41257

RECORD OF DECISION
COLESVILLE LANDFILL SITE
TOWN OF COLESVILLE
BROOME COUNTY, NEW YORK

PREPARED BY THE
U.S. ENVIRONMENTAL PROTECTION AGENCY
MARCH 1991

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Colesville Landfill site
Town of Colesville, Broome County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Colesville Landfill site (the "Site"), located in the Town of Colesville, Broome County, New York, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for the Site.

The State of New York concurs with the selected remedy. The information supporting this remedial action decision is contained in the administrative record for the Site. The administrative record index is attached.

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 Record of Decision (ROD), may present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This operable unit is the final action for the Site. The selected remedy will provide containment through the installation of a cap over the landfill material and leachate collection, which will eliminate the potential for direct human or animal contact with the leachate seeps discharging to the North and South Streams. Contaminated groundwater underlying the Site will be restored to levels consistent with state and federal requirements by pumping at and downgradient from the landfill and by treating the extracted groundwater by using air stripping. In addition, the human health risks from potable use of contaminated groundwater will be controlled under the existing quarterly residential well monitoring program along with the temporary water supply and carbon filtration program for the affected residences until a new water supply is in operation. Also included in the selected remedy are groundwater monitoring, fencing, and deed restrictions. Five-year reviews will be conducted as required by the NCP due to the fact that waste will remain on-site. The purpose of the five-year review is to ensure that the remedy continues to provide adequate protection of human health and the environment.

The landfill will be regraded as necessary prior to installation of the cap to establish slopes which will encourage runoff and minimize erosion. The cap will contain the landfill material and minimize infiltration of precipitation into the landfill material. This will minimize the potential for future contamination of the groundwater.

The major components of the selected remedy include the following:

- Cutting the existing sides of the landfill to slopes of no greater than approximately 33%. The top surfaces of the landfills would be regraded to slopes of no less than 4% to provide for proper drainage.

- Construction of lined (filter fabric) leachate collection trenches.

- Installation of a multimedia cap over the landfill material. Water infiltrating through the vegetative and protective layers of the cap will be intercepted by the impermeable flexible membrane layer and conveyed away from the landfill material.

- Installation of a gravel gas venting layer, with a filter fabric layer placed over the gravel. The flexible membrane liner (FML) will be placed over the filter fabric, and another layer of filter fabric will be placed on top of the FML.

- Seeding and mulching of the top soil layer to prevent erosion and provide for rapid growth of vegetation.

- Pumping the contaminated groundwater beneath and downgradient of the landfill.

- Treatment of the extracted groundwater, using metals treatment and air stripping.

- Discharge of the treated water to surface water.

- Construction of a new water supply system for the present and future affected residences (with the continuation of existing quarterly residential well monitoring and temporary water supply and carbon filtration programs until the new water supply is in operation). It is contemplated that the new water supply system will utilize a new well or wells northwest of the affected area.

- Fencing to further protect the integrity of the caps by restricting access to the Site.

- Periodic inspection of the cap and maintenance as necessary

will provide for long-term effectiveness and permanence of the alternative.

- Imposition of property deed restrictions, if necessary. The deed restrictions will include measures to prevent the installation of drinking water wells at the Site and restrict activities which could affect the integrity of the cap.

- Initiation of a monitoring program upon completion of the closure activities. The monitoring program will provide data to evaluate the effectiveness of the remedial effort over time.

The groundwater treatment will continue until federal maximum contaminant levels (MCLs) and state groundwater and drinking water standards for the organics have been achieved in the groundwater. The goal of this remedial action is to restore groundwater to its beneficial use, which is, at this site, a drinking water source. Based on information obtained during the field investigations and on an analysis of all remedial alternatives, EPA and NYSDEC believe that the selected remedy involves using the best available and most appropriate technology to achieve this goal. It may become apparent, during the operation of the groundwater extraction system that, at a certain point, contaminant levels have ceased to decline and are remaining constant at levels higher than the remediation goal. In such a case, the system performance standards and/or the remedy will be reevaluated.

The selected remedy will include groundwater extraction and treatment for at least 4 years, during which the system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The contaminated groundwater and leachate is being treated, addressing the statutory preference for treatment as a principal element of the remedy. However, the size of the landfill and the fact that there are no identified on-site "hot spots" that represent the major sources of contamination preclude a remedy in which the landfilled material could be excavated and treated effectively.

Because this remedy will result in hazardous substances remaining on-site, a review will be conducted no later than five years after completion of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Constantine Sidamon-Eristoff
Regional Administrator

3/29/91
Date

ROD FACT SHEET

SITE

Name:	Colesville Landfill
Location/State:	Town of Colesville, Broome County, New York
EPA Region:	II
HRS Score (date):	30.26 (June 86)
NPL Rank (date):	984 (February 91)

ROD

Date Signed:

Selected Remedy

Containments:	A multi-media cap complying with New York State Part 360 Solid Waste Regulations with leachate collection and treatment
Groundwater:	Pumping at landfill and downgradient, groundwater treatment, and new water supply for affected residents
Capital Cost:	$4,273,000
O & M:	$250,000/yr
Present Worth:	$5,135,000

LEAD

State Enforcement
Primary Contact (phone): Eduardo Gonzalez (212) 264-5714
Secondary Contact (phone): Sharon E. Kivowitz (212) 264-2211

WASTE

Type:	Groundwater - 1,1 dichloroethane, 1,1,1 trichloroethane, trichloroethene, trans-1,2-dichloroethene, and benzene. Sediments - low levels of benzene, chlorobenzene, 1,1-dichloroethane, 1,1-dichloroethene, and trichloroethene.
Medium:	Sediments and groundwater
Origin:	Pollution originated as a result of disposal of industrial wastes at the landfill. Drums and liquid wastes were dumped into trenches.

DECISION SUMMARY

COLESVILLE LANDFILL SITE
TOWN OF COLESVILLE
BROOME COUNTY, NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

NEW YORK, NEW YORK

MARCH 1991

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SITE NAME, LOCATION, AND DESCRIPTION

The Site, which is located in the Town of Colesville, Broome County, New York (see Figure 1), is characterized as very rural, and includes large tracts of undeveloped woodlands, as well as large-scale agricultural tracts and scattered residential parcels. Of the 113 acres on which the landfill is situated, the site occupies approximately 35 acres that have been used for waste disposal. The largest and nearest residential development is Doraville, just south of the Site.

Topography at the Site ranges from approximately 1,400 feet above mean sea level in the eastern portion of the study area, to about 970 feet above mean sea level in the west. The Susquehanna River lowland valley is at an elevation of approximately 940 feet.

Surface water in the area drains to the Susquehanna River. (see Figure 2). However, the terrace upon which the landfill has been developed is dissected by streams on the north, east, and south. Drainage in the vicinity of the Site is via two unnamed tributaries of the Susquehanna River . Tributary SR-120, the North Stream, is located north of the Site and flows westerly to the Susquehanna River. To the east and south is Tributary SR-119A, the South Stream, which flows to the south-southwest into a low-lying wet area. Both tributaries join the Susquehanna River approximately 0.5 miles above Doraville.

The Susquehanna River is classified as Class B surface water in the vicinity of the Site. Class B waters are suitable for both primary[1] and secondary[2] contact recreation, as well as for fish propagation. Tributaries SR-120 and SR-119A are Class C and D waters, respectively. These waters are suitable for secondary contact recreation and fish propagation only.

Existing flood insurance maps (Federal Emergency Management Agency, 1983) indicate that no portions of the Site are located in either the 100- or 500-year flood zone.

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[1] Primary Contact Recreation--recreational activities where the human body may come in direct contact with raw water to the point of complete body submergence (i.e., swimming, diving, water sports, and surfing).

[2] Secondary Contact Recreation--recreational activities where contact with of water is minimum and where ingestion of water is not probable (i.e., fishing and boating).

During the field investigation, three small wetland areas in the vicinity of the Site were encountered. These areas were all less than one acre in size and appear to be connected to surface drainage swales in the area.

Vegetation patterns at the Site are a mixture of herbaceous field, weed, and grass species. Both open field and forest habitats characterize the surrounding area. These habitats support a large variety of avian and mammalian species. No New York State Department Environmental Conservation (NYSDEC) Significant Habitat Areas are found on-site, although the Site is located within the range of several migratory endangered or threatened species. The predominant aquatic species found in the Susquehanna River include small mouth bass, rock bass, and white suckers.

Many of the residents of the Town of Colesville use private water supply wells to obtain domestic water supplies. These wells utilize groundwater from both shallow and deep aquifer systems. Other homes utilize groundwater obtained from springs.

The nearest homes to the landfill are located to the west and southwest along East Windsor Road. The home closest to the landfill is at distance of approximately 380 feet, and is separated from the landfill by a steep-sided ravine with a small steam flowing through it. Another home, which is not separated by a ravine or stream, is at a distance of 500 feet. Two other homes are at a distance of 640 feet from landfill.

The Town of Colesville has a population of 4,965 persons. The estimated population within a one-mile radius of the Site is 191 persons; 754 persons within two miles; and 1,921 persons within three miles.

SITE HISTORY

Waste disposal operations at the landfill commenced in 1969. The landfill was owned and operated by the Town of Colesville between 1969 and 1971. Broome County took ownership of the landfill in 1971, operating the landfill from 1971 to 1984. The landfill has been closed since 1984.

The trench method of sanitary landfilling was primarily utilized for waste disposal purposes. The area method was used to a limited extent. The Site was primarily used for the disposal of municipal solid waste, although drummed industrial wastes from various sources were also disposed of between 1973 to 1975. Operational records indicate that these drummed wastes consisted of aqueous dye waste and organic solvent waste. Known waste constituents included benzene, cyclohexane, acetone isopropyl alcohol, methanol, ethanol, n-hexane, toluene, xylene, methyl cellosolve, dimethyl ether, zinc, aluminum, iron, tin sulfate,

and chloride. In practice, drummed wastes were randomly codisposed with the municipal solid wastes and disposed of in segregated areas. These drums were either buried intact, or were punctured and crushed prior to burial.

Approximately 468,000 cubic yards of wastes was disposed within three trenches and the area landfill. Nearly 93 percent of the waste was placed within the trenches.

In 1983, samples collected from residential wells in the vicinity of the Site by the Broome County Health Department indicated that the Colesville Landfill was contaminating the groundwater beneath and in the immediate vicinity of the Site. The samples results prompted the Broome County Department of Public Works to provide temporary water supply and carbon filters with a quarterly residential well monitoring program for the affected residences, and to perform two investigative studies of the Colesville Landfill. These studies were performed by Wehran Engineering (Wehran) in 1983 and 1984.

Wehran's 1983 study indicated that the groundwater quality in the vicinity of the Colesville Landfill demonstrated a strong indication of contamination by landfill leachate. Volatile organic levels, measured as total volatile organics (TVOs), ranged from 48 to 2,800 parts per billion (ppb) within and around the landfill. Residential wells ranged from 32 ppb to 415 ppb, expressed as total volatile priority pollutants (TVPP).

Wehran's 1984 investigation confirmed the findings of the 1983 study with respect to the immediate landfill vicinity. Total volatile priority pollutant concentrations ranged from "not detected" in upgradient monitoring wells to 7,795 ppb immediately downgradient. Contamination was confined, primarily, to the upper portions of the glacial outwash aquifer that underlies the Site.

The Site was proposed for inclusion on the Superfund National Priorities List (NPL) in October 1984 and it was listed on the NPL in June 1986.

In 1988, Wehran completed a remedial investigation (RI) at the Site on behalf of the Broome County Department of Public Works, Binghamton, New York and GAF Corporation, Wayne, New Jersey, the Potentially Responsible Parties (PRPs), pursuant to an Order on Consent (Index No. T010687) with NYSDEC. In 1990, Wehran completed a confirmatory sampling program which confirmed the findings of the 1988 RI.

In December 1990, Wehran completed a feasibility study (FS) report which presented an analysis of the potential alternatives for the remediation of contamination observed at the Site.

ENFORCEMENT ACTIVITIES

On May 20, 1987, an Order on Consent (Index No. T010687) was signed by the Commissioner of the NYSDEC. The Order required the Broome County Department of Public Works and GAF Corporation, to conduct an RI/FS to determine the nature and extent of the contamination at the Site and to evaluate alternatives for site remediation. Once the remedial alternative is selected for the Site, the design and construction of such remedy will be implemented as provided for under NYSDEC's Order.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI/FS report and the Proposed Plan for the Site were released to the public for comment on January 5, 1991. These two documents were made available to the public in the administrative record and an information repository maintained at EPA Docket Room in Region II, New York, at the Town of Colesville Town Hall in Harpursville, New York, and at NYSDEC's offices in Albany, New York. A public comment period on these documents was held from January 7, 1991 through February 6, 1991. In addition, a public meeting was held at the Broome County Office building, Binghamton, New York on January 30, 1991. At this meeting, representatives from EPA and NYSDEC answered questions about problems at the Site and the remedial alternatives under consideration. Responses to the comments received during the public comment period are included in the Responsiveness Summary, which is appended to this ROD.

SCOPE AND ROLE OF RESPONSE ACTION

The purpose of this response is to reduce the risk to human health and the envrionment due to the release of volatile organic compounds (VOCs) from the Site to the underlying glacial outwash aquifer, to eliminate the leachate seeps and discharges, to ensure protection of human health and the environment from the migration of contaminants in the groundwater and direct contact with leachate seeps, to ensure protection of the groundwater, air, and surface water from the continued release of contaminants from the landfill, and to restore the groundwater to levels consistent with state and federal water quality standards.

This remedial action will utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. However, because treatment of the principal threats of the Site is not practicable, this remedial action does not satisfy the statutory preference for treatment as a principal element of the remedy. The size of the landfill and the fact that there are no identified on-site hot spots that represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively.

This response applies a comprehensive approach (i.e., one operable unit) to remedial action at the Site. In other words, this project has not been segmented into incremental portions.

NYSDEC is the lead agency for this project; EPA is the support agency.

SUMMARY OF SITE CHARACTERISTICS

The Colesville Landfill was used for the disposal of municipal solid waste throughout its operational life. Between 1973 and 1975, industrial wastes were also disposed of at the facility. Table 1 lists the nature and amount of industrial wastes disposed of at the landfill.

It has been reported that wastes received in drums were randomly codisposed of with the municipal solid wastes and disposed in segregated areas. The drums were either buried intact, or punctured and crushed prior to burial. Facility records indicate that a narrow trench along the south-central landfill boundary was designated for drum disposal. Based upon the estimated total volume of the trenches, it was estimated that approximately 468,000 cubic yards of municipal solid wastes and industrial waste have been disposed of at the Site.

The key findings of RI and confirmatory sampling program are as follows:

- The Site is currently releasing low levels of VOCs.
- Over the last six to seven years, it has become apparent that the extent of groundwater contamination is limited in area and not increasing in severity.
- The current data suggest a slight advancement of a plume southwest of the landfill, with an overall decrease in VOC concentrations at the landfill border.
- VOCs in the part per billion (ppb) range have been detected in wells at three residences downgradient of the landfill. This contamination has been consistent over different sampling efforts, indicating that the contaminant profile has not changed since 1987.
- Historical and current data have failed to confirm contamination of the bedrock aquifer.
- The only bedrock well currently used within the path of the VOC plume is not affected.
- The available data suggest that VOCs currently being released from the landfill via the groundwater pathway are not expected

to have a measurable impact on the Susquehanna River.

- The only measurable surface water contaminated discharge points are in leachate seeps discharging to the North Stream, South Stream, and in sediments in the tributaries immediately adjacent to surficial outbreaks of landfill seeps.

- Groundwater recharge to the tributaries has not resulted in any measurable VOC levels in surface water flowing to the Susquehanna River.

- The areas affected by the seeps, as measured by VOC and metal concentrations, are limited to sediments proximate to the seeps.

- No significant releases of VOCs to the air pathway were suggested by the available data.

Soil Investigation

In order to determine the location and extent of waste landfilled within the trenches and investigate the potential extent of groundwater contamination, a multi-phase geophysical investigation was conducted in soils. The techniques utilized were a magneto-meter survey, which defines local variations in the soils' magnetic field due to buried ferromagnetic material (i.e., drums), the terrain conductivity, which measures the conductivity of subsurface materials and areas of buried waste, and earth resistivity sounding, which measures the resistivity of subsurface materials and the depth and thickness of buried ferromagnetic materials. Based on the results of the magnetometric survey and the terrain conductivity, a number of anomalies were detected which are interpreted as trenches. The results of the earth resistivity sounding indicated that the trenches are generally 30 to 35 feet deep. Furthermore, the off-landfill terrain conductivity survey did not detect any significant areas of high conductivity which might have been associated with groundwater contaminant plumes.

Groundwater Investigations

In December 1987 investigations, Wehran sampled 27 groundwater monitoring wells and 4 residential wells. Data from these sampling efforts are included in Tables 2 through 4. The landfill was found to be releasing low levels of VOCs into the groundwater. In general, five VOCs, 1,1-dichloroethane, 1,1,1-trichloroethane, trichloroethene, trans-1,2-dichloroethene and benzene, were the major contaminants in the contaminant plume. Analyses of data provided from the monitoring wells and Residential Well No. 1 indicate that the center line of the VOC plume extends from the landfill through well W-5 and Residential Well No. 1. No contamination was found in the bedrock aquifer. The

southern extent of the VOC plume reached beyond wells W-18 and W-16S, with low levels of 1,1-dichloroethane (24 and 67 microgram per liter (ug/l)), and 1,1,1-trichloroethane (53 and 6 ug/l) detected in these wells southwest of the landfill. The extent of the benzene plume was somewhat more limited compared to the other VOCs. Detectable levels of benzene were found in a monitoring well in the center of the landfill at 55 ug/l, and in wells along the west and south perimeters of the landfill ranging from 7 to 85 ug/l. It was not detected along the northern perimeter, in the residential wells, or in monitoring wells to the west of the Site. Low levels of benzene were also detected in monitoring wells located to the south of the landfill.

Groundwater monitoring data obtained during the 1989 confirmatory sampling program defined a VOC plume very similar to the plume defined by in the 1987 sampling efforts. The landfill is still releasing low levels (ppb) of hazardous substances to the groundwater. With the exception of vinyl chloride and benzene, the VOCs identified in the confirmatory sampling program were present at comparable levels and at the same monitoring well locations as were observed during the 1987 sampling effort (see Tables 2 through 4).

Analyses of on the 1987 groundwater samples showed elevated levels of dissolved metals, in particular, arsenic, cadmium, and silver in monitoring wells affected by the VOC plume. Levels of lead and zinc throughout the Site in 1987 were variable and did not fit a particular contamination pattern. Analyses of groundwater samples taken during the 1989 confirmatory sampling effort did not show the presence of lead, cadmium, and silver on the Site. Levels of dissolved zinc were once again variable and did not fit a particular pattern of contamination. Dissolved arsenic levels in the VOC plume range from 13 ug/l to 24 ug/l, but were comparable to the 13 ug/l arsenic detected in the upgradient well (MW-25). Elevated levels of dissolved iron were noted at in monitoring well W-24 in the center of the landfill (36,400 ug/l) and within the VOC plume along the southwest perimeter (120,000 ug/l in monitoring well W-6, and 3,270 ug/l in monitoring well W-7).

Surface Water and Sediment Investigations

The surface water and sediment samples collected in 1987 during the RI were obtained from five locations in the North Stream, four locations in the South Stream and three locations along the east bank of the Susquehanna River. No VOCs were detected in any of these samples and no widespread contamination of the surface water in the vicinity of the Site was noted. However, leachate seeps were noted as potential sources of localized water quality impacts on both the North Stream and South Stream. Therefore, the surface water samples taken during the 1989 confirmatory sampling program were obtained directly from the seeps, and then

10 feet and 100 feet downstream of the seep locations (see Figure 3).

In the North Stream, several VOCs were detected in water samples taken in 1989 from the seep at SW-8 and downstream from this area (see Tables 5 through 7). Levels of 121 ug/l of 1,1-dichloroethane were detected at the seep and levels of 4 ug/l and 3 ug/l of 1,1-dichloroethane were detected 10 feet and 100 feet downstream, respectively. Low levels of 1,1,1-trichloroethane, chloroethane, and chlorobenzene were also detected at the seep. No VOCs were detected at seep locations on the South Stream. Samples of leachate seeps along the hillside, south of the landfill showed a very low level of 1,1-dichloroethane (4 ug/l) at SW-18.

Detectable levels of total iron, arsenic, and zinc were present in surface water samples from both streams (see Table 6). Cadmium, lead, and silver were not detected. With the exception of iron, total metal concentrations in the surface waters were not significantly elevated at or downstream form the seeps when compared to samples taken upstream of the seeps. Elevated levels of total iron were noted at and downstream from the seep at SW-8. Levels of total iron at SW-5, SW-6 and SW-7 (upstream) were 274 ug/l, 122 ug/l, and 101 ug/l, respectively, as compared with levels of 7,200 ug/l at the seep and 1,500 ug/l and 1,200 ug/l, 10 feet and 100 feet downstream of the seep, respectively, as was the case with surface water samples taken in 1987, elevated total iron levels were also noted at SW-2 in the area of a pond north of the landfill. Acidification of the pond water by nearby bog vegetation and the resulting mineral leaching is the likely source of the elevated iron content of the waters at SW-2. Total arsenic was detected only at the seep in the North Stream (24 ug/l) and at the seep area south of the landfill at SW-18 (34 ug/l). In the South Stream, levels of total iron were also elevated at the SW-12 seep (22,600 ug/l) and 10 feet downstream from the seep (12,100 ug/l) as compared with upstream levels of 2,630 ug/l. The highest level of iron was noted in leachate seeps emanating from the hillside south of the landfill (266,00 ug/l).

Only low levels of two VOCs (1,1-dichloroethane and chloroebenzene) were detected in sediment samples obtained from any of the seep areas (see Table 7). A sample taken at SD-8 on the North Stream contained 11 milligrams/kilogram (mg/kg) of 1,1-dichloroethane and 0.9 mg/kg of chlorobenzene (see Figure 4). No VOCs were detected downstream from this point. No VOCs were detected in the sediments of the South Stream. Samples from seep areas SD-16 and SD-17, located, south of the landfill, also contained very low levels of 1,1-dichloroethane. Total cadmium, lead, and silver were not detected in any of the sediment samples. Total iron, arsenic, and zinc were detected in sediment samples from both streams and the hillside south of the landfill (see Table 8). No pattern of elevated metals was observed at or

downstream of the seeps, and no widespread contamination of stream sediments was observed. In the North Stream, levels of total zinc ranged from 128 to 1,510 mg/kg, and were variable along the length of the stream. Levels of total arsenic were also variable ranging from 8.3 to 79.7 mg/kg. Comparable levels of total iron were observed above and below the seep on the South Stream (see Table 8). By comparison with levels found in the stream sediments, elevated levels of total arsenic (276 mg/kg) and iron (242,000 mg/kg) were detected at the seep at SD-18 south of the landfill.

SUMMARY OF SITE RISKS

Wehran conducted a Risk Assessment (part of the RI) of the "no-action" alternative to evaluate the potential risks to human health and the environment associated with the Site in its current state. The risk assessment focused on the groundwater contaminants which are likely to pose the most significant risks to human health and the environment (indicator chemicals). The indicator chemicals included 1,1-dichloroethene, 1,1,1-trichloroethane, trichloroethene, tetrachloroethane, benzene, chlorobenzene, 1,1-dichloroethane, 1, 2-dichloroethane, and vinyl chloride.

The risk assessment evaluates the potential impacts on human health and the environment at the Site assuming that the contamination at the site is not remediated. This information is used to make a determination as to whether remediation of the Site may be required.

The RI report presented a detailed site specific risk assessment which addressed site conditions and exposures. The risk assessment qualitatively and quantitatively evaluated the hazards to human health and the environment at the landfill. The qualitative analysis characterized the potential human exposure pathways while the quantitative analysis determined the risk of the complete pathways.

The human exposure pathways considered were ingestion and inhalation of contaminated well water, and dermal contact with contaminated surface water and sediments near the leachate seeps. The potential exposure pathways and the population potentially affected are presented in Table 9.

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate

of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

EPA considers risks in the range of 10^{-4} to 10^{-6} to be acceptable. This risk range can be interpreted to mean than an individual may have a one in ten thousand to a one in a million increased chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the Site.

For groundwater, a comparison was made between observed well contamination levels (Confirmatory Sampling Program, 1989) and existing health-based standards for the indicator chemicals identified. The standards selected for this evaluation were the MCLs for volatile organics established under the Safe Drinking Water Act, National Primary Drinking Water Standards (40 CFR 141), and the New York State Department of Health (NYSDOH) Drinking Water Standards for Volatile Organic Compound (January 1989). Observed groundwater contaminant levels exceeded these standards and guidance values for trichloroethene, 1,1-dichloroethene, 1,1,1-trichloroethane, and 1,2-dichloroethane. The maximum concentrations of VOCs detected in either groundwater monitoring or residential wells and surface water are presented in Table 10. Table 11 compares the MCL for each indicator chemical with the maximum observed contaminant levels in the groundwater at the baseline exposure points (the residential wells).

Based on this comparison of exposure point concentrations to federal and state health-based standards, the existing conditions for the groundwater in the shallow aquifer at the Site are not adequately protective of human health.

The total baseline carcinogenic risk associated with exposure to

potable well water at the Site is 2.85×10^{-4}. This value is at the high end of the range considered acceptable by EPA for carcinogenic risk (10^{-4} to 10^{-6}). Combined pathway specific intakes (ingestion and inhalation) were calculated using the Hazard Index (HI) approach. The HI for the noncarcinogenic compounds present in the groundwater at the Site is 3.85. An exceedance of 1.0 in the HI indicates that conditions existing at the Site are not adequately protective of human health.

Table 12 summarizes the carcinogenic risks associated with the intake of contaminated groundwater containing VOCs at the maximum concentrations observed in Residential Well No. 1 under baseline conditions. This table also illustrates the risks associated with exposure to the noncarcinogenic compounds present.

No elevated human health risk is anticipated from the consumption of aquatic or terrestrial game species due to the low bioconcentration factors associated with the indicator chemicals. No significant adverse toxicity impact to terrestrial or aquatic wildlife is anticipated based on the levels of the indicator parameters measured at the Site.

Exposure to the chemical substances identified at the Site may result from the consumption of contaminated well water and the inhalation of indoor air contaminated by the VOCs present in the water.

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

CLEANUP LEVELS FOR CONTAMINATED MEDIA

Cleanup levels based on public health and environmental concerns and on a review of Applicable or Relevant and Appropriate Requirements (ARARs) were developed for the Site. ARARs were used to determine the appropriate extent of site remediation, to scope and formulate remedial response actions, and to govern the implementation and operation of the selected action. CERCLA requires that primary consideration be given to remedial response actions that attain or exceed ARARs. The purpose of this requirement is to make CERCLA response actions consistent with other pertinent federal and state environmental requirements.

A requirement under CERCLA may be either "applicable" or "relevant and appropriate" to a site-specific remedial action, but not both. Currently, the only enforceable regulatory standards promulgated under the Safe Drinking Water Act are MCLs for the protection of human health. For each indicator chemical selected at the Site an MCL has been specified to a level that is protective to human health. Since MCLs exist for those indicator

chemicals ,therefore, regulatory guidelines were not used for comparative purposes to infer health risks and environmental impacts. However, Relevant regulatory guidelines as Ambient Water Quality Criteria, Maximum Contaminant Level Goals (MCLGs), and EPA Drinking Water Health Advisories were considered during the development of cleanup levels. The ARARs identified for the contaminated media at the Site are summarized below.

Soil

Since the landfill soils contain Resource Conservation and Recovery Act (RCRA) listed hazardous wastes, regulations specified in 40 CFR Part 264 Subpart F and G would be considered relevant for the installation of the multi-media cap. However, the implementation of the New York Code of Rules and Regulations (NYCRR) Part 360 final cover (cap) in lieu of a "RCRA Cap" will meet or exceed the performance requirements of Part 264 Subparts F and G at this Site. Based on the size of the landfill and the fact that there are not identified on-site "hot spots" that represent the major sources of contamination preclude any remedial response actions in which the landfilled material could be excavated and treated effectively. Therefore, the remedial action objective is to eliminate any direct contact with soil and to reduce or eliminate the infiltration of precipitation through the Site

Groundwater

The groundwater at the Site is classified by NYSDEC as class "GA", which indicates that the water is suitable as a drinking water supply. The RI has determined that contaminants from the Site have contaminated the groundwater. The remedial response objectives, therefore, include the following:

- Protect human health and the environment from current and potential future migration of contaminants in groundwater; and

- Restore on-site groundwater to levels consistent with federal and state groundwater standards.

The federal and New York State ARARs associated with quality of groundwater suitable for drinking at the Site are listed in Table 13. A comparison of the concentrations of the contaminants of concern in the groundwater to these ARARs reveals that most volatile organic compounds exceed the regulatory concentrations. As a result, the groundwater cleanup levels should meet the most stringent of the federal MCLs or the New York State Department of Health (NYSDOH) MCLs listed in Table 13. For those compounds having only non-carcinogenic effects, cleanup levels have been derived so that the total non-carcinogenic risk (HI) does not exceed unity (i.e., a value of 0.9 was used as the target HI).

The sources of each of the various cleanup levels are provided in footnotes to Tables 13.

Actual or threatened releases of hazardous substances from this 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.

Sediments

The sediments in the streams at the leachate seeps contain low levels (ppb) of VOCs. The contaminants of concern found in the sediments at the leachate seeps are benzene, chlorobenzene, 1,1-dichloroethane, 1,1-dichloroethene, and trichloroethene. Direct contact with the soil and sediments near the leachate seeps on the Site is a potential route of exposure. No chemical-specific ARARs for sediment are available at this time. The remedial action objective associated with the sediments is to eliminate the leachate seeps from the Site and any associated leachate discharges to the North and South Stream to prevent further contamination of sediments.

Since the health risk associated with direct contact of existing sediments is within the acceptable range, remediation of the existing sediments is not necessary.

DESCRIPTION OF ALTERNATIVES

The FS report evaluates, in detail, nine remedial alternatives for addressing the contamination associated with the Site.

These alternatives are:

Alternative 1: No Action with Monitoring

Capital Cost: $0
Operation and Maintenance (O & M) Cost: $14,000/yr
Present Worth Cost: $128,000
Time to implement: 0 yrs

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison of other alternatives. Under this alternative, no remedial action to control the source of contamination would take place. However, long-term monitoring of the Site would be necessary.

This alternative would involve a continuation of the present groundwater monitoring and water supply program provided by Broome County.

Because this alternative would result in contaminants remaining

on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 3a: Limited Action, Existing Water Supply, and Use Restrictions

Capital Cost: $0
O & M Cost: $71,000/yr
Present Worth Cost: $672,000
Time to Implement: 6 months

This alternative would involve a continuation of the present groundwater monitoring and water supply program provided by Broome County. Maintenance inspections would be upgraded to ensure that the carbon/UV filters that are currently provided at the residences are properly operated for all household needs. In addition, a sampling program will be implemented utilizing the existing monitoring wells which were installed as part of remedial investigations and sampled in the confirmatory sampling program. If the County is able to purchase the affected properties, the deeds for these properties would be restricted with respect to future use of groundwater and the property.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 3b: Limited Action and New Water Supply

Capital Cost: $150,000
O & M Cost: $53,000/yr
Present Worth Cost: $648,000
Time to Implement: 1 yr (includes design)

This alternative would provide new water supply wells upgradient of the landfill, and a distribution system to the residences within the affected area would also be installed.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 4b1: Landfill Cap, Downgradient Pumping, Groundwater Treatment, and Existing Water Supply

Capital Cost: $4,163,000
O & M Cost: $268,000/yr
Present Worth Cost: $5,595,000
Time to Implement: 1.5 yrs (includes design)

This alternative would involve the installation of a multi-media cap that combines a number of layers of different materials, such as a synthetic membrane or a compacted clay layer, sand drainage layer, and topsoil/vegetation. The cap would be designed to be in compliance with New York State Part 360 Solid Waste Regulations. Groundwater would be collected downgradient using pumping wells, and treated using air stripping. Treated effluent would be discharged to North Stream or the Susquehanna River. Potable water would be supplied to residents via the current program, as described under Alternative 3a.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 4b2: Landfill Cap, Downgradient Pumping, Groundwater Treatment, and New Water Supply

Capital Cost: $4,313,000
O & M Cost: $250,000/yr
Present Worth Cost: $5,646,000
Time to Implement: 1.5 yrs (includes design)

This alternative would involve the placement of a multi-media cap complying with New York State Part 360 Solid Waste Regulations, the pumping of groundwater downgradient of the landfill using pumping wells, and the treatment of the groundwater. Treated effluent would be discharged to North Stream or the Susquehanna River. A new water supply would be provided as described in Alternative 3b.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial action may be implemented to remove or treat the wastes.

Alternative 4c1: Landfill Cap, Pumping at Landfill and Downgradient, Groundwater Treatment, and Existing Water Supply

Capital Cost: $4,193,000
O & M Cost: $268,000/yr
Present Worth Cost: $5,040,000
Time to Implement: 1.5 yrs (includes design)

This alternative would involve the placement of a multi-media cap complying with New York State Part 360 Solid Waste Regulations, the pumping of groundwater downgradient of and within the landfill using pumping wells, and treatment of groundwater. The existing water supply program, upgraded as described in Alternative 3a, would be continued.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial action may be implemented to remove or treat the wastes.

Alternative 4c2: Landfill Cap, Pumping at Landfill and Downgradient, Groundwater Treatment, and New Water Supply

Capital Cost: $4,273,000
O & M Cost: $250,000/yr
Present Worth Cost: $5,135,000
Time to Implement: 1.5 yrs (includes design)

This alternative would involve the placement of a multi-media cap complying with New York State Part 360 Solid Waste Regulations, and the pumping and treatment of groundwater at the landfill and downgradient. A new water supply and distribution system would be constructed as described in Alternative 3b.

Long-term monitoring, fencing and deed restrictions would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial action may be implemented to remove or treat the wastes.

Alternative 4d1: Landfill Cap, Downgradient Cutoff, and New Water Supply

Capital Cost: $8,811,000
O & M Cost: $230,000/yr
Present Worth Cost: $10,977,000
Time to Implement: 1.5 yrs (includes design)

This alternative would involve the placement of a partial groundwater slurry cutoff wall downgradient of the landfill and pumping and treatment of groundwater within the containment wall. A multi-media cap complying with New York State Part 360 Solid Waste Regulations would be constructed to cover the entire landfill and the limits of the slurry wall downgradient of the landfill. Attainment of groundwater standards outside the cutoff wall would occur naturally over the long-term. A new water supply would be provided as described in Alternative 3b.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 4d2: Landfill Cap, Downgradient Cutoff, and Existing Water Supply

Capital Cost: $8,701,000
O & M Cost: $268,000/yr
Present Worth Cost: $11,230,000
Time to Implement: 1.5 yrs (includes design)

This alternative would involve the placement of a partial groundwater cutoff wall downgradient of the landfill, as described in Alternative 4d1, and pumping and treatment of groundwater within and outside of the cutoff wall. A multi-media cap complying with New York State Part 360 Solid Waste Regulations would be constructed to the limits of the slurry wall downgradient of the landfill and to the limit of the landfill on the upgradient side. The existing water supply program would be continued as described in Alternative 3a.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility or volume (including the statutory preference for treatment), short-term effectiveness, implementability, cost, state acceptance, and community acceptance.

A comparative analysis of these alternatives based upon the evaluation criteria note above, are as follows:

Overall Protectiveness of Human Health and Environment

The no-action alternative would not be protective of human health and the environment. Alternatives involving the utilization of the existing water supply system (Alternatives 3a, 4b1, 4c1, and 4d2) are protective of the human health, since each of these alternatives call for the provision of carbon filters to the present and future affected residences.

Alternative 3a would not be protective of the environment since no provision is provided for source containment, treatment, or leachate seepage control. Alternatives 4b1, 4b2, 4c1, 4c2, 4d1, and 4d2, which provide for source containment, groundwater treatment, and leachate seepage control, are equally protective of the environment.

Under Alternatives 4c1 and 4c2, the carcinogenic risk associated with exposure to VOCs in the groundwater from the Site would be expected to reach an acceptable range after the first year of pumping. Further decreases in the carcinogenic risk to 10^{-6} would be expected during the subsequent 3 years of pumping. The HI is anticipated to decline from a baseline of 3.85 to 0.27 after 1 year of pumping.

Compliance with ARARs

The no-action alternative would not ensure compliance with chemical-specific ARARs within a reasonable or predictable time frame. Alternative 3a, which addresses actual current groundwater use, would immediately comply with health-based ARARs at the point of use, but would provide no action to ensure compliance at the groundwater source. The pumping and containment alternatives (Alternatives 4b1, 4b2, 4c1, and 4c2) also would ensure immediate point-of-use compliance with health-based ARARs. However, these alternatives differ in their estimated time to compliance at the groundwater source. Nevertheless, each containment alternative has the potential to meet chemical-specific ARARs at the groundwater source (i.e., outside the landfill boundary). The containment alternatives involving a cutoff wall (Alternatives 4d1 and 4d2) would ensure immediate point-of-use compliance with health-based ARARs, but will not result in compliance at the groundwater source within a reasonable time frame.

All containment alternatives can be designed to meet action-specific ARARs with conventional technology.

The estimated time to meet ARARs after implementation of each alternative is presented in Table 14.

Long-Term Effectiveness and Permanence

The no-action alternative would be neither effective nor permanent in the reduction of the magnitude of risk associated with the Site.

Alternative 3a would be effective in the reduction of risk, but the permanence of this alternative would depend on the strict enforcement and frequent monitoring and maintenance of the carbon filters. By comparison, Alternative 3b would be effective in the long-term reduction of risk to residences provided with the new water supply system.

Alternatives 4b1, 4c1 and 4d2 provide for controlled source containment, and groundwater treatment, which would reduce risk, but long-term maintenance and monitoring would be required. The limited action component of these alternatives would reduce the adequacy and reliability of these options when compared to the remaining alternatives.

Alternatives 4b2, 4c2, and 4d1 provide for the reduction of risk by virtue of the provision for a new water supply, source containment and groundwater treatment. These alternatives are similar in their ability to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. The proposed controls would require long-term, O&M, but system adequacy and reliability are relatively greater as the local water supply will be unaffected by the remedial action.

In addition, Alternatives 4b1, 4b2, 4c1, and 4c2 should provide long-term effective attainment of ARARs at the groundwater source after several years.

Reduction of Toxicity, Mobility, or Volume through Treatment

The no-action alternative involves no treatment, and consequently, would not contribute to the reduction of contaminant toxicity, mobility, or volume at the Site. This assessment is also applicable to Alternatives 3a and 3b.

All of the containment alternatives (Alternatives 4b1, 4b2, 4c1, 4c2, 4d1, and 4d2) would reduce the toxicity, mobility, or volume through containment and the treatment of the groundwater using air stripping. For these alternatives, emissions from the air stripper would be at allowable limits for discharge to the atmosphere or destroyed through the use of a catalytic destruction unit.

Short-Term Effectiveness

In the short-term, the no-action alternative would not be effec-

tive in protecting human health and the environment. Improvement of groundwater quality would only occur through natural recovery, which is predicted to require at least 20 years.

Alternative 3a, Limited Action, would be effective in the short-term only for the existing residents. No significant community or worker exposure during the remediation would be anticipated. No improvement in environmental quality would be envisioned. The same assessment also applies to Alternative 3b.

All of the containment alternatives (Alternatives 4b1, 4b2, 4c1, 4c2, 4d1 and 4d2) would provide immediate point-of-use compliance with health-based ARAR limits. Alternatives 4c1 and 4c2 are predicted to provide aquifer cleanup to ARAR limits in four years. Aquifer cleanup under Alternatives 4d1 and 4d2 would take much longer.

Protection against community and worker exposure will be required with all of the containment options. For Alternatives 4b2, 4c2, and 4d1 to protect the residents, interim measures, such as maintenance of the existing filters, would be required until the new water supply system is installed and is operational. Additional worker protection measures, pursuant to Occupational Safely and Health Administrative requirements under Alternatives 4d1 and 4d2, would be required.

Environmental impacts during the construction of the groundwater pumping and treatment components of the containment options could be mitigated readily. Relatively greater potential environmental impacts are envisioned with Alternatives 4d1 and 4d2, and these impacts would require more involved mitigation measures during the installation of the cutoff wall.

Implementability

All of the alternatives are implementable.

Alternative 3a presents added administrative requirements for successful implementation due to the need to purchase additional affected residences and to institute and enforce land and groundwater use controls. This same factor must be considered with each containment option that includes limited action as a sub-alternative component.

The containment options calling for a downgradient cutoff wall would involve some difficult construction on steep slopes, but Alternatives 4d1 and 4d2 can be constructed. In contrast, the pumping components of all the containment options can be implements quickly and efficiently. No problems are envisioned with any of the alternatives with respect to the availability of services and materials.

The estimated time to implement each alternative is presented in Table 14.

Cost

The no-action alternative has the lowest estimated present worth cost of $128,000. Alternatives 3a and 3b have slightly greater estimated present value cost of $672,000 and $646,000, respectively.

Alternatives 4b1, 4b2, 4c1, and 4c2 have present value costs ranging from $5,040,000 to $5,646,000.

Alternatives 4d1 and 4d2, which call for a partial downgradient cutoff wall, are the most expensive at $10,977,000 and $11,230,000, respectively.

The capital, annual O&M, and present value costs for each alternatives are presented in Table 14.

State Acceptance

NYSDEC concurs with the selected alternative.

Community Acceptance

EPA and NYSDEC believe that the selected remedy has the support of the affected community. The community comments and concerns received during the public comment period were identified and addressed in the responsiveness summary which is attached as Appendix 5 of this document. None of the comments from the public raised substantive objections or concerns about the selected remedy. Therefore, EPA believes that the selected remedy has the support of the affected community.

THE SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, both EPA and NYSDEC have determined that Alternative 4c2, Landfill Cap, with Pumping at Landfill and Downgradient, Groundwater Treatment, and New Water Supply, is the most appropriate remedy for the Site. The selected remedy will provide containment through the installation of a cap over the landfill material and leachate collection, which will eliminate the potential for direct human or animal contact with the leachate seeps discharges to the North and South Streams. Contaminated groundwater underlying the Site will be restored to levels consistent with state and federal requirements by pumping at and downgradient from the landfill and by treating the extracted groundwater by using air stripping. In addition, the human health risks from potable use of contaminated groundwater will be controlled under the existing

quarterly residential well monitoring program along with the temporary water supply and carbon filtration program for the affected residences until a new water supply is constructed. Also included in the selected remedy is groundwater monitoring, fencing, and deed restrictions. Five-year reviews will be conducted as required by the NCP due to the fact that waste will remain on-site. The purpose of the five-year review is to ensure that the remedy continues to provide adequate protection of human health and the environment.

The landfill will be regraded as necessary prior to installation of the cap to establish slopes which will encourage runoff and minimize erosion. The cap will contain the landfill material and minimize infiltration of precipitation into the landfill material. This will minimize the potential for future contamination of the groundwater.

The major components of the selected remedy include the following:

- Cutting the existing sides of the landfill to slopes of no greater than approximately 33%. The top surfaces of the landfills would be regraded to slopes of no less than 4% to provide for proper drainage.

- Construction of lined (filter fabric) leachate collection trenches.

- Installation of a multimedia cap over the landfill material. Water infiltrating through the vegetative and protective layers of the cap will be intercepted by the impermeable flexible membrane layer and conveyed away from the landfill material.

- Installation of a gravel gas venting layer, with a filter fabric layer placed over the gravel. The FML will be placed over the filter fabric, and another layer of filter fabric will be placed on top of the FML.

- Seeding and mulching of the top soil layer to prevent erosion and provide for rapid growth of vegetation.

- Pumping the contaminated groundwater beneath and downgradient of the landfill.

- Treatment of the extracted groundwater, using metals treat ment and air stripping.

- Discharge of the treated water to surface water.

- Construction of a new water supply system for the present and future affected residences (with the continuation of

existing quarterly residential well monitoring and temporary water supply and carbon filtration programs until the new water supply is in operation). It is contemplated that the new water supply system will utilize a new well or wells northwest of the affected area.

- Fencing to further protect the integrity of the caps by restricting access to the Site.

- Periodic inspection of the cap and maintenance as necessary will provide for long-term effectiveness and permanence of the alternative.

- Imposition of property deed restrictions, if necessary. The deed restrictions will include measures to prevent the installation of drinking water wells at the Site and restrict activities which could affect the integrity of the cap.

- Initiation of a monitoring program upon completion of the closure activities. The monitoring program will provide data to evaluate the effectiveness of the remedial effort over time.

The multi-media cap will be consistent with applicable regulations that require that when a FML is used in place of clay, the FML may have a permeability no greater than 1×10^{-12} cm/sec. The design requirements contained in the 6 NYCRR Part 360 standards would be incorporated into the cap design.

The cap considered above would also attain the performance requirements for caps at hazardous waste landfills as specified in 40 CFR Part 264.310. These requirements, promulgated under the RCRA, specify that the cap should:

1. Provide long-term minimization of migration of liquids through the closed landfill;

2. Function with minimum maintenance;

3. Promote drainage and minimize erosion or abrasion of the cover;

4. Accommodate settling and subsidence so that the cap's integrity is maintained; and

5. Have a permeability less than or equal to the permeability of any bottom liner present or natural subsoils present.

The first RCRA performance requirement would be attained by establishing proper slopes for drainage of precipitation, vege-

tated topsoil to promote evapotranspiration, as well as the installation of a FML with a permeability of 1 x 10^{-12} cm/sec or less.

A minimum amount of maintenance would be required for the cap. Maintenance activities would primarily consist of periodic mowing. Proper slopes and the vegetated topsoil would be established to promote drainage and minimize erosion of the cover.

It is expected that settling and subsidence has already occurred at the Site due to its age and would not occur in the future. However, an FML is considered to typically accommodate settling satisfactorily.

It is assumed that the effluent from the groundwater treatment system will be discharged by gravity to the North Stream in the vicinity of Residential Well No. 1, and that disinfection of this effluent will not be required. Should disinfection be required, an ultra-violet disinfection system would be included. In the final design, sufficient area will be allocated at the location of the groundwater treatment system for the inclusion of this disinfection system in accordance with the 6 NYCRR Parts 700-705.

The groundwater treatment will continue until federal MCLs and state groundwater and drinking water standards for the organics have been achieved in the groundwater. The goal of this remedial action is to restore groundwater to its beneficial use, which is, at this site, a drinking water source. Based on information obtained during the field investigation and on an analysis of all remedial alternatives, EPA and NYSDEC believe that the selected remedy involves using the best available and most appropriate technology to achieve this goal. It may become apparent, during the operation of the groundwater extraction system that, at a certain point, contaminant levels have ceased to decline and are remaining constant at levels higher than the remediation goal. In such a case, the system performance standards and/or the remedy will be reevaluated.

The selected remedy will include groundwater extraction and treatment for at least 4 years, during which the system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation. Air monitoring will be performed during construction at the Site. Air emissions from the treatment units during groundwater remediation will meet the air emission ARARs. Environmental monitoring will be required during the life of the treatment process. In addition, monitoring of the groundwater at the Site will be conducted for a period of thirty years after completion of the remedial construction, to ensure that the goals of the remedial action have been met.

The new water supply system will be designed to serve the affected residences with the continuation of existing quarterly residential well monitoring and temporary water supply and carbon filtration programs until the new water supply is in operation. It is contemplated that the new water supply system will utilize a new well or wells northwest of the affected area.

The selected remedy will be designed to avoid significant impacts to the North and South Streams. The discharge to the North Stream should be designed to minimize impacts associated with scouring. If the leachate seeps have not significantly subsided or improved in quality within 1 year after remedial construction is completed, collection and treatment of the seeps will be reevaluated.

The groundwater cleanup levels at the Site are based primarily on the classification of the groundwater as a drinking water source. Therefore, the MCLs for volatile organics established under the Safe Drinking Water Act, National Primary Drinking Water Standards (40 CFR 141), and the New York State Department of Health (NYSDOH) Drinking Water Standards for VOCs are relevant and appropriate.

A wetlands delineation (utilizing the "three parameter method"), and a Stage 1A cultural resources assessment will be undertaken during the remedial design phase in accordance with Executive Order 11990. A wetland assessment and restoration plan will be required for any wetlands impacted or disturbed by remedial activity.

The capital, annual O&M, and present value costs for the selected remedy are presented in Table 14.

Remediation Levels

Remediation levels are derived for concentrations of contaminants for each exposure route that is believed to provide adequate protection of human health and the environment based on available site information (55 FR 8712, March 8, 1990).

The media of concern identified for the Site are groundwater from the glacial outwash aquifer and leachate seeps in the North Stream and on the south side of the landfill.

The purpose of the response action for the Site are as follows:

- Control the release of VOCs from the Site to the glacial outwash aquifer that underlies the project area;

- Properly close the landfill and eliminate the leachate seeps, and any associated leachate discharges to the

North and South Streams;

- Eliminate the potential for direct human or animal contact with any active leachate seeps;

- Continue the existing quarterly residential well monitoring program along with the temporary water supply and carbon filtration program for the affect residences until a new water supply is constructed; and

- Restore the groundwater underlying the Site to levels consistent with state and federal ARARs.

STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that achieve protection of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when completed, the selected remedial actions must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy also must be cost-effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

Since a new water supply is to be provided under the selected remedy, human health will be protected. Control of the leachate seeps by the capping the landfill will also prevent human contact with contaminated seeps and sediment, and will mitigate any environmental effects.

The selected remedy will protect human health and the environment through the removal and treatment of the organic contaminants in groundwater, using air stripping and metals removal. Risk reduction will be provided by the selected remedy. The carcinogenic risk associated with exposure to VOCs in the groundwater from the Site would be expected to reach an acceptable range after the first year of pumping. Further decreases in the carcinogenic risk to 10^{-6} would be expected during the subsequent 3 years of pumping. The HI is anticipated to decline from a baseline of 3.85 to 0.27 after 1 year of pumping. An HI below unity is indicative of conditions which would be protective of

human health for carcinogenic effects. Further declines in the HI to 0.10 would be anticipated during the first 3 years of remediation.

There are no short-term threats associated with the selected remedy that cannot be readily controlled.

Compliance with ARARs

The selected remedy will not result in immediate compliance with federal and state drinking water MCLs in the groundwater. However, as predicted by contaminant transport modeling, the contaminant concentrations will be within the MCLs after at least four years of pumping and treatment. The discharge to surface water will be treated to conform to State Permit Discharge Elimination System limits (6NYCRR Part 750 through 758). Discharges to the air from stripping will comply with the Ambient Guideline Concentrations in the New York State Air Guide and the standards presented in 6 NYCRR Part 212. If it is determined during detailed design that vapor phase treatment is required, it will be supplied. Installation of a cap and some downgradient pumping wells will require temporary or permanent alterations to the stream bed of the North Stream. Construction, filling, and stream relocation will be designed to comply with relevant requirements of NYSDEC and the U.S. Army Corps of Engineers (33 CFR Parts 320 through 330).

Since the landfill contains RCRA listed hazardous wastes, regulations specified in 40 CFR Part 264 Subpart F and G would be considered relevant for the cap. However, the implementation of the NYCRR Part 360 final cover (cap) in lieu of a "RCRA Cap" will meet or exceed the performance requirements of Part 264 Subparts F and G at this site. Therefore, RCRA capping requirements are not appropriate, since they do not address all facets of a municipal landfill including landfill gas controls. Landfill gas controls are addressed in NYCRR Part 360. In addition the selected remedy will comply with all chemical, action, and location-specific ARARs.

Cost-Effectiveness

The selected remedy is cost effective because it has been determined to provide overall effectiveness proportional to its cost. The total capital and present worth costs for the selected remedy are $4,273,000 and $5,135,000, respectively. The O & M cost for the selected remedy is $250,000 per year.

The selected remedy is the least expensive of all the alternatives which provide for active restoration of the groundwater resources and establish a new supply of drinking water. The most expensive alternatives (Alternatives 4d1 and 4d2) are up to 119 per cent higher than the present worth cost of the selected

remedy. Likewise, the selected remedy provides the same degree of certainty with regard to the effective removal of all the organic and inorganic contaminants.

The capital, annual O&M, and present worth cost for the selected remedy is presented in Table 14.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA and NYSDEC have determined that the selected remedy represents the maximum extent practicable to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for the final source control operable unit at the Site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA and NYSDEC have determined that the selected remedy provides the best balance of trade-offs in terms of long-term effectiveness and permanence, reduction in toxicity, mobility, or volume achieved through treatment, short-term effectiveness, implementability, and cost, also considering the statutory preference for treatment as a principal element to the maximum extent practicable and considering state and community acceptance.

The selection of treatment of the contaminated groundwater is consistent with program expectations that indicate that highly toxic and mobile wastes are a priority for treatment and often necessary to ensure the long-term effectiveness of a remedy. All the alternatives that consider remedial action are reasonably comparable with respect to implementability, therefore, the major trade-offs that provide the basis for the selection of the remedy are the estimated time to meet the ARARs after implementation, reduction in toxicity, mobility, or volume, and cost effectiveness. The selected remedy can be implemented with less risk to the area of residents and at less cost than the other remedial action alternatives and is, therefore, determined to be the most appropriate solution for the contaminated groundwater at the Site.

With regard to implementability, the components of the selected remedy are easily implemented, proven technologies and are readily available.

Preference for Treatment as a Principal Element

By treating the groundwater by air stripping and by the installation of a landfill cap, the selected remedy addresses the principal threats posed by the Site through the use of treatment technologies to the maximum extent practicable.

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are

legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The contaminated groundwater and leachate is being treated, addressing the statutory preference for treatment as a principal element of the remedy. However, the size of the landfill and the fact that there are no identified on-site "hot spots" that represent the major sources of contamination preclude a remedy in which the landfilled material could be excavated and treated effectively.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are not significant changes from the preferred alterative presented in the Proposed Plan.

APPENDIX 1 - TABLES

TABLE 1

NATURE AND AMOUNT OF INDUSTRIAL WASTES
RECEIVED AT THE COLESVILLE LANDFILL

Waste Type	Description	Amount Drums/ Month
Aqueous Dye Wastes	. pH - neutral to alkline . 0.18% sulfate (average 10%) . Density - 8.3-9 lbs/gallon . 15% total solids at 110° C . Traces of Zn, Al, Fe, Sn	10
Organic Solvent Mixtures	. Density - 6.8 - 8.3 lbs/gallon 5% total solids at 110° C Heating value - 8,000 BTU/lb (min) . Included benzene, cyclohexane, acetone isopropyl alcohol, methanol, ethanol, n-hexane, toluene, xylene, methyl, cellosolve, 10% chlorinated solvents and water, diethyl ether	10
Mixed Chemical Solvents	. Density - 8.3 lbs/gallon . 5% total solids at 110° C . 15% chloride . Heating value - 6,500 BTU/lb (min) . Included isopropyl alcohol, methanol, methylene chloride acetone, minor amounts of other hydrocarbons and solvents	10

Source: Wehran Engineering, "Hydrogeologic Investigation," September 1983.

APPENDIX G

APPENDIX C

Table 2
BROOME COUNTY - COLESVILLE LANDFILL
VOLATILE ORGANIC COMPOUNDS IN MONITORING WELLS

Volatile Compounds (µg/l)	Monitoring Well W-21				Monitoring Well W-22S		Monitoring Well W-22I	Monitoring Well W-22D	Monitoring Well W-23S			Monitoring Well W-24	Monitoring Well W-25
	4/7/84 Chemtech EPA 624	6/8/84 Chemtech EPA 624	12/10/87 Nanco EPA 624	8/15/89 NY Test EPA 8010/8020	12/10/87 Nanco EPA 624	8/15/89 NY Test EPA 8010/8020	12/10/87 Nanco EPA 624	8/15/89 NY Test EPA 8010/8020	12/10/87 Nanco EPA 624	12/10/87 H_2M EPA 624	8/15/89 NY Test EPA 8010/8020	8/15/89 NY Test EPA 8010/8020	8/15/89 NY Test EPA 8010/8020
Chloromethane													
Vinyl Chloride												39	
Chloroethane													
Methylene Chloride				3								4	4
1,1 Dichloroethene													
1,1 Dichloroethane												37	
Trans 1,2-Dichloroethene												0 5	
Chloroform												2	
1,2 Dichloroethane												43	
2 Butanone													
1,1,1-Trichloroethane												3	
1,2 Dichloropropane													
Trichloroethene												21	
Benzene													5
Toluene													
Chlorobenzene												0 5	
Ethylbenzene													
Total Xylenes													
Trichlorofluoromethane	14												
Tetrachloroethene												0 5	

Note: Blank cells indicate not detected

Table 3
BROOME COUNTY - COLESVILLE LANDFILL
VOLATILE ORGANIC COMPOUNDS IN PRIVATE WELLS

Volatile Compounds (µg/ℓ)	Residential Well No. 1						
	3/31/83 NY Testing EPA 624	4/21/83 NYSDOH EPA 601	12/29/83 H_2M EPA 601	9/28/87 H_2M EPA 601	12/11/87* Nanco EPA 624	12/11/87* H_2M EPA 624	8/15/89 NY Test EPA 8010/8020
Chloromethane							
Vinyl Chloride		6					
Chloroethane							
Methylene Chloride	96	10		8			6
1,1-Dichloroethene		12	12	54	7	110	11
1,1-Dichloroethane		33	27	170	130	480	320
Trans-1,2-Dichloroethene	130	70	120			600	140
Chloroform		12	8	12		10	8
1,2-Dichloroethane							
2 Butanone							
1,1,1-Trichloroethane	460	150	330	220	190	400	270
1,2-Dichloropropane							
Trichloroethene	440	130	140	100	84	220	160
Benzene		31					
Toluene	2	1					
Chlorobenzene							
Ethylbenzene							
Total Xylenes		1					
Trichlorofluoromethane		2					

Notes

Blank cells indicate not detected; BMRL = Below Minimum Reportable Level

* Samples taken by Wehran

Table 3a
BROOME COUNTY - COLESVILLE LANDFILL
VOLATILE ORGANIC COMPOUNDS IN PRIVATE WELLS

Volatile Compounds (µg/ℓ)	Residential Well No. 2							
	4/21/83 NYSDOH EPA 601	12/29/83 H_2M EPA 601	5/7/84 H_2M EPA 601	6/8/84 Chemtech EPA 624	9/28/87 H_2M EPA 601	12/16/87 H_2M EPA 601	12/11/87* Nanco EPA 624	8/15/89 NY Test EPA 8010/8020
Chloromethane								
Vinyl Chloride	2					11		
Chloroethane								
Methylene Chloride	1					4		
1,1-Dichloroethene						13		
1,1-Dichloroethane	6	4	4		5	46	6	
Trans-1,2-Dichloroethene	7	11	11	15		40	6	
Chloroform	2					82		
1,2-Dichloroethane								
2-Butanone								
1,1,1-Trichloroethane	10		10	15	7	31	BMRL	
1,2-Dichloropropane								
Trichloroethene					1	5		
Benzene	4							
Toluene								
Chlorobenzene								
Ethylbenzene								
Total Xylenes								
Trichlorofluoromethane					34			

Notes

Blank cells indicate not detected, BMRL = Below Minimum Reportable Level

*Samples taken by Wehran

Table 3b
BROOME COUNTY – COLESVILLE LANDFILL
VOLATILE ORGANIC COMPOUNDS IN PRIVATE WELLS

Volatile Compounds (µg/ℓ)	Residential Well No. 3								
	3/31/83 NY Testing EPA 624	4/21/83 NYSDOH EPA 601	12/29/83 H_2M EPA 601	5/7/84 H_2M EPA 601	6/8/84* Chemtech EPA 624	9/28/87 H_2M EPA 601	12/16/87 H_2M EPA 601	2/11/87* Nanco EPA 624	8/15/89 NY Test EPA 8010/8020
Chloromethane									
Vinyl Chloride									
Chloroethane									
Methylene Chloride	100						2		
1,1-Dichloroethene									
1,1-Dichloroethane									
Trans-1,2-Dichloroethene									
Chloroform							72		
1,2-Dichloroethane									
2-Butanone							13		
1,1,1-Trichloroethane									
1,2-Dichloropropane									
Trichloroethene	1								
Benzene									
Toluene	12								
Chlorobenzene									
Ethylbenzene									
Total Xylenes									
Trichlorofluoromethane									

Notes

Blank cells indicate not detected; BMRL = Below Minimum Reportable Limit

*Samples taken by Wehran

Table 4
BROOME COUNTY – COLESVILLE LANDFILL
COLESVILLE CONFIRMATORY SAMPLING PROGRAM 1989
DISSOLVED METALS IN MONITORING WELLS*
AUGUST 1989

Metal (µg/ℓ)	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8[1]	MW-10	MW-11	MW-12D	MW-13	MW-14S	MW-14D	MW-15	MW-16S
Arsenic			22		24									13
Cadmium														
Chromium														
Copper														
Iron		84.1	21.7	120,000	3,270					34 6				84.9
Lead														
Nickel			26 6											
Silver														
Zinc	37.1	35 5	42.8	51 6	50 2		22			60 5				48 0

Note: Blank cells indicate not detected

* Samples taken by Wehran

1 Not Sampled

Table 4 a

BROOME COUNTY-COLESVILLE LANDFILL

COLEVILLE CONFIRMATORY SAMPLING PROGRAM 1989

TOTAL METALS IN MONITORING WELLS

AUGUST 1989

Metals (ug/l)	MW-3	MW-4	MW-5D	MW-6	MW-7	MW-10	MW-13	MW-16S	MW-16D	MW-17S	MW-17I	MW-22S	MW-22D	MW-24	MW-25
Arsenic	7	7	33		24	8			28	21		52	22	14	22
Cadmium															
Chromium	24 2	20 6	14 4		29 6	10 8	74 4		159			10 8	502	435	19 7
Copper	62 2	46 4	39 6	26 2	76 1	32.1	101	24 3	296	22 3	33	32	979	889	31 8
Iron	42,400	27,800	7,860	125,000	26,400	12,400	132,000	5,570	273,000	3,680	7,850	12,200	785,000	754,000	30,400
Lead	29	19 8	21 5		40 4	20 4	96 2		143		7 7	10 5	652	16,700	
Nickel	37 8	34 2		52 2			128	23 4	329			27	995	696	34 2
Silver									10 3						
Zinc	216	197	122	165	171	130	2,010	163	811	99 8	113	99 7	2,460	2,300	164

Note: Blank cells indicated not detected

* Samples taken by Wehran

Table 5
BROOME COUNTY – COLESVILLE LANDFILL
VOLATILE ORGANIC COMPOUNDS IN SURFACE WATER*
AUGUST 1989

Volatile Compounds (µg/l)	SW-01	SW-02	SW-05	SW-07	SW-08	SW-09	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-18
Chloromethane													
Vinyl Chloride													
Chloroethane					9								
Methylene Chloride			3						5	5			225
1,1-Dichloroethene													
1,1-Dichloroethane					121	4	3	2					4
Trans-1,2-Dichloroethene													
Chloroform													
1,2 Dichloroethane													
2 Butanone													
1,1,1 Trichloroethane					4			2					
1,2 Dichloropropane													
Trichloroethene													
Benzene													
Toluene													
Chlorobenzene					62								
Ethylbenzene													
Total Xylenes													
Trichlorofluoromethane													
1,1,2,2-Tetrachloroethene									5				

Note: Blank cells indicate not detected

* Samples taken by Weiran

Table 6

BROOME COUNTY - COLESVILLE LANDFILL

COLESVILLE CONFIRMATORY SAMPLING PROGRAM 1989

TOTAL METALS IN SURFACE WATER*

AUGUST 1989

Metal (µg/l)	SW-1	SW-02	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-16	SW-17	SW-18
Arsenic								24	6	8								.34
Cadmium																		
Chromium																		
Iron	1,240	1,320			274	122	101	7,200	1,500	1,220	366	2,630	22,600	12,100	297			266,000
Lead		103										86.7	14 5		28.7			67.3
Nickel										21 6			25					
Silver																		
Zinc	32 4	41			38 3	34 5	45 3	37 2	36 1	35	60 4	98 9	54.5	58.3	65 2			56

Note: Blank cells indicate not detected

* Samples taken by Wehran

Table 7
BROOME COUNTY - COLESVILLE LANDFILL
VOLATILE ORGANIC COMPOUNDS IN STREAM SEDIMENTS*
AUGUST 1989

Volatile Compounds (mg/kg)	SD-01	SD-02	SD-03	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-11	SD-12	SD-13	SD-14	SD-15	SD-16	SD-17	SD-18
Chloromethane																		
Vinyl Chloride																		
Chloroethane																		
Methylene Chloride	71	3				23	6	7	5	29	7	23	4	101	3	231	12	21
1,1-Dichloroethene																		3
1,1-Dichloroethane								11									12	
Trans-1,2-Dichloroethene																		
Chloroform																		
1,2-Dichloroethane																		
2-Butanone																		
1,1,1-Trichloroethane																		
1,2-Dichloropropane																		
Trichloroethene																		
Benzene																		
Toluene																		
Chlorobenzene								0 9										
Ethylbenzene																		
Total Xylenes																		
Trichlorofluoromethane																		

Notes

Blank cells indicate not detected, BMRL = Below Minimum Reportable Level

*Samples taken by Wehran

Table 8
BROOME COUNTY - COLESVILLE LANDFILL
COLESVILLE CONFIRMATORY SAMPLING PROGRAM 1989
TOTAL METALS IN STREAM SEDIMENTS*
AUGUST 1989

Metal (µg/ℓ)	SD-01	SD-02	SD-03	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-11	SD-12	SD-13	SD-14	SD-15	SD-16	SD-17	SD-18
Arsenic	8.3	11.6			25.5	28.7	79.7	14.8		12.3	11.9	2.8	16.8	10.4	10.8	25.2	32.4	
Cadmium																		
Chromium	11.1	14.9			11.8	15.6	14.3	14.2	15.3	8.0	13.3	18.1	14.2	12.9	10.9	19.9	8.7	
Iron	23,100	30,700			29,900	37,400	30,200	25,600	31,500	20,000	30,400	31,800	29,400	34,900	35,100	44,200	81,800	24,200
Lead	24.9	21.9			43.7	13.9	12.6	10.1	10.4	15.4	10.7	10.1	1.3	15.7	9.9	428	3.3	11.9
Nickel	28.2	5.3			31.9	25.2	31.9	32.5	25.6	12.5	28.9	33.4	21.4	25	29.0	31.2	34.9	23.1
Silver																		
Zinc	355	191			1,510	159	237	1,170	163	128	144	88.6	140	161	138	261	197	153

Note: Blank cells indicate not detected

* Samples taken by Wehran

1 Not Sampled

Table 9
BROOME COUNTY – COLESVILLE LANDFILL
CONFIRMATORY SAMPLING PROGRAM 1989
POTENTIAL EXPOSURE PATHWAYS

Release Medium	Release Source	Exposure Point	Exposure Route	Number of People	Pathway Complete*
Groundwater	Buried waste	Nearest residences less than 0.5 mile	Ingestion of drinking water	13[1]	Yes
Surface Water	Seeps/groundwater	Direct contact	Dermal	1,921[2]	Yes
Steam/Seep/Sediments	Seeps/groundwater	Direct contact	Dermal	1,921[2]	Yes

Notes:

* Pathway is considered complete if the release medium, source exposure points, and exposure routes all exist.

[1] Source: 1980 U.S. Census data for Town of Colesville estimated 3.18 persons per household.

[2] Population within a three-mile radius of the landfill.

Table 10
BROOME COUNTY - COLESVILLE LANDFILL
CONFIRMATORY SAMPLING PROGRAM 1989
MAXIMUM CONCENTRATION OF VOLATILE ORGANIC COMPOUNDS

Compound	Concentration		
	Groundwater (mg/ℓ)	Surface Water (mg/ℓ)	Soils* (mg/kg)
Benzene	0.120	ND	ND
Chlorobenzene	0.035	0.062	0.001
Chloroethane	0.048	0.009	ND
1,1-dichloroethane	0.320	0.121	0.012
1,1-dichloroethene	0.015	ND	ND
Trans-1,2-dichloroethene	0.140	ND	ND
1,2-dichloroethane	0 043	ND	ND
1,2-dichloropropane	0 003	ND	ND
Ethylbenzene	0.008	ND	ND
Toluene	0.021	ND	ND
1,1,1,-trichloroethane	0.270	0 004	ND
Tetrachloroethene	0.005	0 005	ND
Trichloroetnene	0.160	ND	ND
Total Xylene	0.020	ND	ND
Vinyl Chloride	0.134	ND	ND

Notes:

Samples taken by Wehran-New York, Inc. 1989

* Sediments in the immediate vicinity of leachate seeps

ND = Detected

TABLE 11

BROOME COUNTY - COLESVILLE LANDFILL

CONFIRMATORY SAMPLING PROGRAM 1989

COMPARISON OF MCLs TO ESTIMATED EXPOSURE POINT CONCENTRATIONS

Compound	Value of MCL* (µg/l)	Exposure Point† Concentration (µg/l)	Concentration/ Standard Ratio‡
1,1-dichloroethene	7	11	1.6
Trichloroethene	5	160	32.0
Tetrachloroethene	5	N/D	--
Benzene	5	N/D	--
1,2-dichloroethane	5	320	64.0
1,1,1-trichloroethane	5	270	54.0
Vinyl Chloride	2	N/D	--
Chlorobenzene	5	N/D	--
1,2-dichloroethane	5	N/D	--

Notes:

* New York State Department of Health Drinking Water Standards for Volatile Organic Compounds. January 1989.

† Maximum concentrations measured in homeowner wells (Wehran, 1989 Samples)

‡ Ratios greater than one indicate exceedance of the requirements.

N/D = not detected

TABLE 12

BROOME COUNTY - COLESVILLE LANDFILL

CALCULATION OF BASELINE CARCINOGENIC RISK ASSOCIATED WITH INTAKE OF CONTAMINATED GROUNDWATER

DRINKING WATER INGESTION

Compound	Water Conc. mg/l	Intake mg/kg/day	Oral Slope Factor	Oral RfD	Carcinogenic Risk	Hazard Index
1,1-Dichloroethene	0.011	3.14E-04	-	0.021		1.50E-02
Trichloroethene	0.16	4.57E-03	1.1E-03	2.1E-01	5.03E-06	2.18E-02
1,1,1-Trichloroethane	0.27	7.71E-03	-	0.09		8.57E-02
1,1-Dichloroethane	0.32	9.14E-03	-	1.2E-01		7.62E-02
1,2-Dichloroethene	0.14	4.00E-03	-	0.25		1.60E-02
				Total:	5.03E-06	2.15E-01

INHALATION FROM TAP WATER

Compound	Water Conc. mg/l	Intake mg/kg/day	Inhalation Slope Factor	Inhalation RfD	Carcinogenic Risk	Hazard Index
1,1-Dichloroethene	0.011	4.19E-03		7.20E-01		5.82E-03
Trichloroethene	0.16	6.10E-02	4.60E-03	1.00E+00	2.80E-04	6.10E-02
1,1,1-Trichloroethane	0.27	1.03E-01		6.30E+00		1.63E-02
1,1-Dichloroethane	0.32	1.22E-01		1.38E-01		8.83E-01
1,2-Dichloroethene	0.14	5.33E-02		2.00E-02		2.67E+00
				Total:	2.80E-04	3.63E+00

RfD = Reference Dose

Total Risk and HI:	2.85E-04	3.85E+00

Table 13
COLESVILLE LANDFILL
POTENTIAL CHEMICAL-SPECIFIC GROUNDWATER ARARS

Compound	Number of Detects/ Number of Wells	Concentration Range (ug/l)	Chemical-Specific ARARS/SCGs				ARAR Range	Number of Exceedences/ Number of Wells	
			NYS DEC 703 Stds (1)	Fed MCLs (2)	NYS DOH MCLs (3)	NYS Guidance Values (4)		(of lowest ARAR)	(of highest ARAR)
Benzene	8/32	5-62	ND	5	5	0.7 (A)	ND-5	8/32	8/32
Chlorobenzene	5/32	0.05-35	NA	NA	5	20 (C)	5-20	3/32	2/32
Chloroethane	3/32	8-48	NA	NA	5	NA	5	3/32	-
1,1-Dichloroethane	12/32	3-320	NA	NA	5	5 (E)	5-50	10/32	4/32
1,1-Dichloroethene	3/32	4-15	NA	7	5	0.07 (A)	0.07-7	3/32	2/32
Trans-1,2-dichloroethene	4/32	0.5-140	NA	100 *	5	5 (E)	5-50	1/32	1/32
1,2-Dichloroethane	1/32	43	NA	5	5	0.8 (A)	0.8-5	1/32	1/32
1,2-Dichloropropane	1/32	3	NA	5 *	5	5 (E)	5-50	0/32	0/32
Ethylbenzene	1/32	8	NA	700 *	5	5 (E)	5-50	1/32	0/32
Toluene	1/32	21	NA	NA	5	5 (E)	5-50	1/32	0/32
1,1,1-Trichloroethane	10/32	2-270	NA	200	5	5 (E)	5-200	6/32	1/32
Tetrachloroethene	2/28	0.5-5	NA	NA	5	0.7 (A)	0.7-5	1/28	1/28
Trichloroethene	8/32	0.9-160	10	5	5	3 (A)	3-10	6/32	5/32
Total Xylene	1/32	20	NA	10000*	5	5 (E)	5-50	1/32	0/32
Vinyl Chloride	2/32	39-134	5	2	2	0.3 (A)	0.3-5	2/32	2/32

Notes:
* All values in ug/l; 1989 confimatory sampling round data
U - below detection limits
NA No Standard Available
ND Non-Detectable Level
(1) 6 NYCRR Part 703
(2) 40 CFR Part 141.61
(3) 10 NYCRR Part 5
(4) NYSDEC Ambient Water Quality Standards and Guidance Values, September 25, 1990
(A) 6 NYCRR Part 701.4
(C) 6 NYCRR Part 701.6
(E) 6 NYCRR Part 701.15(e)
(M) 6 NYCRR Part 701.12

* Phase II MCLs promulgated 1/30/91 in 56 FR 3526 and will take effect for PWSS in 7/92. THese MCLs must be adopted or made more stringent by the States by 7/92.

Table 14

COLESVILLE LANDFILL

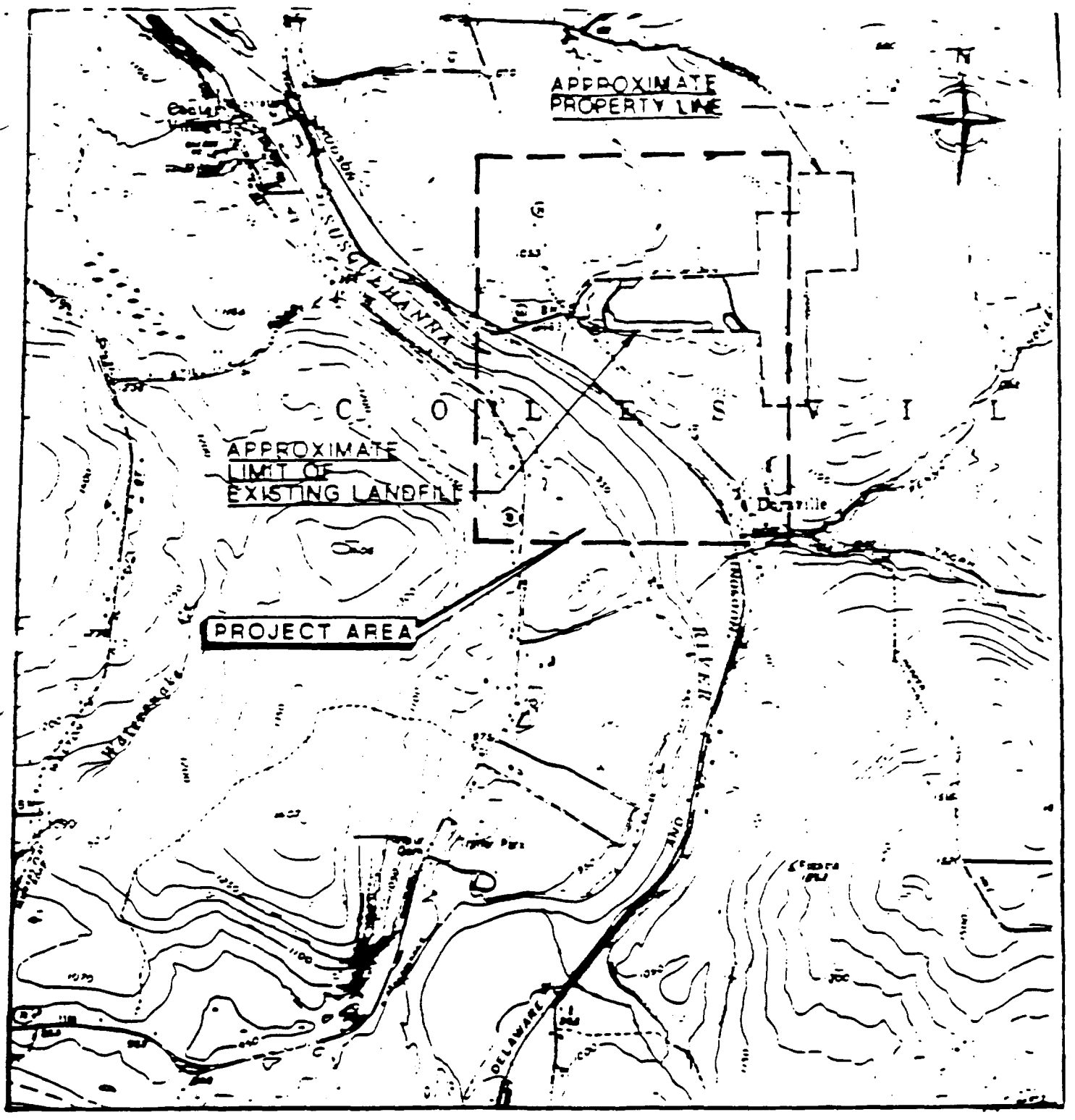
DETAILED ANALYSIS

COST AND TIMING SUMMARY TABLE

Alternative	Estimated Capital Cost ($000)	Estimated O & M Cost (per year) ($000)	Estimated Present Value Cost* ($000)	Estimated Time to Implement (Design/Construct)	Estimated Time to Meet ARARs after Implementation
1	$0	$14	$128	0	>20 yrs
3a	$0	$71	$672 +	6 mo	>20 yrs
3b	$150	$53	$648	1 yr	>20 yrs
4b1	$4,163	$268	$5,595	1.5 yr	8 yrs
4b2	$4,313	$250	$5,646	1.5 yr	8 yrs
4c1	$4,193	$268	$5,040	1.5 yr	4 yrs
4c2	$4,273	$250	$5,135	1.5 yr	4 yrs
4d1	$8,811	$230	$10,977	1.5 yr	>20 yrs
4d2	$8,701	$268	$11,230	1.5 yr	>20 yrs

* The present worth factor was based on an interest rate of 10%/year for the duration of cleanup (30 yrs is used for >20yrs)

APPENDIX 2 - FIGURES



SOURCE:
TOPOGRAPHY TAKEN FROM
1957 AFTON, N.Y.
U.S.G.S. QUADRANGLE
7.5 MINUTE SERIES

SCALE: 1" = 2000'

FIGURE 1

FIG 2

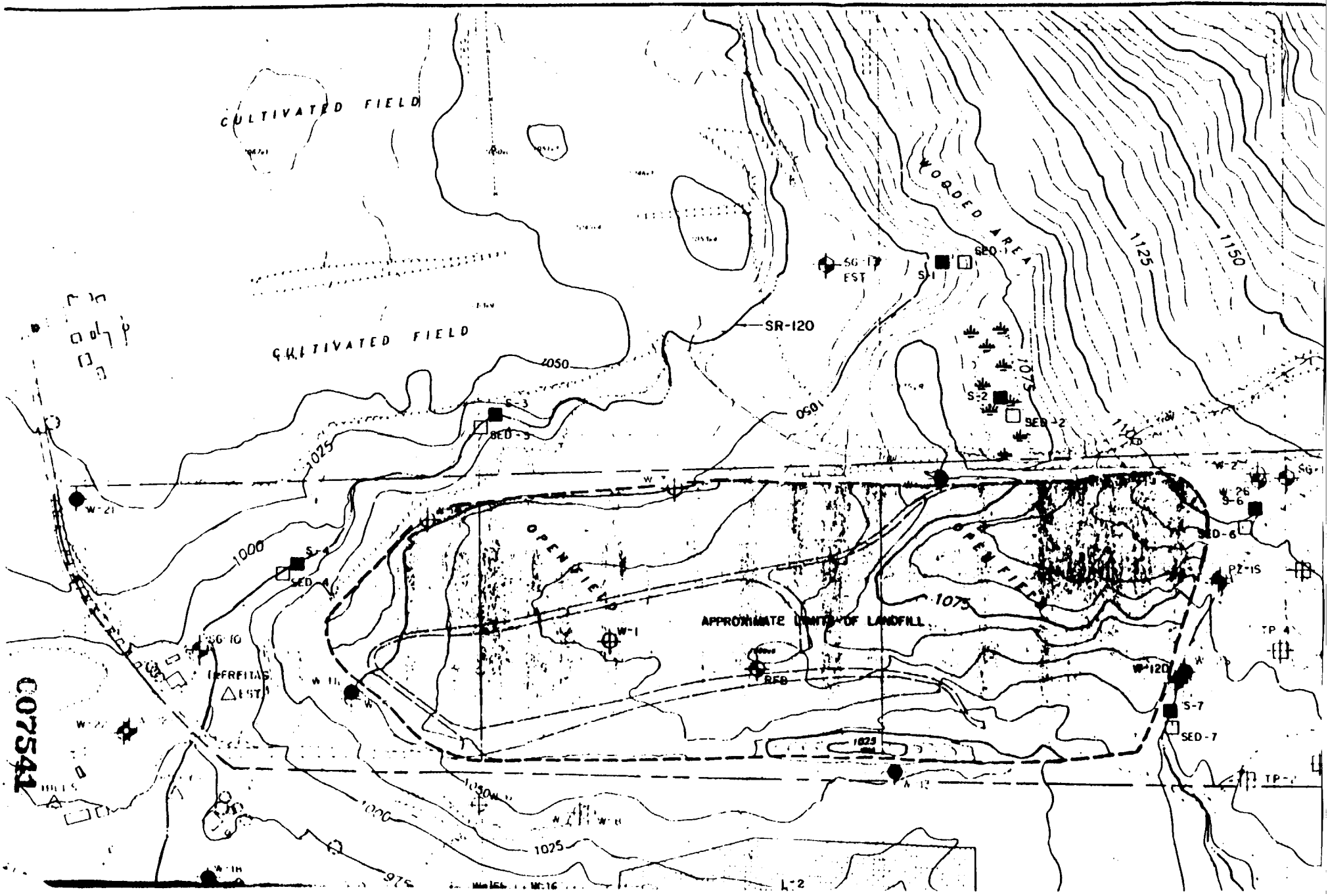

CULTIVATED FIELD
CULTIVATED FIELD
WOODED AREA
SR-120
1050
1075
1100
1125
1150
1000
1025
975
SG-11
EST
S-1
SED-1
S-2
SED-2
S-3
SED-3
S-4
SED-4
S-5
SED-5
S-6
SED-6
S-7
SED-7
SG-10
EFFLUENT
EST
W-1
W-2
W-21
W-26
W-120
PZ-1S
TP-4
TP-
APPROXIMATE LIMITS OF LANDFILL
OPEN FIELD
OPEN FIELD
L-2
07541

FIGURE 3

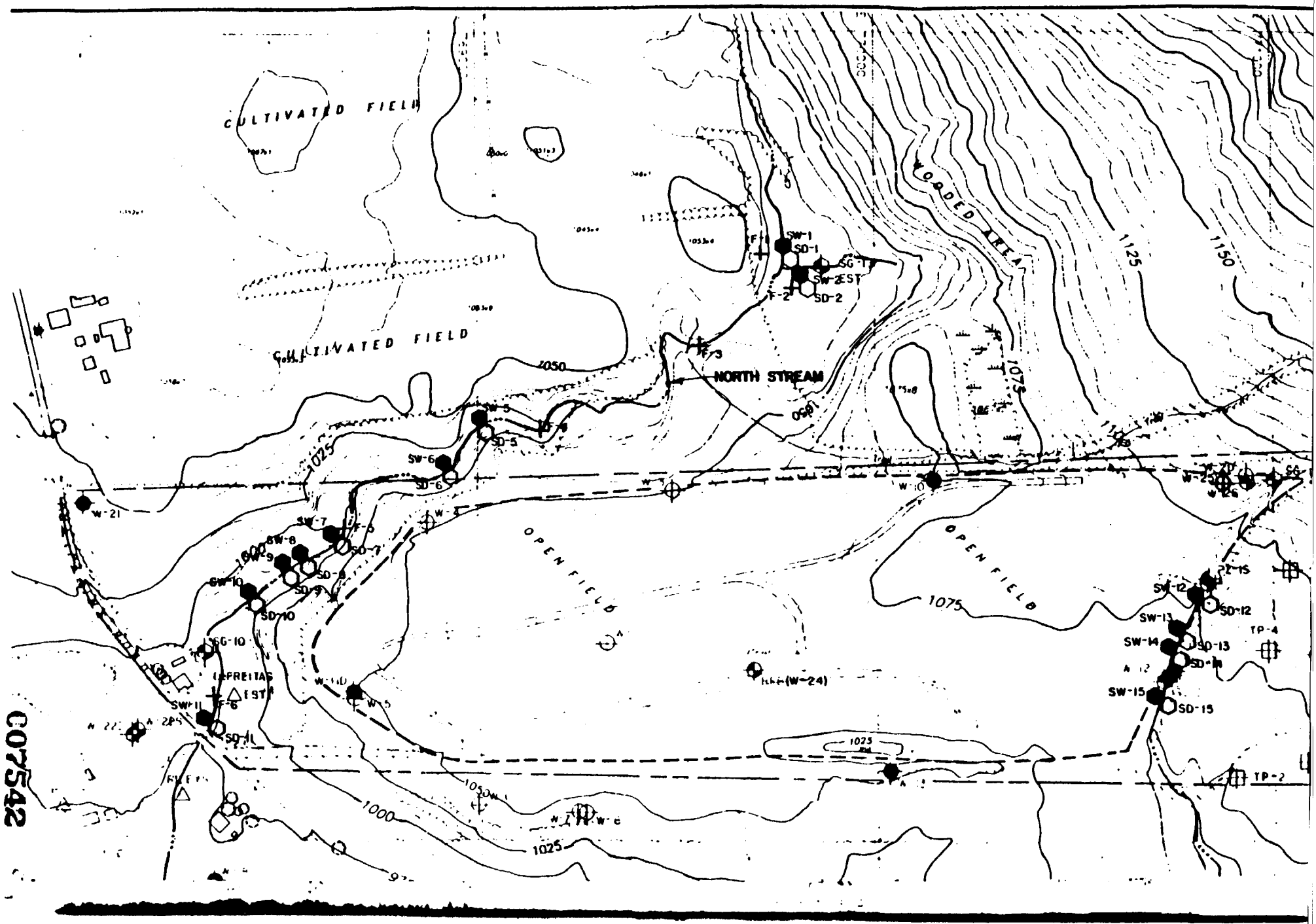
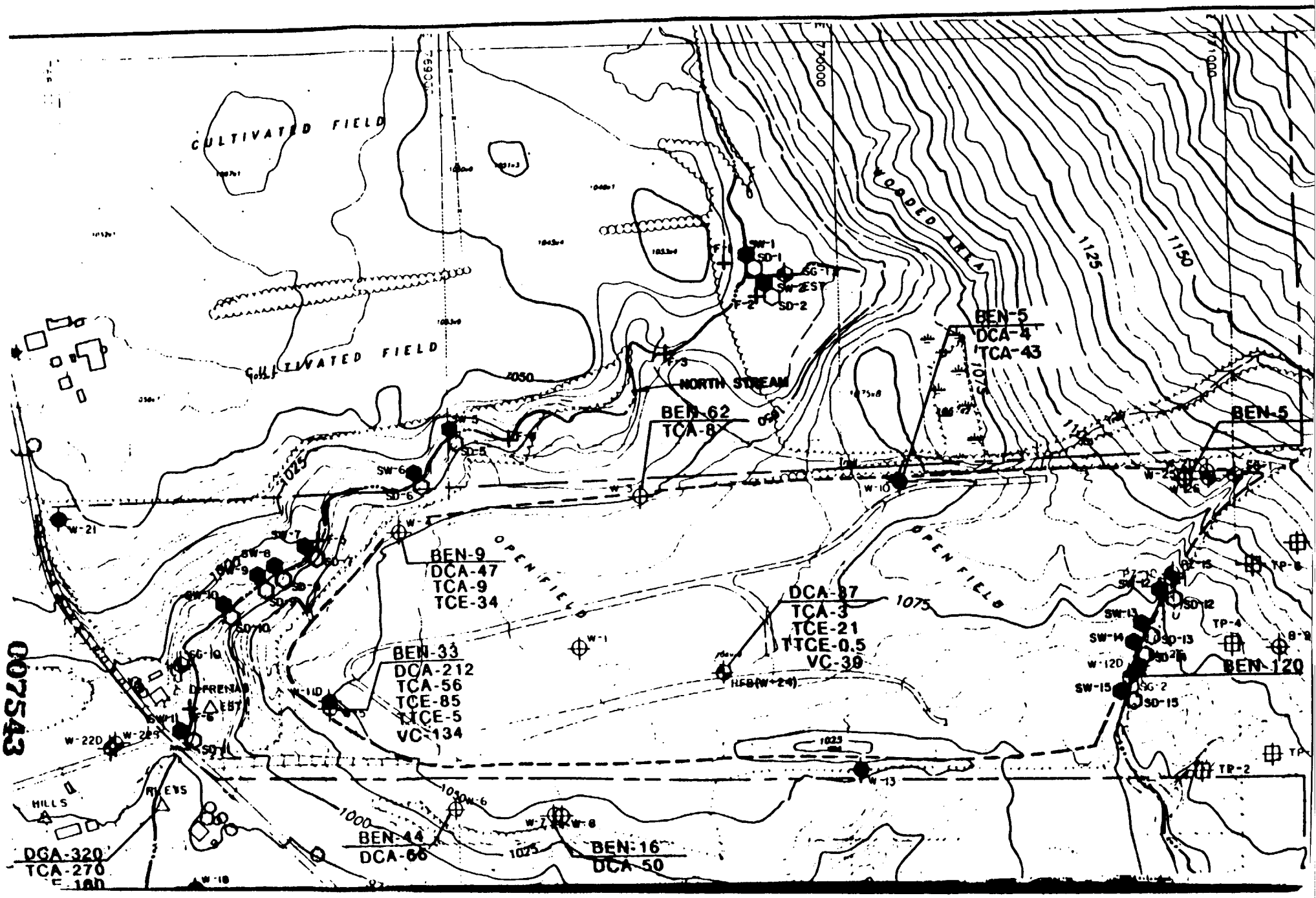

CULTIVATED FIELD
CULTIVATED FIELD
WOODED AREA
NORTH STREAM
OPEN FIELD
OPEN FIELD
1050
1075
1100
1125
1150
1000
1025
SW-1
SD-1
SW-2 EST
SD-2
F-2
F-3
SW-5
SD-5
SW-6
SD-6
SW-7
SD-7
SW-8
SW-9
SD-8
SD-9
SW-10
SD-10
SG-10
DE FREITAS EST
F-6
SW-11
SD-11
W-21
W-10
W-15
W-24
SW-12
SD-12
SW-13
SW-14
SD-13
SW-15
SD-15
TP-4
TP-2
002542

FIGURE 4


CULTIVATED FIELD
CULTIVATED FIELD
WOODED AREA
NORTH STREAM
OPEN FIELD
OPEN FIELD
BEN-5
DCA-4
TCA-43
BEN-62
TCA-8
BEN-5
BEN-9
DCA-47
TCA-9
TCE-34
DCA-87
TCA-3
TCE-21
TTCE-0.5
VC-39
BEN-33
DCA-212
TCA-56
TCE-85
TTCE-5
VC-134
BEN-120
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DCA-66
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TCA-270
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SG-1
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SD-6
SD-5
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SD-11
SW-12
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SD-13
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STATE COORDINATION

CORRESPONDENCE

P. 7300 Letter to Mr. John Murray, Broome County, from Mr. Joseph Forti, NYSDEC, Re: Plan of action for future work, May 7, 1985.

P. 7301 - 7305 Letter to Mr. Edward Murray, Broome County Office Building, from Mr. Joseph Forti, NYSDEC, Re: State/Federal funding, May 28, 1985. Attachments.

P. 7306 - 7309 Letter to Hon. Al D'Amato, from Mr. Christopher Daggett, Re: Response to Mr. Tony Fouguet's letter - reference to Remedial Action at the Colesville Landfill, January 3, 1986.

ENFORCEMENT

ADMINISTRATIVE ORDERS

P. 7310 - 7318 Notice of Hearing, October 16, 1985.

P. 7319 - 7338 NYSDEC, 1986 Environmental Quality Bond Act, Title 3 Inactive Hazardous Waste Disposal Sites Remediation Program State Assistance Contract.

P. 7339 - 7355 Agreement, 1987

P. 7356 - 7389 NYSDEC, Order of consent, January 7, 1987.

CORRESPONDENCE

P. 7390 - 7391 Letter to Mr. Jeffery Teitel, Hannoch, Weisman, from Mr. Joseph Forti, NYSDEC, Re: Review of department's records, April 26, 1985.

P. 7392 Letter Mr. George Malchak, Malchak Garbage Service, from Mr. Joseph Forti, NYSDEC, Re: Potential PRP, March 1, 1985.

P. 7393 Letter to Mr. Samuel Heyman, GAF Corporation, from Mr. Joseph Forti, Re: Potential PRP, March 1, 1985.

P. 7394 - 7397 Letter to Mr. Edward Shea, GAF Corporation, and Mr. Edward Murray, County Attorney, from Mr. Joseph Forti, Re: Meeting, June 17, 1985. Attachments.

P. 7398 Memorandum to Mr. Michael Tone, NYSDEC from Mr. Joseph Forti, NYSDEC, Re: Colesville Landfill, September 11, 1985.

P. 7399 Letter to Mr. Walter Mugdan, U.S. EPA, from Mr. James Sevinsky, Environmental Protection Bureau, Re: Colesville Landfill, September 13, 1985.

P. 7400 Letter to Messrs. Edward Shea, GAF Corporation, and Edward Murray, County Attorney, Re: Remediation of Colesville Landfill, September 13, 1985.

P. 7401 Memorandum to Mr. Norman Nosenchuck, NYSDEC, from Request for information, NYSDEC, Re: Request for information, December 18, 1985.

P. 7402 Memorandum to Mr. Norman Nosenchuck, NYSDEC, from Mr. Request for information, Re: Request for information, December 19, 1985.

P. 7402A Letter to Mr. Anthony Marchetta, Esq., GAF Corporation; Mr. Edward Murray, Broome County; Mr. Philip H. Gitlen, Whiteman, Osterman & Hanna; Mr. Sidney Manes, Tri-Cities Barrels, Inc.; and Mr. Sidney Manes, Manes, Rifken, Frankel, and Greenman, Re: Colesville site, January 13, 1986.

P. 7403 - 7435 Letter to Hon. Andrew Pearlstein, NYSDEC, from Mr. Joseph Forti, NYSDEC, Re: Colesville Landfill, February 21, 1986.

P. 7436 - 7438 Letter to Ms. Sandra Hills, public citizen, from Mr. Joseph Forti, NYSDEC, Re: Governor Cuomo's letter, May 13, 1986.

P. 7439 - 7441 Memorandum to Mr. Norman Nosenchuk, NYSDEC, from Mr. David Engel, NYSDEC, Re: Colesville Landfill site, August 15, 1986.

P. 7442 - 7443 Memorandum to Mr. Joe Forti, NYSDEC, from Mr. Stephan Henriquez, NYSDEC, Re: Colesville Landfill, February 25, 1987.

P. 7444 Letter to Ms. Mary Walsh, Broome County, from Mr. Joseph Forti, NYSDEC, Re: RI Work, August 6, 1987.

HEALTH ASSESSMENTS

ATSDR HEALTH ASSESSMENTS

P. 7445 - 7453 Memorandum to Mr. Doug Tomchuk, NYCCB, from Mr. William Nelson, Department of Helath & Human Services, Re: Enclosed copy of Preliminary Health Assessment for the Colesville site, July 12, 1989. Attachment.

PUBLIC PARTICIPATION

COMMENTS AND RESPONSES

P. 7454 - 7455 Newspaper article, unidentified newspaper, April 10, 1985.

COMMUNITY RELATIONS PLANS

P. 7456 - 7465 Report: Citizen Participation Plan.

P. 7466 - 7472 Letter to Ms. Ethel Oliver, public citizen, from Mr. Brian Davidson, NYSDEC, Re: Citizen participation plan, May 9, 1989.

PUBLIC NOTICES

P. 7473 - 7475 Notice of public comment period and public meeting by the New York State Department of Environmental Conservation.

FACT SHEETS AND PRESS RELEASES

P. 7476 News Release, NYSDEC, April 16, 1987.

P. 7477 News Release: Reactions vary to Colesville dump Plans, January 31, 1991, The Press & Sun Bulletin.

CORRESPONDENCE

P. 7478 - 7479 Letter to Mrs. Sandy LaVare, public citizen, from Mr. Joseph Forti, NYSDEC, Re: Sept. 13 letter, September 26, 1985.

P. 7480 - 7481 Letter to Mr. Joel Singerman, U.S. EPA, from Mr. Brian Davidson, NYSDEC, Re: Administrative Record, January 8, 1991.

APPENDIX 4 - NYSDEC LETTER OF CONCURRENCE

MAR-22-1991 11:39 FROM NYS.ENVIR.CONSERVATION TO ... P.02

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 - 7010

Thomas C. Jorling
Commissioner

Mr. Constantine Sidamon-Eristoff
Regional Administrator
United States Environmental Protection
  Agency, Region II
26 Federal Plaza
New York, New York 10278

MAR 2 2 1991

Dear Mr. Sidamon-Eristoff:

RE: Colesville Landfill - Site No. 704010
Record of Decision

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the Record of Decision for the Colesville Landfill, and the Department concurs with the selection of Alternative 4c2. Alternative 4c2 consists of a landfill cap, gas control, leachate control, drainage control, long-term post-closure monitoring and maintenance, pumping wells at and downgradient of the landfill, groundwater treatment, discharge of the treated groundwater to the north stream or the Susquehanna River, and a new water supply for affected residents. The Department concurs that the Record of Decision adequately documents and justifies the selection of this remedy.

Should GAF Corporation and Broome County successfully negotiate the purchase of the remaining affected properties, construction of the new water supply system would not be necessary.

Furthermore, as is documented in the Record of Decision, this site will be subject to five year reviews as required by the Comprehensive Environmental Response, Compensation and Liability Act as amended by the Superfund Amendments and Reauthorization Act.

Sincerely,

Edward Sull

Edward O. Sullivan
Deputy Commissioner

cc: K. Callahan, USEPA
G. Pavlou, USEPA
J. Singerman, USEPA

007563

APPENDIX 5 - RESPONSIVENESS SUMMARY

Responsiveness Summary

Prepared By: Brian H. Davidson, Project Manager
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation

Colesville Landfill Record of Decision - Site No. 704010

A responsiveness summary is required by Superfund policy. It provides a summary of citizens' comments and concerns received during the public comment period, and the New York State Department of Environmental Conservation's (NYSDEC) responses to those comments and concerns. All comments summarized in this document will be considered in NYSDEC's and EPA's final decision for selection of a remedial alternative for the Colesville Landfill site.

The public comment period for the Colesville Landfill Proposed Plan began on January 7, 1991. The Proposed Plan is attached in Appendix A. A public meeting was held at the Broome County Office Building at 7:00 pm on January 30, 1991. The public comment period and public meeting were announced in legal notices which appeared in the January 7, 1991 and January 28, 1991 Binghamton Press and Sun-Bulletin. The legal notice is attached in Appendix B. A press release was also issued by the New York State Department of Environmental Conservation (NYSDEC), and a newspaper article appeared in the January 11, 1991 Binghamton Press and Sun-Bulletin which provided information on the project and announced the public comment period and public meeting. A copy of the Press Release and January 11, 1991 newspaper article are attached in Appendix C. Residents, interested public, and local officials listed on the contact list in the Citizen Participation Plan for the Colesville Site were mailed letters to encourage their participation and solicit their comments. A copy of the Citizen Participation Plan and a sample of the letter mailed to residents is included in Appendix D.

The public comment period closed on February 6, 1991. Attached is the transcript from the public meeting. About 45 people attended the public meeting. Most of the questions asked at the public meeting were adequately answered by the responses given at the public meeting and are included in the attached transcript. A January 31, 1991 newspaper article that summarized the meeting is attached in Appendix C. The transcript and attendance list is attached in Appendix E.

The written comments essentially reiterated technical concerns that were raised at the public meeting. The one concern that was expressed at the public meeting that was not reiterated in the written comments was the protection of water supply for the Hamlet of Doraville. The Hamlet of Doraville is located south of the south stream and south of the area effected by the site. All of the data collected to date indicates that residential water supply wells in Doraville have not been

impacted by the landfill. The data also indicates that residential supply wells in Doraville are not likely to be impacted in the future. Groundwater discharges to the south stream, and groundwater monitoring wells between Doraville and the landfill have been clean. Nevertheless, there will be long-term, 30 years monitoring of monitoring wells located between Doraville and the landfill. Should the data collected from these wells indicate that contamination is moving toward Doraville, appropriate response action will be considered during the five year reviews.

Response action would most likely include an expansion of the new water supply system. The new water supply system will be designed to have sufficient capacity to accommodate some future expansion. However, we do not anticipate, based on the existing data, that future expansion of the new water supply system will be necessary to protect Doraville.

Mr. Thomas O'Meara asked at the public meeting (Page 69 of the transcript), whether affected residents would ever have to pay for their water. The long-term operation and maintenance of the water system provided to the affected residences is the responsibility of the responsible parties, and therefore, affected residents will not have to pay for their water in the future. It should be noted, however, that since Broome County is a responsible party there will be some cost to all Broome County taxpayers (including the affected residents) associated with the installation and long-term operation and maintenance of the new water system.

Ms. Mary Clark testified at the public meeting (Pages 44 through 49 of the transcript included in Appendix E) that a number of intermittent streams exist in the vicinity of the site. She indicated through her statements that these streams were not mapped or sampled during the Remedial Investigation.

Site reconnaissance and sampling occurred during various times of the year and as was indicated by Mr. O'Hara on Page 47 of the transcript, "We sampled the streams we saw..." The surface drainage in the vicinity of the site is properly characterized in the Remedial Investigation Report, and as is indicated on Page 57 of the transcript, the south stream was repeatedly sampled at various locations along the stream. No contamination was detected in the south stream.

Copies of the written comments that were received are included in Appendix F. The concerns raised in written correspondences, and the response to those concerns is included below.

<u>Correspondence from the Broome County Division of Solid Waste Management Dated February 5, 1991</u>

1. Suggested amendment (a.) recommends purchasing affected properties rather than installing a new water system.

Response:

Clearly, there are advantages to the County and GAF purchasing the remaining affected properties. Construction of the water supply system would not be necessary if the remaining affected properties could be purchased. However, purchasing the remaining affected properties becomes difficult if the property owners are not receptive to that option. The decision of whether to construct the new water supply or negotiate the purchase of the remaining affected properties is GAF's and Broome County's. Either option is acceptable to the NYSDEC and the USEPA. Should GAF and Broome County successfully negotiate the purchase of all the affected properties, they are still obligated to install and maintain the landfill cap and groundwater pump and treat system.

2. Suggested amendment (b.) recommends recirculating treated groundwater under the cap. The concern is raised that the model does not account for unbroken drums that may rupture in the future and Broome County does not want to treat this site for 100 years.

Response:

The Feasibility Study Report estimates that the landfill cap will reduce infiltration from the current 500 gallons per acre, per day to 10 gallons per acre, per day. Since the watertable is beneath the refuse, this will essentially eliminate leachate generation at the site. Although it is possible that unbroken drums of chemicals are buried on site, and will rupture in the future causing slugs of contamination to enter the groundwater, this scenario is not likely for the following reasons:

1. Although we do not have much in the way of disposal records, the records we do have indicate that many of the drums were crushed or dumped and emptied off the back of trucks.

2. Any intact drums would have been buried for 16 to 18 years, and much of their contents would probably have leaked out.

3. A number of intact drums should have indicated anomalies during the geophysical surveys. However, the geophysical data did not indicate any such anomalies.

4. Groundwater monitoring well data collected from 1984 to 1989 indicates that contaminants on-site and immediately downgradient have become less concentrated over time. No spikes or sporadic sharp increases of a given contaminant have been observed. The overall pattern from the groundwater data tends to indicate bulk of contamination from the drums has been released, and is dispersing and diluting in the groundwater.

Recirculating treated groundwater under the cap would defeat the purpose of the cap, and the effectives of such a system would be hampered by stratification in the upper portion of the outwash aquifer.

Obtaining Maximum Contaminant Levels (MCLs) within four years, as predicted by the contaminant transport model, is probably an optimistic prediction. Factors, such as stratification in the outwash aquifer, may hamper the achievement of that goal. However, the effectiveness of the pump and treat system will be reevaluated in five years as required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). If it does not seem to be achieving the program goals as predicted, alternatives will be evaluated at that time.

Correspondence from Mr. Franklyn P. Cism, Jr.

General Comment:

Alternative 4c2 is an acceptable and efficient procedure to follow, and with good fortune, will work.

Response:

Thank you for your comments. We concur that Alternative 4c2 is an appropriate and highly protective remedial alternative for the site.

Comments Included in the February 5, 1991 Correspondence from Broome County Environmental Management Council (EMC)

Hydrogeologic Issues:

Comment No. 1:

General Concern - Wehran Engineering contradicted the vertical profiles at the Public Meeting, log data should be verified, the model is sensitive to one data point which may not be representative of the disposal area.

Response:

The stratigraphic cross-sections from the Remedial Investigation (RI), which were updated and revised as part of the Confirmatory Sampling Program, clearly indicates that the outwash aquifer is in direct contact with the refuse (refer to cross-sections F-F' and G-G'). This fact was correctly stated by Wehran at the public meeting and there is no contradiction between that statement made by Wehran and the geologic cross-sections.

The two-dimensional solute transport model evaluates changes in concentration over time caused by the processes of convective transport, hydrodynamic dispersion, mixing and chemical retardation. Preliminary model input variables for the steady-state base simulation included both hydraulic and transport properties that were determined from available boring log and well data, existing watertable maps, cross-sections and published sources. Therefore, the model is sensitive to more than one data point. The model does require that basic assumptions be made. Those assumptions, and the limitations of the model are discussed in the RI Report and Appendix C of the feasibility study. The results of any groundwater model must be viewed with same degree of skepticism as it is very difficult (if not impossible) to accurately predict contaminate transport in a somewhat complex and variable groundwater flow system. Nevertheless, the groundwater modeling effort used at the Colesville Landfill represents a legitimate attempt to predict contaminate transport.

Comment No. 2:

The RI fails to discuss the source of the stream seeps. In order for the remediation to be effective, the source of the seeps must be substantiated.

Response:

Based on the RI data the North Stream seeps on the north side of the landfill seem to be contaminated springs, or an intersection of the groundwater table and the ground surface. The seeps along the south side of the landfill are close to the watertable, but may actually be due to water perched on thin discontinues clay seams in the upper portions of the outwash aquifer. The seeps are contaminated by landfill leachate. The refuse is above the watertable. The contamination of the seeps is due to infiltration through the landfill mass. Regardless of the exact origin and relation of the seeps to the watertable, they will be remediated by the landfill cap. They should dry up over time due to the combined effect of the landfill cap and the 13 pumping wells. Once the pumping wells are shut off, the seeps on the north side of the landfill may return, but they should be clean due to the landfill cap preventing infiltration through the landfill mass. At this point, we are confident that we know enough to go forward with the remediation. There would be no real benefit from attempting to recalculate stream loading.

Comment No. 3:

The proposed plan does not evaluate the remedial alternative of capping the site and providing a new drinking water supply exclusive of the pump and treat option.

Response:

True. The cost of capping and a new water supply alone can be obtained by subtracting the costs associated with pump and treat from Alternative 4c2 on Table E-1. However, landfill capping with a new water supply without pumping and treating groundwater would not be an acceptable alternative to the NYSDEC or the USEPA.

The outwash aquifer is considered a valuable resource. It has been contaminated by the uncontrolled release of hazardous wastes emanating from the Colesville Landfill. Groundwater quality standards have been violated and an off-site plume of contaminated groundwater has been identified. An attempt must be made to remediate the aquifer and restore the resource.

Comment No. 4:

EMC recommends the inclusion of run-off provisions in all capping alternatives.

Response:

The proper management of run-off of precipitation from the site due to the landfill cap will be addressed during the remedial design.

Managerial Issues:

Comment No. 1:

The cost estimates in the proposed plan do not include inflation factors. Ignoring the effects of inflation can bias the present worth analysis to favor alternatives with large operating and maintenance costs. EMC recommends revising the economic analysis to account for inflation.

Response:

Although cost is considered during the development and initial screening of alternatives, the overall protection of human health and the environment is the driving force behind the selection of remedy.

Typically, cost estimates made during feasibility studies are expected to provide an accuracy of +50 percent to -30 percent, and are prepared using data available from the RI. In conducting the present worth analysis, assumptions must be made regarding the discount rate and the period of performance. Like groundwater models, the results of a present worth analysis must be viewed with some degree of skepticism, since no one can really accurately predict how our economy will perform over the next 30 years. However, it is generally recommended that a discount rate equivalent to the 30-year US treasury bond rate before taxes and after inflation be used in determining the present worth of an alternative. A discount rate equivalent to the 30-year US treasury bond rate before taxes and after inflation would result in a higher present

worth factor than used by Wehran. However, Wehran's present worth factor provides present value costs of remedial alternatives for relative comparison, and recalculating present value costs using an inflation factor or higher present worth factor will not affect the selection of remedy.

Comment No. 2:

Issues relating to the responsible entities for operation, permitting and monitoring of remedial actions were not addressed.

Response:

Broome County and GAF are responsible for the operation, maintenance, and monitoring of the remedial action. Since the Colesville Landfill is a designated hazardous waste site, no actual permits for on-site remedial activities will necessary, although regulatory permit requirements and standards will be satisfied. The NYSDEC will review and oversee the remedial design, construction, operation, maintenance, and long-term monitoring with input from the NYSDOH and USEPA in accordance with the Order on Consent, the State Environmental Conservation Law (ECL), and the Federal CERCLA.

Preferred Alternative:

General Comment:

EMC generally agrees with Alternative 4c2, however, EMC's position is that the remediation of the groundwater will take more than four years to accomplish. EMC is concerned that the pump and treat system will be in operation for many years at a significant cost to the taxpayers of Broome County. EMC recommends a phased remediation with cap and water supply first, and then pump and treat only if necessary.

Response:

The Feasibility Study Report predicts, based on the solute transport model, that MCL's will be achieved within four years by implementing the pump and treat system with the landfill cap. It is entirely possible that this prediction is overly optimistic due to the assumptions and limitations of the model. Nevertheless, the pump and treat system is a necessary and integral part of the remediation. Restoration of the groundwater resource at this site is feasible, warranted and must be attempted.

The pumping wells also enhance the landfill cap by providing hydrologic control. There will be some flexibility during design, and even during remedial construction, to amend the system as necessary based on actual site conditions. The duration and pump rates of various wells can be varied once the system is in place.

This site will be subject to five year reviews established by CERCLA. If, in fact, MCL's are not achieved within four years as predicted by the FS Report, alternatives will be considered during the five year review. It is premature to discuss the alternatives that might be appropriate at that time.

APPENDIX A

Superfund Proposed Plan

Colesville Landfill Site

Town of Colesville, Broome County, New York

EPA
Region 2

January, 1991

NYSDEC

PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Colesville Landfill Superfund site located in the Town of Colesville, Broome County, New York, and identifies the preferred remedial alternative with the rationale for this preference. The Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 USC Section 9617(a) as amended, and the National Contingency Plan (NCP). The alternatives summarized here are described in the remedial investigation and feasibility study (RI/FS) report, which should be consulted for a more detailed description of all the alternatives. The RI/FS report has been prepared by Wehran-New York, Inc., Middletown, New York on behalf of the Broome County Department of Public Works, Binghamton, New York and the GAF Corporation of Wayne, New Jersey pursuant to the requirements of an Order of Consent (Index No. T010687) with the New York State Department of Environmental Conservation (NYSDEC). The NYSDEC is the lead agency for this project; EPA is the support agency.

This Proposed Plan is being provided as a supplement to the RI/FS report to inform the public of EPA's and NYSDEC's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated, as well as the preferred alternative.

Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made if public comments or additional data indicates that such a change will result in a more appropriate solution. The final decision regarding the selected remedy will be made after EPA and NYSDEC have taken into consideration all comments from the public. We are soliciting public comment on all of the alternatives considered in the detailed analysis phase of the RI/FS because EPA and NYSDEC may select a remedy other than the preferred remedy.

Copies of the RI/FS report, Proposed Plan, and supporting documentation are available at the following repositories:

- Town of Colesville
  Town Hall
  Harpursville, NY 13787

- New York State Department of
  Environmental Conservation
  50 Wolf Road, Room 222
  Albany, NY 12233-7010

- U. S. Environmental Protection Agency
  Emergency and Remedial Response Division
  26 Federal Plaza, Room 29-30
  New York, NY 10278

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS report has been made available to the public for a public comment period which concludes on February 6, 1991.

Pursuant to Section 117(a) of CERCLA, a public meeting will be held during the public comment period in the Broome County Office Building, 44 Hawley Street, second floor auditorium, Binghamton, New York, on January 30, 1991 at 7:00 p.m. to present the conclusions of the RI/FS, to further elaborate on the reasons for recommending the preferred remedial alternative, and to receive public comments.

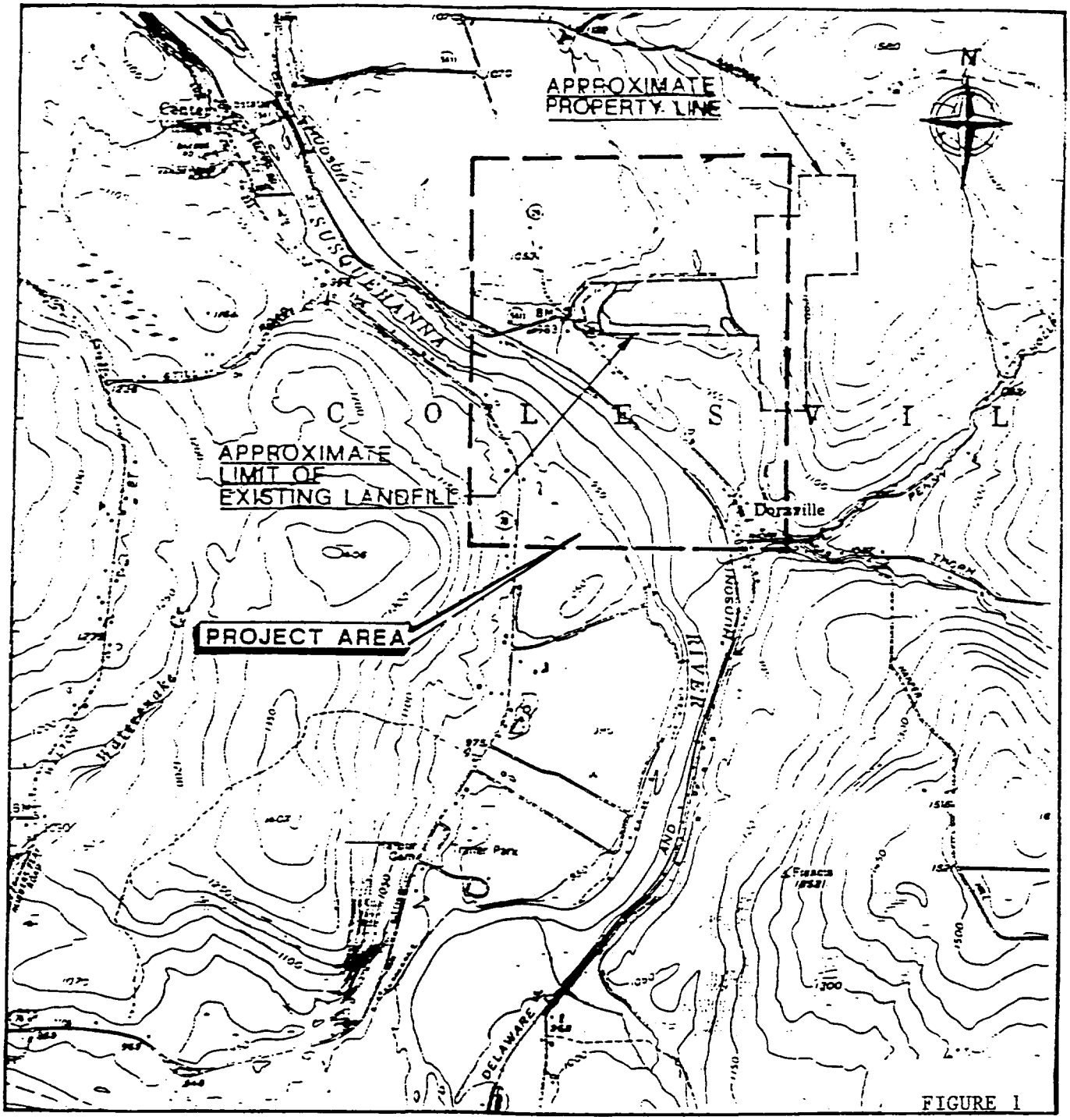

FIGURE 1

Written and oral comments will be documented in the Responsiveness Summary section of the Record of Decision (ROD), the document which formalizes the selected remedy.

All written comment should be addressed to:

Brian Davidson, Project Manager
Bureau of Eastern Remedial Action
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010

BACKGROUND

The Colesville Landfill is an inactive landfill located in the Town of Colesville, Broome County, New York, (Figure 1). This area is characterized as extremely rural, and includes large tracts of undeveloped woodlands, as well as large-scale agricultural tracts and scattered residential parcels. Of the 113 acres on which the landfill is situated, only about 35 acres have been used for waste disposal. The area is bounded by East Windsor Road to the west, and by unnamed streams to the north, east, and west (termed the North and South Streams). Surface water in the area drains to the Susquehanna River. The North Stream to the Susquehanna River is

the surface water body most sensitive to potential impacts from the landfill. Most groundwater contamination in the aquifer eventually enters this tributary. The second potential impact is direct groundwater discharge to the southwest and the river.

SITE HISTORY

Landfill operations at the Colesville site commenced in 1969 and continued until 1984. Throughout its operational life, the Colesville Landfill was used for the disposal of municipal solid waste (MSW). Between 1973 to 1975, drums of industrial wastes were disposed of along with the MSW. The industrial wastes that were disposed of consisted primarily of organic solvents. A total of approximately 468,000 cubic yards of MSW and industrial wastes are estimated to have been disposed of at the site. The landfill has not been closed in accordance with New York State Part 360 landfill closure requirements.

In 1983, samples collected by the Broome County Health Department from homeowner wells near the site indicated that the Colesville Landfill was contaminating the groundwater beneath and in the immediate vicinity of the site. There are four residential wells located downgradient from the Colesville Landfill within the maximum zone of groundwater contamination. Based on the analytical results from groundwater samples taken from homeowner wells, groundwater was found to be contaminated with volatile organic compounds (VOCs) such as 1,1-dichloroethene (11 ug/l), trichloroethene (160 ug/l), 1,1,1-trichloroethane (270 ug/l), 1,1-dichloroethane (320 ug/l), chloroform (8 ug/l), and trans 1,2-dichloroethene (140 ug/l).

This results prompted the Broome County Department of Public Works to install granular activated carbon filters on private well supplies and to perform two investigative studies of the Colesville Landfill. These studies were performed by Wehran Engineering in 1983 and 1984. Both of these studies also indicated that the groundwater was being contaminated with VOCs from the landfill leachate. The contamination was found to be moving southwest toward the Susquehanna River.

The Colesville Landfill site was listed on the Superfund National Priorities List in June, 1986.

In 1988, Wehran completed an RI at the site. In 1990, Wehran completed a confirmatory sampling program which verified the conclusion of the 1988 RI. This additional investigation further defined the nature and extent of groundwater and surface water contamination. The key findings of these investigations are as follows:

The Colesville Landfill is currently releasing low levels (parts-per-billion) of volatile organic compounds (VOCs).

. Over the last six seven years, it has became apparent that the extent of groundwater contamination is limited in area and not increasing in severity.

. The current data suggest a slight advancement of a plume southwest of the landfill, with an overall decrease in VOC concentrations at the landfill border.

. Part-per-billion levels of VOCs have been detected in wells at three residences downgradient of the landfill. This contamination has been consistent over time.

. The only bedrock well currently used within the path of the VOC plume is not affected.

. Historical and current data have failed to confirm contamination of the bedrock aquifer.

. No VOC contamination has been detected downgradient of the Lee property.

. The available data suggest that VOCs currently being released from the landfill via the groundwater pathway are not expected to impact the Susquehanna River.

. The only measurable discharge points to surface water are in leachate discharging to the North Stream and in sediments in the tributaries immediately adjacent to surficial outbreaks of landfill seeps.

. Groundwater recharge to the tributaries has not resulted in any measurable VOC levels in surface water flowing to the Susquehanna River.

. The areas affected by the seeps, as measured by VOC and metal concentrations, are limited to sediments proximate to the seeps.

. No significant releases of VOCs to the air pathway were suggested by the available survey data.

SUMMARY OF SITE RISKS

A baseline risk assessment was performed as part of the RI for the Colesville Landfill site. The risk assessment evaluates the potential impacts on human health and the environment assuming that no remedation occurs.

This baseline risk assessment considered the identity and the number of chemicals found in the various environmental media sampled, potential human and animal exposure pathways, site conditions as related to chemical migration, chemical toxicity, and appropriate environmental standards.

Indicator chemicals for the baseline risk assessment were selected based on their known or potential toxicity and

relative environmental fate and mobility characteristics. They include VOCs such as: 1,1-dichloroethene; 1,1,1-trichloroethene; trichloroethene; tetrachloroethene benzene; chlorobenzene; 1,1-dichloroethane; 1,2-dichloroethane: and vinyl chloride.

The human exposure pathways were: exposure to groundwater; dermal contact with contaminated surface water and sediments near the leachate seeps; and ingestion of game species from the vicinity of the site. EPA considers risks in the range of 10^{-4} to 10^{-6} to be acceptable. This risk range can be interpreted to mean than an individual may have a one in ten thousand to a one in a million increased chance of developing cancer as result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the site.

The risk assessment indicates that the most significant public health risk results form the exposure to potable well water at the site. At this time, the total baseline carcinogenic risk associated with exposure to potable well water at the site is 2.85×10^{-4}. This indicates that an individual has approximately a three in ten thousand increased chance of developing cancer as a result of drinking this water for 70 years. The baseline carcinogenic risk has been significantly reduced by the provision of carbon filters and bottled water to the affected residences.

For non-carcinogenic compounds, combined pathway specific intakes (ingestion and inhalation) were calculated using the Hazard Index (HI) approach. The HI for the noncarcinogenic compounds present in the groundwater at the site is 3.85. An exceedence of unity, that is 1.0, in the HI indicates that conditions existing at the site are not adequately protective of human health.

The risk assessment concludes that exposure to potable water from wells in the vicinity of the site represents a significant risk to human health and the environment.

Furthermore, since the landfill has been a continuous source of groundwater contamination, contaminants are found in excess of federal and state standards in the site groundwater plume. EPA policies and regulations allow remedial actions to be taken whenever impacts result in the exceedance of Applicable or Relevant and Appropriate Requirements (ARARs). EPA has promulgated drinking water regulations designed to protect human health from the potential adverse effects of drinking water contaminants. Under the Safe Drinking Water Act, ARARs include Maximum Contaminant Levels (MCLs), which are enforceable standards that apply to specified drinking water contaminants which EPA has determined have an adverse effect on human health. The MCLs are set to levels that are protective of human health.

Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or one of the other remedial measures considered, may present a current or potential threat to public health, welfare, and the environment through the groundwater pathway.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected site remedy 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 alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The overall objective of the remediation is to reduce the concentrations of contaminants to levels which are protective of human health and the environment. The RI/FS report contains the detailed information and data used in determining the nature and extent of the contamination, and the development of remedial alternatives to address the contamination.

The remedial response objectives for the Colesville Landfill site are as follows:

. Control the release of VOCs from the Colesville Landfill to the underlying aquifer;

. Eliminate the leachate seeps from the Colesville Landfill, and any associated leachate discharges to the North and South Streams;

. Eliminate the potential for direct human or animal contact with any active leachate seeps; and

. Eliminate the potential risk associated with the exposure to contaminated potable well water.

Accordingly, the FS report evaluates, in detail, nine remedial alternatives for addressing the contamination associated with the Colesville Landfill site.

These alternatives are:

Alternative 1- No Action with Monitoring

Capital Cost: $0
Operation and maintenance (O & M) Cost: $14,000
Present Worth Cost: $128,000

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison of other alternatives. Under this alternative, no remedial

action to control the source of contamination would take place. However, long-term monitoring of the site would be necessary.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 3a-Limited Action with Existing Water Supply and Use Restrictions

Capital Cost: $0
O & M Cost: $71,000
Present Worth Cost: $672,000

This alternative would involve a continuation of the present groundwater monitoring and water supply program provided by Broome County. Maintenance inspections would be upgraded to ensure that the carbon/UV filters that are currently provided at the residences are property operated for all household needs. The deeds for these properties would be restricted with respect to future use of groundwater and the property.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 3b-Limited Action with New York Water Supply

Capital Cost: $150,000
O & M Cost: $53,000
Present Worth Cost: $648,000

This alternative would provide new water supply wells upgradient of the landfill, and a distribution system to the residences within the affected area would also be installed.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 4b1-Landfill Cap with Downgradient Pumping and Existing Water Supply

Capital Cost: $4,163,000
O & M Cost: $268,000
Present Worth Cost: $5,595,000

This alternative would involve the installation of multimedia cap that combines a number of layers of different materials, such as a synthetic membrane, compacted clay layer, sand drainage layer, and topsoil/vegetation. The cap should be designed in compliance with New York State Part 360 Solid Waste Regulations. Groundwater would be collected downgradient using pumping wells, and treated using air stripping. Treated effluent would be discharged to North Stream or the Susquehanna River. Potable water would be supplied to residents via the current program, as described under Alternative 3a.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 4b2- Landfill Cap with Downgradient Pumping and New Water Supply

Capital Cost: $4,313,000
O & M Cost: $250,000
Present Worth Cost: $5,646,000

This alternative would involve the placement of a multimedia cap complying with New York State Part 360 Solid Waste Regulations, the pumping of groundwater downgradient of and within the landfill using pumping wells, and treatment of the groundwater. A new water supply would be provided as described in Alternative 3b.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial action may be implemented to remove or treat the wastes.

Alternative 4c1-Landfill Cap with Pumping at Landfill and Downgradient with Existing Water Supply

Capital Cost: $4,193,000
O & M Cost: $268,000
Present Worth Cost: $5,040,000

This alternative would involve the placement of a multimedia cap complying with New York State Part 360 Solid Waste Regulations, the pumping of groundwater downgradient of and within the landfill using pumping well, and treatment of groundwater. The existing water supply pro-

gram, upgraded as described in Alternative 3a, would be continued.

Long-term monitoring would included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial action may be implemented to remove or treat the wastes.

Alternative 4c2-Landfill Cap with pumping at Landfill and Downgradient with New Water Supply

Capital Cost: $4,273,000
O & M Cost: $250,000
Present Worth Cost: $5,135,000

This alternative would involve the placement of a multi-media cap complying with New York State Part 360 Solid Waste Regulations, and the pumping and treatment of groundwater at the landfill and douwngradient. A new water supply and distribution system would be constructed as described in Alternative 3b.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 4d1-Landfill Cap, Downgradient Cutoff, and New Water Supply

Capital Cost: $8,811,000
O & M Cost: $230,000
Present Worth Cost: $10,977,000

This alternative would involve the placement of a partial groundwater slurry cutoff wall downgradient of the landfill and pumping and treatment of groundwater within the containment wall. A multi-media cap complying with New York State Part 360 Solid Waste Regulations would be constructed to cover the entire landfill and the limits of the slurry wall downgradient of the landfill. Attainment of groundwater standards outside the cutoff wall would occur naturally over the long-term. A new water supply would be provided as described in Alternative 3b.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 4d2-Landfill Cap, Downgradient Cutoff, Existing Water Supply

Capital Cost: $8,701,000
O & M Cost: $268,000
Present Worth Cost: $11,230,000

This alternative would involve the placement of a partial groundwater cutoff wall downgradient of the landfill, as described for Alternative 4d1, and pumping and treatment of groundwater within and outside of the cutoff wall. A multi-media cap complying with New York State Part 360 Solid Waste Regulations would be constructed to the limits of the slurry wall downgradient of the landfill, and to the limit of the landfill on the upgradient side. The existing water supply program would be continued as described in Alternative 3a.

Long-term monitoring would be included.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

PREFERRED ALTERNATIVE

Based upon an evaluation of the various alternatives, EPA and NYSDEC recommend Alternative 4c2 as the preliminary choice for the site remedy. This alternative consists of a landfill cap, groundwater pumping from wells at and downgradient of the landfill, treatment of the extracted water by air stripping, discharge of the treated water to the North Stream or the Susquehanna River, and the provision of a new water supply for the affected residents. The cap will eliminate leachate seeps from the landfill. The pumping system will provide containment and removal of the VOC plume, and is predicted to reduce the risk to acceptable levels within one year and to attain groundwater standards within four years. The preferred alternative will be immediately protective of human health by utilizing a new water supply. Long-term monitoring would be utilized to verify the effectiveness of the groundwater remediation and the cap.

The preferred alternative is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. However, because treatment of the principal threats of the site is not practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The size of the landfill and the fact that there are no identified on-site hot spots that

represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively.

RATIONALE FOR SELECTION

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely short-term effectiveness, long-term effectiveness and permanence, reduction of toxicity, mobility or volume, implementability, cost, compliance with, ARARs overall protection of human health and the environment, and state and community acceptance.

The evaluation criteria are explained below.

o Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

o Compliance ARAR's addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

o Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

o Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

o Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

o Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

o Cost includes the estimated capital, O&M, and the present worth costs.

o State acceptance indicates whether, based on its review of the RI/FS report and the Proposed Plan, the State concurs with, opposes, or has no comment on the preferred remedy at the present time.

o Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the RI/FS report and the Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria note above, are as follows:

Overall Protectiveness of Human Health and Environment

The no-action alternative is not protective of human health and the environment. Alternatives involving the utilization of the existing water supply system (Alternatives 3a, 4b1, 4c1, and 4d2) are protective of the human health, since each of these alternatives call for the provision of carbon filters to the affected residences.

Alternative 3a is not protective of the environment since no provision is provided for source containment, treatment, or leachate seepage control. However, with Alternatives 4b1, 4b2, 4c1, 4c2, 4d1, and 4d2 source containment, groundwater treatment and leachate seepage control are provided, protecting the environment.

Compliance with ARARs

The no-action alternative will not ensure compliance with chemical-specific ARARs within a reasonable or predictable time frame. Alternative 3a, which addresses actual current groundwater use, will immediately comply with health-based ARARs at the point of use, but provides no action to ensure compliance at the groundwater source. The pumping and containment alternatives (Alternatives 4b1, 4b2, 4c1, 4c2) also ensure immediate point-of-use compliance with health-based ARARs. However, these alternatives differ in their estimated time to compliance at the groundwater source. Nevertheless, each containment alternative has the potential to meet chemical-specific ARARs at the groundwater source (i.e., outside the landfill boundary). The containment alternatives involving a cutoff wall (Alternatives 4d1 and 4d2) ensure immediate point-of-use compliance with health-based ARARs, but will not result in compliance at the groundwater source within a reasonable time frame.

All containment alternatives can be designed to meet action-specific ARARs with conventional technology.

Long-Term Effectiveness and Permanence

The no-action alternative is neither effective or permanent in the reduction of the magnitude of risk associated with the Colesville Landfill site.

Alternative 3a is effective in the reduction of risk, but the

permanence of this option will depend on the strict enforcement control. By comparison, Alternative 3b is effective in the long-term reduction of risk to existing residents, but not to future residents.

Alternatives 4b1, 4c1 and 4d2 provide for controlled source containment and groundwater treatment, which will reduce risk, but long-term maintenance and monitoring will be required. The limited action component of these alternatives reduces the adequacy and reliability of these options when compared to the remaining alternatives.

Alternatives 4b2, 4c2, and 4d1 provide for the reduction of risk by virtue of the provision for a new water supply, source containment and groundwater treatment. The proposed controls will require long-term operation and maintenance, but system adequacy and reliability are relatively greater as the local water supply will be unaffected by the remedial action.

In addition, Alternatives 4b1, 4b2, 4c1, and 4c2 will provide long-term effective attainment of ARARs at the groundwater source after several years.

Reduction of Toxicity, Mobility, or Volume through Treatment

The no-action alternative involves no treatment, and consequently, will not contribute to the reduction of contaminant toxicity, mobility, or volume at the site. This assessment is also applicable to Alternatives 3a and 3b.

All the containment alternatives (Alternatives 4b1, 4b2, 4c1, 4c2, 4d1, and 4d2) reduce the toxicity, mobility, and volume through containment and the treatment of the groundwater using air stripping. For these alternatives, emissions from the air stripper will be at allowable limits for discharge to the atmosphere or destroyed through the use of a catalytic destruction unit.

Short-Term Effectiveness

In the short-term, the no-action alternative is not effective in protecting human health and the environment. Improvement of groundwater quality will only occur through natural recovery, which is predicted to require at least 20 years.

Alternative 3a, Limited Action, is effective in the short-term only for the existing residents. No significant community or worker exposure during the remediation is anticipated. No improvement in environmental quality is envisioned. The same assessment also applies to Alternative 3b.

All the containment options (Alternative 4b1, 4b2, 4c1, 4c2, 4d1 and 4d2) will provide immediate point-of-use compliance with health-based ARAR limits. Alternatives 4c1 and 4c2 are predicted to provide aquifer cleanup to ARAR limits in several years. Aquifer cleanup under Alternatives 4d1 and 4d2 will take much longer.

Protection against community and worker exposure will be required with all of the containment options. For Alternatives 4b2, 4c2, and 4d1, interim measures, such as filter maintenance, will be required until the new water supply system is installed and is operational, to protect existing residents. Additional worker protection measures, pursuant to Occupational Safely and Health Administrative requirements under Alternatives 4d1 and 4d2, will be required.

Environmental impacts during construction of the groundwater pumping and treatment components of the containment options could be mitigated readily. Relatively greater potential environmental impacts are envisioned with alternatives 4d1 and 4d2, and these impacts will require more involved mitigation measures during the installation of the cutoff wall.

Implementability

All of the alternatives are implementable.

Alternative 3a presents added administrative requirements for successful implementation due to the need to purchase additional affected residences and to institute and enforce land and groundwater use controls. This same factor must be considered with each containment options that include limited action as a subalternative component.

The containment options calling for a downgradient cutoff wall will involve some difficult construction on steep slopes, but Alternatives 4d1 and 4d2 can be constructed. In contrast, the pumping components of all the containment options can be implements quickly and efficiently. No problems are envisioned with any of the alternatives with respect to the availability of services and materials.

Cost

The no-action alternative has the lowest estimated present value cost of $128,000. Alternatives 3a and 3b have slightly greater estimated present value cost of $672,000 and $646,000, respectively.

Alternatives 4b1, 4b2, 4c1, and 4c2 have present value costs ranging from $5,040,000 to $5,646,000.

Alternatives 4d1 and 4d2, which call for a partial downgradient cutoff wall, are the most expensive at $10,977,000 and $11,230,000, respectively.

State Acceptance

NYSDEC concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred remedy will be assessed in the ROD following a review of the public comments received on the RI/FS report and the Proposed Plan.

CONCLUSION

EPA and NYSDEC believe that the preferred remedy described above is fully protective of human health and the environment, meets all ARARs, offers the best balance among the evaluation criteria discussed above, and satisfies the statutory preference for treatment as a principal element in remedy selection.

It is important to note that the remedy described above is the preferred remedy for the site. The final selection will be documented in the ROD only after consideration of all comments on any of the remedial alternatives addressed in the Proposed Plan and the RI/FS report.

APPENDIX B

Notice of Public Comment Period and
Public Meeting by the New York State
Department of Environmental Conservation

Notice is hereby given that at the time and place designated below the New York State Department of Environmental Conservation (NYSDEC) will be holding a public meeting to solicit public comments on remedial alternatives for the Colesville Landfill Inactive Hazardous Waste Site (#704010) on East Windsor Road in the Town of Colesville. Written comments will be accepted during a public comment period that will begin on January 7, 1991 and will continue until February 5, 1991.

The Colesville Landfill is a 35-acre landfill which was operated by Broome County from 1969 to 1984. Between 1973 and 1975 drums of industrial wastes were codisposed with municipal solid waste. In 1983, Broome County Health Department homeowner well samples indicated groundwater contamination in the immediate vicinity of the landfill. The landfill gates were closed in 1984 and the site was subsequently listed on the National Priority List (NPL).

A two phase hydrogeologic investigations of the Colesville Landfill site was completed in 1984. In April 1987, Broome County, GAF Corporation and the NYSDEC entered into an Order on Consent which required a Remedial Investigation and Feasibility Study (RI/FS) to be performed on the Colesville site. The work plan for the RI/FS was presented to the public at two (2) public meetings held on February 4, 1987 at the Broome County Office Building in Binghamton, New York. The Remedial Investigation (RI) was completed in September 1988. The RI Report concluded that:

- The landfill is currently releasing low levels of volatile organic compounds to the groundwater.
- An off-site plume of contaminated groundwater exists southwest of the site.
- Three (3) homeowner wells have been contaminated by volatile organic compounds.
- Impacts from the site to air, surface water and sediments are not significant.

A Confirmatory Sampling Report completed in February 1990 essentially confirmed the RI findings and provided additional data validated data. A Landfill Gas Evaluation Report, dated August 1990, indicated only low levels of methane in one area on the southwest perimeter of the site.

The Feasibility Study (FS), which evaluates remedial alternatives for the site, was completed in December 1990.

The FS Report evaluates the following nine (9) alternatives in detail:

- Alternative 1 - No Action with Monitoring
- Alternative 3a - Limited Action with Existing Water Supply and Use Restrictions. This Alternative would upgrade existing carbon/UV filters, purchase properties and restrict deeds if possible.

Location of Public Meeting	Date and Time
Second Floor Conference Room Broome County Office Building 44 Holly Street Binghamton, New York	January 30, 1991 7:00 pm

Written and oral comments will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

Written comments should be sent to:

Mr. Brian Davidson
Project Manager
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road - Room 222
Albany, New York 12233-7010

APPENDIX C

News Release Region 7

New York State Department of Environmental Conservation

THOMAS C. JORLING, *Commissioner*
WILLIAM KRICHBAUM, *Regional Director*

615 Erie Boulevard West
Syracuse, New York 13204

January 22, 1991

PRESS ADVISORY/BACKGROUND

The New York State Department of Environmental Conservation will conduct an informational meeting on January 30th at 7:00 p.m. to update local citizens on cleanup plans for the Colesville Landfill. The meeting will be held in the second floor auditorium of the Broome County Office Building at 44 Holley Street, Binghamton

The primary purpose of the meeting will be to present results of a comprehensive Remedial Investigation and Feasibility Study (RI/FS) conducted under the supervision of both the State DEC and the U.S. Environmental Protection Agency. The RI/FS was prepared by Wehran-New York, Inc. on behalf of the Broome County Department of Public Works and the GAF Corporation. GAF and the County signed a Consent Order with the DEC in April 1987. Under terms of the agreement, the County and GAF will split the cost of the cleanup. The County will be eligible for reimbursement of 75% of their cost from the New York State Hazardous Waste Superfund which is funded through the voter approved 1986 Environmental Quality Bond Act.

007588

The designated hazardous waste site is a 35 acre portion of the 113 acre former municipal landfill property. The site, located on East Windsor Road just north of the hamlet of Doraville, served as the town's landfill from 1969 until 1984. During most of that time it received usual municipal waste. However, records show that between 1973 and 1975, drummed industrial wastes from various sources were disposed at Colesville. These industrial wastes consisted primarily of organic solvents.

In 1983 the Broome County Department of Health sampled homeowner wells in the vicinity of the landfill and verified contaminated groundwater in the area immediately adjacent to the landfill. The groundwater was contaminated with volatile organic compounds (VOC's). The Broome County Department of Public Works performed two hydrogeologic investigations in 1983 and 1984. Based on the information gathered, the Colesville Landfill was listed on the New York State Registry of Inactive Waste Sites and subsequently (in 1986) was added to the National Priority List (commonly called Superfund List).

Under terms of the agreement signed by the County, GAF, and the DEC, a Remedial Investigation (RI) was required at the site. The work plan for that investigation was described to local citizens at public meetings in a February 1987, and

the RI work was completed in September 1988. The RI report concluded that the landfill continues to release low levels of volatile organic compounds to the groundwater and that three homeowners' wells have been contaminated. Testing confirmed an off-site plume of contaminated groundwater southwest of the site. The report also described impacts to air, surface water and sediments as "not significant." A Sampling Report completed in February 1990 essentially confirmed the RI findings.

A Feasibility Study (FS) based on all the sampling data was completed in December 1990. The FS evaluated nine possible alternatives for remediating the site. The FS recommends that the landfill be capped, that wells be installed to pump and treat the contaminant plume and that a new water supply and distribution system be constructed. The treated water would be discharged to the Susquehanna River. The pumping system is predicted to reduce the risk to acceptable levels within one year and to attain groundwater standards within four years. The selected alternative would provide immediate protection of human health by utilizing a new water supply.

The January 30th meeting will include presentations by DEC and EPA staff as well as by the engineers who prepared the reports upon which the proposed Remedial Action Plan is

based. The presenters will welcome both comments and questions during the public meeting. Additionally, written comments will be accepted until February 5th. Following receipt of oral and written public comments a Responsiveness Summary will be prepared. That document will include evaluation of any new information and answer to any issues raised by public comments. If no major revisions in the selected remedial alternative, a record of decision could be issued in the spring and the process would move to the design and construction phase.

The administrative record which contains information on selection of the remedial plan is available for review at the Colesville Town Hall in Harpursville from 9-4 weekdays and from 9 until noon on Saturday. Additional technical documents, including the Remedial Investigation, the Feasibility Study, and the Proposed Plan are available at the DEC offices in Kirkwood. Written comments should be sent to:

Brian Davidson, Project Manager
Division of Hazardous Waste Remediation
NYS DEC
50 Wolf Road, Room 222
Albany, New York 12233-7010

For additional information contact Katie Lacey, Regional Citizen Participation Specialist, (315) 426-7400.

Dump-cleaning hearing planned

By DON SBARRA
Staff Writer

Cleaning some of the most contaminated property in Broome County is the scheduled topic of a public hearing Jan. 30.

State Department of Environmental Conservation officials are seeking public comment on a $5.14 million remediation plan for the county's old Colesville landfill. The 30-acre dump, operated by Broome County from 1969 until December 1984, is considered a hazardous waste site and is on the federal Superfund list.

County health officials first found chemical contamination in the drinking water of homes near the site about seven years ago, starting a process that prompted study after study, multimillion-dollar lawsuits, and a county buyout of several private homes.

Much of the pollution at the old dump was traced back to a period between 1973 and 1975, when the county legally buried thousands of drums of industrial waste from the former GAF Corp. plant in Binghamton. The burial was allowed at the time under the county's landfill permit from the DEC.

Kate Lacey, spokeswoman for the DEC's regional office in Syracuse, said the cleanup could begin this spring if no significant problems arise out

See HEARING/Page 2B

Hearing planned on Colesville dump —

Continued from Page 1B

of the hearing process. The DEC is accepting written comments on the remediation plan until Feb. 5, and will accept oral comments at a 7 p.m. hearing Jan. 30 in the second-floor auditorium of the county office building.

Lacey said GAF and the county will split the cost of the cleanup, and that 75 percent of the county's cost will be reimbursed through the state Environmental Quality Bond Act. That would leave the county paying about $535,000.

The old dump is along East Windsor Road, about a mile from Doraville and a short distance from the Susquehanna River.

The cleanup plan, selected from several proposals developed through a series of studies at the site, would include placing an impermeable cap over the dump to prevent rain and snow runoff from percolating through the waste and leaching into the ground water below, and installing a pumping and treatment mechanism that strips contaminants from the ground water. The plan would also include drilling new wells up gradient of the contaminated water field, with a distribution system connecting the affected homes near the site.

According to DEC projections, the installation is expected to take about 18 months, with treatment taking up to four years to return ground water quality to acceptable levels.

One of the homes closest to the dump belongs to Charles A. Scott, who has lived next to the landfill all of his 60 years and "long before the landfill came." Scott, who has been drinking bottled water supplied by the county for about six years, said Thursday he fears the remediation plan, especially the cap, will only make matters worse.

He said the dump was built over a creek-crossed piece of property fed by natural underground springs, and that capping it won't stop the contaminated water pouring out from underneath. He believes the cap would prevent the site from "breathing," creating downward pressure that would force chemicals into the ground water.

"It's an underground lake where they put that landfill; water came out from the hills long before they put it there, the woods are all swampy They're not going to dry it up (with cap)." said Scott, a retired Delawar & Hudson Railway Co. worker. "W was here long before that landfill, an we had nothing to say; the people i town had the votes."

More than a dozen homeowners i the area filed civil actions against th county because of the damage th contamination did to their property Several properties have been bough by the county using a $500,000 fun set aside by legislators.

Scott, who can see the old dum from his front door, said he refuse the county's $82,000 offer for the tw parcels he owns partly because h "couldn't put a price" on proper that has been in his family since th 1930s, and partly because "yo couldn't begin to replace it for that."

Reactions vary to Colesville dump plans

By EDIE LAU
Staff Writer

Plans to clean a hazardous waste dump in the Town of Colesville were described Wednesday as too limited, too ambitious and not researched enough.

The reactions came at a public meeting sponsored by the state Department of Environmental Conservation and the federal Environmental Protection Agency to discuss cleanup measures for the old Colesville landfill, a "superfund" site.

The 35-acre dump, owned by Broome County and operated from 1969 to 1984, is contaminated by a variety of industrial chemicals that have infiltrated ground water, including water serving private wells in the area.

A $5.14 million remediation plan advocated by the DEC and EPA as well as the state Department of Health involves capping the landfill to prevent water from flowing through the waste and leaching into the aquifer below; pumping the spoiled water into a device called an air stripper to purify it; and drilling new wells to serve four affected residences near the dump.

The costs would be evenly split by the county and GAF Corp., which once had a plant in Binghamton and illegally disposed of waste chemicals in Colesville. Of Broome's share, 75 percent will be reimbursed through the 1986 state Environmental Quality Bond Act, said DEC spokeswoman Kathy Lacey. She said she expects a decision on the plan within six weeks.

About 35 people attended Wednesday's meeting in the county office building.

Mary J. Clark, regional coordinator for Citizen Action of New York, a consumer and environmental advocacy group, applauded parts of the plan, but asked that the new water system be enlarged to serve residents of Doraville, southeast of the dump on East Windsor Road.

"We're not sure what's in here, what's still in there to be released."
— Michael O'Hara, Wehran Engineering

DEC Project Manager Brian H Davidson said although the county has provided bottled water or a filtration system for a few Doraville residents — as well as people livin

See DUMP/Page 3B

Dump cleanup discussed

Continued from Page 1B

nearer the landfill — tests have shown Doraville's water is unaffected.

Thomas O'Meara, chairman of the Broome County Environmental Management Council, questioned whether pumping and treating the water might fail to reduce contaminants to levels considered safe for drinking water.

Joel A. Singerman, acting chief of the EPA's New York and Caribbean superfund branch, acknowledged that no superfund cleanup efforts have yet restored an aquifer to drinking-water standards. "We're in the process of it. I don't think we've reached the point yet," he said.

Jon P. Link, vice president of Environmental Control Technologies in Sidney, asked whether anyone considered a future surge of contaminants after buried barrels rust apart. Michael W. O'Hara, senior engineer for the county's consultants, Wehran Engineering of Middletown, replied: "Good question. We're not sure what's in here, what's still in there to be released."

Documents detailing studies at the landfill are available for public review at the Colesville Town Hall in Harpursville and at the DEC office on Route 11 in Kirkwood.

APPENDIX D

Citizen Participation Plan
Colesville Landfill (I.D. No. 704010)

I. Introduction to Plan

II. Basic Site Information and Project Description

III. Identification of Affected and/or Interested Public (Contact List)

IV. Identification of Department Contacts

V. Identification of Document Repositories

VI. Description of Specific Citizen Participation Activities

VII. Glossary of Key Terms and Major Program Elements

Section I Introduction to Plan

The New York State Department of Environmental Conservation is committed to a citizen participation program as a part of its responsibilities for the inactive hazardous waste site remedial program. Citizen participation promotes public understanding of the Department's responsibilities, planning activities, and remedial activities at inactive hazardous waste disposal sites. It provides an opportunity for the Department to learn from the public information that will enable the Department to develop a comprehensive remedial program which is protective of both public health and the environment.

Section II Basic Site Information and Project Description

The Colesville Landfill is a 35-acre former municipal landfill in the Town of Colesville, Broome County, just north of the hamlet of Doraville. Landfill operations at the Colesville site commenced in 1969 and continued until 1984. The site was used primarily for the disposal of municipal solid waste, although drummed industrial wastes from various sources were also disposed between 1973 and 1975.

In 1983, homeowner well samples collected in the vicinity of the landfill by the Broome County Health Department indicated contaminated groundwater in the immediate vicinity of the landfill. This prompted the Broome County Department of Public Works to perform two hydrogeologic investigations in 1983 and 1984.

Based on available information, the Colesville site was listed on the New York State Registry of Inactive Hazardous Waste Sites and subsequently was listed on the National Priority List (NPL). The listing of the site on the New York State Registry and the NPL requires that specific procedures be followed to thoroughly investigate and remediate the site. After considerable negotiations between GAF Corporation, Broome County, and the NYSDEC, agreement on a Consent Order and Work Plan for further investigation and remediation of the Colesville Landfill was reached. The Consent Order also allowed for up to 75 percent of Broome Counties costs for site remediation to be reimbursed by the State under Title 3 of the Environmental Quality Bond Act (EQBA), making this Consent Order the first of its kind in the State.

On February 4, 1987, two public hearings were held at the Broome County Office Building to present the Work Plan for the Remedial Investigation and Feasibility Study (RI/FS) to the public. In October 1987, field work for the remedial investigation began, and the RI Report was completed in September 1988. After the RI was completed, confirmatory sampling was performed, and a Confirmatory Sampling Report, completed in February 1990, essentially confirmed the findings in the RI Report. A Landfill Gas Evaluation Report, dated August 1990, presented the findings of a perimeter methane gas survey which indicated only very low levels of methane in area on the southwest side of the landfill.

Section III Identification of Affected and/or Interested Public
(Contact List - the contract list will be expanded as affected or interested public are identified)

Mr. Richard Rhodes
Supervisor
Town of Colesville
Box 27
Harpursville, New York 13787
607-693-1174

Citizens Action of New York
293 Chenango Street
Binghamton, New York
Attention: Ms. Mary Clark
607-723-0110

Mr. Charles Scott Sr.
RD #1 Box 197
Nineveh, New York 13813

Mr. Claude Scott Sr.
Box 98 RD #1
Nineveh, New York 13813

Mr. Charles R. Scott
Box 51A RD #2
Harpursville, New York 13787

Mrs. Janet Smith
Box 196 RD #1
Nineveh, New York 13813

Mr. Marvin Gaines
RD #1 Box 194
Nineveh, New York 13813

Mrs. Sandra LaVare
RD #1 Box 193
Nineveh, New York 13813

Harry and Mildred Jones
RD #2 Box 50
Harpursville, New York 13787

Mr. Larry T. Huggins
Box 201 RD #1
Nineveh, New York 13813

Rudolph and Ella DeFreitas
20 Stoneleight Avenue
Carmel, New York 10512

Anna Valerio Mastellone
42 Lakewood Avenue
Lake Ronkonkoma, New York 11779

Mrs. Marjorie Kitchen
79 Charles Street
Ashley, PA 18706

Gregory Bidwell
RD #2 Box 53 River Road
Harpursville, New York 13787

Elwood Lee
RD #1 Box 584
Afton, New York 13730

Albert J. Laplaca
10 Seth Lane
Hicksville, New York 11801

Gerda Doran
c/o Phoebe A. Brundin
5161 - 69th Avenue North
Pinellos Park, PA 34665

Harry Ray Scott
49 Main Street
Afton, New York 13730

Hon. Edward Mosher
Council Member
RD #2
Harpursville, New York 13787

Hon. Gary Rhodes
Council Member
RD #1, Box 186
Harpursville, New York 13787

Hon. Margaret Wicks
Council Member
RD #2, Box 305
Harpursville, New York 13787

Hon. F. Leon Smith
Council Member
RD #1, Box 35
Harpursville, New York 13787

Hon. James Malley
County Legislator
17 Third Street
Deposit, New York 13754

Senator Thomas Libous
NYS Senate
84 Court Street
Binghamton, New York 13901

Hon. James Tallon, Jr.
19 Chenango Street
Press Building, Room 404
Binghamton, New York 13901

COLESVILLE LANDFILL MEDIA LIST:

Media

WBNG - TV
Front Street
Binghamton, NY 13905

WICZ - TV
Vestal Parkway
Binghamton, NY 13903

WMGC - TV
Ingraham Rd.
Binghamton, NY 13903

WEBO - Radio
119 McMaster St.
Owego, NY 13827

WINR - Radio
Windy Hill
Binghamton, NY 13905

WSKG Radio
531 Gates Rd.
Vestal, NY 13850

WENE Radio
2721 E. Main
Endicott, NY 13760

Binghamton Press/Sun Bulletin
Vestal Parkway East
Binghamton, NY 13902-9982

Section IV Identification of Department Contacts

NYSDEC Project Manager:

Brian H. Davidson
NYSD of Environmental Conservation
50 Wolf Road - Room 224
Albany, New York 12233-7010
518-457-1641

NYSDEC Regional Contact:

Scott Rodabaugh
NYSD of Environmental Conservation
RD #1 Route 11
Kirkwood, New York 13795
607-773-7763

NYSDEC Citizen Participation Specialist:

Susan Miller
NYSD of Environmental Conservation
615 Erie Boulevard West
Syracuse, New York 13204
315-426-7400

NYSDOH Contact:

Gary Robertson
NYSD of Health
677 South Salina Street
Syracuse, New York 13202
315-426-7612
Albany, New York 12203

County Health Department Contact:

Robert W. Denz
Director of Environmental Health
Broome County Department of Health
1 Wall Street
Binghamton, New York 13901
607-772-2887

NYSDEC Toll Free Information Phone:

1-800-342-9296

Section V Identification of Document Repositories

New York State Department of
Environmental Conservation
RD #1 Route 11
Kirkwood, New York 13795

Town Clerk
Town of Colesville
Box 27
Harpersville, New York 13787
607-693-1174

New York State Department of
Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, New York 12233-7010

United States Environmental
Protection Agency, Region II
Western New York Remedial Action Section
Room 29-102
26 Federal Plaza
New York, New York 10278

Section VI Description of Citizen Participation Activities

1. The Consent Order was described, the RI/FS process was explained, and the RI/FS Work Plan was presented to the public at two (2) public meetings on February 4, 1987.

2. When the RI/FS is completed a Public Notice of the Proposed Remedial Action Plan (PRAP) will be published. The Public Notice will include a description of the problems identified at the site, a description of and reasons for the selection of the proposed remedial action, identification of the document repository, identification of a contact person, and a announcement of public meeting.

3. The RI/FS report, preferred remedial action plan, and tentative schedules for design and construction will be presented at the public meeting. The public meeting will be held January 30, 1991 at the second floor Auditorium, Broome County Office Building, 44 Holly Street, Binghamton, New York at 7:00 pm. The PRAP will be available on January 6, 1991, and the public comment period will be from January 6, 1991 to February 5, 1991.

4. A Responsiveness Summary listing significant public comments received and demonstrating how these comments were taken into account will be written.

5. A Public Notice of the Final Remedial Plan selected will be published. The Public Notice will include a brief analysis of the remedial action selected, a discussion of any significant changes from the plan presented to the public at the Public Meeting, and a notice of availability of the Responsiveness Summary.

Definitions of Significant Elements and Terms of the Remedial Program

NOTE: The first eight definitions represent major elements of the remedial process. They are presented in the order in which they occur, rather than in alphabetical order, to provide a context to aid in their definition.

Site Placed on Registry of Inactive Hazardous Waste Sites - Each inactive site known or suspected of containing hazardous waste must be included in the Registry. Therefore, all sites which state or county environmental or public health agencies identify as known or suspected to have received hazardous waste should be listed in the Registry as they are identified. Whenever possible, the Department carries out an initial evaluation at the site before listing.

Phase I Site Investigation - Preliminary characterizations of hazardous substances present at a site; estimates pathways by which pollutants might be migrating away from the original site of disposal; identifies population or resources which might be affected by pollutants from a site; observes how the disposal area was used or operated; and gathers information regarding who might be responsible for wastes at a site. Involves a search of records from all agencies known to be involved with a site, interviews with site owners, employees and local residents to gather pertinent information about a site. Information gathered is summarized in a Phase I report.

After a Phase I investigation, DEC may choose to initiate an emergency response; to nominate the site for the National Priorities List; or, where additional information is needed to determine site significance, to conduct further (Phase II) investigation.

Phase II Site Investigation - Ordered by DEC when additional information is still needed after completion of Phase I to properly classify the site. A Phase II investigation is not sufficiently detailed to determine the full extent of the contamination, to evaluate remedial alternatives, or to prepare a conceptual design for construction. Information gathered is summarized in a Phase II report and is used to arrive at a final hazard ranking score and to classify the site.

Remedial Investigation (RI) - A process to determine the nature and extent of contamination by collecting data and analyzing the site. It includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for, and proposed extent of, a remedial program for the site.

Feasibility Study (FS) - A process for developing, evaluating and selecting remedial actions, using data gathered during the remedial investigation to: define the objectives of the remedial program for the site and broadly develop remedial action alternatives; perform an initial screening of these alternatives; and perform a detailed analysis of a limited number of alternatives which remain after the initial screening stage.

Remedial Design - Once a remedial action has been selected, technical drawings and specifications for remedial construction at a site are developed, as specified in the final RI/FS report. Design documents are used to bid and construct the chosen remedial actions. Remedial design is prepared by consulting engineers with experience in inactive hazardous waste disposal site remedial actions.

Construction - DEC selects contractors and supervises construction work to carry out the designed remedial alternative. Construction may be as straightforward as excavation of contaminated soil with disposal at a permitted hazardous waste facility. On the other hand, it may involve drum sampling and identification, complete encapsulation, leachate collection, storage and treatment, groundwater management, or other technologies. Construction costs may vary from several thousand dollars to many millions of dollars, depending on the size of the site, the soil, groundwater and other conditions, and the nature of the wastes.

Monitoring/Maintenance - Denotes post-closure activities to insure continued effectiveness of the remedial actions. Typical monitoring/maintenance activities include quarterly inspection by an engineering technician; measurement of level of water in monitoring wells; or collection of ground water and surface water samples and analysis for factors showing the condition of water, presence of toxic substances, or other indicators of possible pollution from the site. Monitoring/maintenance may be required indefinitely at many sites.

Consent Order - A legal and enforceable negotiated agreement between the Department and responsible parties where responsible parties agree to undertake investigation and cleanup or pay for the costs of investigation and cleanup work at a site. The order includes a description of the remedial actions to be undertaken at the site and a schedule for implementation.

Contract - A legal document signed by a contractor and the Department to carry out specific site remediation activities.

Contractor - A person or firm hired to furnish materials or perform services, especially in construction projects.

Delisting - Removal of a site from the state Registry based on study which shows the site does not contain hazardous wastes.

Potentially Responsible Party Lead Site - An inactive hazardous waste site at which those legally liable for the site have accepted responsibility for investigating problems at the site, and for developing and implementing the site's remedial program. PRP's include: those who owned the site during the time wastes were placed, current owners, past and present operators of the site, and those who generated the wastes placed at the site. Remedial programs developed and implemented by PRP's generally result from an enforcement action taken by the State and the costs of the remedial program are generally borne by the PRP.

Ranking System - The United States Environmental Protection Agency uses a hazard ranking system (HRS) to assign numerical scores to each inactive hazardous waste site. The scores express the relative risk or danger from the site.

Responsible Parties - Individuals, companies (e.g. site owners, operators, transporters or generators of hazardous waste) responsible for or contributing to the contamination problems at a hazardous waste site. PRP is a potentially responsible party.

Site Classification - The Department assigns sites to classifications established by state law, as follows:

o Classification 1 - A site causing or presenting an imminent danger of causing irreversible or irreparable damage to the public health or environment --immediate action required.

o Classification 2 - A site posing a significant threat to the public health or environment--action required.

o Classification 2a - A temporary classification for a site known or suspected to contain hazardous waste. Most likely the site will require a Phase I and Phase II investigation to obtain more information. Based on the results, the site then would be reclassified or removed from the state Registry if found not to contain hazardous wastes.

o Classification 3 - A site which has hazardous waste confirmed, but not a significant threat to the public health or environment--action may be deferred.

o Classification 4 - A site which has been properly closed--requires continued management.

o Classification 5 - A site which has been properly closed, with no evidence of present or potential adverse impact--no further action required.

State-Lead Site - An inactive hazardous waste site at which the Department has responsibility for investigating problems at the site and for developing and implementing the site's remedial program. The Department uses money available from the State Superfund and the Environmental Quality Bond Act of 1986 to pay for these activities. The Department has direct control and responsibility for the remedial program.

January 22, 1991

SAMPLE

[redacted]

Dear Mr. [redacted]

On January 30th local citizens will be updated on remedial plans for the Colesville Landfill which is a listed inactive hazardous waste site. I have included the press announcement which has been forwarded to the media in order to inform local residents of the meeting. As required by law, a complete legal notice appeared in the Binghamton Press and a copy of that notice is also enclosed.

The encouragement of public participation in decisions regarding inactive hazardous waste sites is an integral part of both the State and Federal programs to locate, investigate, and remediate hazardous waste sites. Staff from both the EPA and the DEC are available to answer questions by phone if you are unable to attend the January 30th meeting.

I would encourage you to attend the public meeting and to raise any questions or objectives you have regarding the studies or the chosen remedial alternative. A Responsiveness Summary will be prepared to answer any questions raised by the local community during this public review process. Most of the documents you might want to view are available at the Colesville Town Hall. Additional, more technical data may be reviewed at the DEC suboffice in Kirkwood. Scott Rodabaugh of the Kirkwood stff would be able to arrange for your access to this material (607-773-7763). If you have any questions or concerns you wish to raise prior to the meeting, you may contact me at our DEC regional headquarters in Syracuse (315-426-7400).

Sincerely yours,

Kate Lacey
Citizen Participation Specialist

KL:fn

Enclosures

007607

APPENDIX E

STATE OF NEW YORK

COUNTY OF BROOME

- -

In the Matter of a

Public Meeting

Re: Colesville Landfill Site

NYSDEC Superfund

and

EPA Superfund

- -

A public meeting held in the above-entitled matter at Broome County Office Building, Second Floor, Binghamton, New York, on the 30th day of January, 1991, commencing at 7:00 PM.

REPORTED BY: CZERENDA COURT REPORTING
Binghamton - (607) 723-5820
- (800) 633-9149
RANDALL A. CZERENDA
Certified Shorthand Reporter

APPEARANCES: Brian Davidson, DEC
Robert Cozzy, DEC
Katie Lacey, DEC
Joel Singerman, EPA
Eduardo Gonzalez, EPA
Michael O'Hara, Wehran Engineering
Anthony Savino, Wehran Engineering

MS. LACEY: Okay, we might just as well get started here.

I am Kate Lacey. I'm the citizen participation specialist for the regional Department of Environmental Conservation office.

Before we get into the actual informational part of the meeting, there is a little bit of housekeeping that has to be taken care of for the legal record.

This is Randy Czerenda, who is taking the official transcript. For the purpose of the transcript, we need to have it in the record that this is a public meeting to receive comment on the Colesville landfill federal and state Superfund site, that it is the required meeting as part of the public review, public participation regulations, and that the meeting has been properly noticed in the local newspaper of the legal record on January 7 and on January 28. The legal notice appeared

in the Binghamton newspaper announcing the public comment period, which began on January 7 and which will last until February 6, and this meeting is an integral part of that public review process.

End of housekeeping.

Now, so that you know who the people are that are going to be up here in front giving you some information first and then answering questions or receiving questions from you, the people on my left are from the State Department of Environmental Conservation. You have to get used to initials when you're dealing with government people.

The DEC is the state environmental group. The EPA are the federal environmental people. So, if you can just remember that these are the federal people, these are the state people.

On my far left is Brian Davidson, who is the project manager for the Colesville landfill site. He is the

direct state person involved in oversite of the Colesville landfill.

Next to him is Robert Cozzy, who is the section chief for the Title III program. The Title III program, in case that term comes up again, is the funding program, the funding mechanism under which the state will be reimbursing the county for a portion of the clean-up expenses. And if there is a question about that later on, maybe anyway it will be a good idea to give some explanation of the way that works, the dollar involvement of the state.

On my right is Joel Singerman, who is the acting chief of the New York and Carribean Superfund branch for the EPA. Anyone who is in charge of New York and the Carribean and chooses to be in New York in January, I don't know as I would go with his judgment.

Eduardo Gonzalez is on the far right and he is the overseeing project manager for the federal EPA.

The people who are going to be doing the bulk of the presentation on the technical information are from Wehran Engineering. If you want to just stand up -- the bulk of the information will be presented by Michael O'Hara, who is the senior engineer with Wehran Engineering. And Anthony Savino is also with Wehran Engineering.

Seated over here in the front, we have a county representative David Donahue, who is with the commissioner of public works, who will be available to comment or answer questions as far as the county involvement is concerned.

We also have a representative from the New York State Department of Health, Gary Robertson, who is over there with his hand raised.

And the oversite of Superfund sites and of programs such as this are a joint responsibility, in this case of the federal and the state government, and of the Department of Health and the

Department of Environmental Conservation. So, the Department of Health does have a role in reviewing information, making sure that the health issues are properly dealt with in the course of the remediation process.

As you came in, I hope that you signed up on the back table. There is a sign-up list with a place for you to put a name and an address. If there is a need afterward to send out additional information, we would like to keep an updated mailing list of people who have an interest, either a direct or an indirect involvement with the Colesville site.

So, if you put your name and address on the sheet at the back, if there is additional information sent out or if there is any reason to contact people who have expressed an interest, we would like to have as accurate and up-to-date list as possible. So, if you didn't sign up on the way in, please do during

the course of the meeting at some point do that.

Also on the back table were some blue sheets, which are fact sheets, particularly pertinent to this meeting because what we're going to be talking about mainly tonight is a remedial investigation feasibility study and the results of that work for the Colesville site. The blue sheet here will give you a pretty good description of exactly what a remedial investigation and a feasibility study, what they are so that -- I know sometimes the technical terms can get to be a bit confusing. And if you grab ahold of some of these, they do give you a little bit of a background to understand what some of the initials and the terms are that people are talking about.

I think with that, I will just point out that one of the requirements of the Superfund was -- is that there be a concerted effort to encourage citizen

input, to inform the public and to allow the public and encourage the public to comment back both to bring additional information to the process and to comment on activities that take place, to criticize, to ask questions, to make us, in effect, accountable for the decisions that are made by asking questions at any point in the process.

We now are at the point of having a considerable amount of data on the Colesville site, and as you'll hear tonight, getting close to the point in the process where some significant decisions are made. So, it is important that the people of the immediate area and of the general area be aware of what's being done and involved in the decision itself.

Following this meeting, there will be until the 6th of February written comments received on the proposals that are going to be discussed here tonight. Those comments can be sent to the DEC

office. There is an address -- a name and an address for forwarding any comments that you have or any additional questions that you have. Before any final determination is made on remediation, it will be necessary to have a responsiveness summary of the questions that are raised, will have to be dealt with, and that will occur in the time after the close of the public comment period.

I think with that, I will introduce the project manager, Brian Davidson, who is going to give a brief overview, a history of some of the activities that have taken place and try to get all of us up to speed on what has occurred over the course of the last several years in the process. Brian.

MR. DAVIDSON: Thank you, Kate. The Colesville landfill is a 113-acre parcel of property owned by Broome County. It's actually 35 acres of landfilled area. It is operated by

Broome County from 1969 to 1984. Other companies that contributed waste to the landfill were GAF Corporation and Tri-City Barrels and Malchak Salvage Corporation. Municipal waste was primarily what was disposed of at the landfill.

Between 1973 and 1975, drums of industrial waste were co-exposed with municipal solid waste. The industrial waste included hickories dyes, organic solvents and mixtures, mixed chemical solvents.

They were primarily disposed of in trenches, in approximately 468,000 cubic yards of material was disposed of in the trenches.

The landfill is in a rural area over large tracts of undeveloped woodlands, large agricultural tracts and scattered residential parcels.

In 1983, the Broome County Health Department sampled homeowner wells and they indicated -- the results indicated

groundwater contamination in the immediate vicinity of the landfill. Broome County then provided bottled water to homeowner wells in the immediate vicinity of the landfill.

In 1984, the landfill gates were closed and then the county provided granulated activated carbon treatment with ultraviolet disinfection to eight homeowners at their request in the immediate vicinity of the landfill.

In 1983 and 1984, a two-phase hydrogeologic investigation was completed by Wehran. In 1985, the site was accepted to the national priority list.

On February 4, 1984, we held two public hearings out here in the Broome County offices to present a proposed work plan for the remedial investigation and feasibility study at the Colesville site, and in April of 1987, an order on consent was signed between Broome County, GAF and the Department of

Environmental Conservation which calls for the investigation and remediation of the landfill.

Under the terms of that agreement, Broome County is paying for 50 percent of the cost of the investigation and remediation, GAF Corporation is paying for 50 percent and the state is reimbursing Broome County 75 percent of their cost under the 1986 Environmental Quality Bond Act.

Remedial investigation was completed in September of 1988 and a confirmatory report was completed in February of 1990, which essentially confirmed the findings of the remedial investigation and provided additional data -- validated data. A methane gas study was completed in August of 1990 and in December 1990, the feasibility study was completed.

Mike, I think I'd like to turn it over to Mike O'Hara from Wehran Engineering to present the findings of

the remedial investigation and the feasibility study.

MR. O'HARA: Thanks, Brian. Just to orient the site, first. This shows the location of the site. The shaded area is a 35-acre landfill site. It's located north of Doraville, east of -- Windsor Road runs nearby and there are several residential parcels, as Brian mentioned, in this area.

Just as some preliminary definitions, the remedial investigation that we're talking about is an investigation of the site so that we can define the occurrence of contamination, and the feasibility study is a study to look at alternatives to remediate the site or clean the site up. So, it's a two-phase type study. So, we can look at the slides.

First, I will go over the components of the remedial investigation so you can get an idea of what we've done over the years with these various phases. There

were various phases done and what I'll do is summarize the results of all the phases.

Basically, we reviewed the available site history, the operations and the setting of the landfill. We looked at soil borings at 27 locations around the site, at various locations and depths to get a handle on the geology of the site, the definition of the different formations, their thickness. We also installed 27 groundwater monitoring wells to define the groundwater occurrence and movement.

We looked at groundwater levels and permeability testing of the aquifers. In total, we sampled 27 groundwater monitoring wells, four private wells in this area of the site, surface water and sedimented samples from the small streams that are located near the site.

There is a south stream and a north stream. There are discharges of leachate groundwater from the landfill

to the streams, so we looked at the quality of the surface water and sediments in those streams.

We actually sampled three seep locations and the analyses that were performed were for volatile organic compounds and metals.

Based on that level of field work, we were able to come up with a hydrogeologic characterization, which basically gives us a picture of the movement of groundwater and surface water around the site, the contaminant assessment which tells us what contaminants are there, where they're located and where they might move. And we also looked -- made an assessment of any increase in risk to human health and the environment.

Based on those, we came up with some preliminary remedial action objectives or some definitions of how we could clean up the site.

In summarizing the major RI

conclusions, the hydrogeologic characterization, there are two aquifers in the project area. There is a shallow permeable glacial outwash aquifer zero to seventy feet beneath the refuse, and the direction of groundwater flow is south -- basically the groundwater flow direction is this way, flow to the Susquehanna River, and also there is a southwest component to the north stream. In other words, the groundwater comes up and surfaces at surface water in the north stream.

Another aquifer is the bedrock aquifer, which is beneath the upper aquifer, and that occurs at 85 to 310 feet below the refuse. And the direction of the flow in that aquifer is southwest to the Susquehanna River.

The major conclusions of the contaminant assessment, and I guess the first one is the most important, is that the landfill is currently releasing low levels -- and by that we mean part per

billion range, of several volatile organic compounds to groundwater and streams at the site. Metals were detected, but did not fit any similar pattern of contamination and, therefore, we don't believe they're attributable to the site.

In the last few years, the extent of the contamination has been limited to the same area. Basically we have -- I pointed out the direction of the groundwater flow. What we see is a contaminant plume that is down gradient of the landfill in that direction of flow and it encompasses an area of approximately that large (indicating). We haven't seen any major movement of this plume over the several phases of sampling. And we have not really seen big increases in the levels of contaminants.

There has been significant contamination of a private well, which we would call the center of the plume,

and that was one residential well. And there has been a trace of contamination of two other wells, which the levels have been consistent over time.

There was one bedrock private well, and that has not shown any contamination. And in conjunction with our five other monitoring wells that we haven't seen any bedrock contamination and can conclude the contamination is limited to the upper aquifer and has not moved vertically downward to the bedrock aquifer.

We also looked at potential impact on the Susquehanna River from this groundwater discharge, and based on some mathematical modeling, using concentrations here, we determined that there is no impact on the Susquehanna River. That was also confirmed with some sampling of surface water and sediments in the Susquehanna River.

There has been discharge to the north stream and the south stream and

the contamination is limited to the exact areas where there has been discharge. And surface water contamination drops off significantly from that point basically.

We also looked at sediments at those points of discharge, and we find low levels of VOC contamination, volatile organic contamination. But, again, it's limited to those areas right where the discharge is to the surface water.

The seeps that do come from the landfill basically present an aesthetics problem and it's also a pathway for direct contact of humans with those discharges. And there has been no significant release of volatile organic compounds to the air or to the air pathway as a result of their disposal in the landfill.

So, basically, the contamination is essentially limited to discharges in the immediate area of the seeps and also the upper aquifer.

Now, based on this contaminant profile and where contaminants may be moving, we also did an assessment of human health and environmental health risk.

Basically, there are two human pathways based on the direction of groundwater flow and potential exposure. One is -- the largest one is consumption of groundwater from the shallow aquifer where the residents have wells that are screened in that shallow aquifer and where there has been contamination documented.

The other human pathway is direct contact with the surface water and sediments in the north and south stream where there has been contamination.

The secondary pathway is consumption of any game animals that are in this area which themselves have direct contact with the surface water or sediments.

We followed a US EPA guidance

procedure for determining any increased health risk and based -- just to outline the process, we selected indicator compounds based on their toxicity and we make an estimate of any increased risk of cancer based on these indicator compounds, possible exposure to the materials, body weights and estimated time of exposure. That estimated time of exposure we used, to be very conservative, as 70 years.

The conclusions from this exercise was that there were unacceptable human health risks from consumption of the untreated ground water from the shallow aquifer. The maximum contaminant levels, which are levels set by the New York State Department of Health, were exceeded for several of the volatile organic compounds.

As far as the other pathways, there is no unacceptable human health risk from direct contact with leachate seeps and sediments, and that's based on the

very low levels of contamination that were in the surface water and sediment.

And also there is no unacceptable human health risk anticipated from the consumption of any game species that may have been in contact with these surface waters or sediments.

Up to now, I've described the investigation portion of the RI process. We have all the background data, we have put together contamination profile, we've looked at a base line risk.

Now, the next step is to look at a feasibility study where we want to determine what's the best way to remediate the site, to clean up the site, given those patterns of contamination, base line risk and also the requirements, regulatory requirements, advisories, guidance that we would have to meet to clean up the site.

Just to outline the feasibility study process, we summarized all the

remedial investigation work, and then we defined remedial action objectives, which tell us which media and where media are groundwater, soil, surface water and sediments, need to be addressed.

We come up with general response actions, and they're very general: They can be treatment, containment of the site or removal of the source waste. We get into a technology screening where we look at the various technologies that are available to remove, in this case, the volatile organic compounds. We screen out those that aren't applicable. We develop alternatives and screen out the alternatives based on their effectiveness in meeting the regulatory requirements and their ability to be implemented. In other words, can this remedy actually be constructed at the site and would it meet the conditions normally required of permits?

After we narrow down the number of

alternatives we have, we look at those remaining and subject them to detailed analysis. And we use these basic -- these criteria to evaluate each alternative.

The protectiveness of human health and the environment is looking at what kind of risk reduction do we get from the base line risk in implementing a remedial alternative. We look at compliance with applicable requirements. For example, do we meet -- after implementing the alternative, do we meet the groundwater requirements? We look at long-term effectiveness. Once we institute the remediation and start to clean up the site, will this alternative provide a long-term effectiveness or will there be some reversability after some initial treatment?

We look at reduction of toxicity, mobility and volume of the contaminants. There is a preference for reducing the amount of contaminants on site and not

simply containing them because we like to have a permanent remedy.

Short-term effectiveness, we look at whether or not there is any potential risk to the community during the construction period. If we're doing things to remediate the site that could have some short-term impacts during construction.

We look at implementability. Again, can the alternative actually be constructed and are there any administrative barriers to implementing the alternative?

We look at cost, we look at capital, operating and maintenance costs and we express the costs, the present value cost.

And the last two criteria are done after our technical analysis, basically the regulatory agency acceptance and what we're doing -- part of what we're doing tonight, the community acceptance.

Now, the major conclusions from the

feasibility study for the remedial action objectives, which is the starting point for looking at different alternatives. The objectives are to control the release of the volatile organic compounds from the landfill to the glacial outwash aquifer, or the shallow aquifer that is contaminated. We want to eliminate the leachate seeps from the landfill and any associated discharges to the streams.

Just cutting off those seeps should be adequate for the surface water and sediments. The levels of contamination in surface water and sediment were not high enough so that we had to look at actual remediation, possible removal of sediments. But cutting off the seeps will mitigate any further contamination of the sediments and surface water.

We want to eliminate the potential for direct human contact or animal contact with these seeps. And we also want to continue the existing homeowner

well monitoring program that's been done by Broome County, along with a temporary water supply and filtration program to the affected residents down here until the remediation of the site is complete.

One thing that came out of the technology screening was, when we were looking at various techniques to treat the site, to remove the VOCs, was that treatment of the mass of the landfill itself, trying to treat the source by various methods such as bioremediation, chemical extraction of VOCs. And vacuum extraction of VOCs from the whole mass of the landfill was impractical because of the way materials were disposed in the landfill. The VOCs are contained in waste that was in drums disposed in the trenches and also co-disposed randomly through the site so we could not -- really it would not be practical to subject the whole mass of the waste and landfill to any treatment in situ because we have discrete pockets of

contamination and we don't know where they are at this point. So, that was one conclusion that came out of the technology screening as far as techniques for treating the waste in place.

We developed a total of 14 alternatives to look at. A lot of these are variations -- some of these are variations on a similar alternative, just that they have different components to them.

But these are the general categories of alternatives. There is no action alternative, which we always have to include based on guidance for doing these studies. And we use that as a base line in which to compare any other remediation.

We determined that that was not effective in meeting the regulatory requirements because that would do nothing to meet our remedial action objective of dealing with the volatile

organic compounds in the shallow aquifer. However, we continue this alternative through the process, even though we determine at this point it's not effective, again to use it as a base line alternative.

We came up with a couple of limited action alternatives, and these are basically continuing the existing water supply and filtration program, putting deed restrictions on future groundwater use so no one can go in there and start using this groundwater without anyone knowing and also the variation on that would be to supply water to the affected residents instead of using the existing filtration program.

And both of those alternatives we considered potentially applicable to look at in further detail.

We came up with a number of groundwater containment and treatment options. Basically, by implementing containment, what we would do is prevent

the flow of groundwater from moving further. We wouldn't arrest the movement of this plume further down gradient in time by putting in interceptor wells, a ring of interceptor wells in the most contaminated area of the plume. And we had several variations on that which I'll get into in the next slide.

The next general type of alternative that we had was to actually go in and remove the waste, remove the source of the volatile organic compounds. The basic problem with that, the fatal flaw in those types of alternatives was that we have mixed refuse in here along with the drums and the co-disposed waste. We could have a lot of bulky material that, when we exhumed it, we would have contaminated bulky waste which we would have to decontaminate, stage in different areas and either dispose of it or decontaminate it and leave it at the landfill site. Essentially, it becomes

a very extensive materials handling problem. And because of the inclusion of the bulky waste in the landfill, those types of alternatives were not considered practical.

The things that we had considered along with the removal were incineration of all the waste, chemical treatment of all the waste. But, again, it wasn't the treatment, it was the material handling problem that really made those types of alternatives impractical.

So, after screening all of those alternatives, we came down to basically nine alternatives that we looked at in detail. And I'll just describe in a little detail what each of these is.

The no-action alternative, again, is basically not doing anything at the site. It's a base line alternative. But what we would do is we would monitor the groundwater to determine if there was any movement of this plume. This sort of would be an analytical program

where we would monitor groundwater basically quarterly and for VOCs.

The limited action, first limited action one we have here, we would again have that same monitoring program, we would restrict groundwater usage at the site and we would use the existing water supply and filtration program.

This basically would be protective of human health because no one would be ingesting the groundwater, the filtration -- supplied water would be still in effect. And no one would be using groundwater inadvertently there.

The variation on that is limited action B where we would restrict the groundwater use and, instead of continuing the existing water supply and filtration program, we would develop a new water source, upgrading of the site and supply water to the affected residents.

As far as the containment alternatives, what we would do to

contain groundwater would be downgrading of the site, we would intercept the contaminated groundwater with a series of pumping wells, and conceptually we had basically ten wells pumping 10 gallons per minute, a total of 100 gallons per minute. That would be collected. This would -- any ground -- contaminated groundwater flowing from the landfill would be intercepted and removed from the groundwater and we would also reverse the gradient for contamination that has gotten further down gradient, we would reverse that gradient and start to pick up that contamination and remove it from the aquifer.

We would collect that groundwater and the technique for treating that would be air stripping, which would strip these volatile organic compounds from the groundwater. We might have to look at metal precipitation because of the natural high levels of iron and

manganese in this groundwater. And also before discharge to the area of the volatile organic compounds, we may need to use a catalytic incinerator or catalytic convert to destroy those. We couldn't simply emit those to the atmosphere.

Those issues on the treatment will be decided in the detailed design phase where we actually look at the amounts of metals coming into the system and the amounts of volatile organics being emitted as they're stripped.

The other aspect of the down grading pumping, to reduce the amount of groundwater that goes through the site and picks up contaminants in the site is to cap the site, is to cut off the infiltration of rain water through the site. And here we would use a multi-layered cap that would meet New York State solid waste regulations for caps. And that is a component of all the remaining alternatives that we

have there.

A variation of the pumping would be to accelerate that pumping by not only pumping down gradient of the site but to pump also within the landfill. We looked at placing two pumping wells within the landfill, and that would accelerate the removal of contaminated groundwater from the landfill. And again, we have variations just with the -- using the existing water supply and coming in with a new water supply.

Another variation of containment was to put in a cut-off wall to actually physically cut off the flow of groundwater down gradient and here we would use what's called slurry wall. We would trench around the site and backfill the trench with a soil and vermiculate fixture which would provide a physical barrier to groundwater flow. And then we could pump outside the wall and also we could pump inside the wall. It's just a variation we looked at to

see if that would speed up the remediation.

As far as evaluating these alternatives, some of the features are that we used a mathematical model to simulate the contaminant transport or the movement of the contaminants under these different scenarios. Where I said we had ten wells pumping at ten gallons per minute, we used a model to predict how long it would take to reach the required groundwater concentrations using those pumping wells. And we also recalculated from the base line risk. We also recalculated the reduction in risk after implementing these alternatives. In other words, as the contaminant levels decreased under the pumping, we looked at the risk that would remain at the receptor areas or the residential areas with time.

This table also, the columns basically give you a good idea of the relative effectiveness of each

alternative. But we have cost and time to implement the alternative, which would consist of designing the alternative and then constructing it and starting it up.

And also the estimated time to meet the groundwater concentration limits. You see an acronym there, ARARS. I'll just say that what it stands for in this case, basically is meeting the maximum contaminant levels for VOCs in groundwater as set by the New York State Department of Health.

As you can see, the no-action alternative, which is just the monitoring, is the least expensive alternative. We could implement it right now because the monitoring wells are out there.

However, if we were to just rely on natural flushing of the landfill, our modeling predicts that it would take greater than twenty years to ever reach the maximum contaminant levels that are

allowed down gradient.

With the limited action, again, there are two alternatives, one using the existing water supply and one with the new water supply. Those could be implemented in six months to a year. However, again, while it is protective of human health, no one is drinking contaminated groundwater. To meet the levels that we want to get to to remediate the groundwater, again, relies on natural flushing and natural recovery of the aquifer, and we predict that that would take, again, greater than twenty years.

The down gradient pumping is basically the ten wells and groundwater treatment and discharge of the treated groundwater to the Susquehanna River. The present value cost of that is $650,000. Take approximately -- sorry. I'm reading the wrong one there. That's a little over five and a half million dollars. It will take approximately a

year and a half to design and construct. And based on our modeling, it would take eight years to meet the groundwater requirements in this area.

If we accelerated the pumping by having the down gradient pumping and pumping in the landfill, we would meet the groundwater requirements in approximately four years. Of course, the models are approximate. These are not exact times. But it gives us an idea that we're talking in the order of years for us to meet the clean-up criteria in the groundwater.

When we looked at putting in the cutoff wall, we actually ended up predicting that it would take longer than twenty years to meet the groundwater requirements because putting in the cutoff wall limited the rates that we could pump at outside and inside the wall. And, therefore, it did not accelerate the pumping rates and removal of contaminants. So, as far as

containment, that was actually the worst one.

So, basically, there was more to the detailed analysis than these columns, but it's a basic summary and gives you the basic idea of the relative trade-offs of each alternative. This is basically where our study concluded.

So, I think Brian wants to discuss the alternatives more.

MR. DAVIDSON: Thanks, Mike. Based on the detailed analysis and the feasibility study, the New York State Department of Health, EPA and the DEC independently arrived at the same conclusion that alternative 4C-2 was the preferred alternative. Alternative 4C-2 consists of the landfill cap, pumping wells at and down gradient of the landfill, air stripping at the groundwater, discharge of the treated groundwater to the north stream or the Susquehanna River and construction of new water supply. It has it all.

It's important to note that the remedy -- that 4C-2 is the preferred remedy for this site. The final selection will be documented only after the record of decision, which is referred to as the ROD, only after consideration of all comments on any of the remedial alternatives addressed in the proposed plan or the remedial investigation and feasibility study. Written comments and any oral comments will be documented in the responsiveness summary section of the record of decision, which is the document which formalizes the selection of the remedy. Kate?

MS. LACEY: All right. Before we get down to questions that you may wish to raise, or statements that you may wish to make, I'd point out that the documents that have been produced as a result of the investigation that's taken place are available for your review at the town hall. Also, the major

documents are at the Kirkwood DEC suboffice which may be as convenient for some of you. Also at the DEC office in Albany and the EPA regional office in New York City, if those are convenient for you.

Almost the entire file is at the Kirkwood office. All of the documents are at the -- all of the studies and the back-up documentation are available in the town hall.

On the back table, along with the blue sheets which describe a couple of the technical terms that you hear thrown around a lot, remedial investigation, feasibility study, also in the back of the room is a stack of copies of a PRAP, P-R-A-P, which is a proposed remedial action plan. This is a description of the alternatives and the process for determining which of those alternatives is at this point preferred. Any of you who haven't picked up copies of this, it gives a more detailed description of

each of the alternatives that were described by Mr. O'Hara and the one that was selected as described by Brian Davidson.

At this point, any of you who have questions or statements, you're more than welcome to make them. Also, keep in mind that written comments can be forwarded between now and February 6 to Brian Davidson and his address and the way to get in touch with him to properly get those comments in is on the bottom of the PRAP. And also, I'm sure if you approached him, he would give you an address so you can make sure that he gets the material.

If you have any questions or if you have any comments that you wish to make, the only thing I would ask is that you identify yourself clearly and with a general address, if you're from the town, just a general address. You don't have to go into great detail. But we would like the stenographer to get an

accurate name and identification of the people who are making comments.

MS. CLARK: My name is Mary Clark. I'm with Citizen Action of New York. I've worked for a number of years with many of the residents who are living in the Doraville area and around the site.

I have a number of questions and concerns that maybe you can answer and comment.

First, in terms of the surface water and the streams, we've written the DEC, and a number of things, back in 1985, of pointing out some real discrepancies with the Wehran report which left out a number of creeks, one that flows directly from the landfill. Is that on your map? I believe you said that it is. I'm not sure if -- from your pointing, that you referred to the south stream. Could you explain to me where you see the south stream?

MR. O'HARA: Here is the north

stream and the south stream and there are also some seeps along this part of the landfill.

MS. CLARK: Because some of the concerns with, particularly the Doraville residents, are at different times of the year that maybe aren't visible in the summer and the spring is that there are actually streams that come out of the seep area on what you would refer to as, I believe, what it looks -- right there.

MR. O'HARA: This area?

MS. CLARK: Right in that area. There is a main stream that comes out of that and the landfill, there is a stream that comes out where you referred to as the south stream. That leads one to -- that comes all the way down and connects to the thing that goes -- the stream that goes by the Doraville area. It comes all the way down.

MR. O'HARA: All the way down.

MS. CLARK: And there is also the

stream that comes out of the main seep area that isn't identified. That leads people to be very concerned, particularly in the Doraville area, that you're indicating that everything is going in a south, southwest manner when we actually have surface streams that are coming out of the other ends that come down towards the Doraville side. And that's very disturbing to people and leads one to question some of the accuracies in terms of the report.

MR. O'HARA: Okay. What we did was we sampled the streams that we saw in this area.

MS. CLARK: They're not visible all year round. I mean, clearly in the spring and the fall, they're very, very visible. These streams are -- particularly the one to the right, our right there, is actually quite a large stream in the fall and in the spring with the other one, it really dries up in the summer. And that's some of the

concerns in terms of how this testing occurred, did it occur for all of these things, throughout like -- all different seasons, through all different years. That's, you know, when it was dry, when it was, you know, extremely, you know, wet, a lot of precipitation, things like that.

MR. O'HARA: Okay. We sampled streams where we saw them here and the outbreaks where we saw them. And we also looked at the results.

As I mentioned, the levels of contaminants in the surface water and the sediments were basically restricted to the area where the seep was coming out.

MS. CLARK: So, you did not sample the streams that you did not see, then, the ones that we're talking about because they do exist. I mean it's very obvious in the spring and the fall and that's some of the concerns in terms of the accuracy of this report.

MR. O'HARA: Based on the levels that we saw, I guess if we had seen higher levels here, we would have expanded -- we would have looked further. But, based on the levels that we saw, which are closest to the landfill which would be the highest.

MS. CLARK: The one stream comes directly out of the landfill. And I guess that leads one to be concerned about -- and particularly with the concept of capping, not that people are necessarily against it. But there is also concerns that there are springs that flow and percolate up which a capping does not necessarily, you know --

MR. O'HARA: In conjunction with the cap, we will have the groundwater pumping, which will cause any springs -- cause the water levels in the landfill to go down. So, we --

MS. CLARK: And where would the pumping be with this one proposal?

MR. O'HARA: Basically in this area just down gradient of the landfill. And also two wells approximately here in this portion of the landfill.

THE COURT: Where would your monitoring wells be?

MR. O'HARA: We would use the existing monitoring well systems here to monitor the effect.

MS. CLARK: Okay. The concern is particularly in the Doraville residence area because we've neglected to actually sample the streams that do exist at certain times of the year is for there to be monitoring wells down in the Doraville area. That's critically important.

MR. O'HARA: There are monitoring wells that go all the way down to Doraville.

MS. CLARK: Will they continue to be monitored? That's the question.

MR. O'HARA: No. We looked at these in the past and basically have not

found contamination.

MS. CLARK: The concern is once we start capping, pumping different things with the residents that there could be, without monitoring of these -- of this whole area, that things could change and, like the other things haven't really been looked at, that we would really prefer that the monitoring of the wells on that side heading, you know, and protecting of the Doraville residents still be maintained.

MR. O'HARA: Basically with the cap and the groundwater pumping, we will be forcing any groundwater to move in this direction much more strongly than is going right now. This is the direction of the groundwater flow now, south to southwest. But when we put the groundwater containment system in, we will design the pumping rate so that we're able to really reverse -- not reverse, but more strongly get groundwater to go in this direction.

And that should alleviate any concern about groundwater flow.

MS. CLARK: What would be the problem with continuing to monitor those wells or some of those wells facing that area in terms of protecting a number of citizens -- a larger number of people who live in that area in addition to those who live in the other?

MR. DAVIDSON: Excuse me, Mike. They will be. As part of -- after the construction is complete, there is an operation and maintenance plan referred to as O&M. Part of the O&M will be selecting monitor wells to monitor long term and perhaps on a quarterly basis. That will be decided in part of the design which wells will be monitored where, how often and for what parameters. So, there will be long-term monitoring. I think that's what you're driving at. And the wells that are between the landfill and Doraville will certainly be included.

MS. CLARK: Okay.

MR. DAVIDSON: There will either be new wells installed or we will utilize monitoring wells that were installed as part of the remedial investigation.

MS. CLARK: That's the assurance I think people want to see that there are monitoring --

MR. DAVIDSON: Absolutely. That's part of every remedial program.

MS. CLARK: The additional question I have is, looking at the water system, when we refer to creating a new water system, which I think is -- you know, I commend that choice rather than keeping with the existing system because currently there is serious problems with break down of the filter system, not being reimbursed for the cost of the electricity or extreme delays in terms of reimbursement for people. Some people have actually even given up the filter system and are just not dealing with it and dealing with the

contaminated water.

What area of the residents are you looking for the new water system or will that also include the area in Doraville?

MR. O'HARA: Basically, we've talked about a new water supply on the conceptual level. Basically we're talking about supplying the residents in this area and not going down to Doraville. Again, the contamination has not been detected.

MS. CLARK: Although in Doraville, two residents are on bottled water. There is also -- the LeVare residence also has a water system put in by the county, a filter system put in by the county. Indeed at some point, there has been some contamination to warrant that action in the past and the concern is that these residents be included as well.

MR. O'HARA: I guess that would be considered in the design of the water supply system.

MR. DAVIDSON: The water supply system is anticipated to take in three, or actually now two, since the county has purchased one property, the two residences that have been impacted by the landfill. The LeVare residence or residences in Doraville may have been provided treatment by the county, but there is no evidence in any of the sampling data that any of the residences in Doraville have been impacted by the landfill.

So, there may -- you know, this system will hopefully be sized such that it could be expanded to some degree, but it's not the intent of this remedial program to provide municipal water supply to everyone in the area. We're looking to remediate the site and to provide a new water supply to the residents that have been impacted by the landfill.

MS. CLARK: The concern is that obviously there was some past history

and some warranting of providing this costly thing to the county to put in these filter systems, to provide bottled water and there is also some concerns in a number of reports throughout -- throughout the years that this has been going on. Any time there has been any kind of level that has been unacceptable or beyond the standards, there has been a statement that says laboratory contamination. And that's been consistent rather than saying that, gee, there may be something here. It's always been basically brushed aside as if there is laboratory contamination.

And some of the residents there and Betty Springfield, whose daughter just actually died of cancer this last week, who is 42 years old, could not make it here. She has had private well testing that indicates different levels than the levels that were indicated by the county testing.

And so there is real concern of

residents in that area that things, particularly when streams aren't indicated, aren't even tested, that there may be some real contamination there. There has been in the past. It's been just removed as we'll just write that off as laboratory contamination, that there is real issues and real concerns of the drinking water in the Doraville residents and they would like to be included in terms of the new water supply as well.

Because it seems almost absurd in terms of putting in a whole new water system to provide things for three families when, less than a quarter mile down the road, there is another ten families that can benefit by that, whether you want to admit or not or whatever the situation may be in terms of just their peace of mind to include them and incorporate them on the water system as well.

MR. DAVIDSON: Well, I think, you

know, we have to go on the evidence we have.

First of all, with respect to your first comments on the streams not being included, the first two-phase hydrogeologic studies done by Wehran in 1983 and 1984, there was a sketch map in there that did not include all of the south stream. And that was noted by one of the residents. It was also noted in our review and it was, in fact, correct, that stream wasn't on there. It was included in the subsequent remedial investigations.

That stream has been sampled continually at various locations along that stream. I have more, perhaps, peace of mind that that stream is cleaner than others because I personally took one of the samples. I mean, I can show you the analytical results if you really wanted to see them about midway in that field in the south stream.

Wehran Engineering also took samples

repeatedly throughout that south stream and along the seeps on the south edge of the landfill. And that, combined with a number of cluster wells that we have, deep, shallow and intermedial depth monitoring wells, repeated sampling indicating the limits of the plume do not extend beyond the south stream.

We're fairly certain of that. I think all studies that have been done on this landfill, incidentally, have come to the same conclusion that the boundary of any possible influence of that plume is that south stream. Once you get beyond the south stream, you're in a different drainage basin. You're still in the Susquehanna River drainage basin, but you're beyond the limits of the influence or the possible influence of the landfill.

MS. CLARK: That's how the stream goes.

MR. DAVIDSON: Excuse me. The county may have provided -- well, I

believe eight residences out there with filters and UV systems. That -- at their request. In other words, if a resident lived out there and requested -- they were near the landfill. Whether or not their well was impacted down gradient, up gradient, the county responded by providing treatment estimates. That doesn't necessarily mean their well was contaminated, or if it did have some contamination, that was in any way related to the landfill. That was the purpose -- one of the main purposes of the remedial investigation is to very clearly bear out where the extent of the contamination that was related to the landfill was.

I know that, for example, it's not uncommon to see, and I don't remember specifically which residents, but in one case, they had extremely high lead levels in one of the samples, I believe taken by the Broome County Health Department, and it was just after their

system was installed. I believe they had a Culligan system that was installed backwards. It was probably -- or could have been due to the soldering -- lead solder being used on the pipes.

In any case, in the landfill, we have been using volatile organics to monitor groundwater contamination because they migrate much faster than anything. And we look for certain organics as a fingerprint along with groundwater contour maps. And that hasn't shown up in Doraville.

MR. O'MARA: My name is Tom O'Mara. I'm with the Broome County Environmental Management Council. Just a series of questions based on the hydraulics and some environmental -- the environmental assessment and the management applications to this study.

First, was the vertical profiles that are in the reports. They seem to lead the reader to believe that there is a continuous till layer below the

refuse, is that correct?

MR. O'HARA: No. There are areas where the refuse is in direct contact with the glacial outwash aquifer.

MR. O'MARA: Secondly, also in the reports, it states that the refuse -- the entire refuse area is below the groundwater table. Is that accurate? Or is above the groundwater level.

MR. O'HARA: Yes.

MR. O'MARA: Is there a water table in the till area, that's in the refuse area?

MR. O'HARA: No. The two aquifers that were identified were the glacial outwash and the bedrock.

MR. O'MARA: So, somehow that till is draining into the outwash, is that accurate?

MR. O'HARA: Well, no, we believe that we're getting the contamination to the glacial outwash where there is no till. In other words, where the refuse is in contact with the glacial outwash.

MR. O'MARA: The till is a very impermeable layer. Therefore, the water is running off the site as opposed to percolating down, is that what you're saying?

MR. O'HARA: Right. The till layer is not saturated.

MR. O'MARA: The groundwater under this site and the seeps, what is the relationship there? Is this a discharge for the glacial outwash? Is that what's causing the seeps or is this a run off of the till?

MR. O'HARA: The seeps, we believe, are discharge of leachate from the landfill. So, it would be discharge from the till.

MR. O'MARA: From the till?

MR. O'HARA: Not from the till. But from the landfill and the flow would be over the till.

MR. O'MARA: It's not an outcropping of the glacial outwash then?

MR. O'HARA: I don't believe so,

no.

MR. O'MARA: There is a silt clay layer under the glacial outwash. Is that continuous? And if so, is that act being as a confining layer to migration moving downward?

MR. O'HARA: Yes. That is continuous. And that is probably why we're not seeing migration vertically to the bedrock.

MR. O'MARA: Also, the interpretation of the hydrology, it appears that there is a downward vertical gradient. Is that accurate?

MR. O'HARA: Yes.

MR. O'MARA: From an environmental perspective, was there any modeling done, looking at the loading to the two creeks or to the Susquehanna?

MR. O'HARA: Yes, there was. That's why we measured the flow in the north stream to see what kind of discharge there was of groundwater to the north stream.

MR. O'MARA: So, from a modeling standpoint, it is insignificant, the discharge to those water bodies, from an environmental standpoint?

MR. O'HARA: To the north stream, yes.

MR. O'MARA: And to the Susquehanna?

MR. O'HARA: We also looked at the discharge there. And we determined, based on the initial concentrations back at the landfill, that the discharge to the Susquehanna of contaminants would be negligible I believe.

MR. O'MARA: From a management perspective, who would be operating -- this is open to the panel as well -- who would be operating the groundwater pump and treat systems once a remediation action has taken place? Would that be the county's responsibility, the DEC as the lead agency? Who would be there for the routine maintenance, filter changes or whatever?

MR. COZZY: It would basically be between the county and GAF. Our agreement with the county is that they will take responsibility for O&M. I don't know what their arrangement is with GAF. Basically from our perspective, it's the county's responsibility.

MR. O'MARA: In looking at the economic analysis, how come inflation wasn't included as a factor? How come there was no inflation rate put into the O&M charges?

MR. O'HARA: Well, that's correct. We didn't use inflation and we didn't use that through all the alternatives. So, it's still valid as a comparative.

THE COURT: Would that be biased if you were looking at a long-term treatment operation where, if you did not include maintenance for the O&M, the O&M charges could sort of skew the results for the net present value analysis?

MR. O'HARA: Well, we could go back and do the costing, including inflation, but we didn't do it in this particular case.

MR. SILVERMAN: Also it's a plus or minus 15 percent accuracy in this study. It's not a ballpark process.

MR. O'MARA: It's just for the county, should the groundwater not be below the MCL after four years, the county is stuck with this albatross and this pumping system, which I'm sure the DEC is not going to allow them to turn off if the groundwater does not meet the MCL. That could be a significant issue with the O&M charges associated with this remedial action. That's all of my questions.

MS. LACEY: Okay. Anybody else?

MS. CLARK: I have a question about the air stripping. That was a question people had. You made some reference to -- in regard to like the heavy metals and things. The air stripping would not

work for that -- or could you explain the air stripping process and what alternative, if that would not alleviate that and how it would affect cost?

MR. O'HARA: Basically, we can use the air stripping to remove the volatile organic compounds for the site. What I was referring to is possible interference with the metals concentrations. There are high natural iron and manganese concentrations there and that would tend to foul the air strip.

In that case, what we would do is simply precipitate the metals out ahead of the air strip to take care of that problem. Or if the levels were intermediate levels, we could use a sequestering agent to prevent the metals from -- it would keep the metals in solution as it went through the air strip so it wouldn't foul the medium.

Basically what you're doing is running the groundwater -- you're

running the groundwater through a tower, you're pumping it up to the top of the tower where it's filled with some plastic-type media, and you're forcing air upward through it. And that strips the volatile organic compounds from the groundwater. And then you have discharge downward and that's what would be sent to the Susquehanna or north stream.

With those rings or plastic medium, if you have metals, they could precipitate on to the medium and reduce the efficiency of the stripping of the volatile organics. And so, if the levels are high enough, you would simply remove the metals or keep them in solution as it went through the tower.

There are techniques to deal with that.

In other words, we wouldn't have a situation where we couldn't deal with that and we would have to go to another removal technique.

MR. O'MARA: In terms of the water system for the residents as they are preparing, would they ever have to pay for their water? I think that's a guarantee people would like to see with the new water system, that it will never be created a situation where they'll have to actually pay for the actual water system.

MR. COZZY: If there is any way for us to guarantee, I don't know if we can do it administratively. We'll get an answer in the responsive summary.

MR. O'MARA: And we'd like to register the comment that we would like the system to be expanded.

MS. LACEY: Way in the back.

MR. O'MARA: My name is John Link from Binghamton. My question is about the modeling that you used to come up with, how long it might take to get under the maximum limits for VOCs in the water. Do you have a handle on the total amount that are in that landfill?

And secondly, are you assuming that you've got a consistent percentage that leeches out? I mean, one of the concerns that Tom brought up, the cost of possibly pumping this ad infinitum, if you have barrels in that with this compound, I assume at the time these barrels would rust through. It would create an influx of these chemicals into the water again. Are these things taken into account or do you have a standard deviation how long it might take to get these levels down?

MR. O'HARA: Basically, that is a good question. We don't -- we're not sure what has been and what's still in here that needs to be released in the future. Basically, the reason we were applying the model is that over the different sampling periods, we really haven't seen much difference in the levels of contaminants. Basically, we went from that, I guess, assumption.

MR. O'MARA: This assumption is

based on four to five years or so that you have looked at it. You're saying that the mental picture is a sponge that's letting this stuff out as the water is going through it. You're basing that consistency of release on four or five years, am I correct?

MR. O'HARA: Well, basically, what we did is we picked the wells, we picked the pumping rate. Based on modeling, we determined how many years it would take to get down to the MCL levels at the receptors.

MR. O'MARA: And that's assuming -- I guess I still don't have a good, clear concept on it. It's coming out at a fixed rate. And you're pumping at a fixed rate. I can see at a certain point in time where the rate of pumping overcomes the rate coming out and so the levels are now below, but it's still coming out, isn't it, leaching out of the landfill. I know it's slower, but .....

MR. O'HARA: Basically, we have a data point in the landfill. We have one well and that gives us the source of concentration. That was the initial concentration used in the model. And based on the dilution, we come out with lower concentrations out here. So, that was -- this concentration that we have data for here was assumed as the initial condition.

MR. O'MARA: There isn't -- is there any factor in this model that takes into account the possibility that perhaps 155-gallon drums with trichloroethylene in it that is sitting in there and no one knows about it, and at some point in time, 10 years or 15 years, they finally give up and start releasing all of that? You have no idea?

MR. O'HARA: We're limited in that point.

MR. O'MARA: Right.

MR. O'HARA: If we don't know

something is in here, we can't take that into account. We did attempt to find out where there were areas where drums were located. We used the geophysical techniques. And that really was not successful in determining clusters of drums or pockets like that.

MR. O'MARA: And I understand that that is very limited as to what went into the landfill. That's why Tom's question particularly distresses me to think about if we put all this money in and do this and the landfill will start bleeding again and we'll be in the same boat that we're in right now.

MR. O'HARA: Well, that will be dealt with in terms of impact by continuing to monitor. We're not saying that after four years, this is going to shut off. The operation is based on monitoring to prove that --

MR. O'MARA: So, the model says this is what's there, this is what we think is there. This is how long it's

going to take to release the concentrations. You don't know anything about what else might show up, which is a big question.

MR. O'HARA: We don't know exactly what might show up, that's correct.

MR. O'MARA: The bedrock aquifer that is -- you use the term aquifer. I'm assuming that that means that that has the capacity to be utilized at a future date, that has the groundwater flow velocities to be utilized as an aquifer, is that correct?

MR. O'HARA: Yes.

MR. O'MARA: And what would be the -- were two alternatives selected and screened out, one being to utilize the deeper aquifer as a drinking water source at the site? I mean at the down gradient locations if it is not contaminated?

MR. O'HARA: Basically, we stayed away from that because we were concerned about carrying contamination from the

upper aquifer down to the lower aquifer during that well installation. So, that's why we were considering more of a sand and gravel well out towards the Susquehanna River. At this point, that's conceptually where we think that would be located. And the exact location of that would be decided in the detail design.

MR. O'MARA: I guess I'm -- has the EPA in any of the Superfund sites remediated a drinking water aquifer to drinking water standards?

MR. SILVERMAN: We're in the process of it. I don't know if any action has been completed where we actually reached drinking water standard.

MR. O'MARA: There is a lot of information that's coming out that it may be impossible to pump an aquifer long enough to ever clean it to drinking water standards. And I'm wondering if, since we're providing private water

source anyway, are we just pouring more money down the drain by trying to remediate something that might not ever be remediated?

MR. SINGERMAN: We're providing water because the people's wells are impacted. So, we're providing alternate water supply. The site itself, we're under an obligation to try to contain the source and prevent further degradation of the groundwater and the leachate seeps and whatever. So, we're attempting to contain the site so that a further degradation of the environment doesn't occur.

MR. O'MARA: So, the alternative of capping and providing a private drinking water source was not evaluated because you felt it did not satisfy the ARARs, is that accurate?

MR. SINGERMAN: They're being violated. If you have groundwater that exceeds the state and federal standards, it's being violated. If the groundwater

is impacted and it exceeds the ARAR, we have to address the problem. And the remedy we're proposing will accommodate that. We're trying to eliminate the source.

MS. LACEY: The purpose of the Superfund program is the reclamation of the resource itself as a resource, not just because people are drinking it, just because it is a groundwater source.

MR. O'MARA: As a nation, shouldn't we be looking at whether this policy is effective and if these aquifers are not being remediated, aren't we just spending money?

MR. SINGERMAN: The leachate is entering -- the contamination is entering the groundwater. The groundwater is being contaminated. That's a resource. Granted we may never reach the levels we're attempting to reach, but at least we're doing some good. We're attempting to clean up the aquifer. I mean just to leave it as it

is now, we'll never clean it up that way. It's going to take perhaps 20 years to degrade by itself.

MR. O'HARA: In this case, where the limits of the plume are basically in this area, we don't try to contain the plume, it will move. That's what Joel is getting at, that we're trying to contain and reverse the flow and also remove the contaminants. We will remove a large mass of contaminants through pumping.

MS. LACEY: Here in the middle. Sir?

MR. ROSE: I'm Richard Rose, Supervisor for the Town of Colesville. We are concerned if we are going to be involved in this procedure or not in any way in the cost of or responsibility.

MR. DAVIDSON: No.

MS. LACEY: The party to the consent order is the county.

MR. COZZY: Only as county taxpayers.

MS. LACEY: Right. A different pocket of the same pair of pants.

MR. DAVIDSON: We elected to use your town hall as a document repository because we felt it was the most available to the citizens in the area.

MR. ROSE: There was rumors that we would be responsible for these wells that you install. That's why I asked.

MS. LACEY: In the back?

MR. CARUBIA: Paul Carubia, Sidney. I just had a question about, if you look at the potential that air stripping will not remove all the contaminants that would make it a -- being able to dump the water once you treated it into the Susquehanna, which I assume that's where it's going to go, I have an understanding that we're putting a cap on the landfill and reducing the flow of water. You may increase the water contaminants that are coming out such as heavy metals which the air stripping won't remove. Have you addressed any of

those possibilities of the contingencies in the pumping scenario in --

MR. O'HARA: Well, basically, we've looked at -- we've looked at the concentrations we've seen in the landfill and here. And we've set the pumping rates so we have contaminant concentrations and flow rates. And based on those concentrations going to the air stripper, there will be no problem. All of the compounds that we're trying to remove are very volatile based on Henry's Law. So, they're very strippable.

MR. SINGERMAN: Also anything discharged in surface water would have to comply with federal and state requirements.

MR. CARUBIA: That's what I'm saying. What happens if the air stripping effluent doesn't meet the requirements, what contingencies are there? Does it shut off or more air strips?

MR. O'HARA: Basically, there are things that you can do to fine tune the operation. You can add more air. If you really had to, you can put in another unit and split the flow. But based on the concentrations and the compounds involved, we don't expect any problems. The metals, if we think they would be a problem fouling the air strip, we can remove them.

MR. SILVERMAN: Also the organics stripped off will be collected as well. So, no discharge from any treatment unit on site would violate any federal or state standards. If it does, at that time, it would be shut off and we would correct the problem.

MS. LACEY: Way in the back?

MR. FISHER: Bob Fisher from Binghamton. I want to ask, how many data points do you have in the landfill from which we can get an idea of what exactly we're dealing with?

MR. O'HARA: Well, within the

landfill, we just have -- we have one well basically.

MR. FISHER: One data point. What type of geophysical survey have you done with that?

MR. O'HARA: It was a magnetometer survey to look for drums.

MR. FISHER: Did you do a resistivity survey?

MR. DAVIDSON: Yes, conductive survey. It was an EM-34 conductive survey done to try to trace the plume, the contaminated groundwater and --

MR. FISHER: Has anybody looked into the possibility of using ground-penetrating radar? It's a technique that allows very good resolution for shallow surface exploration like this, which might allow you to detail what's in there more effectively.

MR. O'HARA: Okay. The studies that we did with the magnetometer, terrain conductive and Earth

resistivity. One of the problems was because of the large amounts of scrap metal disposed in the landfill, there were a lot of interference with those methods. And the ground-penetrating radar, even though it could be effective to a depth of about 40 feet, which is basically the bottom of the refuse, we would expect to have the same kinds of interference due to the metals.

MR. FISHER: With the metal?

MR. O'HARA: Yes.

MR. FISHER: You don't think you can shoot around those?

MR. O'HARA: Well, we don't know where it is.

MR. FISHER: You could stack your data in a way you can't do when you use the resistivity or magnetics and eliminate the effects of those metals. In fact, a lot of metals is what you're looking for, right? When you're looking for buried drums in a lot of cases.

MR. O'HARA: Right. We're looking

for --

MR. FISHER: You're looking for little anomalies.

MR. O'HARA: The ground-penetrating radar would give us profile where we can see shapes of drums. But as you can imagine, there are refrigerators, there are car bumpers, everything in here. And we would get a lot of interferences.

MR. FISHER: So, you don't have any idea what's in this thing is, I guess, what I'm saying. One data point, you said, and you've sampled the soils within the landfill. Based on that one data point, you said that this is what the contaminants we have to deal with are, right?

MR. O'HARA: Well, not just this one data point. We also have things off the landfill site.

MR. FISHER: But you're only measuring what's presently coming out of the landfill.

MR. O'HARA: Yes. With these other

monitoring wells.

MR. FISHER: And the contaminants to the groundwater that are external to the landfill at this point, you're not measuring anything that may be slowly moving out of the landfill?

MR. O'HARA: Yes. We have the periphery covered. There is also some information from -- as I said, we would be looking at the site history. There is also some information on what materials were put in the landfill.

MR. FISHER: But not much, from what I gather.

MR. O'HARA: It's not very definitive. It doesn't tell us exactly how many drums or exactly where they were put or exactly what was in them.

MR. FISHER: You don't think it would be feasible to trench some of these drums and remove them?

MR. O'HARA: Basically, since these drums were put in trenches and also co-disposed, put in randomly, basically

they would be all over the place.

MR. FISHER: I guess what concerns me is what you said is you have a steady stay situation here. We have a little bit of volatile organics leaching out of this thing and they're showing up in these wells. What you're going to do is alter the conditions around this landfill and you're going to start pumping these wells down gradient and you're going to increase the flow out of the landfill. And I don't think you really considered what that may do to other contaminants that are present in that landfill and how that may mobilize those.

MR. O'HARA: Well, basically, what we're going on is what we've seen here.

MR. FISHER: Which isn't much when it comes right down to it.

MR. O'HARA: Well --

MR. FISHER: I mean, you're looking at what's going on now. And you're saying that if everything stays the

same, and we start pumping this landfill, and maybe we can clean it up. But you have no -- I mean, you haven't made any contingency for if something changes. You really don't know what's in there. I mean you really don't have a clue as to what's in there.

MR. O'HARA: That's not entirely true.

MR. FISHER: I mean there could be drums of heavy metals in there. There are plenty of sources of it around here with all the photographic and computer processes that go on. I mean there are tremendous amounts of heavy metal pollutants.

MR. O'HARA: Basically, when these programs of investigation have gone on for seven years, we're not just looking at a sample. So, we do have a good idea from when the industrial waste was put in in 1974. We basically have 16 years of -- an opportunity over 16 years for things to come out. And we have looked

at different snapshots over seven years.

MR. FISHER: Have you looked at -- now, there is a vertical hydraulic radiant in this landfill, right?

MR. O'HARA: Yes.

MR. FISHER: We're not just looking at a horizontal component. There is also a vertical component.

MR. O'HARA: Right.

MR. FISHER: Have you analyzed the water at the bottom of that vertical hydraulic gradient to see what's coming straight down, because it's not -- I mean it's not a given that all pollutants move in the same direction. They can differentially separate out.

MR. O'HARA: Right.

MR. FISHER: Heavy metals and things like that can go right to the bottom and you still have a -- there will be different effects than volatile organics can be swept along in a more horizontal direction. Have you examined that possibility?

MR. O'HARA: We've had -- we've looked at -- we've had five monitoring wells, bedrock monitoring wells analyzed for metals and VOCs.

MS. LACEY: I'd like to suggest that those of you with the kind of technical background and knowledge to really want to get into some of the information that is contained in the files that are in the town hall, the test results and the locations of the monitoring wells and the kinds of data that we received are all available for those who want to -- who have a better understanding than I do of parts per million and those kind of things. But all of that is available for those of you who have these very technical kinds of concerns and the background to really get into some of the data.

There was another question far in the back there.

MR. BRIDGE: John Bridge from Binghamton. I just wanted to reiterate

the point that he made about one sample from the landfill itself, and you're basing mathematical model, initial concentrations on that one sample. You actually admitted in the beginning that they could be -- the concentrations could vary quite a lot through that landfill. How valid is the mathematical model based on one initial concentration? That's one question.

The other question I have is if you have some knowledge of the total amount of the contaminant that was put in that landfill, and you have some knowledge of the rate of discharge of the contaminants, can you calculate how long it will take for those contaminants at that particular discharge rate to move out of the landfill? Do the discharge rates vary seasonally? Did you monitor the wells at different times of the year?

MR. DAVIDSON: I can respond. As far as there being one monitoring point

in the landfill, there is one monitoring well near the center of the landfill that has had -- that we've used for worst-case scenarios as far as it's been one of the worst wells. We installed another boring in another location in the landfill because we wanted to get more definition and we got no refuse whatsoever because the refuse was deposited in trenches. We know -- we have a series of aerial photographs that show the waste being deposited at various times during the operation of the landfill. We looked at records from -- of disposal, the records that we do have. But it's a fairly big area and the waste is deposited in trenches.

We also have a lot of information around the periphery of the landfill. Drilling through refuse is a difficult thing to do at times and not always the wisest thing to do. It can be dangerous sometimes.

In this case, where we did try,

because of the trench method of disposal, we actually put that boring and missed refuse. So, it's difficult to define over the entire 35-acre area that was used for disposal. But we did the best job we could.

And as far as the two dimentional groundwater model that was used, it takes into account a number of things, convective transport, hydrodynamic dispersion, mixing, chemical retardation, a lot of things. It's not perfect. It was an attempt to -- as any modeling is not perfect. It was an attempt to give us parameters to use. Groundwater flow rates were attempted to be calculated based on the data we had from various monitoring wells.

And I believe in the ~~ARAR~~ RI report, rates were estimated that groundwater could be moving from 50 to 250 feet in a year. Something like the rate varied from .1 to .7 feet per day. It's quite

a range. It's variable. But we felt that at the conclusion of the remedial investigation, we had installed enough wells and had enough data that we could go ahead with the remediation.

The other key element in this remediation is the cap. It will be a multi-media landfill cap that we estimate will reduce infiltration from 500 gallons per acre per day to 10 gallons per acre per day. I mean theoretically, it shouldn't leak at all. Evidentally, there is some leakage through the cap. That's the main control over groundwater movement or continued leachate generation will be the landfill cap.

The ten down gradient wells are essentially a hydraulic barrier. And then there will be three additional wells within the landfill mass which will also act as hydraulic barriers. So, I think it's a good remediation compared to what I've seen done at other

sites. It's very conservative. We're doing everything that we can.

If we can get 130 gallons per minute out of those total 13 wells, I think we'll be doing great. But that combined with the cap over a 35-acre area, I think we're doing everything we can to control the hydraulics.

MR. BRIDGE: But can you tell how long, with the present rates that you have mentioned, how long it will take all of the contaminants that you think are in the landfill to flow out? How many years would it take?

MR. O'HARA: How many years would it take for all the contaminants in the landfill --

MR. BRIDGE: All the contaminants that you think are in the landfill to flow out, how many years will that take?

MR. DAVIDSON: I don't know if anyone can give that number definitively. My impression is it would take a long, long time. They would

continued to leach and continue to leach and, you know, you would see more dilution and dispersion in the lower levels. But they would be there for a long, long time.

And if you just go out to the landfill, I mean the landfill is not covered by any kind of impermeable cover or impermeable till. It's covered by just cover and it's very permeable. And an awful lot of -- there is an awful lot of infiltration that will be cut off by the cap.

MR. COZZY: I think the point we're attempting to show here is that we may not know the exact amount of the source. What we're proposing is a way to isolate the source from continuing to leach. You keep asking how long is it going to take to leach out. What we want to do is to stop the leaching and create an inward gradient so it doesn't migrate. That's the whole point of the remediation. It's not to study it for

another five years so we can find every single barrel while the rest of the plume migrates away from us. We want to clean it up now and not five years from now.

MR. BRIDGE: If it hasn't been released yet, how can you clean it up?

MR. COZZY: Because what we're going to capture is what is mobile. What we know is mobile is by our perimeter wells. If it's not mobile, leave it there.

MR. FISHER: What happens if you mobilize something that is presently immobile and you disturb it? You're going to alter the physical parameters there that controls what flows in and out of this landfill. You don't have any idea what that's going to do to the landfill, do you, to the chemical potability in the landfill? You're putting a cap on the landfill so you're changing the amount of water that's flowing into it. And then you're going

to start sucking on these pumps down gradient so you're going to be increasing the hydraulic gradient. You're accelerating the discharge from the landfill at the same time you're going to be cutting off the in flow.

MR. DAVIDSON: I think in the feasibility study, the radius of influence of the pumping wells is predicted. And you know it will gradually spread over the landfill. But it will help to capture anything that's there or comes through. But in terms of drawing water down, it's not going to draw water down below --

MR. FISHER: I didn't say that. I just said you're increasing the rate at which you're drawing water out.

MR. COZZY: But that's only until --

MR. FISHER: You're not drawing any --

MR. COZZY: That's only until the mound is dewatered. Once it's dewatered

and we have a cap over the top, we're not going to have those transport paths. The groundwater -- the refuse will be above the groundwater.

MR. FISHER: So, you're saying that all of the infiltration of this landfill occurs through the -- directly above it?

MR. DAVIDSON: Right.

MR. FISHER: That there is no infiltration that occurs through the sides?

MR. DAVIDSON: The water table is beneath the refuse, that's correct.

MS. LACEY: The gentleman in the back.

MR. DONNELY: Brian Donnely from Binghamton. My concern is kind of a follow-up on some of this other, but if, say, your four years works out, the contamination is down to a level which is acceptable, and let's assume that it gets shut down or whatever as far as having to remove the water, I presume that the monitoring will continue at

least for a number of years. And say ten years from now, you come to another problem. Who is going to pick up the cost or is this something that will continue to be split up by GAF and the state and however it's set up now or will that be something that also the county is going to be totally responsible for?

MR. COZZY: At this point, it would be between the county and GAF. If ten years from now or twenty years from now, there is a similar state bond act, the state may reconsider its position.

MR. O'MARA, just as a follow-up to that point, when does the relationship where the state is contributing 75 percent of the county's cost, when does that dissolve?

MR. COZZY: Shortly after the completion of construction. We allow about a six-month start-up period.

MR. BRIDGE: So, the capital cost would be included, but not the O&M

costs?

MR. COZZY: Right. Basically that's it.

MS. LACEY: Are there other questions? Okay. Any of you who come up with other questions or if you take a look at technical data and something else occurs to you, avail yourself of the opportunity to make written comments. The white copies in the back of the room on the table have the address, where to send in and mail your comments. The last date for comments is February 6. Following that, a responsiveness summary will be produced answering any questions that have been raised tonight or any that are raised in written comments.

Anything else anyone wants to raise, questions? Okay. Thank you very much.

(Whereupon the meeting was adjourned at 8:50 PM)

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STATE OF NEW YORK

COUNTY OF BROOME

I, RANDALL A. CZERENDA, a Certified Shortand Reporter, do hereby certify that the foregoing is a true and correct transcription of my stenographic notes made in the above-entitled matter.

RANDALL A. CZERENDA, CSR

Jobesville Landfill Meeting — Jan 30, 1991

SIGN IN SHEET

Name	Address
Mary Clark	Attention 213 Chenango St Bing.
Jamie Malley	19 Third St, Deposit, N.Y. 13754
Nancy Jones	Box 90 Harpursville 13787
Brian Donnelly	Dorman Rd Bing
Claudia Stallman	Broome County EHC / SUNY-B
Patrick O. Leathie	97½ Oak St Bing. 13901 / SUNY
Suzanne Cohen	16 Mildred Ave J.C. / SUNY-B
Laura Wolsiegel	6 Seymour St Bing 13903 / SUNY-B
Denise Goberille	74 Park Street Bing / SUNY-B
Andrea Zaskin	130 Murray St., Bing. / SUNY-B
Laurence Leveen	19 Schiller St. Bing. 13905
Tifani Safford	Broome Hall - SUNY
Kristopher E. Morand	Johnson Hall - SUNY Binghamton
Jeanette Dolmer	Hinman Hall " "
Kevin Conklin	132 Dickman Hall Suny-B
Cynthia Connell	Dickman Hall Suny-B
Edie Lau	Press & Sun-Bulletin
Margaret Wicks	Harpursville
Richard Rhodes	"
Paul M Gunning	89 Chapin St. 1st Fl. Bing., NY.
Paul Dexter	Broome Hall SUNY-B
DAVID PFIFFER	2 LUCY ST.
Claudine F. Jones	NYSDOH - Albany, NY
Sue Collamer	NYSDOH - Albany, NY
Tom O'Meara	E.M.C. Broome County
Gary Robinson	N.Y.S.D.E.C.
Albeck	DCHD

007710

Curtsure Landfill Meeting
SIGN IN SHEET

NAME	ADDRESS
Jon Link	10 Lookout St, Binghamton
Darryl Kittle	3741 vestal parkway east, vestal
Renato Stabile	4 Florence St., Binghamton
Frank Rush	" "
John Varas	SUNY Binghamton PO 7318
Mike McElhane	DSWM
Paul Carubia	PO Box 239 Sidney NY 13838
Co ✓ Bob Denz	Broome Co. Health Dept
Robert E Fisher	132 Beethoven St Binghamton NY
Chuck Casto	WMGC-TV/WAAL/WBNK Radio
Jim Trenberg	48 Tompkins St Binghamton
Jennifer Haupt	10 Johnson Ave Bing. 13905
✓ Mildred Jones	RD 2 Box 50 Harpursville NY 13787

007711

APPENDIX F

Broome County
ENVIRONMENTAL MANAGEMENT COUNCIL
Broome County Office Building / Government Plaza / Box 1766 / Binghamton, New York 13902 / (607) 778-2116

Claudia Stallman, Director — Timothy M. Grippen, County Executive

February 5, 1991

FEB 8 1991

Brian Davidson, Project Manager
Bureau of Eastern Remedial Action
NYSDEC
50 Wolf Road
Albany, NY 12233-7010

SUBJECT: PROPOSED REMEDIAL PLAN FOR THE COLESVILLE LANDFILL

Dear Mr. Davidson:

In response to the proposed remedial action plan for the "Colesville Landfill Site," the Broome County Environmental Management Council (EMC) has the following comments and recommendations regarding the plan:

HYDROGEOLOGICAL ISSUES

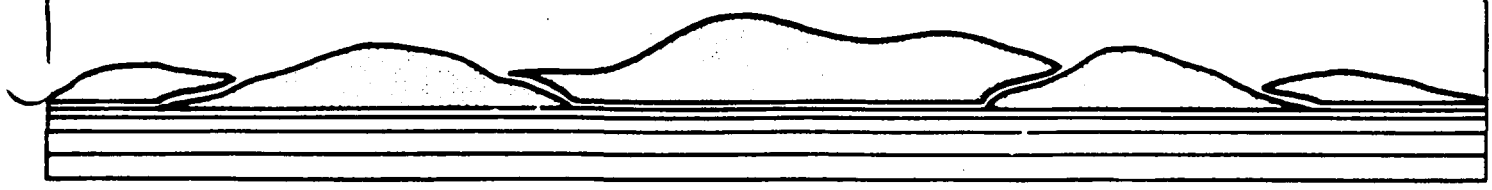
1) The vertical profiles presented in the remedial investigation indicated that the refuse area was encapsulated by the glacial till. However, at the public meeting Wehran Engineering contradicted the vertical profiles by stating that portions of the area where refuse was deposited were in direct contact with the glacial outwash layer. The limited number of borings in this area makes either generalization difficult to verify.

   - EMC recommends that the log data from the boring located within the landfill boundary be verified. We are concerned that the modeling done for the site is extremely sensitive to that one data point. We wonder whether there is reason to believe that this single observation is representative of the situation in the rest of the disposal area. (Additional borings are not requested as any borings in the landfill have the potential to be conduits for contaminant migration into the glacial outwash aquifer.)

2) The remedial investigation fails to discuss the source of the stream seeps. In order for stream remediation activities to be effective, the source of the stream seeps must be substantiated.

   - EMC recommends a review of the remedial investigation data to determine if the seeps are originating from run-off from the glacial till layer or from discharge from the glacial outwash zone. Once the source is verified, the stream loading calculations should be revised accordingly.

3) The proposed plan does not evaluate the remedial alternative of capping the site and providing a new drinking water supply (excluding the pump and treat option).



- EMC recommends the inclusion of a remedial alternative that involves a landfill cap and a new drinking water supply. This alternative would address the immediate concern of local residents by providing a new drinking water supply and allow time to monitor the groundwater to determine the impacts and effectiveness of the landfill cap. It appears to be premature to design a pump and treat system without first knowing the impacts of the cap on groundwater flow and solute migration.

4) The remedial alternatives proposed that involve capping do not address provisions to manage the increased run-off of precipitation from the site.

- EMC recommends inclusion of run-off provisions in all capping alternatives.

MANAGERIAL ISSUES

1) The proposed plan does not include inflation factors for future charges in any of the remedial alternatives. Ignoring the effects of inflation can bias the present worth analysis to favor alternatives with large operating and maintenance cost requirements in future years.

- EMC recommends revising the economic analysis to account for inflation.

2) Issues relating to the responsible entities for operation, permitting, and monitoring of remedial actions are not addressed.

- EMC recommends inclusion of a clear definition of the future responsibilities of PRPs and state and federal agencies in the remedial plan that is selected.

PREFERRED ALTERNATIVE

1) The EMC agrees with the alternative that is selected and described in the Superfund Proposed Plan; however, the EMC requests that the issues described above be addressed prior to finalizing the plan. The preferred alternative (4c2) consists of a landfill cap, groundwater pumping from the wells at and down-gradient of the landfill, treatment of the extracted water by air stripping, discharge of the treated water to North Stream or to the Susquehanna River, and provision of a new water supply to the affected residents. The pump and treat aspects of the remedial plan were calculated to take four years to bring the ground water near the site up to groundwater standards.

- EMC's position is that remediation of the groundwater may take many more years to accomplish, if indeed it is possible. We are not aware of any Superfund site at which groundwater remediation has restored an aquifer to drinking water standards. The more likely scenario is that the pump and treat system will be in operation for many years at a

significant cost to the taxpayers of Broome County. Since a new drinking water supply will be installed for the area residents and the capping will significantly alter the current groundwater system, it appears prudent to conduct the remediation program in a series of phases. In this way, a pump and treatment system can be designed, if needed, to meet the new hydrological conditions.

The EMC recognizes the effort that the DEC and EPA have put into this project and support the agencies' goal of remediating the site. However, the EMC feels that the additional analysis of the data is required to fully address the environmental concerns brought up in the remedial investigation. Furthermore, an additional remedial alternative is proposed here. It may be more prudent to perform the remedial activities in a step-wise fashion. This will ensure that any remedial actions taken are effective and help protect the financial resources of the County's tax payers.

Thank you for the opportunity to comment on this most important subject. Please direct any questions regarding the EMC comments and recommendations to Claudia Stallman, Director of the Broome County EMC. She can be reached at the Broome County Office Building at (607) 778-2116.

Sincerely,

Thomas M O'Meara

Thomas M. O'Meara
Chairperson, Broome County
Environmental Management Council

TOM/nt

cc: T. Grippen, BC Executive
L. Augostini, BC Legislature Environmental Committee
M. McElhare, BC Solid Waste Division
R. Rhodes, Town of Colesville
EMC members

FEB - 5 1991

R D 2 Box 93
Harpursville, N Y
30 January 1991

NYS Department of Environmental Conservation
50 Wolf Road, Room 222
Albany, NY

To whom it may concern:

I am writing with reference to the proposed clean-up of the Colesville landfill that is contaminated by industrial waste that was buried therein between the years 1973 and 1975, and subsequently closed in December of 1984.

It is my sincere hope that nothing will arise at the public hearing this evening in the Broome County Office Building to stop or affect a proposed Superfund - GAF - county endeavor to clean-up, as hard as well as possible, a disaster that has made so many individuals in the Town of Colesville, and especially in Nanticoke, unhappy.

I regret that circumstances prevent my attending this evening's meeting and contributing orally the thoughts that I, as a resident of the Town of Colesville, a member of the Colesville Planning Board, the Colesville Conservation Advisory

Council and a former member of the Colonie Town Board, have in regard to this most important undertaking.

It is unfortunate that so much time has elapsed between contamination and apparent expedition of the clean-up process.

I have examined the NYSDEC's summary of remedial alternatives for the clean-up process and future monitoring of the old landfill and finds that "Alternative 4 c 2 - Landfill Cap with pumping at Landfill and Downgradient with New Water Supply" to be a most acceptable and efficient procedure to follow.

The provision of new water supply wells upgradient of the landfill, quite possibly to the north and most certainly up the hillside to the east, as well as provision of a distribution system to residences within any affected area, is admirable. It is good that the site would be reviewed every five years that remedial action might be taken to remove or treat wastes.

Rock substrata is difficult to determine as are trapped aquifers and dikes. With good fortune, Alt. 4 c 2, will work. Thank you. Sincerely

Franklyn V. Cesine Jr.

Broome County
DIVISION OF SOLID WASTE MANAGEMENT
Broome County Office Building / Government Plaza / Box 1766 / Binghamton, New York 13902 / (607) 778-2482

John P. Kowalchyk, Director

Timothy M. Grippen, County Executive

February 5, 1991

3 / 19

Brian Davidson
Project Manager
Bureau of Eastern Remedial Action
NYSDEC
50 Wolf Road
Albany, New York 12233-7010

RE: COLESVILLE LANDFILL REMEDIATION

Dear Mr. Davidson:

The Broome County Division of Solid Waste Management would like to make the following comments on the FS/RI report:

We agree with the suggested alternative with the following amendments:

a. Instead of installing a new water system, purchase the remaining properties in the area that have contamination. We feel this would be most protective of human health and more cost effective since there is no way to accurately determine how long contamination will continue to leak out of the landfill.

b. We would like to incorporate recirculation of treated groundwater into the design of the landfill cap. We think this would accelerate stabilization of the landfill and help break down any remaining barrels quicker. It is our opinion that the modeling used does not account for more contamination entering the groundwater from as yet unbroken barrels. A "dry tomb" capping scenario would extend future barrels breaking indefinitely, but they would eventually break. Broome County does not want to have to treat this site for the next hundred (100) years. Accelerating the break down will help ensure this does not occur.

Broome County is appreciative of the help and support the NYSDEC and EPA have given, and hope to resolve this situation as soon as possible.

Sincerely,

John P. Kowalchyk

John P. Kowalchyk
Director

JPK/MNM/cas

cc: David Donoghue, Commissioner, Public Works
Bob Behnke, Chief Assistant County Attorney, Law
Anthony Savino, Wehran Engineering
Anthony tenBraak, GAF