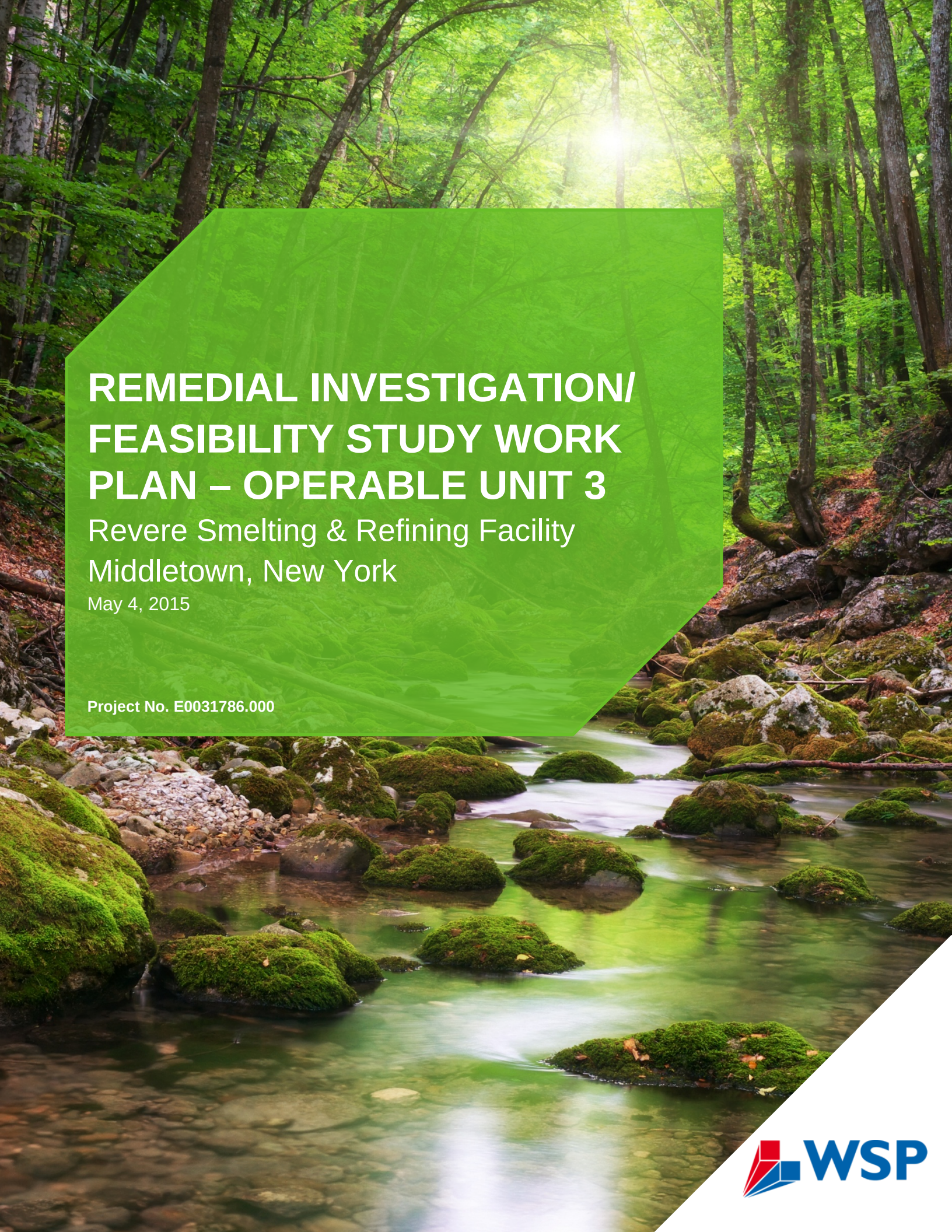

REMEDIAL INVESTIGATION/ FEASIBILITY STUDY WORK PLAN – OPERABLE UNIT 3

Revere Smelting & Refining Facility

Middletown, New York

May 4, 2015

Project No. E0031786.000

WSP

REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN – OPERABLE UNIT 3

Revere Smelting & Refining Facility
Middletown, New York

May 4, 2015

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Certification

I, James A. Sobieraj, certify that I am currently a New York State-registered professional engineer (License No. 77394) and that this *Remedial Investigation/Feasibility Study Work Plan– Operable Unit 3* was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the New York State Department of Environmental Conservation's *Technical Guidance for Site Investigation and Remediation (DER-10)*, dated May 2010.

PE No. 77394

05/04/2015
Date

1 Introduction

On behalf of Revere Smelting & Refining Corporation, WSP has prepared this Remedial Investigation/Feasibility Study (RI/FS) work plan for the Revere Smelting & Refining (Revere) site in Middletown, Orange County, New York (Figure 1). The Revere facility is a secondary lead smelter, and historical environmental investigations have identified impacts to environmental media as a result of operations at the site. The site has been listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site #3-36-053. Lead and arsenic are the primary constituents of concern (COCs). This work plan was prepared in accordance with requirements outlined in the February 1, 2011, Order on Consent (Index # 3-20100528-80; Site # 3-36-053) entered into by Revere and the New York State Department of Environmental Conservation (NYSDEC). The Order defines Operable Units (OUs) 1 to 4 as follows:

- OU1 – all environmental media, other than groundwater (OU2), on property currently owned by Eco-Bat to the east of Ballard Road in the Town of Wallkill, Orange County, New York (Tax Parcels 41-1-70.21, 41-1-70.22, 41-1-70.23, 41-1-71.22, 41-1-73.1, 41-1-73.22, 41-1-74.82, and 41-1-76), except for the Facility (OU4), and all environmental media, other than groundwater, not owned by Eco-Bat in the Town of Wallkill, Orange County, New York within Tax Parcels 60-1-120 and 41-1-72.2.
- OU2 – all onsite groundwater.
- OU3 – all offsite media impacted by Revere's activities, except environmental media other than groundwater on property not owned by Eco-Bat that is included in OU1.
- OU4 – the Facility.

The area covered under each OU is shown on Figure 2. All activities addressed in this work plan will be conducted in accordance with the NYSDEC's DER-10 *Technical Guidance for Site Investigation and Remediation*, dated May 2010 (NYSDEC 2010) (DER-10), and the October 1988 United States Environmental Protection Agency (USEPA) document, *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA 1988).

The Site Characterization Summary for Operable Unit 3 (SCS), prepared by the NYSDEC Division of Environmental Remediation (DER), determined that sufficient soil, sediment, and groundwater samples were collected within OU3 during the RI/FS investigation for OU1 and OU2, to warrant an additional RI/FS for OU3 (NYSDEC 2006). The NYSDEC's site characterization summary concluded that data gaps existed for OU3 with respect to lead in surface soils and sediments and alkalinity and sulfate in groundwater.

In July 2008, WSP proposed a scope of work to address those data gaps (WSP 2008a). Subsequent modifications and phases of investigation were proposed and completed as described in detail in Section 2.4. Section 2.4 also includes a description of modifications to the OU3 limits based on the 2011 Order.

The NYSDEC has requested additional information to complete the RI/FS for OU3 as defined in the 2011 Order. This RI/FS work plan proposes a scope of work to address additional data gaps and will incorporate the following Standards, Criteria, and Guidelines (SCGs) where applicable during the screening and evaluation:

- Soil Cleanup Objectives (SCOs) for soil constituents under 6 NYCRR Part 375-6.8(a) and the site-specific soil remedial objectives defined by the NYSDEC in the 2011 Order for OU1
- The lowest effect level (LEL) for all sediment constituents under *Technical Guidance for Screening Contaminated Sediments* (NYSDEC 1999)
- The standards set forth for surface water and groundwater in the *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* under 6 NYCRR Part 703

An OU3-specific Health and Safety Plan (HASP), Field Sampling Plan (FSP), and Quality Assurance Project Plan (QAPP) were provided as appendices within the 2008 RI/FS work plan (WSP 2008a), and a QAPP addendum was provided in May 2011 as part of the RCRA Facility Investigation and Corrective Measures Study (RFI/CMS) work

plan for OU4 (WSP 2011a). A Citizen Participation Plan (CPP) was also provided by WSP under separate cover (WSP 2008b), and the RI/FS work plan and CPP were approved by the NYSDEC in July 2008 (NYSDEC 2008).

Section 2 of the work plan presents background information on the site and a summary of previous work completed for the OU3 RI/FS. Section 3 provides the additional proposed scope of work for the RI, including sediment sampling in the combined stream and floodplain soil sampling. Section 4 includes a description of previous work completed for the Fish and Wildlife Impact Analysis (FWIA) for OU3 as it pertains to OU3 as currently defined. Section 5 presents a schedule to complete the RI and prepare a RI report and presents the plan to conduct the OU3 FS. Finally, Section 6 presents a summary of references cited in this work plan.

2 Site Background

The following sections describe the site location, surface water and hydrology as it pertains to OU3, and provide a brief history of previous RI work completed in OU3.

2.1 Site Location and Description

Revere operates a secondary lead smelting facility located at 65 Ballard Road, approximately 7 miles east of Middletown, in the Town of Wallkill, Orange County, New York (Figure 1). The Revere facility was constructed in 1970 and acquired by Revere in 1973. Revere manufactures lead and lead alloys. The major raw material is used lead acid batteries, such as the typical automotive battery. Other raw materials used in production include battery-manufacturing by-products, lead-bearing baghouse dust from battery manufacturers and smelters, scrap metal from metal salvage yards, and virgin metal from metal brokers. In addition, Revere reclaims polypropylene from battery cases, and in the process, produces sodium sulfate.

The facility consists of several buildings, including the main smelter building, a crystallizer building, a containment building, a wastewater treatment building, six large storm water tanks, and employee and truck parking areas (Figure 2). In addition, a rail spur from the adjacent Norfolk and Southern Railroad right-of-way services the facility. The operational portion of the site (OU4) encompasses approximately 14 acres. Eco-Bat New York LLC owns the operational property and contiguous undeveloped property to the north and east of the facility and undeveloped property south of the railroad right-of-way. The Eco-Bat properties consist of the eight tax parcels listed in the definition of OU1, which together comprise 154.9 acres. The undeveloped areas are in varying degrees of past disturbance that range from second growth forest, reverting farmlands, maintained lawns, and wetlands.

The facility is located in a combined rural and industrial area of south-central New York, approximately 6,000 feet northwest of the Wallkill River. North of the facility are open, overgrown fields, wetlands, and mature woodlands. North of the woodlands is a Lukoil service station. East of the facility is a combination of open, overgrown fields, wetlands, and mature woodlands. President Container, Inc., operates in a facility located approximately 0.25 mile southeast of the site. Interstate Highway 84 is located approximately 0.6 mile south of the site. A Ball Aluminum can manufacturing facility is located west of the site across Ballard Road, and additional industrial development is located further west and south.

Revere is in the process of designing, permitting, and constructing a Wet Electrostatic Precipitator (WESP) emissions control unit that will be located in OU1 in the former Eastern Fill Area (EFA) (Figure 2). The EFA was recently remediated by Revere, and an onsite containment cell was constructed in OU1 to dispose of lead and arsenic contaminated soils and sediments as part of the Phase I RD/RA for OU1.

2.2 Surface Water Hydrology

There are three active stream channels located on the Revere property which flow into offsite areas. One stream located on the western side of the facility (western stream) flows from north to south and crosses underneath the railroad tracks approximately 225 feet east of Ballard Road (Figure 2). The western stream continues to flow along a generally southern heading through OU1 south of the railroad tracks. Based upon visual observations of surface water flow, the western stream is assumed to be a net gaining stream. In the FWIA, the stream is classified as a marsh headwater stream characterized by well-defined patterns of alternating pool, riffle and run sections with moderate flow. The western stream is designated as a Class C, Standard C(T) water body (O'Brien & Gere 2007).

A pond located southeast of the facility operations in OU1 has a single discharge point (pond stream) which flows along a generally western heading from the pond for approximately 250 feet before changing to a more southern heading and crossing underneath the railroad tracks (approximately 700-feet east of Ballard Road). The pond stream intersects and supplements the flow from the western stream within OU1.

A third stream is located on Revere property approximately 500 feet east of the onsite pond (eastern stream). The eastern stream flows in a southerly direction and crosses underneath the railroad tracks and onto the President Container property approximately 1,900-feet east of Ballard Road and joins the western and pond streams south of their confluence in OU1 (Figure 2).

Combined, these streams continue on a generally southwestern heading in OU1 and cross underneath Ballard Road approximately 0.5 mile south of the entrance to the Revere facility into OU3. On the western side of Ballard Road, the combined stream travels along a southwestern heading within property owned by the Town of Wallkill/Industrial 1 Agency, where it intersects with the discharge streams from three ponds located on the same property. Based on aerial imagery, the combined streams pass underneath Interstate 84 approximately 0.3 mile southwest of the Ballard Road/I-84 overpass and continue towards the Wallkill River located approximately one mile south of the Revere facility.

2.3 Wetlands

The FWIA previously conducted by WSP for OU3 (as previously defined) included a review of New York State Freshwater Wetlands (NYSFW) maps and the United States Fish and Wildlife Services (USFWS) National Wetland Inventory (NWI) maps within 2 miles of the Revere facility (WSP 2010; See Section 4). The previous search radius included the entirety of the combined stream to the confluence with the Wallkill River. The NWI maps have no regulatory significance, but provide an indication of areas potentially meeting the federal criteria for wetlands regulated by the U.S. Army Corps of Engineers.

Along the corridor of the combined stream outside of OU1 to the confluence of the Wallkill River, no state regulated wetlands were identified. The NWI maps identify potential wetlands in the area of the retention ponds located west of the Galleria Mall.

2.4 Summary of OU3 RI/FS Work Completed

As described above, the RI/FS work plan for OU3 was previously submitted to the NYSDEC in July 2008. At the time, OU3 was defined as all offsite environmental media and included areas north (North Border) and east (East-Forested Wetland) of the main plant, the offsite area west of Ballard Road (West of Site), and the portion of the site south of the railroad tracks. The area south of the railroad tracks was divided into two study areas to be sampled using a phased approach: the Southern Parcel and the South Outside Parcel. OU1 was defined as all onsite areas not included in OU4 and did not include the North Border, East-Forested Wetland, the Southern Parcel, or the South Outside Parcel. OU1 was redefined in the 2011 Order to include these four areas, and only the area West of Site was incorporated into the new limits of OU3.

The following is a timeline of previous submittals and regulatory approvals for OU3 as defined before the 2011 Order:

- In July 2008, the NYSDEC approved the RI/FS work plan and the CPP. This work plan included a background soil evaluation; surface and subsurface soil sampling at six locations in the West of Site Area; a two-phased approach based on a grid-spacing of 50-feet in the Southern Parcel and South Outside Parcel (Phase I involved soil sampling at 100-foot node points, extending the sampling an additional 200-feet based on initial results; Phase II included soil sampling at 50-foot node points around locations with surface soils in excess of the lead screening level); soil sampling the East-Forested Wetland and North Border areas using the same gridded approach; sediment sampling in the western, eastern, pond, and combined streams using a 150-foot sampling interval; surface water sampling in the eastern, western, and combined streams; and groundwater sampling of newly installed wells in the South Outside Parcel. In addition, the work plan included Step 1 of the FWIA for OU3.
- A public meeting was held in September 2008; soil, sediment, and surface water samples were collected on properties owned by Revere in September and October 2008; and interim sampling results were provided to

the NYSDEC in December 2008 and January 2009. As agreed to by the NYSDEC, no soil samples were collected on the developed portions of Tax Parcel 60-1-120. In addition to the sediment samples proposed in the work plan, two sediment samples were collected from the combined stream approximately 100 and 250 feet south of I-84.

- Based on the results of the 2008 sampling, WSP proposed modifications to the scope of work in the RI/FS work plan, including further vertical delineation of lead in soil in the North Border, East-Forested Wetland, and Southern Parcel areas; sampling of the South Outside Parcel on a 250-foot node point frequency and at intervals consistent with the definition of surface soil in DER-10, additional sampling in the East Extended Study Area; and additional soil sampling of four transects in the South Parcel and three transects in the South Outside Parcel to refine the limits of heavily impacted soil near the pond and combined streams (WSP 2009). The NYSDEC approved these modifications with conditions in a letter dated April 7, 2009.
- In March 2010, WSP submitted an RI report for OU3 (as previously defined) detailing the results of investigation activities conducted from September 3, 2008, through December 16, 2009 (WSP 2010a). In a letter dated August 26, 2010, the NYSDEC provided comments on the March 16, 2010 RI report for OU3 (as previously defined) and included a requirement to submit a supplemental work plan to further characterize the contamination present in OU3 (as previously defined) and to complete the soil and sediment sampling scope of work approved under the March 6, 2009 *RI Work Plan Modifications for OU3* (WSP 2009). Field investigation activities related to the supplemental work plan were conducted from October 12, 2010 through December 16, 2010. A large portion of the sampling was conducted in areas of the site that now fall under the definition of OU1.
- In October 2010, WSP submitted a FWIA for OU3 (as previously defined). The FWIA was conducted according to the 1994 NYSDEC guidance document entitled *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites*. The FWIA included an evaluation of the potential impact of site-related constituents of concern on fish and wildlife resources (WSP 2010b).

Subsequent to the supplemental RI work plan, the February 2011 Order that redefined the limits of OU3 was signed. Therefore, previous RI work completed for OU3 (as previously defined) in the North Border, East-Forested Wetland, Southern Parcel, and South Outside Parcel areas became part of OU1. To minimize confusion, WSP presented the investigation findings for these areas in a report entitled, *Remedial Investigation Report Addendum, Operable Unit 1*, dated March 31, 2011 (WSP 2011b).

The activities covered by the OU3 HASP, FSP, QAPP, and QAPP addendum previously approved by the NYSDEC are applicable to future work in the redefined OU3; and therefore, are incorporated into this work plan by reference. The following activities were completed after OU3 was redefined in the 2011 Order:

- Field work activities for the supplemental work plan were completed in October 2011, and the data that were applicable to OU3 were submitted to the NYSDEC in May 2012. In August 2012, the NYSDEC requested additional sediment sampling in the combined stream downstream of the Galleria at Crystal Run Property. A subsequent sampling work plan including 9 additional sediment samples to investigate the potential historical contribution of lead from the drainage embankments north and south of I-84 and to further define the extent of lead, arsenic, and/or other metals above the LELs in the combined stream was submitted in September 2012 and approved by the NYSDEC in November 2012.
- WSP submitted the additional sediment sampling data to the NYSDEC in March 2013 for review. The NYSDEC requested additional sampling of the combined stream further downstream in June 2013. A work plan was submitted in July 2013 that included up to 14 additional sediment samples. The additional samples were collected in May 2014 and the data submitted to the NYSDEC in July 2014. As shown on Figure 2, both lead (17.0 mg/kg) and arsenic (5.6 mg/kg) were detected below the screening values in the furthest downgradient sample collected to date (WSP-SED-55).

3 Remedial Investigation

Previous sampling of environmental media at the site has identified site-related impacts to sediments and potentially surface soil within OU3. This section presents the proposed sampling program to meet the RI objectives of delineating site-related impacts to environmental media in offsite areas, refining the conceptual site model for OU3, and evaluating possible remedial alternatives within the FS. The following investigation activities have been identified to meet the RI objectives:

- sediment sampling to delineate the horizontal extent of lead and arsenic transport above sediment LELs to offsite areas
- surface soil sampling to delineate site-related impacts above site background concentrations, SCOs, or the site-specific soil remedial objectives defined by the NYSDEC in the 2011 Order for OU1

All RI investigation sampling will be conducted in accordance with procedures outlined in the approved FSP (WSP 2008). All analyses will be performed in accordance with the approved QAPP and 2011 QAPP addendum (WSP 2008 and 2011), the media-specific sampling plans provided in Table 1, and the analytical program described in Section 3.5.

3.1 Sediment Sampling

WSP proposes to collect up to 5 additional sediment samples (WSP-SED-65 through WSP-SED-69) from the combined stream south of the most downstream sample (WSP-SED-55) to the stream's outfall at the Wallkill River (Figure 2). Consistent with previously approved sampling work plans, an approximate interval of 150 feet along the stream reach was used to guide the placement of these sampling locations. In the area disturbed by the NYS DOT, samples will be collected from the current channel (WSP-SED-69), and if accessible based on the final surface restoration, the previous channel (WSP-SED-65). Sampling locations may be adjusted as necessary to best collect sediments from depositional areas within the streams.

All samples will be collected using a dedicated and disposable stainless steel spoon or trowel in accordance with the FSP and analyzed for lead and arsenic using Environmental Protection Agency (EPA) Method 6010B. The results from the sampling will be compared to the screening values of 31 mg/kg for lead and 6 mg/kg for arsenic. In accordance with the NYSDEC-approved methodology outlined in the July 2008 OU3 RI work plan, the delineation of lead and arsenic in OU3 sediments will be considered complete when two consecutive samples contain lead and arsenic at concentrations below the screening values.

Five percent of the samples will be analyzed for all Target Analyte List (TAL) metals. Samples will be shipped or couriered for delivery to Accutest Laboratories of Dayton, New Jersey, in accordance with WSP's strict chain-of-custody procedures. One duplicate quality control sample and one matrix spike/matrix spike duplicate sample will also be collected and submitted for analysis in accordance with WSP's standard operating procedures and the July 2008 QAPP and May 2011 QAPP addendum.

3.2 Soil Sampling

WSP will collect additional samples from up to 70 locations to define potential impacts in the surface soils in the 100-year floodplain of the combined stream (Figure 3). The following general procedures will be followed during the collection of these samples within OU3:

- Soil samples will be collected from each side of the combined stream approximately 50-feet perpendicular to the stream channel at the approximate locations of previous sediment samples as shown on Figure 3. Similar to the sediment sampling, this corresponds to a sampling frequency of one set of samples per every 150 linear feet of combined stream. If the 100-year floodplain is less than 50-feet from the stream bank, the soil sample will be collected at the limit of the 100-year floodplain.

- Consistent with the definition of surface soil in DER-10, samples will be collected from 0-2, 2-6, and 12-18-inch intervals at each location and shipped to an offsite laboratory for analysis.
- Samples from locations WSP-OU3-63 through WSP-OU3-70 will be held pending corresponding analytical results for sediment samples WSP-SED-65 through WSP-SED-69. If lead or arsenic is detected above the screening values in the sediment sample, then the soil samples at the corresponding locations will be analyzed for lead and arsenic using EPA Method 6010B as described below.
- Samples from the 0-2-inch and 2-6-inch intervals will be analyzed for lead and arsenic using EPA Method 6010B. A laboratory hold will be placed on the analysis of the 12-18-inch samples pending the results of the initial analysis.
- The initial analytical results will be screened against the approved remedial goals for ecological areas in OU1 (400 mg/kg for lead; 13 mg/kg for arsenic). If the 2-6-inch sample contains lead or arsenic at concentrations that exceed the approved RGs, then the 12-18-inch sample from that location will also be analyzed for lead and/or arsenic as applicable.

In addition to lead analysis, 5-percent of the soil samples collected will be submitted for the TCL/TAL analysis for metals and 2-percent of the soil samples collected will be submitted for the full TCL/TAL analysis. Duplicate quality control and matrix spike/matrix spike duplicate samples will also be collected at the rate of 1 per 20 primary samples and submitted for analysis in accordance with WSP's standard operating procedures and the July 2008 QAPP and May 2011 QAPP addendum.

3.3 Site Access

WSP anticipates the need to obtain a highway work permit with the NYS DOT and negotiate access agreements with the following property owners to collect the proposed samples[1]):

- Tax Parcel 78-1-82
  Property Name: 4 Storage 2 LLC
  Property Address: 295 Ballard Road, Middletown, NY 10940
  Owner: 4 Storage 2 LLC
  Owner Address: P.O. Box 368, Montgomery, NY 12589

- Tax Parcel 78-1-92
  Property Name: Galleria at Crystal Run Mall
  Property Address: 1 N. Galleria Drive, Middletown, NY 10940
  Owner: Town of Wallkill Industrial Development Authority
  Owner Address: 4 Clinton Square, Syracuse, NY

- Tax Parcel 0-0-0
  Property Name: NYSDOT Right-of-Way
  Property Address: NA
  Owner: New York State Department of Transportation
  Owner Address: 4 Burnett Boulevard, Poughkeepsie, NY 12603-2594

[1] The property lines shown on Figures 2 and 3 are based on the most recent available (either 2014 or 2015) tax records obtained from the Orange County NY Real Property Tax Services Office (propertydata.orangecountygov.com) on April 22, 2015.

- Tax Parcel 78-1-34.4
  Property Name: Residential
  Property Address: 758 E Main Street, Middletown, NY 10940
  Owner: Edwin D Silvers Inc.
  Owner Address: 75 Lamb Ave, Saugerties, NY 12477

On behalf of Revere, WSP will initiate the process to obtain a NYS DOT highway work permit and correspondence with the property owners at the remaining tax parcels.

3.4 Analytical Program

The QAPP defines the specific requirements of the analytical program (WSP 2008a). Level IV data quality objectives will be used, and Category B deliverable packages will be provided. The data will be evaluated for conformance with the QAPP and a Data Usability Summary Report (DUSR) will be prepared and included in the RI report.

3.5 Decontamination

Non-disposable/non-dedicated sampling equipment used during the RI will be decontaminated in accordance with the procedures outlined in the FSP (WSP 2008a).

3.6 Investigative Derived Waste Handling

Unused soil samples collected from within the OU3 study area will be placed back into the hole from which they were removed. Water generated during decontamination activities will be treated through the facility's existing wastewater treatment system.

3.7 GPS

WSP will utilize a hand-held global positioning system (GPS) unit with sub-meter accuracy to locate and obtain horizontal measurement at each of the soil sample and sediment sample collection locations. Sampling locations, at which a reasonably accurate GPS measurement is not feasible due to canopy interference, will be surveyed if requested by the NYSDEC. Horizontal measurements at each soil or sediment sample location will be referenced to the New York State Plan coordinate system (NAD-83). A coordinate table of final sample locations will be included within the RI report.

4 Fish and Wildlife Impact Analysis

A FWIA was conducted on behalf of the NYSDEC as part of the RI/FS for OU1 (O'Brien & Gere 2007) in accordance with the 1994 document entitled *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites* (NYSDEC 1994) and DER-10 Section 3.10. The study area for the FWIA for OU1 was defined as the site property and the area within a 0.5-mile radius of the site, which included all of the proposed initial sampling locations in the RI/FS work plan for OU3 (as previously defined; WSP 2008). As such, WSP incorporated some of the analysis approved by the NYSDEC for the OU1 FWIA into the OU3 FWIA (as previously defined) submitted by WSP in October 2010 (WSP 2010b). WSP conducted an independent site reconnaissance effort for the OU3 FWIA, and some conclusions related to habitat definition and assessment differ between the two documents.

Because the complete study area for OU3 is not yet established, it would be premature at this time to define the scope of work for the next phase of the OU3 FWIA. It is reasonable to assume that the study area for the OU3 FWIA will include the portion of the combined stream west of Ballard Road to the Wallkill River; however, it is unknown at this time whether surficial soils are impacted and if lead and arsenic are present in sediments at the confluence of the combined stream and the Wallkill River. Significantly, if the scope of the RI expands into the Wallkill River, the nature and content of the FWIA will vary considerably from work completed to date given the vast difference in the characteristics of the combined stream and the significantly larger Wallkill River. Therefore, WSP proposes advancing the OU3 FWIA using a phased approach as the study area for OU3 is further defined. The FWIA will be conducted according to the guidance document entitled *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites* (NYSDEC 1994).

4.1 Previous FWIA Work Completed in OU3

The study area for the OU3 FWIA (as previously defined) was defined as the area of impacted soil and sediments within OU3 and the area within a 0.5 mile and 2 mile radii of the known boundary of impact. In October 2008, a site reconnaissance was performed to determine the covertypes, fish, and wildlife present within the study area. WSP incorporated the physical boundaries of the covertypes as presented in the OU1 FWIA and only changed the covertype description in instances where the October 2008 field assessment differed from the assessment described in the OU1 FWIA. WSP was unable to directly confirm covertype descriptions beyond the boundaries of those properties owned by Revere due to access issues. However, covertype descriptions were inferred beyond the boundaries of Revere-owned property based on observations made in the OU1 FWIA and during the October 2008 field assessment. Each covertype was described in detail in the Step 1 FWIA for OU3.

The presence of fish and wildlife in the study area was assessed through coordination/inquiry with regulatory agencies, a literature review, and the study area reconnaissance. Wildlife was identified based on actual sightings; audible indicators such as bird songs; or other indicators (spore) such as tracks, burrows, or scat. Several benthic macroinvertebrate, fish, amphibian, reptile, avian, and mammal species were observed frequenting the site and/or the study area at the time of the site reconnaissance. Potential wildlife species that would typically utilize some or all of the habitat components were also identified. Evidence of physical or chemical stressors to flora or fauna inhabiting the site was observed. Finally, other environmental features and fish and wildlife resources, such as significant habitats and rare natural communities, rare (threatened or endangered) plant and animal species, regulated state and federal wetlands, and special surface waters that are present within 0.5 miles of the site were identified.

Based on the information collected in Step 1, both contaminant-specific and site-specific criteria applicable to the remediation of fish and wildlife resources were identified. The Step 1 FWIA was provided to the NYSDEC in February 2009, and the NYSDEC determined a Step 2 FWIA was necessary to determine the extent and magnitude of the potential for toxic effects from the exposure to lead for fish and wildlife receptors. The Step 2A (Pathway Analysis), Step 2B (Criteria-Specific Analysis), and Step 2C (Toxic Effect Analysis) of the FWIA were completed and presented to the NYSDEC in the FWIA in October 2010 (WSP 2010).

4.2 Proposed OU3 FWIA Revision

Step 1 (*Site Description)* of the 1994 NYSDEC guidance document is the initial step in completing the FWIA. The purpose of Step 1 of an FWIA is to characterize the physical and biological characteristics of a site. Because much of OU3 as currently defined is similar to OU1 and OU3 (as previously defined), elements of the FWIA previously completed will be incorporated into the FWIA for OU3.

At the completion of the RI sediment and soil sampling scope of work defined in this work plan, WSP will evaluate the data to determine if limits of the OU3 study area can be established. If the OU3 study area can be defined, WSP will update the FWIA to incorporate the new study area limits, including the content of Steps 1 (Study Area Characterization and Description of Fish and Wildlife Resources), 2A (Pathway Analysis), and Step 2B (Criteria-Specific Analysis). Based on the pathway analysis and criteria-specific analysis, WSP will evaluate whether a toxic effect analysis (Step 2C) is warranted for the OU3 study area.

5 RI Sampling Report and Feasibility Study

5.1 Additional RI Sampling Schedule and Report

On behalf of Revere, WSP will initiate the process to obtain a NYS DOT highway work permit and correspondence with the property owners at the remaining tax parcels within 15-days of approval of this work plan and will provide monthly updates to the NYSDEC on the status of the access agreements. If mutually acceptable access agreements are not executed in a timely manner, WSP will seek the assistance of the NYSDEC to obtain access for the proposed sampling. WSP will collect the samples within 30-days of receipt of all signed access agreements and the NYS DOT highway work permit.

An RI report for this additional sampling scope of work will be submitted to the NYSDEC within 60 days following completion of the sampling and data validation activities. The report will include the laboratory analytical data and the DUSR. All sampling data will be provided to the NYSDEC in the appropriate electronic data deliverable (EDD) format for EQuIS. In the event the data do not complete the delineation of site impacts for all media in OU3, the report will also include proposed additional investigation as the next phase of the RI. In accordance with the NYSDEC-approved methodology outlined in the July 10, 2008 OU3 RI work plan, the delineation of lead and arsenic in OU3 sediments will be considered complete when two consecutive samples contain lead and arsenic at concentrations below the screening values.

5.2 Feasibility Study

A feasibility study will be conducted for OU3 in accordance with 6 NYCRR Part 375-1.8(f) and will include present and future land use as an evaluation criteria.

The FS will be conducted in accordance with the USEPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA 1988) and DER-10. The FS will include the development of remedial action objectives for OU3 media based on consideration of site contaminant and exposure migration pathways and potentially applicable SCGs. Remedial alternatives will then be developed and evaluated to achieve the remedial action objectives. The FS report will include a detailed individual analysis of alternatives based on the following criteria:

- overall protection of human health and the environment
- compliance with SCGs
- long-term effectiveness and permanence
- reduction of toxicity, mobility, or volume through treatment
- short-term effectiveness
- implementability
- cost
- site and community acceptance
- comparative analysis of alternatives based on the above criteria, including identification of the preferred remedy

5.3 FS Schedule

Due to the phased approach to implementing the OU3 RI and FWIA along with the schedule uncertainty associated with executing requisite access agreements to conduct the proposed investigation, a detailed schedule for conducting the OU3 FS cannot be prepared at this time. Upon the NYSDEC's approval of the final OU3 RI, WSP will submit a detailed schedule to the NYSDEC for conducting the OU3 FS.

6 References

EPA. October 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA – Interim Final*.

NYSDEC. 1994. *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA)*. Division of Fish and Wildlife. Albany, NY.

NYSDEC. 1999. *Technical Guidance for Screening Contaminated Sediments*.

NYSDEC. 1998. *Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*

NYSDEC. 2010. *DER-10 Technical Guidance for Site Investigation and Remediation*. May.

NYSDEC. 2006. *Site Characterization Summary for Operable Unit 3*. Revere Smelting & Refining. Town of Wallkill, Orange County. Site No. 3-36-053. November.

NYSDEC. 2008. Letter to Ms. Therese M. Cirone of RSR Corporation from William Bennett Regarding "Remedial Investigation/Feasibility Study Work Plan, July 10, 2007, Citizen Participation Plan for Remedial Investigation/Feasibility Study, July 16, 2007, Revere Smelting & Refining Site (Operable Unit #3), Site No. 3-36-053, Town of Wallkill, Orange County, Consent Order #D3-0502-12-06". July 29.

O'Brien & Gere. 2007. *Fish and Wildlife Impact Analysis*. Revere Smelting & Refining Site, Middletown, New York. January.

WSP. 2008a. Remedial Investigation/Feasibility Study Work Plan, Operable Unit #3, Revere Smelting & Refining Facility, Middletown, New York, Site No. 3-36-053. Revision No. 1. July 10.

WSP. 2008b. Citizen Participation Plan, Remedial Investigation/Feasibility Study Work Plan, Operable Unit #3, Revere Smelting & Refining Facility, Middletown, New York, Site No. 3-36-053. July 16.

WSP. 2009. Remedial Investigation Interim Results. Revere Smelting & Refining Facility. Middletown, New York. Site No. 3-36-053. January.

WSP. 2010a. Remedial Investigation Report. Revere Smelting & Refining Facility. Middletown, New York. Site No. 3-36-053. March 16.

WSP. 2010b. Fish and Wildlife Impact Analysis for Operable Unit 3. Revere Smelting & Refining Facility. Middletown, New York. Site No. 3-36-053. Revision 2. October 29.

WSP. 2011a. RCRA Facility Investigation/Corrective Measures Study Work Plan for Operable Unit 4, Revere Smelting & Refining Facility, Middletown, New York. March 3.

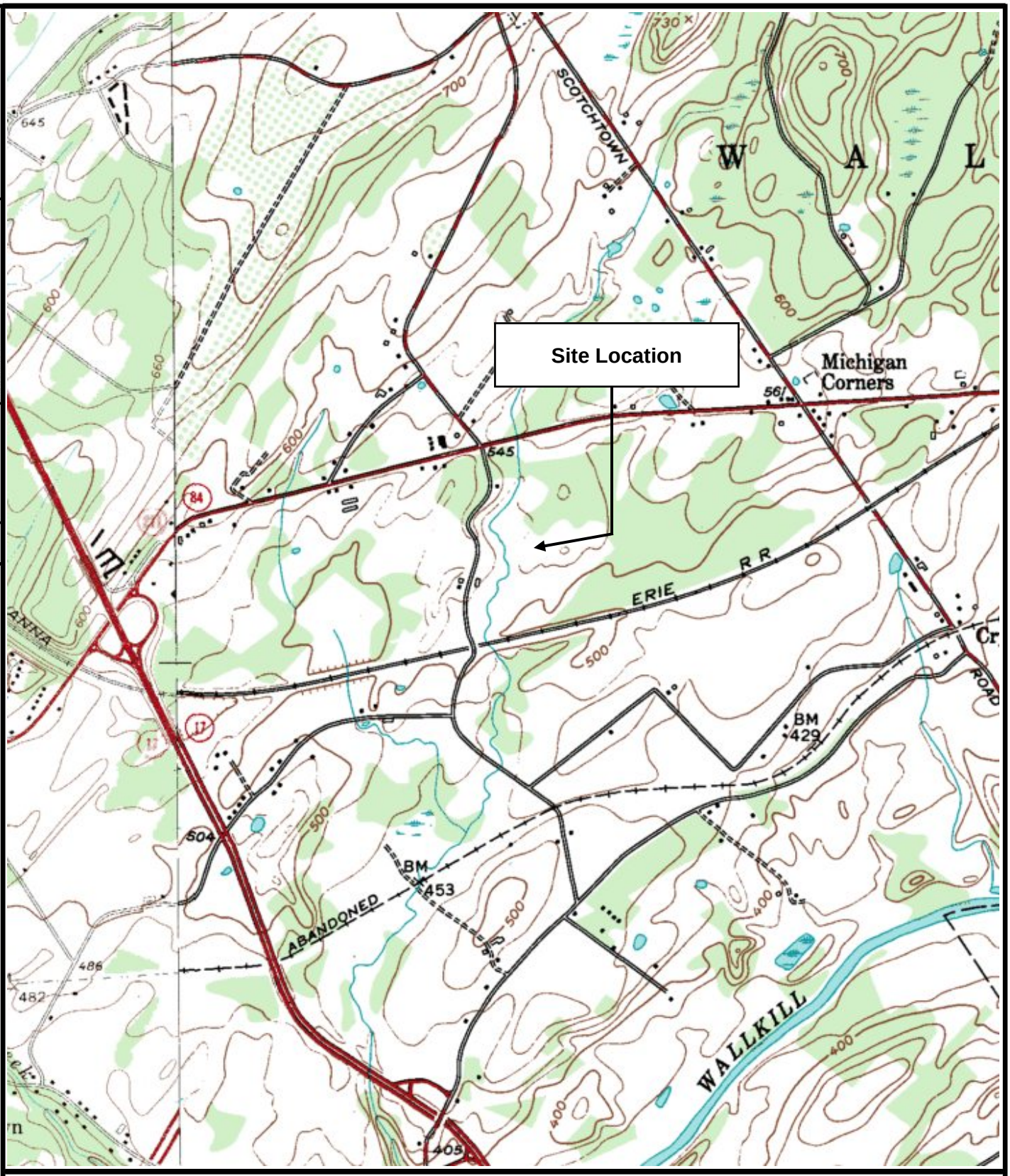
WSP. 2011b. Remedial Investigation Report Addendum, Revere Smelting & Refining Corporation, Middletown, New York, Operable Unit 1, Site No. 3-36-053. March 31.

Figures

DWG Name:

Checked: Approved:

Drawn By: A



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7.5 MINUTE SERIES TOPOGRAPHIC QUADRANGLE
ORANGE COUNTY, NEW YORK
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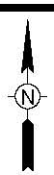

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(781) 933-7340

FIGURE 1

SITE LOCATION MAP

REVERE SMELTING & REFINING FACILITY
MIDDLETOWN, NEW YORK

PREPARED FOR

RSR CORPORATION
DALLAS, TEXAS

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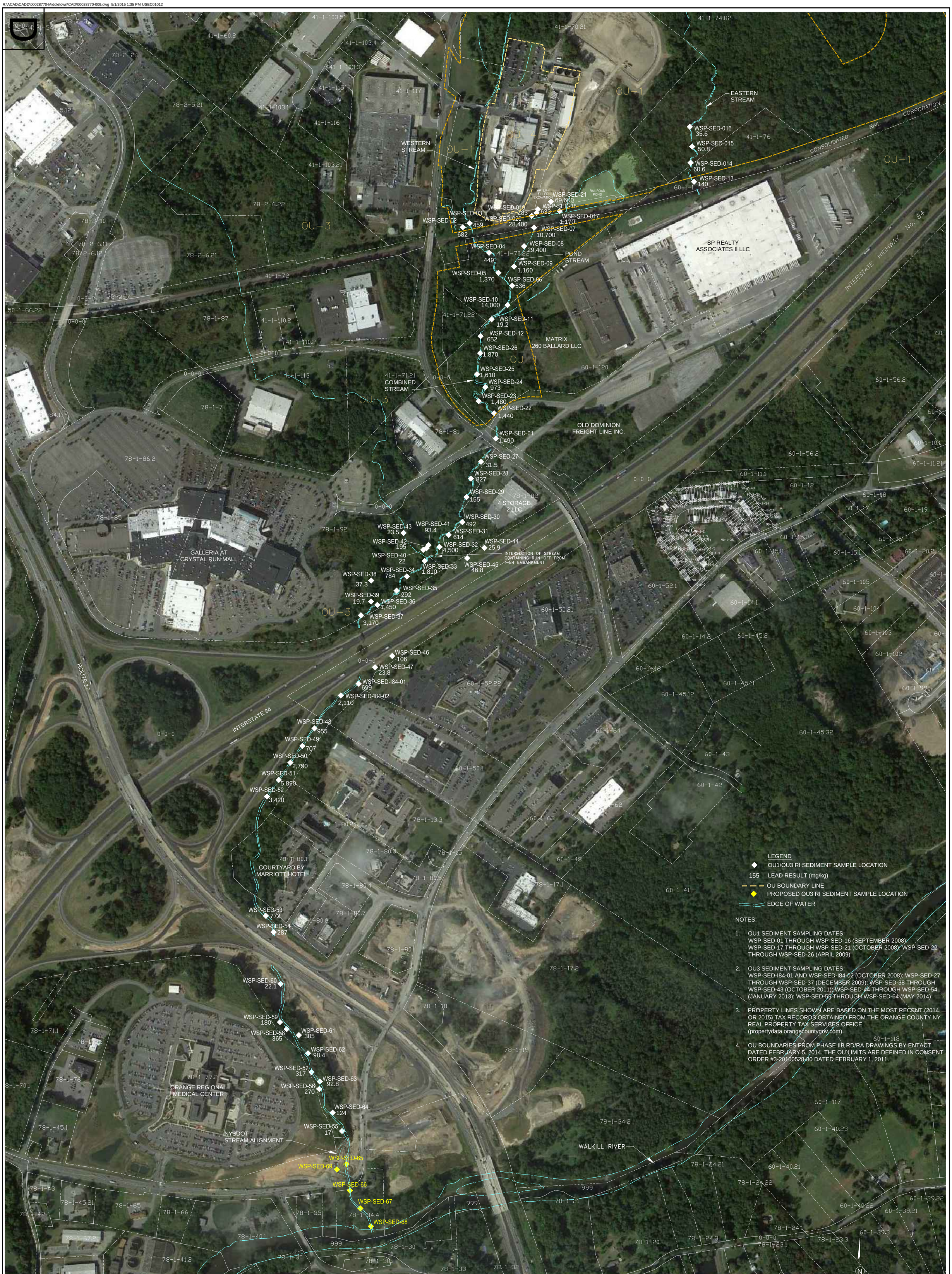

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FIGURE 2

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www.wspenvironmental.com/usa

HISTORICAL AND PROPOSED OU3 SEDIMENT SAMPLING LOCATIONS

REVERE SMELTING & REFINING CORPORATION
MIDDLETOWN, NEW YORK

PREPARED FOR

RSR CORPORATION
DALLAS, TEXAS

DRAWN BY	EGC	
CHECKED		5/4/2015
APPROVED		5/4/2015

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REVISIONS

REV	DESCRIPTION		
1	Revised:	Chkd:	Appr.:
2	Revised:	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:

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OU3 PROPOSED SOIL SAMPLING LOCATIONS

REVERE SMELTING & REFINING CORPORATION
MIDDLETOWN, NEW YORK

PREPARED FOR

RSR CORPORATION
DALLAS, TEXAS

FIGURE 3

Drawing Number
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1	Revised:	Chkd:	Appr.:
2	Revised:	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:

LEGEND
- OU1/OU3 RI SEDIMENT SAMPLE LOCATION
- 155 LEAD RESULT (mg/kg)
- OU BOUNDARY LINE
- 100-YEAR FLOODPLAIN BOUNDARY
- PROPOSED OU3 RI SEDIMENT SAMPLE LOCATION
- PROPOSED OU3 RI SOIL SAMPLE LOCATION
- EDGE OF WATER

NOTES:

1. OU1 SEDIMENT SAMPLING DATES: WSP-SED-01 THROUGH WSP-SED-16 (SEPTEMBER 2008); WSP-SED-17 THROUGH WSP-SED-21 (OCTOBER 2008); WSP-SED-22 THROUGH WSP-SED-26 (APRIL 2009)
2. OU3 SEDIMENT SAMPLING DATES: WSP-SED-I84-01 AND WSP-SED-I84-02 (OCTOBER 2008); WSP-SED-27 THROUGH WSP-SED-37 (DECEMBER 2009); WSP-SED-38 THROUGH WSP-SED-43 (OCTOBER 2011); WSP-SED-44 THROUGH WSP-SED-54 (JANUARY 2013); WSP-SED-55 THROUGH WSP-SED-64 (MAY 2014)
3. PROPERTY LINES SHOWN ARE BASED ON THE MOST RECENT (2014 OR 2015) TAX RECORDS OBTAINED FROM THE ORANGE COUNTY NY REAL PROPERTY TAX SERVICES OFFICE (propertydata.orangecountygov.com).
4. OU BOUNDARIES FROM PHASE IIB RD/RA DRAWINGS BY ENTACT DATED FEBRUARY 5, 2014. THE OU LIMITS ARE DEFINED IN CONSENT ORDER #3-20100528-80 DATED FEBRUARY 1, 2011.

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Tables

Table 1

OU3 Additional RI Sampling Program Summary
Revere Smelting & Refining Facility
Middletown, New York

Study Area (a)	Number of Sample Locations	Collection Interval (inches)	Sample Nomenclature Example (b)	Analysis	Laboratory Protocol
Soil					
Combined Streams	62 (WSP-OU3-01 through WSP-OU3-62)	0 - 2	WSP-OU3-XX-02	Lead and Arsenic (All Samples)	Standard TAT
				TCL/TAL Metals (5%)	Standard TAT
				Full TCL/TAL List (2%)	Standard TAT
		2 - 6	WSP-OU3-XX-26	Lead and Arsenic (All Samples)	Standard TAT
				TCL/TAL Metals (5%)	Standard TAT
				Full TCL/TAL List (2%)	Standard TAT
		12 - 18	WSP-OU3-XX-1218	Lead and Arsenic (All Samples)	Hold
				TCL/TAL Metals (5%)	Hold
				Full TCL/TAL List (2%)	Hold
	8 (WSP-OU3-63 through WSP-OU3-70)	0 - 2	WSP-OU3-XX-02	Lead and Arsenic (All Samples)	Hold
				TCL/TAL Metals (5%)	Hold
				Full TCL/TAL List (2%)	Hold
		2 - 6	WSP-OU3-XX-26	Lead and Arsenic (All Samples)	Hold
				TCL/TAL Metals (5%)	Hold
				Full TCL/TAL List (2%)	Hold
		12 - 18	WSP-OU3-XX-1218	Lead and Arsenic (All Samples)	Hold
				TCL/TAL Metals (5%)	Hold
				Full TCL/TAL List (2%)	Hold
Sediment (d)					
Combined Streams	5	Composite	WSP-SED-XX	Lead and Arsenic (All Samples)	Standard TAT
				TCL/TAL Metals (5%)	Standard TAT

TAT= turn-around-time
a/Duplicates and other QA/QC samples not included. QA/QC samples collected in accordance with the procedures outlined in the FSP and QAPP.
b/"XX" denotes sample number within parcel or stream.

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