE WATER, AND SURFACE WATER SAMPLING REPORT ATTACHMENT C - D FOR THE RINGWOOD MINES/LANDFILL SITE	4659	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENGINEERING AND LAND SURVEYING, PLLC)
458008	10/28/2016	2016 ANNUAL GROUNDWATER SAMPLING REPORT FOR GROUNDWATER, MINE WATER, AND SURFACE WATER FOR THE RINGWOOD MINES/LANDFILL SITE	3774	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(CORNERSTONE ENVIRONMENTAL GROUP, LLC)

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458193	11/08/2016	CORRESPONDENCE REGARDING SOIL SAMPLING AND TESTING FOR 1,4-DIOXANE WITHIN THE O'CONNOR DISPOSAL AREA (OCDA) OF THE RINGWOOD MINES/LANDFILL SITE	4	Letter	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY (CORNERSTONE ENGINEERING GROUP LLC)
451890	11/09/2016	US EPA FACT SHEET - NEW GROUNDWATER SAMPLING DATA - THE RINGWOOD MINES/LANDFILL SITE	1	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)
472302	01/20/2017	FOCUSED OCDA (O'CONNOR DISPOSAL AREA) INVESTIGATION REPORT FOR THE RINGWOOD MINES/LANDFILL SITE	242	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY (CORNERSTONE ENGINEERING GROUP LLC)
472627	03/27/2017	GROUNDWATER SAMPLING REPORT FOR FEBRUARY 2017 - GROUNDWATER, MINE WATER, AND SURFACE WATER FOR THE RINGWOOD MINES/LANDFILL SITE	5646	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(CORNERSTONE ENVIRONMENTAL GROUP, LLC)
473337	05/01/2017	FINAL REPORT OF THE POTENTIAL FATE AND TRANSPORT OF BENZENE, 1,4-DIOXANE, LEAD AND ARSENIC AT THE RINGWOOD MINES/LANDFILL SITE	49	Report		(NORTH JERSEY WATER SUPPLY COMMISSION)
473336	05/22/2017	TRANSMITTAL OF THE NORTH JERSEY DISTRICT WATER SUPPLY COMMISSION FINAL REPORT OF THE POTENTIAL FATE AND TRANSPORT OF BENZENE, 1,4-DIOXANE, LEAD AND ARSENIC AT THE RINGWOOD MINES/LANDFILL SITE	2	Letter	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	CALIGUIRE,TODD (NORTH JERSEY WATER SUPPLY COMMISSION)
541558	06/22/2017	GROUNDWATER ECOLOGICAL ASSESSMENT FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	315	Report		(ARCADIS INCORPORATED)

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541559	06/22/2017	TRANSMITTAL OF THE GROUNDWATER ECOLOGICAL ASSESSMENT FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	2	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(ARCADIS INCORPORATED)
541556	07/19/2017	US EPA APPROVAL OF THE ECOLOGICAL ASSESSMENT REPORT FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	1	Letter	(FORD MOTOR COMPANY)|BUSSA,BRIAN (FORD MOTOR COMPANY)	(US ENVIRONMENTAL PROTECTION AGENCY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)
544100	10/11/2017	2017 ANNUAL GROUNDWATER, MINE WATER, AND SURFACE WATER SAMPLING FOR THE RINGWOOD MINES/LANDFILL SITE	2505	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(CORNERSTONE ENVIRONMENTAL GROUP, LLC)
533901	02/01/2018	TECHNICAL ASSISTANCE SERVICES FOR COMMUNITIES - FACT SHEET - SUMMARY OF GROUNDWATER REMEDIAL INVESTIGATION REPORT (RIR) ADDENDUM FOR THE RINGWOOD MINES/LANDFILL SITE	8	Publication		
533900	02/08/2018	TECHNICAL ASSISTANCE SERVICES FOR COMMUNITIES - REVIEW OF SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT (RIR) ADDENDUM FOR THE RINGWOOD MINES/LANDFILL SITE	40	Meeting Document		
541557	05/18/2018	ADDENDUM TO THE DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT CALCULATIONS FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	405	Report	(US ENVIRONMENTAL PROTECTION AGENCY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(ARCADIS INCORPORATED)
541554	06/11/2018	US EPA APPROVAL OF THE HUMAN HEALTH RISK ASSESSMENT CALCULATIONS ADDENDUM FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	1	Letter	(FORD MOTOR COMPANY)|LIDDELL,COLLEEN (FORD MOTOR COMPANY)	(US ENVIRONMENTAL PROTECTION AGENCY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)

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544794	09/04/2018	FORD MOTOR COMPANY RESPONSE TO COMMENTS REGARDING SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT ADDENDUM DATED OCTOBER 2017, REVISED SEPTEMBER 2018 FOR THE RINGWOOD MINES/LANDFILL SITE	10	Letter	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	DIPIPPO,GARY,J (CORNERSTONE ENVIRONMENTAL GROUP, LLC)
544795	09/04/2018	SITE-RELATED GROUNDWATER REMEDIAL INVESTIGATION REPORT ADDENDUM DATED OCTOBER 2017, REVISED SEPTEMBER 2018 FOR THE RINGWOOD MINES/LANDFILL SITE	1070	Report	(FORD MOTOR COMPANY)	(CORNERSTONE ENGINEERING GROUP LLC)
560672	11/19/2018	2018 ANNUAL GROUNDWATER, MINE WATER, AND SURFACE WATER SAMPLING FOR THE RINGWOOD MINES/LANDFILL SITE	1703	Report	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(CORNERSTONE ENVIRONMENTAL GROUP, LLC)
197521	12/13/2018	Summary of Focused Feasibility Study (FFS) Report for Operable Unit 3 (OU3) Site-Related Groundwater	8	Other		
197527	12/13/2018	Review of Operable Unit 3 Focused Feasibility Study Report Presentation	43	Other		
541552	12/13/2018	US EPA APPROVAL OF THE REMEDIAL INVESTIGATION REPORT ADDENDUM FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	1	Letter	(FORD MOTOR COMPANY)|LIDDELL,COLLEEN (FORD MOTOR COMPANY)	(US ENVIRONMENTAL PROTECTION AGENCY)|GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)
563531	03/05/2019	NORTH JERSEY DISTRICT WATER SUPPLY COMMISSION'S COMMENTS ON THE OU3 SITE RELATED GROUNDWATER FOCUSED FEASIBILITY STUDY FOR THE RINGWOOD MINES/LANDFILL SITE	5	Letter	(NJDWSC)	(JACOBS)

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560895	03/07/2019	RESPONSE TO COMMENTS REGARDING GROUNDWATER FOCUSED FEASIBILITY STUDY SEPTEMBER 2018 REVISED MARCH 2019 FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	8	Letter	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)	(CORNERSTONE ENVIRONMENTAL GROUP, LLC)
560896	03/07/2019	GROUNDWATER FOCUSED FEASIBILITY STUDY FOR OU3 SEPTEMBER 2018 REVISED MARCH 2019 FOR THE RINGWOOD MINES/LANDFILL SITE	228	Report	(FORD MOTOR COMPANY)	(CORNERSTONE ENVIRONMENTAL GROUP, LLC)
541652	12/18/2019	US EPA APPROVAL OF THE REVISED FOCUSED FEASIBILITY STUDY FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	1	Letter	LIDDELL,COLLEEN (FORD MOTOR COMPANY)	GOWERS,JOSEPH (US ENVIRONMENTAL PROTECTION AGENCY)
587286	01/28/2020	PROPOSED PLAN FOR OU3 FOR THE RINGWOOD MINES/LANDFILL SITE	21	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX V – State Letter of Concurrence

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation and Waste Management Program
401 E. State Street
PO Box 420, Mail Code 401-06
Trenton, New Jersey 08625
Tel: (609) 292-1250
Fax: (609) 777-1914

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Commissioner

September 29, 2020

Mr. Pat Evangelista, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Ringwood Mines/Landfill Superfund Site
Record of Decision Operable Unit 3 – Site-Wide Ground Water
EPA ID# NJD980529739/DEP PI#G000004537

Dear Mr. Evangelista:

The New Jersey Department of Environmental Protection (DEP) has completed its review of the "Record of Decision, Ringwood Mines/Landfill Superfund Site, Operable Unit 3, Borough of Ringwood, Passaic County, New Jersey" prepared by the U.S. Environmental Protection Agency (EPA) Region II in September 2020. The DEP concurs with the selected remedy to address site-wide contaminated groundwater and mine water contamination.

The major components of the OU3 selected remedy, which has a total cost of $3.41 million, include:

- Installation of a series of injection wells in the Peter's Mine Pit Area and the O'Connor Disposal Area for subsurface, in-situ treatment of dissolved contamination;
- Implementation of a long-term groundwater monitoring plan in and downgradient of the Peter's Mine Pit Area, Cannon Mine Pit Area, and the O'Connor Disposal Area;
- Installation of a sentinel monitoring well network;
- Implementation of a long-term surface water monitoring plan in and downstream of the site brooks;
- Establishment of a Classification Exception Area/Well Restriction Area (CEA/WRA);
- Permanent closure of the Peter's Mine Pit Airshaft.

Prior to the closure of the Peter's Mine Pit Airshaft, Granular Activated Carbon and resin will be introduced to the base of the airshaft to provide for the adsorption of organic contaminants. Displaced water will be treated through filtration and GAC and then discharged to groundwater within the same general locations, pursuant to the substantive requirements of NJAC 7:14A-7.5

DEP appreciates the opportunity to participate in the decision-making process to select an appropriate remedy for this site. Further, DEP looks forward to future cooperation with EPA during remedial actions for OU3 to ensure protection of residents from contaminated drinking water and historic airshaft hazards, as well as long-term restoration of the area's groundwater resource.

If you have any questions, please call me at (609) 292-1250.

Sincerely,

Mark J. Pedersen
Assistant Commissioner
Site Remediation & Waste Management Program

C: Kenneth J. Kloo, Director, Division of Remediation Management, DEP
Frederick A. Mumford, Section Chief, Publicly Funded Response Element, DEP
Kim O'Connell, Chief, New Jersey Remediation Branch, EPA Region II
Joe Gowers, Remedial Project Manager, NJRB, EPA Region II

APPENDIX VI – Responsiveness Summary

APPENDIX VI

RESPONSIVENESS SUMMARY

INTRODUCTION

This Responsiveness Summary provides a summary of the significant comments and concerns submitted by the public on the January 2020 Proposed Plan for the Ringwood Mines/Landfill Superfund Site (Site), and EPA's responses to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision for the selection of a remedy to address groundwater and mine water contamination at the Site, which has been designated as OU3.

This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS: This section provides the history of community involvement and concerns regarding the Site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES: This section includes summaries of comments received by EPA during the February 10, 2020 public meeting and in writing during the public comment period, as well as responses to these comments.

The Responsiveness Summary includes attachments which document public participation in the remedy selection process for the Site. These attachments are as follows:

Attachment A - January 2020 Proposed Plan for the Ringwood Mines/Landfill Site;

Attachment B - Public Notice published in The Record on January 30, 2020;

Attachment C - Transcripts of the February 10, 2020, Public Meeting; and

Attachment D - Written comments received by EPA during the public comment period.[1]

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

EPA's Proposed Plan for addressing groundwater and mine water contamination at the Site, as well as supporting documentation, were released to the public for comment on January 30, 2020. These documents were made available to the public in the administrative record file available online at http://www.epa.gov/superfund/ringwood-mines, as well as in the EPA Region II Records Center at 290 Broadway, New York City. Furthermore, a notice of availability of the above-referenced documents was published in The Record on January 30, 2020.

[1] Due to the similar nature of the comment letters received through actionnetwork.org, only one example letter has been included in this attachment.

On January 30, 2020, EPA opened a thirty-day public comment period on the Proposed Plan which was originally scheduled to extend through March 2, 2020. However, EPA received requests from the public and U.S, Senator Cory Booker to extend the public comment period to allow additional time for consideration of and comment on the Proposed Plan. In response to these requests, the EPA provided four extensions to the public comment period, which resulted in a public comment period that extended from January 30, 2020 through August 3, 2020.

In addition, EPA held a public meeting on February 10, 2020 at 7:00 pm at the Martin J. Ryerson Middle School in Ringwood, New Jersey to present the findings of the Remedial Investigation and Focused Feasibility Study (RI/FFS) and EPA's Proposed Plan to the community and local officials. At this meeting, representatives of the EPA listened to and answered questions concerning the remedial alternatives developed as part of the RI/FFS.

In order to ensure community involvement at the Site, EPA has facilitated the formation of a Community Advisory Group (CAG) comprised of community members, local officials and other Site stakeholders. Representatives of the EPA and NJDEP routinely attended CAG meetings in order to share Site information with the community. In addition, since 2016, EPA has provided the CAG with access to an environmental consultant, Skeo Solutions, as part of its Technical Assistance Service for Communities program. Under this program, Skeo Solutions has provided technical assistance to the CAG by summarizing and providing for the review and comment on Site-related technical documents.

In response to concerns raised by the Upper Ringwood community regarding the potential of adverse Site impacts, in July 2013, EPA finalized an Environmental Justice (EJ) Assessment for the Site. The EJ Assessment concluded that the Upper Ringwood community had been adversely impacted by the Site and recommended actions that could be taken by EPA and the State and local government to help identify and address potential impacts. As noted in the Addendum to the Environmental Justice Assessment, EPA has addressed all of the recommendations identified in the EJ Assessment.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

176 comment letters were received by EPA via the U.S. Postal Service and electronic mail during the public comment period. Of these comment letters, 158 were received through the actionnetwork.org and included similar language and comments. The following is a summary of the significant comments contained in these letters and during the public meeting held on February 10, 2020, and EPA's responses to these comments.

The entire transcript for the public meeting is attached (Attachment C) to this document. A copy of the transcript of the public meeting is also available in the Administrative Record, which is available in the above-reference information repositories.

Comments were received during the public comment period from numerous groups and individuals, including the Borough of Ringwood, individual CAG members, local residents, various environmental groups, professors from area colleges, and other interested parties. Many

of the comments received expressed concern regarding the protectiveness of the OU2 remedy, which was selected in the June 30, 2014 ROD and the April 15, 2015 Explanation of Significant Differences (ESD) for the Site. EPA notes that the OU2 remedy is not the subject of this ROD, and that public concerns regarding the OU2 remedy were taken into consideration during the OU2 remedy selection process, with responses to comments addressed in the Responsiveness Summary incorporated into the June 30, 2014 ROD. Other comments express concerns regarding threats posed by the Site to drinking water resources, including the Wanaque Reservoir. The following is a summary of these comments, and EPA responses are grouped under these common topics:

- OU2 Remedy
- Remedy for Site-wide Groundwater
- Remedy for the PMP Air Shaft
- Habitability and Health Effects in the Upper Ringwood Area
- Groundwater, Surface Water and Drinking Water
- Environmental Justice
- Other Comments

OU2 Remedy

Comment #1: Many comments were received which expressed concern regarding the protectiveness of the OU2 remedy which was the subject of the June 30, 2014 ROD, and April 15, 2015 ESD.

EPA Response #1: EPA notes that the OU2 remedy is not the subject of this ROD, and that public concerns regarding the OU2 remedy were taken into consideration during the OU2 remedy selection process. Public concerns regarding the OU2 remedy have already been addressed in the Responsiveness Summary incorporated into the June 30, 2014 ROD, available at https://semspub.epa.gov/work/02/255080.pdf. EPA also received and responded to comments on the OU2 remedy during the public comment period on the judicial Consent Decree, entered by the Court on August 5, 2020, which provides for implementation of the OU2 remedy by the Ford Motor Company and the Borough of Ringwood. The Responsiveness Summary associated with this judicial Consent Decree is available at https://semspub.epa.gov/work/02/586145.pdf. EPA encourages the public to refer to the above-referenced Responsiveness Summaries for answers to concerns regarding the OU2 remedy.

Remedy for Site-wide Groundwater

Comment #2: Several commenters recommended that phytoremediation be utilized to treat Site-related contamination.

EPA Response #2: As part of the process of developing potential cleanup alternatives for groundwater contamination at the Site, a wide range of general response actions and associated cleanup technologies and process options were evaluated. Phytoremediation was not identified as a technology that would help to achieve the remedial action objectives identified in this ROD. It should be noted that the effectiveness of phytoremediation would be severely limited due to

the depth of groundwater contamination at the Site. A similar screening of general response actions and associated cleanup technologies during the OU2 remedy selection process also did not identify phytoremediation as a technology which would help achieve the remedial action objectives established in the OU2 ROD. Therefore, EPA does not believe that phytoremediation is an appropriate cleanup technology to address Site-related contamination.

Comment #3: A commenter expressed concern that the groundwater monitoring network to be established as part of the long-term groundwater monitoring plan may not be sufficient. Several commenters also expressed concern that 5 years between groundwater monitoring events is inadequate.

EPA Response #3: EPA will coordinate with representatives of the NJDEP during design of the selected remedy to ensure that appropriately placed monitoring wells are incorporated into the long-term groundwater monitoring plan to effectively monitor the extent of Site-related groundwater contamination. Furthermore, the groundwater monitoring network will include the installation and sampling of sentinel wells to provide advanced warning of any movement of contaminants toward drinking water supplies. While the specific details of the long-term groundwater monitoring program will be determined during design of the selected remedy, EPA anticipates that groundwater sampling will be conducted and evaluated more frequently than every five years. For costing purposes, the OU3 FFS Report assumes that groundwater monitoring will be conducted twice during the first year of remedy implementation, every five quarters for the next five years and biannually thereafter.

Comment #4: A commenter notes that while they agree with EPA's preferred remedy for Site-wide Groundwater, the ROD should clearly state that the remedy is enhanced bioremediation, consistent with the alternative description in the OU3 FFS Report.

EPA Response #4: The description of the selected remedy for Site-wide Groundwater in this ROD clearly indicates that it is likely that oxygen-releasing compound (ORC) will be introduced to the aquifer to provide for the aerobic degradation of Site-related contaminants. However, EPA has modified the description of the alternative evaluated in the OU3 FFS to provide for the implementation of alternative in-situ treatment options, if determined to be warranted during design of the selected remedy. This modification will help ensure the efficient and expeditious implementation of the selected remedy.

Comment #5: A commenter recommends that the ROD be modified to require the implementation and evaluation of the selected remedy for Site-wide Groundwater prior to implementation of the selected remedy for the PMP Airshaft.

EPA Response #5: While EPA currently believes that the selected remedies for Site-wide Groundwater and the PMP Airshaft can be implemented concurrently, the schedule for implementation of the selected remedies will be developed during design of the remedies. If during the development of the design, it is determined that it would be beneficial to sequence the implementation as recommended, EPA will have the opportunity to do so.

Comment #6: A commenter states that New Jersey's drinking water standards are based on a one in a million cancer risk while EPA's standards are based on a one in 10,000 and one in 100,000 cancer risk. Therefore, the groundwater cleanup level should be set to the more stringent New Jersey standard.

EPA Response #6: To clarify, and as noted in the OU3 ROD, EPA's remediation goals for groundwater outside of the mine shaft area are the applicable Class IIA New Jersey Ground Water Quality Standards for identified Site contaminants of concern. Therefore, the groundwater cleanup goals are 1 µg/L and 0.4 µg/L for benzene and 1,4-dioxane, respectively.

Comment #7: A commenter questions what EPA would do if it found through monitoring that its selected remedy was not working. Another commenter asked whether implementation of the selected remedy would preclude the future use of other treatment actions at the Site, such as groundwater pump and treat, if the selected remedy failed.

EPA Response #7: Prior to the implementation of the selected remedy, EPA will require the development of an Operations and Maintenance (O&M) Plan. The O&M Plan will detail the procedures to be followed to ensure that the remedy remains protective of human health and the environment during implementation and will address optimization of the remedy to ensure its continued effectiveness. If EPA determines during implementation of the selected remedy that significant or fundamental modifications are necessary to ensure the protection of human health and the environment, such modifications would be documented through the issuance of an Explanation of Significant Differences or a ROD Amendment. Implementation of the selected remedy would not preclude the use of other groundwater treatment options at the Site in the future, if necessary, to provide for protection of human health and the environment.

EPA Comment #8: A commenter asked whether tap water in residential homes in the Upper Ringwood area will be monitored during implementation of the selected remedy.

EPA Response #8: Residential homes in the Upper Ringwood area receive their drinking water from the municipal water supply system, not groundwater at the Site. The Borough of Ringwood municipal water supply system obtains its drinking water from pumping wells located more than 2 miles from the Site, as well as from the North Jersey District Water Supply Commission. Furthermore, the Borough of Ringwood's drinking water system is regulated by the NJDEP as a community water system, with water quality monitoring requirements. Therefore, monitoring of tap water in residential homes in the Upper Ringwood area during remedy implementation is not warranted.

Comment #9: The proposed location of the treatment wells appears to be only slightly downgradient of well RW-3DD, which has exhibited the highest 1,4-dioxane concentrations downgradient of the mine pit. This well is screened approximately 115 feet into the bedrock beneath at least 50 feet of overburden, and the purported upward gradient from bedrock to overburden is unlikely to bring this contamination into the overburden upgradient of the treatment wells. Therefore, impacted groundwater may bypass the treatment wells.

EPA Response #9: The locations of the treatment wells recommended in the ROD have been proposed in order to intercept groundwater downgradient of the PMP Airshaft, where contaminants have typically been detected at their highest concentrations. EPA notes that 1,4-dioxane has also been detected at elevated concentrations in groundwater samples collected at shallower depths in the vicinity of monitoring well RW-3DD, possibly due to the upward flow of groundwater. Therefore, the recommended placement of these wells appears warranted. Furthermore, the selected remedy for Site-wide Groundwater provides for the installation of treatment wells in the deeper bedrock aquifer in areas where contaminants have been detected at their highest concentrations, including in the immediate vicinity of well RW-3DD (see Figure 6). Therefore, EPA believes that the proposed treatment well locations will provide for effective treatment of groundwater containing the highest concentrations of contaminants. However, the locations of the treatment wells may be subject to modification during design of the selected remedy.

Comment #10: Fractures offer highly transmissive conduits that may result in transport at an angle to the hydraulic gradient. Despite upward gradients, groundwater could continue to flow mostly in a horizontal direction if the horizontal transmissivity is much greater than the vertical transmissivity. Similar concerns affect the azimuth of the horizontal component of flow. Thus, actual field data are needed in order to determine where deep contaminated water is entering the overburden. More wells are needed to constrain the trajectory of the deep 1,4-dioxane contamination in RW-3DD.

EPA Response #10: EPA acknowledges the uncertainties associated with groundwater flow in fractured bedrock aquifers and the possibility of a significant horizontal flow component in the bedrock aquifer in the vicinity of monitoring well RW-3DD. Therefore, the selected remedy for Site-wide Groundwater provides for the utilization of treatment wells in the deeper bedrock aquifer in areas where contaminants have been detected at their highest concentrations, including in the immediate vicinity of well RW-3DD. Furthermore, the need for additional monitoring wells in the vicinity of well RW-3DD will be evaluated during design of the selected remedy.

Comment #11: Although some contaminated groundwater near the proposed treatment wells is very low in dissolved oxygen (DO) (e.g., well OB-11R, with DO = 0.95 mg/L), the most contaminated groundwater (RW-3DD) had DO = 8.65 in 2016, only slightly lower than seen in crossgradient wells RW-4A and RW-4 (approximately 10 to 14 mg/L). With substantial DO present naturally, the treatment wells will likely have little positive effect on oxygen availability for biodegradation.

EPA Response #11: Historically, dissolved oxygen levels measured in monitoring well RW-3DD have varied significantly over time, with recorded dissolved oxygen levels as low as 0.75 mg/L. Therefore, EPA believes that implementation of the selected remedy for Site-wide Groundwater will ensure that sufficient dissolved oxygen is present in groundwater to enhance the aerobic biodegradation of Site contaminants. However, the selected remedy allows for the consideration of other in-situ treatment options during design of the remedy.

Comment #12: Monitoring wells immediately downgradient of the pit (e.g. RW-6, RW-6A, and OB-20B) have negligible DO and elevated dissolved iron (approximately 7 to 23 mg/L). If such

water were to reach the treatment wells, iron precipitation as oxyhydroxides would rapidly consume the available oxygen, encrust the wells, and potentially clog the surrounding overburden. Redevelopment would be costly and potentially ineffective.

EPA Response #12: Iron fouling of monitoring wells and groundwater extraction wells is a common occurrence at Superfund sites. Prior to implementation of the selected remedy for Site-wide Groundwater, an O&M Plan will be developed which will detail how the treatment wells will be maintained throughout implementation of the remedy. The O&M Plan will address the manner in which potential iron fouling may be addressed if encountered in the treatment and/or monitoring wells.

Comment #13: The remedy proposes to enhance the intrinsic rate of biodegradation, but the field data to establish the activity of 1,4-dioxane-degrading bacteria have not been collected, and the observed decrease in concentration with distance from the mine could reflect only dilution and dispersion. Biomarker analysis for 1,4-dioxane-degrading bacteria should be conducted. Without biodegradation, 1,4-dioxane would be reaching the reservoir attenuated by dilution and dispersion to undetectable levels.

EPA Response #13: Oxidation is the suggested in-situ treatment remedy; however, additional information will be collected during a pre-design investigation (PDI) phase. Bench-scale testing using site groundwater can be part of the PDI to determine the most effective in-situ treatment amendment.

Comment #14: Because the Peters Mine Pit is an unlined landfill, unexpected releases can occur as previously intact containers rupture or corrode. This scenario appears to explain spikes in benzene concentration in September 2014 and March 2015, but 1,4-dioxane has been monitored only since April 2015, and the potential for 1,4-dioxane spikes cannot be reliably assessed from the short record.

EPA Response #14: EPA acknowledges that due to uncertainties related to the source of 1,4-dioxane at the Site, the possibility of increased levels of 1,4-dioxane in mine water and groundwater cannot be dismissed. Therefore, the selected remedy for Site-wide Groundwater provides for the implementation of a long-term groundwater and surface water monitoring plan to closely monitor the effectiveness of the remedy in controlling and remediating Site-related groundwater contamination. Furthermore, the long-term groundwater monitoring plan will provide for the sampling of a sentinel monitoring well network to provide advanced warning of any movement of groundwater contamination toward drinking water resources. During implementation of the selected remedy, EPA will routinely assess the collected groundwater and surface water data to ensure the effectiveness of the remedy. If this data indicates that the selected remedy is no longer protective, EPA will take appropriate actions to protect human health and drinking water resources.

Comment #15: A robust monitoring program is needed as part of the selected remedy for near-real-time detection of a 1,4-dioxane release event in the mine and for assurance that surface water has not been affected. Monthly monitoring of groundwater at the base of the airshaft, of the deep monitoring well downgradient of the former pit where benzene releases were detected

(well RW-6), and of surface water in Park Brook before it enters Sally's Pond would meet this need.

EPA Response #15: The selected remedy for Site-wide Groundwater provides for the implementation of a long-term groundwater monitoring plan to monitor contaminant concentrations from groundwater monitoring wells located in and downgradient of the PMP Area, CMP Area and OCDA. Monitoring of mine water at the base of the PMP Airshaft is unnecessary, as any potential releases from the mine would be detected in downgradient monitoring wells in the PMP Area. A sentinel monitoring well network will also be established and monitored to provide advanced warning of any movement of groundwater contamination toward drinking water resources. In addition, the selected remedy provides for the implementation of a long-term surface water monitoring plan which will provide for surface water monitoring in and downstream of the Site brooks to confirm that Site-related contaminants are not threatening downstream receptors, including the Wanaque Reservoir. The specific details of the long-term groundwater and surface water monitoring program will be developed in consultation with the NJDEP during the design phase of the remedy.

Comment #16: The selected remedy should acknowledge the possibility that benzene and 1,4-dioxane from the Site might reach the Wanaque Reservoir at detectable levels. The selected remedy should also discuss how such a release event would be handled, should one occur. A contingency response needs to be ready to be implemented in time to capture a sudden release of 1,4-dioxane from the mine. Passive remedies force a reactive approach, and the contaminant pulse may escape to surface water and head downstream before a response can be put in place. An active remedy like pump-and-treat would intercept release events as part of normal operation. Two potential response actions would be pump-and-treat for mine water via the airshaft, and diversion and treatment with resin or advanced oxidation for surface water in Park Brook. The pump-and-treat system would need to be constructed ahead of time, ready to turn on if monthly monitoring exceeds a specified trigger level, whereas the surface water treatment system could be constructed while the surge in 1,4-dioxane concentration is slowly making its way through the groundwater system. Nevertheless, the surface water system would need to be predesigned with requisitions and contracts in place ready to execute should the trigger threshold be crossed.

EPA Response #16: As noted in the OU3 Site-Related Groundwater FFS, active remedies such as implementation of a groundwater extraction and treatment system were eliminated from consideration at the Site. These remedies were eliminated from further consideration due to concerns that the low yield of the Site aquifers and the limited lateral continuity of bedrock fractures would limit the ability of these remedies to induce and sustain effective hydraulic control. Furthermore, concern was expressed that pumping of groundwater may have an adverse effect on the hydraulic communication among overburden, bedrock and mine features in and downgradient of the PMP Area and may adversely affect contaminant concentration distribution. Therefore, remedies which provide for in-situ treatment of groundwater contaminants were retained for consideration to address groundwater contamination at the Site. EPA believes that the selected remedies for Site-wide Groundwater and the PMP Airshaft will provide for effective control and remediation of groundwater contamination at the Site. Therefore, the selection, design and implementation of contingency remedies is not

warranted at this time. However, the selected remedy for Site-wide Groundwater provides for the implementation of a long-term groundwater monitoring plan to monitor contaminant concentrations from groundwater monitoring wells located in and downgradient of the PMP Area, CMP Area and OCDA. A sentinel monitoring well network will also be established and monitored to provide advanced warning of any movement of groundwater contamination toward drinking water resources. In addition, the selected remedy provides for the implementation of a long-term surface water monitoring plan which will provide for surface water monitoring in and downstream of the Site brooks to confirm that Site-related contaminants are not threatening downstream receptors, including the Wanaque Reservoir. EPA will routinely assess the collected groundwater and surface water data to ensure the effectiveness of the remedy. If this data indicates that the selected remedy is no longer protective, EPA will take appropriate actions in an expeditious manner to protect human health and drinking water resources.

Comment #17: A commenter indicated that the selected remedy should provide for the cleanup of paint sludge located down the mine shaft, and provide for the construction of a groundwater pump and treat system to treat groundwater contamination.

EPA Response #17: Environmental investigations conducted at the Site have not identified the presence of paint sludge or drummed waste in mine shafts, including the PMP Airshaft and the Cannon Mine Elevator Shaft. In 2007, video logging was conducted at five locations within the PMP Airshaft in order to attempt to identify submerged waste material. A video camera was lowered to the base of the PMP Airshaft at each of these locations. Waste material was not observed on the video logs. Similarly, in 2010, video logging was conducted in the Cannon Mine Elevator Shaft. A video camera was lowered to a depth of 379 feet below ground surface. Waste material was not observed on the video logs.

As noted in the OU3 Site-Related Groundwater FFS, active remedies such as implementation of a groundwater pump and treat system were eliminated from consideration at the Site. These remedies were eliminated from further consideration due to concerns that the low yield of the Site aquifers and the limited lateral continuity of bedrock fractures would limit the ability of these remedies to induce and sustain effective hydraulic control. Furthermore, concern was expressed that pumping of groundwater may have an adverse effect on the hydraulic communication among overburden, bedrock and mine features in and downgradient of the PMP Area and may adversely affect contaminant concentration distribution. Therefore, remedies which provide for in-situ treatment of groundwater contaminants were retained for consideration to address groundwater contamination at the Site.

Comment #18: A commenter recommends that treatment wells be installed near well OB-17 in the O'Connor Disposal Area as part of the remedy for Site-wide Groundwater to treat 1,4-dioxane observed in this well.

EPA Response #18: The selected remedy for Site-wide Groundwater specifically notes the potential for in-situ treatment to be conducted in well OB-17 as a component of this remedy. The need for in-situ treatment in well OB-17, or adjacent treatment wells, will be further evaluated during design of the selected remedy.

Comment #19: A commenter notes that the preferred remedy for Site-wide Groundwater recommends the placement of a bedrock treatment well immediately upgradient of the PMP Airshaft. The commenter believes that this treatment well should be relocated to a location downgradient of the PMP Airshaft.

EPA Response #19: The selected remedy for Site-wide Groundwater, as detailed in the ROD, provides recommended locations for the installation of treatment wells in key areas where contaminants have been detected at their highest concentrations. These locations were recommended as they were believed to provide for the greatest effectiveness in enhancing the degradation of organic contaminants in groundwater. However, the exact details of the treatment wells, including their location, will be determined during design of the selected remedy.

Remedy for the PMP Airshaft

Comment #20: A reviewer questions the safety of installing granular activated carbon (GAC) and resin in the PMP Airshaft as a component of the preferred remedy.

EPA Response #20: GAC and resins are treatment media which are commonly used for the filtration of water. GAC and resin work by adsorbing certain contaminants to the surface of the treatment media and will not release other contaminants to the groundwater or mine water. Therefore, the placement of GAC and resin at the bottom of the PMP Airshaft will not exacerbate groundwater and mine water contamination at the Site.

Comment #21: Several commenters noted that they agree with EPA's preferred remedy for the PMP Airshaft. One commenter noted that they believe that this remedy is fully protective, will achieve long-term risk reduction with less impact on the community and at a cost less than other protective alternatives.

EPA Response #21: Comments noted.

Comment #22: A commenter recommends that EPA require the collection and analysis of additional sediment samples from the base of the PMP Airshaft as part of a pre-design investigation and that this data be considered during design of the selected remedy for the PMP Airshaft.

EPA Response #22: A sediment sample was previously collected from the base of the PMP Airshaft during performance of the OU3 RI. Therefore, EPA does not currently believe that collection of additional samples from the PMP Airshaft is warranted. However, the need for additional pre-design investigations, such as the collection of sediment samples from the base of the PMP Airshaft, will be evaluated during the development of the OU3 Remedial Design Work Plan. If pre-design investigations are deemed necessary, these investigations will be conducted prior to submittal of the OU3 Remedial Design Reports and will be taken into consideration during development of the Remedial Design Reports.

Comment #23: A commenter requested that EPA identify other sites where GAC and resin such as Dow Ambersorb 560 have been utilized to treat benzene and 1,4-dioxane in mine water and groundwater.

EPA Response #23: EPA notes that Emerging Compounds Treatment Technologies, Inc. has conducted successful demonstrations of the use of resin for the treatment of 1,4-dioxane in groundwater at sites in Waltham, Massachusetts and St. Petersburg, Florida. Furthermore, successful pilot studies involving the use of resin for the treatment of groundwater containing 1,4-dioxane were conducted at Marine Corps Air Station Yuma (Arizona) and the Combe Fill South Landfill Site (NJ) . In addition, GAC has been successful in treating 1,4-dioxane in Point of Entry Treatment (POET) systems at the Dewey Loeffel Superfund site (NY).

Comment #24: A commenter asked whether EPA considered potential negative impacts on the environment related to the grouting of the PMP Airshaft.

EPA Response #24: As discussed in the OU3 ROD, each of the remedial alternatives was assessed against nine evaluation criteria to determine appropriate cleanup action(s) for OU3. These criteria include Short-Term Effectiveness, which evaluates any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved. Implementation of the selected remedy for the PMP Airshaft is not expected to have a significant negative impact on the environment. EPA notes that it is common practice to use cement grout in the sealing of abandoned mine shafts, and during the abandonment of groundwater wells. However, the selected remedy for Site-wide Groundwater provides for the implementation of a long-term groundwater monitoring program to assess any changes in water quality during implementation of the selected remedy.

Comment #25: The proposed airshaft remedy, backfilling and capping, will effectively isolate highly contaminated mine water from the surface environment, but the added sorbents at the base of the shaft would have a negligible effect on the bulk of the benzene and 1,4-dioxane emanating from the waste. Future access to deep mine water, if needed, would require installation of a 4-inch (or larger) well at the time of capping.

EPA Response #25: EPA believes that the selected remedy for the PMP Airshaft will not only isolate contaminated mine water from the surface environment but will effectively eliminate the airshaft as a potential pathway for migration of contaminants in mine water to the surrounding groundwater aquifer. Investigations conducted at the Site have demonstrated that the PMP Airshaft is hydraulically connected to the adjacent groundwater aquifer. Furthermore, the highest concentrations of 1,4-dioxane in groundwater have consistently been detected in wells located immediately downgradient of the airshaft. The complete closure of the PMP Airshaft will help mitigate the transport of mine water contaminants through the airshaft to the groundwater aquifer. In addition, the introduction of GAC and resin at the base of the airshaft will sequester organic contaminants from mine water which moves through the mine. Finally, during design of the selected remedy, EPA will evaluate methods to mitigate the potential flow of impacted mine water from the deeper mine workings to the Peters Mine Pit. Future access to deeper mine water, if necessary, can be achieved through the installation of a well immediately adjacent to the closed airshaft.

Comment #26: Many commenters indicated their preference for implementation of a groundwater extraction and treatment system at the Site.

EPA Response #26: Please see EPA's Response to Comment #16.

Comment #27: Several commenters noted that Ringwood, New Jersey lies within the Ramapo and Rockaway Valley Fault areas and that there have been 9 small earthquakes from 12/22/88 to 9/20/16. One commenter asks that these factors be taken into consideration by EPA when formulating the final plan for closure of the PMP Airshaft.

EPA Response #27: EPA acknowledges that low magnitude earthquakes occur frequently in northern New Jersey. The potential for future low magnitude seismic activity will be taken into consideration during the design of the selected remedy for the PMP Airshaft.

Comment #28: A commenter requested that details be provided concerning the handling of the estimated 450,000 gallons of impacted water that will be displaced from the PMP Airshaft during implementation of the selected remedy.

EPA Response #28; As noted in the ROD, EPA currently assumes that the displaced water from the PMP Airshaft will be treated through filtration and by passing the water through GAC to remove organic contaminants prior to discharge to groundwater within the same general location, pursuant to the substantive requirements of N.J.A.C 7:14A-7.5, which establishes state limitations on pollutants in discharges to groundwater. Assuming a flow rate of 50 gallons per minute, EPA estimates that the total quantity of displaced water will require approximately six days to treat and discharge. However, the specific details regarding the handling of the displaced water will be developed during design of the selected remedy for the PMP Airshaft and may ultimately include other or additional types of treatment prior to discharge.

Comment #29: Several commenters recommended that the preferred remedy for PMP Airshaft be modified to leave the airshaft open and construct a headhouse over the airshaft to allow for the collection of water samples and the addition of chemicals to treat contaminants.

EPA Response #29: The results of groundwater and mine water investigations conducted at the Site indicate that the PMP Airshaft is hydraulically connected to the adjacent groundwater aquifer. Furthermore, the highest levels of 1,4-dioxane detected in groundwater at the Site were consistently detected in monitoring well RW-11D, which is located immediately downgradient of the PMP Airshaft. These data suggest that the PMP Airshaft may be serving as a conduit for the spread of mine water contamination to the surrounding groundwater aquifer. Therefore, EPA has determined that complete closure of the PMP Airshaft with grout is appropriate to eliminate the PMP Airshaft as a potential conduit for the spread of contamination to the adjacent groundwater aquifer. Leaving the airshaft open and constructing a headhouse over the top of the airshaft would not address this potential for contaminants to spread from mine water in the airshaft to the groundwater aquifer. As noted in response #25 above, future access to deeper mine water, if necessary, can be achieved through the installation of a well immediately adjacent to the closed airshaft

Comment #30: A commenter notes that the volume of water utilized to calculate the amount of resin and GAC needed to treat water in the PMP Airshaft has been underestimated, as the volume of the horizontal shafts encountered at 180 and 232 feet below ground surface have not been taken into account. The commenter believes that the volume of cement needed to seal the airshaft as part of the preferred remedy for the PMP Airshaft has been underestimated for the same reason. Another commenter also indicated that they believe that a greater volume of treatment media would be required to treat Site contaminants.

EPA Response #30: EPA notes that the volume of resin and GAC calculated for installation at the base of the PMP Airshaft as a component of the selected remedy is based on the assumption that the highest concentrations of benzene and 1,4-dioxane detected in the PMP Airshaft would be present in the lower 180 feet of the airshaft. However, mine water samples collected as part of Site investigations consistently indicate that elevated levels of benzene and 1,4-dioxane are only present in samples collected at depths of 180 feet bgs and 230 feet bgs in the airshaft. Therefore, the calculated volume of resin and GAC presented in the ROD appears to overestimate the amount of treatment media necessary to treat mine water in the airshaft. The contaminants levels, if any, in the horizontal shafts at 180 feet and 232 feet are unknown and have not been taken into account in the calculated volume of resin and GAC. The actual volume of resin and GAC to be installed at the base of the airshaft as a component of the selected remedy will be determined during design of the remedy.

During closure of the PMP Airshaft, fast setting grout will be placed over the stone and treatment media at the base of the airshaft to limit the loss of grout into the horizontal shaft at 232 feet bgs. Therefore, EPA believes that including the volume of the horizontal shafts into the calculation of the required volume of grout would overestimate the required volume of grout. However, the estimated volume of grout required for implementation of the selected remedy will be reevaluated during design of the remedy.

Habitability and Health Effects in the Upper Ringwood Area

Comment #31: A commenter expressed concern about the safety of residents living on or adjacent to properties at the Site which contain paint sludge.

EPA Response #31: As noted in the OU3 ROD, in 2011 EPA initiated a removal action to delineate any contamination which may exist on residential properties at the Site and to remove any lead contaminated soils and paint sludge identified on the residential properties. A total of 37 residential properties were assessed by EPA as part of this removal action, and lead-contaminated soil or paint sludge was removed from 23 of these properties, allowing all of the properties to continue to be used without restrictions. Furthermore, since December 2004, Ford has removed over 53,500 tons of paint sludge and associated soil from 15 distinct areas of the Site, in addition to the OCDA and the PMP Area. In addition, the OU2 ROD requires that any paint sludge encounter during the implementation of the remedies for the three disposal areas be removed from the Site. If additional paint sludge is identified at the Site outside of the areas being addressed as part of the remedy selected in the OU2 ROD, EPA will require its removal from the Site.

Comment #32: Many commenters recommend that a community relocation plan be developed and implemented for the Upper Ringwood community residing at the Site, as the Upper Ringwood Area is no longer habitable. Another commenter inquired about the criteria used by EPA to determine whether a community should be relocated.

EPA Response #32: EPA has a longstanding policy to address risks posed by contamination at a Site by using cleanup methods that allow people to safely remain in their homes. EPA's Interim Policy of the Use of Permanent Relocations as Part of a Superfund Remedial Actions, OSWER Directive 9355.0-71P, dated June 30, 1999, is available at http://semspub.epa.gov/src/document/11/174832. A permanent relocation is primarily considered when an engineering solution is not readily available to address an immediate risk to human health or where the structure itself is an impediment to a cleanup. However, at the Site, cleanup solutions are available to address contamination, and structures at the Site do not prevent cleanup. Lead-contaminated soil and paint sludge have been removed from the Site at various locations, including residential properties, either by EPA or Ford without requiring permanent relocation of any residents. Exposure to certain contamination at the Site has been limited through fencing and access restrictions, and the selected remedy for OU2 will address contamination from the Cannon Mine Pit, Peters Mine Pit, and O'Connor Disposal Area. Furthermore, residents at the Site receive drinking water from the municipal water supply, which has not been impacted by Site contamination. Thus, the need for permanent relocation at the Site is not triggered under these circumstances.

Comment #33: A commenter contends that appropriate health studies have not been conducted at the Site, and, therefore, health impacts to Upper Ringwood residents have not been taken into consideration during the remedy selection process. Another commenter sought clarification as to which agencies evaluate past health effects at a Site.

EPA Response #33: Past health impacts at the Site have been evaluated by the United States Agency for Toxic Substances and Disease Registry (ATSDR) and the New Jersey Department of Health (NJDOH). In May 2006, ATSDR and NJDOH completed a public health assessment to determine whether past or current exposure to hazardous substances at the Site presented a public health hazard. This public health assessment concluded that the Site posed a public health hazard in the past and in 2006 based on health risks posed by exposure to lead and arsenic. In December 2011, ATSDR and NJDOH completed two health consultations for the Site: one to evaluate lead exposure and the other to evaluate cancer risks. The lead exposure health consultation concluded that children's blood lead test results indicated that exposure to lead from paint sludge occurred in the past based on one documented case where exposure to paint sludge was considered the likely source of lead. However, blood lead data from children in the community, in general, did not indicate an on-going exposure to lead from residential soils. The health consultation evaluating cancer risks posed by the Site concluded that overall cancer incidence, with the exception of lung cancer in men, was not elevated in the community living near the Site in the time period of 1979 through 2008 in comparison to cancer rates in New Jersey. In addition, NJDOH performed another health consultation in 2015 at the request of a community member. That report concluded that lung cancer in men and cervical cancer among women were statistically significantly elevated for the Ramapough Lenape Nation Turtle Clan community of

the Borough of Ringwood, compared to the Ramapough Lenape Nation Turtle Clan community of the Mahwah Township. It also found that overall mortality among men in the Ringwood Ramapough Lenape Nation Turtle Clan was statistically significantly elevated between 2004 and 2010. However, the report specifically did not draw any conclusions related to environmental factors that may have caused these observations. Instead, the report noted that tobacco smoking was "by far the biggest risk factor for lung cancer," but without data on the rates of tobacco usage among the studied populations, the report did not conclude whether tobacco use or other known risk factors were the likely cause for the observed increase in lung cancer. Similarly, the report noted several known risk factors for cervical cancer, without concluding which of these factors or some other factor may have been the cause of the observed increase in cervical cancer incidents. Additionally, this health consultation noted that it only focused on the residential location at the time that the adverse health incident was reported and did not consider population mobility.

Irrespective of the findings of these health studies, residents at the Site currently receive their drinking water from the municipal water supply and do not consume impacted groundwater. As noted in EPA Response #34, EPA's Superfund Program estimates current and potential future risk to human health related to the potential exposure to hazardous substances at a site if actions were not taken to control or mitigate these potential exposures. EPA has determined that an unacceptable potential human health risk would exist if groundwater at the Site was used for potable purposes. However, EPA believes that implementation of the OU3 selected remedy will address unacceptable human health risk associated with the potential potable use of impacted groundwater at the Site. In addition, implementation of the OU3 selected remedy is expected to mitigate the migration of contaminated groundwater to surface water in the Park Brook, which ultimately discharges to the Wanaque Reservoir. Similarly, EPA believes that implementation of the remedy selected in the OU2 ROD will address potential human health risks associated with the potential exposure to fill material in the Peters Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas of the Site.

Comment #34: A commenter asked whether the human health risk assessment is available online and whether it addressed observed health effects in the community that lives on or in proximity to the Site.

EPA Response #34:The Baseline Human Health Risk Assessment for Site-Related Groundwater and the Addendum to the Baseline Human Health Risk Assessment Calculations for Site Related Groundwater are available online at https://semspub.epa.gov/work/02/377397.pdf and https://semspub.epa.gov/work/02/541557.pdf respectively. The Baseline Human Health Risk Assessment for Site-Related Groundwater and Addendum were prepared to estimate current and potential future risk to human health related to the potential potable use of groundwater at the Site if actions were not taken to control or mitigate these potential exposures. These documents provide the basis for selecting a remedy at a site and identify the contaminants and exposure pathways that need to be addressed by the selected remedy. Potential health effects related to past exposures at the Site have been evaluated in studies conducted by the Agency for Toxic Substances and Disease Registry (ATSDR) and the New Jersey Department of Health (NJDOH), as discussed in EPA's response to comment #33.

Comment #35: A commenter questions the habitability of the Upper Ringwood area due to the presence of abandoned mine shafts and the potential for future sinkhole formation.

EPA Response #35: EPA recognizes that the potential for sinkhole formation exists at the Site due to historic mining operations in the Upper Ringwood area. Therefore, EPA has and will continue to require vibrations monitoring to be conducted during implementation of cleanup actions that may cause significant vibrations. If significant vibrations are detected, EPA will require that immediate action be taken to reduce vibrations prior to proceeding with cleanup. EPA also notes that, in accordance with NJDEP Directive #G000004537, geophysical investigations have been conducted in the Upper Ringwood Area by the Borough of Ringwood to identify the potential presence of underground mining structures. The results of these geophysical investigations will continue to be taken into consideration during the implementation of cleanup actions at the Site.

Comment #36: A commenter asserts that Upper Ringwood residents should by permanently relocated by EPA because their homes are located over contamination in the Peters Mine.

EPA Response #36: Investigations conducted at the Site do not indicate that residential properties are located over Site-related contaminants in the Peters Mine Pit area. Furthermore, as noted in the OU3 ROD, EPA has provided for the investigation and remediation of residential properties at the Site without the need for permanent relocation. Please see EPA's Response to Comment #32 regarding the need for permanent relocation of residents at the Site.

Groundwater, Surface Water and Drinking Water

Comment #37: A commenter asserts that the orange material often observed in surface water at the Site is related to organic contaminants rather than iron.

EPA Response #37: EPA disagrees with the commenter's assessment of the source of this material. It should be noted that the Peters Mine and Cannon Mine are historic iron mines which operated at the Site until the early 1900s. Elevated levels of iron are routinely detected in Site groundwater due to the presence of significant iron deposits. When iron dissolved in water is exposed to oxygen and less acidic conditions, an iron precipitate is often formed. This iron precipitate is often found in waterways near old mining sites. EPA believes that the orange material which the commenter refers to is yellow boy, an iron precipitate.

Comment #38: A commenter expressed concern that contamination from the Site is leaking into the drinking water system.

EPA Response #38: Since 2015, the four brooks which drain the Site have been sampled for Site-related contaminants, including 1,4-dioxane. 1,4-dioxane was not detected in samples collected from the Ringwood Creek, between Sally's Pond and the Wanaque Reservoir, during any of the surface water sampling events. 1,4-dioxane has only been detected in Park Brook upstream of Sally's Pond during these sampling events. In 2018, potable water samples were collected from wells located within one mile of the Site and analyzed for Site-related contaminants. Contamination related to the Site was not detected in any of these potable water

samples. Furthermore, the Borough of Ringwood routinely monitors water quality in its water distribution system. EPA has been informed by the Borough that Site-related contaminants, including 1,4-dioxane, have not been detected at elevated levels in their water supply. Therefore, the results of surface water and potable water samples collected proximal to the Site do not indicate that Site-related contaminants are impacting the Wanaque Reservoir or drinking water wells.

Comment #39: Commenters noted that contamination from the Site is entering surface water bodies at and downstream of the Site which flow to the Wanaque Reservoir, and express concern regarding the consumption of water from the reservoir. Furthermore, commenters assert that this contamination violates surface water and groundwater quality standards.

EPA Response #39: EPA acknowledges that groundwater and surface water sampling conducted at the Site indicates that Site-related contaminants, such as benzene and 1,4-dioxane, have been detected in the Park Brook at levels which exceed surface water and groundwater quality standards. However, these contaminants have not been detected in surface water samples collected in the Ringwood Creek, upstream of the Wanaque Reservoir. EPA believes that, over time, implementation of the selected remedy will reduce the levels of contaminants in groundwater at the Site that may be discharging to the Park Brook. Therefore, implementation of the selected remedy should mitigate the levels of Site-related contaminants in the Park Brook. Furthermore, long-term groundwater and surface water monitoring will be conducted as a component of the selected remedy to ensure that Site-related contamination is not threatening drinking water resources, including the Wanaque Reservoir.

Comment #40: A commenter notes that contaminants from the Site are entering Park Brook and Sally's Pond, which are Category 1 waters, and questions why the State of New Jersey is not suing to protect state parkland and their own waters.

EPA Response #40: Please see EPA's response to Comment #39. Questions concerning the pursuit of natural resource damage claims by the State of New Jersey should be referred to the NJDEP.

Comment #41: A commenter asked about the levels of benzene, Perfluorooctanoic acid (*PFOA) and* perfluorooctane sulfonate (*PFOS) in the groundwater and surface water at the site.*

EPA Response #41: As summarized in the ROD, benzene has primarily been detected in groundwater and mine water in the PMP Area of the Site. PMP Area groundwater generally contained less than 10 µg/L of benzene during groundwater sampling events. However, benzene was detected at approximately 30 µg/L in mine water samples collected at depth in the PMP Airshaft. Benzene was generally not detected in surface water samples at the Site, with the exception of groundwater seeps in the PMP Area. PFOA and PFOS are considered emergent compounds that are not included on the target list of compounds routinely sampled for at Superfund sites. Therefore, groundwater and surface water samples collected at the Site have not been analyzed for PFOS or PFOA. However, EPA has been conducting limited sampling for these compounds at some Superfund sites to identify the prevalence of these compounds at sites, and may conduct a limited sampling at this Site in the future.

EPA Comment #42: A commenter indicated that sampling conducted last year in 8 different areas inside and outside of the Site indicated elevated levels of benzene.

EPA Response #42: EPA's Superfund Program is unaware of a sampling event conducted last year at and in the vicinity of the Site which indicated the widespread presence of elevated levels of benzene. EPA has requested that the commenter share such information so that it can be evaluated by the Agency but has not received any such information.

Comment #43: A commenter questions whether contaminants can be migrating to areas other than the Wanaque Reservoir, given the fractured nature of the aquifer at the Site.

EPA Response #43: As summarized in the OU3 ROD, extensive groundwater investigations have been conducted at the Site in order to determine the nature and extent of Site-related groundwater impacts and the flow direction of groundwater. These investigations have not identified impacts to potable wells in the vicinity of the Site. The selected remedy provides for the implementation of a long-term groundwater and surface water monitoring program which will be designed to monitor for any movement of contaminants in groundwater and surface water at the Site. Furthermore, this monitoring plan will provide for the installation and sampling of sentinel wells which will be used to provide advanced warning of any movement of contaminants toward drinking water supplies.

Comment #44: A commenter asked whether additional potable well sampling had been conducted near the Site since 2018.

EPA Response #44: EPA has not directed the collection of additional samples from potable wells near the Site since 2018. EPA notes that Site-related contamination was not identified in the potable well samples collected within one mile of the Site in 2018. The need for collection of additional potable well samples will be evaluated during the development of the long-term groundwater and surface water monitoring plan.

Comment #45: A commenter requested that additional sediment, groundwater and surface water sampling be conducted at the Site prior to implementation of the selected remedy.

EPA Response #45: EPA fully anticipates that additional groundwater and surface water sampling will be conducted at and in the vicinity of the Site prior to implementation of the selected remedy. It should be noted that the EPA-approved OU2 Final Remedial Design Report specifically provides for the implementation of an interim groundwater and surface water monitoring program at the Site until the long-term groundwater and surface water monitoring plan is developed. EPA currently anticipates that the interim groundwater and surface water monitoring program will be initiated in 2021, concurrent with the commencement of construction of the selected remedy for the Peters Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas. The need for further sediment sampling will be evaluated during the design phase of the remedy selected in the OU3 ROD.

Comment #46: A commenter notes that lead was detected in well water from a church near the Site. The reviewer recommends that the Superfund Program provide for connection of the church to the municipal water supply and the cleanup of soil surrounding the church.

EPA Response #46: EPA has been informed by the Borough of Ringwood that the referenced church was connected to the municipal water supply in early 2020. It should be noted that this church is not located within the Site boundaries. The results of groundwater sampling conducted at the Site does not indicate that Site-related groundwater contamination may be migrating to the church property. Furthermore, EPA has no information indicating that Site waste may have been disposed of on this property. Therefore, EPA has no information that would support the need for a Superfund action at this property.

Environmental Justice

Comment #47: Many commenters assert that environmental justice issues were not addressed during the remedy selection process. Another commenter suggested that the issue of systemic environmental racism has been a major factor in the decision-making processes at the Site and that EPA convene a special tribunal within Washington D.C. to review the complete Administrative Records on this Site and bring it back before EPA's National Remedy Review Board.

EPA Response #47: EPA believes that Environmental Justice (EJ) issues have been appropriately addressed at the Site and disagrees that environmental racism was a factor in site decisions, including the remedy selection process. EPA conducted an EJ Assessment for the Site in 2006 that identified potential EJ concerns of the local community, which includes members of the Turtle Clan of the Ramapough Lenape Tribe who reside in the Upper Ringwood area, and recommended actions to address these concerns. This EJ Assessment was released for public review in draft form and was discussed with members of the community during a public meeting. The recommendations included: restoration of the Site to the National Priorities List, establishment of a Community Advisory Group (CAG), facilitation of a Technical Assistance Grant, coordination with the NJDEP, collection of health data, and improved communication with Site stakeholders. In July 2013, EPA finalized the EJ Assessment, which concluded that the Ringwood Mines community is an adversely impacted area, but that, given the current limits of localized health information about community residents, the area could not be satisfactorily distinguished in order to perform a comparative assessment in determining whether a disproportionate impact (environmental injustice) had occurred or exists. This final EJ Assessment included an Addendum to the 2006 draft EJ Assessment that detailed how EPA had addressed the recommendations in the 2006 draft EJ Assessment. Consistent with those recommendations, EPA restored the Site to the National Priorities List in 2006; facilitated the formation of the CAG for the Site; provided a Technical Assistance Grant (TAG) to the Edison Wetlands Association for the benefit of the CAG; and regularly coordinates Site activities with NJDEP. In addition, in 2006 and 2007, EPA encouraged the NJDOH and ATSDR to begin collection of health information with regard to potential contamination by lead, arsenic, and antimony. In June 2011, the NJDOH and ATSDR returned to the Ringwood community and performed additional blood lead level testing in children. Lastly, EPA has included and continues to include various

stakeholders in the Site cleanup process via the CAG and coordination with NJDEP. Draft technical documents related to the Site have routinely been shared with the CAG for review and comment prior to finalization. To that end, EPA has provided the CAG with access to a consultant through its Technical Assistance Services for Communities (TASC) program for independent review and comment on Site-related documents, and has incorporated appropriate recommendations from the CAG and TASC into its cleanup plans. Furthermore, the EPA Region 2 office has routinely consulted with staff from EPA Headquarters in Washington D.C. to ensure that cleanup actions at the Site are consistent with nationwide cleanup efforts. As this record demonstrates, the remedies selected for the Site, including the OU3 remedy that is the subject of the OU3 ROD and this responsiveness summary, were selected based on the requirements of CERCLA and the NCP, utilizing sound science, with input from EPA Region 2 and Headquarters staff, members of the community, the CAG and the TASC consultant, as well as environmental consultants for the PRPs, with ample opportunity for stakeholder review of Site documents. As a result, further review of the OU3 remedy selection process is not warranted. See also EPA Response #1, explaining that this ROD and responsiveness summary address remedy selection for OU3, not OU2.

Comment #48: Many commenters indicate that the Site is an example of environmental racism and is in need of environmental justice, in accordance with New Jersey Executive Order 23.

EPA Response #48: Governor Murphy of the State of New Jersey issued Executive Order 23 on April 20, 2018. In recognition of the fact that low-income communities and communities of color are often disproportionately affected by environmental degradation, Executive Order 23 directed NJDEP to develop guidance for the Executive Branch of the State of New Jersey to consider environmental justice in implementing their statutory and regulatory responsibilities. It is EPA's understanding that this guidance has not yet been finalized. However, consistent with the draft guidance document, the Upper Ringwood community has been provided a timely and meaningful opportunity to participate and provide its comments on EPA's selected remedy for OU3. As discussed in EPA's Response to Comment #47, EPA has taken, and will continue to take environmental justice concerns into consideration throughout the Site cleanup process.

Other Comments

Comment #49: *Commenters have requested that EPA hold the Ford Motor Company responsible for cleanup of the Ringwood Mines/Landfill site.*

EPA Response #49: EPA has and will continue to follow an "enforcement first" policy throughout the Superfund cleanup process. To that end, both the Ford Motor Company and the Borough of Ringwood have been identified as potentially responsible parties (PRPs) for the Site. Historically, EPA has pursued enforcement agreements with Ford and the Borough of Ringwood which required their performance and financing of Site cleanup work. EPA intends to pursue additional enforcement agreements with the Site PRPs for the design and implementation of the selected OU3 remedy.

Comment #50: A commenter indicates that the Borough of Ringwood allowed Ford to dump on their land in Upper Ringwood and is apparently above the law.

EPA Response #50: Please note that EPA has notified the Borough of Ringwood of its potential responsibility for cleanup of the Site. Furthermore, EPA has issued Administrative Orders to the

Borough of Ringwood which required its coordination and cooperation with Ford during investigations and cleanup efforts at the Site.

Comment #51: A commenter asserts that environmental sampling conducted at the Site cannot be considered accurate because of the difficulty of sampling in the environment and whether contaminant concentrations are consistent over time.

EPA Response #51: Prior to performance of environmental sampling at a site, EPA requires the development of a Quality Assurance Project Plan (QAPP), which details the procedures to be followed during sample collection, transport and analysis, to ensure the integrity of the generated environmental data. This QAPP undergoes EPA review and approval prior to sampling in order to ensure that adequate quality assurance and quality control procedures will be implemented during sample collection and analysis. Environmental sampling conducted at the Site has been performed in accordance with EPA-approved QAPPs. However, EPA does recognize that contaminant concentrations in Site media may change over time. Therefore, the selected remedy provides for the implementation of a long-term groundwater and surface water monitoring plan to monitor the effectiveness of the remedy and any changes in contaminant concentrations.

Comment #52: A commenter indicated that Regional Administrator Alan Steinberg did not put the Site back on the National Priorities List.

EPA Response #52: EPA notes that the Site was restored to the National Priorities List in September 2006, while Alan Steinberg was serving as the EPA Region 2 Administrator.

Comment #53: A commenter asserts that waste encountered during prior removal actions in the O'Connor Disposal Area were determined to be too hazardous to be buried in the United States and have yet to excavated from the Site.

EPA Response #53: EPA believes that the commenter is referring to a soft paint sludge discovered in the SR-3 sludge disposal area, adjacent to the O'Connor Disposal Area, in 2005. This paint sludge, and associated soils, were completely excavated and disposed of at an off-site landfill in Canada.

Comment #54: A commenter asserts that EPA waited 12 months to inform the Upper Ringwood community of the discovery of 1,4-Dioxane at the Site.

EPA Response #54: EPA first became aware that 1,4-dioxane was detected in groundwater and surface water at the Site, outside of the PMP Airshaft, in November 2015. Despite EPA's desire to quickly schedule a meeting with the CAG to disseminate this information to the community, due to schedule conflicts between EPA representatives and members of the CAG, this meeting was not held until March 2016. Regardless, EPA regrets not having made this information available to the community sooner.

Comment #55: A commenter indicated that residents of other cities which receive their drinking water from the Wanaque Reservoir should be included in the public involvement activities for the Site.

EPA Response #55: EPA published a notice of the start of the public comment period on the OU3 Proposed Plan in The Record on January 30, 2020. This notice also informed the public that EPA would be holding a public meeting to discuss the OU3 Proposed Plan and to receive verbal comments on February 10, 2020. Furthermore, this notice informed the public of the date through which EPA would be accepting written comments on its Proposed Plan. EPA has also prepared press releases to help inform the public of the comment period on the OU3 Proposed Plan and extensions provided to the public comment period. EPA has encouraged public input throughout the remedy selection process and has received comments from residents living throughout the State of New Jersey.

Comment #56: A commenter asked for some details concerning the recent formation of a sinkhole near the Cannon Mine Area of the Site.

EPA Response #56: While EPA is aware that, historically, sinkholes have formed over the former Cannon Mine, EPA is unaware of the recent formation of a sinkhole near the Cannon Mine area of the Site.

Comment #57: A commenter asked whether the slides from the February 10, 2020 public meeting presentation are going to be posted on EPA's website.

EPA Response #57: EPA's February 10, 2020 public meeting presentation is available from EPA's website located at http://epa.gov/superfund/ringwood-mines.

Comment #58: A commenter asserts that public comment on the preferred remedy is a waste of time as they will not be considered by EPA during the remedy selection process.

EPA Response #58: EPA considers public comment to be an integral part of the remedy selection process. As noted in this ROD, in selecting remedies for sites, EPA considers the factors set out in CERCLA § 121, 42 U.S.C. § 9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR § 300.430(e)(9), EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies, and OSWER Directive 9355.3-01. The detailed analysis consists of an assessment of the individual alternatives against each of nine evaluation criteria at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against the criteria. Community acceptance is one of nine criteria taken into consideration by EPA when determining which of the evaluated cleanup alternatives is most appropriate for implementation at a Site. This Responsiveness Summary specifically addresses concerns raised by the community during the remedy selection process.

Comment #59: A commenter expressed concern about the discovery of an unknown mine shaft in the O'Connor Disposal Area by a contractor for the Ford Motor Company.

EPA Response #59: EPA is unaware of the discovery of an unknown mine shaft in the O'Connor Disposal Area. The commenter may be referring to a one-foot deep bedrock fracture encountered during the installation of monitoring well RW-16. The presence of this bedrock

fracture does not impact the selection of a remedy for Site-wide Groundwater or the PMP Airshaft.

Comment #60: A commenter indicates that a more comprehensive cleanup is warranted due to the proximity of Ringwood State Park trails to the Site.

EPA Response #60: EPA notes that potable wells located in the Ringwood State Park near the Site were sampled for Site-related contaminants in 2018. Site-related contaminants were not detected in these wells during this sampling event. Furthermore, EPA believes that implementation of the remedy selected in this ROD will reduce groundwater contaminant levels and will be fully protective of human health and the environment.

Comment #61: A commenter requested that the planning and bidding process associated with procuring a contractor for performance of the selected remedy be conducted in a transparent manner to ensure the capabilities of the contractor. Furthermore, the commenter wants to ensure the financial integrity of the selected contractor.

EPA Response #61: Prior to the design and construction of the selected remedy, EPA intends to enter into legally-binding enforcement agreement(s) with the Site PRPs which will dictate the manner in which the selected remedy is designed and implemented. As a requirement of these agreement(s), the PRPs will be required to provide the qualifications of the contractors they intend to utilize for EPA's review and approval. Furthermore, these enforcement agreements will require that the PRPs either demonstrate their financial ability to implement the remedy or maintain financial security for the benefit of EPA in an amount equal to the estimated cost of implementing the work.

Comment #62: A commenter suggested that EPA make another effort to engage representatives of the Turtle Clan in order to address their concerns regarding the Site.

EPA Response #62: EPA has and will continue to seek input from Site stakeholders, including the Turtle Clan, during cleanup efforts at the Site. To that end, EPA facilitated the formation of a Community Advisory Group (CAG) to promote the sharing of information between EPA and the affected community. Historically, members of the Ramapough-Lenape Nation, including the Turtle Clan have participated in CAG meetings, have attended EPA's public meetings concerning the Site and have reached out to the Community Involvement Coordinator for the Site with any ongoing questions or concerns. Furthermore, members of the Turtle Clan are included on EPA's mailing list and receive publicly disseminated information concerning the Site. EPA has and will continue to encourage the Turtle Clan's involvement with the Site.

Comment #63: Many commenters assert that Upper Ringwood residents have been impacted by vapor intrusion of contaminants into their homes.

EPA Response #63: EPA notes that the results of groundwater investigations conducted at the Site indicate that groundwater contaminants which may have the potential to present vapor intrusion issues do not flow under residential properties. Groundwater impacted by benzene and 1,4-dioxane in the PMP Area of the Site migrates to the southeast, through a portion of the

Ringwood State Park and towards the Park Brook, rather than towards residential areas in Upper Ringwood. Therefore, vapor intrusion of groundwater contaminants into residential properties is not anticipated at the Site.

Comment #64: A commenter notes that the results of water samples collected in and immediately downgradient of the PMP Airshaft may indicate that the 1,4-dioxane source is in the mine workings other than the PMP Airshaft.

EPA Response #64: EPA acknowledges that 1,4-dioxane may be contained in mine water in areas of the mine workings other than the PMP Airshaft. However, EPA believes that implementation of the selected remedy will effectively address 1,4-dioxane in mine water in the mine workings as well as 1,4 dioxane migrating to groundwater from the Peters Mine. Furthermore, the selected remedy will provide for long-term groundwater and surface water sampling to confirm that Site-related contaminants are not threatening drinking water resources.

Comment #65: A commenter believes that EPA should conduct a Psychosocial Assessment and take the results of this assessment into consideration during the remedy selection process.

EPA Response #65: While EPA acknowledges that nonchemical psychosocial stressors can impact health, the performance of a Psychosocial Assessment is not a component of the Superfund risk assessment process. EPA conducts a risk assessment to determine the current or potential future risks associated with chemical releases at a Site or a component of a Site in the absence of any actions or controls to mitigate such releases. If the risk assessment determines that an unacceptable human health risk exists, then cleanup actions are warranted to address such risks and actual or threatened releases of hazardous substances from a Site. As discussed in this ROD, the OU3 risk assessment determined that sufficient current or potential future risk exists to warrant the implementation of the selected remedy to address these risks.

Comment #66: A commenter indicates that EPA or the federal government should assist in the recovery of human remains from a lost relative who fell into the Cannon Mine.

EPA believes that the commenter may be referring to the tragic loss of 15-year old Harry Van Dunk who reportedly fell into a mine pit near the Cannon Mine in November 1963. A newspaper article detailing this incident notes that significant efforts were made at the time by the Borough and the Upper Ringwood community to recover Harry Van Dunk. These efforts included pumping water out of the mine pit so that an individual could be lowered into the pit to find the teenager. Unfortunately, these efforts were not successful. While EPA is mindful of the community's loss from this incident, CERCLA limits EPA authority to conducting response actions to address contaminants, pollutants and hazardous substances. It should be noted that reports indicate that Harry Van Dunk fell into a pit near the Cannon Mine. EPA notes the referenced mine pit is reportedly connected to flooded mine tunnels associated with the Cannon Mine, which extend to a depth of approximately 500 feet below ground surface, which could further complicate additional recovery efforts. In the unlikely event that EPA encounters remains during the performance of a response action, EPA would halt response actions in this area and contact the appropriate law enforcement and local and state authorities to properly handle these remains.

ATTACHMENT A – Proposed Plan

Superfund Program
Proposed Plan

U.S. Environmental Protection Agency, Region 2

Ringwood Mines/Landfill Superfund Site Operable Unit Three

January 2020

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the Preferred Alternatives to address contaminants in groundwater and mine water at the Ringwood Mines/Landfill Superfund Site (Site), located in the Borough of Ringwood, Passaic County, New Jersey, and provides the basis for these preferences. Groundwater and mine water have been designated as Operable Unit Three (OU3) of the Site.

The U.S. Environmental Protection Agency's (EPA's) Preferred Alternative to address contaminants in groundwater at the Site is Alternative 3, In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area. This alternative would provide for the installation of wells near the Peters Mine Pit and Peters Mine Pit Airshaft and perpendicular to the direction of groundwater flow for the introduction of an oxygen-releasing compound into the aquifer to enhance the degradation of organic contaminants. In addition, long-term groundwater and surface water monitoring would be conducted to ensure the protection of drinking water resources. The EPA's Preferred Alternative for mine water in the Peters Mine Pit Airshaft is Alternative 3, Treatment/Closure in the Peters Mine Pit Airshaft. Under this alternative, granular activated carbon and resin would be introduced into the Peters Mine Pit Airshaft to treat organic contaminants; the Peters Mine Pit Airshaft would then be closed using conventional mine shaft closure technology.

This Proposed Plan includes summaries of the cleanup alternatives for groundwater and mine water at the Site. This document is issued by the EPA, the lead agency for Site activities, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. The EPA, in consultation with NJDEP, will select the final remedies for OU3 after reviewing and considering all information submitted during a 30-day public comment period. The EPA, in consultation with NJDEP, may modify the preferred alternatives or select other response actions presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this document.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
January 30, 2020 – March 2, 2020
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: February 10, 2020
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Focused Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held in the Martin J. Ryerson Middle School, 130 Valley Road, Ringwood, NJ at 7:00 PM.

For more information, see the Administrative Record file at the following locations:

U.S. EPA Records Center, Region 2
290 Broadway, 18th Floor.
New York, New York 10007-1866
(212) 637-4308
Hours: Monday-Friday - 9 am to 5 p.m., by appointment.

Ringwood Public Library
30 Cannici Drive
Ringwood, New Jersey 07456
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EPA's website for the Ringwood Mines/Landfill Site is:
http://epa.gov/superfund/ringwood-mines

The EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA, commonly known as Superfund). Community Advisory Group Meetings have been held with the community since 2007. This Proposed Plan summarizes information that can be found in greater detail in the OU3 Remedial Investigation and Focused Feasibility Study (RI/FFS) and Risk Assessment and other documents contained in the Administrative Record for the Site.

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SITE DESCRIPTION

The Ringwood Mines/Landfill Superfund Site consists of approximately 500 acres in a historic mining district and is approximately 1.5 miles long and 0.5 miles wide. Portions of the Site are currently used as State of New Jersey parkland (Ringwood State Park), utility corridors (Public Service Electric & Gas and Rockland Electric Company), Borough of Ringwood facilities, including a Recycling Center and a Public Works yard, a power sub-station and open space (Borough of Ringwood property). In addition, 48 residential properties are dispersed throughout the Site. Residents living within the boundaries of the Site currently receive their drinking water from the municipal water supply, which obtains water from well fields located in a different subwatershed approximately two miles southeast of the Site. The Site is drained by four streams that ultimately lead to the Wanaque Reservoir, located approximately one mile south of the Site. The Wanaque Reservoir serves as a source of drinking water for over two million New Jersey residents.

United States Census Bureau records indicate that 866 people live within one mile of the Site. At least 200 people are estimated to live within the 48 residences located within the Site boundaries. Many of the residents living within the boundaries of the Site are members of the Ramapough Lenape Indian Nation, which is recognized as a Native American tribe by the State of New Jersey. Members of this community have strong ties to the land and hunt game and consume vegetation gathered from the Site.

SITE HISTORY

The land which comprises the Site was utilized for the mining of iron ore almost continuously from the mid-1700s to the early 1900s. Prior to 1940, the entire mine area was purchased by the U.S. Government and administered by the U.S. Government Defense Plant Corporation. The mine area was subsequently leased to the Alan Wood Steel Company as part of the World War II effort. In 1956, the U.S. Government sold the property to the Pittsburgh Pacific Company. It is believed that there was some use of the mines during the period of Pittsburgh Pacific Company's ownership.

Mining operations conducted at the Site consisted of the crushing and grinding of the iron ore, with magnetic separation of the iron from the other ore constituents (tailings). It has been reported that much of the mine tailings was sold off as road dressing. However, mine tailings are found throughout the Site, including the O'Connor Disposal Area, which was used for the disposal of fine mine tailings (this "slime pond" area was utilized for the settlement of waste mine tailings from wet ore processing operations).

The Ringwood Realty Corporation (Ringwood Realty), a wholly-owned subsidiary of the Ford Motor Company (Ford), purchased the mine area in January 1965. Records indicate that in 1967, Ringwood Realty entered into a contract with the O'Connor Trucking and Haulage Corporation for the disposal of wastes generated at the Ford factory located in Mahwah, New Jersey. This contract provided for the disposal of these wastes, which included plant trash, paint sludge, drummed waste and other non-liquid plant wastes, at the Site. These wastes were disposed of at various locations on the Site property including the Peters Mine Pit, O'Connor Disposal Area and Cannon Mine Pit.

In 1970, Ringwood Realty donated 290 acres of the Site to the Ringwood Solid Waste Management Authority. During the same year, additional acreage was sold to the Public Service Electric and Gas Company for use as a transmission line right of way. In 1973, 109 acres were donated to the NJDEP; this area was added to the Ringwood State Park. In that same year, Housing Operation with Training Opportunity (HOW TO), a New Jersey not for profit corporation, accepted the donation of over 35 acres of the Site. It is believed that by December 21, 1973, Ford/Ringwood Realty no longer owned any portion of the Site.

The results of a July 1982 Site Inspection conducted by NJDEP identified levels of benzene, ethylbenzene, and xylene in water samples collected from the Peters Mine Pit Airshaft, which led to the Site's inclusion on the National Priorities List (NPL) in 1983.

In March 1984, Ford, a Potentially Responsible Party for the Site, entered into an Administrative Order on Consent (AOC) with the EPA which required the performance of a RI for the Site. The required RI was conducted by Ford's contractor in four phases between March 1984 and April 1988. In June 1987, the EPA issued Unilateral Administrative Orders (UAOs) to Ford which required the performance of a feasibility study (FS), and the removal and off-site disposal of paint sludge and associated soil. Pursuant to these UAOs, Ford completed a FS and removed over 7000 cubic yards of paint sludge and associated soil from the Site in 1988. As part of this removal, pockets of paint sludge were removed from the northern portion of the Site near the Peters Mine Pit and the O'Connor Disposal Area, and from an area near the Cannon Mine Pit.

In September 1988, the EPA issued a Record of Decision (ROD) which selected long-term monitoring of groundwater and surface water as the remedy for the Site. The ROD noted that the known areas of paint sludge had been removed from the Site.

Additional paint sludge deposits and drums were identified in the O'Connor Disposal Area in 1989, prompting the removal of 600 cubic yards of paint sludge and 54 drum remnants in 1990. Some of the drum contents were reported to have contained polychlorinated biphenyls (PCBs) at concentrations in excess of 50 parts per million (ppm).

The Site was deleted from the NPL in 1994, with the presumption that all paint sludge and drums of hazardous substances had been removed from the Site. The deletion was further supported by the determination that groundwater at the Site did not pose an unacceptable threat to human health and the environment.

From 1990 through 1995, Ford conducted a five-year Environmental Monitoring Program which provided for the sampling of monitoring wells and potable wells in the area of the Site. The results of this program indicated that groundwater contaminant levels had been reduced since paint sludge had been removed from the Site.

In 1995, the EPA was notified by a local resident of additional paint sludge located in a utility right-of-way near the Cannon Mine Pit, prompting the removal of an additional 5 cubic yards of paint sludge. In 1998, another resident notified the EPA of the presence of paint sludge in the O'Connor Disposal Area, prompting the removal of an additional 100 cubic yards of paint sludge and soil.

In September 2003, representatives of the Upper Ringwood residents wrote to the EPA regarding their concern over past exposures and paint sludge remaining at the Site, but provided no details regarding the location of remaining paint sludge. Additional paint sludge areas were subsequently identified during an April 2004 Site visit arranged by the residents' representatives.

In December 2004, Ford began the voluntary removal of surficial pockets of paint sludge identified at the Site. The discoveries of additional significant quantities of paint sludge at the Site prompted the EPA to restore the Site to the NPL in September 2006. Ford has removed over 53,800 tons of paint sludge and associated soil from 16 distinct areas of the Site, in addition to the O'Connor Disposal Area and the Peters Mine Pit Area, since December 2004.

In September 2005, Ford signed an AOC which required the performance of an additional RI and risk assessment for the Site. In May 2010, Ford signed an AOC which required the performance of FSs for the Peters Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas of the Site, as well as Site-related groundwater contamination. The Borough of Ringwood, which has also been identified as a Potentially Responsible Party for the Site, coordinated with Ford on the performance of the RI/FSs for the Site pursuant to UAOs issued by the EPA.

In June 2014, the EPA issued the Operable Unit Two (OU2) ROD for the Site. The OU2 ROD selected a remedy to address waste located in the Peter's Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas of the Site. In addition, the OU2 ROD identified a contingency capping remedy for the O'Connor Disposal Area, which would facilitate the Borough of Ringwood's plan to construct a new recycling center in this area, if within six months of the OU2 ROD the Borough could provide (1) detailed engineering plans for the new recycling center; (2) financial assurance(s) indicating sufficient funds will be available for the construction of the recycling center, and (3) assurances and supporting documentation indicating that the construction of the contingency remedy, including the recycling center, can and will be completed within either a shorter or, at least within a comparable timeframe as the selected remedy. In April 2015, based upon information submitted by the Borough, the EPA issued an Explanation of Significant Differences (ESD) to select the contingency remedy as the remedy for the O'Connor Disposal Area of the Site.

In October 2014, Ford signed an AOC which required the preparation of the remedial design (RD) for the OU2 remedy. The Borough of Ringwood coordinated with Ford during the preparation of the OU2 RD pursuant to a UAO issued by the EPA. The Final OU2 RD Report was approved by the EPA in October 2018. A judicial Consent Decree which requires that Ford and the Borough of Ringwood implement the OU2 remedy was lodged with the Court on May 6, 2019. The public comment period on this judicial Consent Decree closed on July 29, 2019.

SITE CHARACTERISTICS

The 500-acre Site is located in the northern portion of the Borough of Ringwood, Passaic County, New Jersey. The Site terrain is mountainous with peaks up to 900 feet above sea level and valleys which are generally below 500 feet in elevation. Bedrock in the valleys and other topographically low areas is covered by overburden which consists of unconsolidated and reworked glacial deposits and weathered bedrock.

The Peters Mine Pit Area is located in the north central part of the Site and is bound to the north by Park Brook. Most of the Peters Mine Pit Area falls within the Ringwood State Park and is expected to remain in use as part of the state park in the future. From 1967 through 1971, the 375-foot long, 200-foot wide and 90-foot deep mine pit was filled to the ground surface with waste from Ford's Mahwah facility. Since this time, settling of the fill in this area has occurred, and a 300-foot long pond currently occupies what was once the deepest part of the mine pit. The pond is believed to be an expression of the water table.

The Cannon Mine Pit Area is located in the southwestern part of the Site. The pit was reportedly 180 feet long, 140 feet wide and 200 feet deep when mining operations ceased. Attempts were made to blast the pit closed when Ford purchased the property, which resulted in reducing the depth of the pit to approximately 60 feet. During the period of Ford ownership, the pit was reportedly filled to the ground surface with waste from Ford's Mahwah facility. Only minimal settling of the fill material has been noted in this area.

The 12-acre O'Connor Disposal Area is located to the south of the Peters Mine Pit Area along the Peters Mine Road. During the period of active mine operations, this area was utilized for the settling of waste mine tailings from wet ore processing operations. Subsequently, during the period of Ford/Ringwood Realty ownership, the O'Connor Disposal Area was utilized for the disposal of waste from Ford's Mahwah facility. The results of investigations conducted in this area indicate that waste and fill materials are present to a maximum depth of approximately 20 feet below ground surface. In general, a layer of undisturbed mine tailings appears to underlie waste materials disposed of by Ford's contractor and other fill materials. The O'Connor Disposal Area generally slopes to the east toward the Park Brook.

Paint sludge and other drummed industrial wastes originating from Ford's former Mahwah facility are the primary sources of contamination at the Site. However, levels of arsenic above New Jersey background soil levels have been found in some samples of mine tailings collected from the Site. Given that arsenic has also been found at elevated levels in some paint sludge samples collected from the Site, the EPA believes that paint sludge is also a source of arsenic in other media at the Site.

The Site is drained by four brooks which include the Mine Brook, Peters Mine Brook, Park Brook and the North Brook. The Peters Mine Brook joins the Mine Brook along the southern boundary of the Site. Mine Brook then flows into the Ringwood Creek, just upstream of the Wanaque Reservoir. Park Brook, which flows adjacent to the Peters Mine Pit and O'Connor Disposal Areas, and the North Brook each flow into Sally's Pond and subsequently to the Ringwood Creek, about one mile upstream of the Wanaque Reservoir.

Site-Related Groundwater Remedial Investigation

From 2004 through 2014, groundwater samples were collected from up to fifty-five monitoring wells located at the Site to characterize groundwater quality and the nature and extent of groundwater contamination. These wells are primarily located in proximity to the Peters Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas, as well as downgradient of the Site. Mine water samples were also collected from the flooded Peters Mine Pit Airshaft and Cannon Mine Elevator Shaft during these sampling events. Groundwater sampling was conducted twice a year from 2004 through 2009 and on an annual basis from 2010 through 2014. In addition, from 2005 through 2012, a surface water sampling program was implemented to assess surface water quality in surface water bodies at the Site. As part of the surface water sampling program, samples were collected from the Mine Brook, Peters Mine Brook, Park Brook, North Brook, a pond near the Peters Mine Pit and two groundwater seep locations. Furthermore, a sediment pore water investigation was conducted in August and September 2014 to better characterize the potential for discharge of contaminants from the Peters Mine Pit through sediment pore water beneath the Park Brook. Sediment pore water samples were collected from beneath Park Brook during this investigation.

Sediment investigations were conducted in 2005 and 2011 in the Mine Brook, Peters Mine Brook, Park Brook, North Brook, the Peters Mine Pit pond and the Peters Mine Pit Airshaft. In 2005, ten sediment samples were collected from the above-referenced brooks to determine whether contaminants are present at levels which may be of ecological concern. Similarly, six sediment samples were collected from the Peters Mine Pit pond in 2011 to determine whether contaminants are present at levels of ecological concern. An additional sediment sample was collected from the base of the Peters Mine Pit Airshaft in October 2011 to evaluate whether this sediment serves as a source of the benzene and other contaminants detected in mine water.

In April 2007, video logging was conducted of the Peters Mine Pit Airshaft to the base of the shaft, located 232 feet below the water surface. During this investigation two horizontal shafts were identified at approximate depths of 180 feet and 200 to 232 feet below the water surface. A pile of sediment/leafy debris was observed at the base of the shaft, but no waste materials were identified. Video logging of the Cannon Mine Elevator Shaft was conducted in March 2010. The video equipment was advanced to a depth of 379 feet before remnant debris from mining operations prevented further progress. Waste materials were not observed during the video logging.

O'Connor Disposal Area

Groundwater sampling associated with the O'Connor Disposal Area indicated that no volatile organic contaminants (VOCs) were detected at levels above applicable New Jersey Groundwater Quality Standards (NJGWQSs) with the exception of methyl tertiary butyl ether (MTBE), which was only detected in one well associated with the O'Connor Disposal Area during one groundwater sampling event. This MTBE is not believed

to be associated with Ford's disposal activities as MTBE was not widely used in the United States until the 1980s and the detection was in a well which is hydrologically upgradient of the O'Connor Disposal Area. Bis(2-ethylhexyl)phthalate was the only semivolatile organic contaminant (SVOC) which was detected above its NJGWQS of 3 micrograms per liter (ug/L) in samples collected from two wells during the 2007 groundwater sampling event. However, bis(2-ethylhexyl)phthalate was not detected in groundwater samples associated with the O'Connor Disposal Area during subsequent sampling events. Pesticides and polychlorinated biphenyls (PCBs) were not detected at levels above NJGWQSs in any groundwater sample associated with the O'Connor Disposal Area.

Arsenic has been sporadically detected above its NJGWQS of 3 ug/L in groundwater samples collected from five monitoring wells located in the O'Connor Disposal Area. However, arsenic has not been detected above its NJGWQS in groundwater samples collected from monitoring well OB-18, which is located hydrologically downgradient of the O'Connor Disposal Area. Lead has also been sporadically detected above its NJGWQS of 5 ug/L in groundwater samples collected from monitoring wells located in the O'Connor Disposal Area. However, since 2011, lead has only been detected above its NJGWQS in groundwater samples collected from monitoring well OB-25, which is located hydrologically upgradient of the O'Connor Disposal Area. Furthermore, lead has not been detected above its NJGWQS in groundwater samples collected from monitoring well OB-18, which is located hydrologically downgradient of the O'Connor Disposal Area.

The results of surface water samples collected from the Park Brook near the O'Connor Disposal Area from 2005 through 2012 did not indicate the presence of VOCs, SVOCs, PCBs or pesticides at concentrations that exceed applicable Surface Water Quality Standards (SWQSs). However, arsenic was detected in two of the surface water samples collected in 2012 from the Park Brook at concentrations which exceeded the SWQS of 0.017 ug/L. In addition, antimony was detected above its SWQS of 5.6 ug/L in one sample collected from the Park Brook during the 2005 surface water sampling event.

Cannon Mine Pit

Groundwater sampling associated with the Cannon Mine Pit indicated that no VOCs were detected at levels above applicable NJGWQSs with the exception of benzene and trichloroethene (TCE). Benzene was detected above its NJGWQS of 1 ug/L in groundwater samples collected from well RW-9 during 2008 but not during subsequent sampling events. Benzene has also been sporadically detected at concentrations above its NJGWQS in groundwater samples collected from well RW-8. TCE was detected above its NJGWQS of 1 ug/L in groundwater samples collected from monitoring well OB-3 during 2008 and 2009. However, TCE was not detected in groundwater samples collected from this well during subsequent sampling events. Bis(2-ethylhexyl)phthalate was the only SVOC which was sporadically detected above its NJGWQS of 3 ug/L in groundwater samples collected during pre-2013 groundwater sampling events. Pesticides and PCBs were not detected in any groundwater sample associated with the Cannon Mine Pit. Arsenic and lead are detected sporadically above their respective NJGWQSs in groundwater samples collected from the Cannon Mine Pit with no consistent spatial pattern.

The results of surface water samples collected from the Mine Brook near the Cannon Mine Pit from 2005 through 2012 did not indicate the presence of VOCs, pesticides or PCBs. Bis(2-ethylhexyl)phthalate is the only SVOC which was detected at levels above the SWQS of 1.2 ug/L in two upstream surface water samples collected in 2012. Lead was only detected in one surface water sample collected in 2012 at a concentration in excess of its 5.0 ug/L SWQS. Arsenic was detected in surface water samples collected from this area at concentrations from 0.32 ug/L to 1.2 ug/L, in excess of the 0.017 ug/L SWQS.

Peters Mine Pit

Prior to 2014, groundwater sampling conducted in and immediately downgradient of the Peters Mine Pit indicated the presence of benzene in groundwater in this area at levels which slightly exceeded the NJGWQS of 1 ug/L. However, groundwater sampling conducted in September 2014 indicated the presence of benzene in groundwater collected from the Peters Mine Pit at a concentration of 56 ug/L. In addition, groundwater concentrations of benzene in a monitoring well adjacent to the Peters Mine Pit increased to 88 ug/L during the September 2014 sampling event. Groundwater samples collected from the Peters Mine Pit and adjacent wells during October 2014 indicated the presence of benzene at levels less than 10 ug/L, which is consistent with historic groundwater sampling results for the Peters Mine Pit Area. Bis(2-ethylhexyl)phthalate was the only SVOC which was sporadically detected above its NJGWQS of 3 ug/L in groundwater samples collected from the Peters Mine Pit Area. During the 2014 groundwater sampling event, bis(2-ethylhexyl)phthalate was detected in groundwater samples collected from two monitoring wells in the Peters Mine Pit Area at concentrations of 3.6 ug/L and 6.6 ug/L, respectively. Pesticides and PCBs were not detected in any groundwater sample associated with the Peters Mine Pit. Groundwater samples collected from the Peters Mine Pit from 2006 through 2013 indicated the presence of lead at concentrations from 5.4 ug/L to 9.9 ug/L, which exceeds the NJGWQS of 5 ug/L. In addition, lead and arsenic have been sporadically detected at

concentrations in excess of their NJGWQSs in groundwater samples collected from monitoring wells located hydrologically upgradient and downgradient of the Peters Mine Pit.

Water samples collected from the Peters Mine Pit Airshaft through 2014 indicated that benzene was the only VOC detected at concentrations above its NJGWQS. Benzene was detected at concentration up to 26.4 ug/L in samples collected from the 180 feet below ground surface (bgs) sampling depth, and up to 33.2 ug/L in samples collected from the 230 feet bgs sampling depth. SVOCs were not detected above their applicable NJGWQSs with the exception of bis(2-ethylhexyl)phthalate, which was detected sporadically in water samples collected from the Peters Mine Pit Airshaft. Lead was detected above its NJGWQS in water samples collected during the May 2008 and September 2014 groundwater sampling event. Arsenic was only detected in the Peters Mine Pit Airshaft at a concentration which exceeds its NJGWQS of 3 ug/L in a sample collected during September 2014.

The results of surface water samples collected from the Park Brook and North Brook near the Peters Mine Pit from 2005 through 2012 did not indicate the presence of VOCs, SVOCs, PCBs or pesticides. Arsenic was consistently detected above the SWQS of 0.017 ug/L in all surface water samples, including samples collected upstream of the Peters Mine Pit, with concentrations ranging from 0.35 ug/L to 0.65 ug/L. Thallium was also detected above its SWQS of 0.24 ug/L in two surface water samples collected from the Park Brook. Surface water samples collected from the pond in the Peters Mine Pit did not indicate the presence of VOCs, pesticides or PCBs. In addition, lead and arsenic were not detected in pond surface water samples at concentrations which exceed applicable SWQSs. Benzene was also detected in water samples collected from a groundwater seep near the Peters Mine Pit at concentrations of 1.2 µg/L, 0.48 µg/L, and 0.85 µg/L, respectively, during the May 2010, May 2011, and May 2012 groundwater sampling events. It is believed that the benzene in the seep may originate from groundwater in the Peters Mine Pit Area. However, the results of sediment pore water samples collected from beneath Park Brook in August and September 2014 did not indicate the presence of VOCs, which suggests that benzene in groundwater is not discharging to the Park Brook at these sample locations.

In order to verify whether or not microbially enhanced natural attenuation mechanisms have affected the benzene concentrations in groundwater within the Peters Mine Pit Area, a stable isotope probe study using Bio-Trap® samplers was performed as part of the groundwater RI. Bio-Trap® samplers containing benzene marked with Carbon-13 were installed in the Peters Mine Pit Airshaft and monitoring wells in the Peters Mine Pit Area where benzene was historically detected. After 33 days, the Bio-Trap® samplers were removed and analyzed for the presence of petroleum-degrading bacteria, percent mass loss of Carbon-13-labeled benzene as well as the presence of Carbon-13-labeled benzene in the microbial community. Carbon-13 was incorporated into the biomass at all sampling locations, indicating that microbial communities capable of degrading benzene exist in Peters Mine Pit Area groundwater.

Site-Related Groundwater Remedial Investigation Addendum

Groundwater sampling conducted in the Peters Mine Pit Area during March 2015 once again indicated the presence of levels of benzene in groundwater samples collected from the Peters Mine Pit (150 ug/L) and one well adjacent to the Peters Mine Pit (344 ug/L), that were much higher than historical levels as these locations, prompting the need for additional groundwater sampling to evaluate these spikes in benzene concentrations. Additional groundwater sampling events were conducted in the Peters Mine Pit Area in April and June 2015. The results of these sampling events indicated that benzene levels in groundwater in the Peters Mine Pit and adjacent monitoring wells had returned to historic levels of less than 10 ug/L. However, a groundwater split sample collected by the Borough of Ringwood during the April 2015 groundwater sampling event indicated the presence of an emerging contaminant, 1,4-dioxane, in a sample collected from the Peters Mine Pit Airshaft. As a result, 1,4-dioxane was added to the compounds analyzed for during the August 2015 annual groundwater and surface water sampling event. The results of the August 2015 sampling event indicated the presence of 1,4-dioxane at levels greater than its NJGWQS of 0.4 ug/L in water samples collected from the Peters Mine Pit Airshaft as well as monitoring wells located primarily in the Peters Mine Pit Area of the Site. 1,4-dioxane was also detected in surface water samples collected from Site brooks and ponds.

Due to the detection of 1,4-dioxane at the Site, additional groundwater monitoring wells were installed in and downgradient of the Peters Mine Pit Area to define the extent of 1,4-dioxane in groundwater. Subsequently, groundwater and/or surface water sampling events were conducted at the Site in December 2015, January 2016, March 2016, May/June 2016, August 2016, February 2017 and August 2017. The results of these sampling events indicate that 1,4-dioxane and benzene are detected at their greatest concentration in water samples collected from the Peters Mine Pit Airshaft at a depth of 230 feet bgs. 1,4-dioxane and benzene were detected at concentrations as high as 146 ug/L and 33 ug/L respectively in water samples collected from the 230 feet bgs depth during these sampling events, with levels of these contaminants decreasing at shallower sampling intervals in the Peters Mine Pit

Airshaft. However, the results of these sampling events do not indicate that 1,4-dioxane or benzene in groundwater is migrating off the Site property at concentration in excess of their applicable NJGWQSs of 0.4 ug/L and 1 ug/L, respectively. Sampling results also indicate the presence of 1,4-dioxane in the Park Brook upstream of Sally's Pond and in the groundwater seeps near the Peters Mine Pit at concentrations up to 4.78 ug/L. However, 1,4-dioxane has consistently been detected at concentrations of less than 1 ug/L in surface water samples collected at the confluence of Park Brook and Sally's Pond and is undetected in surface water downstream of Sally's Pond. Furthermore, a numerical analysis conducted as part of the groundwater RI utilizing historic surface water flow data for the Wanaque Reservoir indicated that 1,4-dioxane would continue to be undetected in surface water at the confluence of Ringwood Creek and the Wanaque Reservoir. Therefore, Site-related impacts on the Wanaque Reservoir are not anticipated.

While residents at and near the Site receive their potable water from the Borough of Ringwood's municipal water supply system, a private well search was conducted within a one-mile radius of the Site. The results of this search identified five potable wells located at the Ringwood State Park and one potable well located at a nearby elementary school. In August 2018, water samples were collected from all of these potable wells and analyzed for VOCs, SVOCs, including 1,4-dioxane, PCBs and metals. 1,4-dioxane and benzene were not detected in any of samples collected from these potable wells. Furthermore, no compounds were detected at concentrations greater than their applicable NJGWQS or drinking water standard in any of the potable well samples.

Saint George's Pit Area Soil Investigation

In order to investigate the nature and extent of fill material located in a suspected disposal area near the center of the Site, in December 2010, a Soil Investigation was conducted in the Saint George's Pit Area. This investigation included the excavation of 1430 linear feet of test trenches and the installation of 15 soil borings to characterize the fill material. The results of this investigation indicated that the Saint George's Pit Area had been utilized for the disposal of common garbage. Paint sludge and other hazardous or industrial wastes were not identified in this area of the Site. Therefore, this area is not considered to be part of the Site.

PRINCIPAL THREATS

The remedial alternatives that are being evaluated in this Proposed Plan address contaminated groundwater. Since contaminated groundwater generally is not considered to be a source material, no principal threat wastes have been identified for this OU.

WHAT IS A "PRINCIPAL THREAT"?

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

SCOPE AND ROLE OF THE ACTION

The EPA is addressing the cleanup of this Site through immediate actions to address imminent threats to human health, and three phases of long-term cleanup.

Site remediation activities are sometimes separated into different phases, or Operable Units (OUs), so that remediation of different aspects of a site can proceed separately, resulting in a more efficient and expeditious cleanup of the entire site. At this Site, remediation activities have been separated into three OUs.

OU1 was originally intended to comprehensively address the Site. Subsequent to the restoration of the Site to the NPL, EPA created two additional operable units, OU2 and OU3. OU2 addresses waste, fill material and soil located in the Peters Mine Pit, Cannon Mine Pit and the O'Connor Disposal Areas. The OU2 remedy, as detailed in the June 2014 OU2 ROD and April 2015 ESD, provides for the excavation of fill material down to the water table and containment of remaining fill in the Peters Mine Pit Area, as well as the consolidation and containment of fill material in the Cannon Mine Pit and O'Connor Disposal Areas. The design of the OU2 remedy was completed in 2018. OU3, which is the subject of this Proposed Plan, addresses contaminated groundwater and mine water at the Site. The OU3 FFS evaluated cleanup alternatives for groundwater and mine water.

In addition, paint sludge and associated soil contamination which were located on non-residential properties outside of the Peters Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas have been addressed by Ford under removal authority. Furthermore, paint sludge and lead-contaminated

soil which was located on residential properties at the Site have been addressed by the EPA under removal authority.

SUMMARY OF OPERABLE UNIT 3 RISKS

As part of the RI/FS for Site-Related Groundwater, a baseline risk assessment was conducted to estimate the current and future effects of contaminants that currently exist in water at the Site on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land, groundwater and surface water/sediment uses. The baseline risk assessment includes a human health risk assessment (HHRA).

The cancer risk and noncancer health hazard estimates in the HHRA are based on current and future reasonable maximum exposure scenarios. Consistent with risk assessment guidance that calls for characterizing activity patterns of site-specific populations (EPA, 1989) scenarios were developed based on conversations with Upper Ringwood community members who identified unique, site-specific exposure characterizations that address traditional and cultural practices, and when applicable, these were incorporated into the groundwater risk assessment. In addition, the EPA also evaluated default assumptions regarding exposure that are consistently used in Superfund risk assessments. These sources of information – site-specific community input and traditional default information – were used to develop the exposure scenarios and assumptions that were carried into the HHRA, along with information on the toxicity of the chemicals of potential concern (COPCs). Cancer risks and noncancer health hazard indices (HIs) associated with exposure to groundwater and mine water at the Site are summarized below.

Human Health Risk Assessment for Site-Related Groundwater

The HHRA estimates potential risks to a hypothetical future residential user of groundwater and mine water at the Site. Because the NJDEP has classified the groundwater aquifers at the Site as Class IIA (potential drinking water resource), the hypothetical future resident was assumed to be exposed to groundwater and mine water used as a potable water source via ingestion, dermal contact while showering, and inhalation of VOCs while showering. The calculated potential risks to a hypothetical future residential user of groundwater at the Site were first presented in the May 2015 HHRA for Site-Related Groundwater. Subsequent to the EPA's approval of this document, 1,4-dioxane was detected in groundwater and mine water at the Site, prompting the performance of additional groundwater and mine water sampling events. Therefore, the risk calculations were updated to incorporate the groundwater and mine water sampling results from these additional sampling events. The revised risk calculations are presented in the May 2018 Addendum to the Draft Baseline HHRA Calculations for Site-Related Groundwater.

The cumulative potential cancer risk calculated for the hypothetical future resident scenario for the adult, older child (or youth), and young child is $2x10^{-4}$, which slightly exceeds the EPA's target cancer risk range of $1x10^{-6}$ to $1x10^{-4}$, primarily due to the presence of arsenic. Potential noncancer risks were also estimated by calculating hazard indices. Hazard indices assessed by target organ for the hypothetical future resident scenario for the adult, older child, and young child, are all at or below the USEPA's target hazard index limit of 1.

Anticipated blood lead levels in Site receptors were also evaluated to determine whether exposure to lead in groundwater at the Site presents an unacceptable risk. Estimated blood lead levels following potential exposure to lead in Site-related groundwater for a young child resident are predicted to exceed 5 micrograms per deciliter (µg/dL) blood lead level in 4% of the hypothetically exposed population, which is below EPA's regional target (no more than 5% exceeding 5 µg/dl) .

As stated previously, groundwater at the Site is considered potable, and mine water was considered representative of groundwater. Due to the higher levels of contamination detected in the mine shaft, exposures associated with this area were evaluated separately. The cumulative potential cancer risk calculated for the hypothetical future resident scenario for exposure to mine water in the Peters Mine Pit Airshaft for the adult, older child (or youth), and young child is $4x10^{-4}$, which exceeds the EPA's target cancer risk range of $1x10^{-6}$ to $1x10^{-4}$. The most significant contribution to this risk is from benzene and 1,4-dioxane. Potential noncancer risks were also estimated by calculating hazard indices. Hazard indices assessed by target organ for the hypothetical future resident scenario for the adult, older child, and young child are all at or below the EPA's target hazard index limit of 1 with the exception of the GI tract target organ, which is due to the naturally occurring iron concentrations in the Peters Mine Pit Airshaft.

Anticipated blood lead levels in Site receptors were also evaluated to determine whether exposure to lead in mine water in the Peters Mine Pit Airshaft presents an unacceptable risk. Estimated blood lead levels following potential exposure to lead in Peters Mine Pit Airshaft mine water for a young child resident are predicted to exceed 5 µg/dL blood lead level in 27% of the hypothetically

exposed population, which is above EPA's regional target (no more than 5% exceeding 5 µg/dl).

Ecological Risk

The Site-Related Groundwater Ecological Assessment (EA) was completed to evaluate the potential of risk to ecological receptors associated with exposure to contaminants in groundwater at the Site. However, because ecological receptors are not directly exposed to groundwater, constituents in groundwater at the Site were determined to only be of concern if they discharge to surface water at concentrations of concern. Therefore, only constituents which were detected at concentrations above ecologically based screening levels (EBSLs) in both groundwater and surface water were identified as constituents of potential ecological concern. The results of this screening indicated that only total (unfiltered) aluminum, barium, copper, and manganese as well as dissolved (filtered) manganese were detected at maximum concentrations in groundwater and surface water which exceeded applicable EBSLs. Benzene and 1,4-dioxane were not detected at concentrations which exceeded their respective EBSLs. However, when potential risk under more realistic exposure assumptions (e.g., 95% Upper Confidence Limit and dissolved metal concentrations) was evaluated, only dissolved manganese exceeded the applicable EBSL. It should be noted that manganese is naturally occuring at the Site and its presence in groundwater is likely associated with native soil and bedrock, as well as historic mining activities.

Potential ecological risk associated with exposure to sediment at the Site was also evaluated. There are no risks to ecological receptors from exposure to Site contaminants of potential ecological concern in sediment.

Conclusion of the Risk Assessment

It is the EPA's judgment that the Preferred Alternatives identified in this Proposed Plan for groundwater and mine water, or one of the other active measures considered in the Proposed Plan, are necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of concern at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response), are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines exposure information and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For noncancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a noncancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which noncancer health effects are not expected to occur.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) were identified for groundwater and mine water at the Site in order to develop cleanup alternatives to address the human health risks presented by potential exposure to this media. Groundwater beneath the Site is classified by the NJDEP as Class IIA, which means that it has the potential for use as a potable water source. Based on the Class IIA aquifer designation, and the results of the risk assessments, the RAOs for Site-related groundwater include:

- Prevent exposure to groundwater and mine water containing contaminant concentrations above their respective NJGWQS.
- Restore the aquifer outside of the capped mine shaft area to Class IIA NJGWQSs.
- Reduce or eliminate the potential for migration of contamination above NJGWQS.

Consistent with the identified RAOs, the preliminary remediation goals (PRGs) for groundwater and mine water at the Site are the applicable Class IIA NJGWQSs for identified contaminants. Therefore, the groundwater cleanup goals are 1 ug/L and 0.4 ug/L for benzene and 1,4-dioxane, respectively.

SUMMARY OF REMEDIAL ALTERNATIVES

General response actions, which are broad categories of cleanup response which may meet the RAOs for groundwater, were first identified. Potential applicable technologies and process options applicable to these general response actions were then identified and screened using effectiveness, implementability and cost as the criteria, with the most emphasis on the effectiveness of the remedial technology. Those technologies and process options which passed the initial screening were assembled into remedial alternatives for Site-wide groundwater and the Peters Mine Pit Airshaft.

Site-Wide Groundwater

Alternative 1 – No Action
The No Action alternative would not include implementation of any corrective action for groundwater. The No Action Alternative was retained, as required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and provides a baseline for comparison with other alternatives.

Total Capital Cost	$0
Operation and Maintenance	$0 (Total)
Total Present Net Worth	$0
Construction Duration	0 months

Alternative 2 – Monitoring with Institutional Controls
This alternative would include active monitoring of groundwater quality and the attenuation processes that are expected to continue to reduce the mobility, toxicity, and volume of Site contaminants in groundwater over time. A long-term groundwater monitoring plan would be implemented which would provide for the monitoring of contaminant concentrations and biogeochemical parameters from groundwater monitoring wells located in and downgradient of the Peters Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas. This alternative also provides for the installation of additional groundwater monitoring wells downgradient of the Peters Mine Pit and O'Connor Disposal Areas which, along with existing monitoring wells, would serve as a sentinel monitoring well network to provide advanced warning of any movement of groundwater contamination toward drinking water resources. In addition, surface water monitoring would be conducted in and downstream of the Site brooks to confirm that Site-related contaminants are not threatening downstream receptors, including the Wanaque Reservoir. Finally, a Classification Exception Area/Well Restriction Area (CEA/WRA) would be established as an institutional control to restrict future withdrawal and use of Site groundwater which contains contaminants at concentrations in excess of NJGWQSs. A CEA/WRA is required pursuant to New Jersey regulations for groundwater which documents the area where water quality standards cannot be met and limits installation of groundwater extraction wells. Sufficient groundwater sampling would be conducted to estimate the extent and duration of the CEA/WRA. Five-year reviews would be required until groundwater reaches remedial goals.

Total Capital Cost	$248,000
Operation and Maintenance	$1,191,000 (Total)
Total Present Net Worth	$1,439,000
Construction Duration	6 months

Alternative 3 – In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area
Under this alternative, in-situ treatment, likely oxidation, would be implemented to promote and support the degradation of groundwater contaminants through attenuation processes. Introduction of an oxygen release compound (ORC) to the aquifer would be accomplished through wells that would be installed in a barrier-style configuration perpendicular to the direction of groundwater flow. The principal location for these wells would be in the overburden. The focus on the overburden is a consequence of the difficulty of introducing any material into a low-yield fractured bedrock environment and the fact that groundwater flow within the area downgradient of the Peters Mine Pit is generally upward from the bedrock, into the overburden, and ultimately to surface water. Therefore,

a portion of the bedrock groundwater would pass through an oxygen-enriched overburden aquifer. The radius of influence for diffusion of ORC varies with formation characteristics, but is typically limited. Therefore, a well spacing of approximately 20 feet is assumed. The recommended barrier arrangement of wells is situated adjacent to an existing gravel access road for ease of access, and down gradient of the Peters Mine Pit and Peters Mine Pit Air Shaft where Site contaminants have typically been detected at their highest concentrations (see Figure 2).

Wells for introduction of oxygen into the bedrock aquifer may also be installed on a limited scale. These bedrock aquifer wells may be installed in key areas where contaminants have been detected at their highest concentrations (see Figure 3). Given the difficulty of promoting movement of any additives in the low-yield bedrock formation, these wells would be assessed during the initial period of enhancement, and if diffusion of oxygen is not demonstrated, use of the bedrock wells may be terminated. Specific details concerning well placement and ORC application would be determined during design of this alternative.

1,4-dioxane has been found at concentrations exceeding the NJGWQS in O'Connor Disposal Area monitoring well OB-17. However, a focused investigation in the area upgradient of monitoring well OB-17 did not identify a source of 1,4-dioxane and 1,4-dioxane was not detected in paint sludge and soil samples collected during this investigation. This suggests the possibility of some diffuse source of 1,4-dioxane in the area of monitoring well OB-17. Under this alternative, ORC may also be introduced into this monitoring well to promote biodegradation of 1,4-dioxane in this localized area.

This alternative would also provide for the implementation of the long-term groundwater monitoring plan and surface water monitoring plan described in Alternative 2. Furthermore, a CEA/WRA would be established as an institutional control to restrict future withdrawal and use of Site groundwater which contains contaminants at concentrations in excess of NJGWQSs. Sufficient groundwater sampling would be conducted to estimate the extent and duration of the CEA/WRA. Five-year reviews would be required until groundwater reaches remedial goals.

Total Capital Cost	$631,000
Operation and Maintenance	$2,184,000 (Total)
Total Present Net Worth	$2,815,100
Construction Duration	12-18 months

Peters Mine Pit Airshaft

Alternative 1 – No Action

The No Action alternative would not include implementation of any corrective action in the Peters Mine Pit Airshaft. The No Action Alternative was retained, as required by the NCP, and provides a baseline for comparison with other alternatives.

Total Capital Cost	$0
Operation and Maintenance	$0 (Total)
Total Present Net Worth	$0
Construction Duration	0 months

Alternative 2 - Oxygen Diffusion in the Peters Mine Pit Airshaft

Under this alternative, canisters of ORC would be installed at various depths within the Peters Mine Pit Airshaft to enhance the aerobic biodegradation of organic contaminants contained in the mine water. The focus of the canisters would be on the lower portion of the airshaft where the concentrations of organic contaminants are highest. To promote aerobic conditions, it is assumed that the canisters of ORC would be installed horizontally and vertically across the lower part of the Peters Mine Pit Airshaft.

In order to implement this alternative, a cap would be installed across the Peters Mine Pit Airshaft with locking sleeves installed through the cap from which ORC canisters would be suspended on cable. Monitoring of the mine water would be conducted to assess the effects of aerobic conditions on organic contaminants in mine water. Replacement of the ORC canisters would occur as necessary to maintain appropriate aerobic conditions. Because waste would be left in place, five-year reviews would be required.

Total Capital Cost	$91,000
Operation and Maintenance	$261,000 (Total)
Total Present Net Worth	$352,000
Construction Duration	6-12 months

Alternative 3 - Treatment/Closure in the Peters Mine Pit Airshaft

Under this alternative, the Peters Mine Pit Airshaft would be closed using conventional mine shaft closure technology. In addition, prior to closure granular activated carbon (GAC) and resin would be introduced into the shaft to treat organic contaminants.

While details regarding the introduction of treatment materials and closure of the Peters Mine Pit Airshaft would be determined during the design, it is anticipated that GAC and angular stone would first be introduced to the base of the Peters Mine Pit Airshaft. Resin would also be introduced in canisters or socks and lowered to the base of the shaft. Subsequent to this treatment step, fast-setting grout would be placed so that it would not flow into the GAC, resin and angular stone or the adjacent mine

openings. Flowable flyash/concrete grout would be placed above the fast-setting grout to the top of the Peters Mine Pit Airshaft, fully sealing the shaft. A poured concrete slab would then be placed above the grout to serve as a final closure surface.

It is estimated that closure of the shaft would result in the displacement of approximately 450,000 gallons of mine water which would need to be addressed. The FFS assumes that the displaced water would be treated through filtration and GAC and then discharged to groundwater. Because waste would be left in place, five-year reviews would be required.

Total Capital Cost	$598,000
Operation and Maintenance	$0 (Total)
Total Present Net Worth	$598,000
Construction Duration	12-18 months

Alternative 4 – Peters Mine Pit Airshaft Closure
Under this alternative, the Peters Mine Pit Airshaft would be closed using conventional mine shaft closure technology. However, treatment of organic contaminants would not occur.

Angular stone or quick-setting grout could be used as a stabilizing course at the base of the shaft to prevent the movement of material into the adjacent mine openings. Flowable flyash/concrete grout would be placed above the fast-setting grout to the top of the Peters Mine Pit Airshaft, fully sealing the shaft. Bentonite would be added to the grout in order to reduce its permeability. A poured concrete slab would then be placed above the grout to serve as a final closure surface.

It is estimated that closure of the shaft would result in the displacement of approximately 450,000 gallons of mine water which would need to be addressed. The FFS assumes that the displaced water would be treated through filtration and GAC and then discharged to groundwater. Because waste would be left in place, five-year reviews would be required.

Total Capital Cost	$646,000
Operation and Maintenance	$0 (Total)
Total Present Net Worth	$646,000
Construction Duration	12-18 months

EVALUATION OF REMEDIAL ALTERNATIVES

Nine criteria are used to evaluate the different remedial alternatives individually and against each other in order to select the best alternative. This section of the Proposed Plan profiles the relative performance of all alternatives against the nine criteria, noting how they compare to the other options under consideration. The nine evaluation criteria are discussed below. A more detailed analysis of the presented alternatives can be found in the Site-Related Groundwater FFS Report.

THE NINE SUPERFUND EVALUATION CRITERIA

1. **Overall Protectiveness of Human Health and the Environment** evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. **Long-term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time.

4. **Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. **Cost** includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. A discount rate of 7% was utilized in the calculation of present worth costs for the Site. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. **State/Support Agency Acceptance** considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. **Community Acceptance** considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Site-Wide Groundwater

Overall Protection of Human Health and the Environment

Alternative 1 would not provide for protection of human health and the environment as no action would be taken to

remediate impacted groundwater or to prevent the potential future use of this water as drinking water. Therefore, Alternative 1 would not meet the remedial goals.

Alternatives 2 and 3 provide for the establishment of a CEA/WRA which is an institutional control which would serve to prevent the future use of impacted groundwater at the Site as drinking water by documenting the area where water quality standards cannot be met and limiting installation of groundwater extraction wells. Furthermore, Alternatives 2 and 3 would use naturally occurring attenuation mechanisms to restore the aquifer to Class IIA NJGWQSs. Therefore, Alternatives 2 and 3 are expected to meet all of the RAOs over time and are considered protective of human health and the environment. However, it should be noted that the ability of Alternatives 2 or 3 to meet the RAO of restoring the aquifer to Class IIA NJGWQS within a reasonable timeframe is not certain because of the absence of a defined source, the natural presence of certain contaminants at the Site, and the potential presence of sources related to the larger mine workings.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Class IIA NJGWQSs are ARARs for Site-wide groundwater. Alternatives 1 would not comply with ARARs. In addition, because no remedial action would be taken under Alternative 1, this alternative would not meet the RAO of restoring the aquifer to Class IIA NJGWQSs.

Alternatives 2 and 3 provide for establishment of a CEA/WRA and would comply with State of New Jersey requirements for controlling use of groundwater by a CEA/WRA. In addition, Alternatives 2 and 3 are designed to meet the NJGWQSs over time through the use of natural attenuation mechanisms. Therefore, Alternatives 2 and 3 are expected to comply with ARARs.

Long-Term Effectiveness and Permanence

Alternatives 2 and 3 would be effective in the long-term through maintenance of the institutional control provided by the CEA/WRA. As long as the CEA/WRA is in effect, these alternatives would be protective by preventing the use of impacted groundwater. Alternative 1 does not include a CEA/WRA, and therefore, a mechanism to ensure protectiveness over the long term would not be in place.

Alternatives 2 and 3 would be similar with respect to permanence as they both rely upon the use of natural attenuation mechanisms to reduce concentrations of contaminants in groundwater naturally, over the long-term with the objective of achieving restoration of the aquifer. The ongoing addition of oxygen release compound and nutrients under Alternative 3 is intended to improve the effectiveness of the natural attenuation mechanisms and shorten the timeframe to restore the aquifer to Class IIA NJGWQSs.

Reduction of Toxicity, Mobility, or Volume Through Treatment

The No Action Alternative would not include any removal or treatment-based remedial actions to reduce toxicity, mobility, or volume of contaminants in groundwater.

Alternatives 2 and 3 would reduce the toxicity and mobility of contaminants present in groundwater through the natural attenuation mechanisms of biodegradation, advection, and dispersion. In addition, redox conditions within and downgradient of the Peters Mine Pit Area help to inhibit the mobility of soluble metals in the downgradient direction. Monitoring would be conducted to confirm these processes are maintained.

Alternative 3 is the only alternative that includes an active measure as it requires the introduction of oxygen and nutrients, which provides the additional step of supporting and enhancing the natural attenuation mechanisms, aiding the positive effects of redox conditions, and thus would enhance the reduction of toxicity and mobility of contaminants.

Short-Term Effectiveness

Alternative 1 includes no construction or remedial activities and would have no short-term impacts. For Alternatives 2 and 3, remedial construction activities would be limited and would not have any significant short-term impacts and would occur over a relatively short duration. Alternative 2 would involve the installation of additional groundwater monitoring wells and establishing compliance with the substantive requirements of state law and may take 6 months to implement. Alternative 3 would require the installation of additional wells downgradient of the Peters Mine Pit Area for the introduction of ORC and is estimated to take 12 to 18 months to implement. Health and safety of workers and the public would be maintained during the installation of these wells utilizing safeguards, as provided for in a Site-specific health and safety plan, to limit short-term exposure risks.

Implementability

Alternatives 1 does not have implementation components. The administrative task of setting up the CEA/WRA, a component of Alternatives 2 and 3, is readily accomplished through coordination with the NJDEP.

Alternatives 2 and 3 are readily implemented with conventional equipment and materials available in the marketplace. While Alternatives 2 and 3 may require consultation with NJDEP to reach compliance on substantive requirements for well installations and placement of oxygen release compound in the aquifer, impediments to establishing compliance are not anticipated.

Cost

Alternative 1 would have no cost as no action would be required.

Alternative 2, which provides for establishment of a CEA/WRA and long-term groundwater monitoring, has an estimated cost of $1,439,000. Alternative 3, which provides for the introduction of an oxygen release compound into the aquifer to enhance the degradation of organic contaminants in addition to establishment of a CEA/WRA and long-term monitoring, is estimated to cost $2,815,000. The total costs are calculated using a discount rate of 7 percent.

State/Support Agency Acceptance

The State of New Jersey agrees with the preferred alternative for Site-Wide Groundwater and Mine Water, which is presented in this Proposed Plan.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Responsiveness Summary of the OU3 ROD for this Site. The ROD is the document that formalizes the selection of the remedy for a site.

<u>Peters Mine Pit Airshaft</u>

Overall Protection of Human Health and the Environment

Alternative 1 would not provide for protection of human health and the environment because no action would be taken to address risks associated with the potential future potable use of mine water in the Peters Mine Pit Airshaft. Alternatives 2, 3 and 4, would be protective assuming a CEA/WRA would be put into place for the Site-wide groundwater alternatives and would also cover the area of and down-gradient from the Peters Mine Pit Airshaft. In addition, Alternatives 3 and 4 would prevent future use of the mine water in the Peters Mine Pit Airshaft as a potable water supply because the airshaft would be permanently closed.

Under the assumption that the Peters Mine Pit Airshaft is hydraulically connected to the surrounding Peters Mine Pit Area aquifer, the treatment associated with Alternatives 2 and 3 would be potentially beneficial in reducing the contaminant concentrations which may result in meeting the RAO of restoring the aquifer to Class IIA NJGWQS within a reasonable timeframe. Alternatives 3 and 4 (both of which physically isolate the Peters Mine Pit Airshaft through closure) may also contribute to reducing contaminant concentrations in groundwater by eliminating the airshaft's connection to the aquifer, which may result in a shorter period of time to meet the RAO of attempting to restore the aquifer to Class IIA NJGWQS within a reasonable timeframe. However, the timeframe for meeting this RAO is considered uncertain because of the absence of a defined source, the natural presence of certain contaminants at the Site, and the potential presence of sources related to the historic mine workings.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Alternative 1 would not comply with ARARs as no action would be taken.

N.J.A.C. 7:14A-7.5, which establishes state limitations on pollutants in discharges to groundwater, would be an ARAR for Alternatives 3 and 4. Alternatives 2, 3, and 4 would meet the substantive requirements for the actions to be implemented (i.e., underground injection, dewatering of the Air Shaft) through consultation with NJDEP.

Long-Term Effectiveness and Permanence

Under Alternative 1, no action would be taken to address risks associated with the potential future potable use of mine water in the Peters Mine Pit Airshaft. In addition, under this alternative there would not be any mechanisms to monitor the concentrations of contaminants in mine water in the Peters Mine Pit Airshaft to determine whether concentrations change over time. Therefore, Alternative 1 would not be effective over the long-term.

Under Alternative 2, ORC could be placed in the Peters Mine Pit Airshaft indefinitely, and therefore, to the extent there are beneficial effects from oxygen diffusion, the effectiveness could be maintained for the long term. Furthermore, monitoring of the mine water quality to assess the performance of the oxygen diffusion would confirm that the concentrations of contaminants in the Peters Mine Pit Airshaft decline over time.

Alternatives 3 and 4 are permanent remedies as the closure component would permanently seal the airshaft and isolate it from the surrounding environment. Furthermore, for Alternative 3, contaminants would remain adsorbed to the

GAC and resin as there would not be a mechanism to regenerate the carbon or resin and release the contaminants. Being a permanent closure of the Peters Mine Pit Airshaft, Alternatives 3 and 4 would be effective for the long-term without any operation and maintenance.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 1 would not treat the contaminants in mine water and would not reduce their toxicity, mobility, or volume.

Alternative 2 would reduce contaminant toxicity and volume by introducing oxygen and essential nutrients into the base of the Peters Mine Pit Airshaft to promote aerobic biodegradation of contaminants in mine water.

Alternative 3 would reduce the mobility of contaminants within the Peters Mine Pit Airshaft through treatment with GAC and resin at the base of the airshaft to adsorb contaminants and bind them in the GAC and resin matrices. Isolating the airshaft from the surrounding aquifer through the closure process would also reduce mobility of contaminants.

Alternative 4 would reduce the mobility of contaminants in the airshaft, but only by isolating the airshaft from the surrounding aquifer through the closure process, not through treatment.

Short-Term Effectiveness

Under Alternative 1, no remedial or construction activities would occur. Therefore, no short-term impacts would be associated with implementation of this alternative.

Minimal short-term risks are associated with implementation of Alternatives 2, 3, and 4. The most significant construction element associated with Alternative 2 is the concrete cap on the Peters Mine Pit Airshaft, which would be complete in a relatively short period of time. The most significant construction element associated with Alternatives 3 and 4 is the grouting and closure of the Peters Mine Pit Air Shaft, which would also be completed in a relatively short period of time. Alternatives 2, 3, and 4 are not anticipated to have any significant short-term impacts as the health and safety of workers and the public would be maintained during construction of each of these alternatives. Safeguards, as provided for in a Site-specific health and safety plan, would be implemented to protect human health and the environment during implementation of these alternatives.

Construction of Alternatives 2, 3 and 4 is expected to be of short duration. The anticipated schedule to have Alternative 2 in place is on the order of six months to one-year and one-year to 18 months for Alternatives 3 and 4.

As part of Alternatives 3 and 4, the placement of stone/grout or GAC and resin at the base of the Air Shaft has the potential to disturb sediments and debris, which could in turn alter the geochemistry in the base of the shaft on a short-term basis. Such a disturbance could potentially cause a short-term increase in contaminant concentrations in the bedrock aquifer adjacent to the Peters Mine Pit Airshaft. Alternative 3 may have the advantage of providing some additional mitigation of potential short-term groundwater quality impacts from disturbance of the sediments and debris in the airshaft because it includes the use of adsorbents to close the airshaft at the same time as the disturbance, whereas Alternative 4 does not.

Implementability

Alternative 1 does not require any remedial activity and, therefore, implementability is not a consideration.

The implementability of Alternatives 2, 3, and 4 is similar in that they can all be implemented with conventional equipment, materials, means and methods available commercially. While Alternatives 2 and 3 may require consultation with NJDEP to reach compliance on substantive requirements for well installations and placement of ORC in the aquifer, impediments to establishing compliance are not anticipated. Therefore, all of these alternatives are readily implementable.

Cost

Alternative 1 would have no cost as no action would be required. Alternative 2, which includes installation of the airshaft cap, 30 years of mine water monitoring and reporting, and routine operation and maintenance activities, is estimated to cost $334,000. Alternative 3, which includes site preparation, installation of stone, GAC, resin, grouting the full depth of the airshaft, and a concrete cap, is estimated to cost $598,000. Alternative 4 is only slightly more costly than Alternative 3 because of the additional cost of using a bentonite additive as part of the closure grouting operation. Alternative 4 is estimated to cost $646,000. The total costs are calculated using a discount rate of 7 percent.

State/Support Agency Acceptance

The State of New Jersey agrees with the preferred alternative for the Peters Mine Pit Airshaft, which is presented in this Proposed Plan.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Responsiveness Summary of the OU3 ROD for this Site.

SUMMARY OF THE PREFERRED ALTERNATIVES

Site-Wide Groundwater

Alternative 3, In-Situ Treatment With Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area, is the preferred alternative for Site-Wide Groundwater. Under this alternative, in-situ treatment, likely oxidation, would be conducted to promote and support the degradation of contaminants. Since the preferred biodegradation pathway for benzene and 1,4-dioxane is aerobic, this alternative would focus on using oxygen as the electron acceptor.

While subject to modification during the design, in concept, the introduction of ORC to the aquifer would be accomplished through wells that would be installed in a barrier-style configuration perpendicular to the direction of groundwater flow. The principal location for these wells would be in the overburden. The focus on the overburden is a consequence of the difficulty of introducing any material into a low-yield fractured bedrock environment, and the fact that groundwater flow within the area downgradient of the Peters Mine Pit is generally upward from the bedrock, into the overburden, and ultimately to surface water. Therefore, a portion of the bedrock groundwater would pass through an oxygen enriched overburden aquifer. The radius of influence for diffusion of ORC varies with formation characteristics, but is typically limited. Therefore, a well spacing of approximately 20 feet is assumed. The recommended barrier arrangement of wells is situated adjacent to an existing gravel access road for ease of access, and down gradient of the Peters Mine Pit and Peters Mine Pit Air Shaft where Site contaminants have typically been detected at their highest concentrations (**see Figure 2**).

Wells for introduction of oxygen into the bedrock aquifer may also be installed on a limited scale. These bedrock aquifer wells may be installed in key areas where contaminants have been detected at their highest concentrations (**see Figure 3**). Given the difficulty of promoting movement of any additives in the low-yield bedrock formation, these wells would be assessed during the initial period of enhancement, and if diffusion of oxygen is not demonstrated, use of the bedrock wells may be terminated.

Furthermore, 1,4-dioxane has been found in concentrations exceeding the NJGWQS in O'Connor Disposal Area monitoring well OB-17. However, a focused investigation in the area upgradient of monitoring well OB-17 did not identify a source of 1,4-dioxane and 1,4-dioxane was not detected in paint sludge and soil samples collected during this investigation. This suggests the possibility of some diffuse source of 1,4-dioxane in the area of monitoring well OB-17. Under this alternative, ORC may also be introduced into this monitoring well to promote biodegradation of 1,4-dioxane in this localized area.

Commercial ORC products are available that can be applied in socks/canisters within wells in a solid or granular form. These commercially available products can also be supplied with buffering compounds and essential inorganic nutrients to further support the microbial populations. This alternative assumes the use of a chemical, slow release source of oxygen, applied in the above-described array of wells, at a typical application rate in the range of 2-5 pounds of ORC per foot of saturated thickness within the treatment zone. Furthermore, it is assumed that ORC socks contained in reusable canisters would be suspended in each well to allow for the replacement of ORC, once exhausted. However, the specific details concerning well placement and ORC application will be determined during design of the preferred alternative.

Furthermore, a long-term groundwater and surface water monitoring program would be conducted which would include the sampling of groundwater monitoring wells in and downgradient of the Peters Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas, and surface water monitoring in the four brooks which drain the Site. In addition, the EPA currently assumes that at least three additional groundwater monitoring wells would be installed in bedrock downgradient of the Peters Mine Pit and O'Connor Disposal Areas to serve as sentinel monitoring wells. These wells would be used to provide advanced warning of any movement of contaminants toward drinking water supplies. The specific details of the long-term groundwater and surface water monitoring program, including sampling location and frequency, would be determined during design of the preferred alternative.

Finally, a CEA/WRA would be established as an institutional control to restrict future withdrawal and use of Site groundwater which contains contaminants at concentrations in excess of NJGWQSs. A CEA/WRA is required pursuant to New Jersey regulations for groundwater which does not meet applicable NJGWQSs. Sufficient groundwater sampling will be conducted to estimate the extent and duration of the CEA/WRA.

Peters Mine Pit Airshaft

Alternative 3, Treatment/Closure in the Peters Mine Pit

Airshaft is the preferred alternative for the Peters Mine Pit Airshaft. Under this alternative, the Peters Mine Pit Airshaft would be permanently closed using conventional mine shaft closure technology. Closure of the Peters Mine Pit Airshaft would constitute isolation of the shaft and its contents from the surrounding environment. In addition, this alternative includes a treatment step using GAC and resin prior to permanent closure of the Airshaft.

Implementation of the preferred alternative would begin with the introduction of GAC and resin to the base of the Peters Mine Pit Airshaft, to adsorb organic contaminants. The amount of GAC and resin to be introduced to the airshaft would be determined during design of this alternative. Angular stone would be interspersed with smaller sized GAC at the bottom of the shaft. The resin density is less than that of water. Therefore, the resin would be introduced in canisters or socks lowered to the base of the air shaft. The rock would provide bearing strength to temporarily support grout that would be placed above the rock. In addition, the angular shape of the rock would limit its movement within the mine workings toward the adjacent mine slope entry. Methods to mitigate the potential flow of mine water from the deeper mine workings to the Peters Mine Pit will also be considered during design of this remedy.

Subsequent to the treatment step of addition of stone, GAC and resin, measures would be taken to permanently close the Peters Mine Pit Airshaft. Fast-setting, low-slump grout mix would be placed on top of the stone and GAC/resin to a total thickness of approximately 10 feet. The fast setting grout would initially be placed so that the grout would not flow deeply into the rock and carbon and seal it from contacting the mine water. The fast-setting grout would also limit the potential for loss of grout into the adjacent mine slope entry.

Flowable flyash/concrete grout would then be placed using a tremie pipe above the fast setting grout, to the top of the airshaft, fully sealing the shaft. The flyash grout is a slower-setting, low-strength mix commonly used in mine shaft closures. The grout mix would be designed to have a strength of between 500 to 1000 pounds per square inch (at 28 days). The grout would encapsulate any remaining wood material and fill voids within the airshaft. Flyash grout mixtures have become commonly available as a ready-mixed material. Therefore, material for the Peters Mine Pit Airshaft closure could be supplied by ready-mix vendors or a mixing plant could be used on site.

This grouting operation would displace the water in the airshaft. The EPA assumes that the displaced water would be treated through filtration and GAC and then discharged to groundwater within the same general locations, pursuant to the substantive requirements of NJAC 7:14A-7.5, which establishes state limitations on pollutants in discharges to groundwater. Based on the dimensions of the airshaft, the total volume of water that will be displaced is approximately 450,000 gallons. At a flow rate of 50 gallons per minute, the total quantity of displaced water would require approximately only six days to treat and discharge.

Following placement of the low-strength grout fill, a concrete cap would be placed with a marker as a final closure and identification measure. The concrete cap would be a conventional poured slab that would provide a durable, final closure surface. Closure of the Peters Mine Pit Airshaft would be permanent and would isolate the shaft from the environment.

Basis for the Preferred Remedy

While Alternatives 2 and 3 for Site-Wide Groundwater would both be expected to reduce the levels of contaminants in groundwater at the Site through the attenuation processes of biodegradation, advection, and dispersion, Alternative 3 would enhance these processes through the introduction of oxygen and nutrients to the aquifer. Therefore, the EPA expects that Alternative 3, In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area, may result in a greater likelihood and/or shorter timeframe to restore the aquifer to Class IIA NJGWQSs than Alternative 2.

For the Peters Mine Pit Airshaft, the EPA believes that the treatment associated with Alternatives 2 and 3 would be potentially beneficial to reducing contaminant concentrations in mine water and groundwater, which may result in a greater likelihood of restoring the surrounding aquifer to Class IIA NJGWQSs within a shorter time period. Furthermore, Alternatives 3 and 4 would prevent the potential for future exposure to impacted mine water in the Peters Mine Pit Airshaft through permanent closure of the airshaft. Therefore, only Alternative 3, Treatment/Closure in the Peters Mine Pit Airshaft, provides the potential benefit of reducing contaminant levels through treatment, while preventing the potential for future exposure to impacted mine water in the airshaft through permanent closure.

Based on information currently available, the EPA believes that the Preferred Alternatives for Site-Wide Groundwater and the Peters Mine Pit Airshaft meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The EPA expects the Preferred Alternatives to satisfy the following statutory requirements of CERCLA §121: (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element or explain

why the preference for treatment will not be met. However, the EPA's Preferred Alternatives may change based upon public comments received during the public comment period or if new information indicates that other alternatives better satisfy the screening criteria.

The total present worth cost, calculated using a discount rate of 7 percent, for the Site-Wide Groundwater and Peters Mine Pit Airshaft preferred alternatives is $3,413,100.

Consistent with the EPA Region 2's Clean and Green policy, the EPA will evaluate the use of sustainable technologies and practices with respect to any remedial alternatives selected for the Site.

Because these remedies will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedies are, or will be protective of human health and the environment.

COMMUNITY PARTICIPATION

The EPA provided information regarding the cleanup of the Ringwood Mines/Landfill Superfund Site to the public through public meetings, the Administrative Record file for the Site and announcements published in the Bergen Record newspaper. The EPA encourages the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted there.

The dates for the public comment period; the date, the location and time of the public meeting; and the locations of the Administrative Record files are provided on the front page of this Proposed Plan.

For further information on the EPA's preferred alternatives for the Ringwood Mines/Landfill Superfund Site:

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On the Web at:
https://epa.gov/superfund/ringwood-mines

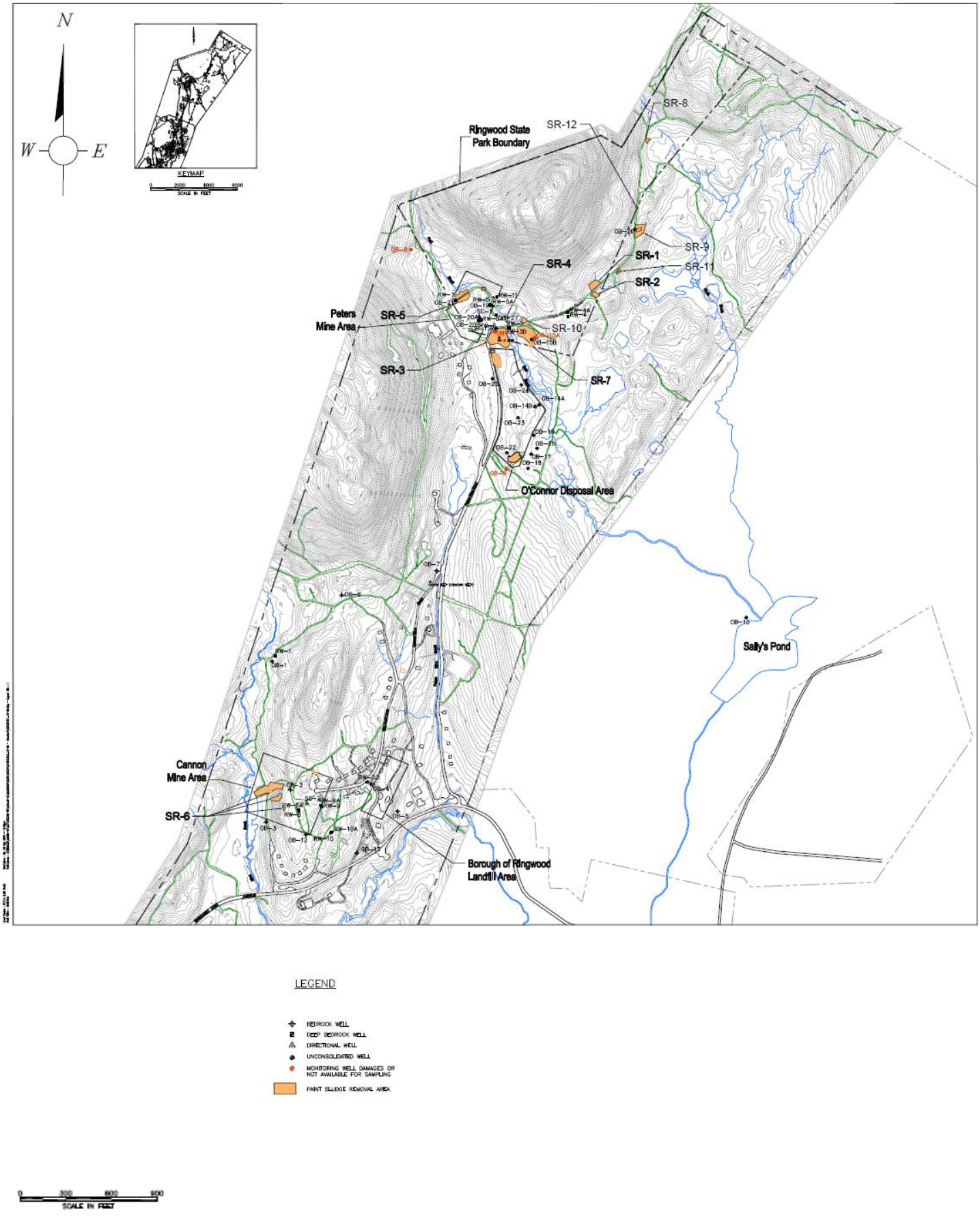


Figure 1 – Location of the Ringwood Mines/Landfill Site Areas of Concern

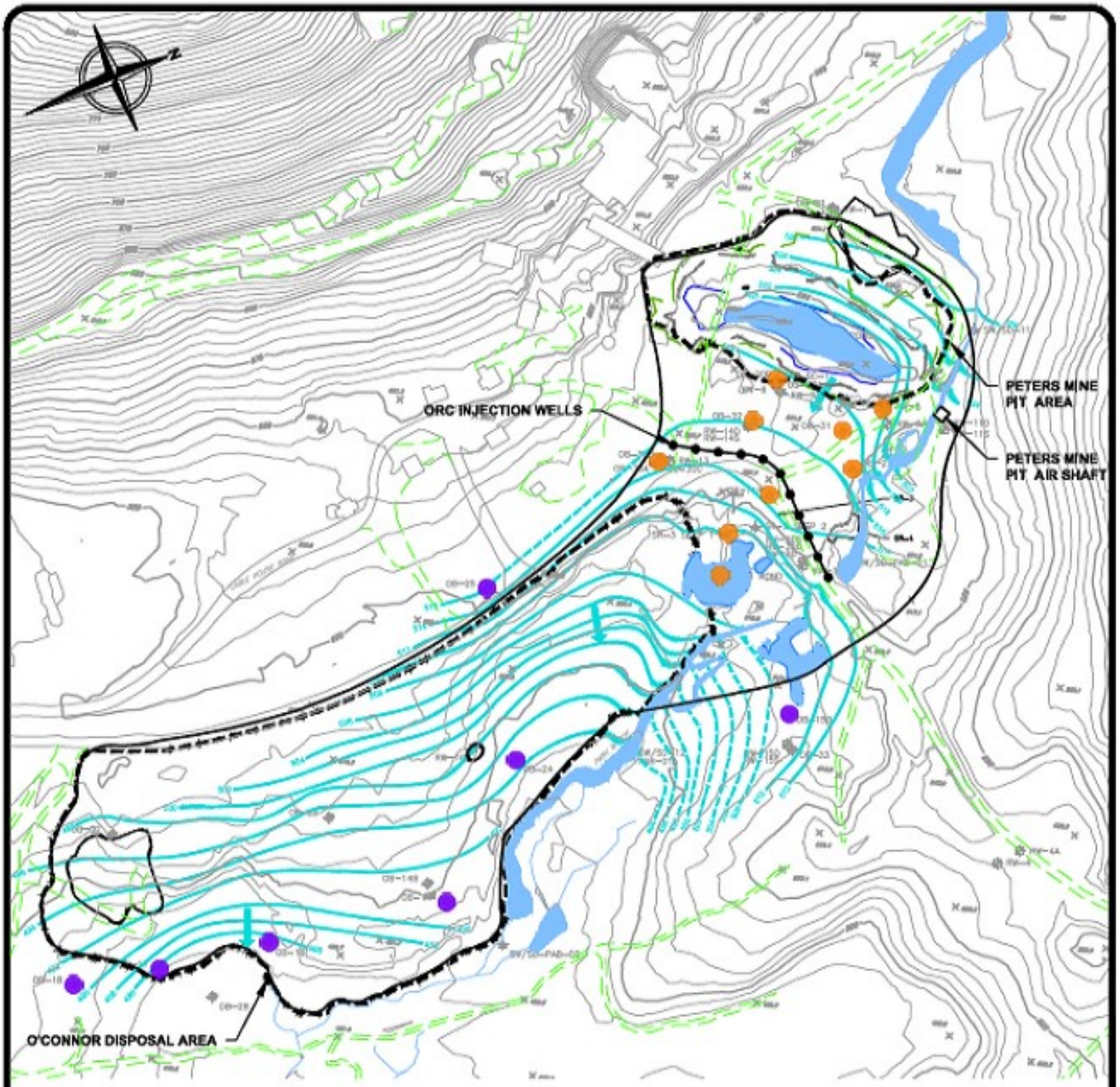
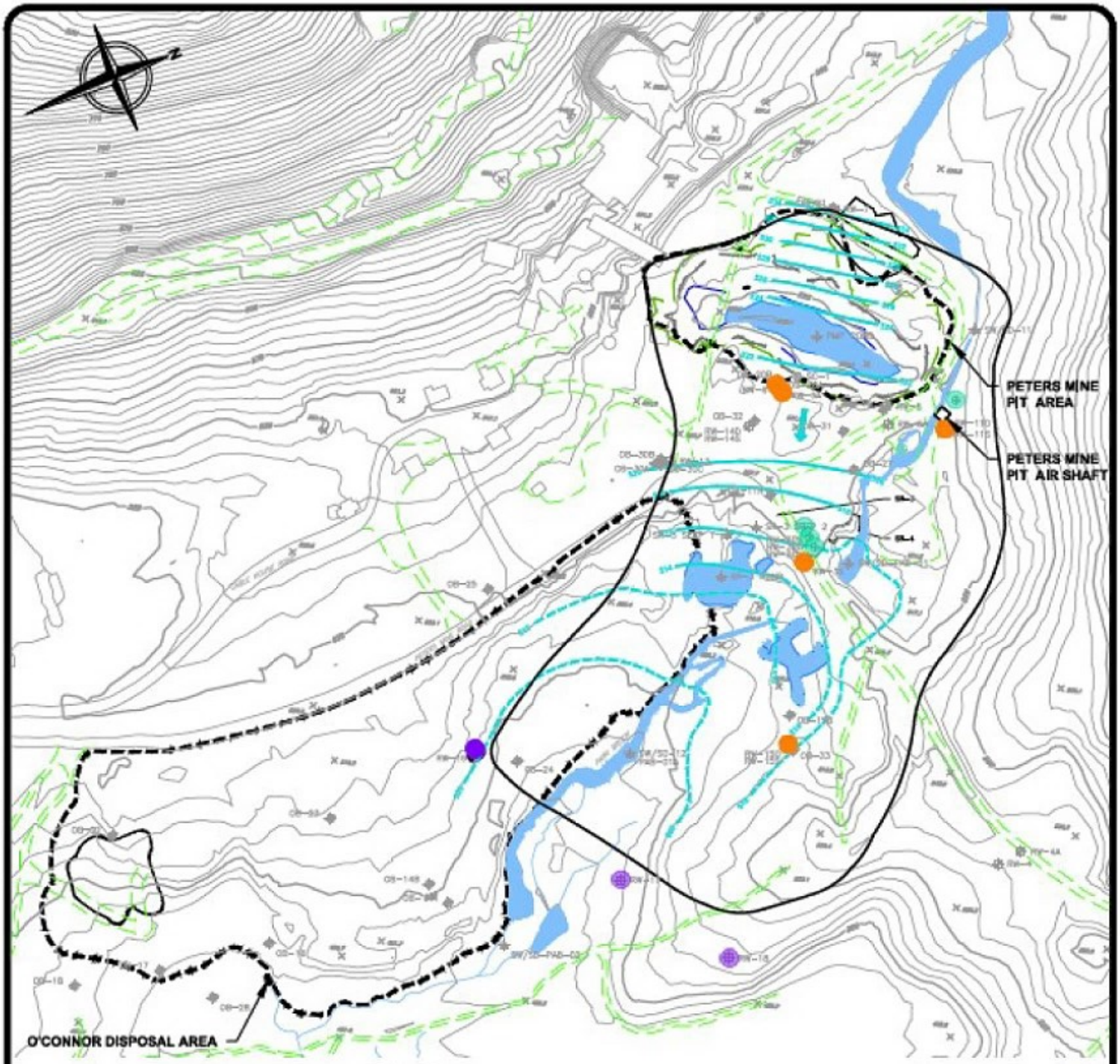


FIGURE 2

ALTERNATIVE 3 - IN-SITU TREATMENT WITH MONITORING (OVERBURDEN)



LEGEND:

OB–27 — EXISTING MNA OVERBURDEN GROUNDWATER MONITORING WELL (Preliminary)

OB–24 — EXISTING SENTINEL OVERBURDEN MONITORING WELL (Preliminary)

RW–17 — PROPOSED SENTINEL BEDROCK WELLS

PROPOSED BEDROCK WELLS FOR OXYGEN RELEASE COMPOUND

ESTIMATED OVERBURDEN GROUNDWATER CEA/WRA BOUNDARY

GROUNDWATER CONTOURS

0 250 500

SCALE IN FEET

FIGURE 3

ALTERNATIVE 3 - IN-SITU TREAMENT WITH MONITORING (BEDROCK)

ATTACHMENT B – Public Notice

Experts worry about spread of virus

China sees cases surpass SARS total

Ken Moritsugu
ASSOCIATED PRESS

A woman buys surgical masks in a shopping mall in Hong Kong on Wednesday as a new coronavirus spreads.
ANTHONY KWAN/GETTY IMAGES

BEIJING – World health officials expressed "great concern" Wednesday that a dangerous new virus is starting to spread between people outside of China, a troubling development as China and the world frantically work to contain the outbreak. For a second day, the number of infections grew dramatically.

The new virus has now infected more people in China than were sickened there during the 2002-2003 SARS outbreak. On Wednesday, the number of cases jumped to 7,711, surpassing the 5,327 people diagnosed with SARS.

The death toll, which stood at 170 Wednesday, is still well below the number who died in China from SARS, or severe acute respiratory syndrome. Scientists say there are many questions to be answered about the new virus, including just how easily it spreads and how severe it is.

In a report published Wednesday, Chinese researchers suggested that person-to-person spread among close contacts occurred as early as mid-December. Based on the first 425 confirmed cases, the researchers estimate that each infection led to 2.2 others on average. That's a bit more than ordinary flu but far less than some other respiratory diseases such as whooping cough and tuberculosis. The rate for SARS, a cousin to this new virus, was estimated to be 3.

"Considerable efforts" will be needed to control the spread if this ratio holds up elsewhere, researchers wrote in the report, published in the New England Journal of Medicine.

More than half of the cases in which symptoms began before Jan. 1 were tied to a seafood market, but only 8% of cases after that have been, researchers found. They reported the average incubation period was five days.

Meanwhile, the World Health Organization's emergencies chief said the few cases of human-to-human spread of the virus outside China – in Japan, Germany, Canada and Vietnam – were of "great concern" and were part of the reason the U.N. health agency's director-general was reconvening a committee of experts on Thursday to assess whether the outbreak should be declared a global emergency.

Dr. Michael Ryan spoke at a news conference in Geneva after returning from a trip to Beijing to meet with Chinese President Xi Jinping and other senior government leaders. He said China was taking "extraordinary measures in the face of an extraordinary challenge" posed by the outbreak.

To date, about 99% of the nearly 6,000 cases are in China. Ryan estimated the death rate of the new virus at 2%, but said the figure was very preliminary. With fluctuating numbers of cases and deaths, scientists are only able to produce a rough estimate of the fatality rate and it's likely many milder cases of the virus are being missed.

In comparison, the SARS virus killed about 10% of people who caught it. The new virus is from the coronavirus family, which includes those that can cause the common cold as well as more serious illnesses such as SARS and MERS.

Ryan noted there were several aspects of the new virus outbreak that are extremely worrying, citing the recent rapid spike in cases in China. He said that while scientists believe the outbreak was sparked by an animal virus, it's unclear if there are other factors driving the epidemic.

"Without understanding that, it's very hard to put into context the current transmission dynamics," he said.

Meanwhile, countries began evacuating their citizens from the Chinese city hardest-hit by the virus. Chartered planes carrying about 200 evacuees each arrived in Japan and the United States as other countries planned similar evacuations from the city of Wuhan, which authorities have shut down to try to contain the virus.

The number of cases in China rose by 1,498 from the previous day, a smaller increase than the 1,771 new cases reported Tuesday. Australia, Finland and Singapore were among those reporting new cases, as the number outside China topped 70. The vast majority are people who came from Wuhan.

Australia, New Zealand and Britain were among the latest countries to announce they are planning evacuations.

British health secretary Matt Hancock tweeted that "anyone who returns from Wuhan will be safely isolated for 14 days, with all necessary medical attention." The measures are a step up from those during the devastating 2014-16 Ebola outbreak, when returning travelers from West Africa were asked to monitor themselves for symptoms.

In China's Hubei province, 17 cities including Wuhan have been locked down, trapping more than 50 million people in the most far-reaching disease control measures ever imposed.

During the 2002-2003 SARS epidemic, China was slammed for hiding that outbreak for months, allowing it to spread unchecked before reporting it to the WHO. Even after inviting international experts to investigate the epidemic, SARS patients were moved from hospitals and driven around in ambulances to conceal the true extent of the virus' spread.

Although the Chinese health minister and others have suggested that the virus is spreading before people get symptoms, data to confirm that has not yet been shared widely beyond China.

"It's still unclear whether that takes place," said Malik Peiris, chair in virology at the University of Hong Kong.

"The fortunate thing about SARS, if there was anything fortunate, was that transmission did not take place before symptoms," he said. If it turns out that the new coronavirus can indeed be spread by people who don't show any symptoms, "a pandemic is a scenario that we have to consider."

Associated Press writers Maria Cheng and Jill Lawless in London; Marilynn Marchione in Milwaukee, Wisconsin; Mark Thiessen in Anchorage, Alaska; Amy Taxin in Riverside, California; and Christina Larson in Washington contributed to this report.

Americans flown from China arrive in California

John Bacon
USA TODAY

A flight carrying 201 Americans fleeing the deadly coronavirus outbreak in Wuhan landed in California on Wednesday after an emotional stopover in Alaska, as the death toll in China continued to rise.

Also Wednesday, Tedros Adhanom Ghebreyesus, director general of the World Health Organization, announced that he would reconvene the International Health Regulations Emergency Committee on Thursday to advise him on whether the outbreak constitutes a public health emergency of international concern, or PHEIC.

Last week the committee found that it was too soon to make such a declaration.

The U.S. flight arrived at the March Air Reserve Base, about 60 miles east of Los Angeles, at about 8 a.m. local time. The flight departed Anchorage early Wednesday after refueling and after screenings were completed on the 201 passengers from Wuhan – the epicenter of the virus outbreak.

All passengers had already been through two screenings in China and were monitored during the flight, said Alaska Health Department spokesman Clinton Bennett.

In Anchorage, all passengers were screened twice more and approved to continue on to California by the Centers for Disease Control and Prevention. In California, they were undergoing additional health screenings.

Anne Zink, Alaska's chief medical officer, said the passengers were excited to be back on American soil.

"For many of us directly involved, this has been a moving and uplifting experience," Zink said. "The whole plane erupted in cheers when the crew said, 'Welcome home to the United States.' "

ATTACHMENT C – Public Meeting Transcript

BOROUGH OF RINGWOOD
Ryerson Middle School
MONDAY, FEBRUARY 10, 2020
COMMENCING AT 7:05 P.M.

IN THE MATTER OF PROPOSED REMEDIAL ACTION PLAN OPERABLE UNIT 3 - GROUNDWATER RINGWOOD MINES/LANDFILL SUPERFUND SITE: RINGWOOD, NEW JERSEY PUBLIC MEETING	TRANSCRIPT OF PROCEEDINGS

P R E S E N T:

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MARK HERZBERG, NJ DEP,
COMMUNITY RELATIONS COORDINATOR

KEN PETRONE, SECTION CHIEF, NJ DEP

I N D E X

MS. SEPPI: Why don't we get started. We appreciate you being here on time. People can catch up as they walk in, but I would like to get started.

So first of all, I want to thank you for coming to our meeting this evening. I want to make some introductions from the people from EPA and DEP who are here, so I would ask them to introduce themselves.

Joe?

MR. GOWERS: Yeah, my name is Joe Gowers. And I'm actually the EPA project manager for the Ringwood Mines Landfill Superfund Site.

MS. SEPPI: Doug.

MR. GARBARINI: Hi. My name is Doug Garbarini. Welcome. I'm the branch chief for the Superfund Site.

MR. DUDA: Hi. Damian Duda, I'm also EPA. A supervisor for this site as well.

Thank you.

MS. SEPPI:

MR. PETRONE: Ken Petrone, I'm with the New Jersey DEP.

MR. HERZBERG: Mark Herzberg, Community Relations for New Jersey DEP.

MS. SEPPI: Thank you.

And don't be afraid to stop if you can't hear somebody.

When we do the actual comments at the end of the presentation, I will ask people to come up and talk into the mic so everybody can hear them and then you'll be able to get the name and the spelling at that time.

My name is Pat Seppi. I'm the community liaison for the Ringwood site.

So the reason that we're here tonight is to present EPA's preferred plan to address the groundwater and the mine water at the site.

You'll notice this meeting tonight is a little more formal than usual. Usually we have a court reporter here who will be taking down your comments and questions, and those comments and questions will eventually be part of what's called a responsiveness summary. It's attached to our meeting binding document which is called a Record of Decision. So Joe will talk more about that tonight, too.

And when that is out there, the Record of Decision and the transcript for tonight, I will e-mail everybody who is on my list and who signed up

tonight and let you know -- I'll give you a link to where you can read that.

One thing I would like to ask, and I know this is difficult, but we ask please to hold your comments and your questions until the end of the presentation, because what always happens is sometimes we'll get off track. A lot of times your question will be answered further along in the presentation, so I would appreciate you doing that. And, you know, we're here, will be as long as it takes to answer all your questions and hear your comments at the end.

So after the meeting, I have some copies up here of the proposed plan, and the overheads, but I am going to wait and then after the meeting, if anybody hasn't read the proposed plan and would like a paper copy, just come up and I will certainly share that with you.

So I think, you want to get started, Joe?

MR. GOWERS: Sure.

MS. SEPPI: You want to take the mic.

MR. GOWERS: Okay.

Yeah, as Pat indicated, we're here to discuss the proposed plan for Operable Unit 3 of the

Ringwood Mine's Landfill Site which addresses the groundwater and mine water contamination at the site. Pat's already -- we've already gone through the introductions that are noted on the slide.

And we're going to start with, sort of, an overview of the Superfund process for those who are not familiar with it.

Basically the Superfund Site first is discover and usually it's, you know, concerned citizens or local or state authorities who notify us of potential Superfund sites.

We then do a preliminary assessment utilizing available background information to evaluate potential hazards with regards to the site.

Usually that's followed by a site inspection where inspectors go to the site to collect additional information to evaluate hazards. That information is then taken and run through our hazardous ranking system to rank the potential hazards relating to the site. And the sites that score high enough are included on our national priorities list which makes them eligible for Superfund cleanup.

Once a site becomes a Superfund Site, the first step is to conduct what is known as a

remedial investigation where data is collected to evaluate and determine the nature and extent of contamination, and then that's followed by a feasibility study where alternatives to address the contamination are developed and evaluated.

Once the RI/FS is completed, we do what we're doing here tonight. We prepare and release a proposed cleanup plan to either address the site contamination or contamination at part of the site.

And, you know, we then open up a comment period as we are doing today, allow comments to be submitted for a certain period of time and then once those comments are submitted, we take them into consideration and prepare a document that is known as a Record of Decision which actually formally selects the cleanup plan for the site.

Once the Record of Decision is issued, the next phase of the project is to design that remedy and then once the remedy is designed, once we have developed the engineering and construction specs for that remedy, the remedy is then implemented in the remedial action phase.

Now, once all the cleanup plans for the site have been implemented and attained, the cleanup goals, then the site can be proposed for deletion

from the national priorities list.

Now, the area that's known as the Ringwood site has historically been used as an iron mining district starting back in the mid 1700s through the early 1900s.

In 1965, a subsidiary of the Ford Motor Company purchased the area that is now the site and based upon records, from 1967 through 1971, a contractor for the Ford Motor Company used the site for the disposal of waste originating from Ford's Mahwah, New Jersey plant.

Now, waste materials disposed of at the site appear to have been plant trash, drum waste and paint sludge. And by 1974, the Ford Motor Company had either sold off or donated basically all of the areas of the site to either the Borough of Ringwood, the State of New Jersey, Public Service Electric & Gas, and a nonprofit corporation.

In 1983, the site was first included on the national priorities list and then from 1984 through 1988, a contractor for the Ford Motor Company conducted a multi phase remedial investigation at the site and a feasibility study.

And in 1988, the Ford Motor Company entered into an agreement with EPA to conduct a

removal action at the site and they had actually removed 7,000 cubic yards of paint sludge and associated soils from the site.

Later in that year, September of 1988, EPA issued the first Record of Decision for the site which basically selected long term groundwater and surface water monitoring as the remedy for the site.

And then from 1990 through 1995, that long term monitoring plan was conducted.

The site was first deleted from the national priorities list in 1994 based upon the belief that all of the paint sludge and drums of waste had been removed from the site.

In September 2003, representatives of the Upper Ringwood Residents actually contacted EPA to let us know that they believed there was additional paint sludge still located at the site.

And in early 2004, EPA -- or actually representatives of EPA and NJ DEP went up to the site and actually physically saw pockets of paint sludge remaining at the site, which then, of course, prompted EPA to contact the Ford Motor Company and starting in December of 2004 running all the way through 2014, the contractor, contractors for the Ford Motor Company provided for removal of over

53,800 tons of paint sludge and associated soil from 16 different areas at the site, plus the Peter's Mine Pit Area and the O'Connor Disposal Area.

Now, the site was restored to the national priorities list in 2006, prompted, of course, by the discovery of, you know, a significant volume of paint sludge still remaining at the site.

In September 2005, the Ford Motor Company entered into an enforcement agreement with EPA to conduct additional remedial investigation at the site.

And in 2010, Ford entered into another enforcement agreement to conduct a feasibility study at the site for the Peter's Mine Pit, Cannon Mine Pit, O'Connor Disposal Area and for groundwater contamination.

The feasibility studies for the Peter's Mine Pit, Cannon Mine Pit and O'Connor Disposal Areas were completed and in June 2014, EPA issued the Operable Unit 2 Record of Decision for the site which selected a remedy for the Peter's Mine Pit, Cannon Mine Pit, and O'Connor Disposal Areas.

Meanwhile, from 2011 through 2014, EPA's removal program provided for the removal of lead-contaminated soil from 23 residential properties

at the site. The investigations of those properties was actually initiated by the New Jersey Department of Environmental Protection in 2010.

In October of 2014, Ford entered into yet another enforcement agreement with the EPA which provided for their performance of the Operable Unit 2 remedial design, the design for the OU-2 Remedy. And that remedial design was finished and then approved by the EPA in October of 2018.

Now, in May of 2019, a judicial consent decree was lodged with the court which, once entered, will provide for the Ford Motor Company and the Borough of Ringwood to actually implement the Operable Unit 2 remedy.

Looking at this figure, we can see some of the areas that we're speaking about at the site. You'll see the site is basically located north of Margaret King Avenue near the intersection of Peter's Mine Road.

The Peter's Mine Pit Area is located in the northern portion of the site.

The O'Connor Disposal Area just south of the Peter's Mine Pit Area.

And the Cannon Mine Pit Area is located in the southern portion of the site.

You will also note that there are four streams which drain the site, and all those streams ultimately lead to the Wanaque Reservoir.

Now, after signing the order with EPA, Ford Motor Company proceeded to perform a Groundwater Remedial Investigation, a Site-Related Groundwater Remedial Investigation for the site.

And from 2004 through 2014, there was a groundwater and mine water samples collected from up to 55 monitoring wells, as well as in the flooded Peter's Mine Pit Airshaft and the Cannon Mine Elevator Shaft.

And groundwater and mine water samples were collected twice a year from 2004 through 2009, and then they were collected annually from 2010 through 2014.

In addition, surface water samples were collected from the four brooks that drain the site, as well as the groundwater seeps that were in the Peter's Mine Pit Area.

Sediment samples were also collected from the four streams at the site, as well as in the Peter's Mine Pit Pond and at the bottom of the Peter's Mine Pit Airshaft.

Video logging was also conducted in the

flooded Peter's Mine Pit Airshaft and the Cannon Mine Elevator Shaft in order to see whether or not or try to see whether or not any sort of waste materials, paint sludge or drums had been disposed of down those shafts.

In addition, there were additional studies that were conducted to evaluate the natural attenuation of contaminants in the groundwater and mine water at the site.

The findings of that study for the O'Connor Disposal Area indicated that there were no volatile organic contaminants detected above groundwater standards, with the exception of MTBE in one well that was located upgradient of the O'Connor Disposal Area.

Now, MTBE basically was starting to be used in the U.S. in the 1980s after, of course, leaded gasoline was banned. And, therefore, we don't believe the MTBE is actually related to the Ford disposal actions.

BEHP, or bis(2-ethylhexyl)phthalate, was the only semi-volatile organic contaminant that was detected within the O'Connor Disposal Area in a sampling event in 2007.

Arsenic and lead have been detected

sporadically within the O'Connor Disposal Area above standards, but they're not detected in a well located downgradient of the O'Connor Disposal Area.

Arsenic was detected above surface water standards in the Park Brook adjacent to the O'Connor Disposal Area in 2012.

And antimony was detected above surface water standards in the Park Brook near the O'Connor Disposal Area in 2005.

For the Cannon Mine Pit Area, no volatiles were detected above groundwater quality standards, with the exception of benzene and trichloroethylene. Now, the trichloroethylene was detected only in one well during sampling events in 2008 and 2009 above groundwater quality standard, its groundwater quality standard, but then was not detected in subsequent sampling grounds.

And benzene was actually detected in two wells, one well during each sampling round, two sampling rounds. One well was detected in one sampling round and one well detected in another sampling round.

Now, BEHP, again, was detected sporadically in groundwater samples collected within the Cannon Mine Pit Area.

And arsenic and lead were detected sporadically during sampling events in the Cannon Mine Pit Area, but with no consistent spatial pattern.

For the Peter's Mine Pit Area, benzene has consistently been detected in the groundwater monitoring wells in that area above groundwater quality standards and also at the base, samples collected at the base of the Peter's Mine Pit Airshaft.

We found that the benzene levels had increased in the Peter's Mine Pit, water samples collected for the Peter's Mine Pit well and in the well immediately downgradient of the Peter's Mine Pit in September of 2014. But then when we sampled again in October 2014, the levels had returned to historic levels.

And BEHP, again, was the only semi-volatile organic contaminant that was detected sporadically above its groundwater quality standard.

And lead and arsenic were detected sporadically at concentrations which exceeded their applicable groundwater standard.

For the Peter's Mine Pit Airshaft, we found that benzene is essentially consistently

detected at the base of the airshaft and was detected at concentrations up to 33.2 micrograms per liter, which is in excess of its groundwater quality standard of one microgram per liter.

BEHP was the only semi-volatile organic detected sporadically above the groundwater standard.

Lead and arsenic, again, were also detected sporadically above their groundwater standard.

And we also found that the results of a stable isotope probe study that was conducted in -- for water in the Peter's Mine Pit Area and in the mine water at the bottom of the airshaft, that these studies indicated that microbial communities existed which were capable of degrading benzene in the groundwater in this area.

Now, subsequent to completion of that study, in 2014 we found conditions which prompted the need to do additional groundwater investigations at the site. One of those was the fact that we found, in March of 2015, that groundwater related to the Peter's Mine Pit had actually increased again above historic levels, and we also found in -- during August 2015 sampling event, we had sampled, essentially, the first time for 1,4-dioxane and had

found 1,4-dioxane at elevated levels in monitoring wells at the Peter's Mine Pit Area.

These results basically prompted a number of additional groundwater sampling events to define the extent of the contamination of the 1,4-dioxane contamination.

And additional groundwater studies were conducted in December 2015, January 2016, March of 2016, May and June of 2016, August of 2016, February of 2017 and August of 2017.

Now, the results of these sampling events indicate that the 1,4-dioxane and benzene are detected at their highest concentrations from groundwater or mine water samples collected from the bottom of the Peter's Mine Pit Airshaft.

In addition, surface water samples collected at the site indicated that 1,4-dioxane is detected above groundwater quality standards in the Park Brook upstream of the Sally's Pond.

However, when we collected surface water samples, basically, downstream of Sally's Pond, between -- from Sally's Pond to the Wanaque Reservoir, 1,4-dioxane was not detected in any of those samples.

In 2018, we also collected samples from

any of the potable wells that we could find within a mile of the site. And we identified six potable wells. They were sampled. And none of those wells had detections of 1,4-dioxane or benzene.

Now, it should be noted that the residents who live in the Upper Ringwood area actually get their drinking water from the municipal water supply. They're not drinking the groundwater at the site.

So because these results indicated that contamination in the groundwater and mine water could present a potential for an unacceptable cancer risk if the mine water or the groundwater is actually ever used as drinking water, we developed remedial action objectives which were used to develop cleanup alternatives to address that potential risk.

The three remedial action objectives were to prevent exposure to groundwater and mine water above groundwater standards, to restore the aquifer outside of the airshaft, the Peter's Mine Airshaft Area to applicable groundwater standards, and to reduce or eliminate the potential for migration of groundwater contaminants at levels above groundwater standards.

Using those remedial objectives, we

developed cleanup alternatives for both site-wide groundwater and also because of the higher levels of contaminants at the bottom of the Peter's Mine Airshaft, we developed another group of alternatives for addressing contamination within the Peter's Mine Airshaft.

For site-wide groundwater, the first alternative that was developed was the no action alternative. And as the name indicates under this alternative, there would be no corrective action implemented for site-wide groundwater.

And it should be noted that we considered this because we're required to consider this alternative in accordance with the National Contingency Plan, and that this alternative serves as a baseline for comparison to other alternatives.

The second alternative developed for site-wide groundwater was monitoring with institutional controls. And this would provide for active monitoring of groundwater quality and attenuation processes. It would involve the implementation of a long-term groundwater monitoring plan. As part of that monitoring plan, sentinel wells would be installed and monitored to basically provide advanced notice if contamination were to move

towards drinking water resources.

Surface water would also -- monitor would also be conducted to confirm that the site continued to not present a threat to the Wanaque Reservoir. And a -- what's known as a Classification Exception Area and a Well Restrictions Area would be established in order to restrict the potential future use of contaminated groundwater.

The final alternative developed for site-wide groundwater is institute treatment with monitoring in the Peter's Mine Pit and O'Connor Disposal Areas. This remedy or alternative would provide for in-situ treatment or in place treatment, likely oxidation, which would be used to promote the degradation of contaminants.

We envision that this would entail both installing a row of wells perpendicular to the direction of groundwater flow which would serve as a way to introduce an oxygen-releasing compound into the groundwater.

In addition, a long-term groundwater monitoring program which includes the installation of monitoring of sentinel wells would also occur.

Surface water monitoring would also occur, again, to confirm that the site is not

threatening the Wanaque Reservoir.

And, once again, a Classification Exception Area, Well Restriction Area would be implemented in order to restrict the, you know, future use of contaminated groundwater.

For the Peter's Mine Pit Airshaft, the first alternative that was looked at was, again, the no action alternative.

And, again, we're required to look at this alternative based upon our national contingency plan, and it provides a baseline for comparison to other alternatives, and this alternative would provide for no corrective action.

The second alternative is oxygen diffusion in the Peter's Mine Pit Airshaft. And under this alternative, basically canisters of oxygen-releasing compound would be installed at various depths within the Peter's Mine Pit Airshaft in order to promote the biodegradation or organic contaminants. A cap would be installed over the Peter's Mine Pit Airshaft with locking sleeves installed which would allow cable -- allow the canisters of the oxygen-releasing compound to be lowered down at various depths within the Peter's Mine Airshaft. Mine water would be monitored to

assess the effectiveness of this remedy.

And then the canisters of the oxygen-releasing compound would be replaced as necessary to maintain the appropriate conditions within the mine water in the airshaft.

The third alternative is treatment/closure in the Peter's Mine Pit Airshaft. And under this alternative, the first step would be to place a resin and, basically, granular activated carbon at the base of that airshaft in order to absorb contaminants.

Fast-setting grout would then be placed above that material.

And then a cement grout will be used to basically grout up the airshaft, seal up the airshaft to its surface.

And then a poured concrete slab would then serve as the final closure surface for that airshaft.

And the final alternative looked at would be Peter's Mine Pit Airshaft closure. And under this alternative, an angular stone of quick-setting grout would be placed at the base of the airshaft to basically prevent any sort of movement of materials into the adjacent mine

openings.

And then the cement grout would be used to seal up the airshaft to the surface of the airshaft.

And then a poured concrete slab would be installed over that material at the surface of the airshaft to serve as a final closure surface.

Now, our next step in the process would be to evaluate all of these alternatives against the set of nine criteria in order for us to recommend the -- what we feel is the most appropriate alternative for both the airshaft and for site-wide groundwater.

The first of these criteria is overall protection of human health and the environment. Any alternative we select have to be protective of the human health and the environment.

The next criterion is the compliance with applicable and relevant appropriate requirements, and that's basically the alternative -- determining whether the alternative would comply with the requirements of state and federal environmental regulations or laws.

The next criterion is long-term effectiveness and permanence, which evaluates whether the alternatives will remain protected over the long

term.

Followed by reduction of toxicity, mobility or volume of contaminants through treatment.

Short-term effectiveness which looks at the length of time to actually construct a remedy, and the risk to the -- to workers or the community while the remedy is being constructed.

Implementability considers the technical and administrative feasibility of implementing a particular alternative.

Cost of the alternative, which includes both estimated capital costs and the annual operation and maintenance costs, as well as the present worth cost of the remedies.

And then after we release a proposed plan and get comments back from the community, we look at basically the final two criterion or criteria, state agency acceptance and community acceptance of the alternative.

Based upon our comparison of the alternatives to those criteria, we feel for site-wide groundwater, that the most appropriate alternative would be alternative three, which is institute treatment with monitoring in the Peter's Mine Pit Area and the O'Connor Disposal Area.

And, again, this would provide for in-place treatment, likely oxidation, to promote the degradation of groundwater contaminants.

Wells would be installed basically in a barrier-style configuration, perpendicular to the direction of groundwater flow, for the purposes of putting an oxygen-releasing compound in the groundwater.

The groundwater quality would be monitored over the long-term, and would include the installation of sentinel monitoring wells.

Surface water would be monitored to ensure the site is continuing not to threaten the Wanaque Reservoir.

And a Classification Exception Area/Well Restriction Area would be established to restrict the future use of contaminated groundwater.

With this figure we can see the Peter's Mine Pit Area and the O'Connor Disposal Area and where we're currently anticipating that we may have to install those wells for putting the oxygen-releasing compound into the groundwater.

For the Peter's Mine Pit Airshaft, after evaluation against the criteria, EPA's preferred alternative would be Alternative 3,

treatment and closure in the Peter's Mine Pit Airshaft.

This would involve, again, putting granular activated carbon and a resin at the base of the airshaft, using fast-setting grout at the base of the airshaft above the resin, the carbon and/or stone.

And then grouting up the airshaft, sealing it up with a cement grout, or a concrete grout, rather.

And then there would be a concrete slab that would be placed over the grout which would serve as the final closure surface.

Now, as we indicated before, we have a public comment period that is going to -- that is currently running through March 2nd.

During that time we will be accepting comments, I could accept comments verbally here today, as well as in writing.

Comments in writing can be submitted to me at the address on this slide or at the E-mail address indicated here.

And if you have any comments or not comments, but questions with regards to the site, you can feel free to contact Pat Seppi.

And we also have a link here to a site that we maintain specific to the Ringwood Mine Site which provides a lot of additional information regarding the site, including the proposed plan and administrative records.

MS. SEPPI: Okay. Very nice.

Thank you, Joe.

Thank you.

So now, thank you all for waiting to ask your questions and we'll be here as long as it takes to answer your questions.

I just want to remind you before I turn the mic over to Dr. Edelstein, please, when you do come up, speak into the mic and let us know your name and the spelling of your name also.

Thank you. And I did promise that Dr. Edelstein, I will let him speak first because he can't stand too much longer, right?

MR. EDELSTEIN: Hi. I'm Michael Edelstein. That's E-D-E-L-S-T-E-I-N.

I'm a professor at Ramapo College of New Jersey. I head the environmental program there.

And it's a pleasure to be back in Ringwood to look at these issues.

I have a long history of looking at

Superfund issues. I began back with Love Canal, where I did research in 1979. Love Canal was the disaster that created the Superfund program.

And I have spent more than 40 years as an environmental psychologist working on the basic question of how does environmental contamination affect people in the communities where it occurs. How does it affect them in their emotional life, their way of living and daily lives. And understanding their health, their homes, their environment, their sense of control over the world, their ability to trust government and others.

And I have pursued issues of environmental justice since before the term was used.

I am currently preparing a third edition of my book, Contaminated Communities, which has been called a classic in this field.

And over these years I have noticed in Superfund processes a tendency to often talk about a lot of technical details, but to miss some of the big questions. Particularly, the questions that the community is most interested in.

One of the concepts that made a profound impression on me over the years is that of the concept of habitability, which I first confronted

when New York State did what was called the Habitability Study of Love Canal.

And habitability is really about this question: When is an environment just too contaminated, too downgraded, too dangerous to permit human habitation in a continuing way.

In my opinion, this question does not often get asked, even when there is an overwhelming basis for considering it.

Now, I've been studying the Upper Ringwood site for over 15 years. In 2006, and again in 2014, I involved my students and my capstone environmental assessment class in projects here. And once again, I have my capstone students working here and some of them are actually over there in row two.

And I have given testimony previously on the impacts that we discovered which have to do with, in the last project, with the environmental justice issues associated with this project.

Habitability is an issue relevant to the issues of the Superfund cleanup. It's not clear whether it fits into Operational Unit 1, Operational Unit 2 or Operational Unit 3. I think there is a fluid boundary between those in terms of big questions.

When we study environmental justice impacts and the process for OU-2, Operational Unit 2, we discovered that, in fact, EPA never really addressed them. And their reason for addressing them was a narrow basis of resting environmental justice, holding on to health impacts, and because studies hadn't been completed about the health impacts, they skipped talking about environmental justice.

And, of course, it's now six years later, those studies are not necessarily in place and environmental justice has not been raised again.

But environmental justice is one way that we can get to the issue of habitability.

How then does habitability come into play with regard to Upper Ringwood and the Ford contamination?

I have a series of propositions. The first, in the community constructed atop a maze of abandoned mine shafts where sink holes actively occur has a habitability issue even before one addresses the issue of contamination.

Second, when those mine shafts are then filled with toxic contaminants, not to mention additional contaminants of the surface, they have an additional habitability issue. And that issue has

been borne out in the Turtle Clan by health issues and unfortunate deaths.

Third, my colleague Chuck Stead, who's not here tonight, witnessed about a week ago an issue with Cannon Mine -- maybe it was more than a week ago, but an issue with the Cannon Mine where construction was ongoing and they hit, apparently, a mine shaft branch that they didn't know was underneath the Cannon Mine and had a major incident there. I don't know if you guys even know about that.

But that calls into question whether the planned remediation under the Operational Unit 2 of the O'Connor Landfill site, in fact, workable.

Fourth, when the best remedial alternatives that are advanced leave the bulk of the contaminants in-situ, on site, continuing habitation atop and nearby Peters and Cannon Mine are not acceptable.

Fifth, the RI/FS, the Remedial Investigation and Feasibility Studies, that were conducted should accordingly have considered a relocation strategy for the Ramapo Turtle Clan and other residents. It is deficient in not doing so. And this assessment must now be made before the

Superfund process can be considered closed.

My environmental assessment class, in 2014, examined this issue, concluding that relocation was warranted. And my current class is assessing a plan for that relocation.

Six, if the population were relocated, it would continue to be a significant concern that an underground reservoir of contaminants exists upgrade of the Wanaque Reservoir.

Tests of these contaminants presented in the RI/FS cannot be considered accurate because of the difficulty just in sampling under that environment, and the question of whether or not those contaminants are consistent over time.

Seventh, climate change, which, according to the National Climate Assessment for the northeast United States already evident shows massive additional rainfall, and, therefore, flooding in our region predicted to worsen over time. And this makes the presence of a reservoir a future hazard of significantly increasing concern for people and the environment and certainly for the North Jersey water system. The simple cap of the mine entrances does not fully address this issue.

Eighth, if the population was relocated

from Upper Ringwood, one of the major impediments, if not the major impediment, to a full remediation of the mines would be removed. Consideration of a full removal of all dumped materials from the site could then become a remedial choice before a Superfund process is closed.

Ninth, the extreme proximity of trails in the Ringwood State Park to the Superfund Site, they actually overlap the Superfund Site, further augers for a comprehensive and full cleanup beyond that proposed in order to protect park users and the integrity of these parklands.

And, tenth, in sum, neither the preferred alternative nor any of the considered alternatives addresses the core issue of habitability. What happens to the people who are now in this community and have been there for something like 60 years.

In addition to monitoring protection of water resources and the safety of recreationalists, this issue of habitability is primary.

With my students, I am currently working on a plan for relocation of the Turtle Clan members that would attempt to keep the community together within their traditional lands by restoring

their access to a safe environment, environmental surround, conducive to foraging and gathering and fishing and important for cultural practices and subsistence. This relocation is intended to give the community a chance to thrive and to look forward to a healthy and positive future, something cruelly denied for 60 years by the action of the potentially responsible parties and which, frankly, the Superfund plan would leave in perpetuity.

So, in conclusion, the issue of habitability must be fully assessed before our remedial plan can be approved, including specifically the fair and just relocation of all Upper Ringwood residents as a requirement of the Superfund cleanup. The remedial alternatives put forth are fatally deficient for this reason.

Thank you very much.

(Applause.)

MS. SEPPI: Yes. Now, anybody have questions or we can bring the mic to you if you'd like.

MR. TITTEL: Sure, I will come up.

MS. SEPPI: Okay. Please don't forget your name and the spelling it.

MR. TITTEL: Sure. I'm always glad to

follow my good friend and long-time colleague.

THE COURT REPORTER: Sir, you need to speak up please.

MR. TITTEL: I'm sorry. I was just saying it's always good to follow my good friend and long-time colleague.

I'm Jeff Tittel, Director of the New Jersey Sierra Club. Also 167 Snake Den Road, Ringwood. My family has been in Ringwood since 1922.

I'm a third-generation property owner and one time chair in the Ringwood Environmental Commission. I was on the Planning Board. My, you know, this town and I have a long connection. I still pay taxes here. And I'm here because --

THE COURT REPORTER: You need to raise the mic up. I can't hear you.

MR. TITTEL: I'm sorry.

I'm here because I've been involved in this site since I walked back there with Al Sheehan 40 years ago during the drought of '81 when the State of New Jersey was thinking that they needed extra backup water supply because the State of New Jersey was running out of water.

In fact, if you went to the Wanaque Reservoir and you looked at the northern half of

Stonetown you can see animal walking across it --

THE COURT REPORTER: I'm sorry, can't hear you. You could see what.

MR. TITTEL: It was that dried.

And so when they went up there to take a look, they saw, hey, a gray and blue sheen on the water. And that started the investigation until it ended up on the Superfund Site.

The first Record of Decision back in the late '80s called for cleaning up the surface and to monitor what's down in the mines.

The problem with that was all that stuff in the mines is still there today. The problem with it was that was on the surface, they were not finding, because we used to go back there and, you know, I remember when we were dealing with the radio tower, we were walking back there with finding a block of sludge, you know, the size of a Buick.

And we went and brought EPA up here in 1998. I got North Jersey Water Supply Commission to test the groundwater. And there were VOCs coming out, you could smell it. But they said, oh, no, it's naturally -- that orange stuff that you're seeing, oh, that's just from iron. It wasn't.

And then in 2005, we get a call from

Jan Barry who I brought up here back in '98 to look at the stuff and started investigating and investigating. And I wanna mention -- and you can check your records in '92, I was the only person who questioned removing it from the Superfund Site, and when we started looking up here to find more sludge, it was a very easy thing to do. I just looked at the map that EPA gave me of all the spots that were clean. So we went to them and we just kept finding more sludge.

And, you know, Lisa Jackson, then was -- a few years later became the DEP commissioner and Alan Steinberg who was the original administrator who's a good friend of mine to this day, didn't put it back on the Superfund Site.

And I have been through this so many times, so, you know, '81, '92, '96, '98, 2004, '5, and we keep going, you know, I was here when, you know, Nightline came up and Robert Kennedy. And at the end of the day, we still have a toxic mess.

And the reason we call it a Record of Decision or a ROD is because at the end of the day, the people in Upper Ringwood kept getting the shaft. That's what keeps going on.

You know, I have been involved in

environmental care for a very long time and I think about, you know, spending 25 years to save Sterling Forest and to save the Muscarelli tract, and to -- to save so many different parcels here. And yet at the end of the day, we brought all this land to protect the reservoir and we still have a Superfund Site leaking into the reservoir. You know, I've worked tirelessly to help pass the Highlands Act to protect the water supply and the Highlands for future generations and we still have the Superfund Site leaking into our water system.

Why I am here is because this cleanup plan is not a cleanup plan. It's what we call a pave and wave. You cover it over and you wave goodbye. Natural attenuation means basically EPA, to the people of Upper Ringwood, we don't care what happens to you.

A pump-and-treat system for mine shafts, mine shafts that have billions of gallons of water, we don't even know where all that water comes from, because there's so many different layers. The main shaft goes down over 2500 feet. There are laterals every 100 feet going down. You're pulling water from who knows where?

So your sphere of influence is what is

it? We know that there's sludge at the first level and the second level going down the shaft. They should have been cleaned up a long time ago. We -- you know we know that this is not going to work, plain and simple. This is just another Band-Aid on a bullet hole. We have to deal with the real issue.

And, you know, quite frankly what surprises me or, kind of, concerns me is that the State of New Jersey's interest, part of the Superfund Site is on state land, is on Green Acres land, the stuff coming out of the mines is going into Mill Brook and Sally's Pond, which are Category 1 waters. State's surface water quality standards, you know, measurable is -- no measurable or calculable change in water quality.

Then why isn't the state suing to protect state parkland and their own waters? And these are Highlands waters. You know, the governor signed Executive Order 23 on environmental justice the second or third week in office. If there is any place in the United States that cries out about environmental racism it's here, and the need for environmental justice.

You know, as someone who's been in this town a long time, you know, just give you a 30-second

view. The radio towers, the power plant, the chemical plant, recycling center, power lines, gas lines, all targeted at the community. If you took a map of Ringwood, and it's, you know, 28 square miles, approximately, every bad thing that this town ever got, they put into one neighborhood and one community.

And what are the consequences of it? The consequences that I've been coming to these meetings for a long time. Usually these meetings are a lot more crowded. Is it because people are frustrated and they gave up? Or are you just outliving -- outlasting them because so many people that I know of in the Upper Ringwood community have died over the years from all kinds of diseases.

If you're not going to clean it up, move everybody the hell out. It doesn't make any sense. You know, when I -- I look at this whole plan that you have, charcoal filter, very nice. You know, it didn't work for Viceroy cigarettes, it didn't stop people from getting cancer.

You're going to put a little grout here. Now, you need to grout a mountain because you have seeps and springs throughout that area. And sink holes that pop all over the place.

How do you contain -- because the purpose of a cap is to basically put a shroud on an area, prevent the water from going into the groundwater so the groundwater doesn't move and the plume doesn't move.

But you don't know where the water is coming from you've got mine shafts that go all over the place. You've got -- you've got fissures in the rock all throughout the mountain.

So how do you control it? You can't. It really just becomes this cynical word natural attenuation, which means you just let it dissipate and dissipate until it gets to a safe level.

But your level is not safe. I mean, one of the issues that I want to raise is that in New Jersey, our drinking water standards are based on a one in a million cancer risk. EPA's are not. They're one in 10,000 and one in 100,000.

So based on that alone, and based on your own studies and what you test for, it's based on a weaker standard than the State of New Jersey's.

And that's of concern because it should be based on New Jersey's one in a million cancer standard where we have set MCLs for benzene and everything else.

And in New Jersey, when we set that MCL and that groundwater standard, that is the cleanup level. So if it's one in a million for benzene, you have to clean it up to one in a million for benzene and you're not doing that here.

And the point that I really want to kind of end with is that ten years ago the State of New Jersey put out an advisory saying do not eat the squirrels in Ringwood because of the lead from the Superfund Site. But it's okay for the people to have that lead contamination and the dioxane and everything else.

You know, as I said before, we spent billions of dollars preserving lands in the Highlands and building these reservoirs that would cost tens of millions of dollars to replace today.

But in all of that, we haven't protected the water coming in. And that's what today should really be about, that this is about not only the community in Upper Ringwood and the Ramapo peoples, but also about the three million people who get some of their drinking water out of the Highlands and out of this reservoir.

And Budweiser, Goya Beans, Manischewitz Matzo, all get water out of the Wanaque Reservoir.

It is part of our economy. It's part of the life blood of New Jersey.

But we're squeezing the life blood out of the people in Upper Ringwood, out of the Ramapos, because we're allowing them to live in this toxic nightmare and this toxic nightmare will not end.

This is the 50th anniversary of the EPA. And this is one of the worst decisions the EPA has ever made in 50 years. And you still have a chance to correct it. Either do a full cleanup or buy the community out and move them.

Thank you.

(Applause.)

MS. SEPPI: Thank you.

Anybody else want to comment? Do you want to come up here, Chief?

CHIEF MANN: My name is Chief Mann. Vincent Mann, V-I-N-C-E-N-T, M-A-N-N.

First of all, as usual, because I am not an expert, the only thing that I can do is to speak about the things that I believe I know and speak from my heart, because if you look behind you, a couple of years ago there was actually 200 people here in this room and as of right now there's about five Ramapos.

Not all of them are not here because they're dead, but it's because they lost faith in the system and, unfortunately, some individuals.

So I'm just going to read this and I am going to leave it with you so you can take it. There are some punches in here, but so be it.

Good evening. My name is Vincent Mann. I am the chief of the Ramapo Lunaape United Nation's Turtle Clan, which is situated within the boundaries of the Ringwood Mines Superfund Site as designated by the Federal Department of the Environmental Protection Agency Region 2.

It's my honor to be afforded the opportunity to speak and to have my words entered into the record as it pertains to this federal Superfund Site and on behalf of those humans that continue to reside there.

As we are all aware of the forward progression to bring some sort of closure to this site, I am constantly reminded of the severity of the impacts not only upon our lands, which we need to continue our cultural ways, but also by the loss of land. The loss of quality of life and a not so clear future for our peoples and our cultural ways.

The Turtle Clan, which has quite

frequently been labeled as the people of Upper Ringwood, are a Native American community, which for the last 56 years has been marginalized and misled by all who have participated in this lifelong legacy of trying to defend ourselves and our lands which we are not only of, but live upon.

We lived here not only when the mines came, not for the last 300 years, but we lived upon these very lands for the last 12,000 years. Our community is an environmental justice community from that long ago, when they came across the mountain and decided to write down about these hovels that were there and about the natives who were living there. That's us. We weren't teleporting.

Years ago while mediation of the O'Connor Landfill Area -- landfill area was taking place, there was an immediate halt put in place that the material that was being sent to Michigan was too toxic to be buried anywhere in the continental United States or its territories.

The first issue here is that this information was withheld from our people for at least a month, but for the workers they were immediately removed and to my knowledge no further excavation has taken place, leaving the question how does the plan

moving forward address this?

Then a few years ago when 1,4-dioxane was found, we once again were not told until they reported two months after the supposed findings, yet months later at a meeting held by the EPA and led by Mr. Joe Gowers, we learned that the EPA was aware of the presence of 1,4-dioxane nearly 12 months prior to them holding this information.

How and who are we supposed to go to and trust for the truth? Where is it that we can actually go to address our concerns? Who is it that we can, once again, find faith in to do what's right, to do what's simply amounts to telling the truth and holding those responsible literally accountable for creating a living hell for those who live within the boundaries of this Superfund Site and all the others who number in the thousands who lost loved ones as well.

We frequently are called stakeholders in this process, but truthfully the actual stakeholders, the ones who get to make the decision for us, are all actually the ones who permitted this to happen to us in the first place.

It's deplorable to me to allow this to happen over and over when we have a PRP who accepts

monies in the millions of dollars because they created a falsehood by claiming Ford dumped on their land. The truth is that Ford's land -- Ford dumped on their own land that they owned. And the town of Ringwood actually allowed that to happen.

This, just on the face, appears to me to be a slight of hand, as the town acquired the land afterwards. Not only that, how can the town force a company such as Ford to pay them millions of dollars for natural resource damages and on top of that, keep it hidden from the residents of Ringwood for years? And yet they are considered the stakeholder. They aren't the stakeholder. They are, by their actions, apparently above the law.

The picture painted before you isn't a pretty one. It's actually quite chilling. Four to six million people are real stakeholders. Four to six million people have yet to hear -- have yet to have their voices heard. Those folks that normally go about their day to day not thinking twice about what's happening in the watershed that provides them with life and the fact that very thing could potentially be a threat to their own existence. How is it that their voices aren't heard?

There needs to be in this same meeting

held in the cities that are provided groundwater -- ir provided water from the Wanaque Reservoir, Newark, Paterson, Jersey City, Passaic, Franklin Lakes; all of them, because without them, you only have a handful of human beings standing up to fight to protect their water.

If four million people, four million humans, decide that what is planned here or what the future plans shall be is not in their best interest, then what would you allow this undermined plans -- would you allow these undermined plans to stay as the option for addressed these? My uneducated guess is absolutely not.

What are the levels of benzene, PFAS, PFOS in the groundwaters or in the surface water? Given your plans here, I don't think that these have truly been addressed, as I have seen reports with very high numbers and my guess is that these are the types of things that are not wanted to be seen.

The EPA standard for benzene is what?

MR. GOWERS: One part per billion.

CHIEF MANN: One part per billion.

And is it not true that the EPA strives to make it zero in lakes and rivers and the like?

MR. GOWERS: That's correct.

CHIEF MANN: That's correct.

I am working with a university that has done their own work on behalf of the Ramapo Turtle Clan because we don't have any experts to stand up for us. We don't have the money that Ford has or the insurance money that the town has or the efforts of money and people that the federal government have.

So in those findings so far, and I am not an educated person with that, but have you guys even tested for PFAS or PFOSs in the groundwater or in the surface water.

MS. SEPPI: Do you want to finish commenting or do you want Joe to answer that now?

CHIEF MANN: He can answer that now.

MS. SEPPI: Okay.

MR. GOWERS: Okay. At this --

MS. SEPPI: Do you want the mic? Okay.

MR. GOWERS: You know, at this point the PFOS or the PFAS category of contaminants, they're emerging compounds. We have not specifically sampled for those up here.

You did mention benzene, of course, we have sampled for benzene.

But we have not -- we have basically checked data of that in terms of the Wanaque

Reservoir had a sample for that in the past as part of the whole process of trying to deal with these emerging compounds and determine whether they are something of concern that needs to be sampled, and the information we have is that it was undetected in the Wanaque Reservoir.

CHIEF MANN: Thank you, Joe.

It would be undetected in the Wanaque Reservoir because we believe that the solution to - pollution is dilution. But there's a lot of ground between the Wanaque Reservoir and the community in Ringwood to include Sally's Pond and Park Brook and all the natural environment that is there.

It would seem to me that it would be warranted, once we're able to share that -- those reports with you, that that is something that you guys are actually checking.

As far as the levels of benzene that were reported last year I have to honestly tell you, they were literally off the chart. Tested in eight different areas on the outside of the Superfund Site and on the inside, to include the Cannon Mines, to include the St. Regis or whichever that's called there.

Also, you know, by Sally's Pond, above

Sally's Pond, these are all areas where these things have been found in the surface water, and the State of New Jersey does have levels of action and I believe, if I'm not mistaken, that the federal government is supposed to follow those.

Is that true?

MR. PETRONE: We have a --

THE COURT REPORTER: I'm sorry. Please identify yourself.

MR. PETRONE: Ken Petrone, New Jersey DEP.

THE COURT REPORTER: Thank you.

MR. PETRONE: We do have one standard for PFNA. One of the constituents of the detox family, and we're working on some other standards.

CHIEF MANN: Thank you.

So, I mean, for me, you know, this is a 56-year-old problem that nothing's changed. You, in fact, told me that the only thing that you and your team and what we've been going through all these years is strictly about remediation and all of those things.

And we get -- I've had to have the park and the EPA be able to come and address things and issues that we have similar that you do for

remediation aspect of it. So I'm hoping that that actually happens in the future.

To close here, I want to acknowledge that I am not an expert in anything other than life and truth. And this whole thing has been nothing close to either of those teachings as far as I can see, not ever.

At one time we did have an expert who worked for us, his name was Richard Chapin, but he was given an ultimatum to stop being our expert or he would no longer be employed where he worked because of one of their clients. So now we rely on state colleges and universities to help us tell and show the truths.

It's no small challenge to bring any of this to closure, but be assured that we will always continue to be whom we are, whom the creator chooses us to be, and for that one thing we are beyond grateful.

My final words here are to address the human remains of our lost relative that have never been recovered from the Cannon Mine. We yet have had to be approached by anyone in this regard which, once again, is an all out blatant disregard to who we are as human beings and even in my opinion, who we are as

recognized Native Americans within this state.

This needs to be addressed, and we will once -- we will not once again allow this to be ye another thing that gets swept under the carpet.

And for these people from my heart on that, you know, is that this is something that has been -- it's not new. This is something that people have known forever.

But yet there has been no effort by the EPA, the federal government or anybody to assist us in either recovering those remains or how are you guys going to go on to that, what we would consider safe and hallow ground, and perform either a ceremony or a closing or any of those things? None of those things have ever been addressed.

You know, we talked about -- earlier you talked about the airshaft. I am sure -- I am not sure if you were involved, but when the Chian Drive (phonetic) there collapsed and how many days and how much concrete did they pour down in there and they kept going and going and going and going and it showed up miles away, right?

So we're talking about dumping this stuff into the airshaft while not really -- I mean, I did see in the report, it said something about

actually trying to cap that mine back off again.

But what happens when you're just continuously sitting there and dumping that stuff in there and it just doesn't stop.

What happens when we all of the sudden close that airshaft up and create a powder keg because that mine starts filling up with all that other groundwater and starts pushing out all other places, maybe closer to the Wanaque Reservoir. Maybe it blows the caps off of your -- your wells that you guys have.

You know, this isn't just about the Turtle Clan in Ringwood, it's not just about the residents in Ringwood, but it is also about those other towns. They have as much of a right to have you guys sit in front of them to explain to them what you plan on doing as we do. They're the one who are the end of the faucet. They're the ones who turn the spigot on and get the water from.

You know, I mean, it would -- it appears to me that four million people or three million people or even a million people, if 500,000 people said to you what you're doing, what this plan is, is not something we are willing to accept, then it probably would stop. It probably would revert.

And they have as much right to the air and to this information that you guys give that we do, if not more so.

Thank you.

(Applause.)

MS. SEPPI: Thank you.

Anyone else have another comment? Robin, you want to come up.

MS. CANETTI: Thank you.

Robin Canetti. R-O-B-I-N, C-A-N-E-T-T-I. I am a resident of 310 Lakeview Avenue.

Questions, I am wondering if we could get -- and wait to the end, but I am wondering if you could give us some information about what happened at the Cannon Mine that Chuck Stead witnessed that maybe some of us should know, the professor earlier said something during construction --

MR. GOWERS: I mean, it sounds -- I can speak louder.

I mean it sounds to me that what he was talking about, I know that back in something around 2005 to 2007 timeframe, that there was the issue where there were borings, I believe -- hole that opened up between two of the residential properties

up there at the end of Van Dunk Lane near the Cannon Mine Pit. And --

MS. CANETTI: I thought he said last week.

MALE AUDIENCE MEMBER: He said something about a week ago.

MR. GOWERS: Oh.

MS. CANETTI: He said something happened last week.

MR. GOWERS: Oh, last week?

MALE AUDIENCE MEMBER: A week or so ago.

MR. GOWERS: I don't know anything that happened at Cannon Mine last week which --

MS. SEPPI: Because we haven't been out there.

MR. GOWERS: Yeah, we haven't been out there working, I mean, in terms of remediating because we're -- as you know, we're working on the enforcement agreement for the OU-2 Remedy and we're developing the plan for the OU-3 Remedy.

MS. CANETTI: So maybe from there --

MR. GOWERS: I mean...

MS. CANETTI: -- from Chuck to here to there to here, it lost something in translation.

MR. GOWERS: Yeah. Because I mean, I do know that on that one site, I think you were aware of the three -- actually there were two residential properties where there were some concerns, there were mine struck -- mine tunnels that were about 10 feet below the properties and ultimately the borough relocated those residents. Not because of the contamination, but because of the physical hazard of having, you know, voids beneath your property.

MS. CANETTI: So to the best of your knowledge, there's nothing new that happened --

MR. GOWERS: Nothing that I'm aware of.

MS. CANETTI: -- last week that we should know about? Okay.

I didn't see in any of the slides -- and are the slides going to be posted on the website?

MS. SEPPI: They are.

MS. CANETTI: Oh, it was.

And I didn't notice the words pump and treat. Are we not doing pump and treat or is it couched in some other language and I just haven't made the connection.

MR. GOWERS: No, we -- we are not doing pump and treat here. It was something, though, that was evaluated in the early process of developing the

alternatives.

There were specific reasons why we felt that pump and treat would not be appropriate here. One of the areas where you would want to target treatment would be, of course, on the Peter's Mine Airshaft.

When you do a pump-and-treat system, you put a well into the aquifer and, basically, where you have a bedrock aquifer you have essentially small fractures within the rock, the earth, the water, little bit of water flows. You pump the well at a relatively slow rate and you can basically pull that water towards, and you sort of control the migration of that water.

In this case we're dealing with something totally different. We're dealing with actually large open mine tunnels as we've indicated down 17 levels basically with a large volume of water. So, essentially, if we were to pump in those wells, you wouldn't be, sort of, containing in that fashion. What we would be doing is pumping dry these large mine tunnels down to 230 feet and basically drying out the mine 230 feet having to deal with a huge volume of water.

So, you know, our -- we looked at that

as no being a feasible alternative, and, therefore, we preferred something to be done in-situ, in place. And that is why the alternative we're proposing is actually to use some of the treatment technologies to pump the water out, basically use certain treatment technologies you remove the contaminants, and then you put the water back in.

In this case, we're looking at an in-situ treatment where we're using some of those technologies to actually treat the contaminants in place without having to remove the contaminated water.

MS. CANETTI: All right.

When Dr. Alexander Gates, who is Rutgers geologist, came and spoke at the CAG, which, for those of you who don't know what a CAG is, there's a community advisory group in Ringwood that's been dealing with this for some time.

And -- and his position was that this whole area is fractured bedrock and what's under the ground is a mystery to all of us. And I think Jeff Tittel sort of -- I won't say, alluded to that, he said that.

We have no idea what's underneath. And we're going to put the cap on. And he also pointed

out that we sit on one of the larger faults in the northeast. And that every time we have the earthquakes, the paths in the bedrock shift and we have no idea where any of that goes.

So, as you know, the majority of the CAG, with one exception, always wanted pump and treat. We wanted a much fuller cleanup.

Jeff Tittel had said that Budweiser and some other companies get their water from the Wanaque Reservoir. I actually heard -- and, again, I'm not sure if this is factually correct or not, but I heard Budweiser does no longer get their water from there.

And if that's true, I am guessing they know -- that they're concerned about the quality of the water for them to have moved from the Reservoir to someplace else.

I eat matzo, so I'm a little disturbed to know that Manischewitz makes their matzo from that water.

And, you know, a lot of this whole talk about the cleanup was always the fear of our taxes going up. Ford's net worth in 2018 was an annual revenue of 106.3 billion and a net income of 3.7 billion, billion. That's billion with a B. This is going to cost them, I think, it was 3-and-a-half

million.

It's just ridiculous that anyone has ever worried about what any of this was going to cost when Ford polluted. Ford should clean it. It's just not sufficient for the future for people that -- I'm old. I'm not going to be here long enough for any of this to matter to me.

But for the children and the children's children and the people that live in this community and the people that live in surrounding communities, to leave the mystery under the ground when Ford could do a much better job of cleaning it up is really just a crime. And I am disappointed that this is where we're ending up.

Thank you.

(Applause.)

MS. SEPPI: Thank you, Robin.

MR. SANDO: Thank you.

MS. SEPPI: Don't forget your name and spell it, please.

MR. SANDO: Okay. Peter Sando, S-A-N-D-O. Ringwood resident.

We have been dealing with this for a long time. I have witnessed -- I have been to a lot of these meetings and I just wanted to comment that

the public comment period, Joe, I have given you this before, my opinion about the public comments as to the history of the O'Connor decision. If we look at that, we have public comments. We had -- the community had petitioned to -- to put the decision on the referendum whether to excavate or cap.

And when it came down to it, the borough attorneys, borough manager and Ford's attorneys went to court and blocked it on a technicality. So they were afraid that the citizens might have made a different decision.

The public comments, I think it's like a waste of time. You know, we have until March 2nd to comment, and I don't think they're really going to be considered at all.

What's going to be considered is the cost, and let's face it, in the -- and, ultimately, Ford and the borough, the council majority, the council manager will sit down, make a decision. EPA will rubber stamp it as they did with the O'Connor, and -- and that will be that.

And, you know, we've been fighting this for a long time. You know, when the council majority shifted we got money from the state to fix Roger's sink holes, and then council majority shifted again.

The money never did fix the sink holes, it got washed into whatever. And, you know, the sink holes are still there and he has a big hole in his yard, as -- as I believe.

Is that correct?

MR. GOWERS: I believe there is still some hole. I know they did try to fill it in.

MR. SANDO: Yeah, there's a fence around it, I think. Okay.

So -- so, I mean, and that's why there's, you know, not a lot of people, folks from the Upper Ringwood community that are here tonight. I thank you for coming.

But I -- I understand some very important members of the community are not here. And I can understand why, because after a while, the fight is just futile, and it's really sad.

Thank you.

(Applause.)

MS. SEPPI: Thank you.

MR. MICHELIN: Steve Michelin, M-I-C-H-E-L-I-N. I live in Ringwood.

I do have one question. I understand the Record of Decision for good or ill, whether you are for or against it, it's going to happen. I have

a question about going forward.

There's a press release that I got from the EPA website from January 30th and it says:

"After the remedy has been fully implemented, conduct a review of the cleanup every five years."

Now, there is a lot of skepticism. I don't know if you're that confident in the solution that you need not look at it for five years. Is that something that you might want to consider checking on more often?

MS. SEPPI: Would you like it to be answered now.

MR. MICHELIN: That's okay.

MS. SEPPI: About the five-year review.

MR. GOWERS: Sure.

I mean, essentially it's our policy to basically -- whenever we leave or have contaminants at a site which are above levels which provide for unrestricted use or unlimited exposure, basically that we come back as long as those contaminants are there at those levels and review every five years.

I mean, that's policy we do. That's something we do for every Superfund Site. So that is to ensure that the remedy that we select remains

protective.

MR. PETRONE: But we'll be monitoring it more often.

MS. SEPPI: Yeah. I mean, that's -- I mean that's what we indicated. We're going to be monitoring it more frequently. I mean, we're talking about developing, under these alternatives, the long-term groundwater monitoring plan, so the exact specifics of that plan are actually being worked out in the remedial design phase, but it would be more frequently than every five years.

MR. MICHELIN: Okay.

MS. SEPPI: Thank you.

MR. CAPUZZI: Good evening. My name's Albert Capuzzi. A-L-B-E-R-T, C-A-P, as in Peter -U-Z-Z-I.

My question is with respect to the treatment scheme that's planned for the O'Connor Mine Shaft that is the recommended alternative, the resin GAC grout approach, has that been used anywhere and is there evidence that it will be effective for this situation?

MR. GOWERS: Sure.

With regards to the materials that we're using to absorb contaminants, yes, that is

widely used. I mean, granular activated carbon is widely used to absorb organic contaminants. Resins are the same situation.

So that component has been widely used elsewhere. Sometimes it's used in-situ, sometimes -- a lot of times it's also used ex-situ to help run it through those materials.

MR. CAPUZZI: Yeah.

I should have been more specific. I was asking as an in-place resin in the bottom of the mine shaft, is that -- you're saying, yes, that's been done before.

MR. GOWERS: Well, I'm saying -- I'm saying those materials have been used to treat organic contaminants.

We don't have a whole lot of sites where we -- mine sites in this region, so, I mean, I don't know if it's actually been used at another mine site in this region, but...

MR. CAPUZZI: Okay. Thank you. That's --

MR. GOWERS: -- but ultimately, the materials are --

MR. CAPUZZI: And just a related question, the in-situ treatment, the row of wells for

the overall treatment, with the addition of the oxygen, is that a method that you have used before for these contaminants and have seen effective results.

MR. GOWERS: Yeah.

I mean, in terms of enhancing the aerobic degradation of organic contaminants, yes, we have used methods of putting in oxygen-releasing compound in order to promote the aerobic degradation of contaminants.

MR. CAPUZZI: Thank you.

MS. SEPPI: Thank you. Any other comment or questions.

Yes, sir. Then you're next. Okay.

MR. GUINAN: Jim Guinan, G-U-I-N-A-N. Ringwood.

Previous people spoke about toxic, the people --

THE COURT REPORTER: Sir, you need to speak up. I can't hear you.

MS. SEPPI: Put the mic closer to your mouth.

MR. GUINAN: The people -- previous people spoke about living in a toxic Superfund Site, and I think that's something that should be looked at

the need to, but I have comments just upon the plan which you're presenting now.

So the first comment, site-related groundwater, I agree with Alternative 3, the in-situ treatment and monitoring. This is the EPA preferred plan. Utilizes barrels of -- well, you discussed this.

I also support installing a well at the O'Connor Disposal Area where you said it might be considered. I think we should do something active treatment in O'Connor to try to reduce the contaminants there.

Now, for the Peter's Mine Airshaft plan, I support EPA preferred Alternative 3.

No, I do not support Alternative 3 as you stated it, which is treatment with a permanent closure. I recommend a modified version of Alternative 3, treatment with a cap which is designed to provide access for future water sampling and placement of additional treatment chemicals in the future.

Now, there's a misunderstanding about Peter's Mine Airshaft. The airshaft was used to provide ventilation and fresh air to the mine workers below.

It is a 16-foot by 16-foot square shaft which is 230 feet deep and connect to the mine workers below.

In a 1914 drawing of Peter's Mine shows the shaft intersecting excavation chambers at levels one and three.

In the 1920 drawing of Peter's Mine shows the shaft more clearly, intersecting excavation chambers at level one and horizontal adit to the main inclined slope or haul-way at level three.

The haul-way road extension the surface pit down to the full depth of the mine to level 17. It's about 2500 feet long, which is a half a mile, and goes to a depth of about 1200 feet. The haul road was used to winch out ore cars out of the mine. It has about a 30-degree downward slope.

Arcadis, the previous environmental consultant on the project, performed a video inspection of the airshaft in 2014, by lowering a video camera down the shaft.

In their 2015 report, page 49 identifies wall openings at 182-foot depth and another opening from 200 feet to 232-feet depth.

This opening is about 32 feet high excavation chamber, which is taller than this room.

The airshaft is located about 230 feet away from Peter's Mine Pit, which is where it is believed that Ford dumped the large quantities of hazardous waste from the Ford Mahwah assembly line.

It is located close to and connected with the main source of hazardous waste at Peter's Mine. The air -- the airshaft water was measured to be the highest concentration of contaminants in the entire Superfund Site. You said that a few minutes ago, but I just want to bring it home. That is where the contamination is coming from.

So the Cornerstone groundwater feasibility study of September 2018, the Cornerstone report misunderstands the connections between the airshaft and the mine workers. The Cornerstone calculations for the amount of benzine and 1,4-dioxane only consider the amount within the vertical Airshaft.

Although they show it with an opening at 180 feet and connect it to the inclined haul-way at 230 feet, they do not consider the contaminants contaminated in the inclined haul-way road which is at the base of the airshaft.

So the Cornerstone estimate for contaminants for the airshaft only for benzene, they

recommend 12 pounds of activated carbon. And for 1,4-dioxane, 420 pounds of Dow Ambersorb resin, which absorbs 1,4-dioxane.

I have the page references.

These calculations address the airshaft only and ignore the contaminants in the chamber at the base of the shaft and the inclined haul-way road. The quantities are woefully inadequate. They're just a drop in the bucket.

Now, plugging or sealing the airshaft with concrete is not the right solution. It would permanently prevent access to the shaft for taking water samples for addition of neutralizing chemicals -- for addition of additional neutralizing chemicals.

It will stop the natural attenuation process of oxidation and evaporation in the mine airshaft.

And it will require significant additional cost to drill a new shaft if access to the mine is required in the future.

The proposed remediation uses natural attenuation with chemical augmentation to immobilize and oxidize the benzene and the 1,4-dioxane in the mine.

One source of oxygen is the open air at

the top of the shaft. The oxygen readings in August 2018 were 1.17 at 50 feet below ground spaces -- surface and 0.62 at 230 feet. In addition, the open shaft allows benzenes and other VOCs to evaporate.

So closing the mine shaft is required for safety, to prevent injury and death of a person by falling down the shaft. Filling it with concrete is not required.

The better solution is to construct a head house over the top of the shaft. This would be a reinforced concrete structure which is above ground covering the shaft. It might be 4-feet high above ground.

All four sides of the head house should have openings to allow the wind to ventilate the shaft. These openings would be secured with steel bars to prevent children from entering. The top would have a capped pipe taking water samples and a removable plate for addition for absorbing chemicals as required in the future.

So the EPA recommended cap designed for the shaft closure Alternative 2 does not provide for these ventilation of the shaft.

So in summary, I recommend a modified

version of Alternative 3. Chemical treatment of mine water calculation should be revised to estimate the water in the vicinity of the shaft.

Capping the shaft with the head house provides ventilation and allows future access for testing and additional chemicals.

I also have additional comments I will submit in writing.

Thank you.

(Applause.)

MS. SEPPI: We will add it to the record.

MR. GARBARINI: Could I just actually address one thing that you raised.

THE COURT REPORTER: Please use the mic.

MS. SEPPI: I'm sorry. Use the mic.

MR. GARBARINI: Doug, Gabarini, yeah, you had, I think, echoed a concern that you said was raised by Dr. Edelstein?

MR. GUINAN: Yes.

MR. GARBARINI: And he had raised a concern about health impacts in the community and unfortunately he isn't here.

But there were a number of studies that

were performed and I think we certainly want to get those out to him and make sure he has them and give him a status update on them.

MR. GUINAN: I am familiar with those AT...

MR. GARBARINI: Yeah, the ATSDR and New Jersey Department of Health studies. Yes.

MR. GUINAN: And the recent update by Arcadis again, the one for the dioxane. I'm familiar with those.

MR. GARBARINI: We just --

MR. GUINAN: But -- but still remains the question of your -- of one in 10,000 versus New Jersey's one in a million cancer risk.

And it still remains the question of people living within a Superfund Site and what kind of life they get.

MR. GARBARINI: No, I agree, and I hear your concerns.

One of the things that I wanted to make clear was EPA, as an agency, is responsible for looking at the current conditions at a site and trying to figure out how to address those conditions to make sure people are no longer being impacted.

So we do have the health studies going

on by the state health department and the ATSDR.

But our job is really to identify the risks and then address them appropriately. And I think we feel here that we identified a couple of alternatives that are going to be protective of the health and the environment.

MR. GUINAN: Well, a better alternative is really --

MR. GARBARINI: Well, I hear you, and I think we'll take that back and certainly address your concerns and --

MR. GUINAN: Actually, I -- i wrote that to the remedy review board about six years ago to relocate the people to have nice new homes in another area specifically a state park which is also state land.

MR. GARBARINI: And Just while -- just --

MR. GUINAN: Yeah.

MR. GARBARINI: -- saying something here, too. I know some people have raised concerns about the water quality in the Wanaque.

And I think, as Joe said in his presentation, there really is no current impact to the water quality of the Wanaque and we don't think

there will be in the future. I just want to make sure that that's out there on the record also.

MR. GUINAN: Right.

The benzene evaporates and dilutes. But as you probably read, the Wanaque study is concerned with the 1,4-dioxane. I'm sure you read that study.

MR. GARBARINI: Yes.

Thank you very much.

MS. SEPPI: Yes.

Please state your name.

MR. SMITH: My name is Steven Smith, S-T-E-V-E-N, S-M-I-T-H.

And my second-generation grandmother is Maria Van Dunk Morgan, so the Morgans, the Manns, these are all family members that live here.

My first question is: Do you deny that the people in Ringwood are suffering from early death, cancer and other illnesses?

MR. GOWERS: Again, with regards to health affects, there have been health studies conducted by other agencies, not EPA, by the ATSDR, Agency For Toxic Substances and Disease Registry, and the New Jersey Department of Health and Senior Services which evaluated those various risks.

So what we understand is what is basically in those reports at this point in time with regards to any, you know, potential impacts related to the site.

MR. SMITH: My question is, are people right now, are they suffering from cancer, other illnesses of disproportionate numbers to that of the national population?

Is there -- are the people here suffering from different illness?

MR. GOWERS: My -- again, my recollection from the ATSDR studies was that there was elevated lung cancer in men.

In, basically, that study that was one of the cancers that were elevated, but my recollection was that most of the other cancers were not shown to be elevated compared to nationwide.

MR. SMITH: So you've heard from people directly over the years. Are you -- and they've told you --

MR. GOWERS: Oh, I'm not -- we understand that there are, you know, deaths in the community. And we understand that there are cancer cases in the community. I mean, we have -- hear about this all the time. We work with Ken.

However, what we're saying is based upon those studies, we are not aware of other cancers within the area being elevated above what other areas are experiencing, based upon the studies.

MR. SMITH: Do you deny that these cancers and other illness are due to the toxins formed by Ford Motor Company dump?

MR. GOWERS: I mean, I -- I can't confirm or deny that because, I mean, it's very -- the situation always is, listen, we were told when I first came out here in 2004, that resident -- that residents used to play with -- in the sludge.

And, you know, I believe there were exposures out there. I mean, and that, you know, years ago, I think people were exposed to hazardous chemicals which could have had health effects or could be currently having health effects on those people who were exposed at that point in time. I mean, we believe that, based upon what the community has told us.

MR. GARBARINI: Yeah, I don't think we're trying to dodge your question at all.

MR. GOWERS: No.

MR. GARBARINI: It's just -- it's really not the role that we play. We come out here,

as I said before, and try and look at the current contamination that exists and figure out how people are being exposed and whether they're at risk.

We really -- that's not our area of expertise to try to go back and do a --

MR. GOWERS: I mean we're --

MR. SMITH: You say it's not your area of expertise. I mean, you heard Dr. Edelstein, he talked about habitability. We had Love Canal where people had communities relocated.

How can you say it's not your area of expertise when that's an option?

Is relocation an option?

MR. GARBARINI: No, you were asking us to, sort of, give our opinion on illnesses in the community.

MR. SMITH: Yeah.

MR. GARBARINI: And what I'm basically saying is we have other agencies that do that sort of work for us.

MR. SMITH: Okay. Well, what other agencies do that kind of work.

MR. GARBARINI: The ATSDR.

MR. GOWERS: Yeah, the Agency For Toxic Substances and Disease Registry on the federal level.

And on the state level, it's the New Jersey Department of Health.

MR. SMITH: I'm sorry. They do an evaluation of people's illnesses or...

MR. GOWERS: That's correct.

They basically look at the health -- in this case they look at, and they compare the health statistics for a particular community to that of the state, essentially, to see whether or not there are any sort of outliers that, again, looks like it's statistically, significantly elevated.

So, I mean, that's been done at this site actually a number of times by the -- you know, ATSDR and the New Jersey Department of Health.

MR. SMITH: Have you all ever been involved in a Superfund Site where the community had been relocated?

Have any of you guys?

MR. GARBARINI: Yes.

MS. SEPPI: Yes.

MR. GARBARINI: Yes.

MR. SMITH: What were the criteria that you guys used in terms of determining whether this community should be relocated or not.

MS. SEPPI: Yeah, I did the relocations

for Region 2.

The criteria is if there is no other way we feel we can clean up the contamination that's there, then we will consider relocation. It's not something that happens very often.

I can give you an example. We had an apartment building in Northern New Jersey where mercury was falling down from the ceiling and coming up from the floorboards. We had to relocate all those people permanently because there's no way we could clean it up. We had to demolish the building.

Usually if we have to demolish a building in order to get underneath it to clean up, that's where we would possibly look at permanent relocation or a temporary relocation if we can clean it up and then move people back.

But I don't think that, you know, any of the situation here meets that criteria at all because we feel that we can, you know, clean it up effectively and responsibly without moving people out.

MR. SMITH: So you're saying that capping the pollution, leaving the pollution in place in a Superfund Site area, you say that's sufficient cleanup.

MS. SEPPI: Yes. Yes, it is for here, yes.

You know you probably -- Joe can explain, you know, the process and the program better than I can as far as the cleanup is related.

But we feel that we can contain or remove the contamination that's here and it will be fine for the people to continue living there.

MR. SMITH: Last question, explain to me how capping the pollution, putting the cap on it in the area there, how that actually removes the pollution o cleans it up?

Explain that to me, this capping business.

MR. GOWERS: Well, I mean capping doesn't remove the pollution. What it does is it cuts off an exposure pathway. It, basically, by putting in -- you know, the main concern that we have in the disposal area is people coming into contact with any of the paint sludge that might remain in those areas.

By capping it, we basically cut off that pathway.

Now, today in terms of what we're proposing in terms of the groundwater, we're looking

at the groundwater contamination and we're looking at ways to address the groundwater component of the contamination.

So we feel between the remedy that was already selected for Upper Ringwood Two, plus whatever remedy is ultimately selected from Upper Ringwood Three, we would be cutting off the exposure pathways.

I mean, if we have a situation where the residents are not drinking the groundwater. We're going to be trying to address the groundwater contamination.

And as far as the fill material that's still there, we're going to be capping it so residents can't came in contact with the fill material.

MR. SMITH: No other questions.

MS. SEPPI: Thank you.

Yes, come on up.

MS. LENINGTON: Sarah Lenington. I'm a Ringwood resident.

My name is spelled S-A-R-A-H, L-E-N-I-N-G-T-O-N.

And I've heard you guys talk about monitoring to see whether or not program that you're

instituting is working, but I haven't heard anything about what you might plan to do if you find that it isn't, and if you find that there are higher levels of contaminants in the water supply than you had expected.

MS. SEPPI: You'd like that answered now, right.

MS. LENINGTON: Yeah.

That's my only question.

MS. SEPPI: Okay. Thank you.

MR. GOWERS: I mean, with regards to it being -- we would monitor it to see, as you indicated, whether or not what we were doing was working.

And if, for some reason, we found that it wasn't working, we would have to consider other alternatives or other modifications to try to address the situation.

I mean, at this point we're not there because we believe that this remedy is going to work.

Again, with regards to some of the contaminants out there like 1,4-dioxane that we found in 2015, we believe those contaminants have been here, basically, since the dumping. I mean, we just weren't -- we were not sampling for 1,4-dioxane.

So we're looking at a period where the contamination has already been here for a period of 50 years. And we're not seeing migration of the contaminants to the residents.

MS. SEPPI: Did that answer your question?

MS. LENINGTON: Yes.

MS. SEPPI: You looked like you had another question on top of that.

MS. LENINGTON: Well, for what it's worth, I live by Erskine Lake, which is probably, I don't know, three miles as the crow flies from the Superfund Site. And I have lead in my well water.

And so I'm not sure that -- that even whether or not you're finding contaminants in the water that's going down to the reservoir necessarily reflects every possible place that these contaminants might migrate to -- given the very fractured nature of the water -- of the rock in this area and the patterns of water in the area.

MR. GOWERS: I mean, just quickly, understand that we're not just simply going to be monitoring surface water. We're also going to be monitoring groundwater. We would be setting up a system of monitoring wells to monitor groundwater

quality not just at the site, but also sentinel wells, wells somewhat off the site, to -- so that we do understand whether or not contaminants are migrating off the site in groundwater.

MS. SEPPI: Thank you, Joe.

Another comment or question?

(No response.)

MS. SEPPI: Anybody?

Oh, sure, come on up. I forget your name.

MS. BOYLE-GEISEL: Hi. My name is Amy Boyle, B-O-Y-L-E, Geisel, G-E-I-S-E-L.

I'm a resident of Ringwood for about 16 years. I have been, kind of, monitoring the situation from afar.

Honestly, I live on the other side of town which was a CM mine, so I have a completely different perspective.

But what I'm hearing, this being one of my first meetings like this, but if I'm following your documentation, which I appreciate you posting, and the overview of the history, I hear decades of frustration.

So when you're here taking in community assessment and comments, that should probably be part

of this report at some point.

I have very specific questions about the documents and the plan going forward, just because, as a layperson, I don't understand some of the science that you're posting in terms of remediation efforts.

So the initial concern was you're referring to a document called the human health risk assessment. I've seen that in at least two of these documents. Is that particular document available online, and does that address --

MR. GOWERS: Yes.

MS. BOYLE-GEISEL: Right, the how --

MR. GOWERS: That document is actually -- there are several human health risk assessments. We have a human health risk assessment specifically for the groundwater at the site.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: And we actually have a human health risk assessment and then -- from 2015, and then it was modified in 2017 to take into account the detection of 1,4-dioxane on the site.

So if you go on our site at the link that we indicated in the overhead here --

MS. BOYLE-GEISEL: Yes.

MR. GOWERS: -- and you go to the administrative record, it will be one of the documents or multiple document files will actually be included within the administrative record.

MS. BOYLE-GEISEL: Okay, great.

So I can access that online.

MR. GOWERS: You can access that right off our site.

MS. BOYLE-GEISEL: So in terms of the overview and the history that you've provided, has that document -- the information, the data in that document, does that touch to the 48 residences, the 200 people, the Turtle Clan that live in or around the Superfund Site.

Is that information regarding their health, those studies?

MR. GOWERS: No. Those studies -- that study is more of a hypothetical study in terms of --

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: -- for instance, with groundwater, if somebody used the drinking water at the site as their -- or used groundwater at the site as it stands in the future as drinking water, would that present a human health risk?

MS. BOYLE-GEISEL: Got it.

MR. GOWERS: And right now the residents do not use --

MS. BOYLE-GEISEL: Okay. I understand.

MR. GOWERS: -- the groundwater.

MS. BOYLE-GEISEL: So that document refers to the levels you've tested, the last known test results of the groundwater and the sediment reflects what would happen to a population that is exposed to that or drinks it or bathes with it.

MR. GOWERS: If they drank a certain amount, like two liters of water every day over a large period of time --

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: -- would that present an unacceptable health risk.

We actually use that document to basically determine whether or not we need to take an action at a site. If it rises to a certain level of risk that we consider unacceptable, then we implement a cleanup at the site, so...

MS. BOYLE-GEISEL: I see. So that triggers the rest of the --

MR. GOWERS: That's what triggers the risk. That's what justifies us taking the action at the site.

MS. BOYLE-GEISEL: Okay.

So then you're talking about the groundwater cleanup at this point, at the last testing, you're basically looking to clean up or reduce the levels of benzene and the 1,4-dioxane. Is that it?

You're basically -- those are the chemicals that we're looking to treat or --

MR. GOWERS: Those are -- those are the chemicals that at this point we're most concerned with because they're not -- I mean, they're basically there and they're migrating some degree in groundwater at the site. Water -- some of those contaminants, the 1,4-dioxane is getting into the surface water also --

MS. BOYLE-GEISEL: Right.

MR. GOWERS: -- in the Park Brook.

So, therefore, because you have what is consider to be groundwater plume associated with those kind of things, that is what we're most concerned with --

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: -- treating of those --

MS. BOYLE-GEISEL: So then the earlier question, using the carbon-based treatment method you

were talking about, the resin, the carbon, the oxygenation will eventually, in your expert opinions, decrease the levels of those two chemicals.

MR. GOWERS: That's what we're anticipating.

MS. BOYLE-GEISEL: That's what the plan is.

MR. GOWERS: That's why we're basically targeting not just site-wide groundwater, but also at the base of the airshaft because, as others had indicated here, that was where the highest levels are, we believe whatever source is down there in the mine, itself.

MS. BOYLE-GEISEL: Okay.

So then what I also saw of the documents posted online, the last tests, I saw in 2018, six potable well samples.

Has there been any other potable well sampling since 2018?

MR. GOWERS: Since 2018, there hasn't been additional potable well sampling.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: We sampled those potable wells, those are actually the only potable wells that were actually located within about a mile of the

site.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: Again, the residents at the site don't drink the water.

MS. BOYLE-GEISEL: Right.

MR. GOWERS: Most of those wells, I believe, were actually in the Ringwood State Park.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: In addition, one of those wells was related to -- actually to a school in the area, and their water is regularly tested --

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: -- for a list of contaminants.

MS. BOYLE-GEISEL: Is that the Erskine school, the K through 3?

MR. GOWERS: Yes.

MS. BOYLE-GEISEL: That's the closest to the area.

MR. GOWERS: Yes.

MS. BOYLE-GEISEL: Okay.

So then with regard --

MR. GARBARINI: The Hewitt School.

MR. GOWERS: I'm sorry. The Hewitt School.

MS. BOYLE-GEISEL: The Hewitt School.
MR. GOWERS: I'm sorry.
MS. BOYLE-GEISEL: Thanks.
For the sediment, according to your documentation that's posted, the last sediment testing goes back to 2014.
Is that correct?
MR. GOWERS: So that's correct.
MS. BOYLE-GEISEL: Okay. So as a layperson, that's a concern for me. If you're looking at a starting point on how you're going to remediate certain levels of chemicals and you're looking at data that's six years old and also two years old as your core starting points, right --
MR. GOWERS: Well --
MS. BOYLE-GEISEL: -- we're looking at potable water samples that go back to 2018. Your sediment samples go back to 2014.
MR. GOWERS: Yeah, but, again, a lot of the contaminants that we're looking at here are basically -- it's basically there are some contaminants that we found moving in groundwater to surface water not really moving in the sediment.
So that's why, you know, our remedies is basically -- and our data were more concerned with

groundwater and surface water data --

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: -- because that's the way it's essentially moving.

MS. BOYLE-GEISEL: So, again, as a layperson, because my background is law, not science, not the sciences that you practice, when you're looking for a starting point on a big project like this, are you going a test before you start? Are you testing again to check the levels before you start the remediation process.

MR. GOWERS: Well, we're going to be -- in terms of the remediation process, we're going to be testing throughout the remediation process here. I mean, that's why we've indicated we're going to be looking at a long-term groundwater monitoring and surface water monitoring program.

The specifics of that are going to be actually developed within the phase of the project we call the Remedial Design Phase.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: So there's going to be -- as long as this project is going on, there is going to be groundwater monitoring and there is going to be surface water monitoring, again, to make sure both

evaluate our remedy, the effective our remedy, and to make sure that the remedy remains protective of human health.

MS. BOYLE-GEISEL: Okay.

But also to establish, like, a starting point, you're going to set the levels, you know --

MR. GOWERS: Yeah. I mean, there will be -- there will be routine samples taken.

MS. BOYLE-GEISEL: Okay. So what I'm hearing, what -- a concern I have, too, is the five-year mark. You are talking about you're monitoring this.

From what I see in the literature, it looks as if, to us, somebody is looking at this every five years. That doesn't mean you come more often whatsoever.

Is there any ongoing process where you're checking the wells, you're checking the carbon -- as you said, when it's exhausted, you're removing the carbon, the cartridges, through the caps, one of the caps --

MR. GOWERS: Yes.

MS. BOYLE-GEISEL: -- and then replacing them.

So how -- is there a process or

baseline for how often you're testing and how often you're checking?

MR. GOWERS: Well, that's -- that's going to be determined within the Remedial Design Phase of the project.

But, I mean, you can expect that at least annually. But the specifics are going to be worked out during the design phase.

I can tell you it's not going to be we're only going to sample every five years.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: It's just that we are required to conduct those five-year reviews based upon our policy.

MS. BOYLE-GEISEL: So that would be your minimum.

MR. GOWERS: That would be -- that would be -- no, for other sites. I mean, you might, for instance, a capping site, you might implement a remedy there. You might collect specific data every year, but then every five years you would formally do a review of that data in what we call a five-year review.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: But we would be collecting

data more frequently.

MS. BOYLE-GEISEL: Do we get that data.

MR. GARBARINI: So -- yes.

MS. BOYLE-GEISEL: Are you going to post that or make it public?

MR. GOWERS: Yes.

MR. GARBARINI: And for a lot of these sites, what we typically do is there's usually an annual monitoring report, so the data is reviewed on an annual basis.

But this five-year review is just something special that's required by the law and we have to --

MS. BOYLE-GEISEL: Okay.

MR. GARBARINI: -- it's just a much more thorough, detailed review.

MS. BOYLE-GEISEL: Because as you can hear and as what I saw in the historic record, there's huge gaps of communication going back to the mid to the end of the '80s and into the '90s. There was events that happened and there was nothing published. There was nothing that was made known to the Ringwood residents.

So I think, from what I'm hearing, is that when you started this process, people came at it

very suspicious, antagonistic, frustrated. No notice was given of the three large meetings when it was taken off the site and then put back on the site. There was a lapse in communication with the Ringwood residents and the citizens here telling you what's going on.

And that's a huge concern to me as a parent, too. I want to know what's happening. I want to know what your efforts are and what your tests come back, like, if it's working. That's what I'm concerned about.

My other concern is, to me, as an attorney, you're making a deal, we're going to settle it, and we don't have any details.

Now, you're saying there is a lot of details to be worked out and I see it in the literature, like, we're still at the phase where we're going for approvals. We don't have specifics. We don't have specifics on the concrete or the type of product that you would use for cap.

Like, my first concern was: We live in a fault zone, right? Right, you know it, the Ramapo fault zone. I looked up there's been 10 -- I've heard a slight earthquake in my backyard in that old sand mine. I've got a fault. I had a crack. It was

2 feet wide.

So I'm concerned about earthquake activity, and I discussed this with some of our borough officials, the integrity of the cap, the integrity of the concrete. Like, I want to know if you're going to use rebar, if you're going to use some kind of steel mesh.

If you must cap it, I am not thrilled with the idea of the lack of oxygen getting in, but I understand the process that you're proposing.

But there's got to be a better way to maintain the integrity of where I'm understanding it's kind of a concrete tomb around one of those sites, the shaft. You're talking about pouring what a 10-foot wall thick of ready mix, when you're adding those additives, some of them make the concrete softer, you know, some of them you can add additives to make concrete harder, like a winter mix. So you get a stronger concrete, pressure per pound. That was my area, construction issues.

So not seeing any of the details of that sort in these documents raises a red flag for me about what -- what are the details on this? How strong is this going to be?

We, I, 'cause I can only speak for

myself, long term, not just the fix, but a real remediation effort where the oxygenation is actually reducing these toxic chemicals. You're making it safe for the families that live there and for the rest of us in the community. And we don't have to come back, you know, in five years or ten years and find out the oxygenation effort is not working, one of the caps has cracked or the side of the wall, you know, down the shaft has cracked and some of that water is traveling.

Another issue that raises a red flag for me is you are talking about pumping out wastewater, 450,000 gallons, it's in two of your documents, when you pour the cap and then the sides, right, you're pumping out contaminated fluid.

So there's a concern there. You're pumping and treating it. And there was a six-day timeframe in one of these documents. It's got to be treated or removed from the site, or ponding, put in a pond at the site, and then removed at -- from the site.

That is a big concern. Because you don't know what's going to be in that water and you're removing 450,000 gallons of contaminated water from one of the mine shafts.

Is there anything else in the details at this point, at this juncture, about plans for treatment of that wastewater?

MR. GOWERS: Again, you know, we -- we do understand from the years of sampling what we anticipate is going to be in the water from the shaft based on the fact that we have sampled this, as we indicated, routinely from 2004, all the way to 2018, we have sampled water in that airshaft.

So we know what to anticipate and we indicated we would be treating that water before it discharged in whatever fashion.

MS. BOYLE-GEISEL: How? How do you treat it on-site and really just --

MR. GOWERS: Well, basically, we would be treating it the same way we would be treating it in-situ, basically. You know, we will be using filters, carbon to basically absorb the contaminants.

MS. BOYLE-GEISEL: And then it goes back into the water table?

MR. GOWERS: It basically goes back.

MS. BOYLE-GEISEL: Okay. And it would take --

MR. GOWERS: It goes back clean.

MS. BOYLE-GEISEL: Okay.

MR. GOWERS: Yeah.

MS. BOYLE-GEISEL: But we're testing that where we're pumping it out?

We're testing it after you've treated it --

MR. GOWERS: Yes.

MS. BOYLE-GEISEL: -- before we go back into the water table.

MR. GOWERS: Yes, it would be.

And those details, you know, I know your frustration at the way our process works, you know, we develop a feasibility study, we get some of the basic -- enough data -- enough information to evaluate alternatives.

We intended to get enough information to select an alternative, and then we develop really specific details in the early phase, during the design phase --

MS. BOYLE-GEISEL: Okay. That --

MR. GOWERS: -- of the project.

MS. BOYLE-GEISEL: That's my next question.

MR. GOWERS: So when you see those documents, those documents are going to have a lot of the answers that you're looking for, a lot of the

specifics with regards to the way the remedy is going to be implemented, in a way -- in terms of the way the monitoring plan is going to be conducted, how frequently which wells, et cetera; all that gets laid out in the design report.

MS. BOYLE-GEISEL: Okay.

So another consideration, I don't see it, but what I'm hearing tonight is how about monitoring those homes?

Is there any plan anywhere for those 48 residents, those 200 people in the local community who sound like they're pretty -- they're pretty scared still and they're pretty worried what's going on with the water underneath their homes.

Any plans to monitor any of those residences?

MR. GOWERS: Well, we continue to monitor groundwater monitoring levels at the site which are not just in the Peter's Mine Pit Area, but they're throughout the site.

MS. BOYLE-GEISEL: But even into that community, this might be something you want to address or consider?

You know, reaching out to that community, the Turtle Clan, and doing something in

that community in terms of monitoring those homes, their taps, you know, something to give them some hope that somebody is watching out for them or addressing some of their concerns.

MR. GOWERS: Again, the water that they're actually drinking is not coming from the site -

MS. BOYLE-GEISEL: It's not coming from the site?

MR. GOWERS: -- it's actually coming from wells which are located miles away from the Superfund Site, the wells that other Ringwood residents are getting their water from.

MS. BOYLE-GEISEL: So then I say to say, too, from, again, a layperson, some of the language in the reports was confusing, because you're remediating concerns about the use of water from the taps. And that was language I saw in three paragraphs about showering, bathing with the water, reducing risk of exposure.

MR. GOWERS: Yes, I --

MS. BOYLE-GEISEL: So that makes the rest of us think that the EPA, as a federal entity, is worried about the content of the water coming out of their taps, just because it's in your report, you

know what I mean?

MR. GOWERS: Yes, I don't --

MS. BOYLE-GEISEL: It's right there in black and white.

MR. GOWERS: That's part of our risk assessment and what we actually are doing is we're looking at what would happen if somebody were to extract the groundwater at the site and then actually use it as potable water, what would happen if they showered with it, if they drank the water at the site, and would that present an unacceptable risk to human health.

MS. BOYLE-GEISEL: Right, so then --

MR. GOWERS: If it does -- if it does, based upon our calculations, that -- we can then take an action at the site to address that groundwater contamination.

MS. BOYLE-GEISEL: Yes, I understand. So the language actually speaks to the hypo -- the hypo, as if somebody goes in --

MR. GOWERS: Yes, exactly.

MS. BOYLE-GEISEL: -- takes water out of the mine shaft and brings it home and bathes in it.

MR. GOWERS: And brings it home and not

only just bathes with it, but bathes with it regularly for a long period of time.

MS. BOYLE-GEISEL: Okay.

MR. GARBARINI: And drinks it --

MR. GOWERS: And drinks it.

MS. BOYLE-GEISEL: Drinks it.

MR. GARBARINI: -- during the day for 30 years or 60 years.

MS. BOYLE-GEISEL: So the other thing I have concern with is what's the process after this?

Again, transparency, letting us know what's going on, if you're going to put this out for bid for a vendor, like, a local concrete vendor or somebody who has or has not got experience; do we get any say in the next phase of this process?

Do you come back to the Ringwood citizens and tell them this is what we're doing, these are the details of the plan, we're sending it out for bid, we're looking for vendors or contractors.

MS. SEPPI: We have -- I can address that.

We have a community advisory group here in Ringwood and it met since 2006 monthly.

Lately, we haven't had a meeting in a

few months, but we're hoping once this plan is ready and the details are ready to go out, that we certainly expect to revamp that group and continue meeting with them as often as possible, as often as necessary, to let them know what's going on.

MS. BOYLE-GEISEL: So they're the conduit.

MS. SEPPI: Yes.

MS. BOYLE-GEISEL: CAG is like liaisons for the community --

MS. SEPPI: Yes.

MS. BOYLE-GEISEL: So I should look for my information from CAG going into the future?

MS. SEPPI: Yes.

MS. BOYLE-GEISEL: But you post dates, meeting dates --

MS. SEPPI: Oh, yes. Yes, we do. We do.

And, you know, if you're interested in being a member of the community advisory group, we're always looking for new members with different perspectives.

So if you -- you know, I will send out information about CAG when we have our next meeting. And if you signed in with your e-mail, I'll be happy

to include you in that, and if you're interested, come to one of our meetings.

MS. BOYLE-GEISEL: Okay, thank you. I appreciate that.

I'm interested in the flow of information.

MS. SEPPI: Yes.

MS. BOYLE-GEISEL: I want to know what you're going to do next, the details on this, because I'm interested. I'm vested in this.

MS. SEPPI: That's good.

I think you would be perfect to be on the community advisory group.

MS. BOYLE-GEISEL: Thank you.

MS. SEPPI: Just volunteer.

MS. BOYLE-GEISEL: Thank you.

(Applause.)

MS. SEPPI: Another comment or question?

MS. HSU: Jennifer Hsu, H-S-U, 205 Lakeview Avenue. I just have one question.

If I am understanding the process that you're proposing correctly, it sounds like you're using the same treatment for arsenic, benzene and 1,4-dioxane?

MR. GOWERS: Well, we're -- we're using the -- the treatment is focusing on 1,4-dioxane and benzene because those are contaminants that we know are clearly migrating to some degree. We have a groundwater contaminant group at the site.

With regards to arsenic and the lead, again, it's being detected sporadically.

One of the issues we run into with inorganics or metals is that they're there naturally in the environments. And, you know, sometimes, you know, when we focus here, sometimes they're detected slightly elevated, sometimes it's not.

A lot of times it depends upon when you grab the groundwater samples, you know, do we have any sort of suspended particles in there because these particles oftentimes contain the metals.

So we're not seeing anything that gives us any indication that there is any sort of, you know, migration or --

MS. HSU: So at least the same treatment for benzene and 1,4-dioxane.

MR. GOWERS: But one -- yes, and 1,4-dioxane, we're looking at the same type of remedy, yes.

MS. HSU: And I was wondering, what is

the evidence that the same treatment would work for both of those substances?

MR. GOWERS: Well, with regard to the carbon and the -- you know, the staff, we do know from experience, that carbon is somewhat effective in both absorbing benzene and 1,4-dioxane. It's been used at multiple sites.

MS. HSU: So it's my understanding that the 1,4-dioxane was a lot harder to treat than benzene.

MR. GOWERS: You're right, it is a lot harder to treat, but with these -- with these technologies we're doing, they're basically not -- what is going in the airshaft, they're basically absorbing the materials, they're binding the materials, and we have used the groundwater activated carbon --

MS. HSU: So there's evidence that carbon would bind --

MR. GOWERS: Carbon would work.

MR. GARBARINI: Yes, but -- but, that's why --

MS. HSU: -- with 1,4-dioxane.

MR. GARBARINI: That's why we're using the resin for the 1,4-dioxane primarily --

MR. GOWERS: Also, yes.

MR. GARBARINI: -- because some -- some carbons do a better job than others in addressing 1,4.

But, yes, like you said, 1,4-dioxane is more difficult to treat --

MS. HSU: Right.

MR. GARBARINI: -- and that's why we're going to use the resin.

MS. HSU: And I'd just like to re-emphasize again the question that a gentleman asked earlier.

It's one thing to do these studies in a lab and it's another one to actually remediate in similar sites.

So I would like to know, again, have you treated 1,4-dioxane in a similar site?

Have you seen it successfully treated with this kind of proposed remediation?

And that would be my question.

MR. GOWERS: I mean, what I can tell you is that we have used these materials to basically treat 1,4-dioxane at other sites.

Again, if you want me to say in terms of other mine sites, we don't have a lot of mine

sites in Region 2, so, I mean, I am not aware of any other site, any other mine sites where we've used these technologies.

MS. SEPPI: I would guess there's probably a lot more mine sites out west that they have used these type of technologies. And they, of course, have many more mines than we have here.

Any other comments?

Okay.

MS. O'KEEFE: Hi, Kathy O'Keefe, O-K-E-E-F-E.

You said that you've used this before. Could you give us a specific site where it's been successful?

MR. GOWERS: You mean where we've used this sort of material?

MS. O'KEEFE: Yeah, right.

MR. GOWERS: I know you had sites where there's been 1,4-dioxane where the carbon has been used as a polishing step.

MR. GARBARINI: Yeah, carbon's been used as a polishing step in that instance.

MS. O'KEEFE: Okay.

MR. GARBARINI: But --

MS. O'KEEFE: -- so, was it successful,

like, and what specific site were you successful with this treatment?

That's the question.

MR. GARBARINI: Yeah, I mean, carbon -- carbon we use at so many of our different sites to address benzene.

The resins, you know, for 1,4-dioxane we use oxidation processes sometimes in water treatment.

At our facilities, resin will have to -- I know generally folks have done their evaluation and feasibility study. But, we believe --

MS. O'KEEFE: But could you point to the specific site, like a Superfund Site, where you've actually used this type of remedy, where you've seen great success that you could point to and say, you know, this is giving us the -- you know, the confidence that this is going to work here.

MR. PETRONE: The State of New Jersey uses carbon and resin to treat drinking water at residential properties in Gloucester County, so we install --

MS. O'KEEFE: Okay.

MR. PETRONE: -- carbon tanks and now we're experimenting with resins in addition to the

carbon to see which is more efficient. It seems right now like the resin lasts longer. The carbons we have to change out more frequently.

But we are using both the treatment for dioxane and benzene.

MS. O'KEEFE: Thank you.

So what does this success look like?

Five years from now when you go back to this site and you do your testing and you come up with a number to tell us, hey, yeah, this is working, what is that measurement? What is that going to look like?

MR. GOWERS: Well, I mean, again, you're asking us what we're going to see in the future.

MS. O'KEEFE: Well, I'm just saying ---

MR. GOWERS: What we're hoping to see is declining levels of the contaminants.

MS. O'KEEFE: I understand that.

But I'm saying, what level would you expect to achieve to show that you're making significant progress?

MR. GOWERS: Well, again, you know, if we're expecting to see declining levels of that. We can't say -- I mean, a lot of times we look at the

way these remedies are costed out --

MS. O'KEEFE: Right.

MR. GOWERS: -- we're looking at a timeframe of about 30 years.

MS. O'KEEFE: Of 30 years?

MR. GOWERS: So that's generally the timeframe we use for costing.

So, you know, these are long-term cleanup options. And -- which is consistent with all or most groundwater contaminants.

MS. O'KEEFE: Okay. So we'll have an answer 30 years from now if this is successful --

MR. GOWERS: Well --

MS. O'KEEFE: -- or if we're on the right track? That's what I'm trying to say.

MR. GOWERS: Well, we're anticipating that within that timeframe we would have met the groundwater quality standards as we indicated outside of the capped airshaft area.

MS. O'KEEFE: Okay.

And the North Jersey Water Commission did recommend the pump and treat which you have decided isn't the best course of action, correct?

If you put these concrete slabs in and we find out that this carbon isn't working, isn't

achieving the goal that you hoped it would, because you've never done this in a mine shaft before, would we be able to switch over to the pump and treat which North Jersey had recommended initially or would these concrete slabs eliminate that opportunity?

MR. GOWERS: I mean, they're not going to eliminate the opportunity.

I mean, we have flooded mine tunnels.

MS. O'KEEFE: Uh-huh.

MR. GOWERS: We could always drill down and, if we needed to, intercept a tunnel with pump and treat.

MS. O'KEEFE: Okay.

MR. GOWERS: That's always an option. We don't believe that's going to be required here.

And part of that -- and one of the reasons that we're looking to seal up the airshaft is not just because of the physical hazard. It's because when we install monitoring wells in the area, we're seeing that the highest levels of benzene and 1,4-dioxane are coming up in monitoring wells that are installed immediately downgradient of the airshaft.

So there's, you know, the possibility that there are fractures in the airshaft that are

serving as a migration pathway.

So we're hoping by sealing up the airshaft we're not only working -- you know dealing with the physical hazard, but we're more specifically dealing with the possibility of there being a migration pathway coming off of that airshaft specifically.

MS. O'KEEFE: I think the biggest problem is not understanding migration underground.

Okay. Thank you.

MS. SEPPI: Thank you.

Somebody else had a question? Yes.

MS. VACCARI: Nicole Vaccari. Hi. V-A-C-C-A-R-I.

I am a student at Ramapo College. I'm one of Dr. Stead's kids.

I just have a couple of questions because I'm really confused about this whole thing.

So for the capping and the pouring cement into a mine shaft, have you thought about the negative impacts at all? Is there any negative things that have been talked about?

Because it seems like really good from what you're saying, but I am not hearing any possible negative impacts on the earth, the environment or

anything.

MR. GOWERS: Well, I mean, we're not envisioning there being negative impacts by sealing up the airshaft and putting something down there to basically absorb the contaminants.

We're hoping that that's going to actually reduce the levels because, again, the highest levels are down there from the mine -- and the -- you know, we believe that whatever source of the contaminants is down there in the mines themselves.

So, we're hoping that this is going to actually improve conditions and not negatively impact them.

I mean, so we are not foreseeing there being any sort of negative impact on doing this option.

MS. VACCARI: Okay.

At any point that you, like, pour concrete, right, has there been any negative impact at all, maybe not now, maybe not in ten years, but in a couple of generations from now?

'Cause if we go through with this and it stays in the ground, I don't want this to be an issue for my kids or my kids' kids.

MR. GOWERS: Yeah.

I mean, I wouldn't anticipate the concrete being a -- no, definitely not the concrete being an issue.

I mean, there may be a situation where levels aren't dropping fast enough or -- and we may determine some time in the future that maybe something else needs to be done.

But we're not anticipating that. We're anticipating that we're going to see a decline in the levels of the contaminants including a combination of alternatives we're looking at here targeting the airshafts, specifically to try to reduce the level and then trying to degrade anything coming off of that area.

MS. VACCARI: Gotcha. Okay.

Thank you.

MS. SEPPI: Thank you.

Any other comments, questions?

(No response.)

MS. SEPPI: Well, if not, thank you all very much. We really appreciate you being here tonight.

And I do have a few copies of the proposed plan of the overheads here if you haven't

been able to take a look at it online.

We probably don't have enough, but if anyone would like them, please come up.

(Whereupon, this hearing is concluded. Time noted: 9:22 p.m.)

C E R T I F I C A T E

I, LAURA A. CARUCCI, C.C.R., R.P.R., a Notary Public of the State of New Jersey, Notary ID.#50094914, Certified Court Reporter of the State of New Jersey, and a Registered Professional Reporter, hereby certify that the foregoing is a verbatim record of the testimony provided under oath before any court, referee, board, commission or other body created by statute of the State of New Jersey.

I am not related to the parties involved in this action; I have no financial interest, nor am I related to an agent of or employed by anyone with a financial interest in the outcome of this action.

This transcript complies with regulation 13:43-5.9 of the New Jersey Administrative Code.

_____

LAURA A. CARUCCI, C.C.R., R.P.R.
License #XI02050 Notary Public
of New Jersey #50094914, Notary
Expiration Date December 3, 2023

ATTACHMENT D – Written Comments

From: Julieann Murphy
To: Gowers, Joe
Subject: Ringwood Superfund Site Comment
Date: Monday, August 03, 2020 1:18:31 PM

Joseph Gowers,

RE: Ringwood Mines/Landfill Superfund Site in New Jersey

Dear Joseph Gowers,

Supporters, Allies, and Members of the Ramapough Lenape Nation, like others in New Jersey, are dying due to the Covid-19 pandemic. Ramapough living in Ringwood have experienced exotic cancers, illness and death for many decades before this pandemic but are especially vulnerable now.

We believe that the public still does not have enough time, especially residents that have been impacted, to comment on the Ringwood Superfund Site clean-up plan in such a short time. We ask that you extend public comment to 60 days beyond the end of the health emergency. People right now are focused on the immediate need for food, income and safety. Therefore, an extension is essential so that people have the opportunity to comment.

An extension and real community involvement is needed for proper public oversight and input especially because the Ringwood Superfund Site is complex and has major problems. We believe that capping the site will not work. Capping the site does not mean the groundwater, which moves, will be leaking out of springs from the mountain. The contamination will stay in the ground but could leak out and vaporize. Even the EPA in their Record of Decision said the site could impact the health of the community who live on top of it. Nearby residents say they have suffered from cancers, kidney ailments and other conditions as a result of the pollution.

Contamination from the Ringwood Superfund site has already impacted state land and groundwater. There is a lot of contamination on or leaking into Ringwood State Park and it is not being cleaned up. Toxic chemicals from the site, like 1, 4 dioxane are coming out of springs and fissures into streams that go into the Wanaque Reservoir, which provides drinking water for three million people. These chemicals are going into Mill Brook and Sally Pond in Ringwood State Park. These are C1 streams and Highlands water.

We believe the contamination from the mines going into the streams violates surface water quality standards. It also violates RCRA and New Jersey's own groundwater cleanup standards. It goes against decades of DEP protocol for cleanup. That is why the state must intervene.

We believe there needs to be further investigation in the clean-up of the site. There are other toxic chemicals at the site that EPA has is not regulating like dioxane and benzene that are impacting people. We also believe that there are other chemicals that will impact the health of the community that need further testing by the EPA and others.

The community of people in Upper Ringwood who are living on top of a Superfund site with vapor intrusion and chemicals impacting their health. This pollution is also in an Environmental Justice Community which makes it even more important for the state to intervene for reasons under Governor Murphy's Executive Order 23. There has been a tremendous amount of health problems already from the contamination and it will just get worse if not cleaned up.

We ask that you intervene on the EPA cleanup and prevalent contamination at the Ringwood Superfund Site. The Ramapough community, which is an Environmental Justice community, has suffered from Ford's pollution for far too long. We believe the plan should not go forward the way it is, there are too many problems and flaws. Due to the pandemic, however, the public is focusing on protecting their health and their family's health. The public however should have a chance to comment on this complex plan for the Superfund site which is why there should be an extension. They are concerned for their drinking water and protection of the state.

Sincerely,

Julieann Murphy
New Jersey Resident and Student

Julieann Murphy
[redacted]

From: Amy Boyle Geisel
To: Gowers, Joe
Subject: Ringwood Mines/Landfill Superfund Site Operable Unit Three Region 2 Proposed Plan
Date: Friday, February 14, 2020 2:19:59 PM

Dear Project Manager Gowers:

Thank you for the Public Meeting on 2/10/20. I found it very informative.

As I noted in my public comments, the State of NJ has designated earthquakes as being a 'definite threat' in No.Passaic Co. I refer to Section 5.5 EQ of the 2019 NJ 'All-Hazard Mitigation Plan' (ready.nj.gov/mitigation/pdf/2119/mit2019 39 pages total) with planning tools and recommendations for development in this area. Ringwood, NJ lies within the Ramapo and Rockaway Valley Fault areas and there has been 9 small earthquakes from 12/22/88 to 9/20/16 (Digital Geodata Series DGS 04-1 document). I would ask that these factors be taken into consideration by the EPA when formulating your final plan for the cement, use of fly ash grout and grout ready mix in the above Plan. The Plan needs to provide that all construction materials are of sufficient strength and elasticity that all components will flex and not crack or shift during an earthquake or tremor. Specifically, I ask for consideration to be given to the type of concrete to be used in the Plan. I would suggest the use of reinforcing rebar and welded wire fabric in the cap AND the use of rebar in the Peter Mineshaft side walls.

I note the comments of the one member of the public who spoke at the 2/10/20 meeting and his recommendation NOT to use a cap but a 'head house' above ground and around the shaft – to afford the flow of more oxygen into the shaft ('Mr.Guinan').

My other area of concern is the removal, treatment and return to ground aquifer of 450,000 gallons of contaminated water from the mines and mineshaft. I ask that details of that clean up be itemized in the plan so that the local population can better understand what will be done to that water. I would ask for information about and concerning the equipment that will be used to treat that water – how will that equipment and treatment effort impact the site.

I believe there may be need for greater amounts of ORC's than previously contemplated based upon stated test results and clean up goals. More granulated carbon, more oxygenators will be needed for this unique site based upon the depth of the mineshafts and the percentages of benzene and 1,4 dioxene found.

I ask for updated sediment, ground water and surface water testing before the project is started. I note that the last testing of sediment was in 2014. The last test of potable well water was done in 2018 and the last ground water and surface water samples were taken in Aug.2017. A 2020 baseline in levels of benzene and 1.4 dioxene at the site in the three areas of concern; groundwater/surface water, sediment and potable well water is appropriate.

I ask for transparency in the planning and bidding process. Ringwood residents will want to know

the corp.status and capabilities of vendors who will be implementing the plan. We will want to ensure the financial integrity of any approved vendor and that proper performance Bonds are in place for a project of this size and sensitivity.

Lastly as I stated at the 2/10/20 Meeting – there are segments of our Ringwood community who feel left out and abandoned. I would suggest that another effort be made by the EPA to meet with designated, authorized representatives of the Turtle Clan. Appoint an EPA liaison; perhaps to offer one more effort to address concerns, to test the air and drinking water inside the 48 residential properties. Perhaps to address the cost/capabilities of removing the human remains from the mine/mineshaft – and what would be involved. One last public relations effort in Upper Ringwood would go a long way.

Thank you.
Amy Boyle Geisel
Attorney at Law
[redacted]

From: ackerperson
To: Gowers, Joe
Subject: Pollution
Date: Thursday, May 28, 2020 6:59:25 AM

Why does the EPA allow the poisoning of the waters that feed into the one Accu Reservoir? People's lives are in danger.

Sent from my T-Mobile 4G LTE Device

From: Joanne Atlas
To: Gowers, Joe
Cc: Seppi, Pat
Subject: EPA Proposed Plan Groundwater Contamination at the Ringwood Mines/Landfill Superfund Site in New Jersey
Date: Saturday, August 01, 2020 12:25:16 PM

RE: EPA's Proposed Plan Groundwater Contamination at the Ringwood Mines/Landfill Superfund Site in New Jersey

I write to comment on the EPA's proposed groundwater plan for the Ringwood Mines. I have lived in Ringwood for forty-four years. Little did I know when I moved into town that there was a poisonous presence in our Ringwood community. It was a shock to learn that in the previous decade incredible selfishness, ignorance and greed brought contaminated paint sludge to our beautiful rural area. As you well know, it has on and off, been declared a Superfund Site but sadly, not much has been accomplished other than the surficial clean-up. We need to set things right, now, finally in the 21st century. Sadly, the proposed groundwater plan set forth by the EPA falls way short of setting things right. I refer you to the two Jacobs Reports commissioned by North Jersey District Supply Commission and their recommendations for a pump and treat system. I strongly believe that is the most efficient, effective, and safest way to right this wrong.

Joanne Atlas
Former Mayor, Ringwood, NJ
Former Chair, Ringwood Environmental Commission

From:	Wanda C.Monahan, Esq
To:	Gowers, Joe; Petrone, Ken; Scott Heck - Ringwood (sheck@ringwoodnj.net); Lawra Dodge (ldodge@excelenv.com); Ron Harwood (rharwood@excelenv.com)
Subject:	Borough of Ringwood"s Comments on PRAP for OU-3 at Ringwood Site
Date:	Wednesday, May 27, 2020 3:27:33 PM
Attachments:	ATT00001.txt USEPA LTR-RESOLUTION-COMMENTS 5.27.20.pdf

Joe – On behalf of the Borough of Ringwood, please see attached:

1. Transmittal Letter dated May 27, 2020 from Scott Heck, Manager, for the Borough of Ringwood;

2. Copy of Borough Resolution No. 2020-99 dated March 24, 2020 authorizing submission of the Borough's comments; and

3. The Borough's Comments on the January, 2020 USEPA Proposed Remedial Action Plan for OU-3, Site-Related Groundwater at the Ringwood Mines/Landfill Superfund Site, Ringwood, Passaic County, New Jersey.

The original is being sent to you today via regular mail. Thank you, Wanda

Wanda Chin Monahan, Esq.
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Westfield, New Jersey 07090
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LOGO Smaller

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Linda M. Schaefer
Mayor

John M. Speer
Deputy Mayor

Council Members
Ryan Bolton
Robert A. Ferretti
Jaime Matteo-Landis
Michael McCracken
Kathleen O'Keefe

VIA ELECTRONIC AND REGULAR MAIL

May 27, 2020

Mr. Joseph A. Gowers
Remedial Project Manager
Emergency and Remedial Response Division
USEPA Region II 290 Broadway, 19th Floor
New York, New York 10007-1866

Re: Ringwood Mines/Landfill Superfund Site – Ringwood, New Jersey
Borough of Ringwood's Comments on the January 2020 USEPA Proposed Remedial Action Plan for OU-3 Site-Related Groundwater

Dear Mr. Gowers:

On behalf of the Citizens of the Borough of Ringwood ("Borough"), please accept the enclosed submission from the Ringwood Council and a copy of Resolution No. 2020-99 dated March 24, 2020 authorizing the submission to the U.S. Environmental Protection Agency ("USEPA"), which sets forth the Borough's comments on the January 2020 USEPA Proposed Remedial Action Plan ("PRAP") for OU-3 Site-Related Groundwater the following summarizes the Borough's comments on the Preliminary Remedial Action Plan (PRAP) for the Ringwood Mines/Landfill Superfund Site, OU-3 Site-Related Groundwater dated January 2020.

This submission is made as part of the Comprehensive Environmental Remediation and Cleanup Liability Act ("CERCLA") process providing for an open public comment period for the PRAP, and constitutes "Community Acceptance", one of the several CERCLA criteria mandated to be considered by the USEPA during the remedy selection process.

If you or anyone at the USEPA has any questions about the Borough's submission on the PRAP or would like to meet with the Borough, please do not hesitate to contact me.

Thank you for your consideration of our submission and the concerns and comments expressed by the Borough, as the host municipality, on behalf of our 12,454 residents.

Regards,

Scott Heck, C.P.W.M.
Borough Manager/DPW Director

Enclosures

Resolution Number
2020-99

BE IT RESOLVED that the Municipal Council of the Borough of Ringwood hereby authorize the Borough's Special Environmental Council and Environmental Engineer to submit on behalf of the Governing Body of the Borough of Ringwood comments on the Preliminary Remedial Action Plan (PRAP) for the Ringwood Mines Superfund Site, OU-3 Site-Related Groundwater.

Linda M Schaefer
LINDA M. SCHAEFER, MAYOR

I hereby certify that the above Resolution was adopted by the Municipal Council of the Borough of Ringwood at its Business Meeting of March 24, 2020.

Nicole Langenmayr
NICOLE LANGENMAYR, RMC
MUNICIPAL CLERK

Council Member	Motion	Second	Ayes	Nays	Abstain	Absent
Schaefer	X		X			
Speer		X	X			
Bolton			X			
Ferretti			X			
Matteo-Landis			X			
McCracken			X			
O'Keefe					X	

Borough of Ringwood's Comments on

January 2020 USEPA Proposed Remedial Action Plan for OU-3 Site-Related Groundwater

Ringwood Mines/Landfill Superfund Site

Ringwood, Passaic County, New Jersey

Submitted to:

The Emergency and Remedial Response Division

U.S. Environmental Protection Agency Region II

Submitted by:

Mayor and Council

of the Borough of Ringwood

May 27, 2020

As the host municipality for the Ringwood Mines/Landfill Superfund Site (Site), the Borough of Ringwood's (Borough's) first priority is to ensure the Site is thoroughly investigated and properly remediated for the protection of human health and the environment both in the short and long term, and as such the Borough's objectives are aligned with the U.S. Environmental Protection Agency's (USEPA's) selection of a remedy which will be:

- Protective of human health, environment, community and residents;
- Technically justified and appropriate for the documented risks;
- Can be implemented in a timely manner;
- Does not cause further risk or harm to the environment, residents, existing infrastructure, or the community; and
- Least disruption/disturbance to the community and its residents.

After consultation with its environmental expert, Excel Environmental Resources, Inc. (Excel), the USEPA, New Jersey Department of Environmental Protection (NJDEP), Ford, and Ford's environmental consultant, Cornerstone, the Borough has the following comments:

1.0 Site-Wide Groundwater (inclusive of the PMP Area, OCDA, and CMP Area)

The Borough is in agreement with USEPA's Preferred Alternative for groundwater downgradient of the Peters Mine Pit (PMP) Area and Monitoring Well MW-17 in the O'Connor Disposal Area (OCDA), described by USEPA in the Preliminary Remedial Action Plan (PRAP) as Alternative 3 – In-Situ Treatment with Monitoring in the Peters Mine Pit Area/O'Connor Disposal Area because this remedy is fully protective, will achieve long-term risk reduction with less impact on the community and at a cost less than other protective alternatives. The Borough's agreement is supported by the findings of the Revised Draft OU-3 Site-Related Groundwater Remedial Investigation (RI) (Arcadis, 2015a), the findings of the additional investigative activities detailed in the RIR Addendum (Cornerstone 2018a), the report entitled Assessment Modeling of Potential 1,4-Dioxane (Cornerstone 2017a) which showed using multiple conservative assumptions that 1,4-dioxane would not be detected in the Wanaque Reservoir, and the findings of the Site-Related Groundwater Baseline Human Health and Ecological Risk Assessments (Cornerstone, 2015b/2018 and 2017).

With respect to the USEPA's Preferred Alternative 3 for groundwater downgradient of the PMP Area and Monitoring Well MW-17 in the OCDA, the Borough requests, however, that the agency clearly state in the Record of Decision (ROD) that the remedy is *enhanced bioremediation* consistent with the description of this alternative in the OU-3 Focused Feasibility Study (FFS), therein entitled *Alternative 3 – Enhanced MNA Treatment Barrier in the PMP Area/OCDA* (Cornerstone 2019e). The ROD should accurately reflect the FFS so the public is aware that Alternative 3 does not directly treat the benzene or 1,4-dioxane---instead, it is designed to increase dissolved oxygen (DO) levels in groundwater and add nutrients to enhance the conditions under which indigenous aerobic microbes in the overburden and bedrock aquifers will degrade these constituents either directly or indirectly.

As described in the FFS, Alternative 3 would be implemented using a treatment barrier approach composed of injection wells, also referred to as a "barrier wall", to promote and support the degradation of the constituents of concern (COCs) through natural attenuation processes. **The FFS describes the proposed remedy the details of which will be refined during the Remedial Design phase of the OU-3 Site-Related Groundwater Remedial Action. The Remedial Design phase of work will include a Pre-Design Investigation (PDI) during which additional data collection and analysis can be conducted to enhance the effectiveness of the remedy and achievement of Remedial Action Objectives.**

Note also that because USEPA's Preferred Alternative 3 is a downgradient enhanced biodegradation barrier wall to treat benzene and 1,4-dioxane emanating from the PMP Area, including the Air Shaft, **this remedy should be fully implemented (including installation and sampling of all downgradient sentinel wells), fully operational, and demonstrated to be effective at treating benzene and 1,4-dioxane concentrations in groundwater to acceptable levels before the field implementation of the PMP Air Shaft remedy. The determination that Alternative 3 is effective at treating the COCs to acceptable levels should be based on groundwater analytical data from wells installed downgradient of the barrier wall and surface water data from the Park Brook and other downstream sample locations. The ROD should include this requirement.**

The USEPA's preferred remedy for groundwater in the CMP Area and the Ringwood Mines Site as a whole, in addition to the other specific measures discussed above, is establishment of a Classification Exception Area (CEA) with a Well Restriction Area (WRA) as an institutional control to document any exceedance of the NJ Class IIA Groundwater Quality Standards at any well included in the site-wide groundwater monitoring program. **Consistent with the OU-3 FFS, the details of the long-term groundwater monitoring plan will be determined during the Remedial Design phase of the OU-3 Remedial Action. The Borough concurs with the agency's selection of a CEA/WRA for the CMP Area and Site-Related Groundwater as the preferred remedy to be implemented in conjunction with USEPA's Preferred Alternative 3 for the PMP Area/OCDA and PMP Air Shaft.**

2.0 PMP Air Shaft

The Borough is in agreement with USEPA's preferred alternative for the PMP Air Shaft, described by USEPA in the PRAP as Alternative 3 – Treatment/Closure in the Peters Mine Pit Air Shaft, because this remedy is fully protective, will achieve long-term risk reduction with less impact on the community and at a cost less than other protective alternatives. The Borough's agreement is supported by the findings of the Revised Draft OU-3 Site-Related Groundwater Remedial Investigation (RI) (Arcadis, 2015a), the findings of the additional investigative activities detailed in the RIR Addendum (Cornerstone 2018a), the report entitled Assessment Modeling of Potential 1,4-Dioxane (Cornerstone 2017a) which showed using multiple conservative assumptions that 1,4-dioxane would not be detected in the Wanaque

Reservoir, and the findings of the Site-Related Groundwater Baseline Human Health and Ecological Risk Assessments (Cornerstone, 2015b/2018 and 2017).

Note that, as part of the OU-3 Site-Related Groundwater RI which included evaluation of the PMP Air Shaft, only one sediment sample was able to be retrieved from the base of the Air Shaft. Because 1,4-dioxane was not included in the analytical work scope at the time the RI was conducted, the PMP Air Shaft sediment sample was not analyzed for 1,4-dioxane. As a result, there are no analytical data for 1,4-dioxane in sediment at the base of the Air Shaft. **As part of the PDI for the OU-3 Site-Related Groundwater Remedial Design, the Borough therefore requests that the agency require additional sediment sampling with analysis of samples for the COCs at the Site, including 1,4-dioxane and benzene, and that these data be factored into the final design of the USEPA's Preferred Alternative for the PMP Air Shaft.**

In addition, the Borough requests that the agency address the question of whether the treatment components in the PMP Air Shaft Alternative 3, specifically granular activated carbon (GAC) and resin, such as Dow Ambersorb 560, have been successfully implemented to treat benzene and 1,4-dioxane, respectively, at the base of other mine or air shafts at any other Superfund site, or at any other contaminated site in New Jersey or any other state or region of the country. The Borough requests that the agency respond to these questions in writing prior to issuance of the ROD.

As previously stated, because USEPA's Preferred Alternative 3 is a downgradient enhanced biodegradation barrier wall to treat benzene and 1,4-dioxane emanating from the PMP Area, including the Air Shaft, **this remedy should be fully implemented (including installation of all downgradient sentinel wells), fully operational, and demonstrated to be effective at treating benzene and 1,4-dioxane concentrations in groundwater to acceptable levels before field initiation of the PMP Air Shaft remedy. The determination that Alternative 3 is effective at treating the COCs to acceptable levels should be based on groundwater analytical data from wells installed downgradient of the barrier wall and surface water data from the Park Brook and downstream sample locations. The ROD should include this requirement.**

3.0 REFERENCES

ARCADIS, U.S., Inc. 2015a. Revised Draft Site-Related Groundwater Investigation Report. Ringwood Mines/Landfill Superfund Site, Ringwood, New Jersey. January.

ARCADIS, U.S., Inc. 2015b. Site-Related Groundwater Baseline Human Health Risk Assessment. Ringwood Mines/Landfill Superfund Site, Ringwood, New Jersey. May.

ARCADIS, U.S., Inc. 2017. Site-Related Groundwater Ecological Assessment. Ringwood Mines/Landfill Superfund Site, Ringwood, New Jersey. March.

Cornerstone. 2017a Assessment Modeling of Potential 1,4-Dioxane Transport. Ringwood Mines/Landfill Superfund Site, Ringwood, New Jersey. September.

ARCADIS, U.S., Inc. 2018. Site-Related Groundwater Baseline Human Health Risk Assessment. Ringwood Mines/Landfill Superfund Site, Ringwood, New Jersey. May.

Cornerstone. 2018a. Site-Related Groundwater Remedial Investigation Report Addendum. Ringwood Mines/Landfill Superfund Site, Ringwood, New Jersey. October.

From: Thomas Conway
To: Gowers, Joe; Seppi, Pat
Cc: Lopez, Peter
Subject: Ringwood Mines/Landfill Superfund Site Comments (OU3)
Date: Monday, May 04, 2020 4:46:00 PM

Comments on the Proposed Cleanup Plan to Address Groundwater Contamination at the Ringwood Mines/Landfill Superfund Site

Mr. Gowers:

First, I am shocked that the comment period was not extended again. I realize that another extension would be very unusual, but these are unusual times. Please forgive any errors and the lack of sources cited.

Ringwood is surrounded by parks and as the Environmental Chair; I have had to spend considerable time dealing with the ATV invasion brought on by park closures. I fight every day to keep my business running while also trying to responsibly provide for my family. Needless to say, I have not been able to find the time to prepare proper comments for the terrible plan the EPA has proposed for the Groundwater. It is unconscionable for the EPA to keep this timeline in light of the worldwide catastrophe that is tying up many resources. Unfortunately, it does continue a pattern of the EPA trying to mute the public and close this Superfund site. Even the meeting in February was given very short public notice.

Your April 1 letter says: "To view the EPA's proposed plan for the groundwater and mine water at the site, please visit www.epa.gov/superfund/ringwood-mines". This link goes to a page that does not exist. The incompetence by the EPA is so profound that it seems intentionally misleading.

I believe this plan has major shortcomings. Without the time to fully expound on them all, I am forced to jot down this quick summary.

1. The EPA methodology does not seem to account for people living above this entire area. I would like to see more research on vapors from the contamination.
2. Phytoremediation seems ideal for groundwater remediation. Why is this not being tested or even proposed? This is the perfect site for phytoremediation.
3. The monitoring wells may not work. The EPA says it cannot determine the source of the contamination, yet it will setup monitoring wells. Seems like double speak. The source is Peter's Mine and it should be pumped and treated.
4. We have no idea what is below the airshaft in the mines. The alternatives discussed for cleaning the airshaft are equivalent to cleaning a cove in a lake. Your reports indicate 50 gallons of water an hour move up and out of the airshaft. Clearly there are millions of gallons of tainted water below this grade and you are only modeling for the amount in the airshaft.
5. No one knows the water pathways there. That's a fact. Yet you write that the monitoring wells will be sufficient. This is a shot in the dark or worse, just scraping the surface.

6. Is there any concern that bedrock aquifer wells will create new pathways for the water to reach the surface?
7. The report correctly acknowledges that oxygenation will help naturally attenuate some of the contaminants. Is there a risk that some of this may escape in gaseous form and hurt the residents?
8. The water patterns are unknown. Five years between monitoring events seems too long.

Please extend the comment period. We need more time to fully review this proposal. This is a decades-long Superfund site and it seems rushed to force this solution through during the Covid19 crisis. This would be a new low for the EPA at this site and the EPA has already shot through the floor a few times.

Regards,
Thomas Conway
Chair, Ringwood Environmental Commission

From:	Kathleen O"Keefe
To:	Gowers, Joe
Cc:	Seppi, Pat
Subject:	RE: EPA's Proposed Plan Groundwater Contamination at the Ringwood Mines/Landfill Superfund Site in New Jerswy
Date:	Sunday, August 02, 2020 1:51:07 PM

I write to comment on the EPA's proposed groundwater plan for the Ringwood Mines.

I moved to Ringwood in 1995. At that time Ringwood had been removed from the State list of Superfund Sites. Sadly in 2006 it was relisted.
The relisting of Ringwood among the nation's 1,246 Superfund sites was an acknowledgment by the E.P.A. that the site had not been sufficiently cleaned up when it was removed from the list. Ford through their dumping have contaminated a sole source aquifer in the "protected" NJ Highlands.

This time the EPA needs to get it right! The proposed groundwater plan set forth by the EPA falls short of accomplishing this goal. The two Jacobs Reports commissioned by North Jersey District Supply Commission recommends a pump and treat system. This is the most efficient, effective, and safest way to right this wrong.

Upper Ringwood is a minority community and they have lived here for generations. In the past the local government has treated this community with disrespect, disregarding their physical and emotional wellbeing. This injustice is a direct result of the systemic racism inbred into past government's decisions.

The Upper Ringwood Community have been locked out of all decision-making regarding the remedy of the Superfund Site. The community was promised that this time their concerns and fears, which were ignored during the first listing, would be paramount this time around. Sadly this is not the case, once again the most important stakeholders have been ignored.

The community does not support the EPA's proposed groundwater plan and neither do I! It's time the EPA did what was right for both the community and the 3.5 million residents who rely on the Wanaque Reservoir for drinking water. Implement a pump and treat system since this is the most efficient, effective, and safest way to right this wrong.

Sincerely,
Kathy

Kathleen O'Keefe
Ringwood Councilwoman
kokeefe@ringwoodnj.net
[redacted]

Further Comments to EPA on the Ringwood Mines/Landfill Superfund Site Operable Unit Three Proposed Remedial Action Plan

Michael R. Edelstein, Ph.D.

Please consider these comments an amendment to my previous testimony at the Public Hearing and submitted on February 10, 2020. I received a reply from Patricia Seppi on May 25 sharing preliminary responses to issues I have raised previously and renew here. I will take this opportunity to rebut EPA's preliminary response in an added final section.

Comments of Michael R. Edelstein, Ph.D.

Beginning with Love Canal---the disaster that spurred the creation of Superfund---I have spent more than forty years working as an Environmental Psychologist on the basic question of how environmental contamination affects people---their emotional life, the way they live their daily lives and their understanding of their health, environmental safety, security of home, sense of control over the world and trust in others. And I have studied issues of environmental justice since before the term was coined. I am currently preparing the third edition of my book *Contaminated Communities* (forthcoming on Routledge/Taylor and Francis), which has been called the classic in this field.

I have been aware of the Ford contamination of Upper Ringwood and adjacent areas of the Ramapo Mountain region for some 45 years. I engaged in research in Upper Ringwood more than 15 years ago. In 2006 and 2014, I involved my senior capstone Environmental Assessment course in intensive research on the Superfund and Environmental Justice impacts there. I have given testimony previously on the insight of these projects into the impacts for residents from the contamination and Superfund activities. My 2020 class is similarly engaged. Our current project relates to my testimony today.

One of the concepts that made a profound impression on me from my work on contaminated communities is that of Habitability, which I first confronted in New York State's assessment of hazards at Love Canal. Habitability asks the ripe question: When is an environment just too contaminated, too downgraded and too dangerous to permit continued human habitation?

Based upon my observations of the impacts of the Ford contamination on the Native American community in Upper Ringwood, it is my opinion that habitability is a key question to be addressed through the current Superfund process, yet it has not been to date addressed.

Authority exists under Superfund to address habitability. EPA is broadly authorized to take actions that protect human health and the environment. Under the

Furthermore, based upon my forty plus years as an expert on the topic, it is my opinion that Upper Ringwood is not habitable and that uninhabitability must be addressed as part of the current Superfund process.

Said another way, the health, wellbeing and restored way of life of Turtle Clan residents and other residents will not be achieved through the current RIFS process. Just as the failed first Superfund "cleanup," the work on all the operable units in Upper Ringwood, if completed as currently contemplated, will fail to make Upper Ringwood habitable for current residents, most of whom are Turtle Clan members.

It is time to recognize that the above restoration cannot be achieved in Upper Ringwood, which has been rendered uninhabitable by Ford's and Ringwood's actions and by its mining legacy. A grave and unacceptable injustice is being perpetuated by any RIFS process that ignores this fact.

Habitability is an issue relevant to all phases of this Superfund cleanup. However, it has not been considered, per se, regarding any of the operable units or phases of this Superfund RIFS process. This oversight must now be remedied before final actions are determined for the final phase of this process. The inclusion of this consideration in the current Superfund process in Upper Ringwood is made possible because remedial activities in the first operable units has not been undertaken and the current consideration of remedial actions for operable unit three is still ongoing.

Concurrent with my opinion on uninhabitability, it is my expert opinion that an Environmental Injustice is being perpetuated and that EPA has failed in its obligations under Executive Order 12898 to properly assess and address the injustice done to Native American residents of Upper Ringwood. They have lived with Ford toxic wastes dumped right in their community for more than 50 years and have lived along and even atop an active Superfund site since 1983 as well as surrounded by additional hazards not included in the Superfund boundaries.

I need only cite the sham Environmental Justice report issued by EPA for this site. The report first erred by assuming that disproportionate impact could only be shown through significant epidemiological health findings, as if all other types of impact were irrelevant. It then concluded that inadequate research had been undertaken to establish such impact and therefore that no finding of environmental injustice could be rendered. [1]To cite the report:

> *Report and Recommendations*
>
> *The Ringwood EJ Assessment concluded that based on evidence and supporting data the Ringwood Mines community is an adversely impacted area. However, given the current limitation of localized health information about community residents, the area cannot be satisfactorily distinguished in order to perform a comparative assessment in determining whether a disproportionate impact (environmental injustice) had occurred or exists. A refined EJ assessment, including cumulative and risk assessments, would need to be performed for this purpose. Community health data proposed to be collected in the future by the New Jersey Department of Health and Senior Services and the Agency for Toxic Substances and Disease Registry will assist EPA in furthering the EJ assessment.* U.S. Environmental Protection Agency Region 2 Environmental Justice Assessment for the Ringwood Mines/Landfill Area (PASSAIC COUNTY, NEW JERSEY), Final, July 2013, p. 2.
>
> *EPA has received information from residents who believe that they and/or their family members have a variety of illnesses (including cancers) believed attributable to the environmental effects emanating from the presence of paint sludge and the ongoing remediation activities occurring in the area. Further, these claims have been referenced in several news sources that have conducted investigative research into the environmental and health conditions of the residents.*

[1] The EJ report also errored in using the ELP model, which relied on three criteria largely irrelevant in this context and, thus, revealed little.

To address these claims, ATSDR has been working with the New Jersey Department of Health and Senior Services to conduct a new public health assessment for residents of the impacted community. Upon its issuance, the health assessment report will be useful in establishing future health strategies and campaigns to combat the effects and illnesses observed in the area. However, for purposes of this assessment, the lack of data to support/reference a community's health condition limits the ability of the assessment team to ascertain whether the adverse health effect is disproportionate and high (i.e., an environmental injustice). Ditto, p. 10.

RECOMMENDATIONS

The Ringwood EJ Assessment Team has concluded that there is evidence that the Ringwood Mines community is an adversely impacted area. However, given the current limitation of localized health information about the community resident population, the area cannot be satisfactorily distinguished in order to perform a comparative assessment in determining whether a disproportionate impact (environmental injustice) has occurred or exists. A refined assessment, including cumulative and risk assessments, would need to be performed for this purpose. Community health data proposed to be collected by the New Jersey Department of Health and Senior Services and the Agency for Toxic Substances and Disease Registry in the future will assist EPA in furthering the EJ assessment. Ditto P. 15

EPA encourages the collection of state/local government health data to further refine the Environmental Justice Assessment of the Ringwood Mines / Landfill site. On May 1st, the NJ Department of Health and Senior Services and the Agency for Toxic Substances and Disease Registry released for public comment a draft Public Health Assessment (PHA) for the Ringwood Mines / Landfill site. One recommended activity of the draft PHA includes conducting an exposure investigation of the Ringwood Mines population. Further, the draft report recommends that concurrent testing of indoor dust and soils close to homes be performed. The collection of specific local health and environmental data, as noted above, will serve as a critical component for establishing baseline (reference) data for the Ringwood Mines community. Such data, when made available, will be useful for the purpose of properly analyzing whether a disproportionate burden exists for the Ringwood Mines community in comparison to another area. Ditto p. 16.

The promise of a definitive study was never delivered on. Now, in 2020, six years after the dismissal of disproportionate impact on the basis of inadequate data, no additional research has occurred to address this inadequacy. EPA and its partners at ATSDR and NJDOH have had ample time to thoroughly study Upper Ringwood's population.

Furthermore, as noted above, there is EPA's limited view of disproportionate impact. As an assessor of Psycho-Social Impact, I do not agree that physical health data should be the sole basis of disproportionate impact. Even in communities where physical health effects due to the contamination go unproven, highly significant psychological health impacts are routinely found. We certainly see this with our current Pandemic. Even without becoming sick, global populations are affected by a whole host of impacts of grave significance. Just as we are beginning to understand that not every population is impacted equally, we can by comparison understand that Turtle Clan members residing in or driven from Upper Ringwood have been disproportionately affected by virtually every measure.

A case in point, the EJ study reviews the history of the tribe, noting at one point that the historical "*mountain people made due with what they had and cultivated their own gardens, and hunted and fished for food*." Ditto, P. 11. Yet, there is no acknowledgement that, as a native people, the Ramapough-Lenape remain a natural resource community. And the contamination of their homeland by Ford and others creates a disproportionate impact compared to non-natives who often view and use the land differently. The failure to provide this assessment helped EPA to allow a last-minute revision of the cleanup plan for the O'Connor landfill, overturning a remedial plan to remove wastes and restore a clean and nature landscape suitable for foraging and other activities. Instead, the site will now receive superficial cleanup, with wastes capped rather than removed. Ringwood will move its recycling center, down the road in Upper Ringwood, to the capped site. The O'Connor site is in the heart of the community. It will now be a waste industry site going forward rather than restored nature. EPA concluded that Ringwood had the right to make local land use decisions. But it never considered in any way the adverse impacts of this reversal. Ringwood also do not consider them. They and Ford saved substantial money by reducing the cost of cleanup while the community suffered the "perpetual jeopardy" of being treated as a waste land. The reversal on this remedial action sealed the deal on finding the community uninhabitable.

Additional limitations of the currently planned "cleanup" and remedial investigation further support this conclusion of uninhabitability. Included are these points:

I would posit, first off, that a community constructed atop a maze of abandoned mine shafts where sinkholes actively form has an issue with habitability. This has been borne out by one death and many close calls from sinkhole formation. Even had Ford waste never come here, habitability would be marginal.

Secondly, however, when those mine shafts have been, are and will remain filled with toxic contaminants, another notch against habitability occurs. This has been borne out by the heath and death rates in the community.

Third, an incident in February witnessed by my colleague Chuck Stead underscores the uncertainties about site conditions that remain even after the remedial investigations. Activity on the O'Connor Landfill site by a Ford contractor released unexpected hazardous exposure when equipment hit an unknown mine shaft. This is just one piece of significant new information about hazards that must be considered. It may not be safe to leave contaminants in situ at the site below a heavily used recycling center. And the discover underscores the potential unknown habitability threats for residents remaining in the community.

Fourth, other new data emerges from research done by NYU professor Dr. Judith Zelikoff made public in a February community meeting and other data to be disclosed. This data suggests additional sites of contamination and additional contaminants affecting habitability of the area.

Fifth, Given the question of habitability, RI/FS studies should have considered a relocation strategy for the Ramapough Turtle Clan and other residents. It was deficient in not doing so. This assessment must now be made. My Environmental Assessment class in 2014 examined this issue, concluding that relocation was warranted. My current 2020 class is assessing a plan for that relocation. Their work will be available later this month.

Sixth, if the population were relocated, it would continue to be a significant concern that an underground reservoir of contaminants exists upgrade of the Wanaque Reservoir. Half a million people depend on this drinking water source. Given the inability to treat such contaminants as 1,4 dioxane and the ever-increasing acknowledgement of linear theory concerns about the hazards of small dose exposures, it may not be sufficient to assume that dilution is an adequate solution to pollution.

Seventh, climate change, which according to the National Climate Assessment has already unleashed a condition of heavy rainfall and flooding in our region, predicted to significantly worsen over time, raises the question of whether remedial choices made assuming old conditions will stand up to future conditions. A reanalysis considering these issues is necessary.

Eighth, if the population were relocated from Upper Ringwood, the major impediment to a full remediation of the mines would be removed. Once the potential harm to residents was removed, consideration of full removal of all dumped materials from the site could then become the remedial choice.

Ninth, the extreme proximity of trails in the Ringwood State Park to the Superfund site further augers for a comprehensive and full cleanup beyond that proposed in order to protect park users and the integrity of these preserved lands.

Tenth, in sum, neither the preferred alternative nor any of the considered alternatives address the core issues of habitability and disproportionate impact. In addition, long term protection of water resources and safety of recreationalists must be considered.

With my students, I am currently working on a plan for relocation for the Turtle Clan members that would keep the community together within their traditional lands while restoring their access to a safe environmental surround conducive to foraging, gathering and fishing important for cultural practices and subsistence. This relocation is intended to give this community a chance to thrive and to look forward to a healthy and positive future, something cruelly denied for sixty years by the actions of the PRPs. Our report can be added to the record if the submittal deadline is extended.

As a student of Superfund, I know that relocations have not been common since the early pre-CERCLA experiences at Love Canal, Times Beach and Centralia. The question of habitability raised by NYDOH after the Love Canal dust settled was instructive in requiring a new round of relocations (although other areas were reevaluated as habitable). It is instructive, then, that a very recent decision by EPA regarding an arsenic contaminated community in Kent, NY called for relocation of some residents. Precedents exist for a de facto conclusion of uninhabitability and subsequent relocation. In keeping with EPA's obligations in working with recognized native groups, full consultation would be required in decisions involving this relocation. Our current work with the Turtle Clan incorporates an assessment of a relocation site selected by Chief Mann. It is our view that such a relocation is both warranted and feasible, as well as just. Furthermore, it is appropriate to have it funded by the PRPs who created the conditions of uninhabitability to begin with.

In conclusion, the issue of habitability must be fully assessed before a remedial plan can be approved, including specifically the fair and just relocation for all Upper Ringwood residents as a requirement of this Superfund cleanup. The remedial alternatives put forth are fatally deficient for this reason.

Moreover, there is ample evidence that Upper Ringwood is uninhabitable and that a grave environmental injustice has been excluded from the record by EPA's inadequate assessment. EPA needs to do a realistic habitability assessment and do a full EJ assessment as part of the current Superfund process. The potential for relocation of inhabitants of Upper Ringwood, specifically the members of the Turtle Clan, should be considered and included in any final order on consent for this Superfund site. In my expert view, it should also be a required as a condition of any final Order.

Rebuttal of EPA's Rebuttal found in the Seppi email of May 25, 2020

In her note to Judith Sullivan and myself on May 25, Pat Seppi set forth what is in effect a rebuttal of my previously submitted comments, renewed above. I make these points.

1. With regard to the Kent proposed relocation, there are certainly differences between these cases. However, ATSDR or New Jersey's department of health have never done comprehensive health studies in Upper Ringwood. The issues that I referred to above as establishing a situation of non-habitability have never been addressed.
2. Furthermore, while Kent residents would be relocated because houses are in the way of remedial construction, in Upper Ringwood, residences are sitting over the contamination in the Peter's Mine. The remedial strategy has been to leave contaminants in the mine. If removal of contaminants was undertaken, then that part of the community might be in the way.
3. That said, the decision to leave contaminants in Peters Mine reflected the cost benefit of attempting to seal them in place versus removal, considering such factors as difficulty of removal and the need to truck out the contaminants, with secondary impact. Potential subsidence may have also been a factor. But it did not factor in the fact that the community in Upper Ringwood remains at risk whether contaminants are left in situ or removed. Thus, the preferred alternative was reached without considering the issue I raise of habitability. I believe that a full review of whether or not it is safe to leave the community in place would result in a decision for relocation in Upper Ringwood. EPA has an obligation to undertake this assessment.
4. I discuss above the last-minute flip on the remediation of the O'Connor Landfill which similarly leaves hazardous materials in situ rather than removing them and nixes the promised restoration to original habitat of that portion of the site. Again, proximate residents are left in an environment where exposure pathways may persist despite the remediation. Certainly, a degraded environment is perpetuated in all facets of this remedial plan.
5. My analysis of the EPA Interim Policy on Relocation contained language that fit the Ringwood Site clearly. When I went to cite it directly in this letter, I discovered that the site had been taken down.[2] EPA's penchant for removing websites is an obstruction to the public and countermands its requirements for transparency and information sharing. Is there a new policy? How does it differ from the old? Or is there now no policy?
6. Fortunately, I had copied it. The Interim Policy speaks to the legitimacy of relocation in Upper Ringwood. The primary determining factor shown in the Relocation policy is protection of human health and environment. The question of physical health impact to the community has

[2] EPA Interim Policy on the Use of Permanent Relocation, which the Seppi letter indicated "can be found at https://semspub.epa.gov/work/HQ/174832.pdf."

never been resolved despite this being the second Superfund process for the site and promises of definitive health study that have neve materialized. The Turtle Clan documents and asserts adverse health effects. And new work done by NYU and NJIT shows exposure pathways not considered by the agency. The fact that the first Superfund action in Upper Ringwood was shown to be a failure to the point the Agency relisted the site demonstrates a continuing record of the agency failing to protect a community that has now lived with the contamination for some 60 years. Psycho-Social Impacts are direct contributors to health impacts as well as factors relevant to the wellbeing, quality of life and health and well-being of affected residents. The record of adverse Psycho-Social Impact to this community is devastating. And the living conditions after the proposed remediation to do alleviate these problems. With the relocated recycling center, they may even exacerbate them.

7. That raises the fact that this site achieves another criterion for relocation, as stated in the interim policy. “Permanent relocation may be considered when EPA determines that potential treatment or other response options would require the imposition of unreasonable use restrictions to maintain protectiveness (e.g., typical activities, such as children playing in their yards, would have to be prohibited or severely limited).” Left living on a mine site known for subsidence and loss of life, the mines filled with in-situ contamination, no restoration of areas where the native community can exercise its native way of life, movement of a recycling facility to the deepest point of community adding traffic and other hazards, and the need to navigate a community that remains in an area where other contaminants may be found or may escape from the in situ sites, Upper Ringwood meets this criterion.
8. Pat Seppi comments that EPA does not do Psycho-Social Impact analysis. NEPA, in requiring Social Impact Assessment, provides a basis for including Psycho-Social Impact Assessment, a type of SIA. As I have repeatedly documented over the past forty or more years, a PSIA is required if the assessment is to include an analysis of how people in the affected community has been, is being and will be impacted. The fact that EPA does not include PSIA in its work is not something to brag about. In fact, it is a deficiency that helps account for frequent public dissatisfaction that their needs and concerns are not adequately addressed by Superfund. I do not just say this rhetorically but based on years of research that include studies of the effectiveness of Superfund and of the adverse Psycho-Social Impacts of Superfund process and remediation. EPA neither assesses these impacts nor addresses them. It is time the agency fixes this deficiency.
9. Towards this end, it is instructive that the Interim Policy on Relocation discusses a stakeholder study undertaken for EPA of residents living near Superfund sites. Beyond wanting health issues to be a key criterion for relocation, “In addition to health effects, stakeholders recommended that relocation be considered whenever the site has a negative influence on the residents’ quality of life. Stakeholders provided anecdotal information about residents who curtailed all outside activities (e.g., allowing children to play outside, socializing outdoors, or opening windows) because of their fear of living near a Superfund site.” In short, second only to physical health concerns are Psycho-Social impacts which contribute to non-physical health concerns, as well. PSIA is a path to identifying these impacts and the health consequences.
10. In sum, I stand by contention that Upper Ringwood is not habitable, even with and in part because of the remedial actions identified in the Superfund process. When this second attempt at a Superfund Cleanup is completed, the resident population will remain at unreasonable risk.

11. It is incumbent on EPA to do the necessary health and Psycho-Social Assessments or to just err on the side of caution and offer relocation to the community.
12. In conjunction with the Turtle Clan, a plan of relocation has been redeveloped making the process of developing and carrying out a relocation highly feasible.

From:	Shannon Lisa
To:	Seppi, Pat; Gowers, Joe
Cc:	jeff.tittel@sierraclub.org; rspiegel@edisonwetlands.org; chiefmaanis; Kaitlin McGuinness; Zach McCue; Doug Ruccione; Wenke Taule; Joseph, Towana; Environmental-Justice; Robin Canetti; Jonathan, Grant; OIG WEBCOMMENTS; Prince, John; Mugdan, Walter; Dwaine Perry; Walt Van Dunk; Luanne DeFreece; Judy Sullivan; [redacted] ONeill, James; Scott Fallon; Chuck Stead; Jan Barry Crumb; Jan Barry Crumb; Jan Barry; Don Torino, President, Bergen County Audubon Society; Debra Manfredonio, President, Skylands Botanical Gardens Association; dje@tlc-nj.org; Auth, Asm. D.O.; sencardinale@njleg.org; julia@NJhighlandscoalition.org; Bob Gordon; Sen. Diegnan
Subject:	Ringwood OU3 Proposed Plan Comment Period Extension Request
Date:	Wednesday, June 03, 2020 12:28:37 PM

Mr. Joseph Gowers, Remedial Project Manager
Ms. Pat Seppi, Community Involvement Coordinator
U.S. EPA, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866

June 3, 2020

Dear Mr. Gowers and Ms. Seppi,

We are writing to demand the EPA to extend the comment period for the Ringwood Proposed Plan by at least 60 days. Since the previous extension, the State of New Jersey continues to have active restrictions on both mobility and access to public buildings as part of the COVID-19 emergency response, and as such, the immediate Ringwood community and other stakeholders have continued to be severely limited in their ability to fully participate in the comment period under its current deadline:

(1) Ringwood reference documents-repositories, such as the Ringwood Public Library, which residents have been directed by EPA to go to access key information on the EPA's activities at the Ringwood Mines/Landfill Superfund Site, have remained (and continue to remain) closed over much of the comment period.

(2) The Ramapough Lenape Nation families and Ringwood community as a whole have experienced serious illness and loss of members of their community because of the COVID-19 crisis, on top of the already decades-long human health concerns from the Site-related contamination.

(3) As you know, the Ringwood Site is unique in that it is the first site to be listed on the National Priorities List (NPL) twice, due to government failures at all levels to address principal threat wastes that continued to pose an unacceptable risk to human health. There are at least twice the amount of official documents in both the Administrative Record and in the over ten years of Community Advisory Group (CAG)-related files, that the community must be afforded an appropriate time to access and review.

Edison Wetlands Association has continued to work during this time to prepare and disseminate information on the Site to Ringwood families, especially those who do not have reliable internet or computer access to review the materials online. Our organization, however, has also been delayed because of COVID-19 in getting the three technical advisors' reviews of EPA and Ford documents uploaded online, which will be crucial for the community to review. The extension must also be granted because we, as does the community, must be able to review the revised Consent Decree and the Proposed Plan in context of the Borough missing its statutory timelines relative to the O'Connor Disposal Area (OCDA). This missed timeline should have automatically triggered the Borough being required to go with the EPA plan outlined in the original ROD.

EPA cannot move forward with ending the comment period on June 3rd in the midst of inherent restrictions on accessing the very public participation resources EPA promotes in its

own Proposed Plan; it is a serious dereliction of EPA's community involvement statutory requirements under CERCLA. The community's participation should be the highest priority, given the significant time adjustments and considerations that were afforded to the responsible parties during every stage of this process; most notably, the derailing of EPA's original remedial plans submitted to the National Remedy Review Board for the site (full cleanup of the OCDA) due to the Borough's last-minute and deceptive recycling center proposal.

EPA must extend the comment period by at least 60 days, then re-evaluate at that time if continued government restrictions and/or force majeure events require any additional time or resources be provided to the community stakeholders. Failing to extend the comment period violates the spirit of the community involvement statute if not the actual regulations within CERCLA. EPA needs to take the community's environmental justice designation into strong consideration during these unprecedented times so that this disenfranchised community and extended stakeholders may have meaningful participation in the decision-making process.

These last several weeks as well as the preceding several months of this year have exposed the inherent racism within our government at all levels, especially our national government. **The issue of systemic environmental racism has been a major factor in the decision-making processes at the Ringwood Site, being recognized by both the U.S. EPA and State of NJ.** Therefore we are asking EPA to also convene a special tribunal within Washington D.C. to review the complete Administrative Records on this Site and bring it back before the NRRB, because the Ramapough Lenape Nation has been subject to racism that has permeated many cities of the United States, and their leadership has expressed on multiple occasions that this has led to the wholesale genocide of their culture.

Please distribute this to all members of the Ringwood Community Advisory Group, within all management of Region 2, as well as the National Remedy Review Board. Please also confirm receipt of this document as well as a response to the requests herein.

Respectfully,

Robert Spiegel
Executive Director
Edison Wetlands Association
Tel: (732) 321-1300

Shannon Lisa
Program Director
Edison Wetlands Association
Tel: 732-882-2451

From: Andrew Herrera
To: Gowers, Joe
Subject: Public Comment on Ringwood Mines Proposal
Date: Tuesday, June 16, 2020 2:59:20 PM

Mr. Gowers,

I am writing to urge you to arrange for the Ramapough Turtle Clan to be moved to Tranquility Ridge. The history of contamination in the area of Ringwood in which they currently live has traumatized generations of Ramapough and other residents. They will never be able to view this land as safe to inhabit, and the current plan to merely cap the toxic sludge confirms this. Capping the sludge in the mines will not prevent it from contaminating underground pools and streams of water in the cavernous mines, which means they can still infiltrate into larger groundwater reservoirs. The EPA has already erred once in preemptively removing the Ringwood Mines site from the Superfund list, and I share the Turtle Clan's fears that it will fail to remediate them again. Please provide the Turtle Clan the resources they require to relocate to Tranquility Ridge.

Thank you,
Andrew Herrera

Jacobs

Memorandum

Subject	**Ringwood Mine Superfund Site – Review of EPA Proposed Plan for Operable Unit Three (OU3)**
Attention	North Jersey District Water Supply Commission
From	Jacobs Engineering
Date	March 6, 2020

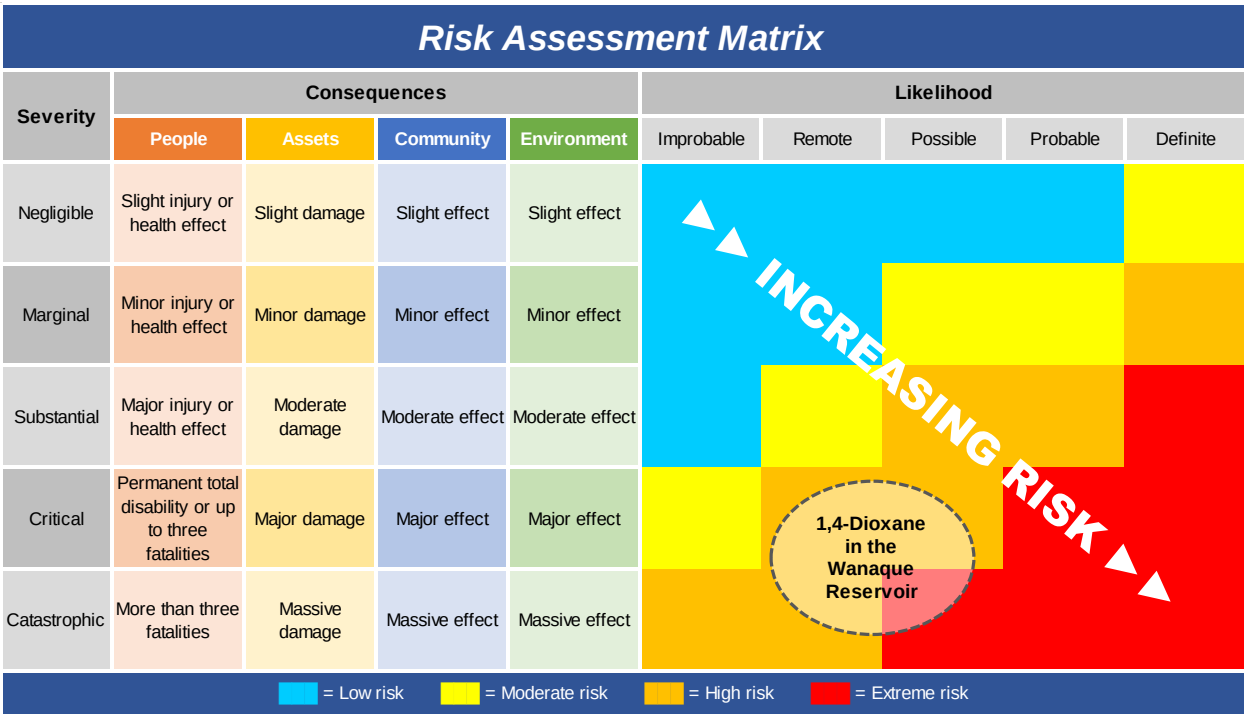
1. Background

The North Jersey District Water Supply Commission (NJDWSC) requested that Jacobs review the U.S. Environmental Protection Agency (EPA) Proposed Plan for *Ringwood Mines/Landfill Superfund Site Operable Unit Three* (EPA 2020). Previously for the Commission, Jacobs prepared a fate-and-transport report (Jacobs 2017) recommending modifications to EPA's strategy at the site and provided comments (Jacobs 2019) on the draft OU-3 focused feasibility study (Cornerstone 2018). EPA issued the Proposed Plan in January 2020, held a public meeting on February 10, 2020 that Jacobs attended, and is accepting comments no later than April 2, 2020.

1.1 Risk to the Wanaque Reservoir

If 1,4-dioxane from the Ringwood Mine/Landfill becomes detectable in the Wanaque Reservoir, drinking water obtained from the reservoir would be affected. Depending on the levels, this could put the major water supply at risk for three million people. If the levels are sufficiently high, the Commission would be compelled to stop distributing water until a treatment could be implemented to prevent the adverse health effects for the residents of Northern New Jersey. In the short term, bottled water would likely need to be distributed.

A qualitative perspective regarding these risks is offered by considering the widely used Risk Assessment Matrix, a version of which is included below. The matrix considers the likelihood of an event versus the severity of the consequences to people, assets, the community, and the environment, and the matrix presents an overall assessment of risk as low, moderate, high, or extreme. The perceived likelihood of detectable 1,4-dioxane eventually occurring in the Wanaque Reservoir in the absence of effective treatment may be somewhere in the range of remote to possible, which might be taken as an indicator of low risk, but the severity of the consequences, enumerated above, lie in the realm of critical to catastrophic for people, assets, and community institutions, and push the overall risk to high or extreme. This level of risk is a compelling argument in favor the implementation of a proven remedy such as pump-and-treat (see Jacobs 2017) rather than taking a wait-and-see approach, which appears to be the case with the Proposed Plan, as discussed below. This memorandum advocates, at a minimum, augmentation of the Proposed Plan to provide early warning and rapid mitigation of increased 1,4-dioxane flux from the site.



1.2 Proposed Remedies

EPA is recommending the following plan for addressing groundwater impacts from benzene and 1,4-dioxane and preventing future migration of site contaminants to the Wanaque Reservoir:

- **Site-Wide Groundwater:** Alternative 3 In-Situ Treatment with Monitoring is the preferred remedy; passive wells containing socks or canisters of an oxygen-releasing compound (ORC) are to be installed in overburden downgradient of the area where 1,4-dioxane-contaminated groundwater is flowing upward from the bedrock. Wells 20 feet apart are intended to create a 400-foot treatment fence (termed a barrier in the Proposed Plan, but it doesn't block anything) perpendicular to southward flowing groundwater in the overburden. The resulting zone of oxygenated groundwater would promote intrinsic biodegradation of 1,4-dioxane and thereby prevent it from reaching surface water approximately 200 feet downgradient that drains via Park Brook to Sally's Pond (Ringwood Mill Pond) 4,000 feet to the southeast and eventually to an arm of Wanaque Reservoir an additional 4,000 feet to the south-southwest.
- **Peters Mine Pit Airshaft:** Alternative 3 Treatment/ Closure is the preferred remedy; the airshaft is to be backfilled with grout and sealed with a concrete cap. Granular activated carbon (GAC) and resin placed in angular stone backfill beneath the grout would adsorb and thereby immobilize a portion of the benzene and 1,4-dioxane contamination in the mine water.

1.3 Conceptual Model

The EPA conceptual model underpinning the proposed remedies, implicit in the Proposed Plan, assumes that benzene and 1,4-dioxane originate from diffuse sources within the trash and industrial waste that

Ford Motor Company disposed of in the 90-foot deep Peters Mine pit from 1967 to 1971. The pit was filled to ground level but subsequent settling to below the water table has resulted in the formation of a pond. Waste drums could have released their contents immediately if perforated during emplacement or after a few years as they were perforated by corrosion. In any case, this source term is generally stable as shown in the consistent contaminant concentrations in monitoring wells and the airshaft, although anomalously high concentrations were seen in September 2014 and March 2015 in the airshaft and a well adjacent to the pit.

Benzene and 1,4-dioxane leave the pit primarily via groundwater flowing through fractures in the bedrock. This flow has an upward component, and the contaminated groundwater enters the unconsolidated soil overburden within approximately 300 ft. Benzene dominantly biodegrades during that advective transport but has still been found in seeps near the mine pit. It has been found rarely in nearby Park Brook and is presumed to be rapidly degraded in aerobic surface water. 1,4-Dioxane is more persistent and has been detected in surface water samples from brooks and ponds near the site and as far downstream as Sally's Pond near the point of inflow from Park Brook. 1,4-Dioxane is believed to biodegrade slowly under aerobic conditions and is also subject to dilution and dispersion as it is transported in groundwater and surface water.

2. Concerns Regarding the Conceptual Model

The principal concern regarding the conceptual model for contaminant migration is the validity of the steady-state assumption, e.g., that the distribution of contaminants seen in the recent past will continue to be seen in the future. Justification for this concern is provided by the substantially elevated benzene levels observed in groundwater adjacent to the Peters Mine Pit in September 2014 and March 2015, with spikes of 88 µg/L and 344 µg/L, respectively. A month after both events, benzene had returned to its historical level of less than 10 µg/L. No such spikes were noted in downgradient wells, which suggests that short-lived events are attenuated with distance and time due to dispersion, retardation, and degradation during advection. The mechanism underlying the anomalously high benzene events is unknown but seems likely to be attributable to a long-delayed release from a drum or other container from the waste in the mine pit.

Although the benzene release events had no repercussions with respect to surface water contamination, the consequences of a similar event involving 1,4-dioxane could be more serious. Compared to benzene, 1,4-dioxane is advected with negligible retardation and little biodegradation (EPA 2017, Mohr et al. 2020), which would allow a release event to propagate more rapidly and to a greater distance. Given 1,4-dioxane's chemical characteristics, it is conceivable that a transient increase in the 1,4-dioxane concentration adjacent to the mine pit could result in a transient increase in surface water 1,4-dioxane concentrations. In such an event, 1,4-dioxane might become detectable downstream from Sally's Pond, and the statement in the Proposed Plan that "1,4-dioxane would continue to be undetected in surface water at the confluence of Ringwood Creek and the Wanaque Reservoir" becomes doubtful.

The historical record for 1,4-dioxane goes back only to April 2015, when this emerging contaminant was first investigated at the Ringwood Mine Site following the second benzene release event. No 1,4-dioxane release events have been observed, but the record is too short to establish their rarity or probable absence. Because no further benzene release events have been observed, the correlation between benzene and 1,4-dioxane release, if any, is unknown.

The selected remedy for Ringwood Mine OU3 should acknowledge the possibility that benzene and, by inference, 1,4-dioxane concentrations could spike and possibly result in conditions under which 1,4-dioxane might reach the Wanaque Reservoir at detectable levels. The selected remedy should also discuss how such a release event would be handled, should one occur. Passive remedies force a reactive approach, and the contaminant pulse may escape to surface water and head downstream before a response can be put in place. An active remedy like pump-and-treat would intercept release events as part of normal operation .

3. Concerns Regarding the Site Wide Groundwater Remedy

The EPA fact sheet (EPA 2017) cites several studies showing that intrinsic biodegradation under aerobic conditions is a significant contributor to the natural attenuation of 1,4-dioxane. One case study (Gedalanga et al. 2016) used a weight-of-evidence approach to demonstrate natural attenuation was occurring at a 1,4-dioxane site in the upper Midwest. Specifically, the team observed declining trends over time (<10 years of data) that could not be attributed purely to dilution and dispersion, which suggested that degradation was also occurring. Numerical fate-and-transport modeling corroborated this inference; the model required a degradation factor alongside dilution and dispersion in order to reproduce the observed concentration trends. Additionally, the team identified the presence of specific biomarkers that demonstrated active bacterial degradation of 1,4-dioxane in the groundwater system. A meta-analysis of 283 sites (Adamson et al. 2015) suggested an overall attenuation half-life on the order of 2 to 5 years, with higher rates correlating with higher dissolved oxygen and lower dissolved metals. Thus, slow intrinsic biodegradation of 1,4-dioxane has been demonstrated at some sites and seems likely (but not proven) to be active here.

Even if intrinsic biodegradation is occurring, the utility of the passive ORC fence as a means of enhancing intrinsic biodegradation faces several issues:

- **Contaminated water may bypass the fence.** The proposed location of the fence (EPA 2020 Figure 2 [Attachment 2]) appears to be only slightly downgradient of well RW-3DD (Jacobs 2017 Figure 1 [Attachment 3]), which has exhibited the highest 1,4-dioxane concentrations downgradient of the mine pit. This well is screened approximately 115 feet into the bedrock beneath at least 50 feet of overburden (Jacobs 2017 Figure 3 [Attachment 4]), and the purported upward gradient from bedrock to overburden is unlikely to bring this contamination into the overburden upgradient of the ORC fence.
- **Fractured bedrock hydrology is complex.** Fractures offer highly transmissive conduits that may result in transport at an angle to the hydraulic gradient. Despite upward gradients, groundwater could continue to flow mostly in a horizontal direction if the horizontal transmissivity is much greater than the vertical transmissivity. Similar concerns affect the azimuth of the horizontal component of flow. Thus, actual field data are needed in order to determine where deep contaminated water is entering the overburden. More wells are needed to constrain the trajectory of the deep 1,4-dioxane contamination in RW-3DD.
- **Groundwater may already be aerobic.** Although some contaminated groundwater near the proposed ORC fence is very low in dissolved oxygen (DO) (e.g., well OB-11R, with DO = 0.95 mg/L), the most contaminated groundwater (RW-3DD) had DO = 8.65 in 2016, only slightly lower than seen in crossgradient wells RW-4A and RW-4 (approximately 10 to 14 mg/L). With substantial DO present naturally, the ORC fence will likely have little positive effect on oxygen availability for biodegradation.

- **Interception of anoxic groundwater would lead to iron fouling.** Monitoring wells immediately downgradient of the pit (e.g. RW-6, RW-6A, and OB-20B) have negligible DO and elevated dissolved iron (approximately 7 to 23 mg/L). If such water were to reach the ORC fence, iron precipitation as oxyhydroxides would rapidly consume the available oxygen, encrust the wells, and potentially clog the surrounding overburden. Redevelopment would be costly and potentially ineffective.
- **Intrinsic biodegradation of 1,4-dioxane has not been demonstrated.** The remedy proposes to enhance the intrinsic rate of biodegradation, but the field data to establish the activity of 1,4-dioxane-degrading bacteria have not been collected, and the observed decrease in concentration with distance from the mine could reflect only dilution and dispersion. Biomarker analysis for 1,4-dioxane-degrading bacteria should be conducted.
- **Surface-water monitoring** . The Proposed Plan provides no specifics, stating that the details of surface water monitoring would be determined during the design phase of the remedy. The details, however, are crucial to the performance of the remedy. Surface water is the main route by which 1,4-dioxane leaves the site, and the de facto point of compliance seems to be Sally's Pond, where 1,4-dioxane has been detected as high as 2.3 µg/L adjacent to inflow from Park Brook, or the next pond down Ringwood Creek, which has been nondetect for 1,4-dioxane (Jacobs 2017 Figure 4 [Attachment 5]). Park Brook as it leaves the site needs to be frequently sampled to provide early detection of a release event that could send detectable 1,4-dioxane down Ringwood Creek toward the reservoir.

These issues suggest that the ORC fence concept is unlikely to be useful in practice. Instead, the ORC fence provides a veneer of treatment to long-term monitoring (Proposed Plan Alternative 2 – Monitoring with Institutional Controls). Active rather than passive treatment (e.g. pump-and-treat) would provide much greater assurance of contaminant capture through induced hydraulic gradients and flow, or rapid-response contingency plans could be developed and partially constructed now, ready to place into operation with a few days' notice to protect the water quality of Sally's Pond and the Wanaque Reservoir downstream. One option to explore would be the ability to divert Parks Brook through a resin treatment facility if 1,4-dioxane concentrations were to spike. In conjunction with this, installing a well now in the airshaft that could we be used for a future pump and treat operation. A packaged mobile treatment system should be considered that includes resin or advanced oxidation.

4. Concerns Regarding the Airshaft Remedy

Backfilling and capping the airshaft will be effective in eliminating a direct path from waste in the mine to the surface environment, but that pathway is incomplete (water above 175 feet bgs is relatively clean), and the addition of GAC and resin to the base of the shaft to sorb benzene and 1,4-dioxane would do nothing to reduce the flux of contaminants from the waste. Although GAC is effective for the removal of benzene and resin is effective for the removal of 1,4-dioxane from water, the sources of these contaminants are in the depths of the mine workings, not at the base of the airshaft. The sorbents will sequester contaminants advected to the airshaft, but the rate of advection appears to be small because the airshaft is crossgradient from the former mine pit. Thus, most of the contamination being released by the waste is expected to enter the fractured bedrock groundwater system and be advected to the southeast, and very little will come into contact with the sorbents at the base of the airshaft to the northeast.

As with the ORC fence, the sorbents provide a veneer of treatment over plain backfilling (Proposed Plan Alternative 4 – Peters Mine Pit Airshaft Closure) but provide no significant reduction in the flux of contaminants leaving the waste and entering the groundwater system. In the long term, permanently sealing the airshaft may not be desirable. If contaminant concentrations were to increase and remain elevated, the open airshaft could provide access for direct remediation of the most contaminated groundwater. Future access to deep mine water could be assured by installing a 4-inch well screened below approximately 175 feet bgs, where highly contaminated water is present.

5. Implementation of Previous Recommendations

Jacobs expressed similar concerns about the remedies considered in the focused feasibility study (Cornerstone 2018) in our March 2019 memo (Jacobs 2019). The focused feasibility neglected to consider several major aspects of potential remedies relevant to the preferred alternatives of the Proposed Plan:

- Pump-and-treat via the airshaft
- Frequent surface water monitoring
- Access through the airshaft after capping
- Sources in the deep mine workings, not just the former pit
- Potential for detectable 1,4-dioxane at the mouth of Ringwood Creek
- Treatability study for the effectiveness of oxygenating groundwater

These issues continue to be neglected in the Proposed Plan.

6. Summary

The Wanaque Reservoir, which supplies drinking water for approximately 3 million people, is not presently receiving detectable levels of contaminants from Peters Mine, but the benzene release events detected in 2014 and 2015 show that the contaminant flux from the mine could increase. The proposed remedial actions include treatment components, but those components are inadequate to bring about a meaningful and apodictic reductions in groundwater and surface water contamination levels in the face of an increased flux of 1,4-dioxane. Pump and treat (Jacobs 2017) would incontrovertibly remove contamination; the proposed passive remedy does not offer the same assurance. Functionally, the proposed remedy is merely long-term monitoring with reliance on unquantified natural attenuation to protect the reservoir, and it has no contingency for rapid response to an increased contaminant flux.

A wait-and-see, monitoring-centric approach is imprudent when millions of people rely on the downgradient water supply. If the proposed plan does not work, the supply cannot be used. Treatment would need to be installed at the 110 million gallon per day facility at present day costs of up to $60 million dollars in construction and up to $5 million in annual operating costs. This could take months to more than a year to implement. Reliance on the dilution in the reservoir is ill-advised, since short circuiting does occur and drought conditions can reduce water volumes significantly. The costs of treatment and the bottled drinking water supplied during design and construction of that treatment are

significant. Although the probability of this scenario is low, the attendant high cost argues in favor of a rapid-response contingency plan to mitigate the risk to the reservoir.

Major specific concernsregarding the Proposed Planare as follows:

- Because the Peters Mine Pit is an unlined landfill, unexpected releases can occur as previously intact containers rupture or corrode. This scenario appears to explain spikes in benzene concentration in September 2014 and March 2015, but 1,4-dioxane has been monitored only since April 2015, and the potential for 1,4-dioxane spikes cannot be reliably assessed from the short record.
- The proposed site-wide groundwater remedy, a fence of passive wells with ORC, is likely to be bypassed by much of the 1,4-dioxane leaving the Peters Mine Pit. Therefore, the fence would have a negligible effect on a 1,4-dioxane release event in the pit. Additionally, groundwater in the vicinity of the proposed fence is already largely oxygenated, and additional oxygen would offer little benefit. If the fence were relocated to more directly intercept contaminated water from the pit, iron fouling would become a major problem.
- Because the groundwater remedy is reliant upon intrinsic biodegradation, biomarker analysis for 1,4-dioxane-degrading bacteria should be conducted to demonstrate their presence and activity. Without biodegradation, 1,4-dioxane would be reaching the reservoir attenuated by dilution and dispersion to undetectable levels.
- Timely detection of increasing 1,4-dioxane in surface water is essential for activation of contingency plans to protect the reservoir, yet the groundwater remedy defers all details to the design phase. The ability of the remedy to appropriately detect a change in site conditions cannot be evaluated without these details.
- The proposed airshaft remedy, backfilling and capping, will effectively isolate highly contaminated mine water from the surface environment, but the added sorbents at the base of the shaft would have a negligible effect on the bulk of the benzene and 1,4-dioxane emanating from the waste. Future access to deep mine water, if needed, would require installation of a 4-inch (or larger) well at the time of capping.

Two elements should be added to the Proposed Plan to offset the risk of 1,4-dioxane migration inherent in the preferred alternative for groundwater and thereby ensure protection of the Wanaque Reservoir:

1) A robust monitoring program is needed for near-real-time detection of a 1,4-dioxane release event in the mine and for assurance that surface water has not been affected. Monthly monitoring of groundwater at the base of the airshaft, of the deep monitoring well downgradient of the former pit where benzene releases were detected (well RW-6), and of surface water in Park Brook before it enters Sally's Pond would meet this need.
2) A contingency response needs to be ready to be implemented in time to capture a sudden release of 1,4-dioxane from the mine. Two potential response actions would be pump-and-treat for mine water via the airshaft, and diversion and treatment with resin or advanced oxidation for surface water in Park Brook. The pump-and-treat system would need to be constructed ahead of time, ready to turn on if monthly monitoring exceeds a specified trigger level, whereas the surface water treatment system could be constructed while the surge in 1,4-dioxane concentration is slowly making its way through the groundwater system. Nevertheless, the surface water system would need to be predesigned with requisitions and contracts in place ready to execute should the trigger threshold be

crossed. The mineshaft system needs to be ready to turn on at a moment's notice because it treats a dioxane release event at the source. Waiting for its construction translates to dioxane escaping into the groundwater system. In contrast, surface-water treatment would have at least several months' warning while a release event in the mine worked its way through the groundwater system and began discharging to surface water. However, this ready-to-construct surface-water treatment allows dioxane from a release event to spread through the whole groundwater system. Also, the travel time from the mine to surface water is not well known and could be faster than expected. These factors all need to be considered when selecting the contingency plan.

A complete remedy needs to include a robust monitoring program to provide early detection and assessment of release events in the mine and include constructed and ready-to-turn on response actions to ensure protection of the Wanaque Reservoir.

Given the numerous deficiencies contained in the Proposed Plan and the significant impact contamination of the major water supply reservoir would have on the residents of New Jersey, the Commission may wish to request a formal review by the New Jersey Department of Environmental Protection Scientific Advisory Board. We also recommend that you test the Wanaque South contribution to the Reservoir for 1,4 dioxane and other emerging contaminants (eg, PFAS) on a monthly basis during transfers.

7. References Cited

Adamson, D.T, R.H. Anderson, S. Mahendra, and C.J. Newell. 2015. "Evidence of 1,4-Dioxane Attenuation at Groundwater Sites Contaminated with Chlorinated Solvents and 1,4-Dioxane" in *Environmental Science and Technology*, v.49, p.6510-6518.

Cornerstone (Cornerstone Engineering Group, LLC). 2018 (September). *OU-3 Site-Related Groundwater Focused Feasibility Study Ringwood Mines/Landfill Superfund Site*. Prepared for Ford Motor Company.

EPA (U.S. Environmental Protection Agency) 2020 (January). Superfund Program, Proposed Plan, *Ringwood Mines/Landfill Superfund Site Operable Unit Three* https://epa.gov/superfund/ringwood - mines

EPA. 2017 (November). *Technical Fact Sheet – 1,4-Dioxane*. EPA 505-F-17-011.

Gedalanga, P., A. Madison, Y. Miao, T. Richards, J. Hatton, W.H. DiGuiseppi, J Wilson, and S. Mahendra. 2016. "A Multiple Lines of Evidence Framework to Evaluate Intrinsic Biodegradation of 1,4-Dioxane" in *Remediation*, Winter 2016, p.93-114.

Jacobs (Jacobs Engineering Inc.) 2019 (March). *Review of OU-3 Site Related Groundwater Focused Feasibility Study*. Memorandum from Al Hardesty to Maria Allegro, NJDWSC.

Jacobs 2017 (May). *Draft Report of the Potential Fate and Transport of Benzene, 1,4-Dioxane, Lead and Arsenic at the Ringwood Mines Superfund Site Relative to the Wanaque Reservoir*. Prepared for the North Jersey District Water Supply Commission.

Mohr, T.K.G., W.H. DiGuiseppi, J., Anderson, and J.W. Hatton. 2020. *Environmental Investigation and Remediation: 1,4-Dioxane and other Solvent Stabilizers* Second Edition. Taylor and Francis/CRC Press, 529 pages.

8. Attachments

Attachment 1. Risk Assessment Matrix

Attachment 2. Figure 2 from the Proposed Plan (EPA 2020): Alternative 3 – In-Situ Treatment with Monitoring (Overburden)

Attachment 3. Figure 1 from Jacobs (2017): 1,4-dioxane Groundwater Highest Historical Concentrations

Attachment 4. Figure 3 from Jacobs (2017): Peters Mine Pit Area Section A-A' 1,4-dioxane Concentrations 08/2015.

Attachment 5 Figure 4 from Jacobs (2017): 1,4-Dioxane Surface Water Highest Historical Concentrations

From:	Jim Oilcan
To:	Gowers, Joe
Subject:	OU3 Comments - Part 1 of 2
Date:	Wednesday, April 01, 2020 10:23:14 AM
Attachments:	200331 OU3 JWG Comments on Proposed Groundwater Plan (written comments) Final.docx

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Joe,

Attached are my comments on the OU3 Proposed Plan.

A copy of my Feb 10 presentation at the public meeting will be sent as Part 2.

I'm looking forward yo your review and response.

Thanks,
Jim Guinan

Mr. Joseph Gowers
U.S. Environmental Protection Agency, Region 2
290 Broadway 19th Floor
New York, New York 10007-1866

RE: Comments on Ringwood Superfund OU3 Proposed Groundwater Remediation Plan, dated January 2020

Dear Mr. Gowers:

Comments:

1. OU3 – Groundwater:

A major source of contaminated groundwater appears to be the Peters Mine Pit, and this contamination is carried into the groundwater by the mine water seeping from the mine.

Based on historical maps, the Mine Pit is approximately 475 feet long, 130 feet wide, and slopes to a depth of 70 feet where it enters the mine Inclined Shaft. Historical reports state that the Mine Pit was the main place where hazardous waste from the Ford Mahwah Plant was dumped. (See Photo 1, Mine buildings in 1947.)

OU2, Soil Remedial Design Report, dated October 2017, places a Permeable Engineered Geotextile/Soil Cap over the Mine Pit. This will allow surface stormwater runoff to percolate into the ground and through the hazardous waste in the Mine Pit.

Currently stormwater is seeping into the Pit, where it percolates through the hazardous waste picking up COC's, then flows into the Mine through the Inclined Shaft (which is closed by steel bars, which allow water to seep into the Mine). The contaminated mine water then percolates into the groundwater at the surface, shallow, and bedrock elevations. (See Photo 2, pond near Peters Mine Pit.)

I recommend an Impervious Cap over the Pit, and stormwater diversion up gradient from the Pit to intercept stormwater flows from Hope Mountain and direct them toward Ringwood Brook. See details in section 2.C.c, below.

Facts:

- Peters Mine Air Shaft has the highest level of COC's in the entire superfund site. The highest level is measured at elevation 320 below ground surface, where the Air Shaft intersects the Inclined Shaft (haul road).
- Drawing 16 of the OU3 Groundwater focused Feasibility Study Report dated March 2019 shows 1,4 dioxane contours in the bedrock groundwater. The highest levels are downgradient from Peters Mine, and the COC's reduce with distance away from the Mine.
- There are no COC's up-gradient from Peters Mine.

This shows that the source of the contaminated groundwater is Peters Mine. Reducing the amount of water entering the mine will reduce the spread of these contaminants via the groundwater.

Use of Groundwater by Residents

The OU3 Proposed Plan, page 7, states that residents near the site receive their potable water from the Ringwood municipal water system, and a private well search was conducted for a one-mile radius.

The March 1, 2020 edition of The Record reported that the Church of Good Shepard on Margaret King Avenue, near Peters Mine Road, takes drinking water from a well. Lead was found in the drinking water as well as the soil with arsenic. Local residents attend this church.

This Superfund Project should include connecting the church to the Borough water supply, pay the cost of the water for the next 50 years, and clean-up of the soil surrounding the church.

2. OU3 Groundwater Proposed Plan – Summary of my comments at the February 10 meeting in Ringwood

A. Site-Wide Groundwater: I agree with Alternative 3, In-Situ Treatment with Monitoring in the Peters Mine Pit Area and O'Connor Disposal Area, modified as described herein:

a. Don't seal Peters Mine Air Shaft. Build a headhouse (cap) over the shaft at surface level. The headhouse should have openings for ventilation (with steel bars for personnel safety), provisions for taking water samples, and a removable cover for future addition of chemicals to adsorb and oxidize the COC's.

b. Install one or more wells with resin (Dow Ambersorb 560) to adsorb 1,4 Dioxane in O'Connor Disposal Area near well OB-17. This was mentioned in the Plan. I believe it will be helpful to reduce the 1,4 Dioxane before the groundwater flows into the Ringwood Brook.

B. Peters Mine Air Shaft:

a. I do **not** support the EPA Preferred Plan, #3 Treatment/Permanent Closure of the Air Shaft.

b. Instead, I recommend a modified version of #3, Treatment with an Access Cap designed to provide access for future water sampling and placement of additional treatment chemicals in the future.

c. At the Feb 10, 2020 OU3 public meeting it was mentioned that the proposed method of sealing the Air Shaft with concrete would prevent leakage of the contaminated mine water through the shaft walls into the groundwater.

The August 2017 1,4 dioxane readings (µg/l) are:

PM-AS-50	NR	50 feet depth (reported over NJGWQS only once)
PM-AS-180	18.7	180 feet depth
PM-AS-230	144	230 feet depth
RW-11D	88.3	262-267 feet depth
RW-3S	29.4	77-87 feet depth

Based on the RW-11D reading of 88.3 µg/l, the Groundwater Focused Feasibility Study, March 2019 (GFFS) Figure 16 shows a 100 µg/l concentration line enclosing the Air Shaft. This data

shows that the high concentration (88.3) is coming from the mine at or below elevation of the base of the Air Shaft (230 feet depth). The higher elevations of the Air Shaft have lower concentrations, 18.7 at 180 feet, and lower concentrations near the surface. The COC source is likely mine water coming through bedrock fractures in the mine excavations, which are much larger than the air shaft. No water samples have been taken directly from the mine workings, only from the Air Shaft.

C. Groundwater Analysis Comments:

a. The proposed ORC is recommended to address the organic chemicals in the mine water. To address the 1,4 dioxane GAC and resin (Dow Ambersorb 560, or equivalent) should also be introduced into the Air Shaft.
The access cap on the shaft should provide natural ventilation (for natural oxidation) and access for future addition of chemicals and taking water samples.

b. Hydraulic Effect of Peters Mine Pond: GFFS Figure 2 shows the August 2016 ground and groundwater contours.
Peters Mine Pond surface elevation – 525 feet
PM Air Shaft (from groundwater contour) – 523 feet - this gives a water surface elevation difference of 2 feet (almost 1 psi). The pond surface is two feet higher than the water in the mine.
Therefore water seepage from the pond is flowing into the mine and pressurizing it. This pressure differential is driving the mine water to flow out from the mine and into the groundwater, spreading the COCs.

c. Finished soil grades over the Peter's Mine Pit:
Drawing P-1 of the OU2 Remedial Design Report (dated October 2017) shows Profile (cross section) A-A and B-B taken on Drawing PMP-4. Profile B-B shows a dip in the finished grade between stations 1+00 and 1+50. This dip will collect rainwater, and create a small pond. Also shown is a small swale on the left (West side) of the Profile, only about one foot deep. This swale should be deepened to better carry away rainwater.

To reduce the COCs from migrating into the groundwater the PMP cap should:

- Be impervious to rainwater
- Be graded to carry water away from PMP
- Have a deeper drainage swale on the West side
- Have protection on the North side from the stream coming off Hope Mountain. This may be a cement block wall or some other solid protection to prevent stormwater from Park Brook from flowing onto or below the impervious cap and entering the Mine.
- The design should be based on the record storm, which is 10" rainfall which occurred during Hurricane Irene in 2011. The rainfall intensity and quantity should be increased to account for global warming for the next 100 years.

d. Groundwater Focused Feasibility Study. March 2019, Figure 26: Relocate the ORC canister from up-gradient of the air shaft to downgradient (southeast) of the air shaft. No COC's were found in the water coming from Hope Mountain. See the 1,4 dioxane contours on Figure 16. The source of COC is Peters Mine.

See my February 10 presentation with photos and mine maps showing the Air Shaft. (Attached)

3. OU3 – Groundwater Remedial Investigation Report

This document was reviewed again, since it was not updated for the Groundwater Proposed Plan. The oversights in the report have not been corrected.

a. Peters Mine Shaft – Darcy's law was **incorrectly applied** when trying to compute the groundwater percolation through the Air Shaft walls.

b. Peters Mine Air Shaft **– Incorrect calculation** of the volume of water for estimation of the amount of chemicals (activated charcoal and Dow Ambersorb 560) to adsorb the benzene and 1,4 Dioxane. The interconnection of the Air Shaft with the inclined shaft and large mine excavations was not considered. Also, due to the large mine excavations which the Air Shaft intersects, the quantity of cement required, and the displaced mine water which will require treatment, is significantly increased. See the mine drawings attached to my February 10 presentation.

The Arcadis report "Site Related Groundwater Remedial Investigation Report", dated January 2017, describes a camera inspection of the Peters Mine Air Shaft performed in April 2007. The report states on page 49:

> "What appear to be two remnant horizontal shafts intersect the air shaft. Both shafts were visible to the east and west; however, the shafts were seen most clearly along the west wall (facing the PMP) at a depth of approximately 180 feet and at a depth of approximately 200 to 232 feet. The lower shaft appears to be larger, corresponds to the depth that the inclined mine shaft is expected to be encountered, which slopes downward to the northeast"

The volume of the shaft at 180 feet depth, and the 32 foot high excavation at the base of the shaft were not included in the Cornerstone calculation.

4. OU2 – Soil Remediation

The soil remediation and groundwater remediation are interlinked. The separation of OU2 (soil) from OU3 (groundwater) was for EPA's administrative convenience, and has no technical basis.

The OU2 Preliminary Design should be revised based on the OU3 recommendations described above. In addition, there are many drawing errors, undefined symbols, graphical problems, etc. which should be corrected.

5. Additional Comments

As of this date, March 30, 2020, the EPA/Cornerstone response to the NJWSC/Jacobs (Wanaque Reservoir) comments dated March 3, 2019 has not been released to the public. I reserve the right to submit additional comments when all relevant information is provided by EPA.

Attachment:

1. Guinan – Comments on Ringwood OU3 Proposed Plan, Delivered at the Public Meeting in Ringwood on February 10, 2020

I request a written response to my comments.

Contact me if you have any questions.

Thank You,

James Guinan

[redacted]

[redacted]

PHOTOS

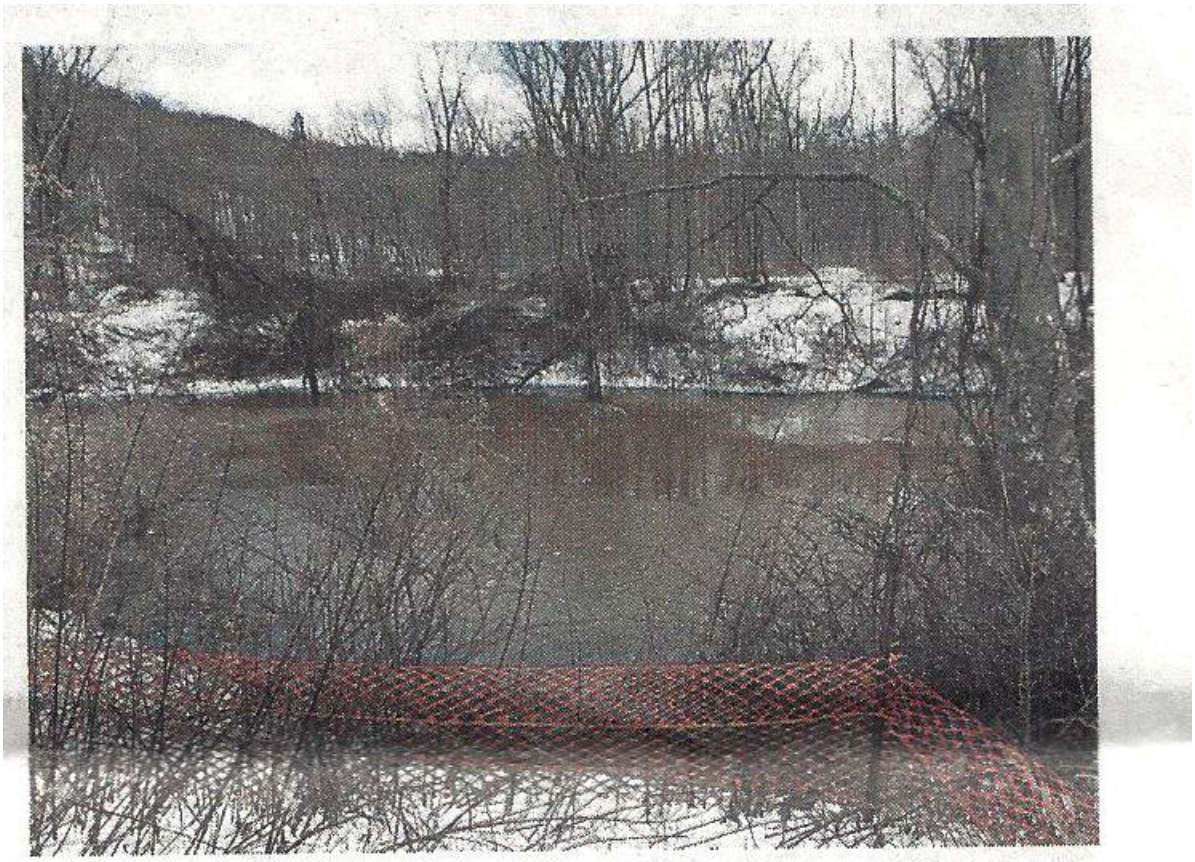
Photo 1

Image: Peters Iron Mine, Ringwood Boro, Passaic County, by Meredith E. Johnson, September 1947.

This photo shows the mine facilities which were renovated by the War Department for use during World War II, if required.

The Iron ore haul ramp goes down through Peters Mine Pit, then becomes the Inclined Shaft in the mine, about 2500 feet long.

Photo 2



The pond of the Peter's Mine pit as seen on March 20, 2013. FILE/NORTHJERSEY.COM

From:	Jim Oilcan
To:	Gowers, Joe
Subject:	OU3 Comments, Part 2 of 2
Date:	Wednesday, April 01, 2020 10:51:00 AM
Attachments:	200210 JWG OU3 Comments on Proposed Grounwater Plan - Final.docx

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Joe,

Attached is a copy of my Feb 10 presentation at the public meeting.

Please note the attached maps of Peters Mine, dated 1914 and 1920.
I included a blow-up of the Air Shaft from the 1920 map. Note how the Air Shaft intersects a mine excavation, and connects to the Inclined Shaft through an adit at the base of the shaft. These are the mine excavations I refer to in my comments. These are incorrectly shown on Cornerstone OU3 Figure 28, which resulted in their incorrect calculations.

Keep well in this pandemic,

Jim Guinan

2/10/2020

Comments on Ringwood OU3 – Groundwater Proposed Plan

Meeting February 10, 2020 at Ryerson School, 7:00 PM

1. Site-Related Groundwater Remedial Plan

a. I agree with Alternative 3, In-Situ Treatment with Monitoring. This is the EPA Preferred Plan.

This utilizes a barrier of wells containing Oxygen Release Compound (ORC) to oxidize the Benzene and 1,4 Dioxane.

b. I also support installing a well with ORC in the O'Connor Disposal Area near monitoring well OB-17, if it appears to be effective. This may speed the biodegradation of the 1,4 Dioxane found at that location.

2. Peter's Mine Air Shaft Remedial Plan

a. I do **not** support the EPA Preferred Plan, #3 Treatment/Permanent Closure of the Air Shaft.

b. Instead, I recommend a modified version of #3, Treatment with a Cap designed to provide access for future water sampling and placement of additional treatment chemicals in the future.

3. Misunderstandings about Peter's Mine Airshaft

a. Peter's Mine Air Shaft was used to provide ventilation and fresh air to the mine workings below. It is a 16 ft. x 16 ft. square shaft, which is 230 feet deep, and connects to the mine workings below.

The 1914 drawing of Peter's Mine shows the Shaft intersecting excavation chambers at levels 1 and 3.

The 1920 drawing of Peter's Mine shows the Shaft more clearly, intersecting excavation chambers at level 1, and a horizontal adit to the main inclined slope (haul-way road) at level 3. The haul-way road extends from the Surface Pit down the full length of the mine, to Level 17. It is about 2500 feet long (one half mile) going to a depth of over 1200 feet.

The haul-way road was used to winch ore cars out of the mine, and has about a 30 degree downward slope.

b. Arcadis (the previous environmental consultant on the project) performed a video inspection of the Air Shaft in 2014 by lowering a video camera down the shaft. Their 2015 report, Page 49, identifies a wall opening at 180 foot depth, and another opening from 200 to 232 foot depth (this opening is a 32 feet high excavation chamber).

c. The Air Shaft is located about 230 feet away from the Mine Pit, which is where it is believed that Ford dumped large quantities of hazardous waste from the Ford Mahwah Assembly Plant.

It is located close to, and connected to, the main source of hazardous waste at Peter's Mine. The Air Shaft water was measured to be the highest concentration of contaminants of the entire superfund site.

4. Cornerstone Groundwater Feasibility Report, September 2018

a. The Cornerstone report misunderstands the connections between the Air Shaft and the Mine Workings.

Cornerstone calculations for the amount of Benzene and 1,4 Dioxane only consider the amount within the vertical air shaft. Although they show it with an opening at 180 feet, and connected to the Inclined Haul-way at 230 feet, they do not consider the contaminants contained in the Inclined Haul-way road which is at the base of the Air Shaft.

b. Cornerstone estimates for contaminant adsorption material for the Air Shaft <u>ONLY</u>:

Benzene: 12 pounds of activated carbon (GFFS, March 2019, pg. 84)

1,4 Dioxane: 420 pounds (2 drums) of Dow Ambersorb resin, which absorbs the 1,4 Dioxane (GFFS, March 2019, pg. 85)

c. These calculations address the Air Shaft only, and ignore the contaminants in the chamber at the base of the shaft (32 feet high) and the inclined Haul-way road.

The quantities are woefully inadequate – **A drop in the bucket!**

5. **"Plugging" (sealing) the Air Shaft with concrete is <u>not</u> the right solution**

- It will Permanently prevent access to the shaft for taking water samples or addition of neutralizing chemicals
- It will stop the "Natural Attenuation" process of oxidation and evaporation in the Mine Air Shaft
- It will require significant additional cost to drill a new shaft if access to the mine is required in the future

The proposed remediation uses "Natural Attenuation" with chemical augmentation to immobilize and oxidize the Benzene and 1,4 Dioxane in the Mine.

One source of oxygen is the open air at the top of the shaft. The oxygen readings in August 2018 were 1.17 at 50 feet BGS, and 0.62 at 230 feet BGS. In addition, the open shaft allows Benzene and other VOC's to evaporate.

Closure of mine shafts is required for safety, to prevent injury or death of a person by falling down the shaft. <u>Filling it with concrete is not required</u>.

A better solution is to construct a "head house" over the top of the shaft. This would be a reinforced concrete structure which is above ground covering the shaft. It might be four feet high above ground.

All four sides of the head house should have openings to allow wind to ventilate the shaft. These openings would be secured with steel bars to prevent children from entering. The top would have a capped pipe for taking water samples, and a removable plate for addition of adsorbent chemicals, as required.

> The EPA recommended "cap" designed for the shaft proposed in Alternative 2 does not provide for ventilation of the shaft.

6. Summary for Air Shaft

I recommend a modified version of Alternative 3:

a. Chemical treatment of the mine water. Calculations should be revised to estimate the water in the vicinity of the shaft.

b. Capping the shaft with a headhouse which provides ventilation, and allows future access for testing and addition of chemicals.

7. I have additional comments which I will submit in writing.

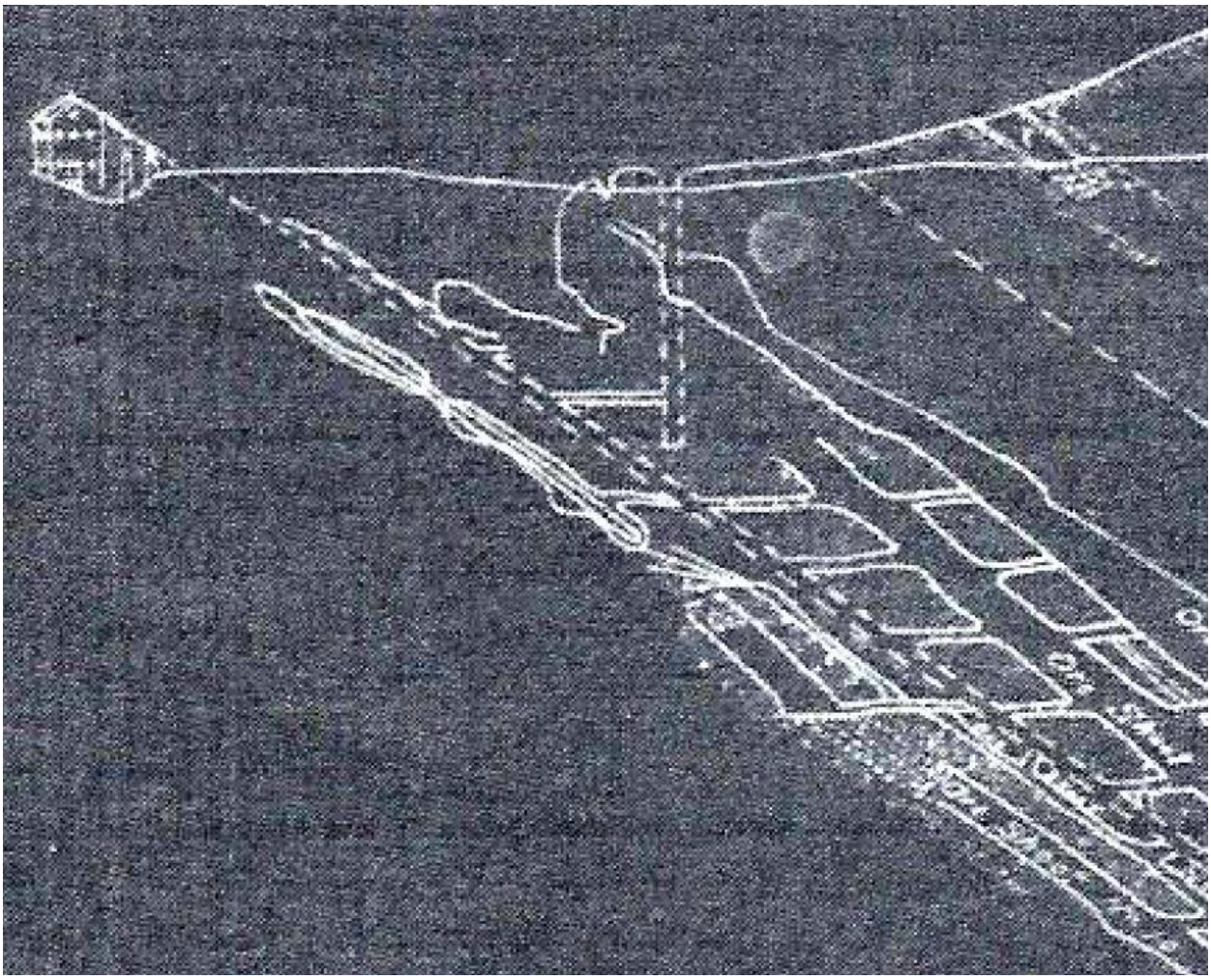
Three photos of a ventilated head house are attached:

New Mexico | Bureau of Land Management
blm.gov

Capped Mine Shaft, Wheal Maid Valley
geograph.org.uk

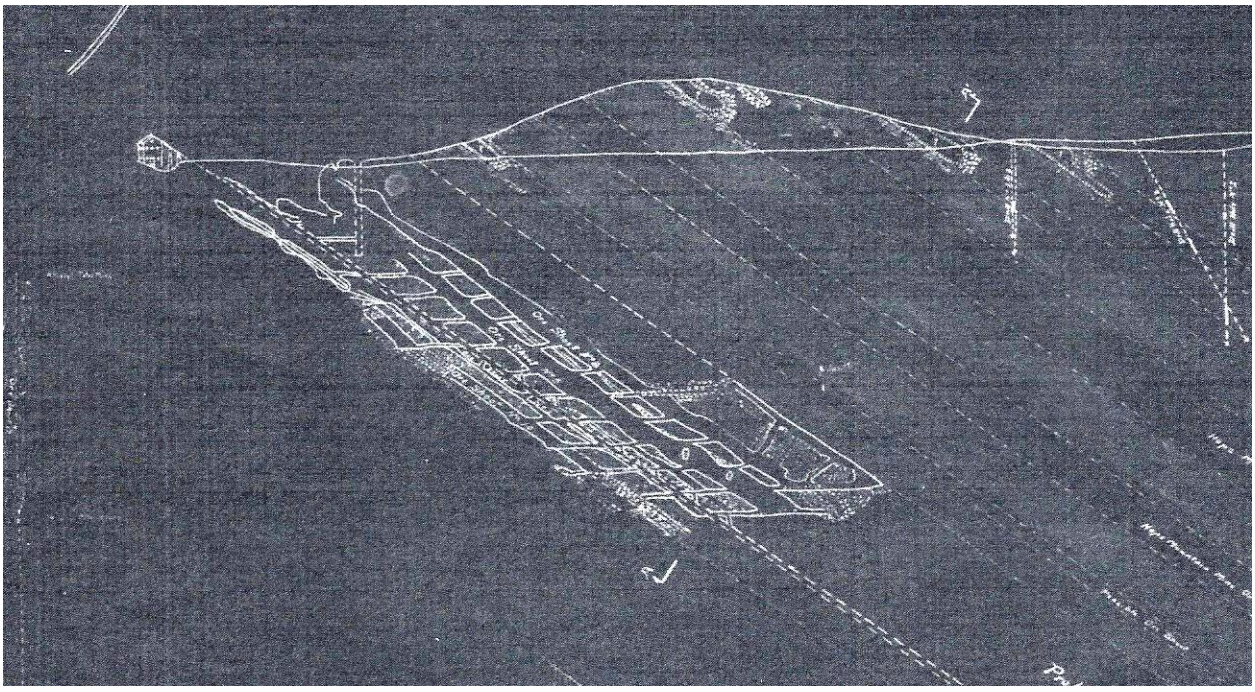
An old abandoned tin mine on moorland above St Agnes, Cornwall, UK.

https://www.alamy.com/stock-photo/capped-mine-shaft.html



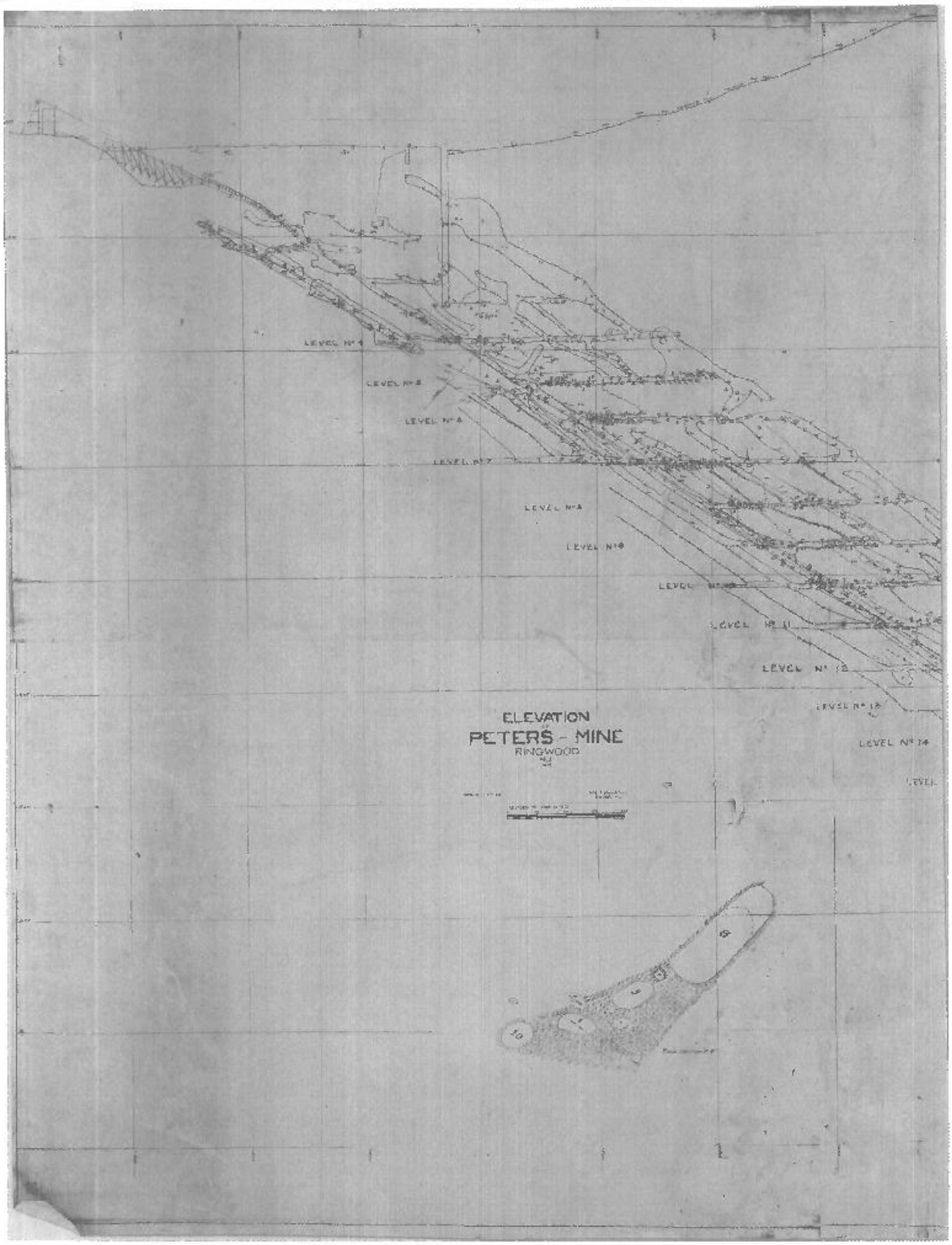
Peter's Mine Elevation, 1920

Showing Air Shaft and Peters Mine Pit (enlarged view)



Peters Mine Elevation, 1920

Showing Air Shaft and Inclined Shaft


LEVEL N° 4
LEVEL N° 5
LEVEL N° 6
LEVEL N° 7
LEVEL N° 8
LEVEL N° 9
LEVEL N° 10
LEVEL N° 11
LEVEL N° 12
LEVEL N° 13
LEVEL N° 14
ELEVATION
PETERS - MINE
RINGWOOD
N.J.

Peters Mine Elevation, 1914

Showing Air Shaft and Inclined Shaft

From:	Jim Oilcan
To:	Gowers, Joe; duda.damian@epa.com; Scott Heck
Subject:	OU2 - Health and safety for local residents
Date:	Tuesday, February 11, 2020 6:06:02 PM
Attachments:	200211 To Gowers H&S for local residents.docx 200211 Attachment - Specifications with comments.pdf

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Joe,

This is follow-up on my discussion with Damian Duda at the 2/10/20 meeting in Ringwood.

The OU2 Design Report specification only addresses worker safety, and does not address protection of local residents health and safety.

Thank you,
Jim Guinan

Mr. Joe Gowers 2/11/2020
Mr. Damien Duda
Environmental Protection Agency
290 Broadway
New York, NY 10007

Dear Mr. Gowers and Duda,

Thank you for speaking with me at the 2/10/20 meeting in Ringwood.

As I mentioned at the meeting, the OU2 Final Remedial Design Report, dated October 2017, does not address the Health and Safety of the residents living within and near the superfund site.

Extensive earthwork will be required to dig up the hazardous waste, categorize its toxicity, use some as fill material, and dispose of the highly toxic material. This will result in soil dust, toxic waste dust, and heavy truck traffic through the local residential community.

The specifications contained in the Design Report only address Worker Safety, and does not address the Health and Safety of the local residents.

Attached are excerpts from the specifications which I have marked up with comments of missing information:

Appendix D Technical Specifications, page 1307 of 1936 pages (note: page footers are not always correct)

- 00 73 19 - Health and Safety
- 01 11 00 - Summary of Work
- 01 35 43 – Environmental Protection

Below is a list of items which may be required, and considerations for the local homes and residents:

A) Inside homes
- Calking and weather sealing the windows, doors, and other openings
- Portable air filtration systems
- Air Conditioners to keep windows closed during the summer months
- Air monitoring inside homes
- Periodic cleaning of homes to remove toxic dust
- Medical testing

B) Outside homes
- Air Monitoring for dust and contaminated materials

C) Traffic Control considerations
- Children waiting for the school bus in the morning, and returning home in the afternoon
- Children playing outside
- Residents walking
- Residents traveling to/from work, shopping, etc.

D) Other protective measures should also be considered

I would appreciate your developing project requirements which properly address the local residents.

Sincerely,

James Guinan
[redacted]

CC: Scott Heck, Ringwood Borough Manager

cornerstone
A TETRA TECH COMPANY

Building lifetime relationships with our clients and employees.

Final Remedial Design Report
Ringwood Mines/Landfill Superfund Site

Operable Unit Two

Ringwood, New Jersey

EPA ID# NJD980529739

Document 528324

February 2017
Revised October 2017

Prepared for:
Ford Motor Company

Cornerstone Engineering Group, LLC
100 Crystal Run Road, Suite 101
Middletown, NY 10941
(845) 695-0200

528324

TABLE OF CONTENTS

SECTION 33 UTILITIES

SECTION 34 TRANSPORTATION

SECTION 46 WATER AND WASTEWATER EQUIPMENT

SECTION 00 73 19 - HEALTH AND SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes health and safety requirements for construction at the Ringwood Mines/Landfill Superfund Site. Requirements include training, personal protective equipment, and specific information to be included in a Contractor generated Health and Safety Plan. Additionally, this Section requires measures to be implemented for safe working conditions throughout construction.

1.2 SITE CONDITIONS

B. ← Protection of residents living on or near work site.

A. The Site is comprised of three areas: The Cannon Mine Pit (CMP), Peter's Mine Pit (PMP), and the O'Connor Disposal Area (OCDA).

B. Contractor is advised the soils and groundwater in the project area may be contaminated.

C. Available information attached to this specification provides indications of contaminants present in soils and groundwater.

D. Owner takes no responsibility for the completeness or accuracy of the information provided in the attachments. Contractor is solely responsible for making its own determinations regarding site conditions and the health and safety of its employees.

1.3 CONTRACTOR RESPONSIBILITY, TRAINING, AND PPE REQUIREMENTS

← F. See site plans for locations of residents

A. Contracor is solely responsible for the health and safety of its employees.

B. Contractor " " " " " of nearby residents.

B. During construction Contractor shall be responsible for managing the site, controlling access, and checking credentials for visitors, per the Contractor's site-specific health and safety plan.

C. While on Site personnel are required to at a minimum don:
   1. General work clothes
   2. Hard hat
   3. Safety glasses
   4. Steel toe boots
   5. Hi-visibility safety vests

D. Other personal protective equipment (PPE) shall be as defined in the Contractor's site-specific health and safety plan.

E. Personnel working on Site must be Hazardous Waste Operations and Emergency Response (HAZWOPER) 40-hour trained, and be current with 8-hour HAZWOPER

refresher training, and have a current OSHA required medical clearance from a qualified health care provider, as applicable.

F. Supervisory personnel shall have completed the 8-hour HAZWOPER Supervisor Training.

G. Requirements for 40-hour training may be modified per the provisions of OSHA 1910-120 for non-intrusive activities.

1.4 SUBMITTALS

A. CONTRACTOR shall provide a Health and Safety Plan (HASP) which establishes policies and procedures to protect workers and the public from the potential hazards posed by the work. The HASP must be prepared and submitted to the Owner's Representative before site activities proceed. Owner's Representative will review the submitted plan and indicate only whether Contractor may proceed.

B. The Health and Safety Plan shall conform to all requirements under 29 CFR 1910.120, and 29 CFR 1926. At a minimum the plan shall:

1. Name key personnel and alternates responsible for site safety.
2. Describe risks associated with each operation conducted.
3. Confirm that personnel are adequately trained to perform their job responsibilities and to handle the specific hazardous situations they may encounter.
4. Include provisions for daily safety meetings.
5. Describe the protective clothing and equipment to be worn by personnel during various site operations.
6. Describe any site-specific medical surveillance requirements.
7. Describe the program for periodic air monitoring, personnel monitoring, and environmental sampling (if needed).
8. Describe the actions to be taken to mitigate existing hazards to make the work environment less hazardous.
9. Define site control measures, visitor logs, exclusion zones, etc., and include a site map.
10. Define means to monitor and protect the surrounding community, including both an encompassing workspace and community air monitoring program. Air monitoning program should include thresholds for respirator requirements and stopwork conditions.
11. Establish decontamination procedures for personnel and equipment.
12. Set forth the site's Standard Operating Procedures for Health and Safety.
13. Include a site-specific contingency plan for site emergencies.
14. Protocol of residents.

C. Documentation of medical monitoring.
residents?

D. Documentation of personnel training.

E. Documentation of personnel respirator qualification and fit testing, if respirators are in use or are planned for use.

F. During Construction:
   1. Maintain required forms and OSHA records on site as applicable.
   2. Maintain a site chemical inventory and index of Safety Data Sheets for the chemical or products present on site.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

A. Implement health and safety procedures in accordance with the accepted site-specific Health and Safety Plan and all relevant regulations.

B. Control site access at all times, including access through all open gates during working hours.

C. Implement health and safety monitoring in accordance with the Health and Safety Plan, and provide monitoring results to the Owner's Representative on a regular basis; maximum of one week intervals.
Health Monitoring of Residents?

D. Update Health and Safety Plan as needed as the work progresses, and advise the Owner's Representative of any changes.

E. Prepare Job Safety Analyses (JSAs) for all activities to be performed for the completion of the Work. Maintain JSAs on site.

F. Update JSAs as necessary during the course of the work.

G. Coordinate with the Owner's Representative in the event of questions regarding protection of community or emergency situations.

H. In the event of an emergency or release execute all reporting responsibilities in accordance with the requirements of the Health and Safety Plan.

I. Prepare incident reports for any occurrences resulting in injury or property damage and for any occurrences deemed to be near misses. Incident reports shall be provided to the owner for review within 24 hours of the occurrence.

END OF SECTION

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 PROJECT LOCATIONS AND ACCESS

A. Project Location:

1. The Site (also referred to as Project Site) is Operable Unit No. 2 of the Ringwood Mines/Landfill Superfund Site located in the Borough of Ringwood, New Jersey.

1.2 SCOPE OF WORK

A. General: The Work consists primarily of closure of three land areas of concern (ACs) known as Cannon Mine Pit (CMP), Peter's Mine Pit (PMP), and O'Connor Disposal Area (OCDA), all former landfills. The project includes excavation, fill, grading, on-site material re-use, off-site disposal, and construction of engineered caps. Work also includes construction of associated stormwater controls and preparation for a new recycling center to be built by the Borough of Ringwood on the OCDA area. The work is more fully detailed in the Remedial Design Drawings (Drawings) and these Technical Specifications (Specifications), and is outlined further below.

B. Principal Features include:

1. Pre-mobilization documentation:

a. Remedial Action Work Plan including Independent Quality Assurance Team, Health and Safety Plan, Emergency Response Plan, Field Sampling Plan, Quality Assurance Project Plan, Construction Quality Assurance/Quality Control Plan, Transportation and Disposal Plan.

b. Site access and layout plans

c. Utilities survey

d. Habitat Best Management Practices Plan

e. Baseline project schedule

f. Baseline site conditions survey

2. Submittals for materials and equipment ongoing, and prior to use in the project.

3. Mobilization and demobilization of equipment, labor, and construction of temporary facilities.

4. Clearing and grubbing in the areas of work.

5. Installation of effective sediment and erosion controls.

6. Excavation as indicated on the drawings to remove or consolidate waste materials.

7. Dewatering and water treatment during construction operations.

8. Moving and stockpiling of excavated material, segregating according to material type.

9. Containment, characterization and re-use, or off-site disposal, of excavated soil and waste.

10. Segregation and containment of paint waste, and characterization and off-site disposal.

11. Backfilling and filling of excavated areas, including compaction, and rough and final grading.

12. Installation of an engineered cap, consisting of a non-woven geotextile and 2 feet of clean fill material.

13. Full restoration of local roadway areas disturbed during construction, including but not limited to pavement, curbing, and striping.

14. Abandonment, decommissioning and relocation of groundwater monitoring wells and landfill gas monitoring wells.

15. Installation of institutional controls including permanent fencing surrounding the ACs.

16. Topsoil, seeding, and site, riparian zone, and wetland restoration.

17. Surveying/Record Documentation.

18. Implementation of dust control measures during intrusive work activities.

19. Preparation of all submittals associated with work activities and materials.

20. Establishment and maintenance of work area Exclusion Zones as required.

21. Procurement of imported materials that meet contract and permit specifications.

22. Snow/ice removal, maintenance of site roadways and work areas during the winter months.

23. Installation, maintenance and repair of traffic control measures as required, both on and off site.

NO MENTION OF NAAQS STANDARDS FOR PRIVATE RESIDENCES

C. The above description of the Work is for general information and contractor orientation only, and does not limit the responsibility of the Contractor to accomplish the Work in strict conformance with the Contract Documents.

D. Environmental Observations: The Work shall be performed in strict conformance with the applicable requirements of the federal, state and local agencies having jurisdiction, and in accordance with the requirements of the Contract Documents.

E. The Work includes all items shown on the Drawings and specified in the Specifications as well as all ancillary, appurtenant, or miscellaneous items reasonably inferred to be included for a complete project, whether specifically called out or not. Contractor will not be entitled to additional compensation for such reasonably inferred project components.

1.3 EXISTING SITE CONDITIONS

A. The Contractor is advised that construction of this project is at former landfills and entails working in, on and adjacent to buried solid wastes and contaminated soils. The Site is also a former mine and working at the site entails working in, on and adjacent to mine tailings.

B. Available project information is attached to these specifications to provide information on Site conditions, wastes, mine tailings, and contaminated soils and other materials. This information is provided for the Contractors benefit. The Owner makes no warranties, expressed or implied, regarding the completeness or accuracy of the available project information. The Contractor is solely responsible to perform prudent and responsible actions to assure the health and welfare of Contractor's employees, subcontractors, and visitors during the performance of this project.

1.4 DRAWINGS

A. Where "as shown," "as detailed," "as noted," or words of like meaning are used in these specifications, it shall be understood that reference is being made to the Drawings included in the Contract Documents unless otherwise specified.

1.5 CODES AND STANDARDS

A. All work to be done and materials and equipment transported, handled, stored or installed shall be done in strict conformance with the applicable orders, rules and regulations of the United States Government, the State of New Jersey, and with all other County, City, or District requirements. Nothing contained in these Specifications or shown or noted on the Drawings shall be construed to permit work not conforming to these orders, rules and regulations.

B. When Drawings or Specifications call for material or construction of a better quality or larger size or capacity than may be required by applicable codes or standards, the provisions of the Drawings and Specifications shall take precedence over the requirements of the code or standard. If there is any other conflict between the Construction Plans or Specifications and the requirements of applicable codes and standards, the more stringent provisions shall govern.

1.6 MANUFACTURERS' SPECIFICATIONS AND INSTRUCTIONS

A. Unless otherwise indicated or specified, all manufactured materials, products, processes, equipment, or the like shall be installed or applied in accordance with the manufacturers' instructions, directions, or specifications. Said installation or application shall be in accordance with printed instructions furnished by the manufacturer of the material or equipment concerned for use under conditions similar to those at the job site.

B. Any deviation from the manufacturers' printed recommendations shall be explained and acknowledged as correct for the circumstances, in writing by the particular manufacturer.

The Contractor will be held responsible for all installations not conforming to the manufacturers' recommendations. If any item of material or equipment is installed not in accordance with the manufacturer's recommendations, the Contractor shall make all changes necessary to achieve such compliance, at its sole cost.

C. Upon delivery, a Receiving and Inspection Report shall be completed for all materials, products, etc. brought to the site, confirming compliance with specifications.

1.7 WORK QUALITY

A. Shop and field work shall be performed by mechanics and workers skilled and experienced in the fabrication and installation of the work feature involved. All Work under this Contract shall be performed in accordance with the standard practices of the various trades involved and in accordance with the Drawings, shop drawings, and these Specifications.

B. All Work shall be erected and installed plumb, level, square and true, or true to indicated angle, and in proper alignment and relationship to the work of other trades. All finished Work shall be free from defects and damage.

C. The Owner reserves the right to reject any materials and work quality which are not considered to be up to the general standards of the various trades involved. Such inferior material or work quality shall be repaired or replaced, as directed, at no additional cost to the Owner.

1.8 FIELD MEASUREMENT AND TEMPLATES

A. Contractor shall secure all field measurements required for proper and accurate fabrication and installation of the Work included in this Contract. Exact measurements are the Contractor's responsibility. Contractor shall also furnish or obtain all templates, patterns, and setting instructions required for the installation of all Work. All dimensions shall be verified by the Contractor in the field.

1.9 TESTING LABORATORY

A. The Contractor shall procure the services of an independent testing laboratory(ies) as necessary to meet all of the requirements for testing of the Work to verify it has been properly completed, as shown on the Drawings or provided for in these specifications.

B. Contractor shall provide the name(s) of independent testing laboratory to the Owner's Representative prior to the start of construction. The Owner reserves the right to accept or reject a testing laboratory with or without cause, and will notify the Contractor if a laboratory is not acceptable.

C. Any analytical laboratory used for the project must be approved by the Owner, must be with the Owner's system, and must have data validated by the Owner's approved data validation provider (currently Cadena).

D. Each laboratory must hold valid certificates or registrations for performing the required testing.

E. Owner may elect to separately retain the services of testing laboratory as a quality

assurance measure, and Contractor shall cooperate in all respects with the Owner's Representative in the collection of samples for testing, providing assistance in obtaining samples and access to materials as required.

1.10 PERMITS AND LICENSES

A. Except as enumerated in this Section, Contractor shall have or obtain all necessary licenses, registrations, permits, or approvals necessary to complete the Work, and shall assure that all Subcontractors have the same.

B. Should Contractor be levied any fines, penalties, or other costs for any incomplete or missing license(s) to properly complete the work, Contractor shall be solely responsible for addressing and rectifying such fines, penalties, or costs. Contractor shall also be responsible for any costs incurred by the Owner due to missing or incomplete licenses which are the contractor's responsibility.

C. Owner will provide the following permit equivalents prior to the associated work:

1. Soil Erosion and Sediment Control Plan Certification (including construction stormwater approval from the NJDEP) from the Hudson-Essex-Passaic Soil Conservation District.

2. General Permit No. 5 per NJAC 7:7A-5.5 for wetlands work on a landfill.

3. Individual Flood Hazard Area permit equivalent for work in the riparian zone of Park Brook (adjacent to the PMP Area and OCDA).

4. A Highlands Act Applicability Determination for an exemption for remediation per NJAC 7:38-2.3(a)15.

5. A NJPDES Permit by Rule equivalent per NJAC 7:14A-7.5 for a dewatering discharge to groundwater.

6. Water Lowering for the PMP Area Pond, pursuant to NJAC 7:25-6.25.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 35 43 ENVIRONMENTAL PROTECTION

2. Tree clearing may be restricted during the time period from March 15 to June 30, if nests or other breeding habitat are found in trees at the time of the Work. Contractor shall obtain the prior, written approval of the Owner's Representative to perform tree clearing within the March 15 to June 30 time period.
3. Activities in the 100-year flood plain of flood hazard area of Park Brook, which could introduce sediment into the stream or which could cause an increase in the natural level of turbidity of the stream are prohibited during the period between March 15 and June 15.

3.4 MAINTENANCE

A. Contractor shall dispose of all debris and waste in a manner approved by the Owner's Representative. Toilet facilities shall be kept clean and sanitary at all times.

B. Contractor shall frequently remove materials no longer required on the site so that at all times, the site, access routes to the site and any other areas disturbed by Contractor's operations shall present a neat, orderly, workmanlike appearance.

C. Contractor shall remove all surplus material and debris of every nature resulting from the Contractor's operations, before final payment. Contractor shall restore the site to a neat and orderly condition satisfactory to the Owner's Representative.

3.5 DUST CONTROL

A. Contractor shall maintain all excavation, embankments, stockpiles, access road, borrow areas, and all other work areas within the project boundaries free from dust which would cause a hazard or nuisance, or which would contribute to surface water contamination.

B. Approved temporary methods for dust control include the spraying of water and the removal of dried soil from land or roadway surfaces with self-loading motor sweepers or vacuum trucks. Spraying water shall be repeated at such intervals as to keep the disturbed areas dampened.

C. The use of additives is prohibited unless approved in writing by the Owner's Representative prior to application. Penetrating asphaltic materials, oils, or any other such materials are prohibited.

D. Dust control is to be performed regularly as required to prevent nuisance or hazardous conditions.

E. Tarping of material stockpiles as required to prevent nuisance or hazardous conditions and prevent erosion.

3.6 NOISE AND VIBRATION CONTROL

A. Contractor shall use every effort and means to minimize noise caused by the Contractor's operations. Contractor shall provide working machinery equipped with adequate muffler systems. Contractor is responsible for maintaining compliance with all applicable noise regulations and all State and local noise ordinances.

From: Luke Slott
To: Gowers, Joe
Subject: Ringwoood NJ Superfund Site comment
Date: Thursday, May 21, 2020 4:15:44 PM

Hi,

I think the Ringwood site should be cleaned up by Ford, they can afford it and it's close to a reservoir that serves about 4 million people.

Why was Pompton Lakes cleaned up from the Dupont Mess but not up here in Ringwood? Smacks of racism.

Lucas Slott
[redacted]

From: Marilyn Maney
To: Gowers, Joe
Cc: Nadler Jackie
Subject: Ringwood Superfund Site
Date: Monday, May 25, 2020 3:29:17 PM

Dear Mr Gowers,

We are requesting that the EPA use its powers to require the Ford Motor Company to do a full clean up of the Ringwood Superfund Site. To permit capping is a half measure that will not work in the long run and will let Ford get away with not providing the adequate funds needed to eliminate contamination. Capping is just hiding the problem for another day. What happens when the toxins seep out, as they are already doing, and head into the Wanaque Reservoir. Where would you like to say you were when that happens?
For 50 years and through numerous EPA plans local residents have suffered with the ill health effects of this toxicity. Many inhabitants of the area are Native Americans and the area is considered an Environmental Justice community. Their voices have not been heard yet their suffering with cancers and other diseases has been great. It's time to do right by this community by providing long term solutions to contamination and holding large corporations responsible for misdeeds.

Thank you for your consideration.

For the Environmental Justice Committee,
Marilyn Maney, Jacqueline Nadler, Co-Chairs
Unitarian Society of Ridgewood, NJ

From: Seppi, Pat
To: Gowers, Joe
Subject: Fwd: EPA Announces Second Extension for Ringwood Mines
Date: Wednesday, April 01, 2020 4:21:31 PM

FYI
Sent from my iPhone

Begin forwarded message:

From: [redacted]
Date: April 1, 2020 at 4:13:22 PM EDT
To: "Seppi, Pat" <Seppi.Pat@epa.gov>
Subject: RE: EPA Announces Second Extension for Ringwood Mines

Pat
Thanks for the info
This plan really needs to be reconsidered
The contamination needs to be removed, as much as possible.....and Ford should be held as liable as possible
The EPA should be protecting our interests
Please don't be complicit with them
Peter Ruccione

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: "Seppi, Pat" <Seppi.Pat@epa.gov>
Date: 4/1/20 10:27 AM (GMT-05:00)
To: "Seppi, Pat" <Seppi.Pat@epa.gov>
Subject: EPA Announces Second Extension for Ringwood Mines

Good Morning,

I've attached a press release which will go out around noon today announcing a second extension to the public comment period for the Ringwood Mines Superfund Site. We wanted you to have it before it goes public.

Please feel free to share it with anyone you feel would be interested and don't hesitate to contact me with any questions.

Thank you,

Pat Seppi

EPA Public Affairs Office

From:	Ramona Criscuolo
To:	Gowers, Joe
Subject:	Ringwood Mines Superfund Site Remediation
Date:	Sunday, March 01, 2020 6:29:00 PM
Attachments:	Ford Dumping - Ringwood - ENGL 1201 Essay Final - Rough Draft.docx Ramapough Ford The Impact and Survival of an Indigenous Community.pdf

Mr. Gowers,

I am writing regarding the Ringwood Mines Superfund cleanup per the recent article in the Suburban Trends written by David Zimmer and Scott Fallon.

I was unable to attend the meeting at the Ringwood middle school in mid-February, so I did not hear the information regarding the EPA's groundwater treatment plan first hand. The limited information I have is from the Trends article.

I can't be certain, but I believe my opinion on the superfund site situation is a less common one.

I am not originally from Ringwood, but I did grow up in the neighboring towns in the late 70's and early 80's. I have long been familiar with the Ramapough Clan and the impact of the paint sludge dumping, though I was not personally impacted. As a teenager in the 80's, I heard many rumors swirling around about the Ramapough community. Many of the people I was acquainted with feared and avoided the area, though I did know just a few of the teenagers who lived there personally.

I have now lived in Ringwood in the Erskine Lake area for the past thirteen years. My family frequents the state parks in Ringwood. We do a lot of hiking and picnicking. My children attended the Ringwood schools and have had friends and acquaintances from the Ramapough Clan. I have had casual conversations with the adults of the community.

My belief is that the Ringwood Superfund Site situation is far more complicated than either/or cleanup decisions. Cap, excavate, plug, pump, drill. Use a variety of these methods in different locations depending on what portion of the dump site is being treated, because the contamination is scattered all over. It really doesn't matter. It's never going to be gone. It's just not possible to clean it all up.

No one knows where it all really is because Ford dumped outside the perimeters of the O'Conner Disposal Area agreed upon by town officials. Paint sludge was dumped on the ground, then later dug up and moved. Every time there has been a cleanup, focus has been in one area, and more is found later down the road.

There is absolutely no way to reach all that had been dumped in the mine shafts. How can it possibly be traced to every crack and crevice under the earth? I understand the concern of the people who are for excavating. They feel that excavating is the way to finally get to all of the pollution which they want gone for good. My opinion is that excavating would be extremely dangerous and would likely only cause more problems. Excavating would likely cause sink holes and cave-ins, which already occur without anyone disturbing the underground. Sections of road have sunken. Houses have been sucked into sink holes and condemned, without excavating weakening all those caverns below. Mess with the underground, and the phenomenon will happen even more frequently.

As far as pumping resins underground, I'm not a scientist, but I can't see how pumping even more chemicals underground is safe either. And what impact would that have on the stability of the caverns and earth below in the mines?

Capping may focus on one heavily contaminated area, the O'Conner site, but what about all the contaminated areas surrounding it, scattered through the woods? What about the clumps of paint sludge clearly visible right in the backyards of the people living there whose homes were built right on top of this mess? How can that be removed or capped without demolishing the houses? I guarantee a few years from now more previously undiscovered and untreated areas will be found.

I understand that many make the EPA out to be the bad guys in an impossible situation. The EPA is not at fault here, other than not being thorough enough in evaluating the situation in years gone by.

The true parties at fault here are the managers at Ford who sneaked around and dumped their barrels of crap in the dark of night, and the Ringwood town officials who failed to monitor and keep a handle on what was going on under their noses. But it's too late for blame now. The damage is done and must be dealt with.

However, the public seems bent on blaming the EPA for being unable to completely rectify an impossible situation. Any plan that is come up with and implemented will be insufficient to resolve the problem because of the nature of the dumping here. No matter what is done, there will be those who are going to be unhappy and/or dissatisfied with the decision and the result. The only thing that can be known to be true is that no matter what combinations of treatments are done, contamination will remain. The plan to continue monitoring the situation for the next thirty years is definitely necessary. The question is, will thirty years be long enough? Obviously the EPA still needs to keep trying to get rid of as much of this toxic waste as possible for the safety of the community and future generations by whatever means necessary.

I've said all that to say this: the community relocation plan is necessary.

The community should never have been built on top of that dump site. Shame on Ford for selling the land cheap and taking advantage of the recipients of low income housing.

The health issues of the people living in the area are real. Their illnesses have not been linked to the toxins in the dump site because a proper study of the small community has not been done, and because the knowledge of the impact of many of the chemicals involved were not fully known. If you look at the list of currently known health effects of these chemicals and compare them to the cancers, kidney problems, reproductive issues, respiratory issues, etc, of this community, there is NO denying it.

There is plenty of talk regarding cleanup around the perimeter of the community, but no talk of cleaning up the land the community itself sits on, at least not that I have ever heard. Why?

Testing has been done of the vegetation and the animals living in the region and they have been found to have elevated levels of the known chemicals from the toxic dumping in their systems. Yet the people are ignored? Seriously?

I have spoken with one member of the community suffering with health issues, specifically kidney failure (a known health issue related to exposure to certain chemicals found in the dumping area). I asked why they stay. First, they can't afford to leave. Who is going to buy any house in that community knowing the risks? How can a family possibly start over when they can't sell their home? Second, they are a very tight knit community. They are a clan. Most of the people living there are related in one way or another. They treasure having their family around them. They watch out for each other's children. They help each other. They are surrounded by people who understand their struggles because many of them are dealing with serious health issues and/or the fear of when it will strike them personally. I do know of just a few families who were able to purchase homes in other areas of Ringwood. They remain in the area and involved in the Ramapough community but have escaped the toxic dump. However, this is not possible for many of the people trapped there.

I do not know how the EPA handles community relocation. I do not know whether homes are bought out and people are left to their own devices to find a place to relocate or whether any attempt is made to find an area to rebuild and relocate the entire community.

Given the history of the Ramapough Clan and their apparent desire to remain a community, and given the fact that there is so much State Park, Highlands Act, Watershed, and Wetlands in the Ringwood area, I would suggest that investigation be done to look into the possibility of utilizing currently exempt land to rebuild and relocate this community within the Ringwood area. Surely with all the undisturbed woodlands in this region, an area suitable for building a new community should be able to be found and acquired. And then the EPA can look at cleaning up the portion of the superfund site that the community used to sit on.

As far as cleanup of the entire superfund site goes, by any means possible, I wish you all the best with this nearly impossible task. I'm not an expert in chemical science or geological science so far be it from me to tell you how to get the job done. Again, I believe that just one method isn't going take care of the issue. Multiple methods are going to be needed dependent upon the various locations of the waste to achieve the best possible result, though it will never all be completely gone.

But please…move the people.

As a final note, I have attached two documents.

One is a research paper done by my daughter in college a couple of years ago when the capping verses excavating debate was raging. Unfortunately, it is not the final paper, just a rough draft, so there are editing corrections, professor's notes, and date typos which I hope you can overlook. The paper contains the viewpoint of a twenty year old college student who grew up in this community.

The second is a thesis paper from 2015 which my daughter recently discovered online. It was written by a person who grew up in the area and witnessed the dumping first hand as a boy and the impact it has had on the community over the years. He is not a part of the Ramapough Clan but is well acquainted with them. You may have already seen this paper. Perhaps the leaders of the Ramapough clan have already referenced it. Perhaps you know the man. The thesis is quite long and very detailed and can be dry at times. It contains a lot of background about the area and the people and cleanup efforts (or lack thereof) over the decades. I'm sure you are extremely busy, but I hope you will read it and encourage you to try not to skim. It

can’t hurt for you to be aware of the information contained in it if you aren’t already. There is information within that is impactful that can easily be missed if you start to skim. For example, the lesions and diseases of the workers that were involved in the dumping, and the moving of the dumped paint from one location to another, just to point out a couple.

Thank you for your time and considering my opinion.

Ramona Criscuolo

Alyssa Criscuolo
English 1201
Professor DasBender
Essay 3

Ford: A Company of Unethical Practices

In the mid-90s, Ford Motor Company began dumping paint sludge and other toxic waste into the soil? in upper Ringwood, New Jersey. This became problematic because the Ramapough Mountain Indians live in upper Ringwood near the dumping site. The Indians were unaware that the sludge was toxic, so they would often play with the paint sludge, or around it. For example, they would make paint sludge mud pies and they would run around playing on the sludge. They would also sift through the sludge looking for scraps of metal to sell. Over time, they developed many health conditions such as~~. These conditions include~~ cancer and other serious health problems. The Indians came to the realization that the other residents in Ringwood were not suffering nearly as often from these illnesses. This led them to believe that the sludge is in fact toxic. The EPA then declared the site as toxic and required Ford Motor Company to clean the waste. In the 1970s, the EPA declared the site as being clear and no longer posing a threat to the lives of the upper Ringwood residents. As time passed, more and more paint sludge was discovered even though the site was "cleaned," so in the early 2000s the EPA declared upper Ringwood as being a toxic site once again. Ford's efforts to clean the sludge started up again. Unfortunately, a large number of the Ramapough Mountain Indians are still sick. Many of them have passed away and even more of them are suffering. The Ringwood residents are working hard to draw attention to the matter in hopes of clearing the site and protecting the environment from further pollution. Originally the Ford Motor Company and EPA said the site would be cleaned until all of the paint sludge was removed, but now Ford and the borough of Ringwood want to cap the site. This has not only caused anger in upper Ringwood, but also a majority of

Commented [GD1]: This is confusing—the sludge was dumped in the mid 90's, right?

Commented [GD2]: Explain what capping means—essentially covering up the contamination by adding soil to the area

Ringwood. The people of Ringwood do not want to simply cover up the waste because this will not solve the problem; the waste will still be there. The waste is contaminating the Wanaque Reservoir, and the water supply of the area so the residents of Ringwood are very concerned.

Because I live in Ringwood, New Jersey, I have great interest in the situation and the effects the paint sludge has on my neighbors and me. ~~I am curious to know~~ to what extent will the paint sludge dumped by Ford in Ringwood affect~~s~~ the environment and the health of the people and to what extent capping the site will protect the residents and the people consuming the water from the harm of the toxins? I have been aware of the situation for a very long time, but the full weight was not revealed to me until recently when the residents started to become even more actively involved. The members of the community are very frustrated with the EPA and their lack of help. Ringwood is a beautiful town full of woods, lakes and nature, so I cannot imagine the contamination being allowed to remain. Strong and clear beginning

Some of the people up to date on the case believe that the paint sludge is not a major health risk and that the levels in the water are not significant enough to be of concern. Scott Fallon and David Zimmer's article, "EPA: Design 2 Cleanup Plans for Ford Site," discusses the two possible cleanup options from a neutral point of view, while taking contamination and health into consideration. Many people believe that there is a connection between the pollution and the health of the people living in Upper Ringwood. The residents say "the pollution has caused a number of ailments and premature deaths, though no health study has linked the two" (Fallon and Zimmer). But because there is no hard evidence that the paint sludge is related to the illnesses that the upper Ringwood residents are enduring, it is not a concern. As for the toxins being released from the paint, the EPA made "the discovery of 1,4-dioxane, a likely carcinogen,

in the site's groundwater [but says] it is not a threat to human health" (Fallon and Zimmer). Town Officials do not believe that the quality of the water is of concern at this current time.

The group of people that believe that the paint sludge does not have immediate adverse effects on the residents and the environment also typically believe that capping the waste site will protect the residents and environment from any further potential spread of toxins. The EPA's article, "A Citizen's Guide to Capping," presents the major points of capping to the reader, which are biased towards the benefits of capping. These points include the ways in which capping protects the life around it. According to the EPA, The protective barrier "[stops] rain and snowmelt from seeping through the [paint sludge] and [from] carrying [the] contaminants to the groundwater" (EPA), so this will help to contain the 1,4-dioxane. In addition, the barrier "[keeps] storm water runoff from carrying [toxins from the waste] offsite or into streams [that connect to the Wanaque Reservoir]" (EPA). Also, the cap will "keep people and wildlife from coming into contact with the [waste dumped by Ford]" (EPA). The main point is that by placing the cap over the waste, the toxic materials are concealed in one place, so they are less likely to spread.

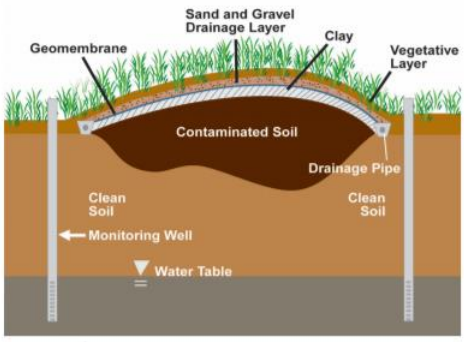

Figure 1Diagram of a type of cap

Commented [GD3]: Nice use of source to explain capping. And terrific graphic.

David Zimmer wrote a nonpartisan article, "Ringwood Officials Stand Firm on Ford Superfund Cap," which includes the mayor of Ringwood's view on why a cap would be beneficial to the residents. Mayor John Speer says the more expensive option of excavating "will not be the answer to the real issue, which is the groundwater contamination caused by Ford's dumping," citation here so it is not worth increasing taxes to fund the excavation (Zimmer). He

adds that excavating "'doesn't get [Ringwood] off the [Superfund] list'" (Zimmer). If excavating does not reduce the levels of toxins in Ringwood, then it is pointless to spend thirty-two million dollars and better to spend ~~rather than spending~~ about five million dollars to cap the site. In addition, the town's insurance will cover the cost to cap the site, but it is unknown if they will cover the cost to excavate, so it is best "to prevent the town from being liable for a cleanup" (Zimmer). The borough of Ringwood believes that although capping does not fully protect against groundwater contamination, it will successfully protect against the spread of the contaminants to other regions. In doing so, residents and animals will not come in direct contact with the toxins.

Nice transition On the other hand, many people do believe that the health risks associated with the paint sludge are of great concern and they believe that the quality of the water is an issue, and will continue to grow into a larger issue over time. There is debate on whether or not the 1,4-dioxane should be of concern. Scott Fallon's "EPA Seeks to Reassure a Skeptical Ringwood about Newly Revealed Contaminant" views both sides of the argument. Fallon notes that the "chemical 1,4-dioxane [is] at concentrations in groundwater almost 100 times the state standard" (Fallon). Residents are even more concerned because "no one knows how long 1,4-dioxane has been in the water because the EPA only began testing for it last year at Superfund sites nationwide" (Fallon). This leads Ringwood residents to question what other chemicals there are that have not been tested for. The "EPA [has reports] showing concentrations of 1,4-dioxane that ranged from 20 micrograms per liter to an estimated 38 micrograms per liter" (Fallon). Although this may seem like a small amount, it is actually "50 to 95 times the state groundwater benchmark of 0.4 micrograms per liter" (Fallon). The EPA claims that the current "levels do not meet the agency's standard for harming health over a lifetime" (Fallon). This is not reassuring to

the residents and the people who get water from the Wanaque Reservoir because “several government agencies have said 1,4-dioxane is a probable human carcinogen. Exposure to very high levels may also cause severe kidney and liver damage” (Fallon). While the levels may not be high at the moment, they will continue to increase as the pollution sits there, and people will drink this water for a very long period of time.

Commented [GD4]: It should be very alarming!

An older article, “Watershed Pollution May Threaten our Reservoirs,” written by Lindy Washburn in 2009 discusses the effects of the contaminants on water quality and health. *The Record* ran tests on streams near the site and found “lead, arsenic, chromium, cadmium, freon and benzene” and they ran tests downstream that revealed “lead, nickel, antimony, arsenic, chromium and copper” (Washburn). Washburn says that “exposure to these individual chemicals is linked to kidney disease, abnormal brain-cell development, skin lesions, birth defects and different types of cancer, among other health problems” (Washburn). Although no test has scientifically proven that the illnesses that the upper Ringwood residents are enduring are related to the pollution, it is proven that these contaminants are harmful. Washburn includes view points from Spiegel, head of Edison Wetlands, and Geoff Welch, chairman of the Ramapo River Committee. The two believe that “the big picture about the effect of Ford’s dumping on public water supplies, in fact, has several blank spots” (Washburn). These gaps include “incomplete information about what was dumped where, and in what quantities, patchy

Commented [GD5]: Was this article about the Ringwood contamination?

Figure 2 Upper Ringwood man with side effects of a disease speculated to be caused by the contaminants (Photographer: Thomas E. Franklin)

understandings of the underground movement of Ringwood's water, and limited scientific knowledge about the health effects of long-term exposure to minute amounts of multiple chemicals" (Washburn). There are too many unknowns for the EPA to be certain of the threats that the pollution does and does not pose. Residents fear the possibility that further down the road a once unknown contaminant could seriously jeopardize ~~be harming~~ their health. Another major concern that Spiegel stated is that Ford dumped paint sludge into the mines and there is the possibility that "the mines may be 'like giant toxic Q-tips discharging contaminants into the groundwater'" (Washburn). If 1,4-dioxane is in the mines, it could spread to the groundwater at an even faster rate. Although the EPA insists that there is no current threat on the groundwater, residents wonder if a threat will develop over time in the years to come. Wonderfully explained argument

David Zimmer's article, "Ringwood Officials Stand Firm on Ford Superfund Cap," mentioned previously, voices the frustrations of the residents towards the borough, Ford, and the EPA. Zimmer writes "Robert Ferretti of Longview Lane said borough representatives should jump at the opportunity to remove any potential source of current or future drinking-water contamination" (Zimmer). Representatives are failing to view the long term effects of the situation. Millions of people will be drinking this water for years to come. It is irresponsible to view the short term effects of saving money by not investing to excavate the site. Ferretti says, "'the residents are most concerned with the

Figure 3 Contaminated stream (Photographer: Rudy Reda)

water, and the cap does not address the water'" (Zimmer). The borough is failing to hear the voices of its people, and is failing to make the health of northern New Jersey residents a priority.

Lindy Washburn's article "Watershed Pollution may Threaten our Reservoirs," ~~also mentioned previously~~, includes why capping may not be the correct answer. The waste that Ford did cleanup was being sent to Wayne Disposal, but the disposal "has found some sludge too loaded with hazardous solvents to accept anymore" (Washburn). This raises concerns for capping because if there had to be a restriction on how much the Wayne Disposal could receive, then this indicates that the paint sludge is highly toxic. Putting a cap over the pollution will only lock in the contaminants; it will not solve the issue related to the quality of the groundwater.

Commented [GD6]: Yes, very good observation

Not only do these articles provide facts on the situation regarding how to clean up the contaminants, the articles also provide information for the reader to understand the power of corporate businesses. There may be limited action that can be taken towards cleaning the site in upper Ringwood, but action can be taken to prevent powerful corporate businesses from taking advantage of small, underserved communities in the future. Ford Motor Company demonstrates that its well established business is no match for a small town. Ford dumped contaminants in many places, and then failed to clean it up when asked to do so the first time. Corporate companies can do as they please without being held accountable for their actions because of their status. By being informed of this power, small towns stand a stronger fight against large businesses.

Commented [GD7]: Yes, absolutely

Based upon the findings and conclusions of Zimmer, Fallon, and Washburn, there appears to be no clear resolution to the issue at hand. Therefore, it boils down to choosing the solution that will be more beneficial in the long run. Excavating the site, though expensive,

appears to offer a long term solution, whereas capping the site offers an immediate solution that will require proper maintenance further down the road.

The health of the residents and the environment will be better improved through excavation than through capping. If the site is capped, it is possible that some areas of sludge outside of the main area of contamination could be left undiscovered and uncapped. By excavating, the contaminants will be sought out much more carefully, so the odds of undiscovered sludge being left behind are much slimmer. This decreases the risk for ressidents as well as for wildlife ~~as well as for the residents~~.

Although excavating would be challenging because, as Spiegel mentions in Washburn's article, no one knows exactly where the sludge has been dumped, no one can see all of the sludge due to the underbrush, and because some of the sludge is deep in the mines, excavating would prevent a large quantity of the contamination from coming in contact with the groundwater for years to come. Even though a cap can conceal the sludge, Ferretti says in Zimmer's article that the sludge could still come in contact with the groundwater. Fallon mentions how 1,4-dioxane has been discovered and the fact that it is speculated to be a carcinogen, so there is the concern that there are other unknown contaminants remaining that could pollute the water. In addition, Washburn discusses the other toxins, such as lead and arsenic, that can lead to many different health conditions that have been known to be contaminating the region for quite some time now. Extreme caution should be taken to ensure that these toxins do ~~will~~ not infect the Wanaque Reservoir in future years. If the Ringwood borough goes through with capping, then what will happen if the levels of toxins in the 2.5 million people's drinking water becomes threateningly high further down the road? Will they then knock down the building that is supposed to be built over the cap? Will they then decide to excavate? Northern Jersey residents want to know that the

water will be safe when their children grow up and then when their children's children grow up. Capping does little to decrease the risk, whereas excavating could do more. Therefore, it is clear that excavating offers more protection to the health of the environment, the residents, and the people drinking the Wanaque Reservoir water.

Excellent work, Alyssa. This topic is clearly very personal but it has far-reaching effects for an entire NJ community as well, and you have done an astonishing job researching the history and details of Ford's toxic dumping in Ringwood. The sources are extremely well presented and your argument in favor of excavation is strongly supported by the evidence you examine. Also, the images you inserted really helped bring the exigence at hand to life! Bravo! I do hope the issue gets resolved in the future through excavation. Good luck, Alyssa!

Grade: A

Annotated Bibliography

Fallon, Scott, and David M Zimmer. "EPA: Design 2 Cleanup Plans for Ford Site."

The Record, 29 Nov. 2016.

Fallon and Zimmer's article in *The Record* explains that two different plans are being made for how the Ringwood borough would like to clean up the superfund site. The plans include either capping the contamination or excavating it. At this point, the borough officials are leaning towards the cheaper plan of capping the site, but no final decision has been made. As a result of the town's indecision, both plans have to be written up. The authors include how residents believe that the contamination is linked to health problems, so they want the site to be excavated. The information provided in this article is helpful in answering my questions about the effects of the contaminants. The article does not present a direct bias towards either side. This source is informative to the residents who are following the cleanup plans. The article is reliable because it is published in a well-known local newspaper.

Fallon, Scott. "EPA Seeks to Reassure a Skeptical Ringwood About Newly Revealed

Contaminant." *The Record*, 2 Mar. 2016.

A different article, written by Fallon that is published in *The Record,* informs its audience about the meeting recently held in which the EPA apologizes for withholding information on a contaminant, 1,4-dioxane, discovered three months ago. EPA officials say that this contaminant will not change the plans to cap the site. Residents are angry that precautions are not being taken since the contaminant is most likely a carcinogen that can lead to kidney and liver damage. This article is useful in answering my question about the effects the paint sludge has on the environment and the people. It also answers my question as to whether or not capping will be effective. This source is not bias towards one side because it includes information to support both sides of the argument. The article is reliable because it is published in a well-known local newspaper.

United States, Office of Solid Waste and Emergency Response, Environmental Protection Agency. *A Citizen's Guide to Capping.* Sept. 2012

The *Environmental Protection Agency's* article gives a brief overview of what capping a site means and answers any common questions that people may have. It explains that capping serves to contain the contaminants so that they cannot spread and so that living organisms do not come in contact with the contaminants. The article says that caps keep the contaminants from being carried to the groundwater. This confused me because the article says that it helps to solve the issue of contaminated groundwater, but the town says that capping or excavating will not solve the issue of the groundwater. This guide says that capping is safe, but the condition of the cap needs to be checked regularly so that it is always properly doing its job. This article is useful to answer my question about how effective a cap will be in protecting the residents from the toxins. This article appears to be bias because it only focuses on the benefits of capping. The source is reliable because it is a government funded organization.

Washburn, Lindy. "Watershed Pollution may Threaten our Reservoirs." *The Record*, 7 Aug. 2009.

Washburn's article in *The Record* discusses how there are many unknowns about the contamination of the groundwater. It appears that no one has clear, well-supported answers to many of the questions. For example, no one knows where exactly all the water in the mines goes, and the mines are filled with paint sludge and other trash so this is an important factor to take into consideration. In addition, no one knows the long term effects of the small amounts of contaminants on the human body. Washburn supports her case that the contaminants are extremely toxic by using the example that Wayne Disposal refused to accept any more waste from the site because the waste was too hazardous. This article reminds me that while there might not be clear evidence to say that the waste poses a threat to the health of many, it does point out the fact that the possibility of such damage should be enough to take extreme caution. This article is bias towards excavating the site. It is a reliable source because it is published in the newspaper *The Record*.

Zimmer, David M. “Ringwood Officials Stand Firm on Ford Superfund Cap.” *The Record*, 24 Dec. 2016.

Zimmer’s article, published in *The Record*, covers the Ringwood borough’s position to cap the site. The officials are sticking with the capping plan, even though many residents prefer excavating. The mayor believes that residents want to excavate the site to help solve the groundwater contamination, but he says that excavating will not solve this problem. He believes that excavating will be a waste of money because the site will still be contaminated. The borough is also choosing to cap the site because they do not want to hold the town liable for the cleanup. This article is useful in answering my question about the extent that capping will protect the site. It helps me to understand why some officials believe that capping is the better of the two options. This also shows me that there are many factors that are being considered; officials are considering other things than just health of the residents and the environment. This article is not bias because the author interviews both people who do support the cap and who do not. The article is reliable because it is published in a well-known local newspaper.

2015

Ramapough/Ford The Impact and Survival of an Indigenous Community in the Shadow of Ford Motor Company's Toxic Legacy

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DISSERTATION COMMITTEE PAGE

The undersigned have examined the dissertation entitled: Ramapough/Ford: The Impact and Survival of an Indigenous Community in the Shadow of Ford Motor Company's Toxic Legacy presented by Chuck Stead

candidate for the degree of Doctor of Philosophy and hereby certify that it is accepted.

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Defense Date: August 22, 2014

Ramapough/Ford:

The Impact and Survival of an Indigenous Community in the Shadow of Ford Motor Company's Toxic Legacy

By:

Chuck Stead

A dissertation submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Environmental Studies

at

Antioch University New England

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2015

The views and opinions expressed in this document are those of the author and do not necessarily reflect those of the reviewers or Antioch University.

This is dedicated to the elders.

Acknowledgments

The author would like to thank Antioch School of Environmental Studies, and the Doctorial Committee, Dr. Michael Edelstein, Dr. Tania Shuster, Charlene Defreese and Dr. Alesia Maltz for their guidance, as well as my cohort colleague Claudia Ford. I would also like to thank the members of the Ramapo Lenape Nation especially Chief Perry, Chief Mann, and Vivian Milligan for their support and guidance. The many traditional storytellers who are identified in the narrative have been especially helpful over the years and it is my hope that my re-telling of their stories does them justice. The work of numerous scholars is cited here and I would like to thank them for their inspiration over the years as well as their example and determination to achieve the academic excellence that they are known for. I thank Ed Lenik and Nancy Gibbs for their review of chapter three and for the additional material they offered. Family members and community members are also cited in this narrative and it is my hope that my memory of the events referenced is appropriate. Students from numerous programs I have had the privilege to work with including: the Nature Place Day Camp, BOCES and the Youth Bureau of Rockland County, Ramapo College of Mahwah New Jersey, Cornell Cooperative Extension of Rockland, Antioch University of New England, and Green Meadow School of Chestnut Ridge in Rockland County. The primary editor of this work has been Kara Graham, without whose help this dissertation would not have been completed. Finally, I would like to thank my immediate family Kat Stead and Luke Forester who have patiently lived under the same roof with my scholarly excesses.

Abstract: Ramapough/Ford, the Impact and Survival of an Indigenous Community in the Shadow of Ford Motor Company's Toxic Legacy

The purpose of this study was to examine the history of the Ford Motor Company's impact upon the Ramapo Watershed of New York and New Jersey, as well as upon the Ramapough Munsi Nation, an indigenous population living there. In a 25 year span the automaker produced a record number of vehicles and dumped a massive amount of lead paint, leaving behind a toxic legacy that continues to plaque the area and its residents. The Ramapough people are not unlike many native nations living in the United States who have experienced industrial excess. This study examines the mindset that allows for marginalizing portions of society as a part of standard business protocol and considers the dynamic of the 'Wounded Storyteller' as a tool of survival engaged by the native community. Just as in ecological restoration the ecologist must work within an adaptive environment, narratives of recovery adapt to the wounding of tradition and emerge anew to a place of recovery. The Ramapough Nation has become the proverbial 'canary in the mine shaft' being on the front line of lead paint sludge contamination. Their struggle to survive and to remake their lives can offer modeling for other communities beset with similar environmental contamination. This is an environmental justice issue that knows no racial boundary and will find its way into the general public. The author having grown up among this community is well versed in the history of discrimination as well as the dismissal of their native heritage on the part of academic institutions. He is also a person of the land and from his childhood witnessed Ford dumping in the watershed as well as the years of illness among the people. This study looks to dispel some of the myth around the community and shed light on the level of exploitation by industry, regulators, and politicians. While this is primarily an historical

account there is an element of participatory research engaged here, as the author has worked with the community and students in the building of an Environmental Research Center designed to focus on recovery in the watershed and community. The electronic version of this Dissertation is at OhioLink ETD Center, www.ohiolink.edu/etd.

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Introduction

It is my hope that this manuscript presents both a scholarly work and a contribution to the larger narrative that I have been privileged to be a part of. As a scholarly work it is significant that an academic study authored by one whose sense of place is informed by the regional landscape, its history, its economy and its people become a part of the local cannon. Academic writing tends to objectify its subject with the premise that truth is achieved by objective detachment. In this attempt at eliminating potential bias, the academy falls prey to its own institutional chauvinism and all too often produces something that is lifeless, sterile. As to offering a contribution to the greater narrative found in the Ramapo Hills, I can only hope that herein the voices of elders remains true and alive, that my commentary does not detract from their sensibility but stewards their story. This then is a collective story by the wounded storytellers of the Ramapough/Ford experience. We here in the watershed live with and will continue to live with the wounds of industrial impact but that is not our soul story, it is only a part of something greater. We have histories that predate the arrival of Ford Motor Company and we continue to move along after the auto maker left us with its waste, just as we have continued to learn how early industry informed our sensibilities, our way of life.

The first chapter is more of a personal account, a story of youthful trapping, a naturalist's journey and an encounter with exploitation. Unlike many academic works, it initiates this text with the personal, this is necessary as the story requires the witness, the local knowledge. The next two chapters look into history, the early pioneering industry that helped shaped the region and then the Ramapough Nation, contemporary tribal descendants of the Munsee Lenape people. The early industry focuses on Iron Mining and Production work in the region, which built a

culture rooted in mineral extraction. This story is marked by a colonial hunger to manifest Christian values laced with industrial economics and finds itself extrapolating indigenous concepts, shaped to fit a new world consumption. The Ramapough story is one of a deep earth bound genesis that collided with a few centuries of domination, than served up to a mighty auto maker as a dumping ground. This story requires a certain deconstructing of the white man's portrayal of native and minority populations, in order to get at the deep injustice of the situation. Getting at the pre-condition that informs the behavior of the Ford industrial model is the stuff of the fourth chapter, entitled Fordism. Henry Ford, the patriarch founder of the industry, established Fordism as his contribution to the world of scientific management of the workforce. Ford was a complex man, portraying himself as a defender of the farmer while at the same time industrializing the countryside; calling for world peace as an anti-militarist while espousing anti-Semitic propaganda and supporting German fascism; and defending individualism while union busting. By mid-twentieth century the industrial model had grown self assured, cocky, confidant, and outright over-reaching.

Chapter five examines the product of that 'over reaching' with a close look at the ingredients of auto paint. Individually most of them are carcinogenic but collectively they are toxic poison. And the next chapter celebrates the work of courageous journalists with the *Bergen Record* who ferret out the story, of that poison. We hear the voices of the Ramapoughs, as collected by the likes of local writers, who transcend the jingoistic propaganda surrounding this rural community. This is followed in chapter seven with an examination of how contemporary media stigmatizes the community and to the complex narrative of the people and the watershed.

The eighth chapter is entitled Wounded Storytellers and presents the voices of the Ramapoughs, as this author has heard them. Here the concept of wounded narratives and the

struggle to reclaim ones story from the “professionals” who have stolen it is explored. This is an intimate study of traditional knowledge as expressed in story; it is about healing through animism. This is a way of being that is thousands of years old, predating monotheism, its closeness to nature being its primary force. It is around this chapter that the entire work lives, manifests, and moves on to an understanding of recovery, recovery of health, identity, and place. Chapter Nine analyzes recovery, Ramapough style, by looking into the work of psychologists and native writers. Here the culture of the contaminated community is examined, along with the native path. Chapter Ten tells the story of the Ramapo Saltbox Environmental Research Center, this being a localized response to the over all impact one of healing for the watershed as much as for the community. The last chapter both reflects on the preconditions and strategies for recovery, as well as offering a transitional ‘stepping off’ place for contaminated communities that here to for have found themselves caught between posturing politicians, evasive regulatory agencies, and a domineering industrial paradigm.

The Epilogue is a fragment of a story, a glimpse into a scene that spoke gently of the larger narrative of contamination

Chapter One

Trapper's Story

I learned to trap from my father, Walt. He went along with me and taught me some of what he knew; he introduced me to other trapper elders who shared their stories and encouraged me on. It was the early 1960s and the west end of Rockland County, New York, was changing from a distinctly rural community to a commuter's suburban landscape. Trapping and hunting were dying out and a boy interested in such was a rarity. Perhaps, that was the reason Walt and his cronies were so generous with their time, or perhaps it was a narrative that expected to be passed along; either way I was the fortunate recipient. Some of Walt's trapping buddies were clearly native, but were cautious about sharing too much of 'that' with a white boy; still, being Walt's son was a calling card which allowed me access to 'ways of being' that many of my generation knew nothing of. Within my own family line there was intense racism, with uncles condemning blacks at large and the Ramapough Indian Community as 'want to be Injun' blacks. I found that among the society of trappers, with which Walt was familiar, ethnicity was of little concern. This was fortunate for me as the best trappers were the Indians, then the Blacks, with the White folks trailing behind.

Walt started me trapping for muskrats along a little creek, called The Gulley, that ran down from the old village reservoir along Sixth Street, eventually leveled off and followed Sixth Street toward the southern end of the village, where it was culvert-run by a section of NYS Thruway ramps that connected the Thruway to New Jersey at the state

line. We worked the lower section of the creek, as there were no houses along there after the Thruway ramp crossed over it. This was the last leg of the creek; channelized by the Thruway construction, it ran straight through a deep gulley and emptied into the Ramapo River. Walt chose this stretch as being out of sight of the Sixth Street houses; he surmised we would arise little interest from kids looking to steal traps. I never believed there were such kids, but it was an old memory of his and he held to it. To access our muskrat trapping, we wadded through the wide culvert with its great overarching corrugated steel frame; drawing up on the other side was like entering a 'forgotten land', like a passage to another time. We chatted some as we walked over to Sixth Street, but once we wadded down through the cold water culvert we fell silent, and moved along studying the shoreline for 'rat' sign. We used little Number 1 Victor jump traps which were small leg hold spring steel devices; we set them in such fashion that the drag weighted the chain out into the deeper water, usually drowning the muskrat, shortly after getting caught. On occasion, the little furry critter would climb a rock or hold onto a log, and we would have to shove him under and drown him. This was the first 'fur bearer' that I killed, sometimes holding it down under water with my boot and feeling the squirm for life slip out of it. We talked about what that feeling was like, how it stuck to you at night when you couldn't sleep but it was all a part of 'getting on', as Walt would say; and I accepted the regret as a reminder that life is precious and worth fighting for, even if you're a muskrat.

Mostly my education in trapping and wood lore was experiential, but there were some books: I read A.R. Harding's series on small game trapping, we subscribed to Harding's magazine *Fur-Fish-Game,* and of course I read the same Ernest Thompson Seton books that Walt had read years before I did. These were all things written early in

the 1900s, which only reinforced my sense of transcending time and place. I came upon Horace Kephart's *Book of Camping and Woodcraft* published in 1906; along with Seton's work, I extrapolated his self sufficient methods for my pioneering exploits in the Ramapo Hills. These authors spoke of a romantic time wherein woodcraft, common sense, and open spaces were the ingredients for endless adventure; this despite the fact that by the first years of the 20th century the likes of naturalist John Muir were battling for preservation policy with National Forester Gilford Pinchot. Some sixty years later the terrain I tramped in the Ramapo Mountains had already been radically altered, and the forty years left in the century would draw even deeper wounds into the watershed. I pioneered a tenuous border along a fragment of yesteryear, shape shifting into a suburban landscape. Our muskrat trap line was the perfect example of this dichotomy: its route first went through the culvert, then, reaching the Ramapo River, turned north up under a huge New York State Thruway overpass. The entire route was accompanied by the sound of fast moving traffic. Commuters had no idea that they drove over a father and son, practicing 19th century fur harvesting. Once we found a twenty dollar bill below the Thruway overpass which we put to a dozen new traps; an offering blown out the window of a commuter, the currency transcended time and shape shifted into another reality.

For a couple of seasons we followed this route and never turned south at the convergence of the Gulley Brook and the Ramapo River. I had heard that down below the Ford Motor Company railroad spur, the river opened up to some pretty fertile wetlands, which made for good muskrat territory. But Walt wouldn't trap there as he said that was Meadows country: a low land portion of housing that was cut off from the rest of the village by the Thruway. Meadows he said was a place where some of the Ramapough

Indians lived, along with some other folks too poor to get out of such a place. Apparently this was a flood plain which to some degree had been abated when the Thruway and Ford completed re-shaping the terrain, but still in times of high water, especially winter thaw, the Meadows could flood and take days to drain. While all this makes for good muskrat trapping, Walt had checked it out and found that Meadows kids were actively working the area, so he refused to even consider intruding. I pressed him further until one day he admitted that he was not at all sure about the health of the animals down in that lower bottom area, beyond the Ford rail siding. He had been to some dump fires down there and said they smoldered a nasty smelling black smoke, like when a house fire blisters up and cooks off the lead paint. Now, we regularly ate fish caught from the Ramapo and it struck me that muskrats caught in Ramapo water were really much the same as fish caught there. Walt pointed out that we ate fish from above the Fourth Street damn which was too high for rock bass and perch to bother jumping (these were the days before the Ramapo was trout stocked). I pressed him on this dangerous dump fire issue in defense of our river, but he said that the fires were most likely 'just' garbage from the Ford Company. He said, "You got to take the bad with the good."

Eventually, I made my way up river beyond the Fourth Street Bridge, beyond the railroad trestles, along the banks of the Ramapo Land Company sand quarry, to where the water of the Torne Brook poured into the Ramapo River. Here was the mouth of the little brook named for the valley which was named for the prominent granite rock ledge that faced south out of Torne Valley and down into the Ramapo Valley. I had a couple of seasons experience behind me and was ready to move up into trapping some larger game. Walt checked the valley and there didn't seem to be anybody working it. At its base it

was maybe three quarters of a mile wide and it extended up to the state park line about three and half miles. Most of this property belonged to the Ramapo Land Company and the only sporting activity it saw was the annual three week deer gunning season (which Walt was long a participant in). My dad had an old friendship with the patriarch of the Land Company, Henry Pierson, who gave his personal permission for me to trap the valley as I saw fit. This is where my trapping story really began. I loved this valley from the start with its sudden creeks after a rainfall, its terraces of ancient granite, its diverse stands of white pine, old hemlock, quaking aspen, fire red sumac, sweet maple, thick browse of mountain laurel, sweet fern, star and cushion moss, and its endless tracking potential. There were also three sand quarries belonging to the Ramapo Land Company: the first of which was a stretch at the mouth of the valley along the east bank of the Ramapo River, the second and third sand quarries followed up slope through the valley along the route of the Torne Brook. These were not deep rock quarries but rather open field quarries that involved removal of the foliage and top soil, exposing the sand deposits left by ancient glaciers. It was fine mineral sand, excellent for concrete mix. By the time I entered the valley these little quarries (which I called lower pit, middle pit and upper pit respectively) were not so active; still, there were some old dump trucks and rusting earth movers about, ready to be fired up when called upon. The first fall I explored the eastern slope of the valley I seldom heard any machinery in use. As the trapping season approached, I planned to concentrate on the eastern slope for about a mile, and then down through a cedar swamp, on along a little water way called Candle Brook and down to where it joined Torne Brook. I planned some tree staked sets at the start of the line, then a few drag sets in the cedar swamp, and then more tree staked sets

down along the Candle Brook. I had seen sign for Mink, Raccoon, Opossum, Skunk and Fox but being new at this I focused only on Mink and Raccoon; Fox struck me as too crafty for my skills.

Over the season, my weekend trapping extended into weekdays with making the rounds in the late afternoon when I got off the school bus, and again in the early morning before being carted back to school. It was really sort of a double life: I was attending a private Catholic school by day, then, stripped of my formal costume, I was a 19th century trapper. While my focus was on reading the forest, tracking wildlife, and watching for changes in the landscape; I also made note of any new activities in the sand quarries. There being a locked gate near the start of Torne Valley Road, and another locked gate at the west entrance of the valley on Lake Road, it was apparent that any such activities were limited to those few who had a key and were employed by the Land Company. After school, I entered the trap line usually covering the most heavily wooded stretch first. Cutting through a little ravine, called Crows Nest, I hiked the eastern wall of the valley until I reached Candle Brook, from there I turned south close to Torne Valley Road. It was often dark by the time I came down. In the morning, I went out in the dark and reversed the trek, so that I came down through the rough terrain by the early light of day. During that first year I took a good number of raccoons, opossum and some skunks, the later causing quite a stir when I got to grade school. Eventually, the good sisters at Sacred Heart School sent me home with a request that I should be kept out of school when I had met with a skunk.

It was during that first year in the valley that I discovered signs of paint dumping. Late on a Saturday, I had decided to walk up the Valley Road instead of down. Having

just come around the bend beyond the gate, I found two pickup trucks parked along the right side of the road. There was a cleared area behind the trucks up off the road, some saplings had been pushed over and the earth was torn up. The trucks were loaded with fifty five gallon drums covered over with a heavy painter's canvas. I put down my trappers pack and climbed into the first pickup, a Ford F150, and found the keys were in the ignition. Thrilled, I was tempted to turn the key but then realized this could mean the owner was near at hand so I slid out. Before leaving, I explored the source of a thick turpentine-like odor and found that it came from the barrels. I climbed up on the back of the bed and was about to look under the tarp, but the smell got to me and caused my eyes to water, so I jumped down. After making the full loop, I returned to the spot where both trucks were parked as before as if waiting for something. I made a note of this in my journal but didn't bother to sketch them; it was dark and I didn't feel confident drawing vehicles. This journal I kept (actually a series of them in various notebooks) was a practice I picked up from reading the Seton books. He advocated journaling as a means of keeping track of your sense of place, making note of any short or long range changes to the area, and holding onto learning. I carried a notebook of one sort or another with me most of the time, although I was not consistent in how I logged into them: sometimes like a diary, sometimes very dry lists of things, and on occasion I sketched along the trap line. Seton had kept a journal of his tracking and I often did the same, but something Seton never did was draw industrial impact. He may have seen little of it in his Manitoba youth and if he did see quarrying activities of one sort or another, it did not draw his attention. I on the other hand, managed to sketch some of the sand quarry activities in Ramapo. By the following year I found more activity in the lower and middle pits.

It was around 1964 that I walked into the wide open space of the lower pit and saw three men standing by a tarp covered pick-up truck, near the old quarry Quonset hut. I recognized them as friends of my father: Pierson Mapes, Ray Conklin and Steve Matson. Pierson Mapes was a family member of the longstanding Pierson family who first established the iron works in Ramapo back in 1798. Mapes was something of a land manager for the company. Conklin and Matson were both contractors who at different times were hired out to work the sand quarry. Of the three of them, Mapes, a big round bellied fellow and the oldest one there, was the talkative out going, and opinionated one. Conklin and Matson were younger than Mapes. Conklin was more engaging than Matson, more chatty. Mapes called me over. Despite my father knowing these guys, I felt a tension in walking up to them.

First I showed them my game in the pack, a raccoon and opossum. They admired it. Conklin observed that opossum fur was worthless. Matson told him that while the fur was worthless, the fat of the animal made excellent boot oil for water proofing. Steve Matson was the best white trapper locally, and his word was usually considered the final say in such matters. Still, Conklin teased me about scrapping down opossum fat instead of just buying a tin of mink oil as modern hunters do. I re-packed my game pack and hefted it over my shoulder. They said good-bye and I walked off lost in thought. I went over everything they said and wondered why it had scared me so; that was when I noticed the stinging sensation in my sinuses. The tarp covered truck bed had steel barrels in it. They smelled like the ones I had found the year before. This was not hunting, trapping or fishing odor; it may have had something to do with quarry work but it reminded me of the turpentine odor that was in my dad's paint shop.

Being a Saturday morning, I walked down to the paint shop at the end of Torne Valley Road and found my Uncle Mal there working on some shutters. He admired my game and offered me a cup of coffee, but I took a flat cola from the ice box instead. As he worked at the shutters, I stood around sniffing the air trying to sort out what was different about this scent than that of the steel drums; they were similar but not the same. That night after I skinned the game, stretched the hide, scraped down the fat from the opossum and capped it in a peanut butter jar for boiling later, I went upstairs to see what my mother was watching on the television. It was a *Gunsmoke* night: a Saturday night Western drama. It was one of the shows my mother, Tessie, watched regularly. She often set up her hair curler folding table by her easy chair and watched the show as she put up her hair into little plastic curlers. Tonight she was doing a different activity at the folding table during the television show. She was removing her old nail polish. This involved brushing on polish remover which softened up the hard polish so it could be slid off the nail. The polish remover was acetone, and it was the mystery scent I smelled at the back of the tarp covered pick up truck. Like so many things in my life at that time: fox scat on logs, leaves curled up before a rain, air bubbles in the mud, I tucked this away as yet another observation to draw on later, much later.

By my third season I was a regular fox trapper. This came to me from both long observation and a great deal of advice. I had noticed that after a fresh snow fall there were fox tracks following my own; often stepping into my tracks very neatly, almost invisibly. Fox would visit my sets, examine them, mark them with urine, occasionally steal the bait and sometimes set off the traps by back digging debris into them. No matter how I disguised my traps, Fox knew where they were. Walt took me to some old native

trappers who lived in small places like bungalows not meant for four seasons, or old air stream trailers set up on cinder blocks. He once took me to a fellow who had his entire aluminum Airstream covered in hand paintings, as one would expect to find a teepee decorated. Walt said that these were not so much decorations as they were picture stories. From these old men I first heard of animal speak: that is of the way in which we learn what it is animals have to tell us. I wasn't very good at doing this but they told me it takes time and that was good too. They believed that too much animal speak too soon for a white boy could be intoxicating. It was explained they meant 'brain drunk'.

I was told that to catch Fox I must be Fox; that is to say as much as one can be Fox. They told me that Fox knows what I'm after and that I would get it by striking a bargain with Fox. This meant that I was to be brother to Fox; if I was allowed to take life I was expected to return it one day. No one actually told me how I was going to return it. This did not mean I would offer up my mortal existence, only that I would walk a path with an ear to Fox, and I would know when Fox called me. Walt enjoyed these little lessons but never gave up what he thought about them. My Uncle Mal, the great skeptic of Indian Lore, advised that I follow the lessons of A.R. Harding and not that of E.T. Seton, as Seton often drew upon the Red Path, something Mal dismissed as just folklore. I took it all in so as Fox tracked me I tracked Fox. If Fox marked one side of a tree I marked the other side. If Fox lay scat on the top of a log I did the same, no easy trick during freezing weather.

There was one Fox that regularly took a route along the Torne Brook, up past the Hemlock Falls, beyond the Candle Brook outlet, and along the west bank marking some sycamore; often the same ones. My trapping buddy, Ricky, and I studied his route.

Eventually we made three sets, each with a different pattern of disguise. All three had two traps each, boiled in bees wax and arranged differently at various distances along the shore line. Then, one Saturday we found most of the Torne Brook frozen over with the only openings where water rushed the hardest. It was at a set closest to the ice that Fox sat waiting, tethered by one of our traps. Now I had been advised that while Coon will put up a fierce battle until the end, Fox knows when he's been had and will await his fate. At the time, my only weapon was a little war club I carved out of a chunk of maple; so with Ricky distracting him I snuck in close to wallop Fox. I hesitated; he turned and attacked. I fumbled, stepped out on the ice, and crashed through into two feet of cold flowing water. Fox wrapped his front paws around my leg and proceeded to gnaw on my shin. Having dropped my club, I grabbed Fox by the throat and plunged him into the water to finish him off. Before the life went out of him, his face turned into my own: it was as if I held myself under water. I jumped back. He was finished. It was complete. Being soaked through, we made a small fire and I dried off. As we talked over the adventure, I said nothing about what I had seen in the animal's face.

Having no male genitalia we believed it was female, later when skinning off the pelt I discovered male testicles shrunken inside his hide or her hide depending on how you look at it. When an old Ramapough woman heard I had killed a Fox that bit me and the Fox was a curious mix of gender, she declared I had killed a Manitou. This is a spirit beast that can take animal form and chooses to come to people for various reasons. Walt's old friends used to chide me that I had obligations to Brother Fox; whenever I killed one after that I used to wonder where my animal debt was leading me.

The first time I actually sketched what could be seen as a record of dumping activities was in late fall of 1965 when I found a back hoe in the evening at Middle Pit. It was next to a freshly dug trench about two and a half feet wide and a good four feet deep. The ground all around was rock hard from freezing, but the trench still had water across its base. There were two or three steel drums empty but I could smell that syrupy sweet, acidic odor from them. I drew the scene including the back hoe, a couple of the drums, and the trench. This was on a weekday evening with the cold dark night closing in. The next morning, I came around the north side of the Middle Pit and the first thing I noticed was the back hoe tractor had been moved. I saw that the trench was filled in with dirt spread around making it difficult to know where the trench had been. Later that day, I stopped by the paint shop to tell Uncle Mal about the quarry crew working at night. He shook his head and told me they weren't quarrying at night, they were burying Ford paint up there. It was that common. A good many folks knew paint was being dumped and buried.

Clearly Uncle Mal (my beloved storytelling elder) had a very strong opinion about earth friendly regulations. After all, only a couple of years earlier, he regaled most anyone who would listen with his critique of Rachel Carson, someone he loathed for being a knew-jerk liberal sensationalist. Hearing him rail against dumping regulations or taking the side of industry was not unusual. I didn't know if paint dumping was inappropriate, although there did seem to be something devious about it being dumped and buried after hours.

That Christmas Walt gave me a twenty two rifle and told me to take it whenever I went trapping. Although we did not discuss it, I had the feeling that the gun was not just

for taking game but maybe for a little security too. Apparently my brother in law, Tony, had something to do with this concern. Tony worked for the Land Company and was familiar with "after hours" activity in Torne Valley. With a gun in your hands, tramping through the woods takes on new meaning. I spent longer hours out, often getting in late at night and being late for school in the morning. I imagined myself cutting quite the figure with my trappers split ash pack, my high boots, hat and gun. I wore an old hunters Woolrich Mackinaw, really too big for me, but I assumed that made me look more stocky. It was warm inside that Mackinaw; in fact, tramping along weighted down by that coat I worked up a good sweat that then on cold nights would chill me. I would stop and make a little fire to sit by, imagining that I was deep in the Yukon far from anything modern. If I saw car lights coursing the Torne Valley Road, I would smother the fire and move from the site in case I had been spotted. I don't know what I was afraid about but the nocturnal paint dumping kept me very much alert to human activity. Once when I was carrying two fox in the pack as I came down through Middle Pit, there stood a man next to a jeep. He looked as surprised to see me as I was to see him. He hesitated and then told me to come over to him. I shook my head and he moved toward me. His was a quick and rather clumsy move. Without thinking I put my gun on him. He backed up and said nothing. I moved away slowly and kept my eye on him until the dark swallowed him. After that, I took a different route down and was careful to only build small fires in low places against big rocks.

Toward the end of my trapping the Torne Valley in the late sixties, there were new activities going on there. There were surveyors in the Upper Pit staking out a site for an electric power substation, and some dumping was going on along the Torne Brook on

its eastern bank down below the bend after the Hemlock Falls. This dumping seemed to involve a lot of junk and the 'nail polish remover' scent was very strong there. By the summer of 1970, the Middle Pit was being excavated for a county lease agreement to be used as a residential landfill; for the county waste incinerator was being shut down. My brother-in-law, Tony, operated a back hoe doing prep work for this site. He used to laugh about how it was necessary to clean up a site for it to be used as a dumping ground. He talked about cutting into the sand and coming up with hardened chunks of gray, blue and red paint. I asked him what he did with it and he said it was just moved off the site that was being leased. It wasn't moved very far. Thirty five years later I would find the paint he moved, but I could not go back and tell him by then he had long passed away from lesions on the brain.

Summary:

Relationship to place based on family history, community and personal experience makes for a sound stewardship. The hunting, trapping, and foraging dynamic invests one in a deeper understanding of ecological systems. To witness hazardous dumping of waste amid a society that has acquiesced to such behavior isolates any objection to this behavior as abhorrent, out of place, even anti-social. The naturalist, craving some form of public forum, may turn a deaf ear to industrial excess; while the alternate choice of advocacy, in opposition to industrial impact, could well marginalize the naturalist to an eccentric status. An historic example of this dichotomy can be found in the gentle work of Catskill naturalist, John Burroughs, as opposed to the impassioned work of John Muir, the sage of the Sierras.

Although I fancied myself something of a radical advocate in my early years, I did not possess the knowledge or skills required for confrontational politics with Ford Motor Company. That said, the ground work on which to build local advocacy was mounting: cancers were starting to increase among community members who lived near to dumping sites, various sites had exceeded capacity and with the initiation of an annual Earth Day, there seemed a change in the wind.

Chapter Two

Iron from Stone

My grandfather worked at the Iron Works. He was there back in the days of the Ramapo Iron Works when they made railroad wheels, track rails, and switch stands. It was a place of hard working men who knew how to work the hot steel into sand molds at just the right temperature. My grandfather started there as a young man and over the years learned various skills until one day he drew in a steel splinter from a lathe machine: it festered and infected his hand. He lost his two middle fingers and his job but the Davidson shop was not without compensation for John Stead. They set him up in a gas station where he could service their trucks and pump gas for the ever increasing volume of cars coming into the Ramapo Valley; mostly Ford's basic black Model T. In his new life he would walk up Lake Road out of the village, through the valley, and there just passed the Presbyterian Church/Cemetery John Stead pumped gas, changed tires and oil, and worked most of his days. Davidson, a manager at the Iron Works, went on to become the school district superintendent. He was a powerful man locally. He was not happy with the advancement of the 'colored' and the Jews. He spoke broadly about 'folks needing to know their place'. He discouraged open talk about the 'hill people' being Indians. In time his was an influence over one of John's sons, the oldest one, the one I came to know as Uncle Mal. If Grandfather (whom I knew as Heebie Jeebie) had lived longer I might have gotten more stories out of him, I might have learned more about how he came to Ramapo, I might have heard from his lips what he thought of his children, but he journeyed when I was four years of age so the first stories I collected were all I had to work with from him.

He came over most days around ten in the morning. I was sickly and tethered to a massive head that anchored me to where ever my mother put me down. He came into the house, dragged me over to the easy chair and lifted me into his lap. We shared a chocolate bar from his flannel shirt pocket. He talked in a fashion that allowed for an ongoing narrative that seemed to travel through his life, connecting local lore with casual acquaintances. Some stories he repeated from various angles and perspectives, one of those was about the Salamander. "The Salamander is in the fire. He is the fire himself. You can see his tongue lick at the logs. He teases those who search for the metal in the rock. He is a shape shifter!" I did not know who this Salamander was but sometime later I learned from Uncle Mal, that the Salamander was a spirit that escaped the forge fires of the German iron workers. Mal told me that these early iron workers in the Ramapo region had learned the secrets of finding ore in the rock and had come to Torne Mountain to extract this precious ore. He said there was one, an iron master by the name of Hugo who had not kept the custom of dousing his forge fire every seven years, and as a result the Salamander escaped to plague Hugo's family thereafter. This tormented the poor man's life until the Salamander shifted into a handsome young man in order to get at Hugo's beautiful daughter, Mary, but this was the Salamander's undoing for he fell in love with Mary, not the sort of thing a proper devil ought to be up to. Mal was not sure what became of the Salamander or Mary or Hugo or any of the people in the story after that. It would be years before I would learn of this from a book called *Myths and Legends of Our Own Land* by Charles M. Skinner who spoke of the story as having a Rosicrucian source, from the mid-1600s.[1] It is not clear as to the credibility of Skinner's version, or for that matter even the geography, he places the story at "High Tor, or Torn Mountain" which he

identifies as the same place despite the fact that today these are two different ridge tops, the former being along the Hudson Shore and the latter in the heart of the Ramapos some twelve miles in land. Furthermore he identifies this mountain as being the final home of Amasis, youngest of the magi who followed the star of Bethlehem. With so much mixed folklore and history it is hard to know the rightful place this story plays in Ramapo culture, but that a metaphysical creature called the Salamander emerging from the forge fire was a part of local lore does seem to resonate with the area. For even the casual chat of back yard Fourth of July celebrants made note of the alternating glow in the barbeque coals, calling it the Salamander.

In time, I would learn that the Rosicrucians were an early 1600s Christian cult that acquainted itself with the Alchemists, the folks who mixed physical science with metaphysics. Contemporary physicists have a tendency to see the alchemists as their predecessors, allowing for a 'magical' speculation in the early years of natural law definition. But it is the influence of such a story as the Salamander that interests me here. In the early industrialization of the Hudson Highlands the Ramapo Salamander stands out as a curious and prophetic tale, while it is questionable to what degree it personifies the man/nature relationship there is no denying that the story hung in the air through the first three centuries. Was the re-telling of this story by Skinner in 1896 an insight to the early industrial mindset or was it more of 'folkie' interpretation after the fact? To answer this question one must look back through the founding of the industrial iron works village, back through the industrialists who developed the Ramapo Iron Works in the valley, back to the earlier enterprising folk who brought with them a European mindset in search of the 'metal in the rock'.[2]

Peter Hasenclever, born in Remscheid, Germany, November 24, 1716, was perhaps the first of the visionary industrialists to enter the Ramapo region. After initiating a commercial firm by the name of Hasenclever, Seton and Crofts in England, he took off for America to reap the natural resources in this 'open land'. He brought with him from Germany all manner of skilled workers and transported them with their families to the colonies, in essence the men and women ripe with the traditional iron mining culture: the forgers, the furnace operators, the charcoal burners, the miners; all the trades needed to build mining camps came to the Highlands. They started in on clearing land, digging mines, building furnaces and telling stories. Here the stories of Rosicrucians mixed with local lore and emerged as Catskill Gnomes, the Spuyten Devil, and the Ramapo Salamander. With the hubris of the Rosicrucian sect informed by European Alchemy, the modern industrialist believed they were destined in this new world to learn the secrets of nature – Perpetual Motion, Philosopher's Stone, the Elixir of Life – and if nothing else, get rich in trying.

Hasenclever purchased the then broken down Ringwood NJ Ironworks Estate, in 1764 from the Ogdens and the Gouvernours. He got it up and running with his workforce and proceeded to expand his holdings. At a time when mercantile investors seldom reached beyond regional locality, Hasenclever focused on volume production and envisioned an iron empire. Drawing on the good faith of his London investors, he purchased close to 50,000 acres of land for use at the iron works which included the making of wood charcoal, and the planting of Hemp, Flax, and Madder; he built the Charlotteburg and Long Pond works, in New Jersey, and the Cortlandt and Cedar Ponds works in New York, although both the New York works were closed for the quality of

ore was not up to grade. Peter Hasenclever's career was plagued with charges of poor judgment and reckless ambition. He outdistanced himself with too many projects and was bogged down with overseas investors who tangled themselves in a series of lawsuits. Still, it was Hasenclever who envisioned a mighty steel industry and imported hundreds of workers into the Ramapos, where they initiated a large scale re-shaping of the terrain. He was not the first iron worker to come into the Ramapo Region, but his vision of a potential industrial empire was fundamental to the shaping of a culture and a social fabric that would in time surrender to an industrial mindset. Called back to England to defend his reputation, he never returned to such speculations, leaving behind the untapped raw resources for another generation.[3]

With the outbreak of the American Revolution, there were a good number of individual blast furnaces and iron works established throughout the Ramapo Mountain region on both sides of the New York/New Jersey border. The Sterling Ironworks, along the north western hills of the Ramapo River Valley established in 1736 as an early works by Cornelius Board, would pass through many owners and claim its place in Revolutionary War History, when Peter Townsend signed an agreement with the Continental Army to manufacture an iron chain that was stretched across the Hudson River at West Point as a barrier for British Ships.

During and after the immediate years of the Revolution, the Sterling Works employed over a hundred and fifty laborers and established housing for this workforce and their families. The work at the large furnace involved ore melted and distilled into bars of pig iron weighing up to hundred pounds each. Along with the ore mines, there was a constant call for hardwood charcoal which in time took its toll on the diversity of the woodlot.

Draft for this furnace was supplied by a pair of large blowers; pumped by water power, they were massive bellows forty eight feet in length and produced a sound that must have shook the very earth. Sterling was a full time industrial site which included a refinery with six large hammers for forge work, furnaces to convert iron into steel, and some years later in 1812 a saw works was erected down on the outlet of Tuxedo Pond near to where Tuxedo Creek enters the Ramapo River; here too mill works included the production of nails, plough shares, horseshoes, steel, forge bellows, anvils, and a variety of other implements.[4] This activity engaged a constant flow of labor, extraction ore, and fuel materials such that by the early 1800s much of the northern sweep of the Ramapo Valley had been expended. But the southern sweep of the valley (or the lower portion of what was referenced locally as the Ramapo Pass) was still largely untouched, and it is here that the Pierson brothers enter this story of iron from stone.

My dad, Walt Stead, used to take me up to Cranberry Lake, which was on a tract of land owned by the Ramapo Land Company, for night fishing. Sometimes we tossed out lines for catfish and sat along the shore. In the cool evenings with just enough breeze to keep mosquitoes off, but on warm summer nights when the air was still the mosquitoes were waiting for us, so we took an old row boat out into the lake. It was kept hidden by my brother-in-law, Tony, who worked for the Land Company. He was a friendly 'talkative' sort who had married my big sister, Joan, and was always willing to indulge Walt in his use of the leaky old wooden boat. One night as we drifted slowly along the middle of the lake, with minnow lines out for bass, Walt directed my attention to the Pierson house. He told me that the Pierson family had industrialized the Ramapo Pass and that, at one time or another, most of the 'old' families around had been employed at

the Ramapo Works. I looked along the shoreline to where this stately home sat and I imagined a wealthy mogul with a big mustache, top hat and watch chain, something like the character in the game *Monopoly*. I wondered if he even had the single lens eye piece to boot. The next day I no longer wondered as Walt brought me up to meet Mister Henry Pierson himself. This was more than a cordial visit; Walt came with a formal request for me to be allowed to trap the Torne Valley which was then part of the Land Company holdings.

We were met at the front door by a servant, a dark skinned woman who could have been foreign and who asked us to wait in the hall while she announced us. We stood there in what was a surprisingly dark front hall with a few portraits of earlier Piersons, looking rather complacent about their lot in life. Then a strong presentation of woman-hood came from around the dining room and she offered Walt her hand while exclaiming that Henry was in his study waiting for us. I noticed that she spoke with a certain air, a presence as if there was something important going on. This was Cornelius Pierson the wife of Henry Pierson. She looked down at me and asked if I was Walter Stead junior. Walt told her that I was but that he called me Chucky. She nodded with approval and said to me, "Well, Chucky, you look like a fine young man. I am sure Mister Pierson will approve of you." This was all very theatrical and I felt extremely self-conscious, but none-the-less I thanked her and followed my dad to Mister Pierson's study.

The room we entered will forever be etched in my memory. It was a library all done in polished wood, book cases and cabinets built into the walls, with easy chairs and reading lamps and a fine writing desk near to a series of windows that looked out through an arbor onto the lake. Mister Pierson looked nothing like the Monopoly Robber Baron

character in fact he was not in any way imposing. He had an easy soft spoken manner, was dressed casual and there was something gentle if not a little tenuous, in his presentation. He offered us seating on a leather couch and he resumed his seat near to the desk, in an easy chair. He and Walt talked first about the lake fish, then about the troublesome snapping turtles that periodically took down a duck or two, and then about hunting and trapping on Land Company property in the Torne Valley. Apparently this was the right of only Land Company employees but we were like legacy, as a result of my grandfather's time with the Iron Works. While they chatted in slow and regular voices, I looked to the book shelves and scanned the collection: along with sets of Cooper, Melville and Hawthorne, there were a great many leather bound volumes: atlases, bibles, histories and such. I saw a thick old copy of Coles' *History of Rockland County*, and an old copy of Green's *History of Rockland County,* an original copy of *Claudius, the Cowboy of the Ramapo Valley* by Johnson, these were all written in the late eighteenth century; but there were also some more recent books like Bedell's *Now and Then and Long Ago in Rockland County* and Penfold's *Romantic Suffern*. I wondered how a person could have the time for this much reading and what sort of knowledge would come from it. Then I found that Mister Henry Pierson was addressing me. I looked at his calm and distant face and he said, "I'm sure you'll be a good and safe trapper, Woodsy". Then he reached around to his desk and took hold of a soft covered book, it had a gray paper cover with a blue spine. He handed it to me. The cover had blue lettering at the center which read *The Ramapo Pass* by E. F. Pierson. He said, "My father Edward Franklyn wrote this in 1915 and my cousin Pierson Mapes edited it 1955. I want you to read it." I opened to the first page, the title page, written in ballpoint across the top

it read, “Please return to: Henry L. Pierson, Sloatsburg, NY”; although I tried more than once over the years, Mister Pierson never accepted it back, he always told me I needed to read it some more.

In 1796 Josiah B. Pierson and his brothers Jeremiah H. and Isaac, founded the Ramapo Works on 119 acres purchased from John Suffern, so tells us Saxby Vouler Penfold whose gentle little history, *Romantic Suffern,* is likely the most accessible of all the twentieth century historic compilations on Rockland County. With its focus primarily on the Town of Ramapo, it was the only volume in Mister Henry Pierson’s study that was also to be found in my father’s modest little book case. Walt Stead’s library was not unlike that of many working class local folk, with roots in both rural and early industrial culture of the Ramapo. Along with trade manuals and texts with such titles as: *Practical Estimating for Painters and Decorators, Signs and Sho’ Cards*, *Spray Painting*, *Modern Floor Finishing*, there could be found Harding’s *Fur Farming*, and of course Seton’s works but the singular local history was Penfold’s *Romantic Suffern*. This little 1955 publication included an impressive bibliography which referenced Pierson’s *Ramapo Pass,* although it offered small detail as to what could be found in the Pierson book. For the most part this little history of Suffern, published by the local historical society, was like so many regional efforts at mid-century romanticizing local lore while justifying an industrial growth paradigm. It is significant that Penfold’s history made its debut the year that Ford Mahwah opened its doors, as the presence of Ford Motor Company in the Ramapo Valley was to many a local advocate nothing short of a regional manifest destiny.

In his forward, Penfold notes that "Whoever knows his roots is on the road to knowing himself", a very prophetic declaration given that he collects and records history without any effort to penetrate or deconstruct its philosophy; we are given the standard of Revolutionary War patriotism, Native Americans are assigned to a place in the past but offered little or no connection to their contemporary descendants, pioneer industrial accomplishments are heralded as the foundation of progress with no mention of environmental impact, the lofty scope of his local history reads not unlike a real estate advertisement. *Romantic Suffern* does offer a fine concise history of the Ramapo area including the Villages of Suffern and Hillburn along with the community of the Iron Works, and like a solid piece of promotional history, it heralds the ideal of twentieth century progress, as viewed from mid-century. This capacity to praise industrial development, regardless of the changes in the land that it wrought, is very much the traditional approach to local history; in Green's *History of Rockland County* (1886) the author proposes that four men essentially established the county, each of them being a man of business: Jeremiah Person for his iron works production at Ramapo, James Wood for his brick industry initiatives in the Towns of Haverstraw and Stony Point, John E. Green for financial support of steam boating that helped established the Village of Nyack, and Eleazor Lord for establishing the Erie Railroad through the county, which was a boom to the Orangetown business district.[5] It is noteworthy that in the sixty nine years that passed between these two publications, there was little or no mention of social issues, environmental impact, inequitable economic demographics and the like. In order to study the whole picture a closer examination of primary sources is necessary.

As noted by Penfold, Josiah Pierson and brothers did come to the region and purchase land from John Suffern with the intent of building an iron works, but one must consider the reason for the Piersons locating their works at Ramapo. As observed by Green, the area known locally as Sidman's Clove[6] retained its pre-revolutionary solitude and with the exception of an occasional grist or saw mill the power of the river current had yet to be harnessed, along with the wealth of biomass for fueling a 'works' industry. Josiah Pierson was all of twenty six years and already experienced in land investment when he and his younger brother Isaac initiated a family business, in 1790, at a New York City site. In 1794 he developed patents for his nail cutting machinery which lead him to seek greener pastures for the growing industry, as his urban site included outsourcing the 'cutting' to a works in Wilmington, Delaware. By 1795 he moved his operation to the Ramapo Valley, where he started an iron works and manufacturing concern that turned the little sleepy hollow into a bustling economic center of home spun ingenuity.[7] In Ramapo he found an abundance of wood and water, essential to iron manufacturing of the day, as well as the space to enlarge and unify his works. From the beginning Pierson took a 'lordly' command of his holdings, as is demonstrated in a letter he wrote from New York to his brother Jeremiah at Ramapo, in which he tells him, "Inform the people that they take their cattle off the farm and that they may stay on the place if they will work for me…accommodate for board as well as you can."[8] These 'people' were a mix of pioneer stock that included former patriots who had lost holdings elsewhere, Native Americans, the occasional former Hessian mercenary, and former free black land holders, all of whom found themselves marginalized in the post war years. The only records of this rural demographic are the work rolls that first appear under the

operatives of J.G. Pierson & Brothers, which reflect the diverse collection of aforementioned ethnicities, although a majority of the men employed at the works were Protestant Irishmen as a result of the glut of such an immigrant workforce following the Irish Rebellion of 1795. This contingent of labor early on formed a "Society of Mutual Support" for the aid and compensation among their brethren.[9]

When Josiah Pierson died in New York City in the year 1797 (apparently from a Yellow Fever outbreak), his brothers Jeremiah and Isaac continued to build their manufacturing concern and continued to attract a sizable worker's population. With the establishment of a common school, a post office and company store, they built over sixty house structures by the early 1800 hundreds, primarily modeled on the 'saltbox' profile for the workers; wherein a linear style structure could be adapted with a long sloping back roof to accommodate more space needed for a growing family. This structure was essentially a story and a half with the second story being a low slung loft, the entire house heated by an open all purpose fire place. With a growing work force and an expanding industrial biomass needed to fuel the furnaces, forges and homes for cooking and heating, resource extraction was at a premium through the coming years. By 1824, Spafford's Gazeteer reported that the full time work force was up to 700 persons and that many more were labored as "partial employment". It is this demographic of partial employment that included the wood choppers and charcoal burners, indispensable for the operation of the works; herein can be found the family names that reveal the mixed ancestry of the rural inhabitants. Those partially employed lived outside the payroll of the 'works' but did benefit from the market for resource extraction, as well as consumption of handmade crafts by the regularly employed families. Baskets, butter bowls, ladles and other such

hand carved local ware were part of the regular trade, as well as farmed goods such as milk, butter and grain that flowed in from pioneer settlements throughout the region. [10]

In respect to the early industrial operations at the works, by 1812 there were as follows: the river was spanned by a 120 foot dam and along the bank of the river stood a blacksmith shop, rolling and slitting mills, and works for cutting and heading nails. Across the river was a saw mill; a Straw House where in water power cut and stored straw for the oxen and mules engaged at the works; and still further west stood numerous stables for horse, ox and mule. In addition to these structures there was also a main foundry, steel furnaces, pattern shop, wheelwright shop, hoe factory, coal house, wire works and smith shop. As the country grew, the demand for sugar from plantations in the West Indies increased, driving up the demand for cut nails which caused the Piersons to increase the size of their nail works; so too an increased demand for whale oil drove up the need for oil cask hoops and again which increased the output of the rolling mill. The international market trade extended to Russia, as three-fourths of the iron used in Ramapo was Russian and their markets were hungry for yarn which the Pierson's produced in their cotton mill by 1815, nearly doubling the size of their works. The magnitude of this early industry reached throughout the county and well into the surrounding area, a multitude of farm wagons brought produce of all kinds from miles around. Those early roads cut along walking trails were widened to accommodate horse wagons loaded with food and trade materials, while the two wheel ox carts hauling ore and manufactured goods traversed the same routes eroding the country side and creating a constant need for road improvement. Coke drawn from the furnace "cast off" was packed down for a fairly substantial road bed, but further on from the works site there were still remnants of the

colonial corduroy roads, crafted from logs bisecting the road beds, as well as stretches of cut stone. Along such rough byways, six mule teams pulled deliveries of crated nails; as by 1813 a million pounds of nails were the annual output of the nail factory alone.[11]

Word here must be given to the founding of the Erie Railroad and the role the Ramapo Works played in this historic enterprise. Mid-nineteenth century railroad historian Edward Hungerford notes that it was Jeremiah's daughter who influenced early railroad builder Eleazar Lord[12] but actually, E.F. Pierson records that it was his father's bride (Jeremiah's daughter-in-law) who heralded the coming of the Erie. In 1831, Jeremiah's son, Henry Lewis Pierson, took his bride, Helen M. Pierson, on their honeymoon to Charleston, South Carolina. They traveled from Philadelphia in an overland mail coach; a rugged journey of nine days. In Charleston they took a ride on what was considered the first train ever to carry passengers in the United States, the couple chugged along by steam power for a total of six miles and the experience was for Mrs. Pierson a vision of the future. Upon returning to the north, she talked endlessly of overland steam rail power being the next logical step toward a great industrial nation, much of her enthusiasm directed to her uncle Eleazor Lord; a little more than ten years later, her vision of a mighty railroad, the New York and Erie through the highlands materialized. Interestingly enough, the early locomotive that served her on that day in Charleston was named 'The Best Friend' and was built at the West Point Foundry, on the Hudson, with spring steel from the Ramapo Works.[13]

Eleazor Lord, a canal investor who lived along the Hudson in Piermont, worked with land owners through the county and built the first leg of the Erie from Piermont to the Ramapo Pass. This road would eventually travel north to Albany and establish such

commerce that stage coach lines, once the primary mode of travel for the public, would become tributaries to the railroad. For the Iron Works this meant the elimination of the six mule teams hauling spring steel to Haverstraw Landing, to be loaded on sloops bound for New York City; by 1841 tons of steel were railed down to Piermont where they were loaded onto steamboats.[14] With the initiation of the Erie Line, the Ramapo Works saw some of its greatest output but by mid-century this industrial activity took its toll on the area.

Hunting and foraging had long been a subsistence activity for the community of workers, as well as gentlemen sportsmen. In 1820, Jeremiah Pierson, along with Rockland County residents Isaac Sloat and Stephen Sloat as well as Orange County resident Jonas Seely, formed 'The Deer Hunting Party' for the purpose of keeping a boat in Tuxedo Pond.[15] By mid-century the ever expanding resource extraction of the works: wood chopping, charcoal burning, mining and the like, had disrupted complex ecosystems with forage and timber loss as well as hillside erosion and sedimentation of fishing ponds. First the large animals: deer, bear and cougar thinned out and then the smaller fur bearers: bobcat, fox, mink and beaver diminished. By 1848, the last bear recorded in the region was killed by John Storms;[16] it would be more than another century before bear returned. Deer herds were back by the turn of the century and proliferated well into the 20th century, as their natural enemies would take much longer to re-emerge. It is in this time frame that Ernest Helfenstein envisioned his romantic tale of loss at the Augusta Furnace, just north of the Ramapo Works. Augusta had been officially shut down after its founder Solomon Townsend passed away in 1811, and two decades later Frank Forester, a noted writer and sportsman, came upon Augusta and described the

setting as "…millwheels cumbering the stream with masses of decaying timber, and the whole presenting a most desolate and mourning aspect."[17] While the Ramapo Works, five miles south along the river, were bustling and productive the resources needed to sustain this output had been exhausted. With wood fired charcoal thinning, anthracite coal was required to be shipped by canal and rail, driving the cost of production up. Helfenstein walked through the Ramapo Pass, taking in the persona of the works, the darkening of the sky from charcoal burning, the barren and eroded landscape, and he married these images to his spirited Rosicrucian metaphysics. The frontispiece in Elizabeth Oakes Smith's book, *The Salamander*, illustrates the remnants of the archway of the Augusta forge along the Ramapo River. Helfenstein in his wanderings through the iron community of the Pass had picked up the vernacular of the workers. The salamander, he learned was a reference to the fused and partly reduced iron ore in a furnace. Standing among the ruins of the Augusta furnace, Helfenstein, and sometime later Smith, clearly saw the imprint of an unworldly manifestation, and mixing archaic Christian imagery with local lore they envisioned a morality tale that spoke of the risk when man draws iron from stone.

Over the next decade, production dwindled such that by 1860 the Gazetteer of New York State reported that the works, "…consisting of a cotton factory, file factory, steel works and car factory, are all idle, and only ten dwellings are occupied. The whole village is rapidly going to decay."[18] What was left of these dwellings were the saltbox structures that made up the communities housing in the works hamlet and a population of family names that held on to what work was still available. There were a number of subsidiary works started in the surrounding area of the Pass, as a result of the Iron Works, which included: a twine works, a mile north of the hamlet at Sloatsburg, run by Jacob

Sloat and at mid-century established as the Sloatsburg Manufacturing Company; the Ramapo Land and Water Company a mile south of the works at Suffern, authorized to "purchase, hold, improve, use, let and sell real estate"; further on just across the state line The American Brakeshoe Company was established in Mahwah, New Jersey; and The Ramapo Wheel and Foundry Company established a works which lead to the formation of a new village in 1873, initially called Woodburn. All of this activity grew out of the works at the hamlet but extended beyond the original Pierson vision for the Pass, as the pioneer industry now gave way to a new future while the country looked toward its first centennial celebration.

William W. Snow established the Wheel Works, with his partners George Coffin and George Church, in 1866, where they produced train car wheels that were the standard for excellence in the industry.[19] But Snow was a modern visionary and as he assembled his work force, he planned housing superior to that of the little hamlet community of pioneer saltbox structures at Ramapo. In 1872, they moved their shops south of the hamlet along the Erie line, just east of the Ramapo River, and then began planning a workers village on the west side of the Pass. This place was originally called Woodburn, in respect to its proximity to woods and water, but in 1882, when an application was made for a post office it was discovered that a village of the same name existed in the state, so it became Hillburn, in relation to the characteristics of the surrounding Ramapo Hills. Snow planned for his village to have all the modern amenities: roads neatly organized, with cut stone sidewalks and a beautiful ice house pond in the middle of the village. The houses were two family structures of the stick Victorian style and were initially equipped with gas lanterns and stoves. Snow had his own elegant mansion and

that of his shop managerial staff housing built along the meadow between the village and the Foundry shops. He supplied the workers with ice boxes and engaged them in ice harvesting from the pond. Even the village trash was regularly hauled away by the horse drawn trash cart and taken down to a meadow, along the southern boundary of the village by the state line, where it was burned and then dumped into the Ramapo River. Snow's operation became known as the Ramapo Iron Works at Hillburn and there he elected R. J. Davidson to be the first secretary of the Iron Works. This village, along with the Village of Suffern, were among some of the earliest communities to be fully electrified, by the then Rockland Electric Company in 1887. At about the same time, the Mountain Spring Water Company was formed to supply water to Hillburn and Suffern.

In 1963, my dad, Walt, applied for a pistol permit when he was appointed water commissioner for the Village of Hillburn. One of his commissioning duties entailed checking on the reservoir pump house, up past Sixth Street which was known rattle snake country. This little reservoir was a remnant of the 'planned village' that William Snow had so carefully laid out. His estate was long gone, taken by the New York State Thruway in the early 1950s, the Wheel Foundry buildings in East Hillburn were now warehouse space for Avon Cosmetics, and the ice house pond had lost much of its water feed so had a tendency to 'muck out' in the summer. But up Sixth Street, past the village dump, the reservoir remained in its final years, a service to the community. Walt never really shot any rattlesnakes; he just fired the gun to scare them away. I had by this time discovered Cole's *History of Rockland County* and that, along with Penfold's *Romantic Suffern*, offered me just enough of a sketch of early village life that I was full of curiosity about his boy hood recollections. But my father was only rarely talkative and often he

limited his information to single statements, as when we were walking through the brush at the reservoir and he pointed up the slope and said something about an Indian camp up that way. I waited but he said nothing more on that subject. I debated pressing the issue when he mentioned that William Snow's daughter, Nora Snow, had established a school for the 'hill people'; these folks being the same folks he referenced as Indians. He recollected about an artist by the name of Francis Wheaton who also offered the Indian children painting and drawing classes. This Wheaton lived up on Grant Road, along the state line in the mountains. But there was a sad stubborn resolution in Walt and like that of his colleagues he resented the progress of the thruway and its impact on village life. Sometimes as he waxed nostalgic, he would fall silent and it would be days, maybe weeks before I could get another story out of him.

Another of his commissioner duties was flushing the fire hydrants. We did this in the summer and kids gathered around to play in the full force of the water pressure. Walt explained to me the intelligence of the systems gravity feed from the up slope reservoir. As we walked through the village, with his big hydrant wrench, he pointed out how the houses were arranged, where the out houses were planned to be at a safe distance from the street water pumps, the segregated schools and churches, as well as the flood plain that accommodated trash burning and disposal in earlier times. He was clearly proud of the village plan, impressed by Snow's vision, and yet he was sad. As he told his stories he relived them with great pleasure, like the time the work horse engaged to drag the ice cutters for block sections fell into the pond. While more men were brought in to help pull the nag out, Nora Snow sent down a bottle of brandy to calm the frightened horse, and

she discovered it was more than the animal's nerves that were soothed by the liquor when the drunken party staggered back up to return the bottle.

His stories also spoke of the sense of inevitable change even in his youth that hung over the village, like a shadow of things to come. At the Works, he and his brothers got jobs painting switch stands and the like. His brother, Dutch, was notably the fastest at this chore. In the late 1920s, the Works Shop was visited by a representative of a spray painting company. It was proposed that spray guns would increase production and improve costs. My uncle Dutchie was called forth to participate in a painting contest with the representative of the spray paint company. Ten switch stands were set up and the Works staff and administrators were invited to watch Dutch and the spray men mix their paint and ready themselves. It was R. J. Davidson's son who held the stop watch and called for the contest to begin. According to Walt, his brother completed one stand and was starting a second one when the spray man finally got his air pump to engage, but the hose blew a gasket, giving the entire office staff a fine lead finish. This of course was a great day for man-against-the-machine but clearly once the bugs were worked out hand painting would be a lost skill.

When the Davidson shop offered my injured grandfather a post at a pumping station in the late 1920s that too indicated a change in the wind, as truck delivery and car transport was very much on the rise. The Iron Works that brought in the railroad was making its final transition to yet another delivery system, one that had been vigorously promoted by Henry Ford. Thanks to Fordism, the wonders of the assembly line promised an increased standard of living, better wages, and cheap automobile travel, along with decreased skill sets, and lowered standards of innovation.[20] Through the Great

Depression of the 1930s, the Ramapo region held out for an industrial answer to their economic woos, theirs had been one of the pioneer seats of industry and despite the works closing at mid-century, there was still the belief that industry would one day return to the valley. In the meantime, the secondary forest growth had re-routed the hill sides, the deer population was thriving, partridge and pheasant had returned and by the early 1950s much of the fur game was back. But the sadness that I detected as a boy, the sense of loss that seemed to be a part of the land was still very strong and filtered through in many of the local stories.

For a brief spell, cougars had returned to the valley in the second decade of the twentieth century. They were hunted with dogs until the last one was tracked down by a Hillburn resident by the name of Onderdonk. His killing of this wild cat cost him two of his hounds. My dad and his brother, Dutchie, remembered the day he returned, with the surviving hound, his gun, and the cougar. He met the boys down along the river, tired and worn out from his hunt. He sold his gun to Walt, who was at the time ten years of age, then he went over to the Davidson's house and sold the cat hide to R.J for twenty dollars. The old hunter was then reported to have gone into the Eureka Hotel in Suffern, where he drank all of his earnings. This story was told many times over the years and always it was offered up as a sad lament to the passing of the last cougar, the passing of something wild and untamed, something innocent and gone.

Another story popular with the hamlet community is that of Lavender, the spirit who hitches a ride with a couple of boys to attend a school dance at the Tuxedo High School. They meet her at the black iron bridge of the Iron Works hamlet, where she introduces herself as Lavender. She was wearing an old fashioned evening dress by that

color. She dances with one of the boys until close to midnight and then is returned to the site, where they met her, and insists upon being dropped off there. She had been chilled, so the boy wrapped his jacket around her shoulders and therefore he returns to retrieve his jacket the next day. After being turned away by most of the inhabitants of the hamlet, an ancient woman tells the boys Lavender was her daughter and that she was killed by a hauling truck with failed brakes at the works. She tells them that Lavender regularly hitches with some boy, as she had her heart set on a night of dancing. The elder directs them to the Ramapo Presbyterian grave yard so they can see her stone marker, and when they get there they find the boys jacket on her stone.[21] This story is strongly believed by the hamlet community at the old iron works, as well as the inhabitants of the Village of Hillburn. Here too we find variations on the theme of lost innocence, of a by-gone time and death being caused by a symbol of industrial progress.

Back up on Cranberry Lake, sitting out on very still water in the early evening of an August night, I looked at the Pierson house. The light had just gone on in Henry Pierson's study. I could see the walls lined in books and the figure of an old man sitting back in an easy chair. Here was the last reigning member of an industrial era, now the patriarch of a land company with holdings that went back to the seventeen nineties. Walt was smoking and I didn't expect him to talk much but he noticed me watching the house. He checked his bass line and then said to me, "You know that Lavender story your uncle Mal told you?"

I nodded.

"Well Pierson there, holds a lot of stock in that, seeing as how it has to do with the iron works and the hamlet and all."

I looked again at the silhouette of the old man, in the window quietly reading, and I wondered how an intelligent man could believe in such things but I was so young then and only just learning about Salamanders, iron works, hitchhikers, and industry.

Summary:

The Ramapo Mountain region has had an industrial profile for the better part of three centuries. Over many generations there has emerged a rich culture of iron mining and manufacturing, as well as all the supportive industries that interact with iron working. The first industrial railroad was built to service the Works by Ramapo investors. Along with economic growth based primarily on an extraction industry, there was tremendous ecological impact. The stories that emerged from the workers told of the terrible price to be paid for taking out the heart of the ore from the valley. The Salamander story speaks of the personal cost paid for "learning the secrets of nature". This story addresses a loss for both mortal and spirit in the flame as they struggle over the re-shaping (re-making) of the earth. It speaks to the idea that with every gain there is a measured loss. Again like that extrapolated from the previous chapter, the general sense of industrial history tends to the foregone conclusion that this is an inevitable pattern. In part this is the result of the historic record being long maintained by industry itself, but the shift from a home spun localized economy to an industrialized pay check should not be taken for granted.

Uncle Dutchie's contest with the spray company representative was a fine little win for man over machine but either way it was funded by the Iron Works Shop. Years later my father and his brothers proudly proclaimed themselves independent workers, even rejecting the Painter's Union they had helped to established. Like their

colleagues, the independent contractors of the Ramapo Valley, they sought a cliental of white collar customers (primarily in residence as a result of Ford's presence). Financial dependency did not fall far from the tree.

Chapter 3

The Ramapoughs

At the Sacred Heart Church in Suffern, New York, receiving of the First Holy Communion is preceded by one's First Holy Confession. In the Dominican Order children confess and receive their communion in second grade, roughly at age seven. Standing on line, waiting our turn for our first venture into the confessional booth, wherein we offer up our digressions and trespasses, aka sins, to the priest behind the plastic screen, all of us were reminded that we were about to further our commitment to a rich and penitent life. The boy behind me was also from my village. He whispered that he would like to go before me; he seemed impatient. I was only too happy to let him go first, as I was still debating as to which 'sins' I would offer up to the man behind the screen. I let Timothy step in front of me and off he went, a short while later emerging from the booth and down the aisle to the kneeler rail, where we were to recite our penance. I soon joined him to say my *Our Fathers* as he was whispering his. But then I noticed his prayers were more exotic than mine; they included references to Father Sun and Mother Earth. When our prayers were over, Sister Frederick took us outside to the playground. She was none too pleased with Timothy whose time at the kneeler was the longest of any of us; it seemed his penance was the greatest, meaning his sins must have been the worst. But in the playground, I learned the reason for his lengthy penance was also the source of his exotic prayers: his Indian grandfather insisted that for every Christian prayer he recite two native prayers. At age seven I discovered there were natives among us.

The Ramapough Lenape Nation has had a history of denial on the part of white academic society, from the Bureau of Indian Affairs (BIA) to regional historians and folklorists. Dr. David Oestreicher, who penned the epilogue for Herbert C. Kraft's authoritative text *The Lenape-Delaware Indian Heritage* (2001), has noted that, "…in the quest for cultural identity and recognition…" the Ramapo Mountain People have come to claim their Lenape heritage. Oestreicher's work on the epilogue is highly commendable with a great deal of authentic Delaware/Lenape scholarship referenced, and not unlike many of his academic predecessors, he is gently dismissive of Ramapough heritage.[22] After first acknowledging the presence of a community, some members of which have "Amerindian physical characteristics" and a long history of isolation due to the "prejudice and fear by the surrounding communities", he relies on the work of David Cohen, a critic of Ramapough credibility. It was Cohen who, in his 1974 book *The Ramapo Mountain People*, declared that their ancestry was comprised of freed blacks and mulattos but offered little documentation for Amerindian background. Oestreicher notes that the emergence of Cohen's book incited resentment and anger among the Ramapough community; this in fact he believes is what encouraged them to incorporate as the Ramapough Mountain Indians in 1978, form a tribal council and clan system, and bring in scholars who could help them renew their native culture. In fact, David Oestricher was an academic who in the early 1980s was financed to teach Ramapough children traditional Lenape culture; culture he had learned from doing field work among Oklahoma Delaware Lenape.[23]

Another author, a local historian by the name of Julian Harris Salomon, published his *Indians of the Lower Hudson Region; the Munsee* in the early 1980s during the time

Oestriecher was teaching Ramapough children of their heritage. Salomon seems even more sympathetic to the community although he too believed that their heritage was fragmented at best. Salomon references Frank G. Speck as the first trained anthropologist to study the community in the early years of the twentieth century. Speck identified that the mountain people living in the Ramapo Hills closer to the Hudson River (essentially in what is now Harriman State Park) were more white than those living across the Ramapo Valley in the Western Hills, whom he described as a mixture of white and black as well as what he called "full blood Indians". Salomon's book offers a good early history of the Munsee.[24] His years spent living in the Rockland County area, along the Harriman State Park land, offered him the opportunity for a close relationship with the hill folks that Speck identified as having a more "white strain".[25] His comments on Ramapough people living in Hillburn and northern New Jersey are in fact few. He closes with observing that the Ramapoughs, having achieved state recognition in New Jersey, had now received some federal funds to pay for native education.[26] He then adds that it is the "spirit of these people" that has not yet vanished, implying that spirit is all that is left of them.[27]

As referenced above, it was David Steven Cohen's *The Ramapo Mountain People* that has made an indelible mark upon their community. Cohen did his field work for this text in the late 1960s, an explosive time for white folklorists probing about among non-white demographics. In Ramapo, Cohen found a place that seemed to be a pocket of forgotten history. His background was in genealogy and folklore. His focus on early Dutch and Black genealogical strains is his strength, with some folklore sections offering excellent oral family stories. However, it is his mixing of history, both objective and subjective, with folklore that presents the problem. The reaction to Cohen's book by the

Ramapoughs was swift and furious. It resulted in their forming a traditional native structure to their body politic - that was the good that emerged from Cohen's thesis; the not so good seems to reside in both his analysis of what is known as the "Jackson White"[28] myth, and in his interpretation of community dynamics. Both these things will be discussed further on, for now it is enough to say that Mr. Cohen suffered the self-delusional characteristic of many academics: he believed he was objective.[29]

Generally speaking as Edward Lenik has indicated in his volume *Ramapough Mountain Indians: People, Places and Cultural Traditions*, "…most historians and anthropologists agree that they are descended from local Munsee-speaking Lenape (Delaware) Indians who fled to the mountains in the late seventeenth century to escape Dutch and English settlers."[30] The focus of this chapter is not on the ancient or middle period of the Lenape people, but on the last few hundred years of these Algonquin speaking people. For as Evan Pritchard has noted in his work *Native New Yorkers*, "…the continued defiance of this small band represents one of the most protracted and hotly debated real estate battles in U.S. history." [31]

Whereas Pritchard may be over reaching with his estimation of the national significance of a Ramapough land claim, he is correct in noting the recent significance of the role the Ramapough now play in land issues. Since their highly public tussle with Ford in Ringwood, New Jersey (see chapter 7) the Ramapough have galvanized themselves as a community to reckon with. They have taken a strong public position in opposition to a proposed expansion of the El Paso Pipeline (also known as the Kinder Morgan Pipeline), and are outspoken in their rejection of hydro-gas fracturing in the Highlands. Locally, they have challenged municipal authorities and the New Jersey

Department of Environmental Protection (DEP) as to the appropriate use of their sacred land along the Ramapo River in Mahwah, New Jersey. This "small band" continues to galvanize in response to the ever pressing industrial/commercial demands of the dominant society. But again, as can be studied in the legal case they made against Ford at Ringwood, it is the mechanization of a legal apparatus designed by a dominant mentality that continues to bear down on the community.

This begs the question: how do a people so long dominated, essentially a conquered people, retain their heritage?

Getting back to my early boyhood, Timothy invited me to meet his grandfather; his native elder. I went to his folk's house, and there on the front stoop sitting in the shade was an old man who looked somewhat like an Indian, strong chiseled features and stoic presence. I remember wondering where he might be keeping his feathers. I was introduced to him and he sized me up and then told me that I looked like a Stead. I asked him if he was an Indian. He told me that most of Hillburn was part Indian and that the white folks were reluctant to admit it. Timothy and I then went down to the park and played Indians and Cowboys, a game that involved a lot of chasing and falling down with no winners, no conquerors. But by the end of that school term, Timothy's folks took him out of Catholic school. They moved away and I lost contact with him. The only record I have of him is a kindergarten photo group shot with us sitting on the floor. He and I clearly have the biggest heads in the class, and frankly we both look native in the shot. We also look very happy, undisturbed by questions of ethnicity.

In trying to tease out an answer to this question of holding onto one's identity despite the odds, I submit that it is the commonality of oppression that facilitates a

people's ideological survival. Just as Timothy's grandfather strategized the 'native prayer' balancing mechanism in the presence of Christian teachings, I believe that it is shared racist oppression as well as a deep heartfelt connection to the land that keeps the native spirit alive in these people. In part, their dismissal by academics such as Cohen and Oestreicher seems to have had a galvanizing impact upon the community, just as marginalization historically has contributed to their preservation.

We look to the Late Woodland period of Indian culture and history, approximately 1,000 to 400 years ago, in order to pick up with the regional identity of the Munsee Lenape and early contact with European traders. During this period, Lenapehoking (an area consisting of southeastern New York, eastern Pennsylvania, all of New Jersey and a stretch of northeastern Delaware) was consistently occupied by Lenape people who according to the archeological record emerged from their predecessors as a distinct tribal people. As Herbert Kraft has observed in his work, the name Lenape was in reference to a sense of place but was apparently difficult for the early Dutch traders to pronounce, so in dialog with the Indians the Dutch came to interpret another Lenape word for the word Delaware, which is how Lenape-Delaware came into use. Lenape was what the people called themselves and Delaware was how they were referenced by white society.[32] Delaware was most likely initiated by Captain Samuel Argall who on August 27, 1610 christened the bay he sailed into in honor of Thomas West, third Lord De la Warre and governor of Virginia colony. The natives living along the shore of the bay, and subsequently further up along the river, became associated with this name as "Indians on the De la Warre Bay", later as "Delaware River Indians" and eventually as "Delawares".[33] The name Munsee first appeared in the Pennsylvania Colonial Records

of 1727 and has also been written as Minsi with both spellings apparently derived from Minisink, Minnising, and Mennissinger; all words used in reference to Indians living north of the Delaware Water Gap. Minisink has been translated to mean "people of the stony country" as well as "on the island". There were other distinct regions of Lenape, including: Unami, "people from down river", and Unalachtigo which designated Lenape people who lived out near Ohio in the later 1700s.[34] As for the name Ramapough, this seems to have migrated in from Connecticut with a band of Ridgefield Indians who called themselves the Ramapoos and who at the end of the 17th century were led by a sachem named Catoonah. In 1708, they sold their lands and came west into the New York colony.[35] Another sachem by the name of Taphow shows up in various deed signings in late 17th century Connecticut and eventually ties in with the Munsee Lenape, as a signatory on a Rockland County deed, concerning the Kakiate Patent lands in 1696.[36]

So there was a consistency of Algonquin speaking tribes moving west from Connecticut and taking up residence with southern New York and northern New Jersey tribes. The name Ramapo, originally Ramapoo in Connecticut, may well have been applied to geophysical features and upon inhabiting a new area been adopted by the people there.[37] This surely was the case for the Lenape Munsee, as their initial dialect had no R sound and therefore this was introduced in the early 1700s.

The early years of the 18th century was a time of change for the Ramapough people, Dutch trade had come and gone leaving in its path a great deal of hostility thanks to the likes of Governor Kieft, at New Amsterdam on Manhattan Island. The Dutch/Indian conflict soured all the lower Hudson natives concerning the interlopers of trade and land acquisition, but by the early 1700s there were some who worked to

establish an equitable relationship with Lenape Munsee. Of these, one, Blandina Bayard, stands out. By 1700, Bayard was a forty-eight-year-old widow and mother of five. She was the daughter of Sarah Kiersted who a generation earlier was a native translator, employed by the Dutch, at the time that New Jersey and New York were known as New Netherland. Like her mother, Blandina was a native translator and was called upon to participate in negotiations. In 1697 she negotiated her own agreement to purchase her land at Ramapo. She wrote the agreement in Dutch and signed it along with twelve Indians. No other European signed this document which spelled out the "sundry goods and wares"[38] she was to provide.[39] Bayard never actually lived at the Ramapo trading post. She maintained her residence in Manhattan and continued to travel about participating in various transactions with Indian groups, serving as translator and conducting her business affairs.

Bayard died sometime between 1706, when she sold land in Manchester Township, NJ, and 1711, when her will was probated. After her death, the wilderness outpost continued under the supervision of her nephew, Lucas Kiersted, and her daughter-in-law, Rachel Bayard, the third generation of this family comfortable working with the Indians.

That Indian presence was strong in the early 1700s at Ramapo and has been noted by archeologist Edward Lenik who identifies two Indian longhouses on Wm Bond's Map of the Ramapo Tract from 1710. These structures are located at the confluence of the Ramapo and Mahwah rivers in the Mahwah, New Jersey-Suffern, New York area; with another longhouse at Oakland, New Jersey, and two more in Wyckoff, New Jersey. Furthermore, he identifies circular wigwams in Ringwood, New Jersey, and in

Sloatsburg, New York, along the Ramapo River by 1765 and the 1780s.[40] Clan membership traced lineage through the mother's family, this matrilineal descent lineage is noted in the many women signatories for the dwelling agreements with white society.[41]

With the constant pressure of Dutch and English land deals, the 18th century saw a great deal of movement among the Indians. Lenape Munsee did not fare well in either the French and Indian War or the American Revolution, although some Lenape/Delaware who had sided with the British and Iroquois were offered sanctuary by Great Britain in Ontario, Canada and on the Six Nations Reserve. According to Lenape/Delaware historian Herbert C. Kraft, "The Delaware had little choice but to go to war. They had been dragged into the hostilities by the manipulative forces of both the English and the French who used the Indians as pawns in the expensive game they played to possess the New World."[42] Such was the anti-Indian temperament of the newly formed Continental United States that most 19th century historians concur the Indians migrated to the west and while there was a long slow migration, it was not as complete as white revisionists believed. Munsee historian, Julian Salomon, after quoting John Heckewelder at length on the migration has written, "…while the great majority of the Munsee and Mahican had left, some sizeable remnants remained on or near the old hunting and fishing grounds."[43] Although Salomon's 1982 work focused primarily on what written record was available, he did believe that the Munsee who stayed behind found refuge in the Ramapo Mountains, "…where some of their descendants reside today".[44]

During the 19th century, that which was Indian was initially demonized in order to justify the ruthless push westward for resources then romanticized once the Indian wars had claimed the western territory. In the East, regional Indians all but vanished from

white histories and the justification for their disappearance found fertile ground in a racist and condescending portrayal, such as that which can be found in the work of Frank Bertangue Green:

> "Strange mystery of history; whence the native came, whither he has gone. Standing very low in the intellectual growth of the human family, contact with civilization did not elevate, it exterminated him. No evidence is found to show that religion or culture made the least impression on his life. With little or no belief in a controlling spirit, he was found and he disappeared, making no sign that that belief had become less shadowy."[45]

But not all writers were so narrowly imperial in their observations, as can be seen in the pages of Edward Franklin Pierson's family history in which he recounts the words of George A. Ford, a traveling servant of God, who on behalf of the Ramapo Church roamed the hills over "wilderness and solitary country" in order to bring Christianity to his flock. In August of 1876, he found at the home of Wm. DeGroat, John DeGroat and Samuel DeFrees Sr. "husbanding with prayer" a handful of corn. Later that same year, Ford was ordained in the Ramapo Church by the Presbytery of Hudson. The following February Communion was celebrated by Evangelist Ford back in the cabin of Wm. DeGroat and was attended by family members of the DeFrees, DeGroat and Mann families. By April, the Brook Chapel was built on the mountain (Hillburn area) for the "colored people". Then in October of 1877, Minister Ford reported that the "Corn Festival" was celebrated with the gathering of various kinds of gifts and among them ears

of corn. Pierson then writes, "These Fall gatherings have been continued from year to year since…"[46]

Edward Lenik found a consistency of these local names in the community when they showed up in an account by traveling tax collector Garret Valentine in 1905. Valentine was delivering tax bills to the residents across the Ramapo Mountains, along the New York/New Jersey border, accompanied by a reporter from the New York Sun who described encounters with the Ramapoughs. When they met with George DeGroat, the reporter noted that his family lived in "dugouts and log huts…their chief occupation being basket making." The reporter described DeGroat as a young man with a "copper colored face." [47] The two traveled along the trail and soon discovered an historic wood road, a corduroy road, later known as the Butler Road. Eventually, they traveled north and came upon a new wood road which led them uphill and to, "…a clearing containing two dwellings occupied by members of the Mann branch of mountaineers. The buildings stood across the line in New York at a spot known as the Cranberry Bog…"[48] From there a Mann guided them to the house of Manuel DeGroat. Before his journey was over, Valentine had walked fifteen miles and encountered more members of the DeGroat family line. His final observation was that these residents carried on farming and maintained some farm animals; a rural self-sufficient community. Clearly, these people had continual residence in the Ramapo hills from colonial times and into the 20th century.

In 1908 anthropologist Frank G. Speck, working among the Ramapoughs, collected baskets and wooden ware from the community. Edward Lenik has documented some of these objects, including: berry baskets, splint baskets with and without lids, eel traps, and carved spoons; it is his opinion that the Bureau of Indian Affairs erroneously

dismissed the Indian's petition for Federal recognition, in their review of these cultural objects. According to the BIA "the Indian-like artifacts collected by Speck were in fact produced by the Pitt-Conklin group of white wood-carvers and basket makers further north in Rockland County (rather) than the Ramapough Mountain Indian settlements".[49] Lenik reviewed the conclusion regarding the baskets and woodenware collected so many years earlier by Speck. At the Museum of Natural History, he found attached to the object inventory a note by Speck identifying the objects as being collected from the "Jackson Whites", a pejorative term used to describe the Ramapough Mountain Indians, not to be confused with the "white wood-carvers". Furthermore, in his study of the Ralph Sessions book *Woodsmen, Mountaineers and Bockies,* which the BIA apparently cited as reasoning for their determination that the objects were from the Pitt-Conklin group, Lenik found that Sessions at no time makes this assertion.[50]

This is but one example of the BIA's findings in respect to the Ramapough's application for federal recognition. In 1993, the New York Times reported that the Ramapoughs, "…did not successfully prove that they had been continuously identified as a separate, distinct Indian community; that it had not lived as a community before 1850; that it could not show continuous political activity since first contact with Europeans, and that it did not present evidence indicating descent from either a historic tribe or individual Indians."[51] One is moved to question by what methodology does the Bureau of Indian Affairs review an application for recognition, but such an inquiry would necessitate one to even recognize the Bureau to begin with. The Bureau came into existence in the late 19th century as an extension of how the dominate society would continue to deal with a nation within a nation. Any research on the part of the Bureau, or for that matter on the

part of any academic institution seeking federal approval (grants, subsidies, underwriting), would be screened by social and economic supervisors. That is to say it would be seen through "imperial eyes" which describes an approach that assumes, "…Western ideas about the most fundamental things are the only ideas possible to hold…the only ideas which make sense of the world, of reality, of social life and of human beings".[52] Linda Tuhiwai Smith, a critic of the historic and philosophical base of Western research, has argued that the Western model to indigenous people conveys a sense of innate superiority and a desire to bring its own form of progress into the lives of indigenous people. That ultimately, the Western model still considers indigenous people as specimens, not as humans. In a world view that considers people to be specimens story matters little but genetic testing matters a lot.

Sometime after my friend Timothy left the Catholic school, I followed my dad, Walt, into the woods on his deer hunt. We were not taking part in a 'drive;' in which some hunters do a coordinated walk through the forest to encourage deer movement in the direction to other hunters posted in wait. This time I just followed my dad as he did a little tracking into a herd thoroughfare, where we hunkered down under a thick old pine tree. This was the quiet waiting game. The stillness caused my young mind to retrace all the events of the last days, then weeks and even months, until I came up with the story about Timothy's prayers. I asked Walt about this, about the presence of such prayers in our world. In his fashion he didn't answer right off, but after a bit he told me about his old friend Freddy Ferrison who was a Blackfoot and who came to live among the Ramapoughs back in the 1930s. Freddy (whose native name was Yellow Dog with Short Tail) found employment with the American Brake Shoe Company, in Mahwah, New

Jersey, because he could play baseball. In those days most large companies sponsored ball teams and Freddy was a baseman while Walt (who actually never worked at the Brake Shoe) played short-stop. Eventually, the two of them went deer hunting together and Freddy was impressed with Walt's ability to wait out the deer. He told Walt that this must be because Walt was in fact a deer; that somewhere in Walt's lineage he was Deer. On the day Walt and I went hunting, we saw only a few doe in the distance and Walt didn't take a shot at them but on the walk out, we found a single deer antler. I took it with me and eventually made Walt and I both a necklace, with a piece from the antler.

The Ramapoughs have found that the academia does not turn an entirely deaf ear to stories, but it is the folk myths rooted in discrimination some deniers of native presence will choose to acknowledge. Many local histories until very recently have manifested the negative stereotype of a lawless mountain people, as is illustrated by Josephine Emerson's essay "The Jackson Whites", published in a collection by the Appalachian Mountain Club in 1945. Like many other local authorities at mid-century, Emerson repeats the Jackson White origin myth which involves slavery and prostitution on behalf of the occupying British forces on Manhattan Island during the Revolution. He makes no effort to examine the credibility of the story, a story that in fact was invented only a few years earlier by another local essayist. In 1936, John C. Storms published a small book entitled *The Origin of the Jackson-Whites of the Ramapo Mountains,* and while the term itself had long been in use through the 19th century in reference to populations of mixed ethnicity, Storms added the ancestry of English and West Indian women brought into the country as prostitutes for the British soldiers of New York City during the Revolution.[53] The problem here is that the story takes on a life of its own and

with every re-telling, every so-called harmless spin of the tale, this sets the pace for what is to follow. By 1974, when David Steven Cohen published his *The Ramapo Mountain People*, the first chapter is devoted to the origin of the Jackson Whites. While Cohen found no evidence that the Ramapoughs had an historic connection to the story, its presence in the book angered the community who for many years had tried to distance themselves from the urban myth.

In Ramapo, no single effort has done more to incite an anti-academic sentiment than Cohen's book. As mentioned earlier, it in fact fired up native pride and ultimately caused the Ramapoughs to declare their tribal identity a few years later, but the deep seated hostility that Cohen tapped into is about so much more than a book. Primarily, the book negates mixed Indian lineage and offers only the slightest nod toward the Ramapough's claim of Munsee ancestry, "…it would probably have been the Lenni-Lenape or Delaware Indians indigenous to the region…it probably could not have involved more than one or two individuals or there would be more documentary evidence."[54] He makes a strong case for Dutch and freed black slaves germinating the mix over the years maintaining numerous Dutch surnames. Julian Salomon has noted a contemporary band of Munsee/Mohican Indians live in Wisconsin, with some bearing "…the very old Rockland County name of DeGroat"[55]. Therefore curiously, Cohen's own genealogical research can serve to identify the Ramapough's claim. So much for the book; as for the groundswell of collective response to his dismissive narrative and the general condemnation of all things academic, this would appear to be an old wound re-opened.

In trying to tease out the nature of that wound, I look back to the native and non-native elders my father brought me to when I was learning to trap. These men often expressed a critical attitude toward "citified education" and some of them talked about the sad days of the American Indian schools like that of the Carlisle School, in Pennsylvania. These were institutions of re-education where native children were boarded and trained in the ways of white society. They were strict and taught that the Indian world was over and replaced by the white Christian world. I heard them talk of beatings and other severe punishments. These schools were supported by the Bureau of Indian Affairs as well as a great many progressive Christian councils and churches. I grew up watching John Wayne movies at the Lafayette Theater in Suffern where recognizable faces of DeGroat, Mann, Defreese and Jennings children cheered on Wayne, as he killed the Indians. By the time I talked with my friend Timothy about his grandfather, I had been reared into a world that demonized the red people and heralded the white ones, leaving the black ones in a sort of post-slavery slump. These are only the memories of a kid looking back at a solitary history, now consider an elder who has lived a life clinging to a narrative and exposing that story (their story) to an academic who in turn re-shapes it and in so doing, tells it back to them corrected. This is what Cohen did. He wrote their story informed by his preconceived idea and like many an academic, he chose the voice he wanted to hear. [56]

Writing a version appropriate to one's field of study, a narrative seeking truth and at the same time holding up academic standards, is of course a noble sentiment. Mark Raymond Harrington (a fine scholar of Lenape culture) no doubt had the best of intentions when he penned his *Indians of New Jersey: Dickon Among the Lenapes*, a

delightful adventure story that incorporates a life time of native study. Originally published under the title of *Dickon Among the Lenape Indians* (1938), this book tells of a young white boy who is adopted by a Lenape tribe and learns the way of the people. Harrington brings so much of the Lenape life into focus that the reader comes to accept every nuance as commonplace for these Algonquin-speaking people; he even includes a short Lenape dictionary of language phrases at the back of the book. The Dickon adventure was popular among white as well as native schoolchildren as it was seen as a vehicle to neutralize the differences. Unfortunately, Harrington included a section on the Walam Olum (which he spelled Walum Oloom) and in so doing further chronicled yet another "white" version of the Lenape story that claimed to be the correct one.

It was David Oestreicher, whose research on the Walam Olum offers the preeminent deconstruction of this so-called 19th century Delaware Bible, who emerges as the great debunker of this Lenape mythology - a curious paradox given his dismissive assessment of Ramapough Lenape authenticity. As Oestreicher notes, "The Walam Olum, or 'painted record' is a series of 183 glyphs allegedly engraved and painted upon wooden tablets, with accompanying textual explanations in the Delaware language."[57] From its emergence in the mid-1830s, the Walam Olum has been a controversial subject with a very shady background. Its discoverer, Constantine Samuel Rafinesque, a self-proclaimed botanist, zoologist, ethnologist, archeologist, scientist and historian, was a self-aggrandizing character who Oestreicher has noted, was categorized by Henry Schoolcraft to "spoil everything he touched"[58]. Oestreicher found inconsistencies with language use in the translation of the text, such that he believed it was not translated from Delaware into English but in fact the other way around. His research and analysis are

very good and indicate that he has found Rafinesque to have fabricated the entirety of the Walam Olum in order to vindicate his theories concerning the peopling of America, to be recognized for his scientific contribution to history and gain much needed income.[59] Oestreicher goes on to propose that Rafinesque had in fact a model in Joseph Smith, the founder of the Church of Latter Day Saints or Mormons. It was Smith's claim that he uncovered a set of ancient tablets in upstate New York written in the "language of the Egyptians" that revealed the peopling of America to be traced back to ancient Jews.[60] There are parallels between both claims: found tablets that reveal the genesis of an ancient people and in both cases the original tablets disappear but whereas Smith went on to establish a religion, Rafinesque laid the groundwork for nearly a century and a half debate on the genesis of the Lenape. While Oestreicher was not the first to question the Walam Olum, it was his scholarly work that has shed light on this creation of Constantine Rafinesque and curiously led him to dismiss the people along with the myth.

In his exhaustive contribution to Kraft's master work on the Lenape, Oestreicher again and again with the tenacity of a legal investigator argues down the Ramapough's native ancestry. In one particular endnote he comments on the argument that the Ramapough traditional herbal cures and folk remedies are similar to that of historic Lenape. He even acknowledges that his predecessor, Cohen, made note that these cures may be, "…survivals of authentic Indian culture" but he agrees with Cohen who goes on to state that this is not enough to be taken as genuine Indian ancestry, as it was really part of a common rural knowledge.[61] In the same endnote, Oestreicher takes on the telling of traditional tales as being a cultural link to their past, and then challenges this as a telling methodology that they learned from him during his teaching job as part of the American

Indian Education Program between 1981 and 1983.[62] Herein is a fascinating conundrum: the white Indian educator who worked with the Ramapoughs to help them recover their traditions turns on the same people and challenges their credibility. It would seem that the Ramapoughs are, either way, a discredited and marginalized people at least by the standards of a dominant academic paradigm. But if the academic would scratch just beneath the surface, he encounters stories that by their very existence challenge his findings.

On a deer hunt in 1963, Walt shared a story with me about White Deer. Apparently, he would not shoot a white deer as it was believed to be some sort of living embodiment of spirit, sort of like a 'game keeper'. He suggested that while this was clearly a local superstition, it was none the less something that carried weight in the rural community. He told me that he had picked up this idea in his youth most likely from someone like Farrison or one of the Mann's, or maybe a Degroat, he didn't remember who told him. He said it was bad luck to shoot the White Deer, that to do so would mean the game would no longer present. That is how he said it, "game would no longer present". Years later I found in John Bierhorst's *Mythology of the Lenape* his notes on the Ganyo Gowa (White Deer) telling of a Seneca story that is similar to one gathered by 19th century historian John Armstrong. Essentially this story recounts the adventures of a boy who ultimately frees the White Deer and in doing so populates the world with animals that followed the White Deer (the Game Keeper).[63] It would stand to reason that the White Deer story had in some way affected my father's generation of hunters.

Stories are really the foundation of who the Ramapough Lenape are and it is from their stories that they claim their native identity, but stories are not genealogical records.

In the world of the BIA, written records are the foundation on which native credibility is established. It is this final conundrum that continues to trip up the Ramapough, being an oral people their written record is scant at best. Howard Harrod, professor of religious studies at Vanderbilt University, has told us of "…fundamental transformations in meaning that occurred when traditions that were essentially oral performances, in which meaning was dependent upon the narrator's presentational style, were reduced to texts."[64] The written word insists on traveling in only one direction, while oration embodies the freedom of spirit that allows for many directions. Shaping native culture, stories, and spirit into the written word transforms identity to the standard desired by those who shape it. Just as Timothy's grandfather insisted that the boy match prayers learned from an elder to the ones studied in the school; the Ramapough insist that their stories will live beyond a BIA academic footnote of rejection.

Summary:

Having long been assigned to a "nation within a nation" status, indigenous populations, targeted with a national extermination policy and regulated by a Federal Identification program, emerge as residents on a nation's garbage heap. The Ramapough story of survival is all too typical among native society. Over the past century, folklorists and scholars alike have found fertile ground in denouncing Ramapough native identity. In the course of this narrative we will discuss the cooptation of one's story by industry, by medical professionals, and by illness itself but at the foundation of this theft of story is the re-writing of native identity or more appropriately put its erasure. The Ramapoughs continue to face denial by a handful of white professionals whose footnote in history is a small gain when compared to the long troublesome legacy it has cost the people.

Today the Ramapoughs hold pow wows, share sweat lodges with visiting nations and continue to study their own history. A determined people, their intent is to outlast their detractors. To be a Ramapough is to know there is a deck staked against you whether it is the musings of a Rutgers scholar, or as we shall see the stigmatization of media and Hollywood. A question that needs to be addressed by this community is: having long lived with a predetermined identity, one fashioned by an external ruler, can they leave it behind? Familiarity even with negativity breeds a certain security. Shedding what is familiar to embrace what is not is a powerful commitment and requires a powerful medicine.

As discussed in the next chapter, a personality destined to be an American icon would further the process of quiescence to power to which the Ramapoughs had been accustomed. The work of the "common man's industrialist", the maker of the Model-T, was destined to impact the Ramapo Watershed and the Ramapough people, the story of which is still unfolding.

Chapter Four

Fordism

By the mid-1960s, the Ford production plant in Mahwah, New Jersey celebrated its tenth year as one of the biggest auto making centers in the country. Riding south on Route 17 out of the mouth of the Ramapo Valley and crossing the state line into New Jersey, the plant swept the open space of the terrain to the east, where once a country club with a small air field was located, and long before that a meeting place for Lenape and other Algonquin nations. This plant was a long series of connected rectangles that was fronted by a vast parking yard for its employees. At the center of the structure was the Ford logo, a familiar script of its name hanged over the front entrance way. At night, this logo illuminated like a beacon heralding Ford's presence at the mouth of the valley; it faced directly west back across its parking lot front lawn, to the south/north lanes of Interstate Route 17 and up the slope of Hovenkopf Mountain. From the front seat of my Uncle Mal's pick-up truck, I could see the crowded lanes of Ford's lot. I noticed that it was not all Fords parked there and I commented on this. Uncle Mal was quick to remind me that a corner stone of American Enterprise was the freedom of choice. "You're not fired there if you drive a Chevy…" he said, "…but I hear they give you a break if you buy Ford." Mal himself drove an International Pick Up and not a Ford although his wife, my aunt Evelyn, did drive a Ford Falcon. When I asked him about this, he said that he was careful not to throw his allegiance all into one brand name. As we swung around the bend in the road, we drove passed Reinauer's Truck Stop, an all-night service station with

lodgings for long distance truckers. My uncle told me that the proprietor used to be a 'pump man' at my grandfather's station up in Ramapo. He said, grandfather let the truckers get some sleep in his back room and that young Charlie Reinauer used to tell him that was a potential source of income. Old John Stead scoffed at the idea of charging truckers for bunk space but the young Reinauer had a vision, apparently my uncle Mal was impressed with Charlie's enterprise. The idea of seeing an opportunity and seizing upon it was something that inspired great admiration in him. For uncle Mal, not unlike many of his generation, ingenuity, thrift and opportunity were intrinsic to the spirit of "American know-how"; and this was embodied in the character of Henry Ford. Mal believed that in his own time as a young man, he witnessed a great advance in scientific management of labor with the emergence of Fordism.

To get at what charmed my uncle about Fordism, one must consider scientific management of the labor force as conceived by Frederick W. Taylor. A foreman of the Midvale Steel Company in the 1880s, Taylor initiated a detailed analysis of each factory job. Here was a man whose systematic testing of alloy compositions, heating procedures, and cutting fluids informed advances in industrial steel work; and it was with this attention to quantitative analysis that he advanced his principles of scientific management.[65] Taylor was "…the originator of time and motion studies, functional foremanship, and 'scientific' adjustment of employee relationships".[66] His work rationalized assembly lines, piecework payment and special incentives for speed. But while the theory was sound and useful, it failed to produce labor harmony. There was no place in the system for unionism; to the workforce it meant more work for less pay. Fordism worked out of and also moved beyond Taylor's scientific management. It

required a grander reorganization of production along flow principles, a large wage increase to insure labor security, and a curbing of the independent authority of shop floor foremen.[67] Whereas Henry Ford initiated his assembly production during the early years of the 20th century with skilled workers who had a voice about how tasks were to be performed, as the size of his plant grew, the friendly paternalistic environment gave way to a series of low level supervisors. By 1913, as rapid growth in employment levels increased, labor turnover and absenteeism were also on the rise; it was in this atmosphere that Ford Motor Company introduced its assembly line. Interchangeable parts in combination with moving conveyors divided assembly work into simple tasks which advanced technological and economic efficiencies; at the same time repetitive motion produced increased mental stress and physical ailments.[68] In order to offset the down side of mass production work, Ford engineers developed the construct of Fordism to include single-purpose machine tools and relatively high pay. The majority of the work force was standardized to repetitive routine monotonous factory life.

The Model T Ford, the iconic standard for mass produced inexpensive means of transportation, was the high mark of success for Fordism. Shop managers replaced standard general-purpose machine tools with single purpose ones, since complex skills were rarely needed in assembly. Jigs, fixtures, and gauges were key elements in the production machinery for Ford assembly lines. These tools were actually referenced as "farmers tools' as "…they made it possible to teach young men right off the farm to make precision parts."[69] When the company eventually switched to the Model A in 1927, it was discovered that special-purpose machine tools could not all be converted for use on the new model. Flexible mass-production became necessary to keep up with annual model

changes. Such technology was not only a method to de-skill a large part of the workforce but it offered a means for altering general purpose machinery inexpensively. But while Fordism offered an opportunity for unskilled workers employment with little technological education, not all plants employees experienced a reduction of their skills. With the advance of specially designed and single purpose machines, the tool room required highly skilled machinists. Skilled workers were also needed on the shop floor in order to adjust and maintain production machines. Along with maintaining shop quotas, foremen and sub foremen needed to understand the operation of complex machines.[70] Still the majority of the workforce in all production lines and assembly plants by the 1920s engaged a dramatic increase in the proportion of unskilled "assemblers". At the heart of Fordism lay a complex social and economic strategy dependent upon employing a large scale populace of unskilled (easily replaceable) workers. The romantic notion of "American know-how", which alluded to some Jeffersonian Renaissance figure of the "gentleman farmer", was destroyed by industrialism and with it the equally romantic notion of independence and self-sufficiency.

My uncle Mal spoke often (as did his companions) about American know-how being that attribute of common sense applied to any daunting task that achieved the obvious resolution. He proudly told the story of his brother beating out the spray mechanic demonstrator, with the switch stand competition, and boasting of how the 'suited' representatives were splattered with lead paint. But over the years he himself learned to handle a paint spray machine, once the technology was perfected and he praised its efficiency. Perhaps it is a characteristic of the American persona to embrace that which defeats you; admiring technocratic advance while keeping note of social and

environmental cost. In this Mark Twain, a great advocate of technology, remained a pessimist about industrial efficiency. As a young man working at typesetting in New York, he experienced the mind numbing repetitive motions that turn human beings into quasi-machines while at the same time boasting to his family about technocratic advances in the printing business. "The tension, between the world of the small town and the modern world shows up throughout Twain's writings as a vacillation between nostalgia and progress, though at times he cannot separate the two."[71] The kind of American ambivalence Twain lent his voice to clearly informed the fabric of the early twentieth century working class. In his greatest work, *The Adventures of Huckleberry Finn*, Twain is often condemned for the extravagant burlesque that Tom Sawyer insists Huck and Jim act out in order for Jim to be rescued from captivity, as opposed to Huck's common-sense proposals. This last third of the book, bringing in the moralistic Tom Sawyer has been seen as a distraction from the powerful theme of the narrative, but "…for Mark Twain it had a vital importance, Tom Sawyer represents the impracticality of traditional culture, and Huck stands for the native American gift for coming to grips with reality."[72] For my family elders, Huck's know-how was the reliable alternate when technocracy failed, but Tom Sawyer's over construed pretentious morals were the building materials of progress; like two sides of the same coin, the duality was inevitable.

There was a dark side to Henry Ford that played a role in his social construct of Fordism; along with his orderly delineation of the workforce, Ford advocated a similar pretext for the social fabric. In 1919, he initiated his own weekly newspaper, the *Dearborn Independent* with a high-flown motto of "Chronicler of the Neglected Truth". Entirely funded by Ford, this sixteen page paper was a curious mixture of anti-trust

progressive muck racking and anti-Bolshevik demonizing. It is from the Independent that America first heard of *The Protocols of the Learned Elders of Zion*, a document purporting to be the minutes of a secret Jewish conclave led by the Grand Rabbi, at the first Zionist Congress in Switzerland in 1897. The purpose of that meeting of the consortium of Jewish leaders was to construct a 'blueprint' for world domination. This was a warning of the future struggle to the death between Aryans and Jews.[73] How is it that Henry Ford, the American icon of the self-made industrial genius, could have supported such a dark vision, and what effect did this have on his management ideal of Fordism? Here we look at the root of Ford's primary education and find the base for an American standard that emerged out of the nineteenth century well into the early twentieth century: the *McGuffey's Eclectic Readers.*

Considered the first standard of public school texts in the United States, the *Readers* were an anthology edited by William Holmes McGuffey that eventually produced more than a 122 million copies from the printing of the first two volumes of primers in 1836 to the publication of the *New Sixth Eclectic Reader* in 1921. McGuffey, who was one of the founders of the common-school system in Ohio, was an advocate of Protestant Christianity as the only true religion in America. His religiosity was "closer to Puritanism than Unitarianism…God was omnipresent."[74] Hard work visa vie Protestant Work Ethic with a drive toward success was heralded while failure was shunned. Early on, exposed to the *Readers*, Henry Ford proudly boasted of his familiarity with the ideal of "McGuffeyland", a vision where pure and pastoral lads worked with their own two hands and benefited directly from that labor. Throughout his life Ford regularly quoted passages from the *Readers*, reprinted the six original volumes, distributed complete sets

of them to schools across the country, and even went so far as to have McGuffey's original whitewashed log home birthplace disassembled from the Pennsylvania hill country and moved to his Dearborn Americana museum in Michigan.[75]

It is in the edition of *McGuffey's New Fifth Eclectic Reader* that the young Henry Ford learned of "Shylock, or The Pound of Flesh", excerpted from William Shakespeare's *The Merchant of Venice*. Shylock, the Jewish money lender, demands literally a "pound of flesh" from his Christian debtor, Antonio, but is defeated by the condition of not shedding a single drop of "Christian blood", while cutting from Antonio the pound of flesh. The student is then encouraged to answer the question as to why the money lender, Shylock, demanded the pound of flesh, rather than the debt payment. As Neil Baldwin has noted in his research on the *Third Reader,* the narrative asserted that the unfortunate Jews never accepted that "…the Bible is a Christian book…to make us wise unto salvation through faith in Christ Jesus."[76] As early as 1914, the B'nai B'rith Anti-Defamation League undertook a campaign to eliminate the required study of the *Merchant of Venice,* as excerpted in the McGuffey standard reader. The ADL sent a circular to school superintendents across the country noting that "…Shylock has become an unhappy symbol of Jewish vindictiveness, malice and hatred."[77]

The first time I heard the name Shylock in use was as an action word, as in "Don't be shylocked" or "He was shylocked"; this along with the phrase "a pound of flesh", in reference to an onerous debt were fixed slang among the elders in our village. Any fire insurance claim that was questionable was referred to as "Jewish lightening", and over site trouble with banking was associated with Jewish financing. While the ancient origin of Jewish money lending may well have its root in a Christian taboo of charging interest

as being sinful, the preponderance of the stereotypical Shakespearean money lender well into the twentieth century does appear to be promoted by McGuffey Readers. They remained a standard in local Ramapo Schools through the early twentieth century. Both my uncle Mal and my father Walt remembered copying passages out of the McGuffey's, as punishment for their tardiness.[78]

Along with the *McGuffey Readers*, young Henry Ford and his siblings were raised on a daily dosage of the American Tract Society's *The Illustrated Family Christian Almanac for the United States.* This evangelical publication predicted that eventually the obsolete Jewish religion would succumb to the New Israel of America. The children were reminded through catechism teachings that it was the Jews who crucified the ultimate symbol of goodness: Christ.[79]

Ford romanticized the past as an ideal time in which nature remained unmolested by the likes of avarice and greed, a curious ideal for an American industrialist. In this he pursued his naturalist hero John Burroughs, the soft spoken sage of the Catskill Mountains in New York State. Burroughs literature was informed by a Christian strain that resonated with Ford. To Burroughs, the cities were places from which man needed to escape and rebirth his sensibilities in the pristine forest. It was through Burroughs that Ford learned of the transcendentalists Ralph Waldo Emerson and Henry David Thoreau. Ford sought out Emerson's work for "spiritual renewal", for years he was known to carry in his pocket a pamphlet of Emerson excerpts to be called upon for inspirational reference when needed.[80] Ford was enamored with Burroughs and regularly sent him gifts including a Model T; after Burroughs wrecked the car it was replaced with a new one. Ford invited Burroughs on an auto trip to visit the birth place of American

Transcendentalism and this excursion initiated a series of camping expeditions in which Ford hosted Burroughs, Thomas Edison, and Harvey Firestone. This was camping Ford style, which included a fleet of cars, servants, a portable kitchen, numerous tents equipped with plank flooring and Ford's personal film crew. Always the opportunist, Henry Ford's expeditions were viewed in movie houses all across America. It was a part of my parent's childhood to see Ford, Burroughs, Edison and Firestone posed as 'gentlemen campers' dressed in their suits and wadding, with the trousers rolled up, in a Catskill trout stream.[81] Such images associated Ford and his ideals with strong American Protestant work ethic values.

While Burroughs was fond of Ford and wrote favorably about him, Ford's growing anti-Semitism was a bone of contention between them. Always a chronicler, Burroughs noted in his journal on one camping trip in the summer of 1919 that Ford believed Jews were responsible for the World War, thieving, robbery in general, and the inefficiency of the Navy. He eventually lashed out at railroad magnate Jay Gould as a "Shylock". Burroughs reports that he corrected Ford on the last count, as he knew Gould to be a Presbyterian. When published, his account of the camping trip left out his notes on the anti-Semitic ravings by Ford, as well as Edison's less strident but none the less bias outlook on the Jewish people.[82] And of course nowhere in the packaged black and white movie showings under the heading of "Millions of Dollars' Worth of Brains off on a Vacation"[83] does the viewer get a glimpse of this bias, but the public found it in the text of Ford's *Dearborn Independent* within a year. In order to improve his circulation he focused on a sensational enemy.

On May 22, 1920, the *Independent* initiated the first in a series of ninety-one successive articles with the heading *"The International Jew: The World's Problem"*. As Ford's Model T moved further into an international market his suspicion about a Jewish syndicate followed, in the series of articles he published "The Jew in Character and Business" which examined a fear of Jewish unity "traced back to the Middle Ages". They are described as a people with "secret knowledge", bank directors and rabbis who "exercise a collective, invisible hand over the enterprises of modern society". The article indicates that this is illustrated in a "Stricken Germany" and that America would soon fall prey, but for "the proud Gentile race" to arm itself against these "few super-men of a long despised race".[84] By the end of 1920, Ford's Dearborn Publishing Company produced a 250-page paperbound anthology of articles from the newspaper, called *The International Jew: The World's Foremost Problem*; the introduction notes that the book was in response to overwhelming demand for back issues of the paper. The first printing ranged from 200,000 to 500,000 copies and it soon was reprinted in sixteen different languages, with six editions in Germany alone. The International Jew did more than any other work to make the Protocols famous.[85] Ford's fanaticism played into the hands of the rising fascist state in Germany, as Reich Leader of the Nazi Students Federation, Baldur non Schirach, recalled he was profoundly influenced by reading *Der international jude* a full year before he even heard Adolf Hitler inflame his followers.[86] Hitler himself acknowledged Ford's contribution to enlightening the world community of the fearsome Shylock's power, "Jews are the regents of the stock exchange power of the American Union. Every year they manage to become increasingly the controlling masters of the

labor power of a people of 120,000,000 souls; one great man, Ford, to their exasperation still holds out independently there even now."[87]

Ford had his detractors, ranging from such notables as: A. J. Muste, the Founder of the Fellowship of Reconciliation, and Ralph Borsodi, American Decentralist to Aldous Huxley author of *Brave New World,* and Father Coughlin, the radical priest and critic of the New Deal. These were men of social/literary concern but not the general public, not the common working class that Ford resonated with. Still each of them attacked Ford critically in areas where he was weak and easily exposed. Muste early on applauded Ford's stewardship of the workforce and his avowed anti-militarist posture in the pre-war years, but over time found fault with the anti-Semitism. Borsodi opposed Fordism with its reduction of skilled labor in the workforce and the melding of human labor with machinery, as did Huxley who criticized the top down hierarchy model as akin to Mussolini's corporate state. But it was Father Coughlin, the Radio Priest, a rabid anti-Semite himself who brought unwanted critical attention to Ford. Coughlin's first public appearance was by request of Hamilton Fish Jr., conservative Republican Congressman and crusader against communism. This was in Detroit, where Fish held hearings on the subject of domestic subversion. Fish asked Coughlin to comment on the threat of subversion in the American workplace and much to Fish's surprise Coughlin announced in the hearing room, "The greatest force in the movement to internationalize (i.e., communize) labor throughout the world is Henry Ford."[88] He believed that Ford and industrialists like him were driving workers toward socialism. Coughlin's own anti-Semitic ravings did not fully surface until his public influence faded in the late 1930s, although earlier on he ruminated about the predominance of a Jewish influence among

international bankers and referenced “money changers” and the “sin of usury”. Still, Ford carried on with his damnation of union management, his distrust of collectivism, and wholesale blaming of the world’s woes on a religious population. Whereas Coughlin had lost the public spotlight, Ford faced the Second World War with renewed vigor, but his vision was over.

Believing that he was above the law, he told the New York Times that the same subversive ‘wire pullers’ were behind the labor unions. He hired a motley assortment of “…ex-prizefighters, wrestlers, and ordinary parolees” to search workers entering his plants for union literature. If a union card was found, the man faced flogging with blackjacks or lashes from a windshield cord. From 1937 to 1941, 4,000 Ford workers were fired for suspicion of union sympathies. Then in 1941, more than 50,000 men at the Highland Park and Rouge plants walked off the job. Ford said he was being persecuted by “the Jews” and threatened to close the plants down. With his wife, Clara, threatening to divorce him, he left the negotiations to his son Edsel and a contract was signed.[89]

During the Second World War, Ford continued to walk a fine line between political factions. In 1939, the Ford-Werke AG plant was opened as a German company with ownership maintained by Ford Motor USA. By 1941, this plant produced 1,000 trucks per month, along with passenger cars for the Wermacht and the SS. Three ton tracked trucks produced for the German Army came from the Ford-Werke plant. Meanwhile, back in the states Ford lost a multimillion dollar truck-building government defense contract; while in England the Ford-Dagenham plant produced jeeps, aircraft motors, and medium tanks. Ford’s arsenal of democracy was also an arsenal of fascism. When asked what he felt about the outcome, he said he “hoped neither side wins.” [90]

Ford passed on only a couple of years after the war, and while it was known that he wanted to build a new North Eastern plant, it is doubtful that he ever knew of the Mahwah site in Ramapo. Ford Motor Company actually initiated plant development further south in New Jersey, but with the advance of the New York State Thruway crossing the Hudson River and plowing through Rockland County to the Ramapo Valley at the edge of the NY/NJ state line, Mahwah became an ideal location. The then Erie Lackawanna Railroad, with a freight yard in the Villages of Suffern and Hillburn along with thruway access, was made to order for an auto plant. In addition there was a potential workforce among the rural and suburban population, a work force that included a diverse mix of ethnicities and cultures: White (of English, Irish, German and Italian decent); African American (some with roots in the southern states, others descendants of colonial land owners); and Indians (descendants of the Lenape Nation).

By 1947, vehicle owners paid out more taxes for the purchase of new vehicles than any previous year in the history of the industry, a total of $2,914,000,000. The record increase in tax collections from vehicle users was due to two factors: increased registration of vehicles, and an increase in the aggregate vehicle miles traveled. In addition, installment credit outstanding at the end of 1947 amounted to $1,050,000,000.[91] By 1948, interstate highway improvement accelerated as a result of the pressure produced by the ever growing production of motor vehicles. Cities built expressways to permit a safe and uninterrupted flow of traffic. The modern highway progress was characterized by the development of hauling, and grading machines, all powered by fossil fuel. The federal government, flush with tax revenue and registration fees from the increase in motor vehicle ownership, doubled their investment in road improvement and new

interstate highway construction.[92] The decade of the 1950s saw the greatest expansion of highway construction to date, exceeding all previous levels. With the passage of the Federal-Aid Highway Act of 1956, the role of the Federal Government in this expansion was greatly enhanced. By 1957, the Federal Bureau cooperated with the states in planning a record volume of highway work, both improvement of existing roads and construction of new highways. Attention centered on the program for interstate and defense highways. Multi-lane expressways to connect the 48 states and all the cities with a population of 50,000 or more, for interstate vehicular transportation, commerce and potential movement of troops and defense equipment. By the end of fiscal year for 1957, the national system of interstate and defense highways contracts were awarded for 561 projects.[93] So the building of the National Highway System, primarily a boon for the oil and automobile industry, was justified as a Cold War action.

This paving of America lead to an exponential growth in automobile ownership. With the further post war expansion of suburbia, an ever greater dependency on individual auto travel produced the "two car family", and as the family grew so too did the number of automobiles per family. By the 1960's, housing stock accustomed to a single attached garage now offered a two car bay. With little oversight the auto industry continued to base their paint compounds with lead, given the free and open use of leaded gasoline, there seemed little reason to question lead contained in a surface or under coating finish. During the 1950s, this industry furthered its use of potential contaminates with the wonder compound of the mid-twentieth century: plastic.

During the latter half of the 1940s, plastic compounds were utilized in interior design components. Saran, created from vinylidene chloride polymers, was a staple in

auto seat covers. Acrylics were used extensively for horn buttons, stop light lenses, and other decorative parts. Nylon was the favorite material for bearings, bushings, gears, rivets, and coil forms. But an important advance in nylon itself was the announcement of a series of standard colors for molding powder.[94] The growing chemistry in synthetic paints was well underway in the post war years. Xylene, a component of paint thinner was found to be a good base for plastic products. Vinyl acetate-vinyl copolymers were adopted in superior finishes for household appliances. Styrene-drying oil copolymers proved to be excellent paint vehicles, containing equal parts of styrene and drying oil.[95] Plasticizers were in use throughout the 1940s; advanced for war production, some of these compounds furthered industrial needs during peace time. The Phthalates, such as Dimethyl Phthalate and Diethyl Phthalate, are just two of a family of solvents and plasticizers that demonstrated carcinogenic impacts on living systems but still found their way into industrial use. Toxicological literature is scant but not absent during this time. A standard handbook used by industrial research scientists was a 1938 German publication, *Toxicology and Hygiene of Industrial Solvents* that offers extension background into rates of worker exposure, animal and human studies. Apparently, Germany of the 1930s had advanced industrial processes such that there was a genuine concern as to the impact of solvents on human health. One can only speculate as to the conditions under which such studies took place. In the forward to the 1943 English translation, it is noted, "The physical properties of solvents – especially their volatility and diffusibility – if they are toxic, render them the most potent source of health hazard. It is important, therefore, that adequate information on this most widespread and potentially harmful type of chemical be available to all concerned with conservation of health."[96] The rapidly growing

automobile industry of the 1950s brought together, along with leaded paint, a host of potentially carcinogenic chemicals wrapped up in the vehicle that transported Americans along endless miles of highway construction. And in the Ramapo Valley, Ford was foremost in this effort.

In May of 1953, Angus M. Harris, manager of the Ford plant in Edgewater, NJ, told his workers that a new plant in the Village of Mahwah, Bergen County, NJ was to be built and they could put in for a transfer to that location. Ford had announced that the choice of the new site was based on low tax structure, availability of labor, water supply, good transportation facilities, and open space. Certainly, all of this was true but the quiet negotiations with the Erie Land and Improvement Company to build a rail spur and yard with access to an existing yard in Suffern NY, played a fairly significant role. In addition to this, the site was at the opening of the Ramapo Valley just along the NJ/NY state line where the New York State Thruway traversed rounding the bend at the foot of Norkopf Mountain, over the top of little Suffern and heading north through the Ramapo Valley. Access to the thruway was paramount to Ford; apparently NJ Governor Alfred Driscoll agreed, pledging three million dollars for widening, improvements and building an over pass for Route 17. Until then this road was a three-lane undivided highway, heavily traveled with a history of numerous accidents and deaths.[97]

Historians Bischoff and Kahn have noted, "Symbolically, the Ford factory broke Mahwah's ties to the rural past and more closely linked it with the Nation's new technological era."[98] This break from the village's rural ties, introduced to the surrounding area of the Ramapo Valley a paradigm shift that would continue to resonate through the decades, for along with a hefty tax payment that covered in excess of twenty

five percent of the local Mahwah property tax base, the region was now subject to the largest automobile plant in the country. The plant's floor space measured about two million square feet, before long over five thousand workers were employed and by 1960 they had built one million cars. The scientific management of Fordism settled into the valley at Mahwah and by its immensity alone it would take on the people and the environment of Ramapo in both states.

One cannot speak of Mahwah Ford without also speaking of the New York State Thruway: both were up and running by 1955, both are products of the automobile age, and both would have resounding impact on the region. Then New York State Governor Thomas Dewey wrote that the region would move, "…virtually overnight, 20 years into the future."[99] Now, close to sixty years later, the huge impact of a thruway that brought with it a massive ex-urbanite pilgrimage, transforming a low key outer county into a suburban extension of the metropolitan area, has taken its toll. The Ford Mahwah plant, which closed in 1980, continues to reveal a lasting legacy of toxic pollution secreted throughout the Ramapo Watershed, yet another example of Fordism. For if we are to truly comprehend this social and economic strategy that allowed for a reckless distribution of environmental contamination, it is necessary to appreciate its contribution to separatism and bigotry from the earliest days of Ford's anti-Semitism to the automated plant designs of the 1950s that resulted in the gradual erosion of production jobs and forced workers into an accelerated pace to keep up with the machines.

Historian Stephan Meyers has written that the norms of Fordism persist with "the basic thrust of automotive technical innovation" informing the further degradation of labor. He believes that unless the premises about production, machines, and workers

changes, the workers will continue to have "diluted skills, intensified work, and eliminated possible jobs".[100] Ford Mahwah was a modern plant steeped with the scientific management legacy of Fordism, a strategy that praised efficiency and streamlined production always with an eye to the bottom line.

Uncle Mal may have chosen to drive an International over a Ford pickup truck, but he admired Ford, the man and his industry, often repeating the story of Ford's common man appeal; his 'chumming' with the likes of Boroughs, Edison and Firestone; and mulling over the histrionics of the Protocols of Zion. Mal (like my father) was a house painter and he was very opinionated about what he called the anti-lead propaganda. He railed against the likes of Rachel Carson and argued that 'liberals' had a financial incentive in de-leading paint. He believed that industry could regulate itself and that progressives were the downfall of a technocratic economy. My Aunt Evelyn, like a few of my aunts, worked at the Avon Cosmetic plant in Suffern. Mal was as proud of Avon's success as he was of Ford's and he warned me not to fall in with the malcontents, the anti-industrialists.

My father, Walt Stead, did not recall that there was any opposition to the news that Ford was coming to the valley; while there was resistance to the building of the New York State Thruway, Ford was considered to be the silver lining of the thruway cloud. Opening its doors in 1955, Ford was an icon to American Know-How, a beacon to orderly capitalist free enterprise, and a model of virtuous industrial success. But behind the long gray building complex, behind the massive Ford logo, there was a gathering of steel drums containing a cocktail of noxious chemicals. Lead based paint sludge filled with drying agents, solvents, plasticizers and heavy metals; this waste was the cast-off

from the industry. And the bottom line, according to Fordism, was this material needed to be removed from production. It needed to be dealt with.

Summary:

Although the man has been gone for more than half a century, Ford's presence remains very much a part of his legacy. His romanticism about an American past rich with simple rural values, seasoned with the sentimentality of McGuffey Readers would be the harmless whimsy of a pastoral poet had he not been a determined self-made industrialist. In search of an 'other' on which to blame the shortcomings of society, Ford found his fabled Shylock calling for a pound of flesh and he proceeded to demonize an entire people; feeding fuel to the flames of fascism.

What is significant about Fordism is that this brand of scientific worker management emerged from a man who craved the power to determine societal status for others. Ford did not see himself as a winner among losers, rather he saw himself as a winner against the losers. Frederic Turner may have developed management theory but Fordism took it further into population management theory: by reducing the skills required to complete a task on the assembly line, Ford reduced the value of individual workers; by guaranteed pay based on output Ford built incentive into production; and by union busting Ford eliminated on alternate voice for the workforce further reducing their bargaining power.

At best Fordism was a highly successful profit making management system, at worse it was the undermining of the American workforce. The move from Edgewater NJ to Mahwah NJ in the Ramapo Hills sought fresh ground, a greater traffic corridor, as well as a new source of inexpensive employment. The exponential growth in the boom years

of auto production was a reminder that a greater tonnage of waste would need new outlets. This opportunistic maneuver reflects the role that Ford industry played in the war-time exploitation of slave-labor at its own Ford-Werke plant during the Nazi regime of Germany. Henry Ford's industrial/workforce management system of Fordism complimented fascist methodology and became the American justification to the Antisemitism spewing out of the National Socialistic Machinery. Given this history, there is little doubt that the pollution of the watershed at Ramapo, along with the contamination of the people there, was the inevitable fallout of Fordism. In order to comprehend the depth of the damage we must now look at the industrial cocktail that made up the waste paint sludge.

Chapter Five

Lead, Plastic, and Nail Polish

In June of 2008 a gathering of individuals representing among others New York State Departments of Health and Environmental Conservation (DOH and DEC), Ford Motor Company, Town of Ramapo, United Water, Ramapo College and Ramapo River Watershed Inter-municipal Council, attended what was billed as a "Ramapo Paint Sludge Stakeholders Meeting" at the Solid Waste Management Authority of Rockland County.[101] Along with these agencies, there were lawyers on behalf of Ford Motor Company, Town of Ramapo and United Water. Essentially the meeting room was filled to capacity. As the assemblage shifted around a long wooden table, drawing back chairs, finding their positions at one side or the other, an announcement was made by a lawyer representing Ford Motor. Ford established a priority that restricted the names I can reveal from that day, thus the only names I can provide are my own and that of my colleague Geoff Welch, chair of the Ramapo River Committee. In fact, Geoff and I were to a large degree responsible for this meeting being called.

A little more than two years earlier, we had discovered that the paint sludge dumping in the Torne Valley was more extensive than previously believed. While on a field study trip sponsored by the Hackley School (a private K through 12 prep school in Tarrytown NY), we came upon a larger field of discarded paint sludge curiously crumbled and mixed with sand and gravel as if it had been dug up and moved from an earlier site. This led to a visit from representatives of the DEC, which led to further

investigation on the part of my undergraduate students from Ramapo College of Mahwah, NJ. Soon more than a dozen sites were uncovered, many of them marked by scraps of Ford automobile parts, all of which were documented by my undergraduates. This was followed by the stakeholders meeting agreed to by Ford and United Water, who operates the well field at the mouth of the Torne Valley. My students field work, Geoff Welch's photographs, as well as a personal narrative of my trapping years during the dumping activity filled the reports sent to the DEC.

At the start of the meeting I asked that given this was referred to as a stakeholders meeting why there were no Ramapoughs invited. I was told that we constituted the parties of interest in respect to the paint contamination of the watershed. I again asked why there were no Ramapough Indians and or other cancer victims from the pollution as they would appear to be primary stakeholders. The answer was that this was a preliminary meeting in which discussions concerning any potential remediation actions were to be fleshed out before going public. Seven weeks later when the public meeting was held, there was no discussion of any potential remediation action. The official summary report from the June 5 meeting that I received from DEC lacked any statement of action and referenced only one name personally from the meeting: mine.

During the public meeting which was held at mid-summer 2008, in the Village of Hillburn Fire Hall, a great many aerial photos of the various New York sites were on display along with representatives from DEC and DOH standing by to answer any questions the public might have. The public, mostly residents of Hillburn and many of them Ramapoughs, primarily were curious as to what was actually in the paint. The only ingredient that had been discussed thus far was the base element of lead, but the list of

solvents, mixers, driers and plasticizers was still a mystery to the people most affected by these compounds. It seemed the state regulators either didn't know or were just not up to such a discussion. So the public meeting turned into an open discussion between my students and folks interested in learning more about Ford's compounds. I remember at the time thinking back to the earlier stakeholders meeting in which a Ford representative stated flatly that the old paint was "benign and in no way an active carcinogen". I thought about that as I listened to various community elders discuss the rampant incidence of cancer, asthma, diabetes, and organ failure in their families.

This chapter is an attempt to bring together a discussion of story and policy. Story is about place and person and is organic not objective, but filled with reaction and interpretation; painful and celebratory. Policy references place and people, and is in response to story but it is objective and filled with data and analysis, painful only to its victims with very little to celebrate. The idea for this chapter was initiated during the stakeholders meeting when Ford's representative said that the cancers I was referring to were "life style" hazards and not linked to the paint sludge. His remark is a standard mantra from Ford and echoed by Ford-friendly media: the rural impoverished Ramapough Native demographic suffers from "life style" ailments. The cancer death rate among the Ramapoughs averages more than six a month with eldership continuing to decline; there are many stories here. Policy is the tool that a society uses in order to conduct its business and assist its maintenance. Policy has failed many times over in the case of Ford's Toxic Legacy, still it is through the confirmation of story that policy could possibly succeed. It is the story of the paint chemicals and their physical/biological impact that needs to impart a new policy of recovery.

After twenty-five years in the Ramapo Valley (at Mahwah New Jersey), Ford Motor Company closed shop in 1980. During its high point of production in the 1960s Ford Motor ran its most successful plant outside of Detroit, reaching record breaking production before the auto market downturn of the early seventies in reaction to the OPEC oil crisis. During its quarter-century production run in North Jersey, Ford employed a few thousand workers and produced some of its most popular models including the Mustang, Pinto, Fairlane and F-150 pick-up truck. Locally, the residents in the Ramapo region (on both the New York and New Jersey side) drove Fords more than any other vehicle; although some folks made a point of driving GM vehicles or International trucks in order to declare their independence. Ford was seen as the standard-bearer of post-World War Two economic growth and aligned with national pride in American-made-goods. With the closing of the plant in 1980, Senator Ted Kennedy, looking toward a presidential bid, arrived in July of that year and railed against the "failed and flawed economic policies" of the Carter administration.[102] Two years later Rock icon Bruce Springsteen immortalized the plant in his song *Johnny 99* in which a fictional auto worker loses his job to the closing of the plant and turns to a life of violence.[103] Then with the dismantling of buildings, a water tower and a rail yard, the plant site became home to Sharp Electronics and a Sheraton International Crossroads Hotel, but the true nature of Ford's lasting legacy was yet to be made public.

During its twenty-five year production span, Ford created a great deal of waste. Whereas some of the scrap metal was re-tooled, most of the chemical compounds were dumped in the region. Starting in the latter half of the 1950s, steel drums filled with paint sludge were buried just across the state line along the north edge of the plant site in a

flood plain community of the Village of Hillburn, New York. Years later in the 1990s a hundred and eighteen 55-gallon drums of paint sludge were dug up from the soils of this community. In the early 2000s another remediation at this site revealed tons of paint sludge to a depth of 10 feet at the site. This was only one of many illegal waste dumps that would eventually be discovered throughout the valley and up into the hillsides. During the 1960s, the after-hours carting activities were mostly handled by individuals, but with the advent of Earth Day carting was 'jobbed out' to mob-related agencies threatening and intimidating any local resistance to the dumping. By the end of Ford's production years in the region, thousands of tons of paint sludge had been buried in old sand quarries, flood plains, wetlands and abandoned mine shafts. The nature of this material was a closely guarded industrial secret, a secret that to this day continues to unravel its deadly legacy.

Actually, the base heavy metals and chemical compounds that made up the paint sludge were no secret to industrial insiders: lead, antimony, chromium, zinc and arsenic had long been a part of the paint industry's list of toxic ingredients, but in the latter half of the 20th century DuPont added synthetics to the mixture: volatile organic compounds (VOCs) and phthalates for durability, as well as industrial solvents and biphenyls for maintenance and upkeep of the spray machinery in the shops. This created a slurry mixture that drained through the shop floor grates and was loaded into 55-gallon drums for disposal. Once the paint was dumped, it aged first into a sludge-like substance and then hardened into a clay-like compound.

Since the closing of the Ford plant, illness and death in relation to the sludge dumping sites have continued to increase. As noted above, Ford dismisses these claims as "life

style" hazards; in other words the impoverished and uneducated community in question by its very nature exposes itself to poor health care: heavy metal exposure, as in lead, could be from house painting surfaces pre-dating the late 1970s, plastics could be from food wrap and leaching container exposure, and solvents like acetone could be from careless shop work and automobile repair. But this list is even assuming that these compounds are the root cause of the cancers, diabetes, and asthma for environmentally related immune system dysfunction and organ failure is the consequence of years of exposure during which time a wide variety of other impacts (smoking, poor eating, stress, etc.) can take its toll. Given the length of time the community has been exposed to paint sludge, the remainder of this chapter will consider the effects of lead, plastic and acetone as a life style hazard.

Lead was the common base metal used in general paint production. Although public awareness of the hazards associated with this soft metal increased through the second half of the 20th century, the auto industry continued to use lead in their prime coats, color mix, and undercoating. As early as 1908, occupational physician Alice Hamilton noted that lead had endangered workers since the "first century after Christ". Two years later she documented that "the painting trades yield the largest number of victims".[104] Yet as late as 1945, Federal specifications approved of White Lead, a component of almost all white paints and light-colored paints as the preferred pigment for household paints.[105] By 1952 the Lead Industry Association (LIA) claimed that White Lead still reigned as the preferred coating for both exterior and interior decorations; tinted, thinned, thickened and colored with the addition of Zinc Oxide, Magnesium Silicate, and Titanium Dioxide. With a linseed oil base, White Lead was promoted as

increasing flexibility as a plasticizing paint. In fact the LIA defined paint film as a plastic which "…like many plastics, it would become hard, brittle and inflexible if it did not contain a plasticizer…White Lead pigments permit the proper formulation of paints that provide flexible films not only after application, but throughout the life of the paint." [106]

At the same time the industry made these glowing claims in its 1952 edition of *Lead in Modern Industry,* it was quietly withdrawing support for promotion of lead in interior house paint in response to intense publicity generated by popular and professional articles, as well as public health studies.[107] Still, lead paint in exterior house paints, industrial use, and automobile finishes remained as a significant part of the market despite the fact that lead as a pigment in paint was a major source of environmental pollution and was considered an important cause of childhood lead poisoning. Lead as a base component for exterior paints (both residential and commercial) was phased out by the late 1960s but remained a part of automobile production in the U.S. during Ford's years in the Ramapo region through 1980.

The toxicity of lead has long been known, its reproductive and neurological effects are credited by some historians with adding to the decline of the Roman Empire. Typical lead symptoms include: intestinal cramps or painter's colic, renal failure, sterility, and irreversible brain damage (cerebral palsy, mental retardation). In milder cases it can cause irritability, while in children it is believed to cause hyperactivity, behavior disorders, and learning disabilities. Evidence of chronic poisoning can be obtained from x-rays. Lead deposits on bones and teeth as lead phosphate which produces "lead lines" on an x-ray. [108] In the late 1990s, a study of lead levels in deciduous teeth (baby teeth) was published by the UF2-Center for Environmental Research at Leipzig,

Germany. The teeth were collected in dentist's surgeries between April 1994 and January 1995. The majority of the 91 children were male (74%). The study examined concentrations of lead in teeth as a measure of internal exposure in the past and low-level chronic exposure. This study also took in consideration a variety of risk factors of long term exposure, such as: involuntary smoking (including by expecting mothers), effect of traffic, how children play and housing conditions. The primary results of this landmark work illustrated an improved understanding of the relationship and long term exposure to lead, but failed to isolate particular lead exposures in connection with lower IQ ratings.[109]

While much of the symptoms associated with lead poisoning including: intestinal cramps, renal failure, sterility, and brain damage could be the result of a variety of potential exposures, it is the consistency of these symptoms within the community that is troubling. An appropriate health survey has yet to be conducted and there has been no support for a deciduous teeth study. Irritability, hyperactivity, behavior disorders, and learning disabilities in early childhood are considered a norm among a low income community. A community of Ramapoughs living no more than thirty miles from the Ringwood site (at Stag Hill in Mahwah New Jersey) subjected to similar economic deprivation indicate few of these symptoms; the only difference is this community lives apart from the paint sludge exposure. It would stand to reason that a comparison study of the Turtle Clan in Ringwood with the Wolf Clan on Stag Hill would put the "life-style" diagnosis to rest.

Antimony, a lead alloy, increases the hardness and mechanical strength of lead and has been used in manufacturing flame-proofing compounds, paints, ceramic enamels, glass and pottery. Liquid antimony has the exceptional property of expanding (not unlike

water) when it solidifies, making it an excellent constituent for filling the crevices of a mold form, yet another important contribution in lead use. Recent applications have included plastics, rubber, and a small amount of highly purified antimony is used by the computer industry in making semiconductors.

The Lead Industry Association (LIA) has long found that antimonial (hard) lead holds up well under a battery of corrosion resistance tests; exposed to city air in Birmingham, England, it rated on a par with stainless steel in the "Seven Year Examination of Bars" (1922-29), and in a 1944 ten-year study by the American Society for Testing and Materials, antimonial lead was rated the highest in resistance to corrosion penetration. [110]

The primary threat of antimony to public health is from concentrations within surface and ground water at hazardous waste sites, as some soluble forms of antimony are quite mobile in water. Some genetic toxicological effects have been observed in animal testing, acute and sub-chronic effects have been reported in human cases. In 1944, sub-chronic and chronic inhalation tests performed with several doses of antimony dust on rats, for a period of twelve months, followed by a one-year observation period, produced microscopic changes in the lungs which were limited to sub-acute or chronic interstitial carcinomas of the lung. Effects on antimony workers have been primarily signs of lung irritation, gastric irritation and fibrosis, metal "fume" fever, cardiac effects and dermal reactions. Antimony dermatitis (known as antimony spots) has been an accompaniment to antimony processing from the start. A 1993 study indicated lesions on the forearms, wrists, thighs, lower legs and in the flexures, the trunk, back of the neck and scrotum, but not on the face, hands or feet. Nosebleeds were also reported.[111]

The Department of Health and Human Services, the International Agency for Research on Cancer, and the EPA have not classified antimony as a human carcinogen. It has been used as a medicine to treat people infected with parasites, although side effects can include diarrhea, joint and/or muscle pain, vomiting, anemia and heart problems. [112] The only known link to cancer comes from a 1960 survey of mortality at an antimony smelter in England, and a 1937-71 survey of over a thousand workers at a Texas antimony smelter; both studies indicated a positive trend toward increased lung cancer rates. [113]

In 2006, upon receiving information that ATV activity was eroding the river banks along the Ramapo adjacent to a site known as the Meadows, my students joined me for a field trip there. The Meadows, a low lying floodplain that had been the site of more than a dozen houses on the NY side of the state line in the Village of Hillburn. In the early 1990s, after reporting more than 80 fifty five gallon steel drums of paint sludge, the DEC investigated and ultimately found more than a hundred of these drums which were removed. An aeration tower was installed and remained on site until readings indicated it was no longer needed. Some years later when my students and I came upon the dirt trails from off-road activity, we found a great deal of hardened paint sludge. At one location I found the remnants of a camp fire. Scratching at the ashes I could smell the smoky sweet scent of lead paint. It is a unique odor. As a young man I worked for my uncle re-glazing warehouse windows. We used a little hand held settling torch to soften up the old leaded window caulk and that was when I first came to recognize the musky sweetness of lead. This helps to explain a curiosity among the Ramapough children during the time of the dumping. There were many reports of children playing with colorful muddy paint, even

making sludge pies and eating them, at Ringwood Vivian Milligan remembered chewing lead paint like gum. Billy Cuomo (of the Ramapo Hamlet in Hillburn, NY) recalled making and eating sludge pies with his brother down at the Meadows site. No doubt it was the sweetness of the substance that encouraged this. Just as the children sampled paint sludge, the wildlife ate exposed paint contaminating deer, woodchuck, rabbit and squirrel, which in turn followed up through the food chain when bear, bobcat, fox and hawk ate these animals. We eventually got excavation at the Meadows site. Billy Cuomo, whose brother died years later of throat cancer, was not surprised to hear of the tonnage of waste removed. Cindy Fountain, another Ramapough whose early childhood years were spent at the Meadows, remembered the dumping there as well as the smoldering waste fires that lasted for days.

It was a part of the village's history that long before the Ford Plant was built back when R. J. Davidson was shop supervisor for W.W. Snow's Hillburn Iron Works village, refuge was taken down below the Meadows where it was eventually burned and then shoved into the river. The village had a long history of burning waste along the river bank and as the century continued that waste became increasingly toxic. At this time, medical science cannot confirm or deny that the throat cancer that Billy's brother suffered or the numerous cancers Cindy Fountain has endured initiated with their childhood exposure, but what it can tells us (as illustrated in the Liepzig, Germany study) is that the odds were against them with the thick smoke of the smoldering dump and that first bite of a paint sludge pie.

Since the late 1960s, there has emerged a growing movement to reduce, restrict and eliminate the use of lead in domestic production. By the late 1970s leaded gasoline

had all but become a thing of the past. Leaded house paint was entirely off the market. Lead as a coloring agent in cosmetics was eliminated and lead in domestic toy finishes was also replaced by a water based finish. While lead coatings and mixes were still in use for off shore production, the public had become sensitive to lead exposure and demanded transparency in order to avoid further contact. The industrial giants quietly withdrew from lead use and despite economic fear mongering; the economy did not collapse when benign replacement materials filled the gap. The same cannot be said about plastics.

In the 1950s Americans fell in love with plastic. It seemed the new super compound could do anything and service every need. From toys to dinner ware, from upholstery to wardrobe, plastic was everywhere. Cellulose, a plant based compound, predated synthetic plastic, an oil based compound. Dupont moved beyond a simple cellulose product and into synthetics with the development of nylon. Cellophane was still a product name but more synthetic than plant based. From scotch tape to food wrap, Dow Chemical joined in with the plastic revolution along with a small army of lesser known industries rapidly pumping product into the suburban landscape.

Among the more exotic plastic additives that have found their way into our daily lives is a family of chemicals known as biphenyls, of these it is the polychlorinated biphenyls (PCBs) that raised concern among researchers. PCBs are a group of synthetic organic chemicals that contain 209 compounds with varying harmful effects. There are no known natural sources of PCBs in the environment. They can be in an oily form or solid form, and have no taste or smell. PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment, as well as old fluorescent lighting fixtures and hydraulic fluids.[114] Although PCBs are no longer made in the U.S.,

people are still exposed to them from older transformers and capacitors, old fluorescent lighting fixtures and electrical appliances, but a main source are old landfills and waste dump sites such as is the case with the Hudson River, heavily polluted from the General Electric site at Troy, New York. Small amounts of PCBs are found just about everywhere and the population may well be exposed to several micrograms of PCBs every day from air, water and food. People living near hazardous waste sites may be exposed primarily by breathing the air that contains PCBs. The most common way infants are exposed is from drinking breast milk that contains PCBs or from the mother when in the womb. A common means of exposure is from eating meat or fish that contain PCBs, and another means of exposure is from breathing the air in buildings that have electrical parts containing PCBs. Animal testing has shown that PCBs can induce liver, kidney, and skin damage. The EPA has determined that PCBs are a probable human carcinogen. [115]

The New York State Department of Health initiated outreach public education about a Hudson River Fish Advisory in 2009. This program has focused on a health advisory in respect to the harvesting and eating of fish taken from the Hudson River. Further up river nearer to the Troy dam, the advisory rejected the eating of any Hudson fish, while down river below Athens there were exceptions but still a strong warning that women of childbearing age and children under the age of thirteen years not ingest any Hudson fish. During the last five years, student interns working along the shore line at Rockland County have learned that fishers still eat from the Hudson, in particular at Rockland communities of Ecuadorian, Salvadoran, Asian and Hasidic populations consume Hudson fish. Another foraged food source taken from the Hudson is blue crab.

The Advisory proposes that no more than six blue crabs be eaten in a week and that is under the condition that the tomalley (the filter organ) is removed. The students observed during the summers of 2009 through 2011 that crab fests held at Piermont offered up blue crab chowder with no regard to the tomalley warning. They reported crabbers along the Piermont Pier expressed a distrust of government regulation and had little faith in government funded science. If the threat of polychlorinated biphenyls is a challenge for the public to accept, then the danger of plasticizers is an even greater hurdle to public education.[116]

Di(2-ethylhexyl)phthalate, also known as bis(2-ethylhexyl)phthalate, is commonly known as DEHP and is a liquid used to make plastics more flexible; it is what is known as a plasticizer. Plastics may contain 1 to 40% of this plasticizer by weight and are used in such products as upholstery, flooring, tablecloths, shower curtains, food packaging, children's toys, and even tubing and containers for blood transfusions. These are all products made from Polyvinyl Chloride (PVC) but DEHP is also used in the production of car undercoating paint to prevent road corrosion and chipping. When PVC is formulated using DEHP no covalent bonds between the two chemicals are made, so DEHP molecules can leave the plastic and migrate to the surrounding environment. The same is true with DEHP molecules being flushed out of a lead/zinc undercoating paint with road salt, wash or rain water.[117]

Estimation of human exposure to DEHP is complex due to the wide range of items containing DEHP and the large number of variables influencing the amount of DEHP per item that could reach an individual. People are primarily exposed from food wraps that contain the plasticizer. Once the compound gets into the gastrointestinal tract,

it is absorbed into the blood and quickly metabolized. In animal studies DEHP has caused liver tumors in rats and mice; based on these results the National Toxicology Program has classified DEHP as a substance that may reasonably be anticipated to be a carcinogen.[118] A more recent study lends support to testicular cancer, with significant increased tumor incidence in rat testes at increased dosages. In these studies published by C.Voss in *Toxicolo*gy (2005) DEHP induced high levels of the steroid hormones estradiol and testosterone.[119] Such studies have been challenged by industry as it has a high stake in the production and use of DEHP, they have argued that step one in identifying hazardous compounds as having "No Observed Adverse Effect Level" (NOAEL) has not been established. Industry has tried to introduce a very high NOAEL for impact on the testes. After much debate in 2001, the European Union (EU) classified DEHP as toxic for reproduction and initiated a discussion for risk reduction. DEHP was now mandated for labeling as to risk and safety, but this was only for packages of pure DEHP, and consumers using PVC and other products containing DEHP were not aware of any such labeling.[120] Then in 2008, the European Chemicals Bureau (ECB) produced a summary risk assessment report published by the Swedish Chemicals Agency that found DEHP had yet to be proven a high risk to aquatic and terrestrial ecosystems as well as human health, although it admitted that "risk reduction measures which are already being applied shall be taken into account".[121] As Jette Rank from the University of Denmark has noted, "It is not easy to understand the politics of the regulatory game because issues other than scientific results set the agenda."[122]

Among the Ramapoughs of Ringwood, New Jersey and Hillburn New York there is a higher than national average of male infant testicular abnormalities known as

hypospadia. This condition involves the misalignment of the urinary tract and requires a surgical correction. The national average can be anywhere from one in twelve hundred to two thousand; in the Hillburn community of less than a thousand residents there are over twelve known cases of hypospadia. Studies from the University of Denmark have suggested that environmentally induced hypospadia does not readily correct with surgery. In one local case at Hillburn, a male child has gone through three surgeries up through adolescence and still suffers from testicular abnormalities. Here the association between DEHP and hypospadia is elusive and subjective at best, but it is not only the higher than average rates of infant testicular abnormalities that have been observed. Just as I killed a predator with malformed testes, other hunters and trappers in the 1960s reported similar discovery in the game they took. This would suggest that mammalian hypospadia was emergent in the 1960s with the dumping activity that introduced the lead and plasticizer mixed sludge. Biphenyls from PCBs and phthalates from DEHP have long integrated into our industrial production line. While PCB production and use have been regulated, their wide distribution and the ongoing production and use of DEHP both promise to further impact living tissue for generations to come. This is the result of industry being allowed to set the standard of proof higher than common sense would call for. An appropriate standard would be that of the "precautionary principle;" that is a chemical is assumed guilty until proven innocent, a principle that industry claims is a threat to economic stability. One is left wondering about the stability of the nation's health which brings us back to my mother's nail polisher remover.

Acetone, a colorless liquid with a distinct smell and taste, is a volatile organic compound (VOC) associated with paint sludge. It evaporates easily, is flammable and

dissolves in water. It is used in production of plastics and other chemicals, as well as a solvent to dissolve other substances. While it occurs naturally in plants, forest fires, and as a byproduct in the breakdown of body fat, industrial processing and waste contributes more acetone to the environment than do natural processes. Acetone released to air takes about twenty days to break down from sunlight; it moves into water and soil and can move by means of evaporation to the air again. It does not bind to soil or build up in animal fat. Most people are familiar with the smell of acetone from nail polish and nail polish remover, although some household chemicals and paints also contain acetone. Exposure at skin surface to liquid acetone offers an immediate access to the blood, for the same properties that make this chemical an excellent machine solvent, allow it easy access to the blood system. Users of nail polish remover are familiar with that chilly sensation at the cuticle where the liquid comes in contact: that is the skin's absorption of the compound. Small levels of absorption can be broken down by the liver and actually used to make energy for normal bodily functions; however, breathing high levels or even small levels over a longer period of time can cause nose, throat, lung, and eye irritation; increased pulse rate, nausea, vomiting; and shortening of the menstrual cycle in women. Health effects from long-term exposure known from animal studies involve kidney, liver and nerve damage, increased birth defects, and lowered ability to reproduce (males only).[123]

On the night I discovered the familiar odor connecting nail polish remover with the paint sludge, it was my mother, Tessie, who told me about the wonders of acetone. She said it could cut through anything. My dad, Walt, had told her that it was the best solvent for cleaning out spray paint guns, yes the same mechanism that my Uncle Dutch

had competed with in his youth at the Hillburn Iron Works. Walt said that ultimately paint "gums up" the jets in the spray guns and blowing acetone through them softens the "gummy" paint and cleans it out; this leaves you with paint/acetone slurry that the Steads used to bury in the ground. In a similar fashion but on a much larger scale, acetone was used in the industrial shops to cut through the paint build up in the spray equipment. As it is, the average amount of paint product that actually adheres to the automobile is only 10%, leaving the rest to overspray across the floor and wash into drain traps. This thickening mixture of lead, plastic, and VOCs, an industrial cocktail helped along by the acetone, was then loaded into fifty five gallon drums slated for dumping in the watershed. My mom dabbed a drop of nail polisher remover on my finger and I immediately felt that 'chilly' sensation as it contacted my cuticle. She said, "Isn't that amazing?"

The only thorough analysis of the compounds in the Ford Motor Company paint sludge on record was completed at the bequest of attorney Stephen Sheller, on behalf of the Ramapough Lenape community residing on the Ringwood Mines/Landfill site. This was completed in cooperation with the Federal Agency for Toxic Substances and Disease Registry (ATSDR). A copy of this report can be accessed through the NJ Department of Health and Senior Services and was made available during the public comment period from May 1 through July 3 of 2006. The report confirms that the chemicals listed above are all to be found in the sludge along with percentages of cadmium, copper, mercury, and thallium. While the summary in this report is a cautious, if not conservative, analysis of potential ongoing exposure, it acknowledges that sludge deposits and contaminated soil and sediment at the site present "…potential pathways identified with past inhalation

of ambient air and past and current ingestion of biota and groundwater from off-site potable wells." [124]

In assessing health impacts, the report acknowledges that exposures associated with antimony and lead (in paint sludge), arsenic (in surface water), and lead (in soil and surface water) may have resulted in non-cancer adverse effects in children and adults. Further potential health hazards are considered a possibility as a result of additive or interactive effects of chemical mixtures, but the speculation is just that and not considered credible for classification. In respect to lead and antimony exposure, the report notes that the pre-1978 housing may also contribute to lead buildup. In respect to arsenic exposure, the report indicated that arsenic may also be found in the area as a remnant of mine tailings and further study would be necessary. While playing down the cancer incidence for the period of 1979 through 2002, indicating that over all cancer was not elevated, something the Ramapough community contests, the report did acknowledge other health concerns residents believed were related to exposures, including: respiratory diseases, reproductive and development effects, neurological disorders, heart diseases, skin rashes and eye irritation, anemia, and diabetes.[125]

The chemical cocktail that makes up Ford Motor Company paint sludge is a 20th century wonder, a new compound that in some ways defies reason, for even the VOCs that ought to have long ago dissipated when exposed to the air remain trapped inside the hardened sludge, waiting to release gas as much as fifty years later. The people who have been in the front line of exposure are primarily members of the Ramapough Lenape community, on account of their close proximity to the land where much of the sludge dumping has occurred. The stories of illness, loss and recovery indicate many of the

symptoms cited above, and they are the legacy of a criminal act, although it could be argued no intentional crime was ever committed. That thought bears repeating: no intentional crime was ever committed. First it must be addressed as to whether or not the burying of a lead-based paint material in a watershed is a crime, and if the answer is yes, then intentionality becomes the issue. Does the intention to bury waste equate to a responsibility for pollution? While the answer may seem to be obvious to many, the burying of waste has long been a practice in this society, with waste management landfills dotting the map. Publicly, Ford has long held that the paint is not toxic but merely a low level hazard and that any remedial work would be purely cosmetic, that is cleaning up unsightly pollution; in other words, picking up what is visible.

At the end of the stakeholders meeting, the Ford representative stated that the Torne Valley was not on their radar. He said that Ringwood, New Jersey was an issue primarily because of the close proximity of residents to the dumping and that in the Torne Valley this was not the case. With few residences anywhere near the sludge sites in the valley, Ford dismissed any call for cleanup in this watershed. This reasoning of course follows the idea that the cleanup work was purely of a cosmetic nature but United Water's representative in the same meeting indicated that the idea of migrating lead paint in the ground water was a "ticking time bomb" in respect to the well heads at the base of the valley. Regardless, Ford's rep shrugged and said to us, as we all stood to leave, that we were not to expect to see them back in Torne. Outside in the parking lot, Geoff Welch looked up at the eastern face of Torne Mountain; the noon sun offered a unique "full face" view of the granite outcrop. He paused to take a picture and I looked up at the high point, an historic site where once George Washington posted men to watch for British

ships sailing into New York harbor forty miles off. This is the same Torne Mountain ridge that speaks of a fabled iron master cursed by a shape shifting salamander. I asked Geoff what stories children a hundred years from now would tell of our time. He turned and as we walked to the car he said, "They'll remember us for the paint sludge we left behind."

Summary

The connection between compounds and heavy metals with immune system dysfunction and fatality has been tenuous at best in part because of the longevity of immune breakdown and in part because of the strict scientific demands encouraged by industrial polluters. Lead has been a known carcinogen through the ages reaching back to contamination of the aqueducts in the Roman Empire. Medical science verified what history indicated with the work of Margaret Hamilton in the 1920s. Through the 20th century, despite the opposition of the American Lead Industry, this known carcinogen has been regulated to minimal use and completely removed as a paint base in America and most of Europe. Its ability to leach into the blood stream was documented as early as the 1820s with dental studies and its impact on the oxygen content in the blood cells is now undisputed science. Long believed to be the stuff of alarmist speculation, the 1990s East/West Germany Studies indicate that children lacking significant exposure to lead rate noticeably higher on IQ exams, especially beyond age ten while their counterparts whose exposure can be as early as infancy rate below standard by pre-adolescence. While the German study focused on lead carbon monoxide exposure and more studies need to be done on exposure to liquid and pulverized lead paint, this remains a clear indication that lead is an active carcinogen.

Plastic in its many forms remains a much harder carcinogenic villain to convict. Of primary concern with the paint sludge is the commonly used plasticizer Di(2-ethylhexyl)phthalate (DEHP). This unique formula mixed in with the paint sludge waste has extended the materials ability to retain VOCs such as benzene, zylene, and acetone for decades. More disturbing has been the association between infant hypospadia and DEHP. Theo Colburn's ground breaking work in the late 1980s revealed the impact of plasticizers on the endocrine system. The rate of hypospadia in the Ramapough community is twice the national average and could be higher, but the stigma associated with this malady limits a complete accounting.

America was in love with a "clean" lead finish until overwhelming evidence challenged the assertions of industry. The complexities of carcinogenic plastic exposure along with a growing distrust of science have obscured this part of the story, but there are signs of plastic losing ground as the wonder product of a once romanticized future. Massive floating islands of plastic garbage in the oceans, sea life losing reproductive ability from ingesting plastic and despite an earnest re-cycling program the manufacturing of PVC continues to rise with an estimate of less than 30% reaching the re-cycling material flow. So while lead has been removed from production and use in the U.S., plasticizers remain an active ingredient in lead free paint.

Acetone has and continues to play a key role in this story. On a personal note it was my mother's nail polisher remover that early on linked the sludge with acceptable household carcinogens. This association with cosmetics was brought home years later when during my study of the Hillburn Meadows dump site, my mother's advanced Alzheimer's proved to be connected with the metal content in her blood cells from

bonding agents in her make-up. We brought her into a state of repaired clarity by removing the targeted carcinogen, aluminum, through chelation therapy. It was then in the winter of 1994 that I realized it is only by removal of the carcinogen that one can nullify its effects.

If this change of heart for lead, a once primary economic ingredient in paint production, can happen then plastics and solvents can be radically reduced and even replaced. It takes the will of the people to go against the grain. It may not always be a popular choice, but as we shall see in the next chapter some people are drawn to truth despite the odds.

Chapter 6

Toxic Legacy

In late summer of 2005, Geoff Welch phoned me and asked that I join him down in the Ramapo Well Field where he was taking Bergen Record photojournalist, Thomas Franklin, to photograph some paint sludge. I had just returned from camping overnight with the Nature Place Day camp and was not much in the mood for going back out, but an opportunity to interact with a reporter concerning the sludge issue was not to be passed up. When I got to the Torne Valley, I found that Tom Franklin was interested in taking both still shots and video. The three of us went first to an area in the Torne Brook where a fairly large chunk of hardened paint sludge sat mid-stream. Tom snapped a few shots and some video of Geoff talking about the nature of the paint. We then went down to the Ramapo Well Field, in the Village of Hillburn. Here some years earlier, there had been a halfhearted attempt at sludge removal which resulted in one barrel of contained material as well as a large mound some sixty feet across and over twelve feet high of excavated soil, laced with fragments of sludge. This mound was only twenty feet from a United Water well head. Tom filmed Geoffrey talking about the need to remove sludge waste from this active well field while I explored the perimeter, and found the distribution of paint sludge covered a much larger area than the site of the mound. From there we went down to a low lying flood plain along the state line, still in the Village of Hillburn. Here we shot footage of some of the house foundations, for although the structures had been dismantled, the footings remained. These concrete blocks rose up

more than four feet, as was necessary in order to cope with the periodic flooding from the Ramapo River. It was getting hot and muggy when Tom asked me to speak on camera about the nature of this community. I hunkered down on the top step of what had been the front entrance to somebody's home and started talking.

This place was called the Meadows. It was subject to overflow from the Ramapo River, but before the days of the New York State Thruway the flooding was more manageable. The thruway altered the river just north of the Meadows, straightening it out such that water volume accelerated for half a mile before it reached the banks of the Meadows. Residents there noticed an increase in the flooding cycle. This was amplified by the railroad embankment just south of the Meadows (built for the Ford Company) which acted as a natural dam against the receding flood waters. In the early years of Ford during the late 1950s, dumping just over the state line into the lower Meadows was common place. Eventually, the local dumping moved out north to the Torne Valley and west into Ringwood, New Jersey. In the early 1990s when I was producing some local cable television, we ran a segment shot in the Meadows discussing the paint sludge with children. This brought us the attention of the New York State Department of Conservation (DEC) which led to the removal of over a hundred 55 gallon steel drums of paint sludge but this was only the beginning of work done at the site.

After the interview, we walked over to an area along the state line, where large chunks of paint sludge remained. Tom Franklin was shocked that DEC over saw the removal of barrels of sludge but did nothing about the rest of the paint. Geoffrey explained that removing barrels is one thing but unearthing paint in among the trees was more costly, it would need industry dollars to finance that sort of extraction. Once the

barrels were removed, DEC had an aeration well put in to help off gas the ground water. After a few years this well was taken down despite the clear visibility of the remaining sludge. As we walked back to our car, Tom Franklin told me that the Bergen Record had been working on a series of stories that would run in early October. This series would also have a computer link for broadband video, photos with narration, documents and discussion boards. I was amazed; for while our local media occasionally ran a sludge story for the most part they remained mute. The Bergen Record was about to release a five part series entitled "Toxic Legacy", since Ford closed its Mahwah plant in 1980, this would be the first in depth coverage of what Ford had left behind. This series would come to play such a significant role in bringing Ford, the Federal Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (DEP), back to the Ringwood site that it bears review and some background as to how this series came about.

Jan Barry, upon first impression, is a fairly unassuming, soft spoken sort of man; a Vietnam Veteran whose journalistic career included ground breaking work investigating the controversial herbicide Agent Orange. Jan is a penetrating storyteller. It was Jan who back in 1995, while working for the Bergen Record, heard of some Ramapough Natives requesting the Borough of Ringwood visit a site where paint had been found. He went to the address which was near to the Cannon mine, a 19th century iron mine, and was surprised to find that representatives from Ford Motor Company, Arcadis Environmental Agency, the New Jersey Department of Environmental Protection, the EPA, as well as Ringwood municipal leaders were all gathered at the site. He knew that this area of Ringwood was a delisted Superfund site and that the residents

continued to claim the pollution there had not been removed. Now, on his first visit to the old mining area (home to a branch of the Ramapoughs belonging to the Turtle Clan) he observed what appeared to be a stone wall, but was actually a wall of paint sludge chunks. The sludge ran along side of a resident's garden. The regulators (DEP and EPA) said that this area must have been overlooked and would be attended to. When Jan returned to the newspaper's office, his superiors showed little interest in the paint story but were very excited that he had found access to the isolated Ramapough Indians. They told him to go back and do a profile on them.

"So I went back", Jan recalled, "and I talked to a person from their community association. He gave me a little walking tour and pointed out some other hazards, such as: an open mineshaft into which a boy had disappeared never to be found, some homes that were slipping into sinkholes, power lines that crossed over houses, a mountain spring that bubbled up orange and smelled like industrial solvent. I mean, everything was hazardous. My tour guide told me that the orange spring used to be where the community could collect fresh water but when the "dumpers" came they were told there was nothing to worry about, since then the water has been fouled." Jan wrote the story and the paper ran some photos of the area but again the government agencies claimed there was nothing to worry about.[126]

Then in 1997 Jeff Tittel, a local environmental advocate, discovered sludge welling out of a bank and going into a stream called Park Brook which flows from a pond at Ringwood Manor, a county park. Tittel called this in to *The Record* and Jan, along with a photographer, was assigned to check it out. What they found was an oily substance oozing out of the embankment at a proposed hiking trail and in sight of some Ramapough

homes. They took photos and the next day Jan spoke with the North Jersey Water District and suggested they look into this. Shortly after that, he received a call from the Water District and was told they took some samples at the site and found elevated levels of benzene and arsenic. Jan then called the Ringwood Borough Hall and talked with the municipal engineer but was told that Ringwood was not concerned. Still, it went up the ladder to the EPA who a few days later told Jan that this was "no problem".

In January 2004, Barry took a reporter from a local weekly paper back to Ringwood in an effort to create more coverage of the story, to bring more attention to the crisis. He was frustrated with the slowness and lackadaisical response of the media in general. Together they found barrels popping up through leaf litter at an area that was supposedly remediated. The story showed up in the weekly, and *The Record* was given the credit for the investigation. Barry had nudged *The Record* a little further into the story. Then in the spring of 2004, the Ramapough Community staged a press conference where they invited state and federal regulators along with the press to go on a 'walk about' with them. This was when Jan met Vivian Milligan and Wayne Mann, two community organizers with the Ramapoughs, of Ringwood. Regulators representing the state and the federal government, along with Ringwood Borough representatives, media, and community members were led along an old mining road to inspect slabs of "lava like" sludge, long slabs revealing a hardened flow of lead paint. This was a trail frequented by the children of the community. Barry recalled that some of the "EPA guys did not take this seriously and were just walking over top of it, as if it were benign". When they reached the last house on a cul-de-sac near to the Cannon Mine, Barry recognized the place as where he had been years before to examine paint sludge in the

man's backyard; now it was discovered in his front yard. Barry lost his usual sense of composure.

"I was fed up. I turned to the regulator and said you were going to clean this up! It was heavy through the grass in and around the children's play area. Their attitude was blasé, they could care less!" That was when *The Record* allowed him more time for the Ringwood story and assigned his colleague, Barbara Williams, to work with him as a sort of "tag team;" between them they could cover the community meetings. Eventually, he was given more support as the managing editor saw a potential for the story netting the paper a Pulitzer Prize. They hired consultants for the stand-along website, even though many of the reporters were highly skeptical that the story would run given the fact that they were up against Ford as well as the federal government. When research turned up mob connections with the carting, they found paint sludge had traveled north to Plattekill, NY, and south to Cheesequake State Park, NJ.[127] During this time, summer of 2005, DEP Commissioner Brad Campbell told Barry that a formal request of criminal investigation of both Ford and the EPA had been made to the U.S. attorney who at that time was Chris Christie. This caused concern with *The Record's* editors who worried as to the appropriateness of releasing the story to the public. Barry wrote a carefully worded article that ran in early summer, but he felt the concerns were nonsense. Frustrated with the constant delays, he was ready to resign. Only later did he learn that the editorial staff was in deep conflict about the story. He noted that one of the editors was what he called "the delayer" and he grew suspicious of this editor's constant defense of industry. Depressed about the delays, he continued to work the story along with six other reporters; still he had the distinct impression that the story was going to be dumped. During this time his

strongest supporter, a managing editor, was let go along with their chief investigative reporter. But despite all this, Barry was never pressured to leave himself. Then on Sunday October 2nd, the first of a five part series appeared on the front page of *The Record* with the headline, "Ford, the Feds, the Mob: Making of a Wasteland".

Back home from church with a freshly brewed coffee, or perhaps at a favorite local Starbucks with a latte, or the warm autumnal day encouraged taking the paper to the park; none the less on this particular Sunday, for readers of the Bergen Record beneath that headline was a full color photo of hardened paint sludge in the woodlands of Ringwood. This first story was an extensive overview of the whole series. Even a casual read could not avoid the shocking news that there was, "…enough paint sludge to fill two of the three tubes of the Lincoln Tunnel". Continued to the inside section, the story acknowledged tests commissioned by *The Record* finding lead, arsenic and xylenes in the sludge with levels a hundred times above what the government considers safe. Under the headline "A Poisoned Landscape", a large color photo shows Angie Van Dunk holding her daughter Jada, with her son Dekwan at her feet, a chunk of sludge sticks out of the driveway beside Dekwan. The narrative was punctuated with Ramapough testimony about how they watched the "dumping" story unfold in their community:

> They remember the 18-wheelers leaving brilliant puddles and splashes all the way up Peters Mine Road. They saw workers push the paint sludge, drums, and other waste into the old iron mines that riddle the landscape. So many trucks arrived in the dark that residents started calling it the "midnight landfill" [128]

But it is the personal testimony of pain, frustration, and loss that is most compelling. Kelly DeGroat, who lost her 10 year old son, Collin, to a rare bone cancer in 2001 said, "They can't tell me that the stuff we're walking in every day and the air we're breathing up here isn't killing people." The cases pile up: thyroid cancer, platelet disorder, tumors, lung cancer, and organ failure; it was overwhelming. Then there is the story of Mickey VanDunk who as a boy fished for walleye and caught turtles for soup in water tainted with paint. He and his friends molded sludge into baseballs, other children made sludge mud pies, in fact they would slide down a mountain of gray paint they called Sludge Hill. But this exposure had its long term consequences. Mickey bears the boils and massive scars that tell his story. He has had twenty-seven surgeries since he was a teen. Diagnosed with a rare condition called hidradenitis supperativa, generally a genetic disease but exposure to pollutants makes it worse. His story wraps up the first in the series, with this commentary:

> Janet, his mom, is convinced her boy was sickened by the contamination that is all around them, in the woods they hunt in, the fish they eat, maybe even in the 20 pounds of deer meat in the freezer.
>
> "Nobody's going to change my mind," she said.
>
> She's certain of something else. Mickey won't have any more surgery.
>
> "Why keep cuttin' on him?" she said as she smoked a cigarette on the front porch. "There's nothing left to cut."[129]

This first installment in the five part series was riveting and quickly became the talk of Bergen County. Jan's persistence had come to fruition and the story of the Ramapough's plight poured into the hearts of Record readers. A humble man who shied away from the lime light, Barry had cut his teeth on the Agent Orange story he researched back in 1977. It was then while working for *The Morristown Daily Record* he attended a town council meeting where an environmental advocate stood and spoke about the chemicals used to defoliate a local power line that strung across the Rockaway River. The advocate claimed that these chemicals were the same toxic substance used to defoliate jungle forests in Vietnam during the war. The next day Barry called the utility company and a spokesperson readily admitted that the company had been using this material for nearly thirty years. He learned this was the same concoction that constituted Agent Orange (a formula containing both 245T and 245D). Jan's editor was a Vietnam Vet and he encouraged Jan to pursue the story. The Morristown Daily had a circulation of about 100,000 and was considered a 'small' paper. As Barry worked with another veteran who helped with the interviews, they learned that Agent Orange was spread in 'Nam' with helicopter and on land by backpack sprayers. He interviewed people trained for chemical warfare that had sprayed Agent Orange but were offered no safety training for this. DDT was sprayed for mosquito abatement in the camps and Agent Orange was sprayed to defoliate the jungle, but pilots told them that sometimes canisters were mixed up and flight plans were jumbled such that occasionally the forest got the pesticide and the camps got the herbicide. Among the stories he collected were tales of military dogs being tossed into vats of chemicals for pest prevention and the dogs, along with the handlers and the veterinarians, were all made sick. It was during this time of research that

Jan learned the term "synergetic effect" that being the increase in toxicity when compounds are added together and found their way into the food system. The veterans called this a Rainbow of Poison.

Barry stuck to it and eventually published a three part series in *The Morristown Daily Record*. At the time all across the country, other papers were looking into defoliant excess in the jungles of 'Nam' as a result of pressure being put on them by young veterans, but these papers only repeated the government position that the chemicals were completely safe. Jan observed that even the Veterans Administration at the time claimed that Agent Orange was benign. His reporting opened the door to a cover-up that ran through the halls of government and deep into the influence of the pharmaceutical industry. Eventually, this produced questions from veterans and their families about Agent Orange and its connection to rashes and skin irritation, miscarriages, psychological symptoms, Type-2 diabetes, birth defects in children and cancers such as Hodgkin's disease, prostate cancer and leukemia. Once his series was published, a flood of information poured in from veterans of South Korea and Guam, as well as vets posted at Fort Drum, Fort Mead Maryland, and Air Force bases in Florida. It was the same story over and over; chemical experiments without telling the captive veterans of the potential dangers involved. Barry found the military services as well as the Forest Service recklessly made use of a mass amount of chemical defoliant and in the process exposed tens of thousands of people. In Oregon women were having problems giving birth. A group of rural Oregon residents disturbed by the miscarriages, birth defects, and illnesses in their families, livestock, and local wildlife believed it was in association with the spraying of aerial defoliant, the same Agent Orange chemicals used in Vietnam. A

lawsuit was filed to force the EPA's suppressed studies of dioxin into the open, and this case resulted in a landmark federal court decision which banned the use of dioxin contaminated herbicides on national forest lands.[130]

Barry wrote that the government was involved in a cover up on behalf of the makers of Agent Orange which included Dow Chemical, Dupont and Monsanto; he cited the Veteran's Administration, the Department of Defense, the CDC and the EPA. As the years passed, his work was picked up by veteran organizations and reproduced and shared throughout the world. Barry readily admits that he moved on to other stories but kept a close eye on further developments, as in the Agent Orange dump in Newark along the bank of the Passaic River. Disgusted with the slowness of the EPA's efforts, Barry observes that a clean-up of the old Diamond Shamrock Chemical Company site was planned for in the mid-90s and only now in 2014 has Occidental Chemical (the current owner of the site) negotiated a clean-up plan. As he put it, "We are a so-called democracy run by industry. Death matters little when profit is the concern." This was the background work for Barry, it produced in him a stubborn streak not easily discouraged.

Monday October 3, *The Record* continued the "Toxic Legacy" series with a front page headline that read, "The Watchdogs Failed". This piece was primarily the work of Jan Barry, and it reviewed the dynamic of the working relationship between Ford and the EPA. Early in the narrative Jeff Tittel, director of the Sierra Club in New Jersey, speaks of the letter he sent to Bradley Campbell of the NJ DEP. Tittel told of his many tours with officials from EPA starting in 1979, he requested that the DEP take legal action against both Ford and the EPA. Campbell, a lawyer and former EPA administrator, contacted then US Attorney for New Jersey, Chris Christie. He wrote, "These sludges

present potential risk to both local residents and the environment; moreover, the presence of this contamination appears in direct conflict with representations that Ford and its consultants made concerning remedial activity." [131] A Ford spokesman, Jon Holt, is quoted as saying that the company continues to cooperate with state and federal regulators, as well as continues to communicate with the community. But *The Record* reported that the public records show federal officials at the EPA repeatedly let Ford walk away from thousands of tons of waste at Ringwood. The very fact that at the time of the publication, Ford and the EPA were back again for a fifth attempt at a clean-up speaks volumes. *The Record* investigation showed that even before the first attempt at a clean-up, state inspectors doubted Ford's report of the extent of the contamination, as early as 1985. By 1987, the DEP complained that the EPA hadn't given the state enough time to review Ford's remediation plans. Thus, the EPA allowed Ford to proceed with an inadequate clean-up. By August of 1988, EPA section chief, Raymond Basso reported to the community that Ford's excavation of the sludge was now complete. Jan Barry reported that Basso, through an agency spokesman, said he had relied on Ford's records of what was dumped in Ringwood and then removed. Ramapough residents recalled that Basso told them Ford had searched extensively over four years for any more paint sludge. Ford then closed the books on the clean-up. It is interesting to note that at the time of this writing in 2014, paint sludge can still be easily found by anyone other than an EPA investigator in the woodlands of Ringwood, along the roads and trails, near to Pine Brook, a tributary to the Wanaque Reservoir, and of course packed deep into the old iron mines. Needless to say, the federal agency was called back another four times and still investigations point to tens of thousands of tons of contamination remaining at the site.

This second part in the "Toxic Legacy" series contains graphic photographs of regulatory inspectors and local activists, wandering about the site, picking up chunks of sludge and studying them; along with two interesting side bar stories. The first one examines the gift of polluted land Ford made to the state of New Jersey, apparently in an attempt to avoid tougher dumping laws adopted in 1970. The transfer of 109 acres previously owned by Ford when it was dumping sludge there from 1967-71 ultimately did not let Ford out of responsibility once the Superfund Law was enacted in 1980. The side bar story discussed the mystery of the land gift, as reported by Clint Riley and Jan Barry that while the deed, dated Dec 21, 1973, says Ford gave the state 109 acres and bears the signature of Gov. Brendan Byrne and his environmental commissioner Daniel J. O'Hern, neither of those men held those positions at that time. Even more curious, the deed was not recorded at the Passaic County clerk's office until August of 1979. This land became a part of Ringwood State Park and to this day is regularly used by hikers and hunters.[132]

The second side-bar story is the first piece in the series that examines Ford dumping across the state line in New York. Under the title, "Ringwood is not the only trouble spot", Barry considers the Meadows in lower Hillburn along the Ramapo River, and then takes the reader up into Torne Valley. In this piece Barry notes that the New York State DEC rejected calls from Rockland County and municipal officials for a clean-up of the sludge. Catherine Quinn of the Rockland Health Department said her agency had been advocating the State to take action on this issue since 1980. This remained a tussle between county and state agencies as the New York site was not listed under Superfund, so the EPA was not involved. Joe Gowers, an EPA project manager, told

Barry, "Just because you have paint sludge there that does not mean that paint sludge is presenting a threat to human health. You have to look at site-specific factors."[133] But Brian Miele, the mayor of the Village of Hillburn, did not agree, "Our goal would be to have anybody who has dumped within the village limits to have it cleaned up properly", he said. "In my opinion there is an inordinate amount of material on that site." He spoke of the midnight dumping and said, "When I first became mayor in 1977 there were complaints by local residents of trucks going into Torne Valley, there was dumping going on there all night." Geoff Welch, Barry noted, was concerned about people unknowingly exposed to sludge. He talked about fishermen and hikers being exposed to hazardous waste. Welch recalled that residents raised concern about sludge amid weeds near to one of the wells, by the river in 1992. The DEC took an action that resulted in contaminated soil piled up into a mound and left there by the well head. It was that mound of sludge, covered in brush and weeds, near to the United Water well that we had photographed with Tom Franklin. This story brought "Toxic Legacy" into New York State and up the Torne Valley deep into the water shed, widening the public concern.

As for the rest of the narrative, Robert Spiegel (of Edison Wetlands, an environmental watch dog group) is quoted as saying that a state law known as the Spill Act, which holds responsible parties liable for remediation of polluted waterways, was violated. Frustrated by the slowness of action on the part of the regulators, Spiegel said:

> "EPA has not done anything to restrict the discharge. Ford has not done anything. And the state has not done anything. We are preparing to sue on this. Some regulatory agency has to be accountable."[134]

But the added disturbing news was the testimony of Bruce Molholt, a former EPA toxicologist, who told the EPA ten months earlier that "PCBs and other toxic substances found at the site cause cancer and nerve damage". Moholt indicated that, "…collectively, their risks may be more than the sum of their individual risks," in other words through a toxic synergism.

Essentially, this installment of "Toxic Legacy" indicates that the regulatory agencies seemed to be offering more protection to industry and little if any to the community. And while the front line of that community may be the Turtle Clan of the Ramapough Indian Nation, according to Barry the EPA displayed little concern even over the safety of the nearby reservoir. As Barry wrote:

> In 1998, *The Record* reported that the North Jersey District Water Supply Commission, which runs the Wanaque Reservoir system, had found elevated levels of lead and benzene in an orange colored seep into a stream near Peters Mine. In response, EPA project manager Monica Matzke wrote *The Record* that the water district "has indicated to EPA that it found no exceedences of any chemicals above standards." [135]

But when the EPA ordered more testing to be done in 2004, Lewis Schneider, the lab manager for the water commission, found that that there were elevated levels of lead and benzene. He concluded that Matzke misstated the earlier results. So a massive reservoir that services millions of citizens in North Jersey continued to be at risk; and like the

proverbial "miner's canary" the Ramapough people continued to suffer. Next the series focused on the Ramapoughs themselves.

The Tuesday October 4th morning edition of *The Record* offered a headline reading: "Wedded to the Land, For better or worse, Ramapoughs call mountain home". Below the headline was a large color portrait of Paul Van Dunk, a diabetes patient who had lost a leg to the disease, sitting on his outdoor bench with a framed photo of his daughter, Pauline, whose death to cancer left behind her two children. Staff writers Mary Jo Layton and Barbara Williams worked on this installment, which puts a personal face on the victims of "Toxic Legacy". Punctuated with Thomas Franklin's photographs of families, children, and elders telling their story of survival against great odds, the narrative reveals a people determined to hold their place, indebted to their forbearers, and focused on recovery. But this will not be a romanticized re-invention of their culture, so much as a reclaiming of their story. Coming to terms with one's own narrative is the hard road to recovery; for Paul VanDunk it may include moving off the land of his ancestors in order to leave something to his descendants. "My dream, if I had the money, would be to just get out of here and take my grandchildren as far away from here as I could", he tells *The Record* reporters.[136]

The text offers a portrait of the community with ramshackle houses heated with wood-burning stoves, alongside newer structures with satellite dishes; a place where native foraging for rabbits and woodchucks is augmented with the aid of SUVs and cell phones. Recognized by the state of New Jersey for their native lineage, the federal government hasn't acknowledged their heritage. One is left to believe that this is linked to the stigmatization of the Ramapoughs, as Fayelynn Van Dunk, a single mother of four

has noted, their heritage can be hard to embrace. Jobs are hard to come by, even in local fast food chains and gas stations. "You can't get anywhere because the Van Dunk name just has a reputation of being ignorant…you might as well just say it: barbaric."[137] Initially, many of the Ramapoughs, so distrusting of government, kept quiet about the paint sludge on their property. Layton and Williams reported that only a few in the neighborhood indicated to officials at the EPA that sludge had turned up in their yards. As Roger DeGroat tells it, the discovery of toxins could well lead to condemnation of the property.

> "What happens if they come in and find our houses and yards so polluted that they condemn them? Asked Roger DeGroat. "Then where do we go? We can't afford to live anywhere else. And I haven't heard any promises that they will pay to move us anywhere." [138]

Layton and Williams make note that the Ramapoughs had retained the Alabama branch of the Johnnie Cochran firm, as well as Robert F. Kennedy's firm but had yet to file suit. Jan Barry noted that once Brad Campbell made his formal request to US attorney for New Jersey, Chris Christie, that law firms took a speculative interest. "By mid-week of the "Toxic Legacy" series hitting the streets, the DEC held a press conference to announce that this was going to be taken care of. Then all kinds showed up: attorneys from Cochran to Kennedy, members of Congress, state politicians, all kinds!" Regardless of the attention, the community remained skeptical of genuine compensation. "If they would help us relocate, we'd move," Linda DeGroat told the reporters. Her memories of picking elderberries with her granddaddy for the wine he made, her love of

the warm familiar sense of place, the security in knowing that the door was always open to someone in need, were challenged by the idea of escaping the contamination she suspects took the life of her grandson, Collin. In 2001, Collin passed on from a rare bone cancer, Ewing's sarcoma. Her family was still morning his passing when his older cousin, Pauline Wright, died of cancer.[139]

Paul, who lost a leg to diabetes, carries on with his wife Sylvia, and looks after the surviving members of their family.[140] "I was born here and I'd like to die here if it weren't for all the stuff around us," Sylvia said referring to the paint sludge, as well as high-voltage power lines over head, open pit mine holes, and methane gas venting up through their back yard. Like many other communities of color, the Ramapoughs live with industrial waste and excess, the down side of a highly lucrative extraction/production industry. With the exception of the big casino funded reservation sites some of the worse industrial dumping grounds and toxic industries are located on Indian reservations or deep in urban ghetto populations.

Wayne Mann, a spokesman for the community, was sympathetic in hearing of Ramapough's attached to their homeland. He speaks of the heritage of long held family traditions, of the Ramapoughs who worked the early mines "…even before New Jersey was a state."

> Yet, with another cleanup under way and so many of his neighbors sick, Mann wonders if he's made too great a sacrifice in staying.

> "I've buried 30 family members over the last few years and I'm just tired," said Mann, 45. "I don't' know how much more we can take."
>
> His daughter has already left with her three children. He worries about his son and a new grandchild who will arrive in December.
>
> "I don't want to leave," he said. "But I want my kids and everyone else to go until they know it's safe."
>
> As a boy, Mann played at "Sludge Hill," a slope off Van Dunk Lane, where he smeared the purple-streaked sludge on his face when the kids played cowboys and Indians. The children even rode down the slick, 4 or 5 on the hood of a car, sledding in July.[141]

Mann blames Ford for the community's illnesses, the asthma, diabetes, and cancer. He considers Ford to be "nothing more than murderers." He watched as Ford and the EPA agreed to returning for a "fifth" attempt at a cleanup but he expressed little faith that the majority of the sludge will be removed, not with indicators such as the discovery of antimony, a metal that causes heart and lung problems, being found in Angie Van Dunk's yard with levels at a 100 times federal safety standards. "We were like specimens to them", he says bitterly of Ford.

Up the road from Angie's place, Mike Stefancik watched the runoff of a stream, laced with benzene across from his driveway. He remembered seeing haulers dump loads of sludge and other automobile cast-offs in the woodlands, around his home. He led EPA

officials on tours of the contamination. Stefancik has little faith that Ford will ever come to full recovery of this pollution. His daughter, Kristy, would like to leave with her little girl, Angel, and find a place that is reminiscent of their beloved Ramapos, somewhere perhaps upstate. Kristy completed her high school years and is not a part of the troubling statistics that indicate 23 percent of American Indian and black students have dropped out of Lakeland Regional High School (serving Ringwood), while fewer than 2 percent of white students dropped out.

For many years social workers have claimed that poor school attendance was an indication of weak family structures among the Ramapoughs. The community blames learning disabilities on elevated lead levels, found in the sludge on their property, while some say it is as a result of the cycle of poverty and poor living conditions. Layton and Williams reported that more than 400 people live in 48 homes, approximately 7 to 10 residents per structure, and these are not large housing units. Crowded home life, weak economy, industrial pollution, sickness and death, the community does not offer much in the way of hope, and yet the Ramapoughs hang on. But for the young, future hopes are linked to leaving the homeland. Jared Milligan, at 6-foot-4-inch was a Lakeland basketball team all-star; and was All-Conference and All-Region at Ramapo College. Jared's home was an old mining building, his ancestors extracted ore from the deep earth, and his relatives scavenged the Ford sludge for copper and carburetors.

Jared Milligan sees his future beyond the Ramapos. "I've learned stuff here I would never have learned anywhere else. But I'm not sure I will come back. I just feel my time here is over." Milligan expresses the doubt that comes to young members of the community, as they witness their elders declining. According to Wayne Mann, the

Ramapoughs used to generally live into their 90s and even some into their hundreds, but now folks are lucky to make it into their 50s and 60s. Native America relies on the guidance of elders, the bearers of tradition to teach the young, but as eldership gets younger and younger itself, the traditional guidance falls short, or as Sub Chief Vin Mann has observed, "Killing off the elders is just another way of killing off the Nation."

The fourth part in the "Toxic Legacy" series raised a great deal of concern with *The Record's* administrative staff, according to Jan Barry. On Wednesday, October 5, the front page hosted a headline that read: "The Mob Cleaned Up". Reporters Alex Nussbaum and Tom Troncone lead this narrative that detailed the role Mafia haulers, and other corner cutting carters, had in dumping Ford waste. Ringwood residents, who advocated against industrial chemicals, medical waste, and Ford paint sludge being hauled to a private landfill in the woods, found their lives threatened. Robert Constant was warned that he could find himself in the bottom of the Hudson River. Others noted that haulers carried firearms in their truck cabs. During the 1970s, haulers carried off industrial waste into the night and spread it in private landfills, into mountain streams, and alongside road beds. Today that legacy leaches through Superfund sites, costing tax payers and corporations millions of dollars in waste cleanup.

Maurice Hinchey, a New York congressman who led a probe on toxic dumping in the 1980s, is quoted as saying, "We know where most of the worst materials are, but there are places off the back roads that have not really been dealt with." Bradley Campbell notes that, "Waste haulers took things to a lot of dumpsites and didn't keep records. Our operating assumption is that there are still additional sites that have not been identified." But according to Nussbaum and Troncone, no one was looking for these sites,

state and federal authorities say they lack the staff to do this work. The role mobsters played in the hauling of toxic waste, as explained by *The Record,* became pivotal as:

> … toxic waste was a growth industry in the 1970s, when the new laws were being imposed. They had exerted control over the garbage business for decades. The Mafia controlled many haulers and demanded tribute from others. They used intimidation to enforce an illegal property-rights system to divvy up customers – whoever hauled to a particular address owned that location forever, free from competition. Move in on another man's territory and you risked getting your trucks blown up, your legs broken or a bullet in our head.[142]

The Record's investigation goes on to identify what it refers to as the "Kingpins of Trash", starting with a Monroe, NY family led by Joseph Mongelli, a hauler who entered the business in the 1960s, then partnered with Louisville, Kentucky based Industrial Services of America (ISA) and landed the Mahwah contract. ISA founder Harry Kletter claimed they only worked with the Mongellis until 1970 and that for their part the Ford waste was dumped properly, which given that none of Ford's paint was appropriate for any of the locations it traveled to, begs the question, what was proper about it? The Mongellis put Mario "The Shadow" Gigante in control of their company ISA in NJ Inc. His brother, Vincent "Chin" Gigante, later headed the Genovese crime family.

Former ISA driver, Charles Oetzel, reported that the Mongellis ordered waste to be sent to more than a dozen locations illegally, one of these was the old Wanaque municipal dump, now a satellite campus of Passaic County Community College. Another frequently used site was a private dump just above Greenwood Lake in Warwick, NY. Trucks carried blood, organs and other hospital waste, battery acids, industrial chemicals and paint sludge. One nearby family spied on the Grace Disposal dump site at Warwick and reported:

> "Household rubbish, mixed with thick black liquid…Black liquid burns skin on contact, has strong smell…Also a bag containing rubber gloves, masks…and a piece of paper stating materials in bag are radioactive-contaminated. About a half-hour later, a load from Ford paint."[143]

Residents who complained to local officials and documented their observations were threatened, brake lines were slashed, and lug nuts on car wheels were loosened. Despite intimidation the residents persisted, as Robert Constant said, "We determined we would risk our lives because the alternative was to allow the lives of millions of people to be in danger." Eventually the dump was closed in 1980. Joseph Mongelli told reporters his family had no contact with organized crime. He also said the Mongellis had taken all the paint sludge to the Bergen County landfill in Lyndhurst; of the testimony of his drivers he said, "When you are talking to the drivers, you're talking to old men. They have to be confused." While his brothers were later prosecuted for racketeering and bribery, they were never charged with illegal dumping.

Other players in the network of illegal Ford dumping included Duane Marine Salvage Corp, a Perth Amboy hazardous waste processor, who landed a hauling contract with the Mongellis to move Ford sludge to their incinerator, which didn't exist, so they stockpiled leaking drums along the Arthur Kill. Eventually, they mixed the sludge with shale, from a Chevron refinery in Perth Amboy, and then dumped it in East Brunswick's Edgeboro landfill. Dirk Ottens, a retired New Jersey State Detective who had investigated Duane Marine Salvage and other haulers, has said, "We're reaping now what we were sowing back then." His long and arduous investigation of the illegal haulers eventually brought about a Congressional hearing which landed him and his partner under heavy scrutiny by New Jersey authorities. Ottens had staked out many of the players and documented their maneuvers, such as Mongelli subcontractor S&W Waste Inc. of South Kearny, whom he witnessed mixing chemical waste with loads of household garbage, a dumping practice known as "cocktailing". S&W Waste morphed into Clean Earth New Jersey, one of the current landfills that continues to work with Ford. Another Ford contractor, All-County Environmental Service Corp. of Edgewater, was shut down over PCB dumping on its Hudson River property. Former mob associate turned government informant, Harold Kaufman, claimed that in 1978, Chin Gigante threatened Joseph Macaluso, whose son, Charles, owned Statewide Environmental, a company that held onto Ford's Edison plant garbage contract, during a very tense meeting that almost escalated into a mob war. Charles, who served as an honorary co-chairman of the 1976 Democratic Convention, had close ties to the Genovese crime family. Nussbaum and Troncone essentially name a gallery of crime families all connected to the Ford dumping,

along with landfill inspectors, local police chiefs, municipal judges, and regulators. As for retired state police detective Ottens, they report that to this day:

> Ottens is uneasy about papers he said went missing at Ford's Mahwah Plant. He claims he visited the factory in 1979 and found memos that identified manifests and fraud by some of Ford's haulers. When he returned with a subpoena for the records, however, key documents were missing. In their place, Ottens claimed, was a note that somebody in the state Attorney General's Office had warned Ford he was coming. [144]

The final installment of the series focused on the compounds themselves. On Thursday October 6th, under a headline that read "Danger Upstream," was a center page photo of a stream, in the Peter's Mine area of Ringwood, brightly colored orange with a stained bull frog lounging in the contaminated water. Lindy Washburn was the lead writer for this installment. Focused on the impact Ford's pollution has upon the watershed, this article was accompanied by graphic photos of contamination and maps, identifying regions of concern. Early in the narrative Robert Spiegel with the Edison Wetlands Association is quoted as saying, "We know that we have contamination leaving the site. We know that there's some in the surface water bodies (on the site). We do not know the full extent." He goes on to indicate both the EPA and the municipal water authority do not know the full extent. While the extent of contamination may be a mystery, the actual cast list is well known, according to *The Record's* own water quality testing they have found: lead, arsenic, chromium, cadmium, Freon and benzene along the

Upper Ringwood's streams, seeps, and pools. Downstream in the Ringwood River bottom sediment there can be found: lead, nickel, antimony, arsenic, chromium and copper.[145] As Washburn indicates:

> Exposure to these individual chemicals is linked to kidney disease, abnormal brain-cell development, skin lesions, birth defects and different types of cancer, among other health problems. The combined effect of several together, even in extremely low doses – "toxic synergy" – is only now being studied.[146]

Washburn focuses on the dispute between one camp, The New Jersey District Water Supply Commission, which has determined that runoff from the contamination area is clean by the time it reaches the Wanaque Reservoir; and the other camp, Edison Wetlands Ass., community members and environmental advocates who argue that regardless of the current indicators, there is a volume of potential contamination waiting to come down stream. *The Record* commissioned tests that found lead and other metals in the brook's sediment to be three times higher than the state's standard for cleanup, but not in the water flow. The distance the water travels from Upper Ringwood to the reservoir is about one and half miles. The water flows through beaver ponds, wetlands, and over a small dam. Beaver ponds are natural sedimentation tanks, as the water flows into them the velocity decreases and the heavy metals fall to the bottom or are captured with other sediment particles, against the rodent's dam. Wetlands filter metals and other compounds through water reeds and algae growth, then phytoremediate the load with decay and exposure to aeration. And a manmade dam is both another settling mechanism

for heavy metals and an aeration mechanism (by means of evaporation) for volatile organic compounds (VOCs). As Washburn states it:

> The heavy metals are not very soluble and tend to settle out of water. They gravitate to the bottom in a still pool. The volatile organics that were trapped in the sludge like the bubbles in a Mallomar cookie dissipate when they are exposed to air, released by the riffle of a waterfall or a wave tossed up by the wind. [147]

Washurn's metaphor of a Mallomar cookie was particularly striking, as it brings home the not so subtle reminder that ultimately this scientific analysis rests on the shoulders of the innocent, the children. So the question is how safe is the water that reaches the Wanaque reservoir? According to Michael Barnes, the chief engineer of the North Jersey District Water Supply Commission, its clean enough, chemically speaking, to drink. "Before it even gets to the reservoir to be treated, you could drink it for lead." In other words it is within federal clean-water standards for lead contamination. But no one actually drinks the water where it enters the reservoir; first it is diluted in a 30 billion-gallon "holding tank" and then is transferred to the water-treatment plant six miles away. At the treatment plant a corrosion inhibitor is added, to keep the water from leaching lead and copper off indoor pipes and fixtures. While this bodes well for the Water Supply Commission's efforts at one end of the pipe, it does not take into consideration the changing nature of both the above and below ground water movement. Barnes is also deeply concerned about the lack of knowledge as to how much total contamination is in the watershed. Since the dumping was primarily done illegally, there are no records and

both state and federal regulators, as well as Ford, have done little to account for the original volume dumped. There is also the concern, expressed by Edison Wetlands Association, that the test wells used to conclude no harm had been done to the groundwater were flawed. According to EWA's consultant engineer, Richard Chapin, the wells were seldom sampled and located in the wrong places to find pollution. Chapin recommends:

> A through study to understand the water's movement underground – through abandoned mine tunnels and natural cracks and fissures. That geology would be complicated enough to map, he noted, "but these cracks have been subjected to underground blasting for 200 years."[148]

In other words, underground water movement, given the altered cavernous terrain of the mining area, along with the ever changing nature of the surface water runoff due to erosion and other soil disturbances, could change the flow of contaminates into the reservoir. And there is still the mystery of knowing the true nature of the underground materials. As Carter Strickland Jr. of the Rutgers Environmental Law Clinic has noted, the underground dumping has yet to be properly characterized. Spiegel of Edison Wetlands thinks of it as, "giant Q-tips discharging contaminants into the ground water". Barnes would like to get rid of it all by drying out the mines, extracting the waste, and trucking it to a landfill. But in order to do this millions of gallons of water would need to be pumped to portable water treatment plants, before it could be released to feeder streams back into the watershed. And as Chapin has observed, this could be tremendously expensive.

Washburn ends the final installment with commentary from environmental activists Geoff Welch and Bob Spiegel. Both men have a long history of environmental advocacy and both of them continue to fight the little battles in the bigger war. Clearly, the role of public participation is fundamental to the process of recovery, while the debate continues the advocate heralds the public to arms but stands alone in the field, unpaid and alienated from much of the mainstream. But their actions do not go unnoticed, as the achievement of "Toxic Legacy" in the fall of 2005 by Jan Barry and his colleagues attests to.

Summary:

The Bergen Record series "Toxic Legacy" was a groundbreaking investigative body of work that brought greater scrutiny to the Ringwood portion of the Ramapough/Ford story; more than a year in the works with a team of journalists devoted to countless hours and stewarded by Jan Barry. Barry is a journalist of the old school accustomed to pounding the sidewalk, knocking on doors, following leads and facing down dubious editors. He kept the story alive. This was not the work of a vain-glorious writer hungry for recognition but that of a man outraged by what he experienced in the field. Barry is a storyteller who chipped away at the regulatory agencies denial, deconstructed local political agendas, and listened very closely to the experience of the Ramapough's ordeal.

Jan Barry, a veteran of the Vietnam War, devoted years to teasing out the truth behind the reckless use of Agent Orange incendiary defoliant. With no official acknowledgement from the U.S. Government, Barry dove into an unpopular investigation about an unpopular military action. Ultimately his work shed light onto negligent and

cowardly behavior on the part of the military and helped to bring some closure to a great many survivors still suffering the long term effects of exposure.

It is the nature of this man and his determined search for the truth that kept the "Toxic Legacy" team going. In a time when public sentiment tends toward apathy and surrender to a dominate presence, Barry challenged the reader to take notice. Although he would be the first to acknowledge the collaborative team work on *Legacy*, it was his own steady continuity that grounded the work. It was Jan's Vietnam experience with his years of Agent Orange investigation that nurtured the writer who would encounter a truth among the Ramapoughs. As we shall see in the next chapter, Jan's approach is unfortunately unique for media all too often prefers the story they want to market.

Chapter 7

A Story as Told by Others

On July 13, 2011, a beautiful sunny afternoon, an HBO documentary entitled *Mann v. Ford* was premiered in the Berrie Center theatre at Ramapo College, Mahwah, New Jersey.[149] I attended this showing of the film with members of the Ramapough Nation, as well as college faculty, students, and invited guests. HBO, who produced the documentary, offered a before-screening reception with drinks and snacks. With a student intern of mine, Sonya, I went out to the courtyard which faces the campus commons and found the Ramapoughs mostly gathered along a windowless stone block wall, while the rest of the assemblage was milling about the tables and bar. My colleagues Michael Edelstein, archeologists Ed Lenik and Nancy Gibbs, and Jan Barry, lead writer of the "Toxic Legacy" series, were in attendance. I walked over to Pat Osterhought, a Ramapough from Hillburn, with whom I have worked in the past. We stood with a few other woman elders and chatted about the unfortunate resolution of the legal case, on which the film was based. No one had any inkling as to how the documentary would portray the Ringwood Ramapoughs, although there was some trepidation about HBO in general. I had gotten the sense that the lawyers in the case had been a major influence in the making of the film, given that the feeling among the community was the lawyers had dropped the ball, this did not bode well for expectations at the screening.

While we socialized, I noticed a darkening cloud form in the sky to the west, just over the ridge of the Ramapo Mountains, in the direction of Ringwood. Moments later a warm breeze picked up and the dark cloud to the west grew larger. An elder looked to the

sky and then caught my glance and said, “You brought this.” It wasn’t a question but a note of acknowledgement, a dark cloud forming a foreboding sign. Chief Perry looked up and said, “I see it, do you?” I nodded and just then a strong and violent wind swept in from the west and blew through the courtyard, toppling the service tables, sending plastic refreshment glasses across the pavement and away. Most of the gathering scurried in for shelter but a good many Ramapoughs backed up to the block wall of the theater to take it all in. Sonya and I joined them, as we watched the mighty oak and pine trees swaying dramatically in the commons. Those inside watched from behind glass doors amazed with the sudden change in weather and amused by those who remained outside, especially when the rain struck. It didn’t last very long, a driving gale force tore at leaves from the oak, and scattered them across the campus. Then a sudden cracking sound and a huge oak limb came crashing down, across the path into the commons. We all stared at it as a flash of lightening passed through, followed by the sudden appearance of a single white tailed doe that dashed across the courtyard, leaped up on the fallen limb, stared at us and bolted away. Then it was over. The sky lightened up and the sun shone through causing the wet leaves to shine like Christmas ornaments. The Ramapough elder, a small round shouldered woman stepped into the courtyard and turned to those of us who had remained outside. Looking in the direction of the deer she said, “You know what this means.”

The deer totem is a strong totem of family, it represents gentleness along the path to new adventures but it can also represent a call to let up on oneself and not be so critical of one’s own path. Deer foster guidance and protection. A doe will stand down fierce predators in the defense of her fawn. Among the Ramapoughs (as is true with many of

the Algonquin tribes) deer is a totem for a clan, although the majority of the Ramapoughs included in this film were of the Turtle Clan with Wolf being Mahwah and Deer being Hillburn. When Deer presents itself it must be read in context of the environment of the presentation; on this day Deer presented in collaboration with a sudden storm and a fallen tree. Of particular significance is the deer taking a stand on top of the freshly broken limb of oak. Oak, a tree of strength and of ancient traditions, is also a tree that supplies food as the traditional oak acorn flour that was long a staple in the Algonquin culture. So Deer, a strong totem of family and protection and gentleness takes a stand atop the oak bough (Oak traditional strength and sustenance) that Wind has torn down (Wind speaks in many voices from four directions). The sign stirred the elders in the way of a warning or an omen: Family and tradition are to be challenged here at this time. That which sustains us has been damaged, this is not our fault. We did not create this.[150]

Essentially, *Mann v Ford* follows two stories: one about the lawyers and one about the Ramapoughs. Maro Chemayeff and Micah Fink descended upon Ringwood to chronicle the Ramapough's legal battle with Ford. Unfortunately, this is a fairly one dimensional film, as the only perspective offered is what the two stories have to offer: big business bad – people screwed. The film makers could not get any comment from Ford, and only a trifling from the EPA. In the absence of such material, about mid-way through the film, they obsess over the legal proceedings, to very little purpose. The lawyers' endless meetings at comfortable mid-town restaurants or highway diners offered up sumptuous shots of eating, supposedly "on the run" while they discuss the tribulations of the case, played as something like a profile of legalese excess. These shots stand in stark contrast to the footage of Ringwood Ramapoughs, having their homes inspected for

dioxin by folks in hazmat suits, or Vivian Milligan walking with a lead attorney indicating the homes of recently deceased neighbors, or a local family celebrating the short life of a child whose cancer claimed him. There are also huge digressions, like the segue that leaps into the childhood of Vicki Gilliam, lead attorney for the Cochran Group, which amounts to a sort of *Inconvenient Truth* sans Al Gore moment. Gilliam's story is poignant and meaningful but oddly placed in this story about the Ramapough's case against Ford. Later in the film, there is another digression with the swearing in of Lisa Jackson, President Obama's choice to lead the EPA. She brings community leader Wayne Mann and company to the swearing in, down at the nation's capital, and she honors them with a touching commentary for the record. Despite her short stint working for then New Jersey Governor Corzine, this Federal post seems to have amounted to little, in terms of aid for the Ramapoughs. She is not mentioned again in the film. Most disturbing, as the lawyers prepare to go into pre-trial hearings, is the announcement that Gilliam has left the case. For the better part of two hours, it is Gilliam who builds relationships with her clients and then suddenly, she is gone from the proceedings. This cried out for an explanation. Ringwood Ramapough Vivian Milligan, who worked very closely with Gilliam, and to this day has no idea what happened, suspects that she had to go; "That girl was on our side, I don't think she would have settled like the others did in the end".

To understand the weakness in the film, it might be best to look back a year earlier to the publication of a *New Yorker* magazine article by Ben McGrath. In the March 1, 2010 issue of *The New Yorker*, McGrath featured a story about the killing of Emil Mann.[151] This had happened on April 1st, 2006 and culminated in the summer of 2009 with a "not guilty" verdict for the park ranger who had pulled the trigger on Emil

Mann's life. I introduced McGrath to tribal chief Dwaine Perry in the summer of 2007. McGrath had met me to discuss his proposed assignment so I took him to meet with the chief, essentially to talk over his access to the community. We drove through the Village of Hillburn, just past Sixth Street we encountered the chief driving in the other direction. We stopped our cars and held an informal council there in the road, eventually being joined by others who came along in a pickup truck. The Chief took to McGrath, who is a charming man and extremely polite. We then went back to the Chief's home, on Boulder Avenue, where Ben was treated to a lesson on the long history the Ramapoughs have had with writers, academics, film makers and the like. By the time we left, Ben was fairly well established as a welcome guest in the community, but there was a string attached. "You can come in and learn, and you can write about us", the chief said, "But none of that Jackson White crap, you understand. We're heard that for too many years." This of course was in reference to the racist mythology that David Cohen had referenced in his book *Ramapo Mountain People*; he had repeated John Storms sexist/racist fable written in the 1930s. And a few years later, when it came to print, Ben's article was a deeply researched piece, and might have emerged as something the Ramapoughs could be proud of, excepting the sections on the Jackson Whites, which included a reference to *New Yorker* journalist George Weller's 1938 piece in the magazine, entitled "The Jackson Whites".

I was at a sportsman's trade show on behalf of the NYSDOH Hudson River Fish Advisory Program, when Ben McGrath called me. The article had just been released and already he was receiving angry calls from Ramapoughs he had interviewed. He was stunned, as he believed the framing of the discriminatory term placed it in proper context.

I reminded him that they didn't want to see it in print at all, regardless of the context. McGrath told me that his editors insisted, as they believed this was an important part of the story, that the racism inherent in the slang informs the setting and precondition, of the park-ranger's behavior on that fateful day. I listened to his frustration on the phone and sympathized but knew that, with *The New Yorker*, he was up against well institutionalized stigmatization, as well as low expectations on the part of the Ramapoughs. They had allowed him into the community but in all likelihood he was expected to fail, expected to exploit, as it was his "way of being".[152] To be sure, Ben at no time struck me as exploitive or deceptive, he is a genuine well-meaning journalist but the neo-liberal *New Yorker,* with its urbane sensibility, is not the stuff of local storytelling. In order to convey a story, *The New Yorker* must come to possess it; when the editors insisted on the trivial folk history perpetuated by a colonizing mentality, regardless of its footnote in the narrative, they came to possess the story, over the wishes of the Ramapoughs who in fact are the story. Even the accompanying color illustration depicts an officer up against what appear to be ruthless renegades, so much for the press.

As indicated in chapter three, the Ramapoughs have a long history of being interpreted by another's agenda. Like many indigenous residents on this continent, they have been identified as an "occupied people", living among colonial conquerors. It is in this respect, regardless of the best intentions on the part of a cool urbane intellectual society emanating from *The New Yorker*, the Ramapoughs would be cast in a pre-determined setting of lost children of Appalachia, clearly in need of guidance. This "lost and needy" classification attracts a great many "progressives" who come armed, also with the best of intentions but are capable of doing a great deal of harm. Lydia Cotz, a

lawyer who offers the tribe pro bono work, continues to state that the Ramapoughs "need a blueprint" or a "schematic" in order to co-exist with white society. It is this kind of condescending good will, thrust upon the people with ingratiating cheer, that suffocates the community and reframes their story. But Ms Cotz is not alone in this attitude, she is joined by academics of all stripes, as well as social workers, health care professionals and politicians; and perhaps the worst of the lot are the college professors, armed with their theories and eager to parade their student interns into the community for a field trip. And the Ramapoughs continue to open their doors for such inspection, all in the spirit of keeping their story alive, but much of this exposure in fact robs them of their story, interprets it, and offers back something that has been de-natured.

What is outstanding in *Mann v Ford*, what strikes the viewer, are the personal interviews and Vivian Milligan's old home movies of children, many of them now passed, playing in Ringwood. This is unadulterated history, a glimpse into a charming world unaware that their legacy was carcinogenetic exposure. Under the direction of Maro Chermayeff and Micah Fink, the film offers a beautiful portrayal of the Ramapough Turtle Clan community; a very rural setting in which the people find comfort in their seclusion. As Vivian Milligan's voice tells us, "The woods, they have been our lives." Then we meet Bob Siegel of Edison Wetlands, New Jersey (an advocacy association) who talks about the noxious mixture of compounds in the hardened paint sludge, as he cracks open a sizable chunk. Although he is wearing rubber gloves to protect his hands, the very compounds he just referenced have just been released in his presence, in fact in later footage, after breaking open another sludge cake with a hammer and chisel, Spiegel complains of the strong odor that has been released. This off-gassing, which was denied

by Ford as solvents and acids theoretically would have burned off early in the paint's life, lingers deep in the sludge as a result of the plasticizer DEHP which traps a virtual cocktail of chemicals in the paint. Mr. Spiegel's advocacy was an opportunity missed to drop in some science on the legitimate hazard of contact with the substance.

Next we are treated to community leader Wayne Mann whose on camera presence is riveting, in the fashion that only a true warrior can be. He walks about at the Ramapough Pow Wow chatting with folks and watching the dancers; a figure of strength among his people. And we meet the lead attorney for the plaintiffs, in the case to be cited as *Mann v Ford*, Vicki Gilliam (the subject of the biography that pops up later in the film). Ms. Gilliam tells us that the case was titled *Mann v Ford* as a tribute to Wayne Mann's work; she calls him "a voice of the voiceless." As the film progresses, Gilliam clearly emerges as the purser of truth and defender of the down trodden which makes her sudden departure from the case even more curious. Jan Barry and Barbara Williams, who headlined the "Toxic Legacy" series, are also interviewed, both of them appealing in their determination to 'get the story out'. Williams quotes Henry Ford Jr. who in 1955 at the Mahwah Plant dedication said, "This plant will provide a substantial lasting contribution to living standards of all Americans." She then comments that the lasting contribution was the toxic waste. Between the advocacy of the *Bergen Record* journalists and the personal testimony of the residents, the film starts off strong and it draws in the viewer for a compelling case against Ford; so that by the time Vivian Milligan walks Vicki Gilliam through the community indicating each house, the illnesses, and deaths associated there in, one is hopeful that this sophisticated lawyer with the southern drawl will come through for the community.

The film documents that in 2006 the Cochran Law Firm (along with the Kennedy, Madonna Firm, and three local firms) filed suit charging Ford with negligent toxic poisoning of the community. By September of that year, the EPA re-lists Ringwood as an active Superfund site, making it the first Superfund site to be re-listed in the country. After much leg work, the legal team focused on Dioxin, a deadly chemical that was produced when the waste caught fire and burned for weeks in the early seventies. Vivian Milligan's home movies actually document the fires that could be seen from Manhattan. Dr. James Dahlgren, the team's medical expert, believed that arsenic and dioxin exposure came about from particulate matter that settled on the community from the fires: it was in the ash. Back in Manhattan, at the upscale Jumeirah Essex House, the team is debriefed by Dahlgren while waiters refill their water glasses. He tells them that the dioxin exposure would have been, and in all likelihood, is still exceptionally high; he tells them that in all his interviews he found on average only 5% of the Ramapoughs were over sixty five years of age, while a comparable average for other contaminated communities was 15 to 20% over sixty years of age. He found diabetes to be four to five times higher than the state average.

Then in 2008, the EPA announces that Ford has just completed yet another clean-up and all of the dangerous toxins have been removed. Now we follow Spiegel along with Richard Chapin and a few Ramapoughs up to the latest site of "recovery", only to see them gather more chunks of paint sludge in plain view; within minutes they collect twenty five pounds of the stuff.

Eventually, the film brings us to court for a case management hearing. It is September 29, 2008, lawyers for both sides sit and listen to Judge Jonathan Harris

announce that they will have to work with all 647 plaintiffs, grouping them into six groups of 108 each, which will lead to a series of phases for the case to follow into a series of court appearances, essentially a case management that was impossible.[153] Interestingly, on the same day, the 29th of September, Ford announced its stock had gone into a free fall and it was facing major financial losses. Kevin Madonna, lawyer for the plaintiff, advised the Ramapoughs that Ford's wavering financial situation made the outcome of a trial look questionable. Ultimately, the case was settled out of court, with a financial compensation that amounted to as much as four to thirty five thousand dollars, awarded per plaintiff. Barbara Williams observed that came to about eight thousand for most of the individuals. Vivian Milligan observed that Ford "got away with it". Jan Barry noted that across the country in similar cases there was a "pattern of intimidation being pushed by the judiciary to come to a settlement". Wayne Mann believed that no matter what happened, "it would never be admitted that a minority community beat Ford".

At the closing of the film, text on the screen announced that a year after the case went into settlement Ford posted profits of 2.7 billion dollars; and then by 2010 posted a profit of 6.6 billion.

It is a long movie, 106 minutes. I found myself exhausted as the credits scrolled up the screen. My intern, Sonya, stretched her legs and said something about how sad this whole thing was. The house lights in the Sharp Theater went up and a couple of the film producers came out for a chat with the audience. Maro Chermayeff was one of them. There was an uncomfortable feeling; that of sadness and frustration. A few Ramapoughs spoke up but it wasn't until Cindy Fountain stood that anyone acknowledged their own part in this. She thanked the Ringwood Turtle Clan for their "courageous" contribution to

this production. I turned in my seat, which was down front, and noticed that the auditorium had partially emptied out. Then Vivian Milligan stood and with tremendous elegance she first thanked the film makers then asked them, "What's next?" The three onstage looked confused by this and Milligan explained that she hoped they weren't going to leave the Turtle Clan behind, now that the film was complete. Maro Chermayeff responded by saying, "Well now it's up to you. Now you have a voice."

Apparently Ms. Chermayeff, after spending the better part of five years in the community, hadn't noticed the community was not exactly voiceless to begin with. I was reminded by Gilliam's observation that Wayne Mann was a voice for the voiceless. But there have been many voices here, before the upscale lawyers and film makers came upon them. Advocates like Spiegel, journalists like Barry and Williams, and Ramapoughs themselves for over twenty years calling upon regulatory agencies, Borough Hall members, and educators to hear their story. And perhaps it is in Chermayeff's relatively condescending remark that we find the films failure, an indication of the larger failure that permeates much of the best of intentions. As will be discussed in the next chapter, the tendency of a dominant party to possess the narrative of those "lesser" parties who are dominated, runs deep. It is the internal structure of systems of power. Ben McGrath did not initiate his research with a carpet bagger's agenda but the final result for the Turtle Clan, once his work was channeled through his "handlers" at *The New Yorker* headquarters, was that of an interloper. Lead attorney Vicki Gilliam, so moved by the story, clearly sought justice but was powerless to the machinery of injustice. And the film makers themselves believed that their work was done once they gave the Ramapoughs "a voice", a noble gift indeed.

As we started to mill about, I caught the attention of a man who was with Ms. Chermayeff and I told him that currently on the New York side of the border, we were working with Ford toward a more cooperative resolution. He dismissed me with a remark about "getting on to other things" and quickly walked away. Outside the Berrie Center, Sonya and I took in the damp night air of the post cloud burst. We walked to our cars and came across Chief Perry. I asked what he thought about the film. He shrugged and said, "Same old colonial crap."

The colonial crap seems to be inherent when external forces come to interpret the Ramapoughs, as we shall see in Chapter Nine even some of Hollywood's great progressives emerge as racist colonizers. In the fall of 2011, two men, Mike and Steve, approached Chief Perry with a film project they wished to embark upon. Chief Perry sent them to me where I was working in a wood shop. Mike and Steve arrived at the shop and were a bit confused as to why they came to see me. I explained that the Ramapoughs have a long history of being exploited by outsiders that I was a sort of insider/outsider, and apparently Chief Perry wanted my opinion of them. They asked if I was to interview them. I shook my head and told them I was not tasked to do so but I would tell them of the tradition of stigmatization of the Ramapoughs. This I launched into, but almost immediately they asked if they could film this session. So they set up their equipment in the shop and again I launched into my lecture. We were going along fine until I mentioned David Cohen. They told me they were planning on using some footage of him as well as some footage of an Oklahoma Delaware, both of whom were long time Ramapough deniers. I told them I believed if they were allowed access to the tribe there was little reason to further stigmatize the tribe, but if they did intend to include these men

they needed to do it sparingly at best. I strongly advocated that they ask the Ramapough Elders how they want their story told.

In the spring of 2014 their work, *Native Americans,* in a rough cut form was previewed at Ramapo College, again at the Berrie Center. As with the earlier film, a bus brought elders from the Turtle Clan for the viewing. I sat on a panel with Mike and Steve, Chiefs Perry and Mann, Michael Edelstein, lawyer Judy Sullivan and Kevin Dann. I found the film disjointed and without a center but this was a rough cut. The outstanding problem was the long segments focused on Cohen's and the Delaware historian's thesis; for along with alienating the Ramapoughs it stood apart from the rest of the film. I said as much during the critique, and judging by audience reaction this was clearly in line with their opinion. Steve and Mike heard a lot of good commentary that evening and perhaps they will eventually produce a superior film.

Native Americans and *Mann v Ford* have the commonality of not being made by the community and perhaps that is the only answer to this problem. As we shall see in the next chapter, a storyteller can be wounded but still take possession of his/her story, for a story as told by others will always remain as such.

Summary:

Historically the Ramapoughs have been interpreted, analyzed, studied and have had their story co-opted by folklorists, eugenicists, historians, social workers, and the media, exclusively a story as told by others. This legacy has established a volume of misleading and erroneous information which has in turn informed each next wave of the ongoing chronicle. Before one can even discuss a fair and honest approach to their state

of contamination, one must deal with the stigmatization that preconditions every well intended approach.

This chapter examined the negative response of the community to the HBO documentary *Mann vs. Ford* with some consideration of another independent film, *Native Americans,* that rendered a similar unhappy response. A third film, a Hollywood fictional story further exploits the community and helps to illustrate the social stigmatization of this community. The HBO documentary initiated as one sort of story and proceeded to fall into a befuddled review of a less than stellar out come from a lawsuit. The independent film starts with the best of intentions but falls short under the influence of specialists in folklore and native genetics. And the third film, *Out of the Furnace,* was nothing short of a racist action adventure story complete with psychopathic violence. Although the films are each unique in their approach they present two strong and troubling commonalities.

The first of these commonalities is the preoccupation with the persona of a people prone to violence or forever being watched over by specialists or guardians. In *Mann vs. Ford,* after a good opening, the narrative becomes the meandering legal discussion staged occasionally in Ramapough country but mostly in restaurants. Ultimately, the film documents a pitiful legal decision which somehow the legal team has no responsibility for. *Out of the Furnace* engaged the talents of a great many Hollywood progressives (Christian Bale, Forest Whitaker, Woody Harelson, Sam Sheperd, Leonardo DiCaprio, to name a few) but still managed to perpetuate a dark violent fictitious posture. Both films drain the viewer away from the core reality of the Ramapough experience and ultimately produce an alternate reality. This other reality is the subterfuge that draws attention away

from the dynamics of the contaminated community. If we are bogged down in the legal determination of measurable dioxin levels (as *Mann vs. Ford* does), we are not focused on the impact of an outstanding cancer cluster in the community. If we are riveted by Woody Harrelson's over the top psychotic characterization we are not thinking about the real violence inflicted by Ford Motor Company upon this community.

The third film, *Native Americans,* presents the second commonality that all three films suffer; that being the susceptibility these productions have from external influence. *Mann vs. Ford* followed the lawyers lead, *Out of the Furnace* was led by the formulaic Hollywood pattern of good vs. evil, and *Native Americans,* after a series of internal glimpses, follows the lead of two 'specialists' both with a highly negative and poorly informed agenda. These stories, documentary or fiction ultimately seek external voices to justify and sum up their work. It has always been thus, whether it is an in depth study by the *New Yorker* magazine or yet another fictitious narrative hinting at incest as in the cablevision production of *Red Road,*[154] the work looks to externalities, both professional and amateur, for justification. As told by others means not told by the self, this then introduces the dilemma of the Wounded Storyteller, the subject of the next chapter.

Chapter 8

Wounded Storytellers

I drove up to the Episcopal Good Shepherd Church, in the Borough of Ringwood, and parked the car in the shoulder of the road, just past the Borough Hall. The last time I had been to the hall was to attend a Community Action Group meeting, in which Ramapough Indians and representatives from the federal Environmental Protection Agency (EPA) faced off; it wasn't pretty. By the end of that evening, the students I had invited were equally exhilarated and exhausted. They stood outside the building on the asphalt lot listening to Chief Mann further expound upon his demand for full remediation of the paint sludge in the watershed. Getting out of my car now on a late Sunday morning, I looked back to the asphalt lot of the Borough Hall and clearly remembered the students' faces, pale in an orange glow from the utility lights. That had been a good night for learning and a bad one for resolution. Their papers poured forth with endless questions. Here in Ringwood everything is questioned, little is answered, and resolution, like remediation, is a constant goal, not an entitlement.

Looking for my new intern, Julie, I walked over to the little church yard, Lisa Mann, the chief's sister, greeted me and then a few elders nodded, one of them asked how things were going in the well field at Ramapo. By this time in the Town of Ramapo, at Hillburn New York, we were deeply involved in a Ford sponsored remedial action. I chatted up with them and then noticed a shadow in a sporty red car at the end of the lot. Lisa asked if her brother was meeting me here and before I could answer, she walked off to phone him. As I approached the red car, the driver's door opened and Julie, a

psychology student intern looking to assist me in oral history work, stepped from the car. She is an attractive brunette with pale skin and big brown eyes and a very gracious smile; until now I had not realized how very white she was. She came around from the side of the car, happy to see me and apologetic about the make of her car: a Ford Mustang. I laughed and pointed out that in this lot of a dozen cars hers was not the only Ford.

Inside, we took the last pew in the church and it was only then that it occurred to me to ask if she was okay with singing about Jesus. She whispered that she was catholic. I nodded and whispered back that this might be a little different. The reverend, a traveling preacher named Stephen Rozzelle, came up to our pew, introduced himself to Julie and thanked her for attending. He is a very vivacious fellow exuding constant enthusiasm, his body language that of an energetic devotee. It is his service that has kept this little community church from being taken over and torn down by the Borough Hall Board. He bounded back to the altar, spun around and jumped right in with an opening Hymn. Julie and I found our hymnals and joined with the congregation, in what was clearly the most off key gathering of voices I have ever experienced, but what it lacked musically it made up for in sincerity. When the last note was heard, Reverend Stephen shook his head and said, "Next time, I want you to sing like Baptists!" Everyone laughed and whatever outside tensions that may have entered the church were now gone.

When we sat down, Julie asked if our host had arrived yet. I looked about the gray braided heads and told her that she was not there yet. "She will come" I reassured her, "She always reads aloud the list of prayer intents." Julie looked puzzled but we were directed to rise for a second song, and this time the little church warmed up to jubilation. Again we sat. Vivian Milligan walked in to my right and looked across the church at

three elders who turned, and noticed her arrival. One of them stepped into the aisle and walked back to hold an urgent little counsel next to the feathered medicine wheel on the reverend's rectory door. Vivian nodded, pulled out her note pad and added a name. During this time a congenial bit of across-the-aisle discussion had broken out, enhanced by a crying baby and small terrier, who offered up a few yelps in response to the child.

The gospel reading from Luke 16:1-13 was about dishonesty and shrewdness which offers up the quote "No slave can serve two masters" and ended with a reminder that one cannot serve both God and wealth. Personally, I had always felt that this blurred God and wealth into some sort of mutual role playing, but then again Luke tended to put an interesting spin on things. Reverend Stephen then launched into a rousing sermon about transcending materialism and eventually advised that one come to reckon with one's calling. This was followed by another song, a group prayer, and then the community peace sharing, which involved the entire congregation walking about shaking hands and chatting. At one point Reverend Stephen turned and walked back to his little altar, where he spun around and called upon Vivian Milligan. She rose slowly and proceeded to read out a list of names from her notepad; actually three lists: the first for those who were no longer with us, the next for those who were suffering, and the last for those in need of money. Almost all the names were the consequence of Ford's illegal dumping in the watershed.

After the service, we received tea and morning cookies in the community kitchen. It was there that my new intern asked me how Indians could be Christians. I told her there was not a simple answer to this and asked her to hone down her question. She then said, "Well, where is the Indian-ness?" So I walked her back into the church and pointed out

the medicine wheel on the rectory door, the sweet grass smudge by the sign-in book, and then I walked her up to the altar. There just to the left of the altar was an ancient sacred turtle shell, after all the Ringwood people are the Turtle Clan. I suggested it would take time for her to take it all in. But the question was a good one, not easily answered. Native America has much in common with those who are battling severe illness, and are co-opted by the medical establishment. Just as traditional indigenous people were first beaten into submission and then colonized, with Christian culture, people who face illness are medically colonized. Their stories are taken from them and reshaped by professionals, who identify them as "patients". But, just as much of Native America has adapted to a variant of Christianity while retaining their "Indian-ness", the ill community might very well adapt to some of the structure of the medical machine while retaining their own story, or reclaiming their own story as a part of their recovery. Arthur Frank believes that the ill person who turns illness into story transforms fate into experience. He writes that, the disease that sets the body apart from others becomes, in the story, the common bond of suffering that joins others in their shared vulnerability.[155]

We took my car and followed Vivian Milligan up Milligan Road into the heart of Turtle Clan country. We drove past little ramshackle houses, each with its own set of dogs that looked up with a certain mid-day disinterest. At one point Vivian's car stopped and idled by a small gathering of photos and flowers. As she proceeded we slowed down and saw that this was a make shift altar, along the road. When we turned up Peter's Mine Road, we drove along a tall cyclone wire fence and then made a left turn, just before a large locked gate, bearing a sign that read a warning from Arcadis, Ford's chief environmental remediation agency. Now the road narrowed, with ruts and boulders. The

Turtle Clan's Matriarch, Vivian Milligan, lived at the top of a rise, just below some of the Peter's Mine foundations. She got out of her car and called to us that she would be right back. We parked in an open space, careful to avoid the constant sudden movement of chickens. The yard was strewn with engine parts, alive with fowl and hound dogs, tethered and barking. Vivian returned with her nephew Jack, with instructions that he was to lead us to Peter's Mine. Vivian, a solid tawny mixture of feminine and masculine attributes announced this and then walked back to her home, to attend to some barefooted child who was at the back door. It was only then, as I watched her walk back to the young Ramapough that I noticed all the faces staring out at us from the shaded windows. Jack said, "It is a pleasure to walk with you."

He led us past fleshing racks and hide boards stacked ready for the hunting season. Everywhere we walked, along the old footings of the mine buildings, past corrugated shacks, and hanging from tree limbs were deer antlers and skulls. He took one of his dogs with us and explained he wore his side arm revolver to scare off the bears. "Mostly the dog ought to do that but just in case, you know." Apparently the bear population was on the rise or as Jack put it, "Maybe they just need to be with us." Julie asked if they hunted bear and he explained that mostly they hunted deer, as it was better sustenance. I asked if they ate the filter organs. Jack nodded and said, "I know where you are going with this. I give them whatever they want from deer. I know they ought not to eat filter organs but liver and kidneys are traditional food."

Jack took us to another iron gate, bearing the Arcadis sign, only this one was torn down. He then pulled out an impressive machete and proceeded to slash his way through a wall of bamboo stalks and thick multi-flora rose vine. We followed at some distance.

He told us that along this side of the valley rattlesnakes were frequently encountered. Julie was by now a bit overwhelmed by the tour and admitted that this place was more than she had imagined. Jack turned around with a prideful grin and said, “I’ll show you one!” He then pulled out his I-phone and proceeded to scan until he found a photo he took, of what appeared to be a five foot long rattlesnake. I could see she was made a little faint by this, so I suggested we move on. As we followed Jack, he told us that they don’t really like to kill the snakes, as the elders believe them to be powerful medicine. Jack himself is the community snake handler and is on call to remove rattlers from house porches. Finally, we broke through a clearing and looked down upon a mustard colored pond. This was actually the open mine hole for the Peter’s Mine, which operated through the nineteenth and into the first half of the twentieth century. It is entirely filled with water and drops into the earth, nearly seventeen stories. The water color is a combination of natural tannins and iron ore rust. The curious thing was the percolating bubbles. This was the action of methane gas rising from deep within the mine caverns. But it was the constancy of this action that was so eerie. Jack explained that Ford had argued the gas burping was natural, for which they had no responsibility. Just as landfill caps require methane vents, deep cavern mine shafts can release natural gas pockets but not with such constancy. It was then that I caught a whiff of the methane and it was sharp and acidic, not a natural light end gas. The flow of gas from this mine pond was a mixture of solvents, an aroma familiar to anyone who has worked in an industrial paint shop.

Back in Vivian’s yard, we were now joined by half a dozen middle aged men who were working on a truck engine, a few more dogs, an ATV with riders dressed in desert-storm camouflage, and Vivian. She climbed up onto an open trampoline, the only clear

surface available and spread out some of her record books. I brought an old graveyard map I had come across. As we shared these things, more men, some of them elders, came along and gathered about the open truck hood, inspecting the work. They talked machines and hunting but all the time keeping a careful eye on Vivian. Soon another of her grown nephews, Chad, joined us and by now Julie had pretty much charmed both Jack and Chad, such that they were laughing and easing themselves into a comfortable way of being. I was so intent on looking over Vivian's records that I hadn't noticed the yard was gradually filling up, with more than a dozen Ramapoughs. Vivian suddenly decided that we would need to meet in a less conspicuous place to really listen to each other and so we planned to continue later in the week. She climbed off the trampoline, called to a few family members and formally announced to them that I was doing a "good thing". There was a moment of hesitation and then Chad shook my hand and said, "Real glad about this."

As we walked back to my car, Vivian told us to go past the memorial. This was not the one we had seen her drive by but something larger. She said eventually I would be allowed to take a picture of it but not just yet. I backed my car around, drove out Peter's Mine Road and up along the Arcadis cyclone fence, where we came upon a massive display of children's drawings and photos, elders pictures from years past, deer antlers and sweet grass ties, smudge sticks and feathers, and poems wrinkled and weathered. This was a sacred place of memory and prayer, a memorial to two community members. Julie was very happy with the visit. She had heard much of the sensational gossip about this reclusive community and now she had seen with her own eyes the reality. She wanted to tell others about the people here, about their love of story, about their struggle

to survive. I suggested that she take her time and try not to change the world all at once. She laughed and then we got to talking about the politics of recovery. That was when she asked me how people recover from such wounds, as what the Ramapoughs have received from Ford. And I got to thinking about them as being wounded storytellers, in fact in a certain light about all of us being wounded storytellers.

We all share a certain "wounded" posture in that we all have run into challenges that ultimately leave us changed for the experience, some of these challenges are pretty dramatic: loss of a loved one, a serious illness, or some such sacrifice that requires a changed status. Our stories embrace the narrative and source of these challenges, the telling of story re-establishes our identity and our position in society at large. But we are always at risk of losing our story, to the professional class of story dominators. This societal class is a force that emerged fully with modernism. According to Arthur Frank, pre-modern people had rich descriptions for disease and ethno-medicine, that is to say culturally based understanding of healing plants and metaphysical beings. With the Enlightenment the emergence of the, "Modern experience begins when popular experience is over taken by technical experience, including complex organizations of treatment."[156] It is modernism that establishes the idea that "not all stories are equal". Professionalism constructs a hierarchy of narrative authority. Some storytellers rule: medical professionals, police officers, judges, politicians and any post for the guidance of the many by the few. Certainly, it can be argued that a large, diverse society, filled with conflicting interests requires authority figures but a health system that requires of the ill person to surrender their narrative, desensitizing any cultural or regional connection to

place indicates a kind of colonialism, as it disregards a traditional relationship to nature which is fundamental to native stories.

The idea of "Native Stories" presents the challenge of identifying just what the notion of "native" means for stories. Native to an area could well depict the stories germane to the ecological nature of the area, the histrionics of the place based culture, the deep indigenous heritage as well as that which the area's residents identify with, so there is a diverse interpretation of such. Having a long familiarity with the local population has given me an advantage of story sharing for decades, which has informed my perspective and no doubt prejudiced my opinion as to the nature of the credibility of the material. While storytellers tend to share sympathies for the sake of this work, I construct critical examination of the material, its source, its influence and a comparative analysis with other similar material, as well as analysis from Frank's main objectives, cited in his work.

Frank speaks of serious illness causing the loss of the "destination map" that previously guided one's life. Through the experience of illness, a person engages the struggle for one's own story; in sharing the experience through story a person starts to shape a new map and discover a new destination. Illness, according to Frank, disrupts the old stories. He believes that while the ill body's stories are of a personal nature, the stories told are also social. It is social both in the telling to an audience and in the shaping of the story from many points of origin. Frank focuses his thesis on three objectives:

1) The need for ill people to tell their stories in order to construct new maps and new perceptions
2) Embodiment of these stories, told not just about the body but through it

3) The period the stories are told in, how social context affects what and how a story is told [157]

These objectives apply with equal legitimacy for the Ramapough's struggle to regain their health as much as to recover their traditional identity; starting with the first objective, the need to tell their stories in order to construct new maps: debilitating illness alters the body's functionality while at the same time it disrupts expectations of the individual. Articulating the now disrupted body, the wounded storyteller shares his/her disappointment with new physical limitations while shaping an altered social context with others. Frank argues it is only through the personal/social narrative journey the wounded storyteller can claim a new map and destination. The Ramapoughs who shared their illness journey with *The Record* reporters were charting their new map just as Mickey Van Dunk, whose restrictions are so extreme, charts his own destiny based on new perceptions and in so doing refuses to surrender to illness. In much the same way, Ramapough chiefs Vincent Mann and Dwain Perry in telling the story of their struggle to recover their native traditions are shaping a new map for the Ramapough Nation. Aware that any romantic ideal of returning to a revisionist, primitive indigenous state is not an option, they struggle to claim a realized twenty first century state or a "new old way". It is the telling of the "trail of tears" or the atrocities of the American Indian schools or the continued second class citizenship offered to them by a white dominant society that the Ramapoughs can build upon to claim new ground for their nation; not just obsessing over past losses but building upon the lineage of their experience.

Frank's second objective is the embodiment of the wounded storytelling not just about the body, but through it. Clearly the narrative that comes through a body changed

by illness leaps onto uncharted ground with a pioneer spirit; this narrative both explores and reacts, shaping the storyteller as much as being shaped by her. In similar fashion, when a native comes in contact with his physical presence linking him with elders he is not held back by archaic traditions, but propelled forth into a new terrain for exploration. This is exemplified by the work of Chief Roger Degroat who brings traditional imagery of Grandfather Turtle into his architectural renderings and by Kevin Powell who muses over his boyhood stories of muskrat trapping speculating on what lessons they bring to his eldership.

Frank's last objective is the period the story is told in; how social context affects what and how a story is told. Over the last forty years, telling stories of transformation due to illness has evolved dramatically. What used to be hushed dialogs shared with but a few family members has become a vehicle for empowerment; interestingly, this transition has also proven to be a challenge to the medical hierarchy. As wounded storytellers share experiences with each other, their expectations and inquiry with professionals have increased. Managed care requires the cooperation of a participatory patient, one who is well versed in handling their experience. With greater access to technical information there comes a greater awareness of alternative treatments putting the standard practitioners into a more equitable relationship with the person of illness. Likewise, as the genuine story of the Ramapoughs comes to light, the telling of traditional stories follows: Cindy Fountain has found wide acceptance and support for her 'medicine' stories, like that of grandfather snake, from a contemporary collegiate society today, whereas such tales were the stuff of folklore in years passed. As she further explores her identity, she is

literally deconstructing long held colonial methodologies both for herself and her listeners.

Finally, this chapter is entitled Wounded Storytellers which draws emphasis on the 'tellers' themselves but one must also bear in mind that the stories too are wounded and much of the intent here is to reach recovery. With that in mind, the author wishes to remind the reader that story sharing and reading aloud is crucial to keeping a story alive and well, so it is recommended that you take the time to read portions of the following narratives aloud first in a room alone and then among others.

White Deer of the Ramapoughs

After the killing of John F. Kennedy, which was a story that happened and retold itself into my generation such that it became a living myth, I learned of White Deer. This is how in our village a boy learns to hunt by following along an elder (in my case my father, Walt) into the woods and watches what the elder does. On one particular chilly November morning in the early 1960s, I sat with Walt beneath the cover of an ailing Hemlock as a soft rain blew in and around at intervals. It was morning and already I was bored. We were near the top of a ridge and below us in the Torne Valley a soft gossamer mist was rising. Walt was smoking his pipe with one hand on the stock of his Remington bolt action twelve-gauge and the other warmed by the pipe, packed with Dills Best Sour Mash tobacco. I was studying a squirrel dancing about at some distance until he was gone then I started making little structures with twigs at my feet. Then there was a sound, different from that of a squirrel. It was a little sound cautious and slow pressed against the earth, followed by another and then another still. Walt motioned the direction, he eased the barrel of the twelve-gauge and rested it on his left knee aimed in that direction.

I studied hard at an arrangement of thick green Mountain Laurel about sixty feet off. Something seemed to be in movement there and Walt drew his right index finger inside the trigger guard and leveled his line of sight down along the barrel. Then I saw a deer, a two point buck, lift his head and step from behind the laurel; first one step, then another and then the deer was clear of the foliage. I saw this deer, a fine animal clearly more than a year in age. He was firm and strong with a splash of white along his front flank and then full around his rump. This was unlike any deer I had seen and surely a prized trophy! I watched as he moved broadside of our perch and then I realized Walt had let up on his aim resting his gun across both knees. I whispered to him, "What?"

He looked at me, took the pipe from his mouth and said, "That's the White Deer. You don't shoot the White Deer."

Eventually I learned that this was not the first time he rejected White Deer from his take. As a young man he was once hunting in a place known as Wrightman's Fields which was marked by a curious series of rock formations referred to locally as "The Circle of Stones". There he came near to taking down White Deer but chose not to. Perhaps he was spooked by the opportunity being at the Circle of Stones, or perhaps it was an association with some local lore; either way he chose not to shoot. When he told me of this he noted that I ought not to hunt at "The Circle of Stones" or take a White Deer myself and when I pressed him as to why he shrugged and said something about an old belief. He was not directly forthcoming on the subject, although in time I learned more.

There had been a close friendship with a man named Freddie Farrison, a mid-western Indian who came out East to live among the Ramapoughs. Farrison (whose

native name was Yellow Dog with Short Tail) took a job with the American Brakeshoe Company in Mahwah, New Jersey; the factory sponsored a baseball team and Farrison was a good base man. This was how Walt had gotten to know him as Walt often played short-stop on the Brakeshoe team. It was Farrison who told Walt about White Deer. He said to the Algonquin people White Deer was as powerful a spirit animal as White Buffalo was to the Lakota. He knew Walt was an avid deer hunter, he believed that Deer was Walt's guiding totem and he advised Walt to never shoot White Deer as this animal was a game keeper and not to be taken. Some years before that, when Walt was still a boy, Billy Mann, a Ramapough from the Stag Hill area of Mahwah, New Jersey, spoke of White Deer's adventures. Walt recalled that Mann's White Deer stories were never told the same way twice, that they had more detail in Winter than in Spring but mostly he found them too fantastic to follow. Mann told of a time when humans and animals were interchangeable, characters died and returned at will; some years later when Farrison spoke of White Deer with a certain reverence it resonated with Walt and he took it as sign. I pressed him for a retelling of the Billy Mann stories but he was short on details other than White Deer being a game keeper spirit; meaning that it is through the administrations of White Deer that some game are offered up and some are not.[158]

John Bierhorst, a collector and translator of many works in the field of Native literature, documented a telling of White Deer by John Armstrong of New York State. This is a complex version of the story that ultimately is a creation story in which the hero releases White Deer resulting in the great animal populations that roam the world at will. The story also indicates the hero traveling west to bring animals there which may well be the telling of the Lenape connection with their Delaware brethren in Oklahoma. It is

debatable just how much the traditional telling of White Deer relates to that of the Ramapough understanding of it. But wherever it is told, it reflects a deep sense of animal spirit, it identifies White Deer as a game keeper and holds onto a prohibition against the killing of White Deer. But the telling that Bierhorst collected is far more complex, more of a hero's journey with a cast of characters and challenges, more like that of Joseph Campbell's mythology. It seems the understanding among the Ramapough is animal spirits, or Manitou, appear when necessary and are usually born with a very light pelt or dramatic patches of white over the rump or down the back. This "game keeper" is particular to place and people, just as the Lakota have White Buffalo the Ramapough have White Deer. These animals can be regional as well as universal. Their whiteness can fade and go away over a couple of seasons. Fade or be killed they eventually re-emerge and when they do in succession across the map it is believed a new path or opportunity has come. Generally speaking this is less about empowerment and more about choices, and while a good choice may bring empowerment, a poor choice can bring trouble so the sign must be read carefully; deep meditation is called for.

The significance of the emergence of White Deer offers hope to those who suffer domination, illness or deprivations that call into question traditional values. That I first learned of White Deer from my father, a man of white society, illustrates the inter-relationship of cultures in the Ramapo. What some might regard as his folklore superstition it achieves two goals: first it identifies his meta-physical relationship to nature, and secondly it acknowledges the Ramapough's native identity. The time and place in which he experienced this story was in his youth while hunting, an act itself steeped in ritual. As an elder, he shared a brief explanation of the story leaving a great

deal to speculation but the significance is in his action (not to shoot the deer) which lends credibility to a belief connected to a time and place. There is hope for existence if the Game Keeper carries on her work. In that this emerges as a story of recovery.

Keepers of the Stories

It was from Farrison that Walt learned about Grandfather Rocks being the Keepers of Stories. The Ramapo Mountains were home to a great many Native Rock Shelters and Native Stone Markers. Farrison told Walt that in older time native hunters would offer tobacco to certain Rocks or at stone circles; they would wait and learn the early stories of their people. Native stone markers can be found in most of the villages in the Town of Ramapo such as: Indian Cove in the Village of Hillburn, Indian Rock in the Village of Montebello, and Spook Rock in the Village of Monsey to name a few; each of them have legends attached that often speak of ruthless native warriors causing terror upon early Dutch settlers.[159] Historian Julian Harris Salomon considers these tales the stuff of European interlopers. Salomon was cynical about continued native presence in the Ramapos when I spoke with him in 1980. While he believed native blood was very much alive, he scoffed at the notion that Ramapough culture was still intact.[160] In 1980 after hearing him recount the Dutch/English legend of Spook Rock, a story he considered pre-colonial propaganda, I spoke with Ramapough Chief Otto Mann (a descendant of the aforementioned Billy Mann). The Ramapoughs had only recently re-organized their tribal structure and were interested in telling their story as opinions like Salomon's were typical in white society. Mann told me he was familiar with the white version of Spook Rock but he had heard from Elders the following version:

This place, this Rock lives it breaths and it speaks. Go there on a cold night and listen. Owl lives in White Pine and speaks and Pine speaks, Wind whispers, they talk, Rock mostly listens. Sometimes, sometimes Rock speaks. This was a meeting place, a sacred place, now it's an intersection for cars. The hole in the rock that once spoke is filled with concrete so the wind can no longer move there but go there, if you like. That's all."

I have not heard a Ramapough speak of the Spook Rock since then, so it is a story that seems to have been co-opted by the folklorist. But the idea that rocks are the keepers of the stories and that they too embody spirit is still very much alive in the community. Resistance to a local stone quarry application in the late 1990s brought about support from Ramapoughs who could be called upon to speak of the spirit of the earth at village hearings; they came in numbers in opposition to a proposal to blast out the Indian Rock at the Village of Montebello. At a recent meeting for a local stone worker to expand his operation in the Village of Hillburn, Ramapough Elders offered opposition about the further cutting away of ancestor's memory, "these rocks, they have stories", they said to the Village trustees.

Telling stories associated with the idea that cutting into rock involves cutting into history indicates both an understanding of the depth of their rock/human relationship and a need to recognize the context of the now changed relationship. A new perspective emerges from a changed mountain which does not go unnoticed by a people who are of the land. In the recent expansion of the El Paso Pipeline through the Ramapos, Chief Mann and tribal members have monitored the crew and joined by archeologists from the state have kept sacred sites from being cut into. While they may not be able to stop

industry in its tracks, they can slow it down and keep it honest. Chief Mann tells his stories of interaction with the pipeline company and speaking through the story he recovers some dignity for his people. Clearly with Ford's impact, the earth has been wounded and just as clearly to hear the locals speak of this they are as much talking about mother earth's wounds as their own illness. Indigenous people identify with the land and consequently tell their stories through the landscape. The rocks we are told are the oldest thing, it is written in stone as it were.

Vulture Stories

Vultures in our region have grown in numbers since my boyhood; while turkey vulture used to be the dominant scavenger, in recent years the slightly smaller and more agile black vulture has moved in. Studies indicate the black vulture, which is not entirely black, is more aggressive than the turkey vulture, causing some ornithologists to keep a close eye on their interactions. Either way, increased presence of vultures is usually an indication of increased exposed human garbage. That was the case in Torne Valley: during my boyhood trapping, sighting vultures was not yet common place but with the opening of the landfill it was a daily occurrence; with the landfill capped but a continued presence of waste material at the transfer station, a sizable vulture population, both turkey and black, has been sustained.

Whenever a Ramapough comes into Torne Valley and a vulture glides effortless on out stretched wings, spiraling upwards on the rising thermals from the Superfund methane gas vents, they talk of this sacred bird; this scavenger. To the Ramapoughs, a scavenger animal, as any naturalist knows, serves an important role in the ecosystem. But the significance goes beyond maintenance; the vulture teaches a powerful lesson in

sustainability, sustaining both the outer and inner environment. Digging through rotting carrion, the vulture is subject to harmful bacteria which are dealt with by solar cleansing; accumulating strong ultra violet rays with his long black feathered coat, even the talons are cleansed with a digestive chemical in the urine that serves as a bactericide.

Back in the 1980s from Chief Redbone, I heard that Turkey Vulture burned his once beautiful feathered head dress off when he pushed the sun back in place. This story resembled the traditional tale recorded by Ted Andrews in which Vulture is the only animal willing to push sun back to a safe distance from the earth, in so doing he burns off his head dress. Andrew's version includes the exploits of other animals trying and failing but also being marked by the sun's flame: fox has his mouth burned black and opossum has his tail burned scaly.[161]

Along with Chief Redbone, I have heard others, both white and non-white, talk of Vulture burning off his head feathers. Notably some of the white versions tell of Vulture's calamity with the sun as being a result of his arrogance in proving he could fly higher than Eagle. To men, like Chief Mann and Chief Perry, these big elegant and ancient looking creatures are elders with powerful medicine. Ramapough Cindy Fountain, of Newburgh NY, believes that Vulture assists the passage of deceased animals into the spirit realm. In Algonquin culture, Vulture, like many of the Raven and Crow family, lives in a place between realms. Often at road-kill sites, vulture feathers can be found. There is a wide range of interpretation around feather medicine. Believing in a "purposeful" existence governed by a divine being, no action is without meaning; every feather found therefore has its meaning. While eagle feathers are about majesty and pre-

eminence, vulture feathers are about care and accompaniment between realms; death and rebirth.

Soaring over the top of the Ramapo Landfill, a capped Superfund site, the vultures mark the sky with their great wingspan. They glide down the valley over Ford's fields of lead paint and then over the landfill where asbestos, spent engine oil, countless tires, tons of plastics, Avon cosmetics and of course Ford paint sludge fester deep in the ground. These elder birds are a reminder to Chief Mann that this is a place in transition, a place where the death and rebirth cycle is very apparent.

Muskrat Stories

Down below the Meadows in the Village of Hillburn, south of the Ford/Erie track spur, Ramapough Kevin Powell walked with me to look for Ford debris. This was the place where the waste fires behind the Ford Plant had darkened the sky spreading dioxin and heavy metals back to the Meadows' homes and across the Ramapo River into the Westward section of the Village of Suffern. Up river of the Meadows, I trapped with my dad for muskrats but we never came south along the Ramapo as he believed others were already trapping here. Now walking through oversized stands of Phragmites, an invasive wetland plant where once native cattails stood, Kevin reminisced about trapping muskrats. We shared river trapping stories and discovered that we worked the river at the same time. I asked him if the muskrat held any particular significance for the Ramapough. He wasn't sure at first other than as an indicator of a robust ecology. Muskrats subsist on vegetation, small fish and craw-daddies. Muskrat's presence indicates a healthy presence of all that they prey on.

As we tramped along the river bank our feet sinking in fresh summer mud, we talked about muskrat trapping a good bit and about their excellent swimming ability. Like their cousin the beaver, muskrats although awkward on land are excellent swimmers. Both rodents have hairless tails that support their underwater dexterity. Kevin mentioned that animals that exist in different states – above and below the water, on ground and in the air – are significant to Indians. I was reminded of Calvin Martin's observation of being, "At the edge of the water – at the skin of the world." I told Kevin of Martin's work with the Yup'ik Eskimo storytellers who understood that animal spirits could pass through a membrane as it were and shape shift into other beings; that some humans could also do this.[162] Kevin laughed and said it never happened to him. But he did add that muskrat trapping as a boy he believed linked him to a kind of living past. Returning up land beneath an overhead power line grid, we speculated as to the lack of Ford artifacts in this area. One possibility was the scraps were buried, although not likely as the periodic flooding would have unearthed them. Another possibility was the presence of the grid towers; their placement could have initiated a remedial action. I then suggested that perhaps when Ford closed the plant they removed the burnt trash. Kevin smiled and said, "On their own? Not likely."

We climbed back up the Ford/Erie spur and then turned around to take in the low lying marsh one more time. It was only then that these two one-time boyhood muskrat trappers realized that along with no immediate sign of Ford debris in the meadow, there was also no sign of muskrats. Out there beneath the waving golden stalks of Phragmites we didn't notice a single muskrat slide. Phragmites as it turns out proliferates in soils

laden with industrial metals such as chromium, mercury, and lead. Perhaps the absence of muskrat and the presence of Phragmites was a sign.

White Influence/Native Delivery

Clearly the stories told by the Ramapoughs have been acculturated by non-native influence; along with Eurocentric traditions there is also an Afro-American theme to be found in the local lore. So how is a listener to discern the native element? A keen eye and ear can pick up what is Ramapough Lenape when in the presence of a traditional teller. Often there is less formality and less theatrics with the exception of ceremonial occasions. They may encourage a circle around a small fire, the teller will burn some traditional offering such as sage, cedar or even Beaver chew which are gathered chips from a freshly gnawed tree site. Delivery by tradition defies Western grammar. Tenses jump around and dissolve with the deep past leaping into the present, often events yet to happen play across the teller's narrative. As Chief Ronald Redbone said, "Stories are kept alive through the telling. By telling of what happened a hundred years ago, it comes into being and happens now." For the same token Ramapough Mozelle Van Dunk Stein has said, "When you talk about tomorrow it becomes today." This re-ordering of a linear time continues as part of the traditional belief and is core to the idea of "speaking into being". It is fundamental to the native way and it is the key hurdle to native acculturation into white society. In terms of teasing out the influence of industrial culture and the impact of Ford contamination, one first looks to the traditional nature of the stories and examines how the story has come to its late twentieth century manifestation. All stories absorb their environmental surroundings and more or less report on them. Walking with a trapper who is a person of the land accustomed to local knowledge, it is inevitable to read the lack of

muskrat sign and start to think of Muskrat as a being more from the past than the present. The elder in this case plays an important role in bringing Muskrat into the present, through the story. The Phragmites, an invasive plant that may indicate industrial influence in the soil, brings forth another piece of the change. While a conservation biologist may indicate Phragmites is here purely as an opportunist invasive, a Ramapough may ask, "Why has the Phragmites come to this place?" Phragmites in the latter case arrives with a story and builds upon an existing story. In the narrative of place, opportunity is not without intention; all beings bring sign and tell stories.

In delivery Ramapough stories can begin with "This once is happening…" or "In a place where this is now…" or just "Here is something…" and often there is no formal beginning but a continuation as some tellers seem to feel a formal beginning draws too much attention to the teller who is only the vehicle. The story may end with "And that is it" or "That is what I heard, anyway" or my personal favorite "Lets break camp." Most tellers encourage people to take in the story and to repeat it in their fashion; this then begs the question of reliable native telling as creative re-telling allows for a broader interpretation. Given the cascading impact of white society from early Christendom, through mercantile trade, to industrialism and the U.S. Government Indian Schools and more recently the Ford Motor Company toxic dumping, the reinterpretation of tradition reflects the coming to terms with social change. The Western model calls for traditional stories to be recorded and transcribed but like so much of the "relic hunting" that has permeated modern society, the meaning of these stories is then distilled to formulaic greeting card sentimentality. Oral cultures that resist this consumer codification risk dying out unless they linger among a teller/listener network. Oberlin Alumni Professor of

Social Ethics, Howard Harrod believes there are fundamental changes in meaning when the stuff of oral tradition is reduced to text.[163] As Ramapough Chief Dwaine Perry has noted, "A lot of this can't be written down, it must be heard, in hearing there is a certain truth." And as elder Vivian DeGroat has said, "Reading happens in one direction." But perhaps the best way to consider the pervasive influence of white Judeo/Christian culture is to start at the beginning…

Turtle Island

At a presentation gathering in February of 1980, Mozelle Van Dunk Stein spoke of Turtle Island and its place in the Bible.

> *We live here on Turtle Island. Our elders speak of how everywhere was ocean until Turtle rose up and earth was brought up from down under by Muskrat and Beaver and let to dry on Turtle's back so that there could be dry land on which to plant.*[164]

At this event there were Ramapough women who remembered a version that included a woman falling from the sky and swimming to Turtle to seek safety and it is from this woman spirit that Lenape were born. Evan T. Pritchard, scholar of Native American Studies and comparative religion, has noted that earlier versions of the Turtle Island story are referred to as The Mud Diver Story. Usually Mud Diver is Muskrat and here the theme involves the littlest creature becoming the hero. He postulates that even earlier versions of the story find Mud Diver to be a mud turtle known for diving in the mud and returning with mud on its back.

Mozelle spoke of the Creator as being feminine and that this Creator initiated much of creation but not all of creation. Numerous other spirit like beings continue to

have a role in creation, it is an ongoing process. This being a dialog with the general public at which a dozen or so Ramapoughs were in attendance, the question of allegiance to the church was raised. The Ramapoughs acknowledged attendance to Episcopal, Presbyterian and Baptist Pentecostal services; they explained that offering prayer to Creator can take many forms but understanding how this influences the overall cosmological take on existence is a far more complex endeavor.

Chief Anthony Van Dunk notes that Creator, or Patamawas, has many names; that Ramapough Creation Stories often comment on the narrow priorities of organized religion. As Ramapough Cindy Fountain has observed, natives may know about Commandments but they live by "intentions". This resistance to codification speaks of their general lack of conformity to non-native authority, as Chief Dwain Perry has noted, being native within a nation one makes a lot of allowances. "Humanity likes to come up with all kinds of rules for things", Cindy Fountain has said, "the native way is to not so much claim a rule or a law for things, as to read the sign that is animal speak and that changes all the time". From this perspective some traditional stories are in a constant state of flux, so codification of behavior based on written commandments extrapolated from these traditional stories is not consistent with the native way. The question is, if intention or interpretation has such an open field of direction than is all of existence merely fickle, incapable of any established order?

"No" Fountain argues, "when we ignore sign or misread nature or use it to gain our own end there is hell to pay."

Chief Redbone has said, "Listening to the Wind takes time, we are only at it a few thousand years, the Wind has been at it forever."

Still the Eurocentric Judeo/Christian influence has found its way into the Ramapough Stories and by extension into their behavior, but not without native commentary. Of Noah's Ark Farrison told my father, "Oh that fellow, now he had a mighty appetite that is the true reason he took two of every animal." Of Jesus Vivian DeGroat has said, "God sent him down to the bad people to administer to them that is why he didn't come here to this place back then, there was no work for him here." Few Ramapoughs accept a celestial bound deity without acknowledgement of Turtle Island.

It would then stand to reason that Fordism, that is to say the scientific management paradigm of pragmatic order leading to sound capitalist return on investment, came to Turtle Island to shape shift existence. If it was condoned by a celestial power recognized by Henry Ford that would indeed be a power that opposed the devilish trickery of Semitic money changers, something Ford spent most of his life blaming for any obstacle to his empire. Ford himself believed that his "common man" roots and puritan values linked him to a pioneering industrial past, not unlike the men who tore ore from the earth and fashioned it into useful metal. But even for the miners of Ramapo, there were foreboding stories such as the Salamander that warned of the terrible consequences when humanity constructs shape shifting, based on economic gain.

Animal Speak

It has been observed that animism, or the intuitional guidance of a soulful existence among any forms of life, can be found in all the major religious texts, that its presence has not been eliminated despite monotheistic authority; given the persistence of animism and its place in Ramapough Stories it merits closer consideration.

While preparing for a closing ceremony of the 2009 AmeriCorps Environmental Summer Training Week at Rockland Lake State Park Nature Center, I suffered a heart attack. At the time I experienced a sharp pain across the back while lifting a rock. Believing I was dehydrated, I walked off in search of water and upon walking across the newly dug Butterfly Garden (a project I had raised the funds for) the pain increased feeling as if my shoulder blades were expanding and about to break out of my back. Consequently I survived this event and a month later attended the closing ceremony, at which Cindy Fountain spoke of Butterfly.

> *Butterfly says to me, you can't help but change, oh you can fight it but that just slows it down, it don't stop it. I look at all your young faces and I see Butterfly telling you to accept and move with change. You know Butterfly tells us about shape shifting and you are all shape shifting all the time. When you feel them wings coming on you ask yourself what change are you in now? Are you truly ready to fly? Can you learn the winds message? Grandmother wind will direct you, will you fight her or move with her?*

Privately she told me that at the time of my incident a month earlier her granddaughter along with several other people, including my step-son, saw a fox. This she believed was a sign that I was at a crossroad and she believed that my journey was in transformation, she advised that I pay close attention to this sign as it was instrumental in my recovery.[165] Fountain, a four time cancer survivor, knows well the role animism plays in her own recovery. She speaks of a grandfather story that continues to aid in her healing.

> *This happened in my grandfather's garage but telling it makes it happen now for me. I was at the door and my grandfather was calling me in but Black Snake was hanging down from overhead and I would have to walk right past Black Snake. Grandfather said, "Come on. He won't hurt you. He's just smelling for mice or something. You can get passed him fine." And I did walk right passed Black Snake and all the time he was in that garage Grandfather and I just let him be. Sometimes we'd find one of his skins and grandfather says he's been born again*.

She likened that "born again" remark to the Born Again claim of Fundamentalist Christianity but observed that Christians are not the skin shedders that Snake is. During one of her more difficult bouts with cancer, Cindy was given a Dream Catcher staff with Black Shake carved into the handle. This staff hung over the doorway of her home where she could see it from the couch on which she lay in pain while calling on Creator to "end the pain". She then heard Grandfather's voice calling to her from the garage in her childhood. She looked at the staff over the door and saw Black Snake hanging down while the voice of Grandfather said, "You can get passed him. He won't hurt you. You can make it." She did make it, and with Black Snake guidance was again born. After that she meditates on Snake and focuses on how snake sheds skin, its eyes clouding over, its appearance of decay and death, it inhabits the death/rebirth cycle and from such closeness with death the rebirth brings new knowledge; wisdom to see things a new. Since then she has never passed road kill without acknowledgement of transformation, often times stopping to hold ceremony.

A year after my cardio incident I was again preparing for the AmeriCorps Training Closing Ceremony, again at the Butterfly Garden and again Cindy Fountain was joining us. At the time I was planning on returning to my graduate studies that September. As we gathered for the ceremony with some forty AmeriCorps Students and another twenty guests, Dragonfly hovered directly in front of me for an extended time, also three people including my step-son photographed Dragonfly along the Nature Trail. Once a fire was made and Cindy started walking around it she told this story.

> *This morning meditating on Butterfly, on transformation, on light and on shape shifting, Dragonfly came to me. I said," Dragonfly this now is not about you. Go on leave me with Butterfly!" Dragonfly said, "No, this now is my sign. I came from water. I am now in air, you listen to me!" But I would not and Dragonfly refused to go. So here I am with you all and here is Dragonfly. What does he tell us? He lives in the realm of light and by water, so he tells us be in the sun by the water in order to restore. Dragonfly is a nymph in the water, for two years before he or she can shape shift, this can mean a two year time of change before you are ready to fly. Dragonfly is a sign for us. That is all I have for you."*

Two weeks later I returned to Cardiac Care and had a second surgery which required another period of recovery initiating a medical leave which extended my recovery time to two years. On the morning I was to leave for surgery I sat in my living room deeply troubled by this turn of events when up to the window walked Fox, who stared in at me for some time before leaving.

Nature or Disney

A visit to Cindy Fountain's home is like entering a transforming flux in existence: ancient tribal regalia, totems and animal skins are hung in juxtaposition to modern appliances, plastic toys and Disney icons. The Dream Catcher snake staff is over the front door and in sight of the computer (to be watchful). Grandfather's hand tools, an icon of hand skills, displayed with costume jewelry from China. Owl wings above a plastic Christian image. Everywhere there are dolls: small straw figures in an orchid pot, an eight foot tall grandmother doll made from a step ladder, dolls snuggled into an overcrowded glass hutch, dolls in the front yard housing bird nests, dolls Cindy explains are the totems of Spirit World. But this spirit world, with its emphasis on animal speak, seems to draw no line of distinction between the anthropomorphism of Disney and the living soulful intention of indigenous cosmology which begs the question – Is it Nature or is it Disney? The very pervasiveness of the Disney Empire could lead one to believe that all snakes are evil along with vultures and anything cat-like, while mice are inherently innocent and ducks exasperating; how does this reflect on the nature of traditional animistic belief or has it informed and in some ways re-sculptured that belief?

Biologist and longtime science writer Carol Kaesuk Yoon believes that the naming of nature is an ancient practice, deeply rooted in a close association with nature. She speaks of what biologists call the "umwelt" (pronounced OOM-velt) which is a German word that means "the world around". For biologists the umwelt signifies the perceived world, the world sensed by an animal. She believes our human umwelt "gives us our stereotyped, hard-wired way of perceiving the order in living things."[166] Anthropologist Calvin Martin believes that in the deep past humans and animals shared

perceptions, that the animal world is the deep ancestry of the human world.[167] Telling stories that endow animals with human language and human characteristics has long been a part of the native tradition and as Yoon observes a constant of the human umwelt. In a traditional telling of *Turtle, Turkey and Wolf*, the wolf is an image of strength if not bravado, the turkey is one of intellect if not of arrogance, and the turtle is one of endurance and constancy.

> *Turtle, Turkey and Wolf are on one side of the river and some good food is on the other side. They plan to see who can get there first. Turkey and Wolf both tell Turtle not to bother as one can fly while the other can leap but Turtle can only walk. So as Turkey flies and Wolf leaps Turtle walks under the water to the other side. Turkey with his big wing span gets caught in an updraft and is blown way up stream while Wolf only got part way across lands in the current and is taken down stream. Turtle comes up on the other side a little wet and very hungry for the food which is now his.*[168]

Certainly this story reflects the Aesop *Tortoise and the Hare* theme, of slow and steady wins the race, a deeply Western moralistic affirmation for the guidance of the plebian class in ancient times. It is the characteristics attributed to the animals that would draw Yoon's attention and herein she would note that both stories identify Turtle with virtues of endurance, steadfast constancy and humility; all significant qualities for the act of recovery but how is the animism of Ramapough Lenape traditional stories any different than that of Aesop's moralistic lessons? Are the pre-Christian fables working

the same territory as the indigenous stories or do they contain that which lends them to a post-modernist context, as Frank would have it?

White Man's Indian

In my Ramapo boyhood there were white men who believed in local native presence and one in particular was a good friend of Uncle Mal's. He often defended the credibility of the Ramapough Nation, Mal arguing that the movement was all a ploy for some financial benefit and Jeff Masters arguing that it was a case of pride, as there was no financial benefit.[169] At the time I did not comprehend why some white people had such strong opinions about native presence but over the years I have come to realize the significance of the White Man's Indian being consigned to the Reservation System and Warner Brother's animations. To acknowledge native presence is to acknowledge native rights and after the Indian Wars, with the formation of the Bureau of Indian Affairs (BIA), this 'problem' was dealt with in the late 19th century with the institution of the U.S. American Indian Schools, such as the Carlisle School in Carlisle Pennsylvania. Here the final solution to nativism was to take the survivor's children and board them in an institution dedicated to the sole purpose of "de-Indianization". So for people like my Uncle Mal native culture had vanished, even their stories were anglicized.

In 1964 as civil rights were drumming up in the south and the politics of segregation were being challenged, Uncle Mal brought Jeff Masters and a few of us white kids to see a genuine Indian down at the Lafayette Theater in the Village of Suffern. This was an attempt on the part of the Lafayette to boost attendance for the matinee on the eve of Thanksgiving. The theater was packed so we sat down in the front row while the whitest Indian we had ever seen, dressed in buckskins and wearing a full chief's head-

dress such that he resembled a Hollywood Apache, did some rope tricks and blew smoke rings with his cigar after which John Wayne flashed across the screen shooting Indians. Behind us sat many of the Ramapough families, we all watched John Wayne shooting Indians.

As the theater emptied out, Jeff suggested we go visit with a native friend of his who lived in the next county. Uncle Mal was reluctant but we kids begged him and he gave in. Having just seen the "genuine" Hollywood Indian and the Wayne film, we were filled with expectations of war paint, buck skin teepees and eagle feather headdress; what we drove up to that late afternoon was an old Air-Stream trailer on cinder blocks, a yard strewn with debris, and a pack of slobbering mutts. Inside the trailer lived an ancient man swallowed by his rough clothes and folded in an easy chair. He was introduced as Little Crow and once we settled in Jeff asked for 'the story'. This old man spoke to us kids directly. He told us of how he, Little Crow, was taken to the Carlisle American Indian School where his hair was cut short, his traditional clothes were taken from him and he was punished if he spoke his native tongue. After a year or two he remained miserable and often tried to escape but was always returned to the school. Then one Thanksgiving eve he was told that a great traditional meal would be served the next day and he would be expected to be thankful for all the good things he had. He went up to his sleeping quarters all alone and wept as he had nothing in his heart for which he was thankful. The old man told us kids of his deep sorrow, of his boyhood agony, and then he heard something…

> *There was a knocking at the window, like a tapping, and there was Crow hitting the glass with his beak. I looked at him and he said, "Let me in,*

Little Crow! Let me in!" I opened the window to this Crow. He flew about the room: first to the chair, then to the bed, then to a school book where he stayed.

He said, "Why do you cry, Little Crow? Why do you cry?"

I told him they cut my hair, they took my clothes, they changed my words, and I no longer knew who I was.

Crow laughed, "Haw! Haw! Haw!"

I said, "Crow, please be quiet, if they hear you I will be punished."

He said, "Little Crow, they will not hear me!"He then stared at my short hair and he said, "So they took your hair, Little Crow but are you just hair?"

I said I wasn't.

Crow looked at my clothes and said, "So they took your clothes, Little Crow but are you just clothes?"

I said I wasn't.

Now Crow looked at my mouth and he said, "So they took your words Little Crow but are you just words?"

I said to this too that I wasn't.

Crow now jumped up and said, "Your hair grows back, your can change your clothes and your words you can learn again, these things are not all that you are, Little Crow!"

I said, "But how do I know if I am still me?"

Crow said, "Because you hear me, they do not hear me, you do.

And for that you can be grateful!"

We asked him if he could still hear Crow and he said that just that morning Crow told him we would come by for the story.

The stories of the Ramapoughs represent the changing nature of traditional tales and the difficulty faced by the folklore and ethnological community in their attempt to track credible cultural roots; this is an oral tradition that defies a particular time or place. The written record, as noted above, is a one way passage that identifies only one moment in a story's cycle. Oral tradition is a living embodiment of story, as the native teller would say on completion of a story, "I am done with that, now it is yours to tell." The telling and re-telling keeps the story alive and a living story changes as we do. In the last thirty years, the true nature of Ford Motor Company contamination of the watershed has devastated much of the Ramapough Community and while this has lowered their average life expectancy by nearly two decades, it has also affected the nature of the stories with a greater emphasis on survival and recovery. Accordingly, some native tellers have gotten into the habit of referencing place names with an association to contamination, as in, "…this happened near the old mine holes, you know where Ford did that dumping" or, "…this was down along the river, when you could still eat the fish there." Cindy Fountain is even more direct drawing on her animism in response to contamination, with references to Vulture's purification sign at contamination sites and snake renewal stories for recovering community members.

Over the last three decades the Ramapough telling tradition has carried on consistent with the flow of indigenous oral cultures, in that it continues to adapt to a

changing social ecological nature. While it is noted that the Westernization of Ramapough stories and traditions cannot be denied, so too can be found strong native influence in the non-native community. Richard Wheelock in writing about the impact of myth on American Indian Policy speaks of the need Indian people have to retain a strong tribal identity. He agrees with Robert K. Thomas that American Peoplehood requires sharing four things in common: language, religion, ties to the land, and a sacred history.[170] Over a hundred years ago the intention of the American Indian Schools was to coop these four commonalities; Little Crow's story transcends that strategy just as Cindy Fountain's stories of Vulture seek recovery from contamination. The survival of native themes in the Ramapo region indicates the survival of the Ramapoughs themselves.

Native historian Ward Churchill has written that the gleaning of native tradition into non-native culture is the final stage of Western cooptation of the indigenous community and certainly a sound argument can be made for the smothering assimilation manifest by Western consumption.[171] Having grown up in the Ramapo Region, it has been my experience that there are other more subtle forces at work, whose persistence effectively undermines the all-consuming nature of the market society. Just as the institution of Christianity can influence indigenous culture, native culture can inform Christianity.

When I was seven years old and attending my first Catholic Confessional, a Ramapough friend named Timothy was on line with me. We each took our turn in the confessional booth whispering our transgressions to the shadow of a priest who sat behind a screen, like our colleagues we were sent to the kneeler rail to say our prescribed penance; a few Catholic prayers chosen by the priest. I knelt alongside Timothy and

started into my series of *Our Fathers* when I heard his prayerful voice whispering something about *Father Sun* and *Mother Earth*, certainly not the stuff of the Christian *Our Father*. I finished up my penance but Timothy was at the kneeler rail longer than the rest of us, earning him a new found reputation of being the greatest sinner in our lot. Only later did I learn why the longevity at the rail with the curious prayers: he told me his grandfather insisted that for every Christian prayer he recites he was to offer up two native prayers.

The Wounded Storyteller descends, as we all do, from ancient pre-modern roots. For indigenous people, modernism with all its advances of scientific objectivity cuts into their story and extracts much of its sensibility. Just as Frank has observed the ill person surrenders her narrative to the medical professional industry, the native must bargain away what is left of his narrative to the dominant class. But this is not a complete analysis as it is based on a Westernized construct of story. Native stories as we have seen are in constant motion; they are not easily held down to any one interpretation and re-format themselves according to the situation. Frank's objectives in his study of wounded storytellers are all met with the indigenous narrative: told in order to construct a direction, told not just about the experience but through it, and told in relation to social context. Frank asserts that for the wounded storyteller "Postmodern times are when the capacity for telling one's own story is reclaimed."[172] For him, postmodern experience of illness begins when a person recognizes there is more to this experience than the medical story can tell. But in order to achieve that, in order to enter that postmodernism experience we have to imagine. Arthur Frank defines imagination as being, "…the consciousness struggling to gain sovereignty over its experience."[173] The modernist

storyteller pursues a narrative that ends as the culmination of all the status the teller has spoken of throughout, while the postmodernist storyteller, engaged with imagination, knows that the story could always be told from any number of perspectives. For the postmodern teller, the place from which I would submit the Ramapoughs speak, there remains a wide variety of potentialities. As Frank has observed postmodern stories are not tidy; they lack linearity, competing voices slip in and out while other stories interrupt the narrative. The Ramapoughs, long familiar with their narrative being interrupted, have learned to expect as much and can even find themselves lost in another's story. Frank's path to reclaiming ones identity (therefore one's own story) is through the telling of the wounding, through stories told not just about the body but through it. As the Ramapoughs grapple with survival, they manifest a narrative of recovery only possible by means of relentless spirit. That is to say, the animal spirit kept alive through their stories.

In the winter of 2009 I drove up to Gander Mountain Outdoor Sporting goods store in Middletown, Orange County, New York. This is a large hunting/fishing/camping center located in a town that has a wide range of social/economic diversity, including some Ramapough families. I was in the market for a pair of boot liners but I actually went there to follow up on a rumor. Gander Mountain is pretty much like the average big box store laid out with various departments across the open space of its main floor. There is dramatic taxidermy displayed atop many of the clothing racks: Black Bear, Musk Ox, Elk, Turkey, Salmon, and there atop a boot rack White Deer. This was an average sized doe with a white patch extending down across her chest and back and around most of her rump. I stood a few feet off to one side and studied her and thought about my father. Two young men walked by me, they glanced at her and then muttered something about a freak

of nature. I was about to leave when my eye caught a small brown lump, tucked in near to her front left hoof. I moved closer and saw that it was a miniature leather tobacco pouch, an offering to spirit.

Summary:

Arthur Frank has identified the wounded storyteller as one whose story is determined by their diagnosis, their treatment regimen and the changing of their relationship within the environment. Michael Edelstein has identified the contaminated community's identification with sickness as a potential barrier to their recovery, in that one remains accustomed to that which is familiar. And Robin Tuhiwai Smith advocates deconstructing colonial dominance by identifying the stages of an assigned narrative and systematically dismantling them, in order to take on responsible self-determination. This then brings us back to Frank whose guidance includes accepting a wounded state as the new reality. Similar to Jordan's ecological restoration, Frank sees that there is no returning to an earlier self or an unspoiled Garden of Eden, there is only the commitment to carrying on wiser for the impact, a garden adjusted by invaders.

The Ramapough Illness is associated with impact on the watershed. Their traditional foraging and hunting methods have been altered by the changing of the nature of the land. Stories that have preserved medicinal characteristics of flora have been lost or radically altered as science debates the phytoremediation nature of these plants. Wildlife (amphibious, reptilian and mammal) have shown signs of impact bringing in to question traditional stories that have helped sustain animal population count. As animals for food source as well as metaphysical medicine and guidance become distracted by illness, their story too is interrupted. These stories of the land by the people of the land

connect the Ramapoughs to their ancestors and to Creator. To risk losing their connection to professionals (medical diagnosis, psychological profile and historic determination) is to risk losing one's identity.

It is the task of the Wounded Storyteller to survive and to carry the scars of that wounding onto the next thing. In order to move on, to heal there must be an acceptance of the plight of the wounded. The Wounded Storyteller incorporates the story of the wounding and in so doing the story evolves (shape shifts) into a narrative of recovery. While some stories (Creation tales, trickster episodes, medicine stories) seldom change, recovery stories move with the storyteller adapting to a new set of rules. It is the challenge of both Ramapoughs and academics to come to understand these new rules in an ever changing environment.

Chapter Nine

Recovery

According to the modern paradigm, ill people delegate responsibility for their health to physicians; illness responsibility is reduced to patient compliance.[174] Given this condition, the greater good is achieved when the professional adheres to the norm of the profession, rather than the demand of an individual patient. Therefore the profession is responsible to institutional truth, that is to say the truth of medical science, the truth of hospital management, and the truth of economic sustainability. According to Frank, this requires the patient's narrative surrender to medicine.

The Ramapough people have continually, since early contact, had their narrative taken from them: first, as participants in the European fur trade whose insatiable hunger for profit depleted what had been a sustained resource for centuries; then as newly baptized Christians once the introduction of foreign pathogens tore down their population demographics; then as renegade hold-outs clinging to a homeland they were exiled from; next as reclusive inter-bred outcasts (the Jackson White period); and finally as a marginal population to be recipients of industrial waste. With each of these identities thrust upon them, their own true heritage continued to be chipped away until the final insult of contamination seeped into their homes like a thief into the night to take away the final piece, their lives. But here Frank offers hope for a new kind of recovery:

> Ill people still surrender their bodies to medicine, but increasingly they try to hold onto their own stories. [175]

As he sees it, refusing narrative surrender is an exercise in responsibility. While people may still require their professionals for some things, a growing distrust between the public and the institution is another indication that recovery of health is linked to recovery of story.

At Community Action Group (CAG) meetings between the Ramapough Council, EPA, and the Borough of Ringwood officials, seldom does the evening pass without a sharing of wounded stories, loss, and struggle for recovery; the very telling of the stories ignites the process of recovery. Recognition and acknowledgement of health issues go a long way to healing both the individual and the community. While stigmatization based on loss of body control appears to be a societal norm elsewhere, it is not among the Ramapoughs. In the community a wide range of ages experience hampered bodily functions that previously were associated with elder care. As society at large demands a considerable level of control, the Ramapough are sensitive to the dynamics of an unruly body. Frank references the work of Ervin Goffman who says that the stigmatized person, "…is not only to avoid embarrassing himself by being out of control in situations where control is expected. The person must also avoid embarrassing others, who should be protected from the specter of lost body control."[176] Goffman notes that the ill person is expected to keep from public view a "spoiled identity". Frank responds that wearing a cancer support pin is a kind of reverse action. He sees this coming-out as distinctively postmodern. Therefore, the postmodern reality begins when ill people recognize there is something more here than the medical story can tell.

For the Ramapoughs, the something more ranges from the institutional denial that their illness is from toxic waste to a belief that contamination is just one more step in the

long walk toward extermination. They understand Goffman's assessment of essentially blaming the victim for existing, as they have been denounced for even bringing public attention to Ford's paint sludge, as if they were responsible for the paint. John Gaventa pours much analysis into the idea that the well-seasoned victim comes to expect victimization. In his work *Power and Powerlessness*, he examines the interdependent dynamic between the dominate power class and the subjugated powerless class of an Appalachian coal mining community. He examines three dimensions of power in order to understand the reaction to dominance by a powerless group. There are similarities in a comparison of the oppressed coal miners to the Ramapough but also important distinctions that indicate a recovery process within the native community.

Gaventa's first dimensional approach to power involves a conflict in the decision-making process, that is to say the mechanics of power involve political resources – votes, jobs, influence – that can be brought by political actors. Gaventa found that despite advocacy on the part of the mine workers community, the very nature of contextual preference based on the power culture continued to derail the worker's efforts. Clearly, the Ramapoughs, an isolated rural native community do not have the political where-for-all of the municipal politicians or the negotiating skill of the state and federal regulators. But the Ramapoughs continue on regardless of being an 'outsider' to the power inner circle. Their persistence over the years has brought them into greater contact with other social strata and raised consciousness about the ever widening impact of Ford's waste in the water shed. As they recover their native stories and share these with the public, the image of indigenous stewards fighting the "good fight" continues to bring Ford back into the dialog of recovery.

Gaventa's second dimensional approach to power has to do with the mobilization of bias, that is to say, "A set of predominant values, beliefs, rituals, and institutional procedures (rules of the game) that operate systematically and consistently to the benefit of certain persons and groups, at the expense of others."[177] Key to this process is the 'non-decision' mechanism, with the most obvious cause being force or sanctions ranging from intimidation to co-optation against the miners. A less obvious cause of "non-decisions" are "decision-less decisions" made from anticipation that an aggressive decision could invoke sanctions. Herein lies a non-event (something that has not yet happened) coming to bear on an empowering action. It is easy to see how this dimension plays out among the coal miners; their entire economy was based on the investment and ownership of the power class. With the Turtle Clan Ramapoughs of Ringwood, there is a similarity in that if too great a focus is brought to bear on the dangers of the old mining area, they may find their homes condemned. There is also the anxiety of further alienation in bringing too much attention to their collective illnesses, which stirs up the unpleasant image of a contaminated watershed. But industry's sins and cover-ups in recent times have received a lot of press and public outrage at the slowness of government response, so in that the Ramapoughs could have timing on their side.

Gaventa's last dimensional approach to power has to do with how power influences the strategies of challenge. This includes social myths, language, and symbols, and how they are shaped in power processes. This can be done through the control of information, mass media, and through socialization. Herein a far more subtle process works to undermine the empowerment of the dominated. Like Gaventa's coal miners, the Ramapoughs are stigmatized as outcasts; like the miners their "recognized" educational

achievements are limited; and like the miners their social symbols are degraded as that of a "lesser" class. But unlike the miners, they have moved into a "middle" ground socially by reclaiming their narrative at Pow Wows and educational forums open to the public. As for the limited educational achievements, it is noteworthy to examine the standard of degree bearing education that is measured. Ramapoughs, in order to excel at the undergraduate level, must walk in two worlds; as often the case, resistance to formalized education for native people has to do with an entirely different way of thinking. To be native involves a naturalistic sensibility, not so easily adapted to Westernized academics. It is for this reason, along with the hardships of economic insecurity based in part on numerous health issues, that the Ramapoughs have struggled to attain a greater presence in academic institutions but these same institutions have in the past stigmatized the Ramapoughs. Folklore, posturing as reality, has continued to find a vehicle in regional studies, for the Ramapoughs the sight of a professor leading graduate students into the field triggers concern that academic abuse is not far behind.

Perhaps the greatest obstacle to the Ramapough community has to do with mythology. As noted, Gaventa identifies myth as integral to how power influences the strategies of challenge. For the Ramapoughs, myth, in its various forms, has come into their narrative and taken a place in their struggle to recover identity. For over a century, writers of the academic class, or who Gaventa would identify as the dominant strata, have composed fictional tracts masquerading as historical record. This material, some of which was referenced in chapter three, has been replayed in "folksy" local newspapers, shown up in pseudo documentaries, repeated in countless undergraduate studies, and even been instrumental in Hollywood's stereotyping of the 'dark' element in society.[178] As Gaventa

has noted, participation in the political process is as a result of a high level of political awareness, most often associated with a favorable socioeconomic status. When constantly bombarded by a demonizing mythology, there is little accessibility to a different socioeconomic status, "political learning is dependent at least to some degree of political participation within and mastery upon one's environment".[179] It is for this reason that those denied participation might not develop political consciousness of their own situation, and might not come to comprehend how that situation can be changed. Here the Ramapoughs have much in common with Gaventa's Appalachian coal miners. Because of their lesser status as a political player, they tend to rely on guidance from a power elite player, such as the lawyers for the *Mann vs. Ford* case, which leaves them prey to a similar social dominant class as that which produced Fordism.

In fact Fordism, that is to say Ford's theories of scientific management of the workers and the economy, compliments Gaventa's dimensional approach to power by engaging the workforce in a redundant job at a healthy salary thereby co-opting the workers need for empowerment and further increasing the worker's product consumerism, which in turn furthers the workers dependence on industrial economy. Reaching back a hundred years before Fordism, the Pierson brothers of the Ramapo Iron Works built an industrial economy that links the workers to further resource extraction, ultimately altering the environment which is the cost for engaging the Salamander. In the post Henry Ford years, his well-ordered class conscious doctrine builds upon the paving of America and ultimately condemns the watershed.

This is not to say that the advance of the industrial age did not bring civilization out of a primitive mercantile economy, nor does this justify a neo-luddite call for

returning to domestic animal transportation; we live in a technocratic society with medical, transportation and communication wonders at our finger tips, at least at our middle class fingertips. But just as the Ramapo Salamander's appearance was the downside of industrial advancement, there comes with our wonders a catalogue of issues. The cost of a medical industrial complex keeps us tethered to an industrial economy. Criticism of the powerful pharmaceutical and insurance agencies brings on fear of industrial retribution; Gaventa's 'non-event' stalls the advance of such criticism for change. Our vehicular transportation is dependent upon fossil fuel which only increases the dominance of a gas and oil economy; in turn this links us to foreign wars and domestic conflict over natural gas mining. And then there is our vast electronic communication system which is reinventing how we even tell stories, the jury is out on the long term impact but as for the short term, questions of privacy and domestic surveillance come to mind.

One constant throughout the last few hundred years has been the native population, certainly not unaffected by the force of capitalistic progress, always marginalized just outside the benefits at best and stigmatized as aberrant to the "natural order of things," at worst; rooted in the painful reality of pollution which they come to identify as the consequence of being a contaminated community. While there are avenues they can pursue to transcend much of Gaventa's analysis, transcending contamination is a far greater challenge. Michael Edelstein, professor of environmental psychology at Ramapo College of New Jersey, has pursued the impact of lifescape change, a cognitive adjustment to toxic exposure. Edelstein identifies "lifescape" as a framework of understanding that governs perceptions, in other words that which is "normal". He sees

lifescape as central to our psychological well-being. Lifescape, he tells us, remains invisible until challenged. Any forced change to our routine activities upsets the central premise of our perceived state of normalcy. Toxic exposure changes what people do as well as profoundly affects how they think about themselves.

Edelstein believes that we tend to think of ourselves healthy until proven otherwise, that for most of us, we plan our lives around believing our good health will continue. Illness disconfirms this basic assumption. Exposure to toxins inspires a fear of cancer for at least three reasons. "First, synthetic chemicals are reputed to be carcinogenic and potentially fatal to humans; second, given the invisibility of pollutants, toxicity is inferred simply as the result of knowledge of a proximate hazard; and third, cancer is inherently frightening due to 'suffering, pain, disability, disfigurement, dependence, social stigma, isolation, and disruption of lifestyle'."[180] Like Frank, Edelstein focuses on loss of personal control. Threatening events can shatter basic assumptions about the world. With toxic exposure, victims lose their sense of control and are forced to confront challenges to their most cherished personal beliefs. Once contamination is discovered, the victim is pulled along with no opportunity to stop.

Here it must be noted that the victims were often employed by Ford. The Ramapough men who once lived on Sixth Street in the Village of Hillburn worked at the plant, some in the paint spray shops themselves. Residents of Sixth Street recall paint being dumped at the village dump located at the top the hill above their homes.[181] If this is so, not unlike the paint sludge dumped in the Torne Valley, it was taken there by citizens, many of whom were employed by Ford.[182] In the course of my research I have heard that "making six drums disappear off the loading dock in the back of the Ford plant

was worth a hundred dollar bill". And even within my own family such stories were common along with a certain dark humor marginalizing the concerns of the growing environmental community. Ford was never viewed as an enemy; the company was inseparable from the legend of Henry Ford himself. Like my Uncle Mal, folks were proud to boast of the plant just down the road that offered a secure income and produced an American icon. So in the years after the plant closed down, the creeping sense of contamination served to undermine their sense of lifescape, that is to say what they had conceived as normal was no longer. Paint was just a fabricated material for covering surfaces; its durability was looked upon as a desired quality not as a potential hazard. Lead paint was believed to be the most durable (as promoted by industrial advertising) and there was no connection between a good durable product and a potential hazard. To believe otherwise would mean challenging the paradigm of what is normal. Edelstein talks of the effect of the discovery and announcement of contamination when toxic victims find themselves thrown into an unfamiliar life context, their sense of normal shattered. Along with surrender to technical experts and lawyers, there is also the deep realization that they have played a role in their own contamination. In a marginal sense, those who drive a Ford could feel a tinge of guilt, while those who have worked at Ford could feel a slightly larger anxiety as a recipient of Ford's employment, but those who dumped no doubt have been derailed from their sense of well-being. There is first the idea of responsibility and then the possibility of direct exposure themselves. In identifying disablement among the community, Edelstein identifies that what is lost is their ability to participate directly in a determination of the course of action important to their lives. How does one proceed knowing they wittingly exposed themselves and

countless others over the years to potential contamination? Denial, a clear preference by many in the region, lasts only as long as their health keeps up, eventually in the aging process questions of immune system compromise produce doubt and increase paranoia that past exposure is responsible.

Once a person is diagnosed with a major illness they are now faced with a duel struggle; one of biological health and one of psychological health. While the medical professionals support the former, the latter is far more complex than a visit to a counselor can achieve. Edelstein has observed that psychological recovery from contamination is pegged to ecological recovery. He says, "It is not possible to restore mental health and well-being if one knowingly continues to live in a polluted environment."[183] For the most part there is no expedient fix to contamination, industry, government and the citizenry carry on a contentious dialog for years, even then clean-up operations carry on through stages sometimes taking additional years. Edelstein identifies this with the term "mitigatory gap" meaning that space in time that it takes to go from identifying contamination to removing it. This all plays a role in the psychological health of the contaminated community. A major part of the psychosocial cost of contamination is rooted in the process of action or inaction. If the commitment to remediation does or does not materialize, the costs are iatrogenic; that is caused by the treatment employed. Society at large addresses contamination by stigmatizing those contaminated which in and of itself becomes a consequence of those who identify themselves as contaminated. Then there is the danger of extraction at the site of the pollution wherein the victims may well be re-exposed to toxins that have been dug up. Here we need to address what it means to be an indigenous "person of the land". During numerous meetings with the

community, the idea of relocation has often been circulated. While this would at least bring the community away from the source of the pollution, it also brings them away from the source of their being. People of the land believe that they are intrinsically connected to the very soil they came from, surrendering that "birth" soil is not unlike deserting one's identity. As one Ringwood elder noted, leaving the land from which we came from, our relative, would be like leaving behind a sick elder. This calls into question the safety of the home.

With contamination in the community, the once safe haven of the home is inverted. As Edelstein has indicated, home "…connotes a private place separate from the public that helps center our lives. It is a place for relating to intimates. Home serves as a basis for two key psychological factors – security and identity."[184] Cultural identity understood as the American Dream of ownership of a home on an acre or so of land, is problematic to people of a contaminated area. For the Ramapoughs, the challenge to their identity as native people along with the consequence of being native, and therefore inconsequential, is the double edged sword that slices through any notion of lifescape. Being a culture closely associated with the earth from which their elders emerged, brings the psychological impact of "home inversion" to an even greater depth. How do a people of the land escape the land? As the elders have said, "If the earth is sick then I am sick, if the earth is well then I am well".

Edelstein also speaks of loss of social trust, for as efforts to cope with contamination are made, the victim's trust in social and institutional support is tested over and over. Victims come to question whether government, industry, or others had any ability to prevent the exposure. At the Ringwood site, Ford's purchase of the land, on

which many of the Turtle Clan lived, indicated to the community that industry had stigmatized them as subservient to its needs. Once the contamination was done and before its true health impacts were understood, Ford gave back parcels to the community for the How-To housing project, which in turn offered subsidized housing on contaminated land. Here again inherent questions of trust are raised and go a long way to altering the victim's sense of lifescape.

In sorting through this wounded narrative, as Frank would identify it, the question of responsibility for toxic exposure plays a distinct role in the evolution of distrust. As Edelstein points out, it is the confusion over the assignment of responsibility that victims must get through, in order to expose why the pollution has occurred and who is at fault. Government officials are blamed for failing to prevent contamination and further blamed for delays in discovering contamination. Ultimately, there are only three possible parties involved with responsibility for exposure: the victims, the polluters, and the government. Edelstein's analysis of how this works can be applied to the Ramapoughs, Ford, and the governing municipality, as well as regulatory administrations.

Victims of aquifer pollution find little support from government agencies, as opposed to surface water bodies such as reservoirs, despite the fact that aquifers feed surface waters. The Ramapoughs of Ringwood have argued that the paint sludge pollution, deep in the old mine shafts, will access the groundwater and migrate to the Wanaque Reservoir, but governmental regulatory agencies are limited as to when pollution is termed a problem: deep in a cavernous shaft beneath groundwater level or in measurable amounts at surface water level in the reservoir?[185] Since surface water can be dealt with in a variety of methods: macrophytes (willows, reeds) for treatment of landfill

leachate; bulrush and cattails incorporated into constructed wetlands; purification by means of fishponds, municipalities can adopt these tools for remedial work. Groundwater, particularly water that is deep below the flow of surface water, would require an extensive knowledge of the geological nature of the setting as well as elaborate pumping mechanisms to access the area of pollution. It is the depth of the pollution in the Peters and Cannon mine at Ringwood that challenges any attempt at reclamation.

Citizens bear the burden of proof that poor health is caused by pollution, in this any complexity challenges the baseline study: nearness to high tension lines, lifestyle such as smoking and drinking, work exposures over the years, or any number of other factors can play into health issues. There is also the question of time of the exposure long past, leaving no discernable trace of heavy metals in the blood, despite a shattered immune system and a virulent "returning" cancer. Government lacks the expertise in analyzing the effects of chemical synergy, that is to say how the various industrial chemicals have reacted in the sludge mix and what the consequences to that mix may be. There has not yet been laboratory work documented on this, surly the victims do not have the means or the technical expertise for such work. A recent example of this emerged when I asked Ramapoughs of Ringwood and engineers working at a clean-up site about the levels of DEHP, a carcinogenic plasticizer. The Ramapoughs, although exposed to it, knew nothing about the compound and the engineers were equally at a loss. One is forced to ask, how do we deal with responsibility about a compound if we don't even know that it is there, and the research on it is scant at best?

For the Ramapough community, this ultimately brings in the question of what is known and what is unknown about the potential contamination of the paint sludge. While

there is ample documentation as to the carcinogenic properties of the paint ingredients (see chapter five), given the time span since the dumping and the current state of the sludge there are many unknowns involved. Does its level of toxicity decrease over time? Through what pathways might the exposures occur? Have the plant and wildlife been contaminated and therefore offer another pathway to this foraging community? Does the community's proximity to the dumped material make a difference to the level of contamination? Will the hardened sludge migrate to the Wanaque Reservoir? Despite these unknowns, the perception of the danger is driven by the known risks of which the Ramapoughs are relatively clear. As Edelstein has indicated, the known "facts" about a pollution site make up the "risk personality of the contamination in question.[186] Known facts making up the risk personality amplifies according to the volume, drams, controversy and demand for attention. From experience the Ramapoughs know: removal of the sludge does not increase exposure (or given the danger of living in close proximity to the sludge a slight temporary increase means little), the material does break down and migrate with groundwater, the illnesses they have been stricken with does pass along through to later generations, and off-gassing of VOCs continues from forty to fifty year old sludge.

Edelstein advises that the "3 Cs of risk" – its cause, consequence, and controllability make a useful shorthand for risk evaluation. Under cause is gathered the attributes of the hazard as in the origin of the materials (Ford Motor Plant), its boundaries (throughout the watershed, in mine holes, municipal dumps, open fields, etc.), and its nature (lead based substance with a mix of compounds and plasticizer). Under consequence Edelstein talks of the expected severity of the outcomes and the likelihood

of its occurrence (various organ failures, cancers, diabetes, asthma, and general immune system breakdown). These outcomes are most threatening when the observer sees them as a personal threat. Finally, there is the mitigation of the threat for hazards that can be prevented when trust and belief in methods of control can be implemented (removal of the hardened paint sludge, plants and soils that are contaminated and safe replacement soil spread over the site). For the Ramapoughs, to one degree or another, all three "Cs" make up the known conditions of their risk personality. In their move toward recovery, they have become well versed in articulating their risk personality. This strikes at the heart of Ford's proposal to 'cap' the Cannon and Peter's Mine sites. While the Ramapoughs may not have an understanding of the potential pathways of underground water migration, they do know that the continual off-gassing at these sites will not change by the 'capping' process. With the EPA favoring the 'capping' process, the Ramapoughs are faced with having to hold up their anti-capping argument. As Edelstein notes, the victim is most often left with the burden of watch-dogging government and consultants for accuracy.

> "Although Superfund was intended to allow government to act independently on contaminated sites, in fact, the paucity of funding and the complexity of governmental involvement has meant massive delay and the reliance on potentially responsible parties (PRPs) to conduct studies and develop remedies. This pattern raises what should be obvious issues of vested interests where consultants paid by the PRPs do the key work with minimal independent

> oversight, quality control and corroborative information. The process commonly fails to provide affected residents with a trusted measure of exposure, any consequences, and the best protective actions."[187]

The Ramapoughs have been involved in bringing the EPA back to Ringwood five times, each of them after the government broadly announced the clean-up was complete, (actually the Ramapoughs count it as seven times while the government maintains the five count). It is only based on their persistence that anything ever comes to light in the Ringwood case. But they also take the heat from other residents that are not on the front line of exposure, residents who drink the Wanaque water but are in denial that it is threatened. As Edelstein observes, it is the citizens who bear the burden of defining the scope of both the problem and the response.

As for the polluter's responsibility, where a polluter is identified, available laws may not provide adequate support for prosecution. A polluter can seek bankruptcy protection and incur numerous legal delays. Government agencies often order "orders of consent" settling a case without full remediation, time delays are frequent, and Superfund fails to expedite timely remedies to contamination. Edelstein notes that it "is ironic that the polluter often receives less than its share of victim's blame. Anger may be mollified where the polluter is a major source of local employment."[188] This too has been the case for the Ramapoughs, as many in the community had at one time been employed "on the lines" at the Mahwah plant. Apologists can be found within the community, among their non-native neighbors in Mahwah and in the surrounding areas. As one community member put it, "I worked there for more than a decade, shop steward in the paint shop,

and I don't have cancer!" Ramapoughs for the most part support the clean-up campaign but some have a tendency to blame the various government agencies rather than Ford directly. Timothy Gulick, a non-native Hillburn resident, worked both at the Ford Plant and the American Brakeshoe Plant, between the two, despite lead and asbestos exposure, now in his senior years he is in good health. "I'm not saying they didn't dump but I am saying I got a lot of exposure and I'm okay." This sort of anecdotal testimony from the "fortunate ones" negates the Ramapough's claim of polluter responsibility, if there is any doubt of the compounds toxicity.

As for the government, there is a distinct loss of public trust, lacking technical competency and expertise to make sound decisions the EPA instills little public confidence. As was exhibited with Lisa Jackson's short stint at the EPA, having minor success with moving the agency along, it is assumed by community members that the government was just too ineffectual for her to accomplish much. Edelstein indicates that once a contaminated community realizes that they cannot depend upon government to solve their problems, they move to action aimed at forcing a solution. Government, faced with angry citizens, falls into what he calls dynamic distrust, wherein the parties involved have increasingly divergent views.

As Edelstein sees it:

> "The loss of trust, the inversion of home, a changed perception of one's control over the present and future, a different assessment of the environment, and a decided tendency to hold pessimistic health expectations are all indications of a fundamentally altered lifescape."[189]

It is in this arena that the Ramapoughs claim their identity as survivors of contamination and stewards of the land. But the land that they claim has had a long history of industrial manipulation, a history that includes acquiescence on the part of the local community, for the sake of employment. The fundamentally altered lifescape of the Ramapoughs was not a pristine ideal before the contamination. Their pre-Ford lifescape was woven from a fabric of contested histories. Just as the Story of Little Crow illustrated, Native America was long accustomed to being a colonized populace. As Linda Tuhiwai Smith has indicated, "Under colonialism indigenous peoples have struggled against a Western view of history and yet been complicit with that view."[190] The indigenous people have allowed their histories to be told and in doing so have become outside listeners, to characterizations that sculpt a "safe" and "dominated" native. Attempts to reclaim their rightful identity, language, lands, knowledge and sovereignty are met with criticism for having lost these things to begin with. The Western perspective tends to define native America as a romantic fragment of a noble past but irrelevant in a contemporary sense. Locally, the Ramapoughs have long faced challenges to their native heritage from historians and academics alike, and as noted in chapter three, academics have a tendency to "decide" who the Ramapoughs are regardless of their own traditional family stories. But academics such as Cohen and Oestreicher have in a certain light moved the Ramapoughs to reclaim their narrative, just as they are now faced with reclaiming their story from medical professionals, environmental regulators, and Ford Motor Company.

Linda Tuhiwai Smith asks if a history in its modernist construction is important for a native community. Given the struggle over land claims, the abusive mascot issue

which trivializes native history, and the industrial impacts on reservations, the answer to this question would seem self-evident. That is to say, if the society at large genuinely practiced an ideology of fairness. But history is also about power, or as Smith would say, history is mostly about power. In this sense Western history is not important to indigenous people, as the powerful produce the 'narrative' that informs the pubic as what their story is. Smith proposes a revisiting of history as a significant part of decolonization. Like Frank, she looks to achieving a postmodern identity but first calls for settling "some business" with the modernist stigma. "Coming to know the past has been part of the critical pedagogy of decolonization." She tells us, "To hold alternative histories is to hold alternative knowledges."[191]

For the Ramapough people, telling the story of their contamination has emerged as an alternative history that challenges the power structure paradigm, informed by Fordism. As the story is told and retold, an alternative knowledge emerges, it is one that lays claim to a recovered lifescape, deconstructs the paradigm of acquiescence, and embraces what Frank calls the core morality of storytelling.

> "In the reciprocity that is storytelling, the teller offers herself as guide to the other's self-formulation. The other's receipt of that guidance not only recognizes but values the teller. The moral genius of storytelling is that each, teller and listener, enters the space of the story for the other. Telling stories in postmodern times, and perhaps in all times, attempts to change one's own life by affecting the lives of others."[192]

Just as the testimonial telling stories of sickness at a community action group meeting initiates the process of recovery, speaking at a rally or in a radio interview engages a reciprocal dynamic with the listener. When Ramapoughs visit with my undergraduate students and tell their story, the students' own narrative changes some. In the last decade there has been a reckoning over the Ford impact in the regional watershed and with the personal damage it has done to a people who have long been marginalized. No longer dependent on academic reckoning, the Ramapough community has embraced its native identity sponsoring pow wows, rallies in opposition to gas pipeline impact and fracking, gathering the traditional stories once held by family elders, and sharing photographs of elders with their children. As Charlene DeFreese has observed, "We can't expect others to do this for us. This is our business." In response to the stigmatization by the media they attend workshops, visit classrooms and hold forums to tell their own story. Still struggling with the Ringwood debacle, they regularly attend community action meetings and debate with EPA representatives and Ford site supervisors as to the nature of their situation. As Chief Mann has said, "We will not take this lying down. This is about our lives here. It is about saving mother earth." And in respect to the Bureau of Indian Affairs reneging on their historical claim, they remain undaunted as to who they are. As Chief Perry reminds us, "This is about four hundred years of oppression. This is nothing new. We're going to outlast them."

There is of course a dilemma involved with recovery. Recovery, not unlike ecological restoration, does not mean a returning to a previous state. Recovery, if successful, means transformation and emergence into a new state; just as the Wounded Storyteller survives by means of transcendence and is delivered wounded but reborn

anew, recovery requires a similar transformation. The problem with this involves leaving behind what is known, albeit contamination, and transforming into a state of what is unknown. Here any number of theoretical vehicles may offer help but scholar J. Steven Picou working with Alaska Natives impacted by the Exxon Valdez oil spill has forwarded "The Talking Circle" as a tool for recovery toward cultural transformation.

Picou notes that in contrast to natural disasters, human-caused toxic disasters cause a social context of uncertainty, anger, and isolation. Taking an active role as a participatory researcher, Picou works with a consortium of natives in Cordova, Alaska, a small community of 2500 residents. Implementing the Talking Circle was intended to offer a platform for exchange of knowledge and interactive participation on the part of village leaders and local residents. The social context of the circle does not allow for debate or argument, rather it is a forum for "sharing oneself...experiences, feelings and thoughts". The focus of the Talking Circle was the Exxon Valdez disaster and anything shared within the circle was protected by traditional rules of confidentiality. It was believed by the indigenous at Cordova that the oil spill had created a massive death in nature which in turn took away the souls of the creatures and of Alaskan Natives. This loss was seen as "holes" where the souls once existed. Only by, "Recognizing this threat can people restore both nature and themselves. Restoration and healing will occur through public testimony, apology, and collective rituals, and accordingly, the holes and the spirit of all, both human and nature, will be transformed and restored to a healthy state".[193] Picou found that the "Talking Circle resulted in the fusion of instrumental, interactive, and critical knowledge, which transformed both individuals and the collectivity to a more cultural conscious participatory position".[194]

Picou's Talking Circle (which is common in most native cultures) could play a significant role in the recovery process for the Ramapough community. Following the two day format proposed by the Alutiiq, ceremony could be held down at the Sacred Grounds along the Ramapo River in Mahwah New Jersey, then a first day circle (focused on the pollution and impact) could be held at the Good Shepherd Church in Ringwood NJ; the second day could initiate with a healing ceremony in Torne Valley of Hillburn NY at the site of remediation activities followed by a second circle (focused on transformation) at the Community Center on Stag Hall back in Mahwah NJ; and end the weekend with a closing ceremony down at the Sacred Grounds along the Ramapo River. This two day journey could help to unite the clans and focus on recovery. The morning of the second day would be an opportunity to bridge the community needs with the remedial work of the Ford in the wetlands, for it is there in the Torne Valley that ecological recovery is transforming the polluted area.

Across the border in the Village of Hillburn and the Ramapo Hamlet, local politicians, environmental advocates, students, community members, Ramapoughs, and Ford have found common ground where negotiation has reigned over litigation, where recovery has taken shape in a little two hundred year old Saltbox house, and where remediation is linked to reclaiming a story of the land.

Summary:

In the course of a journey challenges are met, discoveries are made and the hero is changed for the experience. If this was a vision quest story the hero would expect and in fact look for a new self, a changed reality, a lesson learned. Stories of recovery do not

have such a focused agenda, they are rather subtle interpretations of existing nature speak, they offer sign along the journey in acknowledgement of the process. Generally nature does not offer a codified schematic that the individual can reference; there are no commandments in nature. It is what the individual brings to the relationship that augments an understanding of recovery. A person suffering organ failure encounters an abundance of butterflies, internalizes the shape shifting nature of this creature, and may interpret butterfly medicine as a sign to accept change. Another person with similar illness, similar challenges may encounter dragonflies and along with accepting change may interpret this medicine as encouraging greater mobility into the future and the past as a result of Dragonfly's multi-directional maneuverability. A person who has lost a partner, parent or child may take solace from regular visits by the departed's totem animal. The animal life itself may also exhibit indications of contamination which lends even greater credibility to the animal sign.

With the passing of eldership, shortening life spans, and the pressure of contamination, much of the oral tradition has been lost. This too contributes to the changing nature of the stories. Fragments survive and are adapted according to need. Putting aside the academic question of to what degree can a changing story still be considered traditional this study considers the use of story to the recovery process. Cindy Fountain's snake stories shed skin and engage rebirth, Kevin Powell's stories of trapping muskrat and his speculations consider the duel realm muskrat lives in, the members of the Turtle Clan whose reverence for Turtle is in respect to Turtle Island creation stories but also as a bottom feeder and survivor; these all indicate the subtle movement of significant animal totems through the people's world of contamination.

This is not to say that Christianity is not a part of this community, to the contrary like many Native Americans they are of strong Christian faith in addition to the earth bound meta-physics of animal speak. This does not make them pagans, rather it opens the spectrum up for what is possible. God (Creator, Gitche Manitou, Nanabozho, Great Spirit) remains the initiator of existence while the pantheon of earth spirits (animal totems, plants, wind, water, etc) are much like the angels, in fact one's totem animal is essentially a guardian angel. What is significant here is that Native America, regardless of a few hundred years of dominance and adaptation, remains connected to the earth. In this we find a pathway to recovery. The Great Religions do not adjust their stories for climate change while indigenous earth bound stories find relationship with climate change.

Finally, when a storyteller engages a narrative and finds themselves inside the story as they tell it, they are building on tradition. Edelstein talks about the building of liberating structures that is the assemblage of a methodology for a pathway to empowerment. The very act of engaging a structural dynamic inhabits a narrative of recovery. Next we look at the actual physical building of a structure toward recovery which becomes a story of recovery.

Chapter 10

The Saltbox

In October of 1996, while working on a photo archive project of historic houses in the Village of Hillburn with local resident Tim Gulick, I was accosted by a village elder. She walked up to me and said that if I was so "fired up about history" why I hadn't done something to save the old saltbox house. Apparently, a fire training burn was planned for one of the old Iron Works buildings in the Hamlet. That same day, I went to the Hamlet and down along Lake Road, I found a little red saltbox house prepped for the fire exercise. There was something oddly familiar about the building. The Hamlet (aka Ramapo Hamlet) was one of the last remnants of the once bustling nineteenth century iron worker's community, still in the ownership of the Ramapo Land Company, heir apparent of the original Pierson Iron Works. The saltbox, situated such as it was, may have been one of the first erected at the site, placing it as early as 1798. I negotiated for ownership of the building which led to an agreement that I would dismantle it and remove it from the site, not a simple task; the initial stages of dismantling involved removal of an extended mud room and stripping the roof which was done with the help of local contractor John Rule. For the next six weeks students from the Nyack High School Drama Club and community volunteers helped to remove the interior wall covering (sheet rock, plaster, wall board); this deconstruction itself become a 'learning lab' in history. Some sections of interior walls had very old thick plaster mixed with cattle hair for binding. Once the walls were revealed, the oldest framing of the original portion of the building was clearly delineated from two later extensions, one being the "salted"

(extended) back roof framing and the other was a bump out, also framed in a saltbox profile. Careful study of the materials used (milled nails, metal straps, basic timber joinery and plaster lathwork) revealed the second extension to be approximately early/mid nineteenth century. We dismantled the framing (rafters, joists, corner posts and pegs) and saved it for spare parts; looking to one day reassemble only the original eighteen hundred structure.

Well into the fall, we continued to dismantle the house and travel further back into its history, following the nails through cut metal, rolling mill and ultimately hand wrought. The post framing of oak timbers, joists, and rafters revealed an even earlier use, with butterfly mortises and pocket joinery; this was the first indication of an earlier historic period for the house framing. It was among these older timbers that the hand wrought Rose Head nails were discovered, again evidence of an earlier period. As we worked we photographed, sketched and kept a journal of what we found and how it was laid out. We numbered all the salvaged pieces and those numbers corresponded to the drawings in the journal. Although we had no idea if or when we might one day reassemble the structure, we still kept a detailed log for future reference.

There were also numerous historic cultural artifacts that told the stories of past generations. As walls were carefully removed, a large number of old soda pop bottles were found sandwiched between the interior and exterior surfaces. Bottles were sometimes used as a cheap vapor and insulator barrier, but the number of bottles extracted was unexpected. There was also a late nineteenth century children's shoe, as well as pieces of an old coin bank dated 1888. The most curious thing discovered were two balls woven in what turned out to be willow branches. These two baseball sized

spheres were each found inside the wall, over the two original door frame headers, being the earliest entrances to the house. There are stories from the Ramapo region associating willow woven balls, over the entrance, as possessing a kind of neutralizing agent that would protect the home dweller from bad spirits or dark witches who might enter the structure. This is not unlike the country fashion of hanging a horse shoe over the door entrance.

While I had help early on in the fall of 1997, as winter settled in, my student volunteers retreated to a warm classroom, leaving me in the Hamlet to complete the job. Fortunately, Karen Morgan, who lived across the street, always kept a warm pot of coffee on and hunkering down with her husband and daughter for a chat, kept my spirits up. The agreement with the Land Company was that I would remove any vestige of the structure from the site. For the final stages of work, twin brothers, Simon and Adam McCaffrey from Nyack NY, were instrumental in much of the heavy lifting. As we dismantled the chimney and fireplace, there was a massive hearth stone that needed pulling up. I told the boys that often was the case, when a house was built in olden times a "keep-sake" from a previous generation was placed in the sand, beneath the hearth stone. Of course having witnessed other discovered curios they believed my fabrication completely. I then left them to the arduous miserable work and they took to it like seasoned laborers. I went about numbering the latest pieces we would ship off to storage and was outside the structure when their excited voices called me back. There they stood with the stone up on end and they pointed into the hearth where they discovered a small pewter teaspoon pressed into the sand bed! Upon examination it appeared to be of the colonial period and it no doubt went a long way to insure my credibility with the McCaffrey brothers.

For the next ten years, the Ramapo Saltbox was stored in a mid-nineteenth century dairy barn at Campbell Hall, New York. Noel Jablonski (a distant in-law of mine) afforded the space in her barn. Appropriate storage is crucial for dismantled structures; I have learned over the years of a number of well-intended efforts that ultimately failed as a result of poor storage. Unfortunately, the barn needed to be utilized during this time, so the stock pile of timbers, siding, five quarter planks and bricks were moved about on at least five occasions, making it an even greater challenge to sort through. Then in 2007, we agreed to return it to the Town of Ramapo, in hope that this would eventually lead to some form of reassembly. The Town brought the structure down to one of their warehouses on Torne Valley Road in the Village of Hillburn, packed in two large steel containers.

I had long been involved in studying the pollution sites of Ford Motor Company's lead paint dumping in the New York/New Jersey area.[195] By 2005, I started investigating portions of the Torne Valley indicated in my trapper's journal from the 1960s. Working with my undergraduate student interns from Ramapo College of Mahwah, New Jersey, I mapped out locations of paint dumping and ran tests to measure depth and condition of the hardened sludge. This was arduous work often done in the winter but with borrowed equipment and the help of Geoff Welch's photography, we managed to draw the Department of Environmental Conservation (DEC) and the Town of Ramapo back into council over this threat to the watershed.[196] Over the next two years the Town negotiated with the Land Company to purchase a thirteen acre tract of land that included the paint sludge sites my students and I were studying. By 2007, while the two parties neared an agreement, Ford sent their remediation agency, Arcadis, into the Torne Valley to remove

sludge we had documented in the flow of the Torne Brook. This was the first sludge to be dealt with by Ford in the Torne Valley. My students continued to examine the area and eventually they drew up a map indicating sixteen dump sites of various depositions. As this work continued, the Town re-negotiating their offer price based on the amount of pollution we were finding.[197] Finally, in January 2008, a signing for the thirteen acres was held at the Town Hall where Jack O'Keefe (then president of the Ramapo Land Company) happily told me that from now on I would no longer be trespassing at the site.[198]

As referenced earlier (see chapter 5), on June 5th of 2008, Ford representatives announced that they were not concerned about sludge sites in Torne Valley. While litigation continued to brew and frustrate the Ramapough community in Ringwood NJ, our efforts to get the DEC focused on a Ford remediation plan for all sites in the Torne Valley of NY, were stymied. A year later on my birthday, June 4th of 2009, I was back up in the Torne Valley walking through the sites along the Torne Brook. For four years my students had worked this field with me in all manner of harsh weather, I was proud of their work but now with the Town as owner of this contamination, I was frustrated. Down the Torne Valley Road there also sat another project in two metal containers: a two hundred year old saltbox house. I sat on a rock along the shoreline of the brook. This was at a stretch of sweet babbling mountain water where Arcadis had removed some massive chunks of sludge, sludge that was still parked in sealed barrels up the bank waiting for further removal. A few feet beyond the gurgle of the brook was a hardened flow of sludge, left behind as this clean-up was a trifle in terms of the real amount. I knew our

work here was far from over but how to further things along was the question. Then it occurred to me. The answer was in the storage containers in the lower valley.

Two months later, I proposed to Town of Ramapo Supervisor Christopher P. St. Lawrence that we initiate an innovative approach to bringing Ford around. The idea was to build the Saltbox at a site near to one of Ford's dump sites in order to house our activities and continue public education about the need for remediation in the watershed. St. Lawrence liked the collaboration of historic preservation with environmental restoration so we worked out a budget of minimal cost and he convinced his Town Board to approve it.[199] For me, this meant the Saltbox would finally have a home and my students would have a base from which they could work; for Christopher P. St. Lawrence the physical manifestation of our work could only be an asset in his effort to bring Ford back for the clean-up. Soon we had the support of Ramapo College in New Jersey, Cornell Cooperative Extension of Rockland County in New York, and Antioch School of Environmental Studies of New Hampshire. As Joy Ackerman of Antioch put it, "The Saltbox, an icon of nineteenth century industry, now houses research on remediation by Ford, an icon of twentieth century industry."

The next step involved moving the two storage containers further up Torne Valley Road, to a different warehouse, situated across the street from the St. Lawrence Community Center. Here I organized a workshop and started to unpack the containers with the aid of my Ramapo College undergraduates. Then through Cornell Cooperative Extension of Rockland, we put together a grant to work with BOCES of Rockland teaching high school students restoration and woodworking skills. For the next two years, BOCES kids spent time at the warehouse workshop cutting, shaping, planning, and

building all with nineteenth century hand tools. During this phase, we brought in various guests to spend time with the kids including: Ramapough Chiefs and members of the tribe, descendants of the Iron Works community, and scholars who have studied early American Iron Industry. These informal classes at the warehouse workshop helped to further our experiential learning model with the BOCES students. The students designed and built a number of original pieces of furniture crafted out of some of the extra five quarter oak planks from the house. By early spring of 2011, we were ready to break ground.[200]

The site for the structure was chosen along Torne Valley Road, both for its public access and its location on the periphery of a Ford "Brown" Field.[201] During excavation at the site, a careful examination of the soil was necessary in order to detect any possible presence of paint sludge. Happily none was found at the site, although a few hundred feet further west we knew of a sludge dump buried in a ravine. While the Department of Environmental Conservation had no objections for our final site in terms of the soil, there was concern over rattlesnake impact. The Torne Valley is home to a thriving rattlesnake population, in fact, it was concern over this venomous snake (listed as a threatened species with the DEC) that kept a power plant proposal out of the valley in 2000.[202] According to the DEC we were not allowed to excavate after April first and before November thirtieth. Since winter dragged well into April that year, they allowed extra time, but insisted upon the Town bringing in Randy Stechert, a snake consultant who has worked with the NYSDEC on similar projects. With Randy present we incorporated his field work into our work with the students and held a very exciting class on herpetology at the warehouse workshop, with Randy and his field partner marking rattlers with radio

transmitters.[203] Stechert talked with us about his work that was instrumental in defeating proposed power plants in the valley a decade earlier. One of the plants had argued that they could build an alternate basking area for the dispossessed rattlesnakes but Stechert effectively argued that down given the vulnerability of the species. This then introduced to the students and our volunteers the question of ecological restoration.

Throughout our work on the Ford remediation issue, there was a constant that hung just out ahead of us, that being: once the lead paint gets excavated what is possible in terms of restoration of the site. The Meadows site received a sort of boiler-plate seeding of various grasses, including non-native species. These grasses were ultimately torn up when the area was exploited by ATV riders and dirt bikers, leaving it an eroded mess, although given the area's propensity for flooding it is questionable as to the usefulness of seed grass, with no deep rooting plants to help sustain the soil. In Torne Valley there was a good mix of hardwoods, diversity of shrubs, and in recent years a variety of invasive plants. Stechert's successful opposition to the Power Plant proposals had much to do with the frailty of nature, the unlikelihood of creating a successful rattlesnake habitat. As William R. Jordan, founding editor of *Ecological Restoration* has said, "By itself, restoration is not a satisfactory conservation strategy or paradigm for our relationship with the rest of nature."[204] Jordan believes that as a partner in creation we must explore all avenues, other than our romance with an "impact" free past; in this he is not unlike Frank who tells us that a wounded storyteller carries her wounds always, and adapts to them in a sort of ritualistic taking-hold of her own narrative.

The narrative we were taking hold of in the Torne Valley included plans I had sketched for the reconstruction of a Ramapo Saltbox house. The plans called for its

historic footprint, twenty feet wide and twenty five feet deep, but I elected to raise the roof by three feet in order to add a foot to the first floor ceiling and two feet to the loft ceiling. From the beginning, we planned that the building would become both a museum and an Environmental Research Center, so building an exact reproduction had never been the intention. Actually, in order to establish a contemporary use for the building, I was compelled by the Town to build, first a structure to code from new wood and then retro fit the old timbers, siding and various original pieces. There were a number of adjustments necessary to make in order to adapt this "pre-code" 18th century structure to 21st century approval. For example, the new roof rafters numbered up to sixteen while the original structure had seven pairs of rafters. The additional rafters were added since the code requirement is sixteen inches on center and the original structure followed no formula and varied from eighteen inches to twenty nine on center. One might wonder why the structure did not cave in. This no doubt had to do with the fact that while modern rafters are milled from wood into 'two by eights', early American rafters were often hand hewn logs that averaged five by five. Modern sheathing on a structure is generally laid out in three quarter plywood, while our original saltbox was sheathed with five quarter oak planks. Essentially, they had infinitely stronger materials to work with.

This work on the original rafters inspired a great deal of debate among my students as to the nature of the age of the structure. According to Williams and Williams as cited in *Old American Houses:*

> "In order to ascertain the original construction it is necessary to examine the rear roof timbers. If the rafters extend in one piece from the ridge to the rear, first-floor eaves, the house was almost

> certainly built as a "saltbox". If the lean-to rafters are pieced into the main roof rafters at the second floor plate, it may possibly be a later addition, but the evidence is by no means conclusive."[205]

The uncertainty with which the authors speak was clearly illustrated in our case, as to any attempt to date the original lean-to extension of the saltbox, for while our rear rafters were clearly all of uniform length (not pieced together), once the original sheathing was removed each of them were discovered to have a short sectioned "sister" timber; being the cut peak end of an earlier original rafter from the house when it was once not a saltbox styled structure. So our saltbox roof was literally extended over the top of an earlier roof, once completed the interior was removed excepting the peak end of the earlier rafters, the ends of which were still pegged to the front roof timbers. Another indication that the front rafter timbers were built into the structure at an earlier time was that they were irregular hand hewn framing, while the back extended rear roof rafter timbers were milled.

A departure from the standard Early American Saltbox was the lack of a central chimney. Again, according to Williams and Williams, the central-chimney early American Saltbox is the most common surviving type of this structure and yet in the hamlet the remaining saltbox structures, as was indicated with ours, had an enclosed chimney at one end of the structure. Where we did find a chimney at the center of the structures was where a later addition was built out to surround it. What was common to these structures was that the area of the hearth back wall was exposed to the exterior, but

the chimney that rose from it was enclosed by framing and siding, with only a short section of chimney breaking at the roof peak, usually capped with a piece of slate.

When we took the building down the open hearth had long been bricked over, upon revealing it we discovered the pot crane still fixed to its rings inside the hearth. Replicating such a fireplace with its bed five feet wide directly beneath the chimney flue was never my intention, as I looked to heat the building with wood and such an open hearth would have burned excessively. With the help of some hardy volunteers, we dragged an old Vermont Castings stove down from one of the town's recently acquired properties. The stove was a mess but I figured it could be reconditioned. I took a few photos of our sorry little find and brought them around to Larry Savino who operates *Fireplaces by Design* at the corner of Torne Valley Road and Route 59 in Hillburn. Mr. Savino took one look at my photos and said he wouldn't touch the thing. Before I could try and talk him into a second look, he indicated one of his display stoves and said that's what I needed. Of course buying a new energy efficient *Harmon* wood burning stove was out of the question. Larry then told me that he was thankful for the work we were doing going after Ford for their paint sludge pollution. He said, "Let me do this." By the summer of 2012, Larry had installed a new *Harmon Wood Burning Stove* in our Saltbox. Whenever I light a fire in the *Harmon*, I tell folks about Larry Savino, for me he is what stewardship is all about.[206]

By the spring of 2012, this house was still wrapped in plywood sheathing and covered with Tyvek paper, when folks associated with the Hamlet came up to see it they were not pleased. First of all, we were modeling it on what we had come to understand was its form in 1815 which was quite different than the last eighty years of local memory.

But it was the height that disturbed them. In the original building, the back wall, at the lower part of the lean-to roof slope was less than six feet high, easily reachable from the ground. In part, this was due to the fact that the back footing was close to ground level, but I had raised the structure by three feet and clearly, along with a twelve inch concrete footing, the low end of the slope was now closer to nine feet in height. This was only one of many objections that were voiced over the next few months, until the old restored siding went up. Gradually, as the building took form folks were less critical and more curious about the story of the saltbox.

As noted above, the Hamlet holds a tale of the original saltboxes having been brought down from Sterlington's Iron Works. During the winter of 2010, Doc Bayne, local historian and naturalist, joined me in a search at Sterling Forest, along the stretch of Long Meadow Road known to locals as Ghost Town Road in reference to the old stone footings there. We found at least three candidates that could have once supported our saltbox house. Then there were the hand wrought nails deep in the structure, beneath the outer sheathing boards, as well as the original timber framing bearing joinery from an earlier use but to the cynic any of this could be explained away. Given the time period, building with salvaged material was common, as two hundred years ago there was no such thing as a "throw away" society. Folks from the Hamlet were not nearly as concerned about the actual age of the building, as they were about a story associated with it. The local story of Lavender, a romantic tale of a young girl who is killed tragically in an accident at the Iron Works black bridge over the Ramapo River, has long been associated with this saltbox.[207] This was why I had a sense of familiarity when I visited the building in 1996, for when I was a boy it was identified as Lavender's home. There is

debate among historians as to whether or not this was actually the genesis of her story but one thing is certain, during the years it was in storage there was concern that the house would not return to Ramapo, its true home. Gradually, through the summer of 2012, locals came by to visit with my students and quietly acknowledged that this was a good place for Lavender to be.

The proposal to the Town for a combined museum, classroom, and research center, at a time pivotal in the negotiation for Ford remediation of the watershed, brings a spatial/temporal dialectic into focus. The historic setting in the Torne Valley has been one of constant exploitation but it is that same colonizing of place that has maintained a record of the changes in the land, allowing us a constructive history of its use, both industrial and indigenous. Some of the records for example have indicated the Candle Brook/Torne Brook confluence as a Healing Springs, no doubt a place-name gleaned from the native forefathers. Given that our project's selling point to Supervisor St. Lawrence was its use toward recovery of the watershed, the association with a place of healing seems natural. By 2012, we had successfully negotiated with Ford to propose a feasibility study of remediation for the Torne Valley. It became evident that the saltbox project was instrumental in the return of Ford to the valley, when during the summer of 2011, as student interns from our local AmeriCorps program were still framing the structure, Ford representatives came up to the site ready to engage. The visit was part of their day which included dialogue with St. Lawrence and his administration as to the new round of environmental impact studies (EIS) that were underway. With Ford and DEC at the site, we talked about some of the objections Ford had presented four years earlier (at the stake holder meeting in 2008); the difference this time, was my students responded

with sound challenges to Ford's earlier theories of benign compounds in the paint sludge. These young people who had been privileged to some of the wounded narratives of the Ramapoughs and who had come to understand how an impacted watershed connects to their own story, were telling an arguably new story; one that was inclusive of the social/ecological shape shifting that is all around us. Their exchange with industrial and regulatory administrators helps to deconstruct a technological and bureaucratic mindset, in order to construct a new lifescape, one that does not shirk the call for responsible participation in one's own story.

This is not about a total overhaul of existing policies and operations, nor is it about seeking government to sweep in and "fix" whatever is broken; to paraphrase John Kennedy's famous quote, this is about, "Not asking what your community can do for you but asking what you can do for your community." Certainly working with existing policies and operations comes with its own risks: the changing nature of political regimes, along with the sometimes convoluted network of municipal authority, can often work against itself. Then of course there is the shifting alliances of public advocacy groups, as has happened in Ramapo where rumor spreads, leaving reality behind. Still, it has been my experience that what has worked in Ramapo, with the building of the Saltbox ERC, comes down to: keeping the costs at minimum (under fifty thousand dollars) by means of incorporating educational programs, volunteers, and working with only local suppliers; honest dialogue about the primary objective with all the players, often a project becomes tangled with too much speculation on future potential; and a municipal administration that clearly sees a multiple use outcome. As to the last point, I believe that along with the ongoing educational and research work at the Saltbox, we

have proven ourselves as a component in the restoration of the watershed for generations to come.

And perhaps, this is the key to what can happen in other communities. All across America there is a rich history of sites and structures, pertinent to their local towns and villages, most of them in need of restoration. And most of these communities have something else in common: brown fields, polluted infrastructure, and illegal dump sites. Whether its mercury, cadmium, aluminum, polychlorinated biphenyls (PCBs), polyvinyl chloride (PVCs), or lead paint (only a short list of what is out there) our country is rich in industrial toxins and there seems to be only three choices in the mix: drag a community through the courts fighting a multi-national player; do nothing and try to survive the onslaught of health care necessary with toxic exposure; or galvanize a community with a "multi-use" project such as the Ramapo Saltbox Environmental Research Center.

Summary:

The therapeutic benefits of building, shaping, and accomplishing a physical endeavor have long been appreciated. From Habitat for Humanity to the magnificent basket weaving work of the Mohawk Akwesasne, laying hands on materials and constructing a new is about recovery. Inspired by the work the Mohawk did in building their Environmental division, the Ramapo Saltbox Environmental Research Center merged as an idea that honored history and protected the environment. The reassembly of a two hundred year old iron worker's house sited at the perimeter of a Ford dumping ground brought an icon of 19th century industry into the heart of 20th century industrial impact. That the building was assembled primarily by students and community members

lends an even greater credibility to the idea of assembling a liberating structure. That the building itself played a role in constructing a dialog toward remediation and restoration illustrates a literal application of Edelstein's conceptual liberating ideal.

From 2007, when a Ford representative stated unequivocally that Ford would in all likelihood do little work in Torne Valley, to 2011 when Ford representatives entered into negotiation with Town of Ramapo for a clean-up, Supervisor St. Lawrence and his legal team continued the dialog while the Saltbox rose up situated between a Federal Superfund Site and a thirteen acre parcel where a few thousand tons of paint was buried; from 2011 to the present (2015) many locals have visited the Saltbox to reminisce about their grandparents years at the Iron Works and share their own account of paint dumping in the Torne Valley. The building has come to embody a safe haven, a place of healing and recovery.

Summer camps, high school STEM programs, undergraduate study and environmental science interns have come to work at the Saltbox ERC, along with scholars, Ramapough Natives and community members. As a participatory model of recovery, the Saltbox ERC has excelled and continues to explore new ground. The question then arises why success here and not in Ringwood? While the hands-on building project is a great galvanizing tool for community action and could well be useful at Ringwood, it is the topography of that site which brings a different set of challenges. Most of the houses of the Turtle Clan are on or directly adjacent to contaminated soil. In reality relocation of the community would be the most appropriate strategy, but the community itself is divided on this. There is a sense among the people that if they relocate Ford will never clean-up what is left behind. So if a classroom/research center

were to manifest, it might first locate in an existing building like the annex to the Ringwood Good Shepherd Church.

Another distinct difference between Ramapo New York and Ringwood New Jersey is the lack of political will on the part of municipal leaders in Ringwood. To put it simply, Ringwood does not have a supervisor like Christopher St. Lawrence. Their histories are also different for Town of Ramapo NY never willingly took part in paint sludge dumping while Ringwood NJ opened its landfill and accessed the old mines for Ford dumping.

In June of 2014 when representatives from the Mohawk Nation came to participate in a Medicine Garden dedication, they emphasized building into the future. As the final chapter illustrates, assembling a structure is not unlike planting perennials, its value is in the commitment to carry on.

Chapter Eleven

The Medicine Garden

Evan T. Pritchard, whose journey back to his own native traditions is chronicled in *No Word for Time*, explains that in most Algonquin languages there is no word for time that time is relative and elusive in nature. There are words for day and night, for sunrise and sunset, for one lunar cycle, one yearly cycle, youth, adulthood, and old age, "…but no word for an absolute time which measures the Universe from outside of it." [208] He explains that the idea of time draws distinction between the past and the future; that stories of the past and prophecies of the future are all related to the present. Max Oelschlaeger, professor of philosophy and author of *The Idea of Wilderness*, has written that in the deep Paleolithic Era people believed that time was synchronous, folded into an eternal mythical present; it wasn't until the emergence of the early Judeo/Christian ideas of nature that time became diachronic and headed somewhere. [209] Quoting a Haudenosaunee teaching, Winona LaDuke in her book *All Our Relations*, tells us, "Our past is our present, our present is our future, and our future is seven generations past and present." [210] Pritchard and LaDuke speak of this in a contemporary sense, while Oelschlaeger, a well-recognized scholar on the evolution of environmental philosophy, speaks of this notion of synchronous existence as an artifact of deep history, as the stuff of myth. His conjecture on historical ideas of wilderness has merit, but his marginalizing the reality or perhaps the alternate reality of "native time" illustrates the wide gap between Western Technocratic culture and the native way. This is the place that the Ramapoughs, like all native people, find themselves; in a world within a world, a people

occupied by a dominating ideal, one that is antithetical to the very foundation of indigenous thought.

The contemporary ideas of environmental remediation and ecological restoration, loaded with feasibility studies and assessment reports, are industrial methodologies that buy big polluters time; just as the *Mann v Ford* battle was measured out in time: the judiciary expecting hundreds of interviews and examinations which dragged the process beyond the time prosecutors were up for, Ford meanwhile claimed a failing economy threatened their ability to pay out in the not too distant future, and the Ramapoughs faced with the realization that even a weak settlement might be helpful in the remaining days of a fading life. All of this being a construct of linear thinking, it folds into a directionality that would appear as inevitable as the coming of the automobile. Clearly, the insatiable hunger of an industrial economy cannot continue mining non-renewable resources and yet fossil fuel remains our number one energy source, as if ordained to be so. In much the same fashion, the average American diet offers little or no nutritional value and can in fact deplete the immune system and lead to a life time of debilitation; still, mass produced junk food remains the sustenance on which a population feeds. This acquiescence to a given industrial norm, as a standard, has much in common with Oelschlaeger's early Judeo/Christian sense of time, a given directional standard. It would appear that once an economy has taken root, its linear growth is unquestioned. This is the philosophy that initiated Fordism.

Before Henry Ford developed his brand of scientific work management, the auto shops were the work place of craftsman, tinkerers, and designers, all inter-mingled, and auto production was a unique and expensive art. With Fordism, the range of skills per

worker was limited, manual redundancy became a norm, no single soul was indispensible, and reasonable wages justified the loss of craft. Ford did not invent mass production or the assembly line, he perfected it and in so doing, he worked his philosophy into his lifescape. With visions of a pure simpler time, as exhibited by his McGuffey Reader Museum, Ford's role in American anti-Semitism can be seen as another side of his control management philosophy. In this light, Fordism and anti-Semitism are cut from the same cord. Given the pro-Ford sentiment exhibited by the National Socialists, the "assembly line" methodology incorporated into the efficient mechanization of their death camps harkens back to the darker side of Fordism. Just as the man reinvented his own background and romanticized his Americana sensibility, he condemned an entire people and offered a system of population management. A coward to the end, he accepted the honors Hitler bestowed upon him but was careful not to openly support Nazism, while advocating that the longer the war continued the greater the profits for his company. It is this supremacy that the auto industry brought into the Ramapo Valley and effectively reined as one of America's more successful producers supplying the populace with the vehicle of upward mobility. The watershed served to supply a resource and a disposal site until the mountains of wasted paint sludge took their toll. The "lesser" population demographic was never a concern other than other than some untidy business along the periphery. Like Gaventa's miners, the Ramapoughs and their non-native neighbors are collateral damage for a multi-national industry. Ford's old alliance with fascism speaks volumes to its profit oriented single mindedness just as it's long term damage to the watershed undercuts the promise of a secure upward mobility.

The Ramapoughs may be the front line of contamination but the toxic cocktail mixed by Dupont and served by Ford is for all of us.

The Ramapough Nation, not unlike other marginalized and exploited rural communities, are pawns to the industrial standard, but the back pockets of rural life that cling to an indigenous sensibility do have a life line: what is native and survives contamination by a dominant class transcends it. This transcendence does not return them to a restored past, for restoration wrapped in the cloak of nostalgia is meaningless. It is through the tradition of storytelling that native people survive; wounded, yes; changed for the journey, certainly; but for the experience, a little further beyond an acquiescent role. They are not without their own linear thinking: earning a living, paying a mortgage, writing a paper, but this is tempered with an ever changing environment. Nature changes in cycles, it was from their close proximity with nature that their cyclical view of existence emerged. Existence does not pull away, it returns; not always in the complete form of its previous self but in a continued renewal of its unfolding pattern. This renewal is not about a fabled journey toward perfection, in fact cyclical unfolding can lead to any number of possibilities; in that there is a certain anarchistic potential. Herein we find the challenge of restoration ecology: genuine renewal allows for a greater potentiality, put simply there is no clear path back to the garden. As William Jordan has indicated, an ecosystem can survive and flourish but only on radically new terms, that is to say it follows a kind of self unfolding. Just as Frank has indicated, the narrative voice speaks out of the experience of the wound and in so doing partakes in the process of recovery, a self-directed recovery.

For the Ramapoughs of Ringwood, their narrative voice has now led them to shaping a renewed effort for the proper Health Surveillance Analyses.[211] On July 30, 2013 the New Jersey Department of Health (NJDOH) and the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) met with Chief Mann and about thirty five residents of Upper Ringwood to address health concerns. This meeting, called by Mann and supported by the community, established a commitment from NJDOH with the support of ATSDR to continue periodic meetings in the form of a health issues interest group. This group is intended as an open forum for community members and representatives to express concerns about health, define questions, discuss solutions, tell stories, and advise the NJDOH. Previous health investigations on behalf of ATSDR produced a Public Health Assessment (PHA) in 1989, concerning the Ringwood Mines/Landfill site. After a partial remediation, the site was delisted but the community continued to testify publicly as to the high levels of exposure, and new investigations brought ATSDR and NJDOH back to Ringwood for another draft PHA which was produced by 2006. This draft recommended additional characterization to better understand potential health impacts. The Ramapoughs contend that the DOH comparative analysis of cancer rates included state wide population demographics, and in so doing did not present a true and accurate study of the Upper Ringwood cancer cluster. They also contend that data collected by the New Jersey State Cancer Registry, covering the period of 1979 to 2002, does not indicate the exponential rise of illness in the community as it needs to cover a comparable portion of years before the Ford dumping in order to measure the increase in cancers and other related illnesses. They call for an update of age-standardized incidence ratios (SIRs) through 2011, as well as the comparative

analysis of cancer occurrence previous to Ford's presence. They call for a wider range of cancer groupings, including: prostate, breast, ovary, cervix, lung, bronchus, colorectal, urinary bladder, non-Hodgkin lymphoma, melanoma, leukemia, kidney, pancreas, thyroid, brain and central nervous system, and liver. They have also called for a more thorough calculation of age standardized mortality rate ratios (SMRs), as well as a study of the occurrence of adverse birth outcomes, specifically low birth weight and prematurity.

This pro-active stance on the part of the Ramapough community represents a coming to terms with their wounded narrative. It appears that after failed regulatory actions and remediation, disappointing judicial experience, and little more than lip-service on behalf of governing agencies; the Ramapoughs are left to their own device. For the future of this native community, the clean-up is something of a last stand. Being at the epicenter of contamination does not bode well for a continuance of traditional family structure. Native author Ward Churchill has spoken of the final stages of cooptation that in his words can lead to extinction. In a macabre fashion, white middle class society suffering from a shallow materialistic ethic seek to invest themselves with the trappings of the indigenous; while playing "Indian" on the one hand, they maintain an industrial economy that on the other hand condemns the native population.[212]

For the Ramapoughs, it is the loss of eldership that strikes a severe blow to their future. The elder is the keeper of the stories, the bearer of wisdom which only the years of experience can bring. In the pre-Ford years, even during Ford's tenure at Mahwah, centurions were not unusual; the average life span ranged in the high 80s and low 90s. As a boy, my father used to bring me to people whose earliest memories included the Civil

War. Today, more than thirty years after Ford's departure from the Ramapo Valley, eldership ranges in the mid-sixties to mid-seventies, with a few stalwart seniors reaching into their eighties. According to Chief Mann, they have lost twenty years in the median eldership age expectancy. With the loss of the true keepers of the knowledge, the stories are in danger of being lost. It is for his reason that the wounded storytelling must carry on, must be nurtured.

At the Good Shepherd Church in Ringwood the community gathers for service at noon on Sunday, followed by repast in the meeting room where even on a record cold January the grandmothers can be heard sharing their stories. Reverend Stephen M. Rozzelle, a gentle unassuming man, comes alive with spirit every Sunday sermon, talking gospel and sharing personal anecdotes that illuminate the Christian word. On a recent frigid Sunday, after a reading about John the Baptist's arrest and Jesus initiating his church (Matthew 4:12-23) Reverend Rozzelle talked about how Jesus took a terrible event, the arrest and murder of John, and chose to start his church, not a building so much as an association between the people and God. The reverend (who prefers to be addressed as Reverend Stephen) then walked down the aisle indicating various members of his little congregation and celebrating their achievements over adversity. He shouted, "You are my heroes!" and he thanked them for the opportunity to serve them. While it was never mentioned, the one common un-daunting challenge, like a constant ghostly presence in their lives, was just outside the window leaching into the creeks and groundwater, slowly migrating to the Wanaque Reservoir.

"Yes" he proclaimed, "I am blessed to be among heroes!"

William Jordan has written that, "Attempting to rescue a landscape from history, the restorationist moves inevitably toward the discovery that there is no escape from ecology." [213] He believes that while ecological restoration has been criticized as nostalgia, it is in fact the opposite; not a romantic daydream of the past, but a struggle with time and change. He conceived an idea of the process of entry into community, which included four stages which he believes provides an ideal, a "unique contest for negotiating stages in the development of a relationship between ourselves and the classic landscape"[214] These stages include: achieving awareness of the other; getting a job and learning the language; the exchange of gifts; and, resolving ambiguity. The first stage is in reference to that intractable other that sometimes accepts and sometime resists our efforts at restoration. The second stage includes the purposeful exchange of goods and services with the other, as well as entering into a dialogue with non-human nature in its own language, that is to say the language of action and performance. The third stage involves the replacement of the quid pro quo economic standard with the offering of a gift; in other words, an open ended exchange that transcends the purely economic. And the fourth stage, about resolving ambiguity, comes as a result of the gift exchange cycle which does not guarantee equity of the relationship. This, Jordan suggests, is the prime function of ritual.

Of these four stages, the Ramapoughs meet them with varying degrees of success. First there is the encounter with the intractable other, something the Ramapoughs have a long history of experience with, as native people they have struggled for generations with the other found in a dominate white suburban society, seldom accepting native identity and usually demonizing the rural population. The Ramapough's sense of restoration

ecology is informed by their deep personal relationship with nature and their sense of kinship to a contaminated landscape. As for the purposeful exchange of goods and services with the other, their ritualistic embodiment of a relationship with both predator and prey accounts for this, along with their non-Western animal-speak sensibility. Jordan's third stage concerning the idea of 'the gift' as well as his fourth stage resolving ambiguity is very much a part of the Ramapough 'way of being'; but, this also presents a conflict in terms of their dialogue with government regulatory agencies. In order to grasp this concept and resolve its inherent ambiguity, ones must move beyond the limitations of classical liberalism. As Jordan indicates, "It may be that the higher values of beauty, community, meaning, and the sacred are no longer available to us". [215] Here he is speaking of the dynamics of faith and suggests that the flourishing evangelical religion could represent a step in an appropriate direction. Interestingly, Max Oelschlaeger also makes a case for an ecumenical focus after working with a thesis informed by Lynn White's theory of Biblical roots for environmental degradation. Coming to terms with the power of the faithful, as exhibited in the 1960s Civil Rights movement, he looks to a similar galvanizing force informed by faith, to construct a restored and equitable relationship with nature. [216] This may be the root of the popular contemporary trend toward native human/nature relationship, of all the faith based beliefs indigenous faith rooted in a naturalistic dynamic lends itself to a consumer oriented 'ready mix' answer. It is noteworthy that much of the same "wanna-be" native mentality can be found among those people who deny the Ramapough their place in history.

Still, if we are to accept Jordan's understanding of true ecological restoration then by his own definitions we find the Ramapoughs, as we could find most indigenous

nations, speaking the alternative language, telling the alternative histories, and as Linda Tuhiwai Smith has noted, sharing the alternative knowledge. In my work, I cannot say that I know that this will happen; I can only say that I have faith that this can happen. In order for this to come about, we as a society will need to get beyond what Calvin Martin identifies as our "ethnocentric bias" that is the "tendency to interpret another culture using the norms and values of one's own culture as a point of reference".[217] This brings me back to the June 28th, 2008 meeting referred to in chapter five as a "stake holders meeting" where in I asked why the Ramapoughs hadn't been invited to attend. I was told that those of us there: Ford, the DEC, DOH, County Health Department, United Water, etc. constituted the parties of interest in respect to the paint contamination in the watershed. I asked again, indicating that Ramapoughs, who were the primary population impacted by the paint, seemed like a party of interest to me. But the conflict was in how the phrase "stake holders" was being used. The parties of interest, according to Ford, were those people who were least affected by the contamination, clearly they would be the most unbiased, in terms of a "final decision" as to what course of action needed to be taken. What was not stated, but I submit easily extrapolated by this inference, is the notion that the ill community was not the overriding concern, rather this was a meeting focused on dealing with some unsightly pollution and therefore a discussion about landscape cosmetics. But if remediation is to be followed by restoration and have any meaningful purpose then the acknowledgement of the wounded native storytellers must be a part of the work.

During the winter of 2013 and well into the summer of the same year remediation of the Ramapo Well Field, known as Operable Unit–1 (OU-1) took place, making this the

second Ford industrial recovery site in Rockland County, NY; the Meadows in the Village of Hillburn a few years earlier was the first site to be cleaned up. The strategy for the clean-up at OU-1 included weekly on site briefings with members of Arcadis (over site remediation management team), Environmental Quality (excavation contractors), DEC, Ford, and the Town of Ramapo representatives. Although I played a role as citizen advocate that helped initiate this project and was identified as working with Cornell University[218] where I held the position of environmental educator at the time, eventually I was given an official title as Town Restoration Consultant and therefore was identified in the minutes as either working with the university and/or with the town.[219] Ramapoughs are in association with the Ringwood N.J. site and although there are Ramapoughs living in the Village of Hillburn N.Y., the well field site (OU1) is at some distance from the village proper. The closest houses to the site include the Ramapo Hamlet which is just north and across the Ramapo River, and a small section of East Hillburn which is just south and also across the river. Directly across the river from the site is the St. Lawrence Community Center and football field, which was of some concern and required careful air monitoring during the excavation. Other than that, the site is bounded by the Ramapo River along its east flank and by a transportation corridor on the west flank (State Route's 17 and 59, the NJ transit railroad tracks, and the NYS Thruway). Local memory still recalls some iron workers homes at this site and it is believed this was a community of polish iron workers. While some Ramapough Indian members live at the Hamlet, as well as in the Village of Hillburn, there is not the tight association of native residents that can be found at the Ringwood site. Still the historic landscape in the Torne Valley reveals a great deal of native presence as indicated by Ed Lenik's work documenting early rock

shelters and 19th century map locations, such as the Mineral Springs along the Torne Brook, a reference to native areas associated with 'healing'. Then of course, there is the prominent Torne Mountain ledge overlooking the valley and associated with early Dutch iron masters and indigenous culture (see chapter two).

The clean-up operations at OU-1 carried on through the spring and by early May, Chief Perry asked if a medicine garden could be worked into the restoration plan. I took this request back to Ford and proposed a sizable plot (approximately half an acre) be designated for a medicine garden and that Ford was to build this with a deer fence, gates and top soil. The garden would be for the use of Ramapoughs and my undergraduate students, planting and harvesting medicinal and ceremonial native plants, (sweet grass, sage, cedar, etc.). While the extraction of pollutants in the well field was moving along fine, this addition of a medicine garden did not sit well with Ford. In the coming months, we would continue to negotiate with the auto maker as to the necessity of the garden in the restoration plan. At one point Ford offered the cost of the garden construction, being two thousand dollars, to the town for us to build it ourselves, but we held firm that Ford must build this as a token of their commitment to healing the earth and acknowledging the native way. It wasn't until the middle of the summer that Ford finally agreed to do this.[220] By August 28th, with the completion of the main section of OU-1, a total of 37,783 tons of waste material was shipped off site with a small area that could include approximately another 3,000 tons of material to be excavated later in the year, bringing the total just over 40,000 tons of contaminated waste material to be shipped off site. This marked the completion of the first of three proposed clean-up operations on the New York side of the border.[221]

This was a victory in terms of wetland recovery and well field protection, with the proposed medicine garden held off, as a result of the additional waste that needed to be extracted in November. But now the main focus was on OU-2 which is further up the slope into the Torne Valley and adjacent to the Saltbox ERC site. A discussion on a revised feasibility plan was set for October 25th but in the meantime I had to deal with a health issue which demanded attention.

Two years earlier in 2011, I had undergone intestinal surgery for a tumor in my colon. My post-op tests were good and there was no need at that time for any follow up procedure or treatment. Early in August of 2013, tumors were discovered in my liver and I was diagnosed as having contracted Stage Four Liver Cancer. Working with Sloan Kettering and with the Schachter Center for Complimentary Medicine, I combined chemo therapy with Vitamin C infusion drips and reduced the tumors to an operable state by late October. Sloan was ready to operate on October 25th, but as noted that was the date to hash out our response to the feasibility study. I was more than eager to attend the study meeting, as Ford's latest proposal offered what I surmised to be a "back-peddling" proposal which included some "capping" of the paint sludge. So I set the date for surgery on October 29th and wound up attending the Ford meeting on the 25th which was held in Westchester County, across the Hudson River from Rockland. My attendance at that meeting was useful in keeping Ford focused on the need to do a full extraction. But more than that, toward the end of the meeting Town Lawyer Michael Klein added a request for a second medicine garden to be built at the OU-2 site. While Ford's lawyer was none to willing to entertain this idea, Mohammed Zakkar (representing Ford headquarters in Dearborn Michigan) openly discussed the ideology around the medicine garden concept.

He was willing to commit Ford to a second garden, despite the fact that the first one was yet to be built. Then I requested that he personally attend our Healing of the Earth Ceremony at which we planned to dedicate the first of the two gardens, and I asked that he speak there as well. To their own lawyers surprise he agreed and said he would even bring his family to attend. Given the fractured relationship between the Ramapoughs of Ringwood and Ford, I found this to be a significant advance toward a more equitable understanding, with hope that building on actions like these we can one day find peace for the Ringwood Community.[222]

A few days later, my surgery went well and the post-op work is showing excellent signs of recovery. That I too have suffered cancer like so many foragers and hunters here in this Ramapo region is unfortunately not unusual. That along with the prayers of friends, family, and the little congregation at the Good Shepherd Church in Ringwood spoke words of faith on my behalf, is truly a gift and a reminder of the power of story. The building of the Ramapo Saltbox Environmental Research Center is an act of recovery. Community members, children, college students, Ramapoughs and descendants of the iron works community assembled a structure to house our work of recovery. The medicine garden built on top of lead paint excavation is another act of recovery.

According to ethno-botanist Daniela Shebitz, sweet grass once prevalent in this area has declined as a result of a shift in harvesting practices; from carefully breaking the stem off at the base to pulling the plant up which takes up the roots or at least damages them. In addition to this impact, the absence of controlled burning might also be responsible for the decline. Shebitz interviewed elders from the Akwesasne Territory who recalled burning to encourage sweet grass growth. This burning was low intensity, small

in area, and conducted in the spring. This practice was believed to put nutrients back into the soil.[223] Renewing the soil, bringing life back to a damaged place, surviving contamination, it is all a part of the same story; the story of recovering from the wounds.

The wounded narratives of the Ramapough people, who along with their Christian faith, maintain a native presence as true stewards of the land. Anastasia M. Shkilnyk, in her study of the struggle of an Ojibwa community to survive industrial mercury poisoning, has told us, "All matter was related to the energy of the universe, and both man and nature were endowed with life by the Great Spirit."[224]

Summary:

Toward the middle of the 20th century among the Ramapoughs there were root drinkers, foragers, and basket weavers. There were storytellers who had childhood memories of the Civil War, the emergence of the BIA, and the early 20th century eugenics movement. Hunters offered a prayer over their kill and spoke in a hushed respectful manner about the spirit in the flesh they ate. So much of this is gone now. It has gone to the colonialism that has marginalized native culture with public education and the tools of a homogeneous society. Certainly there are other factors such as popular culture, television, Hollywood, etc. but key to the loss of traditional knowledge is the loss of eldership. Traditional societies are measured by the significance of the elder's role as historian, teacher, mentor, and the voice of the people. According to some community members, Ramapoughs have lost twenty years of longevity and what elders have survived are entirely focused on their health and that of their surviving family members; reclaiming language, ceremony and regalia while struggling with a less than supportive

medical system has been a constant in the lives of these people. The focus of this study has been to trace the tenuous native identity through the circuitous maze of social and industrial dominance, many have suffered impact but the Ramapough have an additional tool of survival: that which is left of their traditional knowledge. Theirs is not a story of desperately clinging to a romanticized past but a re-emergence of that which makes them whole.

In the spring of 2013, well into the remedial work at the Ramapo well field, Chief Perry and Charlene Defreese requested that along with forest restoration Ford build a deer fence for a medicine garden. This garden, to be sited at the heart of the clean-up, was for the Ramapoughs a part of the recovery process. They requested sweet grass, sage and eastern cedar. Having already incorporated eastern cedar into the restoration plan, we focused on the sweet grass for this first season. Ford having spent $15 million on the remediation and $70 thousand on reforestation had no interest in spending another $2 thousand for a deer fence installation. Chief's Perry and Mann believed that the clean-up was one hurdle but recognition of the Ramapough Indians was entirely another. Mann observed that a medicine garden honors the earth and that this was not a part of Ford's agenda. So well into the summer of 2013 the town of Ramapo continued to negotiate for the garden, and eventually Ford agreed. With the dedication of the garden on June 8, 2014 a small but significant milestone was reached. Since then Daniela Shebitz has joined the project and we have instituted a series of experimental sweet grass plots in the garden to study the effects of controlled burning.

The garden covers half an acre and holds a prominent place in the well field. It is a simple thing, a token to the people and to the land. It is recognition that at this place

something was done, something bad and that eventually something good was done to correct it. It is a reminder that with time and will power, community and commitment, people can come to terms with existence. Creator has not deserted us; it is we who need to find our way back to Creation.

Epilogue

A Story Continued

I walked into our family's paint shop on a warm, not hot, summer afternoon. Uncle Mal and my dad, Walt, were inside with Mal standing by his coffee counter talking about something. He was not happy; he bit off his words and shook his head in disapproval. Walt sat on an upturned wooden milk crate smoking his pipe, listening. I hunkered down by the folded canvas drop sheets and rubbed shop dog Mike's belly to which he responded with a pleasurable moan.

Mal said, "I'm telling you the man's all mixed up. You see he's got it in his head that he's sending messages to the future by tossing Ford car parts into the paint waste barrels. He told me himself, he said, he figures that one day somebody will find the paint and see by the parts that it came from Ford and then they'll know who to go after!"

Walt nodded.

Mal turned to pour himself some more of his infamous bitter shop coffee. "Never mind that he's only been working there for ten years and the job keeps his kids dressed decent, food on the table, and he drives a Ford himself; no what pisses me off is his hair brained idea that somebody would someday actually dig through the old paint looking for Ford's fingerprints!"

Walt smoked and continued to say nothing.

"Look Walter, you and I both know there's not a damn thing wrong with lead paint. Hell, I read an article that said it was the safest thing to paint your infants room with. You and I do a house and the lead finish will hold for years to come but if we got to go to water based latex it won't hold, the customer will blame us for that. No sir, it's that

damn Rachel Carson with all her knee jerk liberal friends have got everybody worked up!"

Walt drew the pipe from his mouth and said, "Wasn't she talking about DDT?"

"Huh? Oh yeah that's right but it's the same dam thing, you got something that works lets tear it down. No sir, John Maloney has got it in his head that the paint dumping is dangerous. I tried to tell him there was nothing to that but no, he sees the barrels going out at night and he figures this means it's illegal."

Walt said, "Well, they are doing it after hours."

"And so what? You catfish after hours, does that mean it's illegal?"

Walt shook his head.

Mal said, "The man actually thinks some jack ass will go chasing after Ford and get them to dig up all that old paint of theirs." He looked at me. "Chucky, you seen any paint dumping up in Torne Valley when you're up there with your traps?"

I shrugged. "I've seen some trucks and I know where they use one of the backhoes to dig trenches. They're doing it at night."

"Yeah, I know you've told me that before but you ain't actually seen them dumping, have you?"

"No, they do that later in the night after I've been through."

Walt looked in my direction and said, "If you do see some dumpers you steer clear of them, you hear me?"

I nodded. I knew he figured they wouldn't be happy about being seen. I knew this 'dumping' thing must have been illegal or else why would they be doing it late at night and burying as well? Mal and Walt got on to other topics. I walked outside with old Mike

following me into the shop yard. I looked across Route 59 at the entrance to Torne Valley Road. I hadn't been up that way since the end of trapping season last March. So leaving the dog behind at the shop, I went across 59 and started up into Torne Valley. Not too far along the way I came to a large stone with a plaque on it; this was the historic marker for the Ramapo Quarantine Grounds, a place that during the American Revolution soldiers who were sick with 'fever' and consider contagious camped. I turned around and looked back across the little clearing up against the mountain; here is where the annual turkey shoot takes place. Ramapough Indians and non-Indians alike gather and fire shotguns at little targets. Up a little further on the right is a place we call Crows Hollow where my Uncle Inky was attacked by a flock crows when he shot one. I wondered if the spirit of the American Revolutionary sick patients saw Inky chased by the crows or if they attend the annual turkey shoot with the Ramapoughs. This place always made me think about history, about how some little things that happen now can tumble into bigger things that happen later. And I believed at the time that there was nothing in my life at this place that would play out in the years to come. The following winter I would kill a fox, have a vision, and decades later find some paint.

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[1] Skinner, Charles M., *Myths & Legends of Our Own Land*, (1896) vol. 1, fourth edition, J. B. Lippincott Company, Philadelphia & London, "The Ramapo Salamander", p. 53.

[2] Skinner actually based his interpretation of the Salamander Legend on a manuscript edited from the papers of Ernest Helfenstein entitled *The Salamander: A Legend for Christmas*, edited by Elizabeth Oakes Prince Smith and published by George P. Putnam, 155 Broadway NY, NY 1848. In her introduction to Helfenstein's version, Smith identifies the setting as the Augusta Falls Furnace (Tuxedo, NY) which is just about a mile north of Torne Mountain. Both Smith and Helfenstein are given to romantic excess in their narratives but this early text with its footnotes and edits offers background on the Germanic/Rosicrucian influence in the Valley Iron Works. Helfenstein even notes that in his own time the superstition of the Salamander in the flame of the hearth was still very much alive.

[3] Ransom, James M., *Vanishing Ironworks of the Ramapos*, 1966. Rutgers University Press, N.J. "Peter Hasenclever and the American Company" pp 17-27.

[4] Ibid, pp 177-191

[5] Green, Frank Bertangue, *The History of Rockland County*, 1885, A.S. Barnes & Co. NY, p. 167

[6] Ibid, "The Ramapo Valley, or Sidman's Pass, was the great pathway from West Point and new Windsor to the country south of the Highlands, and was in almost constant use by some portions of the army from 1776 till the close of the war…remains of the intrenchments are still visible.", p 82

[7] Pierson, Edward Franklyn, *The Ramapo Pass*, 1915, edited by H. Person Mapes, 1955, pp 101-102

[8] Cole, Rev. David, *History of Rockland County*, 1884, J.B. Beers & Co., New York, p 273

[9] Ibid, *The Ramapo Pass*, 1915, p 136

[10] Ibid, p 126

[11] Cole, p. 274

[12] Hungerford, Edward, *Men of the Erie*, 1946, Random House, New York, p 16

[13] Pierson, pp 153-160

[14] Ibid. p 161

[15] Throughout the nineteenth century shooting parties often fired upon game from a boat, this along with 'Jack Lighting' a nighttime hunting practice was eventually outlawed in the twentieth century as being un-sportsman like.

[16] Pierson, p 149

[17] Ransom, p 129

[18] *Historical and Statistical Gazetteer of New York State*, 1860, p 571

[19] The Wheel and Foundry Company produced at such a high standard that, "…the Russian Government gave a large order for them for one of their great railway lines. At the Vienna Exposition of 1873, the wheels of this company took the prize over all competitors." Penfold, *Romantic Suffern*, p. 79

[20] "The success of the new strategy depended upon labor's willingness to accept regimentation, unilateral managerial control of shop floor decisions, and higher effort norms in exchange for the chance to earn relatively high wages." Comments on Fordism as a strategy from *On the Line*, Chap 2 "Fordism and the Moving Assembly Line: the British and American Experience", 1895-1930, by Wayne Lewchuk, p 24, edited by Nelson Lichtenstein and Stephen Meyer, pub University of Illinois Press, 1989

[21] For further information on the Lavender story see Carl Carmer's *Dark Trees to the Wind*, 1949; as well as Jan Harold Brunvand's *The Vanishing Hitchhiker*, 1981 pub W.W. Norton & Company; and to read Uncle Mal's version see *Back Porch Stories*, 2002, by Chuck Stead, pub. Back Porch Productions.

[22] Kraft, Herbert C., *The Lenape-Delaware Indian Heritage* (2001), Lenape Books, p. 544

[23] During this time I attended a dance ceremony by Ramapough children under Oestriecher's direction in Orange County, New York. I found Dr. Oestriecher to be an affable and sincere educator, although I did not get the impression that he thought much of the Ramapough's native credibility. We chatted briefly but when he learned that I was from the Village of Hillburn (one of the three villages associated with Ramapough clanship) he drew away.

[24] Salomon identifies Munsee as one of three tribal divisions of the Delaware (Lenape) Nation: Munsee were the northern tribe associated with the wolf totem, the Unalichtigo were more to the south along the Delaware River and were associated with the turkey totem, and the Unami were through the center of New Jersey associated with the turtle totem. The modern day Ramapoughs have maintained a turtle clan in Ringwood NJ, a wolf clan in Mahwah NJ, and a deer clan in Hillburn NY, although the contemporary Ramapoughs consider themselves all to be Munsee Lenape. Salomon also points that Munsee, "like other Indian names, is spelled many ways, including: Minsi, Muncy, Munsey, Minisink, Muncie, Monsey, Menessinck and Munsi". See *Indians of the Lower Hudson Region*, p 14

[25] Salomon, Julian Harris, *Indians of the Lower Hudson Region, the Munsee* (1982), Historical Society of Rockland County, p. 67

[26] In 1980 there was great enthusiasm in the Ramapo region over the rumor of Salomon's soon to be released book. I arranged for him to attend a Ramapough Nation speaking engagement at the village of Spring Valley Finkelstein Library in the town. In advance of this event he invited me to his home in Village of Suffern. There he talked at length about what he called the Ramapough Identity issue. It was his expressed belief that while the community may well have been of Lenape ancestry, it was the lack of a continued native civil structure, dress and language that would hold up their BIA recognition. Having not yet seen his manuscript, I asked him if his sensitivity to their plight was in print. He offered me little hope that he had written any such commentary, although he did tell me that he "left the door open."

[27] Ibid, p.74

[28] I have long considered how to approach this racist phrase in this work, but still hearing it in common use by supposedly intelligent society necessitates some deconstruction. It is with that in mind that the reader will only find this phrase referenced sparingly, and only in terms of breaking down its place in society.

[29] In the interest of full disclosure, my family name and my own father were portrayed in Cohen's book as less than admirable. My intent in analyzing his work is not to seek revenge but to come to grips with potentially corrosive academic methodologies.

[30] Lenik, Edward J., *Ramapough Mountain Indians: People, Places and Cultural Traditions* (2011) The North Jersey Highlands Historical Society, p 1

[31] Pritchard, Evan T., *Native New Yorkers, The Legacy of the Algonquin People of New York* (2002) Council Oak Books, San Francisco, p 266

[32] Kraft, Herbert C., *The Lenape-Delaware Indian Heritage: 10,000 B.C. – A.D. 2000* (2001) Lenape Books, p. 12

[33] Ibid, p 8

[34] Ibid, p 6-7

[35] De Forest, John W., *History of the Indians of Connecticut from the Earliest Period to 1850* (1851) Connecticut Historical Society, p. 359

[36] Ibid. Lenik, p. 6-8

[37] Ed Lenik has pointed out that noted linguist, Raymond Whritenour suggests that Ramapo/Ramapough means "under a rock" or "beneath a rock" from the Delaware word "Allamapuchk", which describes the numerous rock shelters in the mountains, (this from conversations with Lenik during the summer of 2013).

[38] McMahon, Reginald, *Ramapo: Indian Trading Post to State College* (1977), Ramapo College of New Jersey, p 1

[39] Nancy Gibbs, a colleague of Ed Lenik, has done extensive research on the life of Blandina Bayard, who participated in a number of historic negotiations. The author is thankful to Gibbs for her generosity on the subject, as Gibbs has yet to publish her work on the Bayard/Kiersted Indian trading post.

[40] Lenik, Edward J., *Indians of the Ramapos, Survival, Persistence and Presence*, 1999, North Jersey Highlands Historical Society, p 49

[41] Lenik, Edward J., *Ramapough Mountain Indians: People, Places and Cultural Traditions* (2011) The North Jersey Highlands Historical Society, p 11

[42] Ibid, Kraft, p 463

[43] Ibid, Salomon, p 56

[44] Ibid, p 65

[45] Green, Frank Bertangue, M.D., *The History of Rockland County* (1886) A.S. Barnes & Co., NY, p 11

[46] Pierson, Edward Franklin, *The Ramapo Pass* (1915) family history published for the Homestead Ramapo, p 174-5

[47] Ibid, Lenik, p 20

[48] Ibid, Lenik, p 22

[49] Ibid, Lenik, p 160

[50] Ibid, Lenik, p 162. In my own family history the preferred 'clothes basket' as well as split reed 'game basket' was traditionally purchased from the Ramapoughs. In the early years of the twentieth century a Ladentown store keeper marketed locally carved spoons, bowels and hand woven baskets but when that market faded in the 1920s locals had to go directly to the crafters homes for the ware. The last locally made clothes basket my father purchased was in the late fifties from a community member on Stag Hill in Mahwah, NJ.

[51] "Agency says Tribal Status is in Doubt: Decision Damages Chances for Casino" (1993) New York Times, Dec 4

[52] Smith, Linda Tuhiwai, *Decolonizing Methodologies* (1999) Zed Books, London/New York, p 56

[53] Storms claimed that his 'prostitute' story was recorded in the Colonial Newspaper *Rivington's Loyal Gazette* but this was never corroborated by other researchers. In 1980 I spoke with Ann Lutz, a local research historian who knew Storms and had questioned him about his story not being found in the Colonial Gazette. She had told historian David Cohen that Storms said someone must have destroyed those pages of the Gazette, but when I spoke to her some years later she told me he admitted that he made up the story.

[54] Cohen, David Steven, *The Ramapo Mountain People* (1974) Rutgers University Press, p 42

[55] Ibid, Salomon, p 60. I am grateful to Mark Wamsley, a graduate student with Empire State College of New York, for bringing this to my attention.

[56] Cohen did not consider the archeological evidence pertaining to Indians in the Ramapo Mountains. Lenik's data shows that the mountains were occupied by bands of Indians beginning around 12,500 years ago and they continued to inhabit the area into the historic times. See Lenik's *Indians in the Ramapos* (1999) especially chapter six, "Continuing Presence of Indians in the Historic Period: Historical References, Observations and Folklore", p 47 - 54

[57] Oestreicher, David M. "Unmasking the Walam Olum: A 19th-Century Hoax", 1994*, Bulletin of the Archaeological Society of New Jersey*, p 1. Oestreicher's paper was originally entitled "The Deconstruction of the Walam Olum: A 19th-Century Hoax" delivered on October 30, 1993, at the Algonquian Conference at the University of Quebec, Montreal; and subsequently presented at the American Society for Ethnohistory Conference at Indiana University in 1993 and then for the Archeological Society of New Jersey at the New Jersey State Museum, Trenton, in 1994.

[58] Ibid, Oestreicher, p 2

[59] Ibid, p 12

[60] Ibid. p 13

[61] Ibid. Kraft p 563

[62] Ibid. Kraft p 563-4

[63] Bierhorst, John, *Mythology of the Lenape*, 1995, University of Arizona Press, p. 37-8. See also, John Bierhorst's *The White Deer and Other Stories told by the Lenape*, 1995, New York: Morrow.

[64] Harrod, Howard I., *The Animals Came Dancing*, 2000, The University of Arizona Press, p. 20

[65] Gordon, Robert B. & Patrick M. Malone, *The Texture of Industry, An Archeological View of the Industrialization of North America*, 1994, Oxford University Press, New York, p. 380, "Taylor subsequently exploited the reputation he gained from his metallurgical accomplishments to advance his social theories about organization and control of the workplace".

[66] Cochran, Thomas C. & William Miller*, The Age of Enterprise, A Social History of Industrial America*, 1947, Macmillan Company, New York, p. 244

[67] Much of this study's understanding of Fordism is drawn from *On the Line, Essays in the History of Auto Work* edited by Nielson Lichtenstein and Stephen Meyer, in particular Chapter Two the essay entitled *Fordism and the Moving Assembly Line: The British and American Experience, 1895-1930* by Wayne Lewchuk; as well as Chapter Four *The Persistence of Fordism: Workers and Technology in the American Automobile Industry, 1900-1960* by Stephen Meyer.

[68] Ibid, Gordon p 388-9

[69] Ibid, Gordon p 390

[70] Ibid, Lichtenstein p 80

[71] Camfield, Gregg, *The Oxford Companion to Mark Twain*, 2003, Oxford University Press, New York, p 293

[72] Hofstadter, Richard, *Anti-intellectualism in American Life*, 1963, Alfred A. Knopf, New York, p 243

[73] Baldwin, Neil. *Henry Ford and the Jews, The Mass Production of Hate*, 2001, Public Affairs, New York, p 82-3

[74] Ibid, p 4

[75] Ibid, p 6, Baldwin observes that in 1936 Ford served as an associate editor on a collection of Old Favorites from McGuffey Readers which bears a dedication to Ford citing him as, "…lifelong devotee of his boyhood Alma Mater, the McGuffey Readers."

[76] Ibid, p 3

[77] Ibid, p 7

[78] Uncle Mal Stead's favorite excerpted passage from the McGuffey's series was from the Sixth Reader, "The Death of Little Nell", excerpted from Charles Dickens's *The Old Curiosity Shop*. He often lamented when in consideration of a sad loss of youthful life, "Poor little, noble Nell". This imprinting of characterization indicates the profound manner in which the primary reading selections informed the student throughout life. My father on the other hand only recalled the readings from naturalist John Burroughs.

[79] Ibid, Baldwin, p 28

[80] Ibid, p 46

[81] Renehan, Edward Jr., *John Burroughs, An American Naturalist*, 1992,Black Dome Press, New York, p 273-4

[82] Ibid, Baldwin, p 88-9

[83] Ibid, Renehan, p 274

[84] Ibid. Baldwin, p 102-5

[85] Ibid, p 145

[86] Ibid, p 172

[87] Hitler, Adolf, *Mein Kampf*, 1925, (annotated English version) 1940, Reynal & Hitchcock, New York p 930

[88] Brinkley, Alan, *Huey Long, Father Coughlin & The Great Depression*, 1983, Vintage Books, a Division of Random House, New York, p 102

[89] Ibid, Baldwin, p 311-12

[90] Ibid, Baldwin, p 312-14

[91]1948 Britannica Book of the Year, Encyclopedia Britannica, Inc. Chicago, p 91

[92] 1949 Britannica Book of the Year, Encyclopedia Britannica, Inc. Chicago, p 625

[93] 1958 Britannica Book of the Year, Encyclopedia Britannica, Inc. Chicago, p 597

[94] 1949 Britannica Book of the Year, Encyclopedia Britannica, Inc. Chicago, p 574

[95] Ibid, p 548 , also see notes on ethyl benzene a component in the making of styrene

[96] Foulger, John H. as quoted in *Toxicology and Hygiene of Industrial Solvents*, 1943 edition, The Williams & Wilkins Company, Baltimore, p V

[97] Bischoff, Henry, Mitchell Kahn, From *Pioneer Settlement to Suburb, A History of Mahwah*, New Jersey, 1700-1976, 1979, A.S. Barnes and Company, South Brunswick and New York, p 338-42

[98] Ibid, p 340

[99] Panetta, Roger, *The Tappan Zee Bridge, And The Forging of the Rockland Suburb*, 2010, The Historical Society of Rockland County, p 74, Governor Dewey also promoted the defense justification for the building of the thruway, warning, "If anyone ever does drop a bomb on New York City, you won't hear any more arguments about whether New York City needs a Thruway." P 57

[100] Lichtenstein, Nelson, and Stephen Meyer*, On The Line, Essays in the History of Auto Work*, 1989, University of Illinois Press, p 94

[101] A summary of this *Ramapo Paint Sludge Site Stakeholders' Meeting* as written by then DEC employee Karen Mariano is in the authors' collection, also available with the NYDEC archive on Ramapo Site Meetings. This summary is slight at best and did not include any dialog that in any way would be objectionable to Ford.

[102] Ervolino, Bill, "Mahwah's Ford assembly plant gone but not forgotten", NorthJersey.com, July 25, 2010

[103] Springsteen, Bruce, *Nebraska*, 1982, recorded by Columbia Records, *"Well they closed down the auto plant in Mahwah late that month, Ralph went out lookin' for a job but he couldn't find one, He came home too drunk from mixin' Tanqueray and wine, He got a gun shot a night clerk now they call'm Johnny 99"*

[104] Markowitz, Gerald & David Rosner, *Deceit and Denial*, *the Deadly Politics of Industrial Pollution*, Pub. University of California Press, 2002, p. 12

[105] Walker, Percy, & Eugene Hickson, *Paint Manual, with Particular Reference to Federal Specifications*, Pub, U.S. Dept. of Commerce, 1945, p. 15. This standardized manual describes the pigments which make up the base of lead paints for industrial and residential use and reads as follows: "White lead, a component of almost all white and light colored paints, is one of the most important white paint pigments. Both kinds, basic-carbonate and basic-sulfate, are frequently used in ready-mixed paints. For paint mixed on the job, paste-in-oil is used, whereas the dry pigment is used by paint manufacturer. The term "white lead" is used to designate the usual paste that white lead is composed of: about 91 percent of basic-carbonate white lead and 9 percent of linseed oil, or 89 percent of basic-carbonate white lead, 2 percent of turpentine, and 9 percent of linseed oil."

[106] *Lead in Modern Industry, Manufacture, Applications and Properties of Lead, Lead Alloys, and Lead Compounds* Pub, Lead Industries Association, NY, 1952, p. 152. This industry manual, published in a time of public concerns about lead paint, offers justification for the use of "lead soaps" as plasticizers in paint. "Lead plasticizes paint, increasing its flexibility. In reality paint film is a plastic, although it is not generally referred to as such…Lead soaps act as plasticizers. In multiple pigment paints their effect is supplemented by other soaps usually present in the film."

[107] Ibid Markowitz & Rosner, p. 94

[108] Francis, Magnus, *Toxic Substances in the Environment*, 1994, Pub Wiley-Interscience Publication, p. 144

[109] Franck, Ulrich, Olf Herbarth, Oliver Langer, Hans-Joachim Stark, and Alfred Treide*, Environ Toxicol*, 1999, #14: p. 439-454.

[110] *Lead in Modern Industry*, p. 55-56

[111] *Public Health Goal for Antimony in Drinking Water*, 1997, Pesticide and Environmental Toxicology Section Office of Environmental Health Hazard Assessment, California Environmental Protection Agency (CEPA), p. 9, section on Subchronic Effects

[112] *ToxFAQs for Antimony and Compounds*, 1995, Agency For Toxic Substances and Disease Registry (ATSDR), www.atsdr.cdc.gov/tfacts23.html

[113] Ibid *PHG for Antimony in Drinking Water*, 1997, p. 11, under the section Chronic Toxicity and Carcinogenicity

[114] *eco-usa.net*: Toxics: Chemicals: PCBs. 1995

[115] ATSDR, ToxFAQs: Polychlorinated Biphenyls (PCBs), 2001

[116] From 2009 through 2014 in my capacity as environmental educator with Cornell Cooperative Extension of Rockland I worked with AmeriCorps Summer Interns on behalf of the New York State Department of

Health doing outreach public education for the Hudson River Fish Advisory. Information indicated in this document references our findings during the 2009 through 2011 period primarily among the fishers and crabbers at the Piermont Pier area.

[117] Rank, Jette, "Classification and Risk Assessment of Chemicals: The Case of DEHP in the Light of REACH", 2005, *The Journal of Transdisciplinary Environmental Studies* vol. 4, no. 3, p. 3

[118] eco-usa.net, Toxics: Di(2-Ethylhexyl)phthalate, 2008

[119] Voss, C., Zerban, H., BAnnasch, P., and Berger, M.R. (2005) "Lifelong exposure to di-(2-ethylhexyl)-phthalate induces tumors in liver and testes of Sprague-Dawley rats" *Toxicology* 206, p. 359-371

[120] Ibid, Rank, p 12

[121] "BIS(2-ETHYLHEXYL)PHTHALATE (DEHP), Summary Risk Assessment Report", 2008, *Swedish Chemicals Agency*, Sweden, p 21

[122] Ibid, Rank, p 1

[123] ATSDR, ToxFAQs: Acetone, 1995

[124] *Public Health Assessment, Ringwood Mines/Landfill Site*, 2006, pub NJ Dept of Health and Senior Services, Trenton NJ p. 1

[125] *Public Health Assessment, Ringwood Mines/Landfill Site*, 2006, p. 2 In this summary section recommendations for the site include, "…the remediation of paint sludge and associated soil and groundwater contamination, characterization of potential biota contamination, further assessment of background concentrations of arsenic and other site related contaminants, and an exposure investigation of the community living on the Ringwood Mines/Landfill site."

[126] Jan Barry headed the team of Record journalists who eventually worked on this story for eight months before it went into print. Jan's narrative about how this came about was collected by means of both recorded interview and subsequent notes from personal conversation.

[127] Barry claimed that they discovered more than two dozen dump locations throughout NY and NJ. In Greenwood Lake NY, in the Western Ramapos, paint was dumped at a municipal landfill that was eventually declared a Superfund site. This landfill is along the north shore of Greenwood Lake, a recreational site with permanent dwellings in both states. This lake suffers algae growth, particularly along the north shore, where it appears to be affected by potential leaching from the landfill. This could be a highly charged phosphorous nitrogen mix migrating into the lake waters. The lead paint and volatile organic compounds (VOCs) of the paint sludge under the earthen superfund cap could just as easily migrate into these waters.

[128] Barry, Jan, Mary Jo Layton, Alex Nussbaum, Tom Troncone, Lindy Washburn, Barbara Williams and Thomas Franklin, Oct 2, 2005, "Ford, the feds, the mob: Making a wasteland", *The Record*, North Jersey Media Group, Inc. p A-17

[129] Ibid, p A-24

[130] "During the mid-1960s, as US defoliation campaigns in Vietnam were escalating, a government study conducted by Bionetics Laboratories revealed that dioxin-contaminated components of Agent Orange and

other military defoliants caused severe birth defects in the offspring of exposed animals."Van Strum, Carol, "Back to the Future: EOA Reinvents the Wheel", 1995, *Synthesis/Regeneration 7-8*

[131] Barry, Jan, "The Watchdogs Failed, Four cleanups, yet waste still is everywhere", Oct 3, 2005, *The Record*, North Jersey Media Group, Inc. p A-1

[132] Ibid, p A-7, sub titled: "How did Ford give away Toxic Land? A Puzzle Indeed"

[133] Ibid, p A-8, sub titled: "Ringwood is not the only trouble spot"

[134] Ibid, p A-9

[135] Ibid

[136] Jo Layton, Mary & Barbara Williams, "Wedded to the Land", Oct 4, 2005, *The Record*, North Jersey Media Group, Inc. p A-1

[137] Ibid, p A-8

[138] Ibid, p A-9

[139] Ibid

[140] Some of the highest diabetes rates in the country can be found among the Ramapough community, according to nurse practitioner Kathleen P. Moskin, who lives adjacent to the Ringwood site at Hewitt, NJ.

[141] Ibid, p A-9,10

[142] Nussbaum, Alex & Tom Troncone, "The Mob Cleaned Up, Big Profits from Illegal Dumping; now We're Paying", October 5, 2005, T*he Record*, North Jersey Group, Inc. p A-1

[143] Ibid, p A-16 quoted from a testimonial document written by the Penaluna family

[144] Ibid, p A-17

[145] Seldom referenced in the Toxic Legacy Series are the Volatile Organic Compounds, of which there are a number but perhaps the most concerning is Di(2-ethylhexyl)phthalate or DEHP, a plasticizer developed by Dupont Chemicals and used in the undercoating paint for auto and truck chassis. See Chap 5

[146] Washburn, Lindy, "Danger Upstream, Watershed Pollution May Threaten Our Reservoirs", October 6, 2005, *The Record*, North Jersey Group, Inc. p A-15

[147] Ibid

[148] Ibid, p A-16

[149] An examination of *Mann v. Ford*, 2013, (directed by Maro Chemayeff and Micah Fink; executive producer, Donald Everett Axinn; Producers Chemayeff, Fink, and James Redford; editor, Howard Sharp; HBO senior producer Nancy Abraham, executive producer, Sheila Nevins) is the primary theme of this chapter.

[150] For more on animal and nature sign see Ted Andrews works: *Animal-Speak*, 2000, Llewellyn Pub; *Animal-Wise*, 1999, Dragonhawk Pub; and *Nature-Speak*, 2004, Dragonhawk Pub. as well as *American Wildlife in Symbol and Story*, 1987, by Angus K. Gillespie and Jay Mechling, University of Tennessee Press; *Animal Spirit*, 2002, by Patricia Telesco and Rowan Hall, New Page Books Pub; and *Bird Medicine*, 2013, by Evan Pritchard, Bear and Company Pub. The popularity of these, and other works of similar theme, illustrates a growing interest in native philosophy.

[151] "Strangers on the Mountain" by Ben McGrath, *The New Yorker*, March 1, 2010 issue, p. 50-9

[152] This expression of a "way of being," in respect to that which constitutes the morals and social conditioning of a person, is something of a standard in the Ramapo region for both native and non-native residents. It is used in a similar way that the Yup'ik people of the Alaska tundra use the phrase "way of the human being" as noted by Calvin Martin in his work *The Way of the Human Being*, 1999, Yale University. The distinction here is that rural residents in the Ramapo Mountains shorten the phrase to include the behavior of both human and non-human beings.

[153] According to Jan Barry, Judge Harris was not a random pick and his record had long been industry friendly. Barry felt that the legal team needed to challenge his decision to work with all 647 plaintiffs, as such a decision was doomed to failure. According to Ramapo Town attorney Michael Klein, in such cases it is custom to allow for twelve plaintiff choices picked from both sides making a total of 24 to work with.

[154] Released only a couple of months after *Out of the Furnace*, *Red Road* was written by Aaron Guzikowski who previously authored the Hugh Jackman vigilante film *Prisoners*. In an interview with *Star Ledger* writer Vicki Hyman Guzikowski is quoted as saying, "I wanted it to feel authentic, and I wanted it to ring true." *Star Ledger*, 2/27/14. Mr. Guzikowski has said that he had no intention of drawing undue attention to the Ramapoughs, that in essence he was inspired by their story to create a fictionalized Lenape tribe living half an hour from Manhattan. When I spoke with Chief Mann of the Turtle Clan he agreed with what Chief Perry had said that the term Red Road was a native term for the "right path of life". It would seem that Mr. Gusikowski believes that his sensational story line is exemplary as a right path of life.

[155] Frank, Arthur, *The Wounded Storyteller*, 1995, The University of Chicago, p xi

[156] Ibid, p 5

[157] Ibid, p 3

[158] For more on White Deer and its significance for the Lenape see John Bierhorst's *The White Deer*, (1995), William Morrow and Company, Inc. New York. pp 67-75. Bierhorst tells us, "In Lenape lore the white deer has sometimes been called a master of game. It controls the other deer who are thought to flock around it or follow it. Game masters can be helpful, because they have the power to give game to hunters. But they can also be dangerous, since they need to protect their charges from hunters who hunt too often…"

[159] Many place names in Ramapo reflect early native influence, as in the name "Ramapo" which was a name identifying an area of the 'sloping rock to water' but this was first recorded by the Dutch, from an oral native source, in all likelihood, since the Lenape had no R sound in their dialect, the word was Amapock which was also a Lenape sachem or chief. The place name of Monsey, for a village in Ramapo, is

based on the Lenape tribe of the region, the Munsees, who were the People of the Mountain, also known as the Wolf Clan.

[160] Salomon's early writing includes *The Book of Indian Crafts and Indian Lore*, published in 1929 during a time when he was living in Nyack, New York, twelve miles from Ramapo, and despite the opening chapter offering a general review of Native tribes throughout the United States, there is no reference to the Ramapoughs, or for that matter to the Lenni Lenape Nation but there is a reference to the Delaware. "Delaware" is the European name given to the Lenape who lived in the region of the Delaware River which was named by Europeans, in honor of Lord Delaware. In his long awaited 1982 publication *Indians of the Lower Hudson Region: the Munsees*, Salomon again offered little on the native community in the Ramapo Mountains, despite the fact that he had by then lived most of his years in close proximity, at his residence in the Village of Suffern. This county Historical Society publication offered in its first half a generalized early history of the Lenape/Delaware and then jumped a few hundred years to its second half, which spoke in detail about regional "white" mountain dwellers. Given that the hills were populated with blacks, Indians, as well as whites, Mr. Solomon seemed interested in only the white "hill people".

[161] Andrews, Ted, *Animal-Speak*, 2000, Llewellyn Publications, St. Paul, Minnesota, p 200

[162] Martin, Calvin Luther, *The Way of the Human Being*, 1999, Yale University Press, p 44

[163] In "*the animals came dancing*", 2000, Harrod tells us, "Creative transformation of meaning are part of the broader process of reinterpretation…", he notes that these are attempts to come to terms with social change such as that brought in by re-education processes, consumer culture, and industrial despoliation.

[164] This gathering was the Ramapough's first public presentation held at the Finkelstein Memorial Library, in Spring Valley, New York, February of 1980. Initially offered as an examination of Ramapough Society, the informal dialog that followed produced a rare glimpse into the social and metaphysical constructs of the community. The event was videotaped but the master tape was eventually destroyed by the library.

[165] As noted in Chapter One, Fox is a personal totem for me that emerged in 1964, when as a boy of ten years of age I killed a Red Fox and had a vision. This animal had bitten me and when a Ramapough elder heard of this she told me that I had killed a Manito of Animal Spirit, the consequence of which was the animal was now in me and would remain a guiding spirit. Over the years Fox has returned many times, in many fashions.

[166] For more on the umwelt see Carol Kaesuk Yoon's *Naming Nature, the Clash Between Instinct and Science*, 2009, W.W. Norton & Co. Inc.

[167] For more on Martin's analysis of the human/animal connection see *Keepers of the Game*, 1986, University of California Press

[168] Turtle, Turkey, and Wolf are the original clan divisions of the early Lenape. See *Mythology of the Lenape* by John Bierhorst, 1995, University of Arizona Press, The Clans [Turtle Phratry is Best] p 43

[169] The name Jeff Masters is a pseudonym as my uncle's friend is long gone and family permission to use his name was not available.

[170] "The American Story" by Richard Wheelock can be found in *Destroying Dogmas, Vine Deloria Jr. and His Influence on American Society,* 2006

[171] For more on Churchill's analysis see his *Indians Are Us? Culture and Genocide in Native North America*, 1994, Common Courage Press, Maine

[172] Ibid. Frank, p 7

[173] Ibid, p70

[174] Frank, Arthur*, The Wounded Storyteller*, 1995, University of Chicago, p 15

[175] Ibid, p 16

[176] Ibid, p 31

[177] Gaventa, John, *Power and Powerlessness, Quiescence and Rebellion in an Appalachian Valley*, 1980, University of Illinois Press, p 14

[178] Released late in 2013, *Out of the Furnace*, directed by Scott Cooper, with a screenplay by Cooper and Brad Ingelsby, this film portrayed Ramapoughs (identified as Jackson Whites) as being violent psychopaths. This further stigmatization went so far as to identify a major character with the name of Harlan DeGroat, literally using one of the key family names among the Ramapoughs. Produced by Ridley Scott and Leonardo Di Caprio, *Out of the Furnace* starred major Hollywood actors, including: Christian Bale, Casey Afleck, Woody Harrelson, Zoe Saldana, Forest Whitaker, William Defoe, and Sam Shepard, this cast boasts of individuals that are known for their "progressive" posturing, yet the film engages in characterizations of the Bergen County Ramapoughs drawn from local raceism. On December 18, 2013, Ramapo College sponsored a public forum in response to the film, Chiefs Dwaine Perry, Roger DeGroat, and Vin Mann attended along with attorney Judith Sullivan, they spoke to a gathering of more than two hundred students and community members about this latest outrage. Dr. Michael Edelstein joined me in this open forum, and Edison Wetlands advocate Robert Speigel, along with Ramapough Cindy Fountain spoke eloquently during the "break-out" sessions.

[179] Ibid Gaventa, p. 17-18

[180] Edelstein, Michael, *Contaminated Communities, Coping with Residential Toxic Exposure*, 2nd edition 2004, Westview, p 71

[181] Sixth Street resident Patricia Osterhought recalls former Mayor Brian Mielie arguing against excavation of the village dump in search of paint as he believed it could tangle the village into a litigation nightmare. This was during the early 1990s when the women of Sixth Street called attention to the frequency of cancer there especially among the men. In 2013, working with the support of Mayor Craig Flanagan, I had some preliminary excavation done at the old dump site only to discover that it had been covered over in layers of highway debris and compacted. This was done during a period of governance in the late 1990s under guidance of then Mayor Bernard Jackson (a former Ford supervisor himself). When asked about the possibility of paint sludge in the dump, Mayor Jackson dismissed it adding that it was his belief the paint was harmless to begin with. An in depth examination of the dump's contents has yet to be completed.

[182] I have spoken with at least a half dozen Hillburn and Mahwah residents who wish to remain anonymous and who acknowledge their involvement in some dumping activities. In most of these cases they did not dump far from their homes, they dumped after hours or at night, and they consistently claim that at the time they believed the material was harmless. In my research I have come upon stories of men dumping the paint from the 55 gallon drums, taking the drum home, hosing it out and converting it into a practical wood stove. I have not been able to prove this as none of those men are alive and family members are no longer interested in talking about it.

[183] Ibid, Edelstein, p 162

[184] Ibid, p 93

[185] Ford Motor Company has made a similar argument in respect to the Ramapo Aquifer in Hillburn, New York. See chapter 10.

[186] Edelstein, p 12

[187] Ibid, p 114

[188] Ibid, p 116

[189] Ibid, p 118

[190] Smith, Linda Tuhiwai, *Decolonizing Methodologies*, 2004, University of Otago Press, Dunedin, p 33

[191] Ibid, p 34

[192] Ibid, Frank, p 17-18

[193] Picou, J. Steven, The "Talking Circle" as Sociological Practice: Cultural Transformation of Chronic Disaster Impacts, 2000, Sociological Practice: A Journal of Clinical and Applied sociology, Vol. 2, No. 2, pp 77-97

[194] Ibid, p 94

[195] My work documenting paint sludge sites began in the early 1990s when working with a small local cable company, TKR, and friends at the Nature Place Day Camp, I taped children, approximately ten years in age at a site of over a hundred barrels of discarded paint down at the Meadows area in Hillburn. The children, wearing protective gear and face masks, explained on camera what the sludge was and how Ford had dumped it. They talked about its impact on the wetlands and about the need for Ford to clean it up. This was done with the consent of their parents who were outraged by the dumping. The program aired numerous times in the spring of 1992 and was eventually bootlegged and aired on other local cable networks as far south as Washington D.C. This initiated the return of the DEC to the area and the hundred plus drums were excavated at Ford's expense. Almost a decade later the early 2000s, my students and I

discovered that the drums were only the surface pollution at the Meadows site. ATV vehicles adventuring down through this area caused enough erosion that buried paint broke through to the surface. Although it took a good deal of wrangling, Ford eventually remediated the site by 2007, making it the first New York Site that was fully remediated.

[196] Geoff Welch during this time was living at an historic site in the Village of Sloatsburg, further north in the Ramapo Valley. The site known as Harmony Hall has on its property a large two bay garage, where we set up a make-shift lab to analyze our paint sludge samples. Using inexpensive hand held testing kits that had a range of 0 ppm (parts per million) to 50 ppm, all the sludge samples we tested were over 50 ppm of lead. Other tests we performed involved studying plants from the site (various grasses and shrubs) as well as some animal scat (rabbit, ground hog, fox) and while we could not ascertain ppm counts for these samples, we did find lead indicators in all of it.

[197] The subject of whether or not the Land Company knew of the dumping and possibly condoned it at the time came up during these negotiations. The Land Company's position was that the paint must have been dumped at the site once the site was opened for use as a landfill in 1970. An examination of the County Health Department records supports that date as the official opening of the landfill. Dating when a contaminant has been dumped, especially since Ford kept no records of this activity, in the early years is not easy, but my undergrad students and I devised a method. In the winter of 2007, we cored the largest trees (greatest DBH) that had grown on buried sludge. We did this with a number of tree species (maple, oak, ash) and found that none of them were younger than thirty seven years, some being forty two years in age. This put the Torne Valley dumping back in the 1960s when I had witnessed such activity and when the property was under the control of the Land Company.

[198] From 2005 to 2008 I had been conducting field work with my students at this site. The land was then still the property of the Ramapo Land Company. On occasion Company employees and even local Town Police would be sent to discourage our activities. When we were encountered I offered a field lecture and essentially won over the support of these people. My "trespassing", which was noted also by the NYS DOH, continued unabated.

[199] Christopher P. St. Lawrence is something of a rogue figure in the politics of the Town. Popular with some and scorned by others, he is unafraid of controversy and has survived his opponent's sensational allegations. While some 'armchair' environmentalists have questioned my work with St. Lawrence, I have found in him a genuine conviction for environmental justice.

[200] Working with the Town of Ramapo during the first couple of years at the warehouse, we received a great deal of support from properties manager Tom Sullivan's crew: Ron Agard, Kent Rasmini, and Franko Palamaro. As the project moved up to the building site, Mr. Sullivan continued in guiding our work. Town engineer Ted Dzurinko guided the project when it was time to break ground for the site. Librario Derario, town architecture, produced the final approval for the building pad and footings.

[201] The term 'Brown Field' has been tossed around by regulatory agencies for years, with some proponents claiming that unless it is a Federal Environmental Protection Agency classification it is not a brown field. I have come to use the term as it has been used by environmental advocates, meaning any area containing a significant amount of contamination that presents a threat to the health of that area. I

believe we are in agreement with at least that much in respect to the thousands of tons of lead paint and the volatile organic compounds found within it.

[202] Sithe Energy had applied for the installation of a gas to electric production plant In the late 1990s and after a public debate withdrew its proposal in 2000. For the DEC and the PIPC (Palisades Interstate Park Commission) the crux of the opposition weighed in on the threatened rattle snake species. While Sithe Power offered various mitigation measures to protect the snake population, ultimately they were not satisfactory and Sithe moved on. A second plant was proposed by American National Power under the name of Ramapo Energy at the same time and after wrangling with Stechert's work, ultimately they withdrew as well.

[203] Randy Stechert has always been very generous with his time when it comes to rattle snake education. Jon Furman, author of *Timber Rattlesnakes in Vermont & New York* (2007, University Press of New England) describes Stechert as, "…the most important contributor to timber rattlesnake conservation in the state of New York." Furman believes that without Randy Stechert there wouldn't be any realistic effort to save these snakes from extinction In the state.

[204] Jordan, William R. *The Sunflower Forest*, 2003, University of California Press, p 26

[205] Williams, Henry Lionel & Ottalie K. Williams, 1957, *Old American Houses*, pub. Bonanza Books, p 63

[206] By stewardship, I mean the volunteer support and commitment to a greater good. While this is a relatively loose interpretation of the term, it covers a great deal of the efforts put forth by many of the volunteers who have committed countless hours to the building of the structure, to working with the students, and to the ongoing work necessary to complete the cleaning up of the watershed, at Ramapo. It is worth noting here that students from a wide range of institutions have joined in with this effort, including Ramapo College of New Jersey, BOCES of Rockland, AmeriCorps Summer Interns through the Youth Bureau of Rockland, Nature Place Day Camp campers and counselors to name a few. Also, of note are the adult volunteers who have donated time, particularly Jim Elling (aka Cousin Jim) whose carpentry expertise has been invaluable and Holden Texel who's mechanical skills have often gotten us through many a tight spot.

[207] The story of Lavender was chronicled by Carl Carmer under the title of "The Lavender Evening Dress" in his 1949 book *Dark Wind to the Trees*, published by William Sloane Associates of New York. Carmer's version, despite the fact that he claims to have heard it from locals in the Ramapo region, bears little resemblance to that which is told by residents of the Hamlet community. I first heard the story at the Ramapo Graveyard as told by my Uncle Malcolm Stead, when I was ten years old. That version is more true to the tale found at the Hamlet and has been included in my 2002 publication *Back Porch Stories*.

[208] Pritchard, Evan T. *No Word for Time*, 2001, Council Oak Books, LLC, p 11

[209] Oelschlaeger, Max, *The Idea of Wilderness*, 1991, Yale University, p 12 & p 66

[210] LaDuke, Winona, *All our Relations*, 1999, South End Press, MA, frontispiece

[211] Materials concerning the Ramapough proposed Health Surveillance Analysis are from a working draft prepared for the Ramapough Mountain Health Issues Group and prepared by representatives of the New

Jersey Department of Health, based on input from the Ramapough Mountain Indian communities. The preparers also received assistance from the federal Agency for Toxic Substances and Disease Registry's Region 2 office.

[212] Churchill, Ward, *Indians Are Us*, 1994, Common Courage Press, see chapter entitled Indians Are Us (p 207) for a detailed essay that explores the commercialization of American Indian Culture which Churchill believes is a threat to indigenous struggles for sovereignty. See also, Churchill's *Fantasies of the Master Race*, 1992, for an in-depth examination of the connection between culture and genocide.

[213] Jordan, William, *The Sunflower Forest*, 2003, University of California Press, p 50

[214] Ibid, p 51

[215] Ibid, p 52

[216] Oelschlaeger, Max, *Caring for Creation*, 1994

[217] Martin, Calvin, *The American Indian and the Problem of History*, 1987, Oxford University Press, p 27

[218] In my position at Cornell Cooperative Extension of Rockland County, I was able to call upon the University for guidance in completing a tree survey of OU-1 during the spring of 2012. This was called for by the town in reaction to Ford's initial restoration proposal which offered scant tree replacement in respect to what was being removed. The survey, which was conducted with undergrad students from the Environmental Studies Program at Ramapo College of N.J., focused on three tri-sects covering three slightly different terrains at the site. Notes from the survey are filed with the author and with the Town of Ramapo. The most interesting finding was in fact not unusual tree species but additional paint sludge outside of the proposed excavation footprint, which lead to an expanded footprint.

[219] At these weekly meetings representing ARCADIS was usually John Rocklin and Krista Mastrocola; for Environmental Quality (EQ) was John Geary and John Ackerman; for the Town of Ramapo was Tom Sullivan, Ted Dzurinko, Paul Gdanski, intern Nina Medakovich, and myself; for NYSDEC was Dave Herman; in addition the following attended occasionally or called in on conference phone: Dave Crosby (DEC), Mohamed Zakkar (Ford), Paul Bracken (ARCADIS), and Erich Zimmerman (ARCADIS).

[220] A visit in the Fall of 2009 to the St. Regis, Akwesasne Mohawk Reservation, Environmental Division helped to inspire our work on the Ramapo Saltbox Environmental Research Center, as well as our plans for a sweet grass medicine garden; the Mohawk Nation work with the Haudenosaunee basket makers, herbalists and ceremonial leaders in preserving sweet grass cultivation and harvesting for baskets, as well as ceremonial smudge and incense. For more information on sweet grass medicine gardens see Daniela Shebitz, Weaving Traditional Ecological Knowledge into the Restoration of Basketry Plants, *Journal of Ecological Anthropology*, Vol., 2005, p 51.

[221] Data concerning work supervised by ARCADIS is extrapolated from ARCADIS project meeting minutes, for the OU-1 site during the year of 2013. The author retains a copy of these minutes at the Ramapo Saltbox ERC.

[222] As it turned out Mr. Zakar did not attend the garden dedication as Ford executives disapproved of him being there, but we continue to build a substantial dialog with members of the Arcadis team in order to better understand their methodologies. This was a condition set in place by Supervisor St. Lawrence calling for complete transparency.

[223] Shebitz, Daniela, Weaving Traditional Ecological Knowledge into the Restoration of Basketry Plants, 2005, *Journal of Ecological Anthropology*, Vol., pp 58-59

[224] Shkilnyk, Anastasia M. *A Poison Stronger than Love*, 1985, Yale University Press, p 72

From: Peter Sando
To: Gowers, Joe
Subject: Superfund Comments
Date: Saturday, August 01, 2020 5:23:26 PM

Hello Joe,

Here is my comment. Kindly confirm receipt.

Thank you,
Peter Sando

Superfund mission as stated on the EPA website: "EPA's Superfund program is responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills and natural disasters. To protect public health and the environment, the Superfund program focuses on making a visible and lasting difference in communities, ensuring that people can live and work in healthy, vibrant places." Superfund's goals as stated are supposed to be:

- Protect human health and the environment by cleaning up contaminated sites;
- Make responsible parties pay for cleanup work;
- Involve communities in the Superfund process; and
- Return Superfund sites to productive use.

Here in Ringwood, you have made a mockery of these noble intentions.

I am shocked and dismayed that the EPA and DEP would be complicit with an unjust and corrupt deal between local government and a corporate giant, leaving tons of pollution in a residential neighborhood, and the Upper Ringwood residents sick, weary and powerless. You caved at the 11th hour and betrayed your professional and moral responsibilities. You disappointed all good people with concern for the environment, the community and government. You appeased the local borough officials and Ford Motor Company, who together actually took residents to court to squash a proposed referendum that would have allowed the people of Ringwood to vote on the issue.

The recycling center is, as admitted by the Mayor, just an excuse to allow for a cap. It is unneeded and an obvious waste of time, money and effort. The cap will cost more to maintain in the long run and ultimately fail, leaving the residents once again at risk and our children and grandchildren with the age old problem. This is an obvious case of "kicking the can down the road".

This whole process, from the shady private meetings to the 11th hour surprise should be investigated and re-opened.

May I also add that I submit my comment in full knowledge that this whole public comment process is an obligatory exercise and, as in the past, will have no bearing on your decision making. In my opinion, the fix is in. I hope you prove me wrong this time.

Peter Sando

[redacted]

[redacted]

From:	Taylor McFarland
To:	Gowers, Joe
Cc:	jeff.tittel@sierraclub.org
Subject:	NJSC COMMENTS RE: Ringwood Superfund Site Cleanup Plan
Date:	Monday, March 02, 2020 3:18:07 PM
Attachments:	0302 RE Ringwood Superfund Site Cleanup Plan.pdf

Dear Mr. Gowers,

Please see our comments below and attached regarding the clean up plan for the Ringwood Superfund Site.

Thank you!

_____

Joseph A. Gowers
Remedial Project Manager
U.S Environmental Protection Agency, 290 Broadway, New York, NY 1007
Email: gowers.joe@epa.gov

March 2, 2020

RE: Ringwood Superfund Site Cleanup Plan

Dear Mr. Gowers,

We are concerned that EPA's proposal to address contaminates at the Ringwood Superfund site will not effectively protect the people of Upper Ringwood from the toxic chemicals there. Hazardous chemicals found at the site like lead, arsenic, cobalt, PCE, TCE, have created a witch's brew in the mines. In their plan, the EPA is proposing a small pump and treat system. The only way to remove toxins out of water is to remove the paint sludge and get a larger pump and treat system. EPA's plan to pump in oxygen into the water will take time and may not work. We should not be experimenting on the community. Pollution the Ringwood Superfund site has already impacted the community's health and safety.

EPA need to implement a full cleanup plan because their current proposal will not clean up the contamination there. Contamination from the Ringwood Superfund site has already impacted state land and groundwater. There is a lot of contamination on or leaking into Ringwood State Park and it is not being cleaned up. Toxic chemicals from the site, 1, 4 dioxane are coming out of springs into streams that go into the Wanaque Reservoir, which provides drinking water for three million people. These chemicals are going into Mill Brook and Sally Pond in Ringwood State Park. These are C1 streams and Highlands water. We believe the contamination from the mines going into the streams violates surface water quality standards. It also violates RCRA and New Jersey's own groundwater cleanup standards.

EPA's experiment for their clean-up plan will not work. What the agency must do is to clean up the paint sludge down the mine shaft and around the surface, seal out the leaks, and build a comprehensive pump and treat system that will remove the contamination. The people in Upper Ringwood and the 50 families are living on top of a Superfund site with vapor intrusion inhalation and chemicals impacting their health. There's over a billion gallons of water that is contaminated in this area. Arsenic and lead have already been found at the Church of Good Shepard in Ringwood. There has been a tremendous amount of health problems already from the contamination and it will just get worse unless more testing and an effective cleanup plan is implemented. This nightmare for the people of Upper Ringwood has gone on for over 40 years. If the EPA cannot effectively clean up the area, they should have Ford buy out the community and move them somewhere else.

If you have any questions or would like to discuss this matter further, please feel free to call me at (609) 558-9100.

Sincerely,

Jeff Tittel

Director of the New Jersey Sierra Club

--

Taylor McFarland

Community Outreach Coordinator

(o) (609) 656-7612

SIERRA CLUB
FOUNDED 1892

NEW JERSEY CHAPTER
145 West Hanover St., Trenton, NJ 08618
TEL: [609] 656-7612 FAX: [609] 656-7618

Joseph A. Gowers
Remedial Project Manager
U.S Environmental Protection Agency, 290 Broadway, New York, NY 1007
Email: gowers.joe@epa.gov

March 2, 2020

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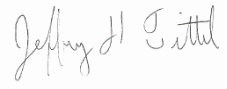
NEW JERSEY CHAPTER
145 West Hanover St., Trenton, NJ 08618
TEL: [609] 656-7612 FAX: [609] 656-7618

Sincerely,



Jeff Tittel
Director of the New Jersey Sierra Club

From:	Katrina VanDeusen
To:	Gowers, Joe
Subject:	Response to Ringwood Mines Proposed Landfill Capping Design
Date:	Monday, February 17, 2020 2:26:19 PM
Attachments:	image001.png image002.png image005.png Phytoremediation Services - Whitman -.pdf

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Mr. Gowers,

With respect to the clean-up plan for the 500-acre Ringwood Mines/Landfill Site which is located in the Borough of Ringwood, New Jersey have you thought about adding a component to your capping which will be a win-win for everyone? The site, which is in a forested area with about 50 private homes, includes abandoned mine shafts and pits, an inactive landfill, and other disposal areas. During the late 1960s and early 1970s, areas of the site were used to dispose of waste materials, including paint sludge and waste in drums, from Ford's automobile assembly plant in Mahwah, New Jersey. Sampling of the paint sludge showed that it contained lead, arsenic, chromium and other contaminants. According to the website, EPA's cleanup of the land-based contamination in three areas of the site is in the pre-construction phase. It contains the following elements to address contamination in three areas of the site:

- Peters Mine Pit – Contaminated soil and other material will be removed from around the opening of the mine pit, and the pit will be capped.
- Cannon Mine Pit – The mine pit will be capped.
- O'Connor Disposal Area – The area will be capped, and the Borough of Ringwood plans to build a recycling center on this area of the site.

I am an environmental scientist with over 20 years of professional remedial experience in the New York tri-state area. I have been following this case since I worked on it in the late 90's, and I think I have a solution that not only is cost-effective, but has a whole host of benefits to the ecosystem and the community at large that I would like to share with you.

One of the innovative strategies I use on sites located in an environmentally sensitive natural resource such as this Site is phytoremediation. Phytoremediation uses plants and trees to absorb and metabolize contaminants in soils, groundwater, sediments and surface water bodies. The problem with using old-school capping technologies is that you'll have to maintain and monitor it for decades and encapsulation sometimes leads to the creation of anaerobic conditions that may change the contaminant degradation, or all together stop it.

Phytoremediation can be used to create an organic capping system, which is basically a landscape plan using plants and trees that can break down or absorb the contaminants in the soil. You can also plant species in the lakes to treat sediments. The plants run on solar, so there are no energy costs. The planting

design will be comprised of species normally indigenous to New Jersey that break down or hyperaccumulate metals, but are planted in such a way that they don't achieve the biomass that necessitates harvesting. The natural propagation of these perennial species will promote succession and prevent invasive weeds which would need to be managed on a cap in any case. Talk about a long-term strategy, it will work in perpetuity, without long-term monitoring requirements after the first 3 years, which is equivalent to maintaining 90% survivability and natural success of species for the first three years only. The total cost of remediation is reduced because all you pay for is the grubbing/clearing and installation of new plants and amendments. The plants must be in contact with the impacted soils so there are no additional soil capping requirements which is important in New Jersey because the backfilling of soil needs to be with clean, certified fill. Afterwards you can make the area a natural preserve with hiking trails to promote good will for the community. And I don't have to tell you that the EPA is one of the biggest promoters for green, sustainable, innovative phytoremediation. The EPA has literally wrote handbooks which are the industry standard for this work!

So please consider phytoremediation for a pilot study as one of the caps to see if this will be the best available "technology" for this site. If this sounds good and you would like to learn more, please don't hesitate to contact me. Good luck moving forward in any case.

Yours truly,

Katrina VanDeusen
Senior Project Manager

WHITMAN

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PHYTOREMEDIATION SERVICES

Overview

Whitman is well equipped to help you navigate through the complex remediation of former brownfield, commercial or industrial properties that may have an environmentally sensitive natural resource (ESNR) in close proximity to a proposed redevelopment site. Whitman can provide a wide-range of ecological engineering remediation services, from characterizing the ESNR to designing the final vegetative cap for regulatory restoration requirements.

All properties impacted with hazardous contaminants near an ESNR now require mandatory regulatory compliance with the NJDEP's newly promulgated June 2018 Technical Guidance for Ecological Evaluation (EE). Many ESNRs are located in highly sought-after development areas such as along the coast of oceans, rivers, or nestled in forests surrounding lakes. With the number of rules and regulations surrounding redevelopment, how can you ensure a return on investment?

Phytoremediation

The new focus in New Jersey and New York for contaminated sites is to revitalize and redevelop the land with long-term and sustainable innovative technologies that promote both habitat restoration and human health. **Phytoremediation** uses vegetation to mitigate environmental issues and improves the health of the property to achieve compliance with appropriate regulatory agencies. Traditional methods of excavation or chemical *in situ* injections can destroy the natural ecosystem resulting in complex, costly or impractical post-remediation strategies. **Phytoremediation** costs are typically a fraction of costly traditional methods. Additionally, vegetative caps can maintain or improve landscape aesthetics, especially for high-profile sites where mechanical pump-and-treat or Soil Vapor Extraction (SVE) systems will detract from overall site appeal.

What kinds of sites are viable candidates for Phytoremediation? Here are just a few:

- ✓ Sites with many acres of residual typical Brownfield soil contaminants in the upper overburden.
- ✓ Sites with plumes that are migrating into an ecological receptor.
- ✓ Sites with random soil hot-spots of contaminants that are expensive to remediate such as PCBs.
- ✓ Landfills that contain leachate.

Case Study: Former Industrial Site (Bergen County, NJ)

- Owners purchased suburban property where Phase I did not identify historic impacts.
- Site contained a petroleum-based LNAPL plume that was migrating off-site but had not degraded significantly over the 20-year time period under investigation.
- A pump and treat system was proposed at a cost of a few million dollars to hydraulically control the groundwater plume, pumping an estimated 1.5 million gallons per year of groundwater.
- Whitman designed a **phytoremediation** hydraulic inhibition perimeter constructed out of a few types of tree species to address both the plume contaminants and residuals in the soil.
- The **phytoremediation** vegetative cap created an aesthetically pleasing landscape architecture on-site that the public surrounding properties only saw as landscaping.
- The hydraulic control of an estimated 2 million gallons per year and treatment of dissolved phase groundwater contaminants through the trees' natural metabolism was achieved.
- Other benefits: the **phytoremediation** organic pump and treat system ran on solar power so there were no long-term energy costs; there were no installation or abandonment of machinery; there were no repair or maintenance costs; and there were no hazardous groundwater disposal costs, decreasing the overall cost of this innovative technology to a few hundred thousand dollars over the long-term.

For more information regarding these services, please contact:
Kat VanDeusen, Senior Project Manager
(732) 390-5858 or kvandeusen@whitmanco.com