

**5<sup>th</sup> FIVE-YEAR REVIEW REPORT  
EASTERN DIVERSIFIED METALS SUPERFUND SITE  
RUSH TOWNSHIP  
SCHULYKILL COUNTY, PENNSYLVANIA**

**EPA ID#: PAD980830533**



**U.S. Environmental Protection Agency Region 3  
1650 Arch Street  
Philadelphia, Pennsylvania**

**February 2018**

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**FEB 7 2018**

**Date**

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## LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
CBOD	Carbonaceous Biochemical Oxygen Demand
CCC	Criteria Continuous Concentration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
EDM	Eastern Diversified Metals
EPA	Environmental Protection Agency
ERM	Environmental Resources Management
FBA	Former Burn Area
FYR	Five-Year Review
HI	Hazard Index
IC	Institutional Control
MCL	Maximum Contaminant Level
µg/L	micrograms per liter
µg/m <sup>3</sup>	micrograms per cubic meter
MSC	Medium Specific Concentrations
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PCB	Polychlorinated Biphenyl
PCN	Polychlorinated Naphthalene
ppm	Parts per Million
PRP	Potentially Responsible Party
PVC	Polyvinyl Chloride
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RPM	Remedial Project Manager
STP	Site Treatment Plant
TCE	Trichloroethylene
TSCA	Toxic Substances Control Act

## **I. INTRODUCTION**

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for Eastern Diversified Metals Superfund Site (Site). The triggering action for this statutory review is the signature date of the previous FYR (February 11, 2013). The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

The Site consists of the following four operable units (OUs) which will be addressed in this FYR:

- OU1: hotspot areas, sediments and soils contaminated with metals above target levels, and misc. debris;
- OU2: groundwater (i.e., shallow and deep groundwater and stormwater management);
- OU3: remainder of the Site, in particular the remainder of the fluff pile; and
- OU4: on-Site containment of the fluff pile.

The protectiveness of the OU3 remedy is not assessed in this FYR because it was never implemented and it was replaced by the OU4 remedy.

The Site FYR was led by EPA Remedial Project Manager Frank Klanchar. EPA participants included hydrogeologist Herminio Concepcion, toxicologist Linda Watson, Biological Technical Assistance Group biologist Bruce Pluta, community involvement coordinator Gina Soscia, and Pennsylvania Department of Environmental Protection (PADEP) Environmental Protection Specialist Meg Boyer. The review began on January 31, 2017.

### **Site Background**

The Site is located in Hometown, Rush Township, Schuylkill County, Pennsylvania. The Site is approximately one mile northwest of the intersection of State Routes 54 and 309 at the end of Liberty Street, approximately 1,500 feet west of Lincoln Drive (State Route 1021). The Site covers approximately 26 acres of partially forested land at the western end of a light industrial park (see Figure 1). A shallow unnamed tributary to the Little Schuylkill River flows westerly along the southern border of the Site.

The Site is a former industrial property containing a massive pile of “wire chopping fluff” - chipped plastics composed of aluminum and copper wire insulation. The fluff is the residual material from the chopping of copper and aluminum communication, power wire, and cable in the recovery and recycling of the metal content of the wire. The fluff is primarily composed of polyvinyl chloride and polyethylene insulation chips, fiber insulation liner, and residual wire fragments. Industrial operations at the Site generated an estimated 350 million pounds of fluff located in an approximately 7.5-acre pile on Site.

The Site is comprised of two parcels: the Sall property (parcel 25-08-0005.003) on the west and the Gordon property (parcel 25-08-0005-.005) on the east (see Figure 2). The Sall property contains the fluff pile. The Gordon property contains the former processing building. See Figure 3 for a detailed site map.

The Site was listed on EPA’s National Priorities List (NPL) on October 4, 1989.

## FIVE-YEAR REVIEW SUMMARY FORM

<b>SITE IDENTIFICATION</b>		
<b>Site Name:</b> Eastern Diversified Metals Superfund Site		
<b>EPA ID:</b> PAD980830533		
<b>Region:</b> 3	<b>State:</b> PA	<b>City/County:</b> Rush Township/Schuylkill
<b>SITE STATUS</b>		
<b>NPL Status:</b> Final		
<b>Multiple OUs?</b> Yes	<b>Has the site achieved construction completion?</b> Yes	
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> EPA <i>[If "Other Federal Agency", enter Agency name]:</i>		
<b>Author name (Federal or State Project Manager):</b> Frank Klanchar		
<b>Author affiliation:</b> EPA Region 3		
<b>Review period:</b> 1/31/2017 - 12/29/2017		
<b>Date of site inspection:</b> 9/25/2017		
<b>Type of review:</b> Statutory		
<b>Review number:</b> 5		
<b>Triggering action date:</b> 2/11/2013		
<b>Due date (five years after triggering action date):</b> 2/11/2018		

## **II. RESPONSE ACTION SUMMARY**

### **Basis for Taking Action**

Table 1 lists the hazardous substances detected at the Site during the Remedial Investigation (RI) in the various media:

TABLE 1 - HAZARDOUS SUBSTANCES DETECTED AT THE SITE	
Medium	Substance
Groundwater	<ul style="list-style-type: none"><li>1,1,1-trichloroethane (1,1,1-TCA)</li><li>trichloroethylene (TCE)</li><li>lead</li></ul>

**TABLE 1 - HAZARDOUS SUBSTANCES DETECTED AT THE SITE**

Medium	Substance
Leachate	<ul style="list-style-type: none"><li>• TCE</li><li>• Polychlorinated Biphenyls (PCBs)</li><li>• bis(2-ethylhexyl)phthalate</li><li>• di-<i>n</i>-octylphthalate</li><li>• copper</li><li>• zinc</li><li>• manganese</li><li>• phenols</li></ul>
Surface Water	<ul style="list-style-type: none"><li>• copper</li><li>• lead</li><li>• zinc</li><li>• manganese</li></ul>
Soils	<ul style="list-style-type: none"><li>• bis(2-ethylhexyl)phthalate</li><li>• PCBs</li><li>• dioxins</li><li>• copper</li><li>• lead</li><li>• zinc</li><li>• cadmium</li></ul>
Sediment	<ul style="list-style-type: none"><li>• bis(2-ethylhexyl)phthalate</li><li>• di-<i>n</i>-octylphthalate</li><li>• PCBs</li><li>• copper</li><li>• lead</li><li>• zinc</li><li>• aluminum</li></ul>
Fluff material	<ul style="list-style-type: none"><li>• PCBs</li><li>• dioxins</li><li>• polychlorinated naphthalenes (PCNs)</li><li>• lead</li></ul>

### **Response Actions**

The remedy for the Site is contained in four Records of Decision (ROD) issued in March 1991 (OU1), July 1992 (OU3), September 1993 (OU2), and November 2001 ROD (OU4) which superseded the OU3 ROD. The OU4 ROD also provided for other minor changes to the other previous RODs. The selected remedy address the following operable units:

- OU1: hotspot area (fluff and soil areas contaminated with high levels of dioxins and PCBs), sediments and soils contaminated with metals above target levels, and miscellaneous debris;
- OU2: groundwater (i.e., shallow and deep groundwater and stormwater management);
- OU3: remainder of the Site, in particular the remainder of the fluff pile; and
- OU4: on-Site containment of the fluff pile.

The Remedial Action Objectives (RAOs) provided in the 1991 ROD and the 2001 ROD included:

- To address the principal threats at the Site by preventing further exposure and reducing the toxicity, mobility, and volume of fluff containing high level of dioxins and PCBs, and
- To reduce human and animal contact by decreasing fluff and contaminant transport to groundwater and surface water.
- To prevent contact with the fluff pile and contaminated soils, including dermal exposure, ingestion and windborne inhalation of fluff-related contaminants;
- To prevent leaching of contaminants into the shallow groundwater and elimination of surface water runoff carrying fluff particles into the stream to the south of the site fence; and
- To create a clean, level area of the Site for beneficial reuse, if possible.

The Site's final remedy is contained in the 1991 ROD, 1993 ROD, and the 2001 ROD, and consists of the following components:

- Incineration of the principal threat (fluff and soil areas contaminated with high levels of dioxin and moderate levels of PCBs);
- Removal of contaminated streambed sediments, metals-contaminated soils and miscellaneous debris;
- Stabilization of incinerator residuals, soils and sediments, if necessary.
- Enhanced shallow groundwater collection and treatment by upgrading the existing on-Site treatment plant to achieve NPDES permit limits;
- Grading the fluff pile to a ratio of less than four horizontal to one vertical (4:1) slopes and covering the fluff pile with a Resource Conservation and Recovery Act (RCRA) equivalent multi-lined cap system;
- Excavating all site soils contaminated above the cleanup levels listed in the 2001 ROD and placing the soils under a RCRA-equivalent multi-lined cap;
- Managing stormwater run-on and runoff and elevated overburden groundwater around the cap containment system;
- Studying gas generation in the fluff pile and, if necessary, installing a gas collection and treatment system.
- Monitoring groundwater and, if necessary, landfill gas;
- Putting in place institutional controls to prevent certain access and to prevent damage to the cap and associated structures;
- Conducting site inspections and maintaining the cap; and
- Elimination of the requirement to remove PCB hotspots detailed in the 1991 ROD due to the conclusion that the PCB hotspots did not really exist and were the result of a lab analysis problem.

***March 1991 ROD – Hotspot Areas (OU1) and Shallow Groundwater (part of OU2)***

EPA issued the first ROD for the Site on March 29, 1991. The remedy for OU1 that included incineration of the principal threat (fluff and soil areas contaminated with high levels of dioxin and moderate levels of PCBs); removal of contaminated streambed sediments, metals-contaminated soils and miscellaneous debris; and stabilization of incinerator residuals, soils and sediments, if necessary.

The 1991 ROD also selected an interim remedy for OU2 that included enhanced shallow groundwater collection and treatment and further study of the deep groundwater system. The shallow groundwater is overburden groundwater/leachate. The 1991 ROD called for upgrading the existing on-Site treatment plant “as necessary in order to achieve Pennsylvania NPDES permit limits for organics and Pennsylvania ARARs for metals in surface waters”.

Table 2 presents the NPDES limits and surface water ARARs for the Site.

TABLE 2 – NPDES DISCHARGE LIMITS AND SURFACE WATER STANDARDS			
NPDES DISCHARGE LIMITS		SURFACE WATER ARARs	
Parameter	NPDES Permit Monthly Average (µg/L)	Parameter	1991 ROD ARAR (µg/L)
Zinc	600	Copper	4.0
CBOD <sub>5</sub> <sup>a</sup>	25,000	Iron	300
Total Suspended Solids	30,000	Lead	0.6
pH	6-9	Manganese	50
a. CBOD <sub>5</sub> = Five-day carbonaceous biochemical oxygen demand		Zinc	36

**July 1992 ROD – Recycling of Fluff Pile (OU3)** - EPA issued a second ROD for the Site on July 2, 1992 that was superseded by the 2001 ROD.

**September 1993 ROD – Deep Groundwater (part of OU2)**

On September 29, 1993, EPA selected a “No Action” ROD for the deep groundwater at the Site. Groundwater sampling did not find Site-related contamination in the bedrock groundwater; contaminants were at relatively low levels in the shallow overburden leachate. Sampling results found trichloroethylene (TCE) in the deep groundwater, however, EPA determined the TCE contamination was not attributable to the Site.

**November 2001 ROD – On-Site Containment (OU4)**

EPA issued a fourth ROD on November 26, 2001, selecting a containment remedy for the fluff pile. The 2001 ROD also revised several other aspects of the previous RODs. The 2001 ROD was the final ROD for the Site.

The 2001 ROD eliminated the requirement to remove “PCB hotspots” detailed in the ROD for OU1. EPA determined that the PCB hotspots were the result of a lab analysis problem where polychlorinated naphthalenes were misidentified as PCBs. Further sampling results indicated that virtually all the fluff and soils are below a conservative level of 100 mg/kg (ppm). The containment remedy adequately addresses the fluff contaminated with this level of PCBs by placing this PCB contaminated fluff under the cap.

The ROD did not specify cleanup goals for groundwater, but monitoring is required to ensure that Site contaminants in groundwater are not increasing and are not migrating at levels posing a risk to human health and the environment.

In addition, the OU4 ROD noted that completion of the sediment removal from the unnamed tributary under OU1 would be deferred until after the final construction of the cap and associated components in order to avoid contaminating a clean area during the OU4 remedial action.

Table 3 presents the soil cleanup levels for on-Site soils outside the footprint of the cap area as selected in the 2001 ROD.



**TABLE 3 - OU4 SOIL CLEANUP LEVELS**

Soil Contaminant	2001 ROD Cleanup Levels
Copper	270 mg/kg
Lead	400 mg/kg
Manganese	1,000 mg/kg
Zinc	400 mg/kg
Bis(2-ethylhexyl)phthalate	100 mg/kg
PCBs	10 mg/kg
Dioxins	0.5 µg/kg

### **Status of Implementation**

#### ***March 1991 ROD – Hotspot Areas (OU1) and Shallow Ground Water (part of OU2)***

EPA issued three Administrative Orders directing Nassau Metals Corporation (Nassau Metals) and Sall to implement the 1991 ROD: September 30, 1991 Administrative Order; March 2, 1994 Administrative Order; and August 4, 1994 Administrative Order. In 1993, Nassau Metals removed approximately 6,500 cubic yards of debris (consisting of unchopped wire, wood, scrap metal, soil and fluff) from the Site and transported it off site for disposal.

The on-site wastewater treatment plant was upgraded. In 1997 and 1998, the PRPs added biological treatment and a 20,000-gallon equalization storage tank to the treatment plant and operated the plant to mitigate the threat of uncontrolled overflow of the equalization basin on the Site. The pump and control valve in the ground water sump were replaced. Leachate and shallow ground water continues to be collected and treated at the treatment plant pursuant to the March 1991 ROD.

In 1996, the PRPs installed a new stormwater collection and treatment system at the Site to prevent erosion and runoff water from carrying fluff from the Site. The ground water collection trenches were upgraded and a subsurface leachate collection trench along the southern and western toe of the main fluff pile was constructed in the fall of 1998. The fluff pile leachate is now collected by the expanded subsurface system constructed in 1995. In the fall of 1998, the PRPs repaired the leachate collection trench and constructed additional leachate seep collectors near the stormwater runoff basin and downstream of the treatment plant on the unnamed tributary of the Little Schuylkill River.

#### ***Dioxin-Contaminated Fluff***

The source of dioxin-contaminated fluff was a hotspot on the south-central side of the fluff pile. The presence of the dioxin hotspot was attributed to fires that occurred in 1977 and 1979 at a location on the Site called the “Former Burn Area” (FBA). A miscellaneous debris pile was found to contain burnt and melted fluff similar to that observed in the FBA. Burnt and melted fluff and debris from both miscellaneous debris piles and similar loose material on the apron of the FBA were handled separately from other miscellaneous debris piles and placed in 30-cubic-yard rolloff containers and staged on site in 1993. These 20 containers were shipped off site in March and April 1994 for incineration at the Aptus incinerator in Coffeyville, Kansas.

A dioxin cleanup level of 20 µg/kg was established in the 1991 ROD for the removal of dioxin-contaminated fluff from the FBA. Initial delineation sampling of the FBA was conducted in March and June 1996. The FBA hotspot removal started in October 1996. The areal extent of the contamination and depth into the pile increased substantially over the initial estimates. The excavation of the increased amount of dioxin-contaminated fluff, coupled with limited timeframes for acceptance of the material by the off-site disposal facility, periodic interruptions due to temporary facility shutdowns, and long laboratory turnaround times, resulted in removal of the dioxin-contaminated fluff taking much longer than anticipated. FBA hotspot delineation and removal finished in November 2001. Remediation of the dioxin hotspot in the FBA resulted in the excavation and incineration of

3,856,860 pounds (1,928 tons) of dioxin-contaminated fluff at off-site facilities. The Aptus facility in Coffeyville, Kansas, received all but one load of the FBA material. The Safety-Kleen facility in Aragonite, Utah, received one load.

***July 1992 ROD – Recycling of Fluff Pile (OU3)***

On June 25, 1993, EPA issued an Administrative Order directing Nassau Metals and Sall to implement the OU3 ROD. Nassau Metals evaluated recycling of the fluff and determined that it was not a viable alternative, because the plastic fractions within the fluff contained PCB contamination at levels that would prohibit reuse absent an authorization by EPA under TSCA. On June 17, 1997, EPA signed an Administrative Order on Consent with Nassau Metals to conduct a focused feasibility study to evaluate alternatives to address the fluff pile instead of recycling. This order also suspended all deadlines required by the June 1993 order to implement the 1992 OU3 ROD (fluff recycling).

***November 2001 ROD – On-Site Containment (OU4)***

Based on the results of the focused feasibility study, EPA issued a ROD for OU4 on November 26, 2001. This ROD changed the remedy for the fluff pile from recycling (as selected in the July 1992 OU3 ROD) to on-site containment.

The United States and Nassau Metals signed a consent decree for Nassau Metals to perform the work selected in the November 2001 ROD. On January 29, 2004, EPA approved a remedial design workplan for OU4. Nassau Metals was unable to secure access to the Site. In May 2004, the United States obtained a warrant for short-term access to perform response activities. Long-term access was provided by the U.S. District Court by Order dated November 8, 2004.

EPA approved the removal of impacted soils and fugitive fluff from the Gordon property, a property that abuts the eastern boundary of the Sall property, to assist the property owner in selling the property. EPA approved the soil remedial action workplan for the Gordon property in November 2005. Nassau Metals completed the removal of impacted soil and fugitive fluff from the Gordon property in December 2005. The cleanup removed an estimated 1,855 cubic yards of soil from the Gordon property and consolidated the material on the fluff pile on the Sall property. The Gordon Property Remedial Action Completion Report was approved by EPA on April 13, 2006.

The remedial action for OU4 and the remaining part of OU1 was constructed from September 2006 to July 2008. The central feature of the remedial action is the RCRA-equivalent cap installed to cover the fluff pile. The cap's design prevents future direct human contact with the fluff pile and contaminated soil, and minimizes the infiltration of precipitation and subsequent leaching of Site contaminants. The fluff pile was regraded to provide stable slopes for the placement of cap components.

The following elements of the OU4 remedy have also been put in place:

- Relocation and expansion of the leachate and overburden ground water collection trenches.
- Installation of a new discharge line for the treatment plant.
- Removal of sediments from the unnamed tributary and restoration of the tributary.
- Removal of impacted soils from the floodplain areas within Pennsylvania State Game Land #227 and restoration of those areas.
- Construction of stormwater management features.
- Relocation of utilities.
- Construction of access roads.
- Installation of new security fencing around the Sall property to prevent unauthorized access to the cap and supporting features, including the leachate collection and handling facilities and the treatment plant.
- Construction of gabion baskets to protect a public water main crossing the unnamed tributary.
- Institutional controls to prevent certain access and damage to remedial components.

The Site achieved construction completion status when the Preliminary Close Out Report was signed on September 16, 2008.

#### *Institutional Controls*

The 2001 ROD included land use restrictions to the cap and ancillary systems. Institutional controls for the Site have been recorded with Schuylkill County to prevent access and damage to the cap and associated structures. In 2011, the Commonwealth of Pennsylvania issued an order under Section 512(a) of the Hazardous Sites Cleanup Act (PA512 Order). The PA512 Order was recorded in the Schuylkill County Recorder of Deeds Office on May 5, 2011. The current status of ICs for the Eastern Diversified Metals Site is contained in Table 4.

<b>TABLE 4 - SUMMARY OF PLANNED AND/OR IMPLEMENTED ICs</b>					
<b>Media or areas to be addressed by Institutional Controls</b>	<b>ICs Needed</b>	<b>ICs Called for in the Decision Documents</b>	<b>Impacted Parcel(s)</b>	<b>IC Objective</b>	<b>Title of IC Instrument Implemented and Date (or planned)</b>
Sitewide/Landfill Cap	Yes	Yes (2001 ROD)	Sall property (25-08-0005.003)	Prevent certain access and damage to remedial components	Commonwealth of Pennsylvania Order under Section 512(a) of the Hazardous Sites Cleanup Act. Recorded in the Schuylkill County Recorder of Deeds Office on May 5, 2011.

#### **Operation & Maintenance, Groundwater Monitoring, and Surface Water Monitoring**

Nassau Metals is responsible for the long-term operations and maintenance (O&M) of the treatment plant and landfill cap, as well as groundwater monitoring at the Site. O&M activities are conducted in accordance with the approved Revised Post-Construction O&M Plan, which is contained in the “Final Report for Remedial Construction and Notice of Completion – OU1 and OU4”, prepared by Environmental Resources Management (ERM) on January 9, 2009. O&M activities are contracted to several firms and include quarterly inspections of the landfill cap and related remedial components with repair/maintenance activities conducted as warranted based on site conditions.

ERM provides engineering oversight and support, and conducts the O&M activities for the cap and groundwater monitoring at the Site. Nassau Metals has also retained Weston Solutions, Inc. (WSI) to assist in the management of O&M activities associated with the treatment plant. A WSI subcontractor, RJS Environmental Services (RJS), operates and maintains the plant, and an operator is on-site approximately two days per week to ensure proper operation of the treatment system.

RJS also collects the plant discharge samples in accordance with the approved standard operating procedure for the plant (revised August 2017). The analytical data from these samples are tabulated and provided to ERM. ERM prepares the monthly progress reports for the Site and monthly Discharge Monitoring Reports, which are provided to EPA and PADEP.

### ***Site Treatment Plant (STP)***

The treatment plant originally consisted of four distinct treatment processes connected in series to treat the leachate and upper ground water trench influent streams. These processes included influent mixing/equalization, extended aeration biological treatment, metal scavenging ion exchange, and pH adjustment.

Following the completion of OU4 remedial activities, Nassau Metals conducted an evaluation of the treatment plant's performance. In September 2010, the biological treatment was determined to be unnecessary and the nutrient feed system was turned off and aeration in the basin was substantially reduced. This effectively modified the biological treatment unit into an aeration/settlement basin.

Bench scale and pilot testing was completed in 2015 and 2016, and it was determined that adequate treatment for zinc could be achieved through pH adjustment alone. On March 17, 2017, EPA and PADEP approved the bypass of the ion exchange system. The infrastructure for the ion exchange system remains in place. As a result, the current treatment processes have been simplified and include only influent mixing/equalization and pH adjustment.

The primary objectives of the treatment system is the removal of carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), and zinc, along with pH adjustment, to meet effluent discharge limits in Table 2.

Following treatment in the STP, treated water is then discharged via an approximately 700-foot long buried PVC pipe into an unnamed tributary of the Little Schuylkill River, approximately 60 feet upstream of the confluence of these water bodies. Under the current STP configuration, the water from the lower ground water collection trench is allowed to discharge to the ground surface in the vicinity of the reaction chamber, where it flows overland or via diffuse ground water flow to the unnamed tributary.

The leachate collection and upper ground water collection trenches flow entirely by gravity to the plant. The lower ground water collection trench is hydraulically downgradient from the STP and also flows by gravity, but is equipped with a sump from which the collected water can be pumped to the plant if necessary.

The influent mixing/equalization process manages the fluctuating inflow rates to more gradually increase (or decrease) flow through the treatment process. Storage is provided to address flow management during maintenance activities and periods of high influent flow. Stored influent, as it occurs, is mixed with fresh influent to assure a more consistent influent quality. A schematic of the process flow through the treatment plant is presented in Figure 4.

An emergency generator is connected to the plant for use in the event of power outages. An auto-dialer notifies the operator when non-routine or problematic conditions exist.

### ***Groundwater Monitoring***

The groundwater monitoring program is specified in the Sampling and Analysis Plan attached to the January 2009 O&M Plan for the Site. Eight wells (MW-14/S, MW-14/O, MW-16/I, MW-16/S, MW-3/O, MW-3/S, MW-8/O and MW-8/S) are sampled twice per year (May and October) using low flow methodologies. Following completion of the 2014 site monitoring activities, Nassau Metals requested, and EPA/PADEP approved via letter dated September 1, 2015, a modification in the sampling frequency due to the overall observed stable site conditions. This included a reduction in groundwater and vent gas sampling frequency to every five years, with analysis of groundwater samples for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and dissolved metals during the spring (May) event and for dissolved metals during the fall (October) event. The results of groundwater sampling and vent gas monitoring are to be provided in the year prior to completion of each Five-Year Review cycle.

### ***Surface Water Monitoring***

Surface water monitoring is outlined in the September 2006 *Remedial Action Sampling and Analysis Plan* (SAP) included as part of the approved Final Design for the OU4 remedy. The SAP specified that sampling for benthic macroinvertebrates (BMI) and surface water quality within the unnamed tributary should be conducted in May of the third year following completion of remediation (i.e., May 2011) and in subsequent years as required. Sampling activities were completed during this FYR cycle in 2013 and 2017 which included both surface water quality sampling from five locations and collection of benthic macroinvertebrate (BMI) samples from the unnamed tributary. Surface water monitoring within the unnamed tributary will continue into the next FYR cycle and sampling for BMI may be conducted, if necessary.

## **III. PROGRESS SINCE THE LAST REVIEW**

This section includes the protectiveness determinations and statements from the **last** FYR. There were no recommendations or follow-up actions from the **last** FYR.

<b>Protectiveness Determination/Statements from the 2013 FYR</b>	
<b>Protectiveness Determination</b>	<b>Protectiveness Statement</b>
Protective	<p>The remedy for OU1 is protective of human health and the environment. Hotspot areas of dioxin-contaminated fluff were excavated and incinerated off site, and contaminated sediments were removed from the unnamed tributary.</p> <p>The remedy for the shallow groundwater segment of OU2 is protective of human health and the environment. The treatment plant effluent consistently meets the NPDES permit limits and groundwater at the Site is not being used. EPA selected a “No Action” remedy for the deep groundwater at the Site.</p> <p>The OU3 remedy (recycling of the fluff pile) was not implemented because the OU4 remedy replaced it.</p> <p>The remedy for OU4 (on-site containment of fluff pile) is protective of human health and the environment because the fluff pile is contained and there are no completed exposure pathways.</p> <p>Institutional controls are in place to ensure long-term protectiveness.</p> <p>Because the remedial actions at all OUs are protective, the Site is protective of human health and the environment.</p>

## **IV. FIVE-YEAR REVIEW PROCESS**

### **Community Notification, Involvement & Site Interviews**

A public notice was placed in the *Lehigh Times News* on November 17, 2017 stating that there was a FYR and inviting the public to submit any comments to the U.S. EPA. The results of the review and the report will be made available online at <https://semspub.epa.gov> and at the following information repositories:

EPA Administrative Records Room,  
Attention: Administrative Coordinator  
1650 Arch Street  
Philadelphia, PA  
(215) 814-3157

Hours: Monday through Friday, 8:00 am to 4:30 pm;  
by appointment only.

Rush Township Municipal Building  
104 Mahanoy Avenue  
Tamaqua, PA 18252-4000  
570-668-2938

During the FYR process, EPA spoke with the local township to document any perceived problems or successes with the remedy that has been implemented to date. The Township Supervisors did not have any questions or concerns related to the Site. The Township Secretary stated that the Township sometimes receives inquiries related to the sale of the Site property, but that the Township is not pursuing any sale at this time. During the last FYR, one resident was interviewed, however that resident has since passed away. No additional residents were interviewed for this FYR as there are none in close proximity to the Site and community interest for this Site remains relatively low.

### **Document Review**

This FYR included a review of relevant documents including the 1991, 1992, 1993, and 2001 RODs, the 2013 Five-Year Review Report, the Monthly Progress Reports, and the Annual Inspection/Maintenance/Monitoring Reports for the Site. A list of documents reviewed is included at the end of this Report.

### **Data Review**

Data from the previous Five-Year Review Report was reviewed along with annual inspection/maintenance/monitoring reports, monthly progress reports, monthly discharge monitoring reports, and surface water results provided by Nassau Metals since 2013. The data review discussion is divided into the following sections: Groundwater Monitoring, Surface Water Monitoring, Treatment Plant Monitoring, and Gas Vent Monitoring.

#### ***Groundwater Monitoring***

ERM, on behalf of Nassau Metals, sampled groundwater twice per year (May and October) in 2013, 2014, and 2016. Eight wells were sampled (two depths at each of four locations). In 2013, the samples were analyzed for dissolved metals. In 2014 and 2016, the samples were analyzed for volatile organic compounds, semivolatile organic compounds, PCBs and dissolved metals during the May event and dissolved metals during the October event. On September 1, 2015, EPA approved a reduction in the sampling frequency at the Site to every five years. The parameters analyzed during the May and October sampling events remain unchanged.

In annual reporting for the Site, ERM compares the results against EPA's MCLs and Pennsylvania's medium specific concentrations (MSCs) for non-residential, used aquifers with total dissolved solids of 2,500 µg/L or less. The results indicated an exceedance of the MSC for aluminum (200 µg/L) in 2016 at MW-3/O at a concentration of 254 µg/L, but nearly all samples during the sampling events were below applicable standards.

Groundwater sampling also detected iron, manganese and TCE above MCLs and MSCs during this FYR period and are presented in Appendix A. However, EPA concluded that these contaminants are not related to the Site. The Supplemental Hydrogeological Investigation Report (June 11, 1993) concluded that manganese and iron are likely due to natural background conditions within the aquifer and are unrelated to the fluff pile. EPA determined that TCE contamination is from an unknown upgradient source not associated with the Site.

Groundwater elevation data was also compiled during the groundwater sampling events in 2013, 2014, and 2016. Based on the elevation data, groundwater flow appears unchanged since the last FYR and has maintained the pre-remediation westerly and southwesterly flow direction on the Site.

### ***Surface Water Monitoring***

In the 2013 and 2017 Unnamed Tributary Investigation Reports, the surface water results are compared to ecological surface water quality criteria, including both Ambient Water Quality Criteria (AWQC) and PADEP Chapters 16 and 93 surface water standards (PASWS). For copper and zinc these standards are the same, so these will hereafter be referred to as surface water standards (SWS). Figure 5 graphically presents the surface water data for copper and zinc for the 2017 data, as well as the 2005, 2011, and 2013 data sets for comparative purposes.

Both total and dissolved phase zinc from each of the five sample locations were below the SWS for zinc of 73.59 µg/L. Total phase copper exceeded the SWS of 5.56 µg/L in the three furthest upstream samples (SW-3, SW-13 and SW-14) with concentrations ranging from 9.0 µg/L to 13.0 µg/L. Dissolved copper also exceeded the SWS at these three locations with concentrations ranging from 6.4 µg/L to 10.8 µg/L. Copper results (both total and dissolved phase) were below the SWS at the downstream sample locations, SW-15 and SW-6. As shown on Figure 5, although copper concentrations had a slight increase at SW-3 from 2013 to 2017, the overall concentrations continue to trend down, with an 86% decrease in total copper concentration from 2005 to 2017. Further downstream, a similar trend was noted, although the initial copper levels were lower and the overall decrease has been less. The 2017 results were consistent with the other post-remediation data indicating copper levels remain significantly lower than the 2005 results.

While zinc levels remain highest closest to the initiation of surface water flow within the unnamed tributary (SW-3), all results remain below the SWS. Zinc levels detected at the head of the unnamed tributary trend lower as the samples progress downstream except at SW-14 where zinc levels are slightly higher than the upstream sample at SW-13. Zinc levels continue the decreasing downstream trend below SW-14 at sample locations SW-15 and SW-6. This trend demonstrates the continued improvement of the ground water quality feeding the head of the stream as a result of the fluff pile capping activities. The 2013 and 2017 zinc levels at SW-3 are almost half the total zinc results noted in 2011 and in 2005.

In general, the 2017 benthic macroinvertebrate (BMI) study data indicates continued BMI community recovery in both the upstream and downstream reach of the unnamed tributary following the implementation of OU4 remedial activities. However, decreases in sensitive macroinvertebrate species were noted in 2017 and are believed to be related to the elevated copper concentrations.

### ***Treatment Plant Monitoring***

On December 13, 2016, Nassau Metals began implementation of a treatment system modification and the new effluent sampling location is from Manhole 1 prior to plant discharge. Prior to that date, effluent sampling was collected at the sampling port at the end of the lag resin tank in the treatment plant. The discharge point for the effluent is in the unnamed tributary, just before the confluence with the Little Schuylkill River. Based on the monthly monitoring reports available for this FYR period, the plant effluent is in compliance with all permit discharge requirements. Appendix B provides monthly treatment plant discharge data from 2013 to 2017. There were no violations of the required NPDES limits for CBOD, total suspended solids, pH, or zinc. Treatment via pH adjustment alone is meeting NPDES limits. Shallow groundwater/leachate flow into the treatment plant during this period ranged from 2.7 to 33.4 gpm.

### ***Gas Vent Monitoring***

Gas monitoring was performed at the Site during the May semi-annual groundwater sampling events in 2013, 2014, and 2016 for the twelve (12) gas vents installed on the cap in accordance with the approved SAP. As of September 1, 2015, gas vent monitoring is performed every five years. The next gas monitoring event will be in May 2021.

The vapor from each vent is monitored with a series of portable meters to assess levels of the following: total volatile organic vapors (PID and FID), carbon monoxide, hydrogen sulfide, methane (as % of lower explosive limit), and oxygen.

In general, minimal gas readings were detected from all of the vents. No significant PID and FID readings consistently occur with the exception of gas vent #12 (GV-12) which shows elevated FID readings and detections for methane. The FID measurements taken in May 2016 from GV-12 was 480 ppm and 0.1% of methane LEL was detected. Carbon monoxide and hydrogen sulfide are consistently not detected in any of the vents, and oxygen levels are at typical atmospheric levels (approximately 21%).

### **Site Inspection**

The inspection of the Site was conducted on September 25, 2017. In attendance from the EPA were Frank Klanchar (RPM), Mark Conaron (RPM), Gina Soscia (CIC), PADEP Project Officer Meg Boyer, John Galasso (Nassau Metals), Pete Beyer (ERM), Andrew Cressman (Weston Solutions), and Bob Stockl (RJS Environmental Services). A tour of the Site was conducted to inspect the condition of the capped area, treatment plant, discharge location, surface water structures, monitoring wells, access roads, and fencing. No issues with the physical condition of the remedial action systems, surface water features, or perimeter security fencing were found during the Site inspection. There were no signs of erosion on the cap. The vegetation was well-established and woody growth had been removed earlier in the year. A new roof was installed on the treatment plant building and all metal features outside the building were recently repainted. All documentation and record keeping for the treatment plant was well organized and readily available. The treatment plant outfall is functioning adequately and screened by rocks prior to discharge into the unnamed tributary. A sign is posted at the outfall location and reads, " Non-potable water source - Do not drink". There was no evidence of vandalism or trespassing on the Site.

## **V. TECHNICAL ASSESSMENT**

**QUESTION A:** Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, and the results of the Site inspection indicate the remedy is functioning as intended by the March 1991, September 1993, and November 2001 RODs.

### ***Hotspot Areas (OU1)***

The remedy is functioning as intended by the decision documents. The hotspot areas of dioxin-contaminated fluff were excavated and incinerated off-site as intended by the 1991 ROD. The contaminated sediments were removed from the unnamed tributary and consolidated on the fluff pile that was capped during the OU4 remedial action.

### ***Shallow Groundwater and Leachate (part of OU2)***

The results of analyses from the discharge samples over the last five years demonstrate compliance with the discharge goals in the August 1994 Order (based on NPDES permit discharge limits), and treatment via pH adjustment alone since December 2016 is meeting these criteria. The only Site-related contamination detected during this review cycle was for aluminum in well MW-3/O in 2016. Otherwise, shallow groundwater is below state and federal standards. Groundwater will continue to be monitored at the Site every five years in the months of May and October. The Pennsylvania State Game Land immediately downgradient of the Site cannot be developed and ensures no exposure to potentially contaminated groundwater.

### ***Deep Groundwater (part of OU2)***

The 1993 ROD selected a "No Action" remedy for the deep groundwater at the Site.

### ***On-Site Containment of Fluff Pile (OU4)***

The remedy is functioning as intended by the decision documents. The fluff pile is being contained on-site as intended by the 2001 ROD. The cap is in place and in good condition. It is preventing direct contact with the fluff and contaminated soil. The fence and signage are in good condition; they are preventing unauthorized access to, and tampering with, the capped area and the treatment plant. Surface water quality results and physical habitat



data from 2013 and 2017 within the unnamed tributary generally demonstrates improvement of the water quality and habitat conditions following completion of the cap remedy. The 2013 data demonstrate that water quality criteria are being met under certain conditions. However, the three furthest upstream surface water samples in 2017 exceeded the surface water standard for copper and resulted in decreases in sensitive macroinvertebrate species. Surface water in the unnamed tributary will continue to be monitored and sampling for benthic macroinvertebrates may be conducted, if necessary. Institutional controls are in place to protect the integrity of the remedies and prevent unauthorized access.

#### *Optimization Opportunities*

Several initiatives were recently implemented by Nassau Metals to optimize the remedy at the Site and to reduce overall costs for operation and monitoring activities. These optimization initiatives were approved by EPA in the last FYR cycle and do not affect either the short-term or long-term protectiveness of the remedy. The initiatives include:

1. A reduction in the sampling frequency for groundwater from annual to every five years. The parameters analyzed during the May and October sampling events remain unchanged.
2. A reduction in the frequency for landfill gas measurements from annual to every five years.
3. Elimination of the ion-exchange unit process at the treatment plant and replacement with pH induced precipitation to reduce zinc concentrations. This modification optimized the overall treatment process by simplifying the zinc removal step, reduced energy consumption, eliminated maintenance and labor associated with an unnecessary unit process, while continuing to enable the plant to meet the requirements of the remedy and NPDES discharge limits.

**QUESTION B:** Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

The RAOs used at the time of remedy selection are still valid. Capping the fluff pile and contaminated soils has achieved the remedial objectives to prevent direct contact, to prevent leaching of contaminants into shallow groundwater, and to eliminate surface water runoff carrying fluff particles into the unnamed tributary. Institutional controls are in place to prevent certain access and damage to remedial components.

There are no new routes of exposure or receptors at the Site that could affect the protectiveness of the remedy. EPA performed a qualitative evaluation of the potential for fluff/soils containing dioxins from the Former Burn Area (FBA) to leach to groundwater during the 2013 Five-Year Review. EPA's determination that leaching of fluff/soils containing dioxins under the cap to groundwater is highly unlikely and it is unnecessary to sample for dioxins in groundwater at the Site remains valid. There are no unanticipated toxic byproducts of the remedy that were not previously addressed by the decision documents. The site conditions have not changed that would affect the protectiveness of the remedy.

The land use of the Sall property has not changed and remains not in use. It is noted that the eastern end of the Sall property is relatively flat and contains three areas that have been cleaned up to allow for commercial or industrial use (Areas A, B, and C; see Figure 2), subject to the restrictions recorded with the Schuylkill County Recorder of Deeds. The adjacent Gordon property is in industrial use. The area surrounding the Site remains primarily industrial and forested. The Site is bordered on the north by a railroad right-of-way, and beyond that are an undeveloped property and a residential property. The Site is bordered on the south and east by an industrial park for light industry. Pennsylvania State Game Land #227 borders the Site to the west. EPA does not expect the land use at or near the Site to change in the near future.

**QUESTION C:** Has any other information come to light that could call into question the protectiveness of the remedy?

There is no other information that calls into question the protectiveness of the remedy.

## VI. ISSUES/RECOMMENDATIONS

There were no issues identified at the Site during this Five-Year Review. As a result, there are no recommendations or follow-up actions.

## VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
<i>Operable Unit:01</i>	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy for OU1 is protective of human health and the environment. Hotspot areas of dioxin-contaminated fluff were excavated and incinerated off site, and contaminated sediments were removed from the unnamed tributary.	

Protectiveness Statement(s)	
<i>Operable Unit:02</i>	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy for the shallow ground water is protective of human health and the environment. The treatment plant effluent consistently meets the NPDES permit limits and groundwater at the Site is not being used. EPA selected a “No Action” remedy for the deep groundwater at the Site.	

Protectiveness Statement(s)	
<i>Operable Unit:04</i>	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy for OU4 (on-site containment of fluff pile) is protective of human health and the environment. The fluff pile is capped and there are no completed exposure pathways. The OU3 remedy (recycling of the fluff pile) was not implemented because it was replaced by the OU4 remedy. Institutional controls are in place to ensure long-term protectiveness.	

### Government Performance Results Act (GPRA) Measure Review

As part of this Five-Year Review, the GPRA Measures were reviewed. The GPRA Measures and their respective statuses are as follows:

#### ***Environmental Indicators***

Human Exposure (HE) Survey Status: Current human exposure is controlled and protective remedy in place.  
Groundwater Migration (GM) Status Survey: Contaminated groundwater migration under control.

#### ***Site-wide RAU***

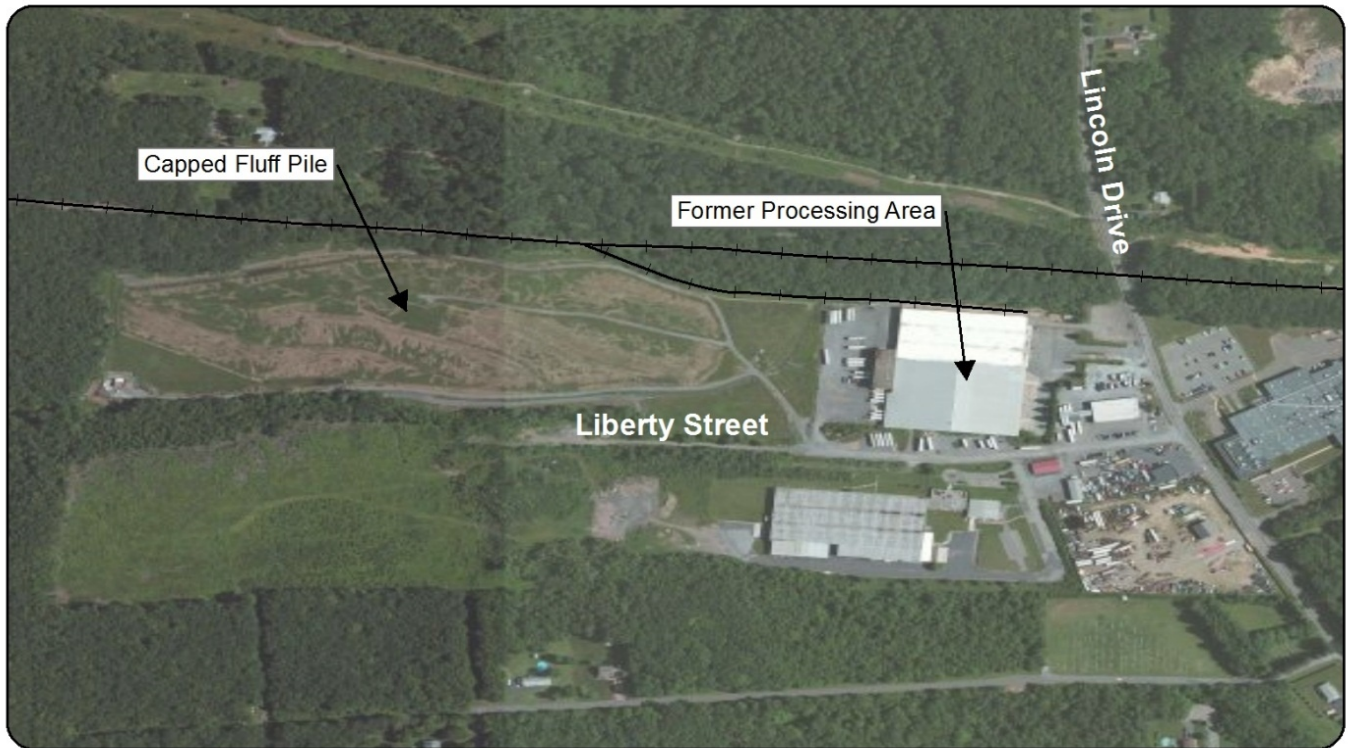
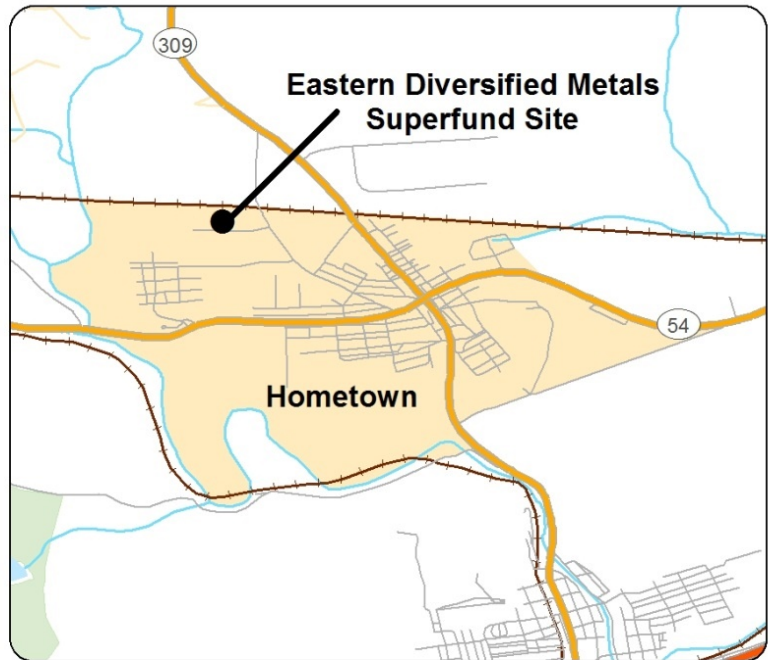
The Site was determined to be Site-Wide Ready for Anticipated Use (SWRAU) on January 24, 2012.

## **VIII. NEXT REVIEW**

The next FYR report for the Eastern Diversified Metals Superfund Site is required five years from the completion date of this review.

## **REFERENCE LIST**

- 2016 Annual Inspection Maintenance/Monitoring Report - Eastern Diversified Metals Site (ERM), March 2017.
- 2015 Annual Inspection Maintenance/Monitoring Report - Eastern Diversified Metals Site (ERM), March 2016.
- 2014 Annual Inspection Maintenance/Monitoring Report - Eastern Diversified Metals Site (ERM), April 2015.
- 2013 Annual Inspection Maintenance/Monitoring Report - Eastern Diversified Metals Site (ERM), February 2014.
- 2012 Annual Inspection Maintenance/Monitoring Report - Eastern Diversified Metals Site (ERM), March 2013.
- Comprehensive Five Year Review Guidance, U.S. EPA, OSWER No. 9355.7-03B-P, June 2001.
- Five Year Review, Eastern Diversified Metals Superfund Site (EPA), September 2013.
- Monthly Progress Reports (Nassau Metals), March 2013 – November 2017.
- Record of Decision for OU1 and Interim OU2 (EPA), March 29, 1991.
- Record of Decision for OU3 (EPA), July 2, 1992.
- Record of Decision for OU2 (EPA), September 29, 1993.
- Record of Decision for OU4 (EPA), November 26, 2001.
- Revised Post-Construction Operations and Maintenance Plan; Eastern Diversified Metals Site (ERM), January 2009.
- Standard Operating Procedures; Eastern Diversified Metals Site Treatment Plant (ERM), Revised August 2017.
- Unnamed Tributary Investigation Report - Eastern Diversified Metals Site (ERM), September 2013.
- Unnamed Tributary Investigation Report - Eastern Diversified Metals Site (ERM), September 2017.



EASTERN DIVERSIFIED METALS  
SUPERFUND SITE  
RUSH TOWNSHIP PENNSYLVANIA

## SITE LOCATION MAP

FIGURE:

1

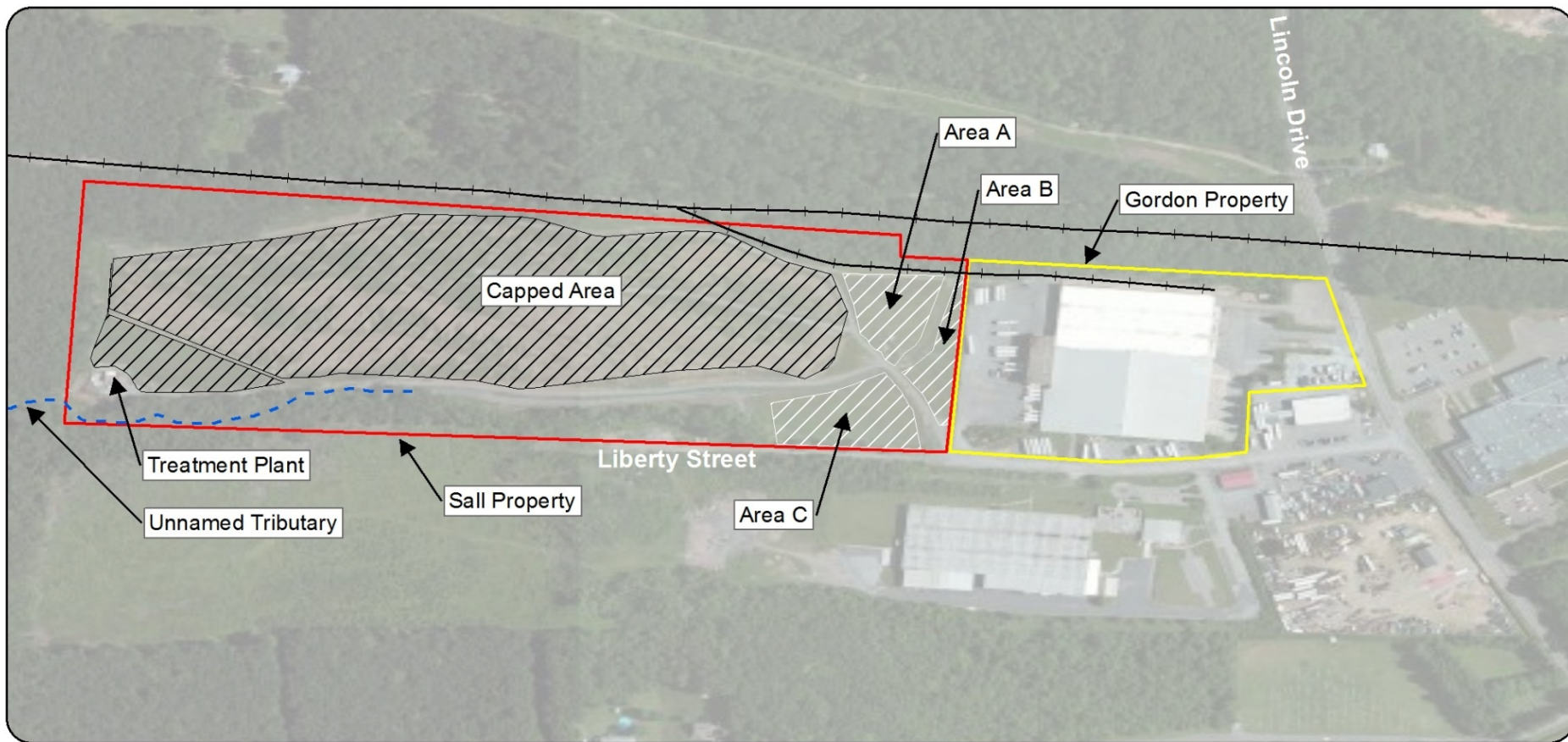
JOB NUMBER:

DRAWN BY:

CHECKED BY:

APPROVED BY:

DATE:



0 250 500 1,000  
Feet



**Legend**

- +— Railroad
- ▭ Sall Property
- ▭ Capped Area
- ▭ Gordon Property
- ▨ Areas A, B and C



EASTERN DIVERSIFIED METALS  
SUPERFUND SITE  
RUSH TOWNSHIP PENNSYLVANIA

**SITE AERIAL PHOTO**

FIGURE:

2

JOB NUMBER:

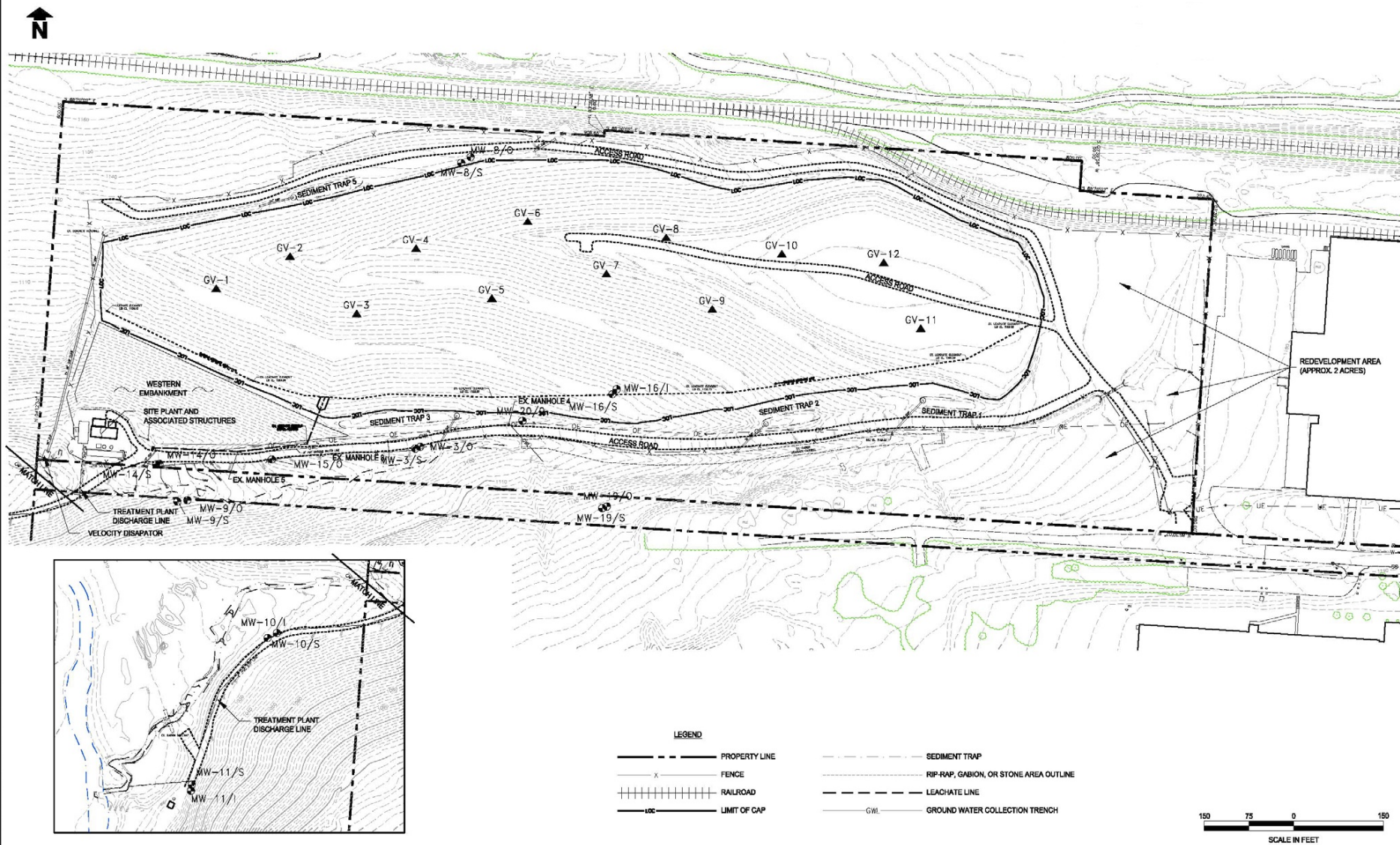
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APPROVED BY:

DATE:





EASTERN DIVERSIFIED METALS  
SUPERFUND SITE  
RUSH TOWNSHIP PENNSYLVANIA

## DETAILED SITE MAP

FIGURE:

3

JOB NUMBER:

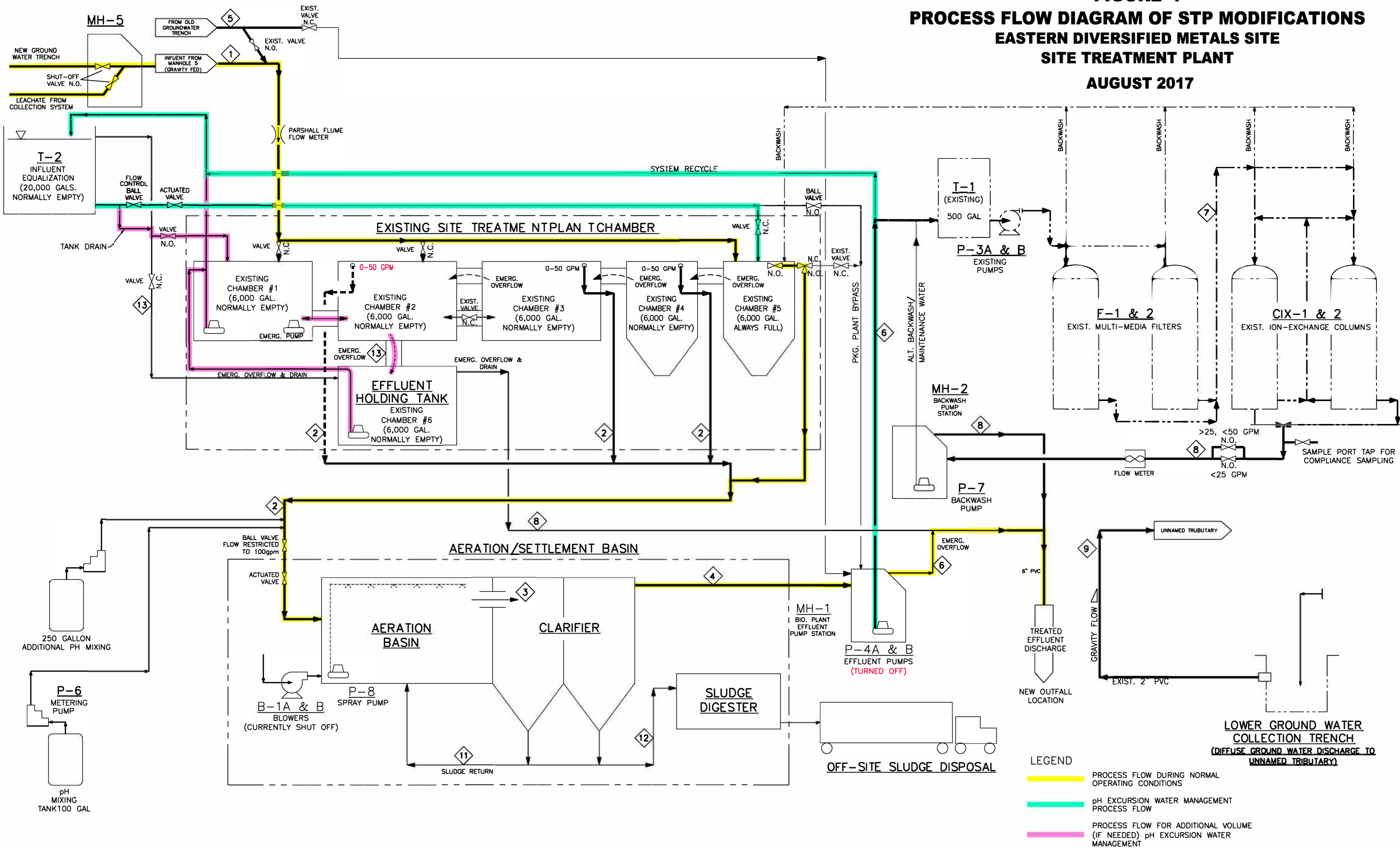
DRAWN BY:

CHECKED BY:

APPROVED BY:

DATE:

**FIGURE 4**  
**PROCESS FLOW DIAGRAM OF STP MODIFICATIONS**  
**EASTERN DIVERSIFIED METALS SITE**  
**SITE TREATMENT PLANT**  
**AUGUST 2017**

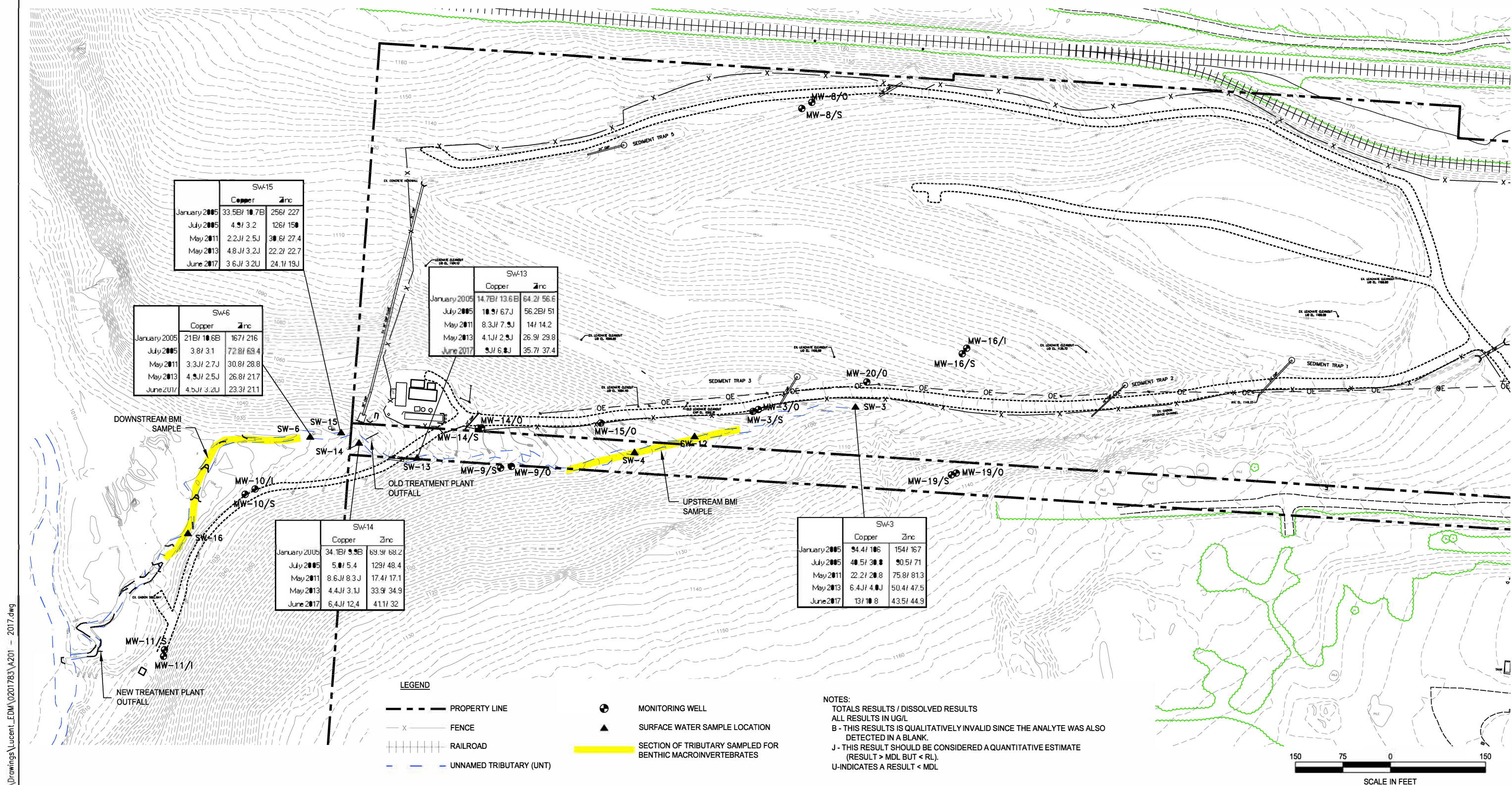


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**FIGURE 5**  
**SURFACE WATER RESULTS**  
**SEPTEMBER 2017**  
**EASTERN DIVERSIFIED METALS SITE**  
**HOMETOWN, PENNSYLVANIA**



## Appendix A – Groundwater Sampling Results for TCE, Iron, and Manganese in Site Wells

Well Number	PA Act 2 MSC	EPA MCL	May 2013	October 2013	May 2014	October 2014	May 2016
<b><i>MW-3/O</i></b>							
TCE	5	5	NS	NS	27.8	NS	26.7
Iron	300		<24	<13	<12	<12	281
Manganese	50	50 <sup>1</sup>	74.8J	73.5	61.3	64	73.4
<b><i>MW-3/S</i></b>							
TCE	5	5	NS	NS	11.3	NS	9.6
Iron	300		28.3J	37.7J	<12	13.1B	<12
Manganese	50	50 <sup>1</sup>	21.4	28.1	19.5	26.2	19.1
<b><i>MW-8/S</i></b>							
TCE	5	5	NS	NS	<0.50	NS	<0.26
Iron	300		3300	5930	430	5740	2140
Manganese	50	50 <sup>1</sup>	376J	429	252	421	279
<b><i>MW-14/O</i></b>							
TCE	5	5	NS	NS	<0.50	NS	1.3
Iron	300		<24	14.0J	52.1B	<12	<12
Manganese	50	50 <sup>1</sup>	<0.90J	<6.6	5.0B	0.80B	71.3
<b><i>MW-14/S</i></b>							
TCE	5	5	NS	NS	3.2	NS	2.4
Iron	300		<24	<13	<12	16.3B	<12
Manganese	50	50 <sup>1</sup>	970J	581	951	749	1120
<b><i>MW-16/I</i></b>							
TCE	5	5	NS	NS	1.3	NS	1.2
Iron	300		<24	24.4J	<12	67.2B	<12
Manganese	50	50 <sup>1</sup>	<9.0J	<8.5	6.1B	15.6	7.5B
<b><i>MW-16/S</i></b>							
TCE	5	5	NS	NS	36	NS	28.8
Iron	300		<24	<13	<12	17.4S	<12
Manganese	50	50 <sup>1</sup>	43J	26.2	36.3	26.7	34.7

**Notes:**

All units in µg/L

NS = Not sampled during this event.

MW-8/O could not be sampled all events as the well was found to be dry.

<sup>1</sup> – EPA Secondary Maximum Contaminant Level

J or B – Indicates substance at an estimated value. Result was > MDL but < reporting limit.



### Appendix B - Site Treatment Plant Discharge Data, 2013-2017

Date Sampled	CBOD <sub>5</sub> (mg/L) [25] <sup>1</sup>	TSS (mg/L) [30] <sup>1</sup>	pH [6 – 9] <sup>1</sup>	Zinc (mg/L) [0.6] <sup>1</sup>	Flow (gpm)	Aluminum (mg/L)	Iron (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Chloroform (µg/L)	Gallons Treated
<b>2013</b>												
Mar 06	ND <1.6	ND <1.5	6.27/6.25	0.112	23.5	ND <0.016	ND <0.024	ND <0.0013	ND <0.0017	0.0057 J	ND <0.2	950,048
Apr 13	ND <1.6	ND <1.5	6.52/6.34	0.164	23.1							1,093,569
May 08	ND <0.92	ND <1.5	6.51/6.31	0.148	22.1							895,669
Jun 10	ND <0.92	ND <1.5	6.53/6.38	0.134	16.7	ND <0.019	ND <0.013	ND <0.001	ND <0.0024	0.0542	ND <0.2	707,451
Jul 10	ND <0.92	ND <1.5	6.50/6.15	0.163	19.9							973,329
Aug 07	ND <0.92	ND <1.5	6.53/6.33	0.140	16.7							710,734
Sep 09	ND <1.6	ND <1.5	6.49/6.27	0.142	13.7	ND <0.011	0.0199 J	0.0015 J	ND <0.0057 J	0.0057 J	ND <0.2	491,099
Oct 09	ND <0.92	ND <1.2	6.44/6.51	0.134	7.8							393,174
Nov 06	ND <0.27	ND <1.2	6.66/6.96	0.121	6.7							243,207
Dec 05	ND <0.27	2.0 J	6.42/6.64	0.164	9.4	ND <0.011	ND <0.013	ND <0.001	ND <0.0024	ND <0.00018	ND <0.25	480,812
<b>2014</b>												
Jan 17	ND <0.45	2.0 J	6.26/6.51	0.209	17.5							N/A
Feb 12	2.1 J	ND <1.2	6.48/6.59	0.190	16.2							641,784
Mar 07	ND <0.45	7.0	6.37/6.49	0.211	17.9	ND <0.011	0.0138 J	0.0043 J	ND <0.0024	0.0093 J	ND <0.25	753,412
Apr 11	1.7 J	ND <1.2	6.69/6.61	0.291	29.8							1,358,832
May 16	2.5 J	5.0	6.57/6.57	0.118	33.4							1,409,234
Jun 05	2 J	ND <1.2	6.33/6.34	0.107	30.1	ND <0.016	0.0108 J	ND <0.00086	0.0017 J	0.224	ND <0.2	1,331,798
Jul 10	0.66 J	2.0 J	6.58/6.36	0.091	24.1							1,133,060
Aug 06	ND <0.27	ND <1.2	7.04/6.73	0.054	17.3							713,867
Sep 11	0.43 J	ND <1.2	7.77/7.99	0.0416	9.5	0.0255 J	0.0138 J	0.005 J	ND <0.0015	0.0028 J	ND <0.2	394,106
Oct 08	ND <0.45	5.0	6.99/7.9	0.0824	7.3							N/A
Nov 12	ND <0.27	4.0	7.42/7.49	0.1550	5.4							234,236
Dec 04	0.55 J	ND <1.2	6.71/6.62	0.1060	7.9	0.0225 J	0.0327 J	ND <0.00086	ND <0.0015	0.0123 J	ND <0.2	496,823
<b>2015</b>												
Jan 09	ND <0.45	3.0 J	6.29/6.46	0.2060	15.2							647,918
Feb 12	ND <0.99	ND <1.2	7.10/7.18	0.121	11.1							461,533
Mar 10	ND <0.99	2.0 J	6.34/7.09	0.187	16.9	0.0746 J	0.0511 J	0.0024 J	ND <0.0015	0.0114 J	0.29	708,064
Apr 09	ND <0.99	ND <1.2	6.56/6.21	0.107	24.4							1,162,785
May 07	ND <0.99	ND <1.2	6.37/6.40	0.169	19.2							876,905
Jun 10	ND <0.99	ND <1.2	6.58/6.68	0.169	23.6	ND <0.018	ND <0.032	ND <0.0015	ND <0.002	ND <0.0018 J	0.23 J	929,724
Jul 21	ND <0.99	ND <1.2	6.34/6.38	0.179	27.2							1,160,148
Aug 05	ND <0.99	ND <1.2	6.48/6.34	0.0127J	18.2							707,405
Sep 16	ND <0.99	ND <1.2	7.8/8.07	0.0058J	12.4	0.0378 J	ND <0.032	0.0015 J	ND <0.002	0.032	0.22 J	518,138
Oct 13	ND <0.99	3.2 J	6.48/6.61	0.0147J	9.9							481,349
Nov 09	ND <0.99	ND <1.2	6.30/6.54	0.011 J	12.9							577,424
Dec 09	ND <0.99	ND <1.2	7.5/8.28	0.0149J	15.6	ND <0.018	ND <0.032	0.0015 J	ND <0.002	ND <0.00054	ND <1.0	855,277

### Appendix B - Site Treatment Plant Discharge Data, 2013-2017

Date Sampled	CBOD <sub>5</sub> (mg/L) [25] <sup>1</sup>	TSS (mg/L) [30] <sup>1</sup>	pH [6 – 9] <sup>1</sup>	Zinc (mg/L) [0.6] <sup>1</sup>	Flow (gpm)	Aluminum (mg/L)	Iron (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Chloroform (µg/L)	Gallons Treated
<b>2016</b>												
Jan 19	ND <0.99	ND <1.2	7.32/7.85	0.0449	24.0							991,502
Feb 12	ND <0.99	ND <1.2	7.92/8.68	0.0679	26.2							1,075,596
Mar 10	ND <0.99	ND <1.2	7.62/8.05	0.0869	28.0	0.0298 J	0.0262 J	ND <0.0026	ND <0.0025	0.0626	ND <0.19	1,334,197
Apr 12	ND <0.99	ND <1.2	8.27/8.92	0.1080	22.8							991,455
May 05	ND <0.99	ND <1.2	7.11/7.48	0.1950	22.3							902,449
Jun 08	ND <0.99	ND<0.41	7.94/8.30	0.104	18.0	ND <0.022	ND <0.018	ND <0.0026	ND <0.0025	0.0049 J	ND <0.23	866,904
Jul 12	ND <0.99	1.6 J	8.03/8.51	0.274	11.7							420,636
Aug 04	ND <0.99	ND<0.41	7.79/8.31	0.092	9.1							481,091
Sep 15	ND <0.89	0.8 J	8.16/8.67	0.0741	6.4	ND <0.022	0.0341 J	ND <0.0026	ND <0.0025	0.0079 J	ND <0.23	289,209
Oct 04	ND <0.99	0.6 J	8.02/8.51	0.0966	5.0							180,311
Nov 10	ND <0.99	ND<0.41	7.77/8.40	0.119	2.7							130,963
Dec 13	ND <0.99	1.1 J	7.68/8.42	0.232	7.7	0.171 J	0.166	0.0124	ND <0.0025	0.0778	ND <0.23	134,235
<b>2017</b>												
Jan 16	ND <0.99	ND<0.41	7.57/8.48	0.232	6.1							N/A
Feb 7	ND <0.99	0.8 J	7.91/8.58	0.370	6.2							N/A
Mar 1	ND <0.99	ND <3.2	8.35/8.85	0.600	11.4	0.153 J	0.140	0.0161	ND <0.0025	0.215	ND <1	N/A
Apr 13	ND <1.7	1.4 J	8.38/8.52	0.494	21.8							N/A
May 3	ND <2.5	3.5 J	7.43/7.97	0.483	21.0							N/A
Jun 8	ND <2.5	2.8 J	7.91/8.39	0.397	22.2	ND <0.032	0.895	ND <0.0065	ND <0.0026	0.278	ND <0.29	N/A
Jul 13	ND <1.7	3.1 J	7.87/8.58	0.345	22.8							N/A
Aug 10	ND <2.5	4.9	7.93/8.13	0.427	16.2							N/A
Sep 13	ND <1.7	2.5 J	7.56/8.31	0.427	14.3	0.034 J	1.10	ND <0.0065	ND <0.0026	0.239	ND <0.29	N/A
Oct 10	ND <2.5	3.1 J	7.81/8.51	0.290	11.4							N/A
Nov 17	ND <2.5	1.3 J	7.01/7.78	0.485	14.0							N/A

Notes:

1 – NPDES Permit Discharge Limit - Monthly Average