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Haley’s Ditch Remediation Plan

May 15, 2009

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Haley's Ditch Remediation Plan

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Table of Contents

Figures

Appendices

ARCADIS

1. Introduction

On behalf of Lockheed Martin Corporation (Lockheed Martin), ARCADIS US, Inc. (ARCADIS) has prepared this Haley's Ditch Remediation Work Plan (Work Plan) to conduct voluntary remedial construction work within and along portions of Haley's Ditch located north of the Airdock facility in Akron, Ohio. Sediments and adjacent soils along portions of Haley's Ditch have been impacted by polychlorinated biphenyls (PCBs), primarily Aroclor 1268.

The objective of the remedial construction is to remove PCB-containing soil and sediment within and near Haley's Ditch such that any remaining PCBs will not pose an unreasonable risk of injury to health or to the environment. The approach to the Haley's Ditch remediation activities was presented in Lockheed Martin's Risk-Based Disposal Approval Request for PCB Remediation Waste, approved by USEPA on May 8, 2009. The purpose of this Work Plan is to present additional information regarding the approach for remedial construction activities to address the targeted PCB-impacted soils and sediments. This Work Plan has been developed based on the existing data and current knowledge of site conditions, including soil and sediment PCB data collected during investigation activities conducted at Haley's Ditch.

1.1 Site Background and History

The Akron Airdock facility is located off U.S. Route 224 on Emmitt Road in Akron, Ohio. A Site Aerial Photograph illustrating the location of the Airdock facility and Haley's Ditch is provided as Figure 1. The Goodyear Airdock in Akron, Ohio was constructed in 1929 by the Goodyear Zeppelin Corporation from plans created by the Wilbur Watson Engineering Company of Cleveland, Ohio. Goodyear Aerospace Corporation operated the plant for the construction and maintenance of airships. Loral Corporation purchased Goodyear Aerospace Corporation and the Goodyear Airdock in 1987, and the facility was acquired by Lockheed Martin in 1996. Several tenants currently occupy the various buildings on the property, including the Airdock facility.

The structure consists of riveted steel arches and supports covered with Robertson Protected Metal. Robertson Protected Metal is corrugated metal siding covered with a protective coating that included PCBs, apparently as a plasticizer and fire retardant. The concentration of these non-liquid PCBs in the Robertson Protected Metal is 3% to 5%. That coating was, in turn, covered by a weatherproofing material and aluminum paint. Asphalt coating was applied over the exterior face of the siding in the 1940s, 1950s, and 1960s. Approximately 25% of the siding was replaced in 1976. In 1992, a project was initiated to cover the exterior face of the siding (roof) with rubber sheeting.

The exterior of the Airdock has been subjected to approximately 75 years of weathering. Despite the maintenance activities described above, this weathering has resulted in exfoliation of the surface and deposition of solid granular material from the siding on the ground. The PCBs that have been detected in the soil and on paved surfaces outside the Airdock are in particles that appear to have been released from the Robertson Protected Metal siding. It is not clear when such releases may have taken place, because the siding has been in place since 1929. The predominant type of PCB contained in the Robertson Protected Metal is Aroclor 1268, which is a solid at room temperature and is highly insoluble in water. Based on these physical characteristics, its mobility in the exterior environment is predicted to be extremely limited, with the primary route of distribution being through surficial transport.

One route of potential PCB transport is the site stormwater piping system, which receives runoff from the site. The stormwater system consists of a large-diameter stormwater drain system under the site, with stormwater ultimately conveyed to a main drain pipe that runs beneath the adjacent airport runways to the north, eventually discharging to Haley's Ditch (see Figure 1). The underground stormwater pipe is approximately 2 miles long. Lockheed Martin has recently completed the removal and off-site disposal of accumulated sediment from the pipe from the Airdock to Haley's Ditch.

Portions of Haley's Ditch are located on property currently owned by Lockheed Martin, while other portions are located on property owned by the Goodyear Corporation and other private parties. A salvage yard is located on the western side of Haley's Ditch, while residential properties are located on the eastern side, approximately 100 feet from the ditch. The Akron-Fulton International Airport is located to the south of Haley's Ditch. A fence is located around the portion of Haley's Ditch located on the Lockheed Martin property, Goodyear property, and a combination of Goodyear property and privately owned property between Wildon Avenue and Archwood Avenue.

1.2 Overview of Approach for Haley's Ditch Remediation

This section provides an overview of the approach to the Haley's Ditch remediation activities. The approach to the remediation activities described in this Work Plan has been developed based on the existing PCB data for Haley's Ditch and current knowledge of site conditions.

In general terms, the project will involve the excavation, removal, and offsite transportation and disposal of accumulated, unconsolidated sediment deposits in Haley's Ditch, as well as adjacent soils containing PCBs at concentrations above the approved soil cleanup level of 1.0 mg/kg.

Remediation of Haley's Ditch will generally proceed in an upstream to downstream sequence. The remediation activities will begin in the ditch beginning at the 60-inch storm drain pipe outfall to Haley's Ditch located on the Lockheed Martin property (South Area). Remediation will continue to the north toward the adjacent Goodyear property (Middle Area) and from the Goodyear property starting near Wildon Avenue and proceeding north to Archwood Avenue (North Area). Figure 2 illustrates the project boundaries, proposed horizontal soil and sediment removal limits, and depths. The actual limits of remediation will be determined through completion of a verification sampling and analysis program (discussed below).

The Haley's Ditch remediation activities will include the following tasks, generally performed in sequential order:

- mobilization and site preparation, including utility mark-outs, pre-remediation surveying and site control layout, installation of erosion and sedimentation controls, removal of above grade of vegetation, installation of temporary access roads and ditch crossings, and construction of temporary staging areas, as needed;

- setup and operation of a surface-water bypass pumping system to divert the water flow in Haley's Ditch around the active work area and thus allow for completion of the removal activities "in the dry";

- excavation and off-site disposal of all sediment deposits in Haley's Ditch, and soils exceeding the soil cleanup level of 1 mg/kg.

- post-excavation verification sampling in soil removal areas to document that the cleanup level (1 mg/kg total PCBs) has been achieved. Additional soil excavation will be conducted, if necessary, to achieve the cleanup level, followed by additional verification sampling.

- off-site disposal of PCB remediation wastes at concentrations greater than 25 mg/kg at the Environmental Quality (EQ) facility located in Belleville, Michigan. The EQ facility is a permitted and licensed Toxic Substances Control Act- (TSCA-) regulated disposal facility;

- off-site disposal of PCB remediation wastes at concentrations less than 25 mg/kg at the Waste Management American Landfill located in Waynesburg, Ohio. American landfill is permitted and licensed to receive non-TSCA PCB waste containing PCBs at concentrations less than 50 mg/kg;

- restoration of remediated and disturbed areas, including the channel bottom, ditch banks, and adjacent soil areas as described in a separate Haley's Ditch Restoration Plan;

- site demobilization, including removal of the temporary access road(s) and soil and sediment staging area(s), equipment decontamination, restoration of disturbed areas, and demobilization of equipment and any unused materials;

- preparation of a final report documenting the Haley's Ditch remediation activities; and

- maintenance and monitoring of the restored areas, as required by project permits (USACE, Nationwide 38) and approvals.

1.3 Work Plan Organization

The remaining portions of this Work Plan are organized into the following sections:

- Section 2 describes the pre-remediation activities that will be completed before initiating the onsite remediation activities for Haley's Ditch;

- Section 3 presents the scope of work for the Haley's Ditch remediation activities;

- Section 4 presents, in narrative form, a preliminary schedule for the Haley's Ditch activities outlined herein.

- Section 5 describes the reporting that will be performed by Lockheed Martin in association with the Haley's Ditch remediation activities;

- Appendix A presents a Sampling and Analysis Plan (SAP) describing additional site characterization and verification sampling programs; and

- Supporting figures referenced throughout the text are included at the end of this document.

2. Property Access, Permits, and Approvals

2.1 Property Access

Based on the data collected to date, the current limits of remediation work include the section of Haley's Ditch beginning at the 60-inch storm drain pipe outfall located on the Lockheed Martin property (South Area), downstream to Goodyear property (Middle Area), and further continuation downstream to additional Goodyear and privately owned properties to Archwood Avenue (North Area). Figure 2 illustrates the remediation project area. Lockheed Martin has obtained an access agreement with Goodyear to allow completion of the proposed remediation activities. In addition, Lockheed Martin has conducted a tax record search to identify the property owner(s) of the Haley's Ditch North Area and has obtained access agreements for the purposes of completion of the proposed remediation activities.

2.2 Permits and Approvals

Permits and approvals will be necessary prior to performing remediation activities at Haley's Ditch. The permits and approvals are as follows:

Permits

- Grading Permit (City of Akron);
- Nationwide 38 Permit (US Army Corp of Engineers);

Approvals

- Risk-Based Disposal Approval for PCB Remediation Waste (US EPA);
- NPDES Notice of Intent (Ohio EPA);
- Storm Water Pollution Prevention Plan (Summit County Soil and Water Conservation District);

3. Haley’s Ditch Remediation Activities

This section presents the overall scope of work and general approach to the Haley’s Ditch remediation activities. The work will be performed in accordance with the scope of work defined herein, the approval granted by EPA (including Lockheed Martin’s application for that approval), and the applicable requirements of 40 CFR 761, which specify the procedures for management and disposal of PCBs under TSCA. In addition, field work will be conducted in conformance with the Site-Specific Health and Safety Plan, which will be prepared prior to mobilization.

3.1 Mobilization and Site Preparation

Site mobilization will include mobilizing the necessary manpower, equipment, and materials to the site to implement the Haley’s Ditch remediation project.

Equipment, trailers, water storage tanks and similar equipment will be located in equipment staging areas as illustrated on Figure 3.

Once mobilization is complete, site preparation will be performed in accordance with the sections below to establish construction support areas and installations that will facilitate the safe and efficient performance of the work.

3.1.1 Identification of Utilities

Prior to any intrusive activities at the site, a utility mark-out will be performed. This effort will include contacting Ohio’s Utility Protection Service (1-800-362-2764) to request a mark-out of utilities in the proposed work areas. In addition, Lockheed Martin and Goodyear will be consulted regarding the locations of utilities in the vicinity of Haley’s Ditch on their respective properties (i.e., in areas where public utilities are not marked). Any drawings provided by Lockheed Martin and Goodyear that illustrate utilities within the work area will be reviewed, and the locations of the utilities will be marked in the field.

In addition, a private utility locating company will be used to locate electric, gas, water, and sewer utilities within the work areas and verify utilities identified from drawings and the public utility service.

3.1.2 Surveying and Site Layout

To provide control for soil removal and verification sampling, the surveying will be performed to stake out the construction stationing every 25 feet along the length of ditch to be remediated (i.e., 0+00, 0+25, 0+50, and so on), the pre- remediation top of bank, the lateral limits of soil excavation adjacent to the ditch, and excavation cut depths. Surveying will either be performed with convention methods performed by a licensed surveyor or with survey-grade GPS equipment. GPS equipment will be maintained onsite during excavation activities to guide verification sampling. Site survey work will be referenced to the Ohio State Plane Coordinate System, North Zone.

3.1.3 Installation of Temporary Site Controls

Temporary site controls will be established prior to the performance of remediation activities. The entire work area is currently enclosed with a chain link fence, which provides controlled access to the site. Additional access gates will be installed at several locations along the existing chain-link fence to allow access for construction and hauling vehicles from Landon Street. The specific locations of the gates will be selected during the mobilization phase.

Warning tape or construction fence will be placed within the remediation area, as needed, to designate the work areas at locations, such as open excavations, equipment cleaning areas, and soil processing areas, to restrict access. For the duration of the remediation activities, a log sheet will be maintained at the site trailer and all project personnel and site visitors will be required to sign in upon entering the site and to sign out upon leaving.

Temporary site controls will be removed, as appropriate, following completion of remediation or restoration activities within each area.

3.1.4 Erosion and Sedimentation Best Management Practices

Prior to initiation of remediation activities, the necessary erosion and sedimentation control measures will be installed at the site in accordance with a Storm Water Pollution Prevention Plan (SWP3) approved by the Summit County Soil and Water Conservation District. In addition to the various physical types of control measures that will be installed, certain operational and Best Management Practices will be implemented throughout the project to provide an additional measure of erosion and sedimentation control and stormwater pollution prevention. The specific erosion and sedimentation control measures and Best Management Practices for the remedial activities will depend on a number of considerations that include the scope of activities, site topography, type of ground cover, whether controls are land- or water-based, and operational and maintenance considerations. The types of erosion and sedimentation controls that are anticipated for this project include the following:

- silt fence or staked hay bales installed downgradient of work areas and along the creek banks around the perimeter of areas where vegetation is removed;

- riprap or straw bales installed at or downstream of the creek bypass discharge point to provide energy dissipation and manage potential scouring of the channel bottom;

- use of downstream rock check dams to settle solids within the creek channel and prevent downstream migration;

- pumps to collect potentially impacted water for treatment that accumulates within the soil and sediment removal areas (i.e., between the bypass diversion dams); and

- stabilized construction entrances to prevent the tracking of clean soil from access roads onto public roads.

The specific locations of these controls will be determined during the excavation and will adjusted, as necessary, in the field, based on site-specific considerations related to drainage, topography, and work activities. In accordance with the Storm Water Pollution Prevention Plan, any measures implemented will be inspected and maintained throughout the project.

3.1.5 Removal and Disposal of Vegetation

Prior to removal activities in an area, brush and trees will be removed, as required, to provide access to Haley's Ditch and adjacent work areas. Clearing of vegetation will be minimized to the extent practical. The South Area will be cleared first and the North Area will be cleared prior to beginning excavation activities in that area (the Middle Area is generally free of woody vegetation). The above-grade materials cleared from the excavation areas will be chipped, shredded, or cut for potential subsequent use as mulch onsite, or staged at designated areas onsite for subsequent use during restoration activities. Tree branches and tree trunks greater than six inches in diameter will be staged at designated tree areas (see Figure 3) to be saved for use during restoration activities. A portion of branches and trunks less than six inches in diameter will be utilized in the stream and wetland restoration effort. Tree branches and tree trunks less than six inches in diameter that are not used in the restoration effort will be chipped. Below-grade materials (e.g., tree stumps and roots) will be removed as part of the soil and sediment remediation activities and disposed of in the same manner as the co-located site soils.

3.1.6 Temporary Haul Roads and Ditch Crossings

To provide equipment and vehicle access to the ditch and the temporary soil and sediment staging area(s), haul roads may need to be constructed. The roads will be utilized for hauling excavated soils and sediments and for importing backfill and other restoration materials. Where possible, the haul roads will be installed at least 25 feet back from the top of the bank and in areas where soil removal is not anticipated. The haul roads will be constructed by clearing vegetation, performing limited grading (if necessary), and placing geotextile followed by a layer of imported soil (or gravel if needed based on site conditions). Turn-around or bypass areas will be provided, as necessary, based on the anticipated vehicular flow patterns (locations to be determined during mobilization). Access to the temporary roads will be primarily from Landon Street in the South and Middle Areas and from Archwood Avenue in the North Area. The approximate location of an access road off of Archwood Avenue is illustrated on Figure 3. The width of the haul roads is expected to be approximately 16 feet wide to accommodate hauling vehicles. Following the completion of the soil and sediment removal, the haul road(s) will be removed.

Temporary stream crossings, constructed of culvert pipe and stone will be installed as necessary to allow equipment and vehicle access to both sides of Haley's Ditch. The stream crossings will only be installed where bypass pumping will occur. The locations of the stream crossings will be determined in the field based on site-specific considerations and may be adjusted as necessary. Figure 3 illustrates potential ditch crossings in the South and North Areas. The temporary crossings will be dismantled and removed upon completion of the soil and sediment removal and restoration activities.

Tracking of soils offsite will be prevented through the use of properly maintained construction exits and by manually cleaning truck tires, if needed, prior to leaving the site. Note that off-site transportation vehicles will not be allowed to drive on soils designated for remediation; these vehicles will remain on constructed access roads and staging areas. Thus off-site vehicle tires will not be in contact with PCB-containing soils. When necessary, plastic sheeting will be draped over the truck sides and tires (loading side only) to control the spillage of PCB-containing material onto the trucks and tires. If needed, tires may be cleaned with brooms, shovels, and brushes to prevent tracking of clean soil onto public roadways. Cleaning of the public roadway will also be conducted if needed by shoveling, sweeping, or washing. Truck loading will be performed on plastic sheeting to further reduce the potential for tracking and plastic will be kept well swept.

3.1.7 Temporary Soil and Sediment Loading Area(s)

It is expected that most of the excavated materials will be directly loaded into vehicles for off-site transport and disposal, thereby minimizing the need for temporary soil and sediment staging. All materials containing greater than 50 mg/kg total PCBs will be directly loaded (i.e., not staged) for off-site transport.

In the event that direct loading of the removed soils and sediments into offsite haul vehicles is not possible (due to site access or logistical restraints or elevated water content of the removed materials), the materials will be transferred to temporary day pile loading areas (expected storage duration, when needed, would be 1 to 3 days) located within the North and South Areas of the work area as illustrated on Figure 3. Staging piles will be located within the remediation footprint on soil areas targeted for subsequent excavation; soil containing total PCBs greater than 1 mg/kg will be removed for disposal as the remediation progresses. Since these areas will be subsequently excavated, it is not necessary to isolate these temporary staging piles from the underlying soil (e.g., with plastic). The location, size, and capacity of the loading areas will be determined prior to excavation activities and will depend upon site-specific constraints of the work area (e.g., access restrictions, topography, and size of the work area), anticipated volumes of materials to be removed, and the frequency and rate at which removed materials will be transported offsite. To the extent possible, the temporary loading areas will not be established in a location that may interfere with facility operations, removal activities, the public, or normal construction traffic flow. In addition, the location of a staging area will consider site topography and avoid (to the extent possible) significant rainfall drainage ways.

Although not expected, short-term storage of excavated materials outside of the targeted remediation area may be required. If needed, separate staging areas will be constructed for materials containing greater than 1 mg/kg but less than 25 mg/kg (targeted for non-TSCA facility disposal) and soils containing greater than or equal to 25 mg/kg (targeted for TSCA facility disposal). Specific requirements for construction of the temporary soil and sediment loading area(s) if constructed outside of anticipated soil removal areas are as follows:

- The area upon which the temporary loading area(s) will be constructed may be lightly graded to form a smooth surface with no protruding objects. The area will also be sloped to drain to a low point for the removal and collection of liquids. Following grading, an impermeable liner (high-density polyethylene [HDPE] or similar), 20 mils in thickness, will be placed in accordance with the manufacturer's specifications to form the bottom of the staging area. The impermeable liner will be covered with 12 inches of clean sand or other appropriate material from an offsite source. The sand layer will provide a working surface for the sediment handling activities and will protect the underlying liner from puncture. The material used for this purpose will be free of any debris or sharp objects that may puncture or otherwise damage the liner.

- Temporary earthen berms or hay bales will be placed around the perimeter of the temporary loading area(s) to control run-on and run-off to or from the staging area.

- The loading area(s) will be clearly marked in the field with signs indicating "PCB Remediation Waste."

If necessary, sediments and soils removed from within and along Haley's Ditch will be transferred to the temporary soil and sediment loading area(s) in haul vehicles traveling along the designated haul roads. The haul vehicles will not enter the loading area. Rather, the haul vehicles will back up to the loading area berm and dump the materials inside the bermed area. An excavator will add solidification materials or dry soils if necessary to absorb excess moisture and perform mixing (there will not be any liquids encountered in this project that approach or exceed 50 ppm PCBs). Vehicles hauling the soil and sediment offsite for disposal will also stay outside the bermed area during loading to minimize the potential for tracking impacted materials offsite. As an additional precaution, the area around the temporary loading area(s) will be monitored, and any spillages or other observed impacts will be addressed promptly. Water that accumulates in the low points of the temporary loading area(s), if any, will be collected using submersible or trash pumps and managed in accordance with the procedures presented in Section 3.4.2. Staged materials will be covered with plastic sheeting when the loading areas are not actively being used.

Following transfer of all materials from the temporary loading area offsite for disposal, the temporary loading area will be decommissioned. The temporary berm, sand layer, and liner materials resulting from the decommissioning will be removed and transported offsite for disposal. Following decommissioning of the temporary loading area, a composite soil sample will be collected from the loading area footprint and analyzed for PCBs to verify that the soil and sediment staging did not impact the site soils. If (in the unlikely event) the analytical results indicate impacts to the site soils beneath the staging area as a result of operations, the impacted soils will be removed (approximately six inches) for off-site disposal and a second composite sample will be collected to show that the impacted soils have been removed.

3.2 Water Management

This section presents the approach to water management during the Haley's Ditch remediation activities. When practical the existing stream channel will be maintained and used to convey surface water flows as it currently does. However, surface water diversion will be required during the sediment removal work in order to perform the removal "in the dry." Surface water diversion will also be employed when excavating soils near the ditch to control the discharge of soils to the surface water. This will be accomplished by utilizing a surface-water bypass pumping system.

3.2.1 Bypass Pumping

Diversion of surface water from the ditch will be performed to facilitate efficient removal of sediments and adjacent bank soils containing PCBs. The diversion will be completed in two or more phases, depending upon accessibility and other site conditions. Figure 4 presents an illustration of a typical bypass pumping configuration.

The bypass pumping system will consist of the following main components:

- electrical powered bypass pumps (minimum of two) of sufficient capacity to handle base flows (1-2 CFS) that would be contained within the banks, plus a surge safety factor.

- appropriate length of HDPE bypass pipe (length based on total length of ditch to be remediated and number of bypass set-ups anticipated); and

- pumps, hoses, and fittings necessary to remove areas of accumulated water within the excavation areas.

Bypass water will be conveyed around the work area and discharged downstream back into Haley's Ditch. Locations of the proposed bypass pumps are shown in Figure 3. Hay bales or riprap will be utilized for energy dissipation at the discharge point to control potential scour within the channel.

The creek bypass system pumps and ancillary equipment will be positioned at secure locations away from general automobile and pedestrian traffic. To the extent possible, the location will be selected to allow for easy access for pump maintenance and operation, and to minimize disturbance to adjacent property owners. The pump bypass system will be operated as necessary to maintain the work area free of water.

3.3 Soil and Sediment Removal

This section presents an overview of the remediation efforts for site soils, top of bank soil, and ditch sediment. Remediation activities are expected to progress from upstream to downstream. Two or more bypass pumping system set-ups will be required to complete the remediation project. Site soils will be remediated first, followed by bank soils and ditch sediment. Figure 2 illustrates the soil and sediment removal limits and depths. This sequencing will minimize actual by-pass pumping as well as maintaining the channel for directing stream flow during rain events.

As illustrated on Figure 5, a 25-foot grid system has been established over the entire project site. The 25-foot grid system was established to facilitate collection of verification samples after soil and sediment have been removed from a grid area; as discussed in the SAP, verification samples will be collected from 25-foot sub-grids. The grid system contains areas of soil and sediment that will be removed from depths that range between 1 to 3 feet based on site characterization data. Verification soil and sediment samples will be collected in accordance with the stand alone site-specific SAP that has been prepared for this project (Appendix A) to document that the targeted soils have been removed. An overview of verification sampling is presented in Section 3.4.

3.3.1 Site Soils

The soils along Haley's Ditch will be excavated to achieve the approved PCB cleanup level of 1 mg/kg. Soils will be removed using conventional construction equipment (e.g., track-mounted excavators and dump trucks). Dust control procedures (e.g., water misting) will be implemented, as necessary, based on field conditions. If required, smaller machinery also may be used in areas where excavator access or maneuverability may be limited. The existing bridge, sheet piling, and concrete structure at Lockheed Martin property South Area will be removed in conjunction with soil and sediment removal activities and will not be replaced.

To the extent possible, excavation activities will be initiated at the outermost edge (or higher elevation) of the excavation area and progress toward Haley's Ditch (i.e., upgradient to downgradient). Soil will either be directly loaded into offsite transportation vehicles or be loaded into haul vehicles (e.g., dump trucks or off-road dump trucks) and transferred to a designated temporary loading area where the soils will subsequently be loaded into trucks for offsite transportation and disposal. As noted above, all soils containing greater than 50 mg/kg will be loaded for immediate off-site transport and disposal; soils greater than 50 mg/kg will not be staged. Following completion of excavation activities in a grid area, confirmation soil samples will be collected as discussed in Section 3.4. Sub-grids that achieve the cleanup level will be backfilled to planned restoration grades as soon as practical.

3.3.2 Bank Soil and Sediment

To minimize by-pass pumping, the existing stream channel and creek banks in each work zone will be excavated last. Excavation will start at the upstream limit of the work area and will progress downstream. Soils and sediments will be removed and transported in the same manner as described in the preceding section. Following completion of excavation activities in each grid area, confirmation soil samples will be collected.

Depending on the moisture content of the sediment materials being removed, they may be mixed with dryer stream bank soils at the point of removal to provide adequate solidification (the elimination of free standing water) for direct loading or transfer to the temporary loading area.

3.3.3 Site Restoration

Site restoration activities will be performed by River Works, a Lockheed Martin subcontractor. River Works will perform restoration activities as soon as practicable where remediation has been completed. A full description of the restoration activities is included in a separate Restoration Plan. As part of the restoration, ARCADIS will work with River Works to cut a new channel as necessary and provide rough grading to sub-grade prior to the start of restoration activities.

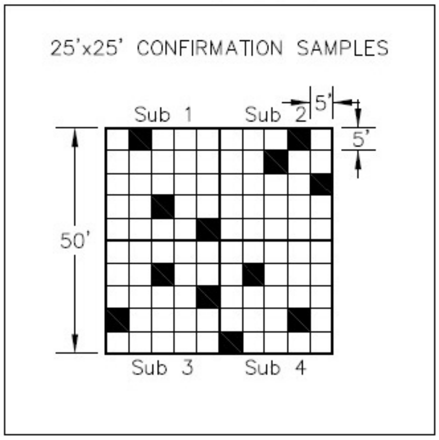
3.4 Verification Sampling

Following the removal of soil from the excavation areas, verification samples will be collected for analysis of PCBs. As described in the Risk-Based Disposal Approval Request, confirmation soil samples will be collected from 25-foot square sub-grids established across the excavation area. These sub-grids will be further subdivided into 25 5-foot by 5-foot sample squares (see below). Each sub-grid that encompasses an excavation area will be characterized by analyzing a sample consisting of a composite of sample aliquots from three randomly selected sample squares, selected via random number generator, within the sub-grid. Note that samples will be collected from excavated areas; sub-grids that are not excavated (i.e., grids that fall outside of the currently proposed excavation perimeter will not be sampled.) Sample locations will also be adjusted within sub-grids that are partially excavated (e.g., a grid is bisected by the excavation perimeter) to locate samples within the excavated portion of the sub-grid.

Three individual sample aliquots will be collected and composited from the center of each randomly identified sample square from each sub-grid using a stainless steel scoop or core sampler with a diameter ≥2 cm and ≤ 3 cm from the base of the excavation to a maximum depth of 7.5 cm. Verification samples will be submitted for laboratory analysis for total PCBs using USEPA SW-846 Method 8082, modified to include Aroclor 1268, with Automated Soxhlet Extraction (ASE, SW-846 3545A). If the analytical result for any of the verification samples equals or exceeds the cleanup objective, additional soil removal will be conducted for the corresponding 25-foot sub-grid square. Additional verification samples will be collected following the additional excavation to verify that the cleanup objective is achieved and subsequent additional excavation and verification sampling will continue until the cleanup goal is reached for each sub-grid.

A figure diagram showing the proposed sampling grids, which have been individually numbered for ease of sample identification and tracking, and the soil excavation area is provided as Figure 5. In addition, separate figures for each sampling grid have been prepared to illustrate the individual aliquot locations for each composite sample and guide field personnel in sample collection. An example of the sub-grid verification sample figure is presented in the SAP. As shown in the example, each aliquot location (identified via random number generator), sample coordinate, and sample identification have been pre-determined to assist the field crew in proper sample identification and tracking. For sub-grids that will only be partially excavated, the random selection process was modified to only select samples within the excavation footprint. If the excavation footprints are modified in the field, the sample locations will be modified accordingly on a case-by-case basis to be representative of the excavation footprint.

Sample grid and composite sample aliquot information is also provided in Table 1 of the SAP. Sample aliquot locations were selected using an online random number generator provided by Randomizer.org (http://www.randomizer.org).



3.5 Materials Handling and Disposal

This section describes the various waste materials (soils, sediments, liquids, residual wastes, and general trash) that are expected to be generated during the remedial activities and the handling and disposal procedures associated with the Haley's Ditch remedial activities. The procedures have been developed to provide proper management of waste materials.

During the waste management activities, Lockheed Martin or an assigned designee will be responsible for the following:

- reviewing waste manifests and their associated documents to confirm that they meet requirements for signature;
- tracking returned manifests and maintaining on file all shipping documents, including manifests, land disposal notifications, and related documents;
- providing regulatory compliance checks on potential transporters and treatment, storage, and disposal facilities; and

3.5.1 Soil and Sediment Management and Disposal

To minimize the potential for the release of PCBs to the environment during soil and sediment removal and handling activities, it is desirable to minimize the number of times that the materials are handled. Therefore, where possible, the excavated soil and sediment will be directly loaded into waste hauling trucks to achieve "real time" removal from the site. In instances where direct-loading of the materials into offsite hauling vehicles is not practical the soils and sediments will be transferred in hauling vehicles along designated haul roads to a temporary loading area described above. The temporary loading area(s) will function as the soil and sediment load-out area for waste transport vehicles upon their arrival at the site. The temporary loading area will be designed to accommodate an excavator that will be used to load the soil and sediment or, if needed to remove free liquids, process the materials (e.g., add and mix solidification agents or dry soil to remove excess water) and load materials from the temporary loading area into the offsite transport vehicles. The determination as to whether soil and sediment materials can be directly loaded for offsite transportation and disposal include the considerations listed below.

- the physical condition of the removed materials and any onsite processes necessary to prepare the materials for subsequent disposal (e.g., removal of excessive moisture);
- the locations from where the materials are removed and proximity to the temporary loading area;
- the amount of space available for a temporary loading area;
- the production rate, or quantity of soil and sediment that can be removed in a specified timeframe; and
- the overall sequence and schedule of the remedial activities.

If dewatering of soils or sediments to remove excess moisture (free standing water) is required prior to offsite transportation and disposal, it may be accomplished via a combination of techniques, including gravity drainage of water, addition of solidification agents such as lime or kiln dust, and mixing of wetter sediment materials with dryer soil materials. None of the liquids that will be managed in this fashion will contain PCBs in concentrations that approach or exceed 50 ppm.

The soil and sediment materials will be loaded into offsite hauling vehicles for offsite transportation and disposal. Soil and sediment removed during the Haley's Ditch remediation activities that contain PCB concentrations greater than or equal to 25 mg/kg will be transported off-site to the TSCA-permitted EQ facility located in Belleville, Michigan. The appropriate TSCA notification of generation of PCB remediation waste will be filed with the USEPA, as required. Offsite transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations. Loaded vehicles leaving the work area will be covered, cleaned to remove any accumulated dirt as needed to prevent tracking (as necessary), manifested, and placarded in accordance with federal, TSCA, and Department of Transportation requirements, as well as any equivalent state requirements.

Materials containing less than 25 mg/kg total PCBs will be transported off-site for disposal at a permitted solid waste management facility meeting the requirements of 40 C.F.R. 761.61(a)(5)(i)(B)(2)(ii).

3.5.2 Liquid Waste Management and Disposal

Water removed from the active excavation areas and temporary staging areas will be temporally stored and allowed to settle in storage tanks located in the South Staging Area as identified on Figure 3. Water from the excavation areas will first be placed into a 20,000 gallon weir tank where fine materials will be allowed to settle out. The water will then be pumped through a bag filter system to remove suspended material, and through an activated carbon unit to remove any residual PCBs and into a 20,000 Frac tank. The process is illustrated on Figure 6. Up to four 20,000 gallon Frac tanks will be placed in the South Staging Area to store treated and untreated water. The filtered water will then be sampled for total PCBs using USEPA Method SW846 8082. Once the analytical results indicate non-detectable concentrations at a 1 part per billion (ppb) detection limit, the water will be discharged from the Frac tank to the City of Akron POTW. The POTW discharge point is the sanitary sewer manhole located on the west side of Landon Street at the intersection of Landon Street and Wildon Avenue. The City of Akron has issued a discharge permit to Lockheed Martin; all discharges to the POTW will conform to the City of Akron's requirements.

3.5.3 Decontamination Wastes

Solid decontamination wastes, including used disposable equipment and personal protective equipment will be placed in appropriate containers, labeled, temporarily stored within the staging areas, and properly disposed by Lockheed Martin.

3.6 Personnel and Equipment Decontamination

The purpose of this section is to provide the minimum procedures and guidelines for the proper decontamination of equipment, tools, and personnel that have come in contact with PCB-impacted materials. Decontamination activities will be an integral part of the remedial activities at the site.

3.6.1 Equipment Cleaning

Equipment cleaning will be performed to control offsite transport of PCBs on the equipment used for remediation activities. The cleaning activities will include:

- An equipment cleaning area will be constructed near the work area and will generally consist of an impermeable barrier that is sloped to a collection sump. Decontamination fluids (water) will be collected using temporary systems (e.g., drums, tanks, and pumps).

- Material handling equipment (e.g., excavators, off-road haul vehicles) that has been used to remove PCB-containing soils or sediments will be cleaned before it enters non-work areas, handles "clean" materials (e.g., backfill), or leaves the site. Equipment cleaning will be performed by dry cleaning methods (shovels, brushes) to remove bulk material, followed by high-pressure, low-volume, power washing (as needed) to remove residual material.

- Decontamination fluids will be collected and containerized for subsequent treatment and disposal in the on-site water treatment system.

- Wipe sampling of heavy equipment (e.g., excavators, loaders, water storage tanks) will be performed following final equipment cleaning for any equipment that has worked in PCB-impacted areas. If wipe sampling indicates PCB levels greater than 10 µg/100 cm^2, the equipment will be re-cleaned and re-sampled until a PCB level less than 10 µg/100 cm^2 is achieved. Wipe sampling will not be required for equipment that has only worked in non PCB-impacted areas.

3.7 Decontamination of Personnel

Decontamination of personnel will be performed as described in the Site-Specific Health and Safety Plan.

3.8 Storm Management

The Haley's Ditch soil and sediment removal activities are weather dependent. Therefore, scheduling of daily remedial activities will be planned in accordance with anticipated weather conditions to minimize adverse impacts as a result of heavy rain. However, in the event that heavy rains occur, water will be managed as described below. Water encountered during the project may include storm water (including direct precipitation and overland runoff), surface water from the ditch, and groundwater. Shallow peizometers have been installed in the project area and normal groundwater elevations appear to be lower than the planned excavation, so groundwater is not expected to be encountered.

Storm water management will include erosion control measures to be installed in accordance with the SWPPP. Storm water diversion measures will be used as needed to prevent run-on to active work areas. Run-on from storms events will be limited to the extent possible by bypass pumping and limiting the extent of disturbed work areas. Significant overland flow from upland areas is not expected, however, soils berms, sand bags, hay bales, or diversion swales may be used to prevent excessive run-on into excavation areas, if needed. The need for additional measures to manage surface water will be based on site conditions encountered throughout the project. If run-on prevents soil removal or loading then diversion measures above will be implemented using onsite personnel and equipment and locally obtained materials (clean fill for berms, sands bags, hay bales, etc.).

If significant storm events are anticipated, Lockheed Martin will take all practical measures to ensure that disturbed areas will not be negatively impacted. If time allows excavation in active grids will be completed prior to the storm event and excavated soil will either be transported off-site for disposal or placed in a staging area and covered with sheeting during the storm event. Because by-pass pumping of significant storm flows is not practical, storm water will be allowed to flow through Haley's Ditch.

To manage storm water that falls directly into and accumulates in the excavation, any overland or ditch run-on that cannot be prevented from entering excavations, and any groundwater that may be encountered, ARCADIS will mobilize a series of tanks and water treatment equipment to the project site. Poly tanks on trailers or tanker truck(s) will be used to contain water pumped out of the excavations. Pumped water will be transported to the on-site treatment facility prior to final discharge to the POTW in accordance with the requirements discussed above. All tanks provided by others will be visually inspected prior to being used for water storage. All tanks will be accessible for decontamination and wipe sampling at the end of the project.

During construction it is possible that water from the adjacent properties or groundwater may enter excavation areas. Groundwater infiltration is also possible depending on final excavation depths in some areas. All water that enters active excavation areas will be handled in the same manner as storm water described above.

3.9 Air Monitoring

During all removal activities that involve the handling, movement or disturbance of soil and all excavation activities, it is anticipated that there is a potential for generation of airborne particulate (dust) that can potentially contain PCBs. An air emission status program will be implemented to determine that work practices and control measures maintain airborne emissions below the applicable air monitoring action thresholds, as described in Section 3.8.1 and listed on Table 1. This plan will be implemented in conjunction with the air monitoring requirements as described in the Site Specific Health and Safety Plan (HASP.) The primary objective of the sampling is to obtain accurate data on the current levels of airborne contaminants at the site.

3.9.1 Air Monitoring Action Levels

Pre-determined action level thresholds as listed below, will provide for a system to trigger implementation of engineering and administrative controls to reduce the generation of dust. Implementation of controls will provide protection for both on-site workers and the local community.

To provide for a conservative level of protection for potential off-site migration this plan will measure and control airborne PCBs associated with dust below USEPA National Ambient Air Quality Standards (NAAQS) and Occupational Health and Safety (OSHA) Permissible Exposure Limits (PELs).

The following calculations and rationale were used to develop air monitoring Action Levels (AL).

PM10* – 250 ug/m^3 24-hour average of particles with diameter of 10 micrometers or less.

PCB PEL = 500 ug/m^3

(assuming 52% chlorine or greater)

*NIOSH Method 0500 and real-time dust monitoring will be utilized to measure total airborne dust and PCBs will be analyzed using Method 5503 as necessary. This method captures all airborne particulate including all particulates below 10 micrometers in diameter. This method will provide a more conservative estimate of potential exposure since all airborne particulate will be collected based on PM10.

Action Level calculation with safety factor:

The prescribed 15 minute AL of 250 ug/m^3 and a 150 ug/m^3 cumulative daily average monitoring is below the PCB-PEL so this will provide a conservative level of protection to exposure to PCB's based on total dust levels.

Action Level rationale:

The exposure criteria for these activities are based on occupational exposure. The PEL for PCB's is 500 ug/m^3. Levels will be maintained below the regulatory limits by utilizing engineering controls and air monitoring for verification that the engineering controls are working. The 250 ug/m^3 total dust action level provides a conservative value that allows for implementation of engineering controls to maintain exposure well below the PCB PEL.

3.9.2 Sample Collection Locations

During the soil handling phases of site activities, an air emission monitoring program at each of the active excavation sites will be established to evaluate employee exposures and prevent impact to the community. The air emission monitoring program will consist of a tiered approach as outlined below:

Work Zone:

Location - area immediately around excavation area, approximately 10-foot buffer around edge of excavations

Activity – excavation and soil removal

Sample Collection/Monitoring

Real-time Monitoring: continuously monitor for total airborne particulate (dust) which includes PM10 at the downwind area and perimeter of each excavation with an MIE DataRAM. Background dust levels will be collected upwind throughout the day at the discretion of the sampling specialist and prior to starting activities. All sample results will be datalogged and maintained for review and documentation of ambient air dust levels. The MIE DataRAM measures the total airborne particulate concentration including particles less than 10 micrometer in diameter, so this is a more conservative method.

NIOSH Method Monitoring: NIOSH Method 0500 and 5503 (total dust, PCBs)

Personal sampling: 10% of employees or at least 1 employee working in the EZ, until 5 consecutive days of NIOSH method and real-time sampling indicates results are below defined action levels

Area sampling: one monitoring station at a downwind location until 5 consecutive days of NIOSH method and real-time sampling indicates results are below defined action levels, then at a rate of 20% (1 every 5 days)

Perimeter Monitoring:

Location - area surrounding work zone

Activity - support and logistics

Sample Collection/Monitoring

Real-time Monitoring: MIE DataRAM for total dust, at least hourly at randomly selected downwind perimeter locations

NIOSH Method Monitoring: NIOSH Method 0500 and 5503

Area sampling: one monitoring station downwind and one upwind of the site perimeter for the first 5 consecutive work days and then at a rate of 20% (1 every 5 days)

Personal sampling: no samples required

Work will continue on the site as dictated by real-time monitoring results. If any TWA results indicate exposure above the applicable action levels, work will cease until additional control technologies and/or work procedures can be established to reduce the level of air emissions.

TABLE 1

AIRBORNE CONTAMINANT ACTION LEVELS

Parameter	Reading	Action
Real-Time Work Zone		
Total Particulate averaged over 15 minute time period	0 to 250 ug/m^3	Normal operations
	> 250-500 ug/m^3	Stop work; investigate source of particulate, reduce generation rate, Upgrade to Level C protection if readings cannot be reduced through engineering controls
	> 500 ug/m^3	Stop work; investigate source of particulate; initiate dust suppression
Real-Time Perimeter		
Total Particulate averaged over 15 minute time period	0 to 250 ug/m^3	Normal operations
	>250	Stop work, until particulate generation rates can be maintained
Total Particulate cumulative average during work shift up to 8 hours per day	> 150 ug/m^3	Stop work; investigate source of particulate, reduce generation rate
TWA Monitoring	Results in ug/m^3	
Employee	PCBs < 500 Total Dust < 1000	Normal Operations
Perimeter	PCBs < 500 Total Dust < 1000	Normal Operations
Collected initially for the first 5 days, then 1 sample every 5 work days.		If action levels are exceeded - stop work investigate source of particulate, reduce generation rate Contact health and safety

4. Schedule

Lockheed Martin plans to perform the Haley's Ditch remediation activities during the summer of 2009. Arcadis plans to mobilize to the site in May 2009 and complete the remediation work in September 2009.

5. Reporting

Upon completion of the Haley’s Ditch remediation activities, a final documentation report will be prepared. The report will summarize and document the completed field activities, present the confirmation sampling data, and provide copies of the waste manifests executed for the transportation and disposal of the waste. In accordance with EPA’s approval of May 8, 2009, this report will be submitted to EPA within 60 days of project completion. A copy of this report will also be placed in the public repository and be available for public review.

Figures

LEGEND:

STORM SEWER

0 600' 1200'
GRAPHIC SCALE

LOCKHEED MARTIN CORPORATION
AKRON AIRDOCK FACILITY
AKRON, OHIO

SITE AERIAL PHOTOGRAPH

ARCADIS

FIGURE
1

CITY: CARY DIV/GROUP: 141 DB: LEE GMS LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=REF
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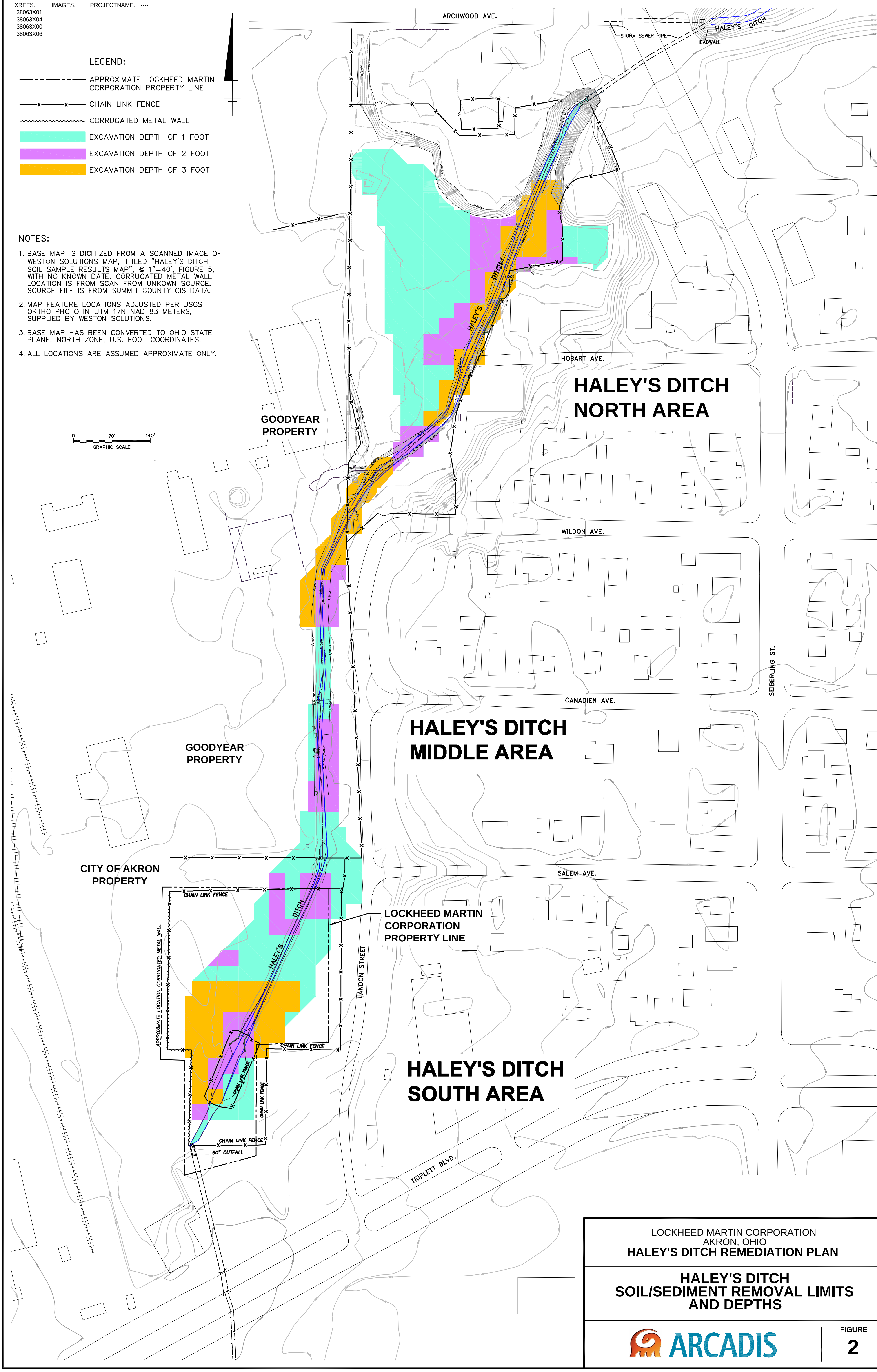

LEGEND:

- APPROXIMATE LOCKHEED MARTIN CORPORATION PROPERTY LINE
- CHAIN LINK FENCE
- CORRUGATED METAL WALL
- EXCAVATION DEPTH OF 1 FOOT
- EXCAVATION DEPTH OF 2 FOOT
- EXCAVATION DEPTH OF 3 FOOT

NOTES:

1. BASE MAP IS DIGITIZED FROM A SCANNED IMAGE OF WESTON SOLUTIONS MAP, TITLED "HALEY'S DITCH SOIL SAMPLE RESULTS MAP", @ 1"=40', FIGURE 5, WITH NO KNOWN DATE. CORRUGATED METAL WALL LOCATION IS FROM SCAN FROM UNKOWN SOURCE. SOURCE FILE IS FROM SUMMIT COUNTY GIS DATA.
2. MAP FEATURE LOCATIONS ADJUSTED PER USGS ORTHO PHOTO IN UTM 17N NAD 83 METERS, SUPPLIED BY WESTON SOLUTIONS.
3. BASE MAP HAS BEEN CONVERTED TO OHIO STATE PLANE, NORTH ZONE, U.S. FOOT COORDINATES.
4. ALL LOCATIONS ARE ASSUMED APPROXIMATE ONLY.

LOCKHEED MARTIN CORPORATION
AKRON, OHIO
HALEY'S DITCH REMEDIATION PLAN

HALEY'S DITCH SOIL/SEDIMENT REMOVAL LIMITS AND DEPTHS

ARCADIS

FIGURE 2

CITY: SYRACUSE, NY DIV/GROUP: 141/ENVCAD DB: LJP RCB LD: LJP PIC: L.MCBURNEY PM: M.HURBAN TM: M.PELTON LYR:(Opt)ON=*;OFF=*REF*
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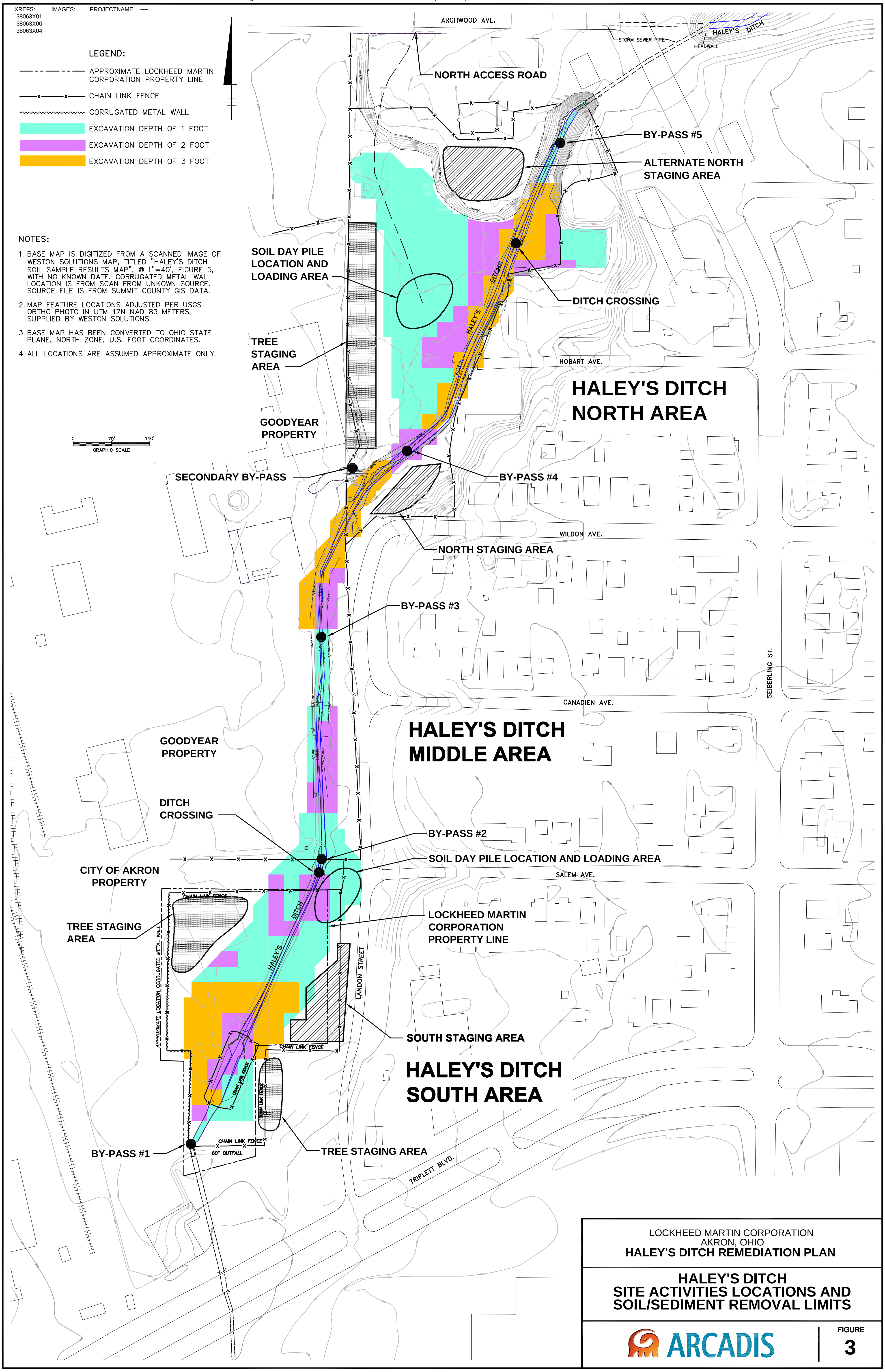

LEGEND:

- APPROXIMATE LOCKHEED MARTIN CORPORATION PROPERTY LINE
- CHAIN LINK FENCE
- CORRUGATED METAL WALL
- EXCAVATION DEPTH OF 1 FOOT
- EXCAVATION DEPTH OF 2 FOOT
- EXCAVATION DEPTH OF 3 FOOT

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2. MAP FEATURE LOCATIONS ADJUSTED PER USGS ORTHO PHOTO IN UTM 17N NAD 83 METERS, SUPPLIED BY WESTON SOLUTIONS.
3. BASE MAP HAS BEEN CONVERTED TO OHIO STATE PLANE, NORTH ZONE, U.S. FOOT COORDINATES.
4. ALL LOCATIONS ARE ASSUMED APPROXIMATE ONLY.

LOCKHEED MARTIN CORPORATION
AKRON, OHIO
HALEY'S DITCH REMEDIATION PLAN

HALEY'S DITCH
SITE ACTIVITIES LOCATIONS AND SOIL/SEDIMENT REMOVAL LIMITS

ARCADIS

FIGURE
3

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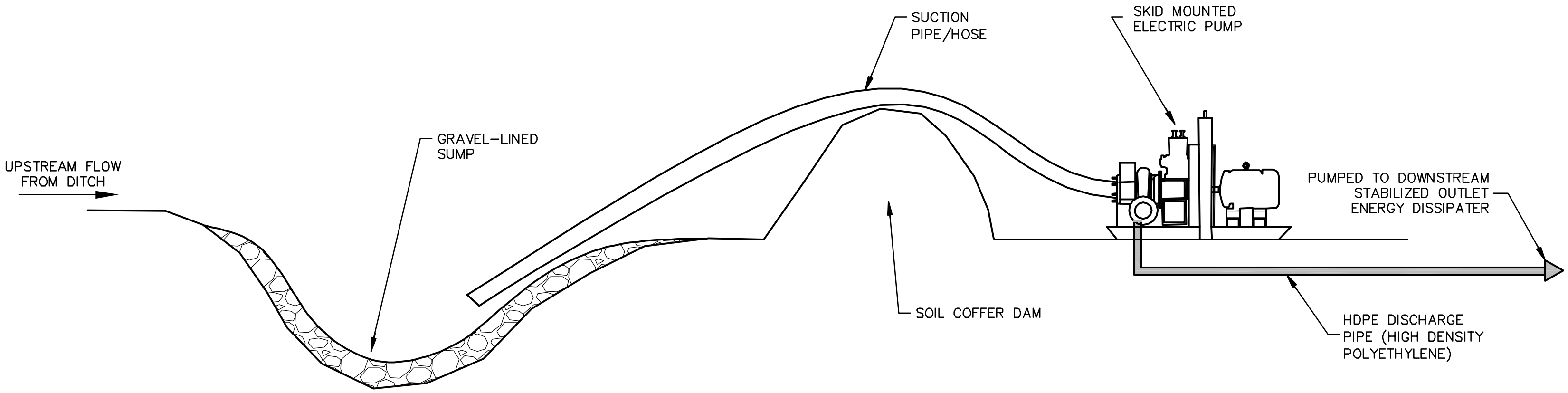

LOCKHEED MARTIN CORPORATION
AKRON, OHIO
HALEY'S DITCH REMEDIATION PLAN

HALEY'S DITCH SURFACE WATER BY-PASS PUMPING DETAIL

ARCADIS

FIGURE
4

CITY: SYRACUSE, NY DIV/GROUP: 141/ENVCAD DB: LJP LD: LJP PIC: L.MCBURNEY PM: M.HURBAN TM: M.PELTON LYR:(Opt)ON=*;OFF=*REF*
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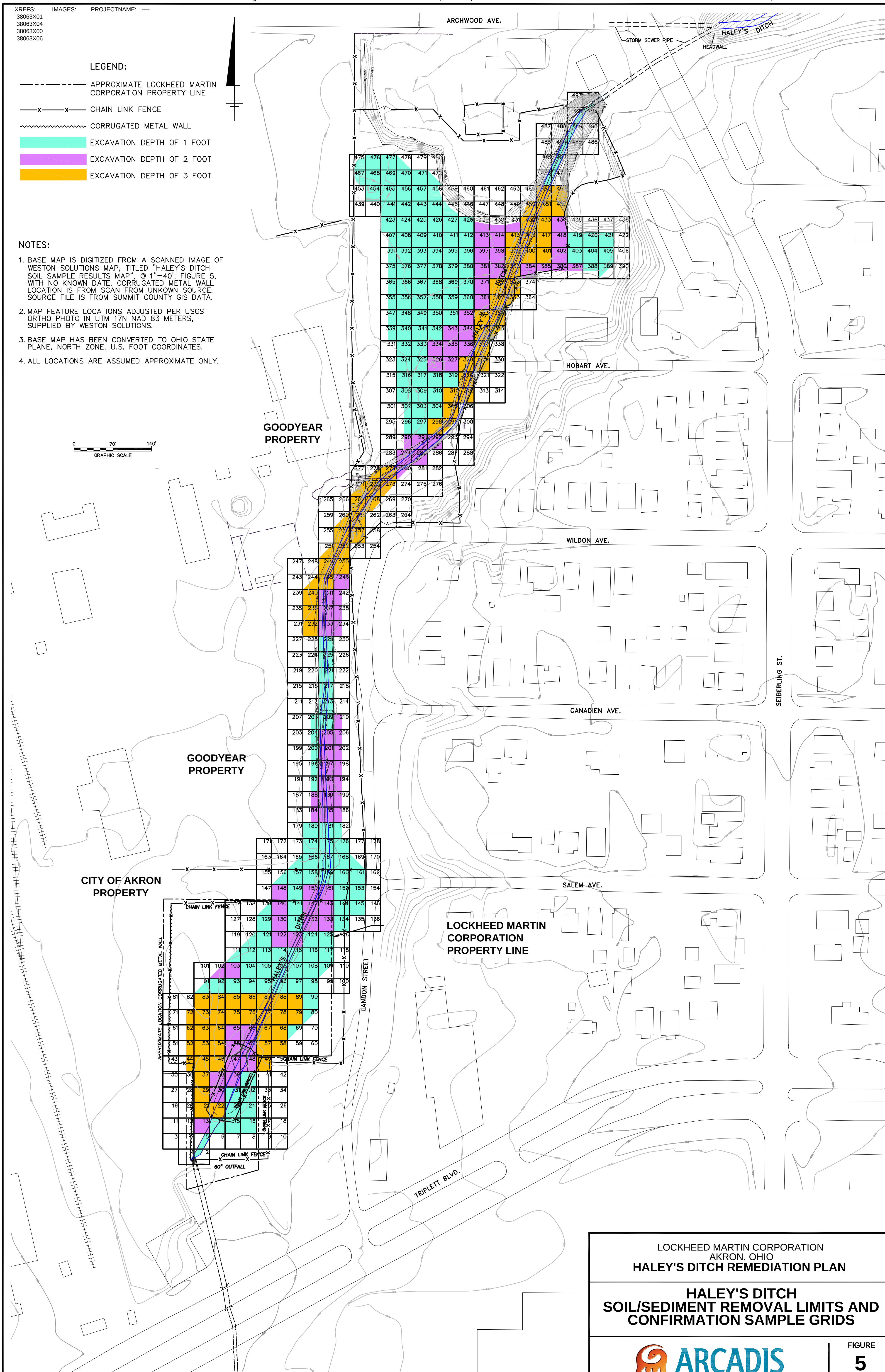
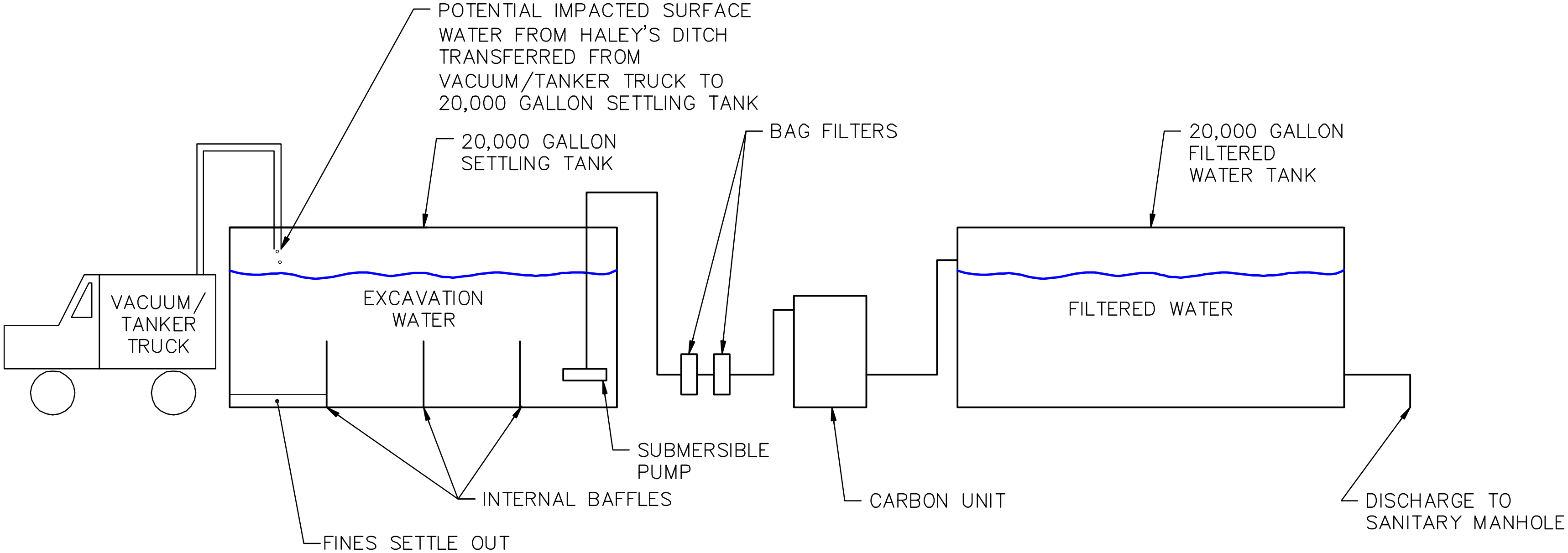


LOCKHEED MARTIN CORPORATION
AKRON, OHIO
HALEY'S DITCH REMEDIATION PLAN

HALEY'S DITCH SOIL/SEDIMENT REMOVAL LIMITS AND CONFIRMATION SAMPLE GRIDS

ARCADIS

FIGURE
5



LOCKHEED MARTIN CORPORATION
AKRON, OHIO
HALEY'S DITCH REMEDIATION PLAN

HALEY'S DITCH EXCAVATION WATER TREATMENT PROCESS SCHEMATIC

ARCADIS

FIGURE
6

ARCADIS

Appendix A

Sampling and Analysis Plan

HALEY'S DITCH SAMPLING AND ANALYSIS PLAN

Lockheed Martin Corporation

LIST OF ACRONYMS AND ABBREVIATIONS

ASTM	American Society for Testing and Materials
bgs	below ground surface
EB	Equipment Blank
FBQSTP	Field Branches Quality System and Technical Procedures
GPS	Global Positioning System
HASP	Health and Safety Plan
IDW	Investigation-Derived Waste
MSDS	Material Safety Data Sheet
NIST	National Institute of Standards and Technology
OSWER	Office of Solid Waste and Emergency Response
PID	Photoionization Detector
PPE	Personnal Protective Equipment
PSI	Pounds per Square Inch
QA/QC	Quality Assurance/Quality Control
SAP	Sampling and Analysis Plan
SB	Soil Boring
SS	Surface Soil
TB	Trip Blank
TCLP	Toxicity Characteristic Leaching Procedure
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey

1. Introduction

This Sampling and Analysis Plan (SAP) provides procedures for collecting data in support of the soil/sediment removal activities at the Haley's Ditch site located in Akron, Ohio (the Site). A description of the Site, along with a Site history, is provided in the *Application for 40 CFR §761.61(c) Risk-Based Cleanup of Soil At Haley's Ditch, Akron, Ohio* (December 2008). This SAP is intended to guide all sampling, measurement, and other field and laboratory measurement activities. The procedures specified in this SAP are in accordance with the procedures presented in United States Environmental Protection Agency's (USEPAs) *Field Branches Quality System and Technical Procedures* (FBQSTP) (USEPA, 2008 or most recently available versions online).

2. Sampling Objectives

The general objectives of the field sampling activities are to:

1. Collect verification soil samples from the base of excavation areas that are representative of the site conditions following soil removal; and
2. Collect additional characterization soil samples from the perimeter of the proposed excavation areas to verify the horizontal extent of PCB-containing soils targeted for removal and that remedial goals have been met.
3. Collect samples of treated water prior to discharge to the City of Akron POTW.

All sampling is to be performed in accordance with the procedures outlined in this SAP to ensure that data of known quality are generated.

3. Field Data Collection Procedures

3.1 Excavation Perimeter Soil Sample Collection

Prior to soil excavation activities, additional soil samples will be collected around the perimeter of the proposed excavation area to verify it encompasses the horizontal extent of soils containing PCBs greater than or equal to 1 mg/kg. Soil samples will be collected in 6-inch depth intervals from ground surface to a maximum depth of 3 feet bgs consistent with prior investigation characterization sampling efforts. Soil samples will be collected using the sample collection procedures provided in Attachment A. To complement existing characterization data that was collected along transects spaced approximately 100 feet apart, additional boring locations will be placed between the existing transects to provide samples spaced at approximately 50-foot intervals around the proposed excavation perimeter. Consistent with previous characterization efforts, sampling and analysis will be performed in an iterative fashion (i.e., if PCBs are identified at concentrations above 1 mg/kg at any boring location, an additional boring location will be installed stepping out away from the excavation area); the location of additional borings, if needed, will be determined based on site conditions (e.g., topography). If soils containing greater than or equal to 1 mg/kg are identified at the perimeter locations the proposed excavation boundary will be modified to include removal and disposal of those soils in accordance with the remedial plan. Approximate perimeter sample locations are shown in Figure 1.

Perimeter soil samples will be submitted for laboratory analysis for total PCBs using USEPA SW-846 Method 8082, modified to include Aroclor 1268, with Automated Soxhlet Extraction (ASE, SW-846 3545A). Consistent with prior characterization efforts, samples from the top 1 foot (e.g., 0-0.5', and 0.5-1' samples) will initially be analyzed for each boring location. If PCBs are found to be below 1 mg/kg in the top 1 foot, samples from deeper intervals will not be analyzed for that location. If PCBs are found to be above 1 mg/kg in the top 1 foot, samples from the 1 to 2 foot depth intervals will be analyzed and the data review will be repeated to determine whether analysis of the 2 to 3 foot bgs samples are required.

3.2 Verification Soil Sample Collection

Following the removal of soil from the excavation areas, verification samples will be collected for analysis of PCBs to document that the targeted soils containing PCB equal to or above 1 mg/kg have been removed. As described in the Risk-Based Disposal Approval Request, verification soil samples will be collected from 25-foot square sub-grids established across the excavation area. These sub-grids will be further subdivided into 25 5-foot by 5-foot sample squares. Each sub-grid that encompasses an excavation area will be characterized by analyzing a sample consisting of a composite of sample aliquots collected from three 5-foot sample squares, selected via random number generator, within the sub-grid. Note that verification samples will be collected from excavated areas; sub-grids that are not excavated (i.e., grids that fall outside of the currently proposed excavation perimeter) will not be sampled. Sample locations will also be adjusted within sub-grids that are partially excavated (e.g., a grid is bisected by the excavation perimeter) to locate samples within the excavated portion of the sub-grid.

Three individual sample aliquots will be collected and composited from the approximate center of each randomly identified sample square from each sub-grid using a stainless steel scoop or core sampler with a diameter ≥2 cm and ≤ 3 cm from the base of the excavation to a maximum depth of 7.5 cm. Verification samples will be submitted for laboratory analysis for total PCBs using USEPA SW-846 Method 8082, modified to include Aroclor 1268, with Automated Soxhlet Extraction (ASE, SW-846 3545A). If the analytical result for any of the composite verification samples equals or exceeds the cleanup objective of 1 mg/kg, additional soil removal will be conducted for the corresponding 25-foot sub-grid square (or portion thereof if the entire sub-grid isn't targeted for remediation). Additional verification samples will be collected following the additional excavation to verify that the cleanup objective is achieved and subsequent additional excavation and verification sampling will continue until the cleanup goal is reached for each sub-grid.

A figure showing the proposed sampling grids, which have been individually numbered for ease of sample identification and tracking, and the soil excavation area is provided as Figure 2. In addition, separate figures for each sampling grid have been prepared to illustrate the individual aliquot locations for each composite sample and guide field personnel in sample collection. An example of the sub-grid verification sample figure for Grid 13 is attached. As shown in the example, each aliquot location (identified via random number generator), sample coordinate, and alphanumeric sample identification have been pre-determined to assist the field crew in proper sample identification and tracking. For sub-grids that will only be partially excavated, the random selection process was modified to only select samples within the excavation footprint. If the excavation footprints are modified in the field, the sample locations will be modified accordingly on a case-by-case basis to be representative of the excavation footprint. Sample grid and composite sample aliquot information is also provided in Table 1. Sample aliquot locations were selected using an online random number generator provided by Randomizer.org (http://www.randomizer.org).

3.3 Treated Water Sample Collection

In accordance with the Remediation Plan, water removed from the active excavation areas will be temporally stored and treated on-site (via filtering and carbon adsorption) prior to discharge to the City of Akron POTW in accordance with a discharge permit issued by the City. Water collected from excavations will be treated in batch mode, and the treated water will be stored in a Frac tank. Prior to discharge to the POTW, each batch of treated water will be sampled for total PCBs using USEPA Method SW846 8082. Once the analytical results indicate non-detectable concentrations at a 1 part per billion (ppb) detection limit, the water will be discharged from the Frac tank to the City of Akron POTW. [Water sample collection procedures are included in Attachment B.

3.4 Equipment Cleaning Procedures and Personnel Decontamination

All non-disposable equipment involved in field sampling activities will be decontaminated prior to use, between sample locations and intervals, and prior to leaving the site, as detailed in Attachment C.

Personnel decontamination procedures are specified in the Site-Specific Health and Safety Plan.

4. Sample Designation System

4.1 General

A sample designation code will provide each sample with a unique “name”. This alphanumeric system will apply to all samples that are to be transmitted to the analytical laboratories during implementation of the field data collection activities. Each sample will be designated by an alphanumeric code that will identify the sample name and matrix sampled, and will contain a sequential sample number. Site-specific procedures are elaborated below.

The following is a general guide for sample identification:

First Segment	Second Segment		Third Segment (optional)
LM --	AA	NN---	N---
Site Name	Location Type	Specific Location	Depth/Date/Other

The first segment will contain the project identifier: LM for Lockheed Martin.

The second segment will contain the location type and number. The location type describes if the sample is collected from a soil boring (perimeter sample), or base of excavation confirmation sample. The location number is unique to each location, beginning with 01 for soil sample sub-grids and increasing accordingly. Treated water samples will use a designation that corresponds to the Frac tank identification. The following abbreviations will be used for the location types:

- SO = Soil Sample;
- SO-C = Confirmation (Verification) Soil Sample;
- TW = Treated Water
- TB = Trip blank; and
- EB = Equipment rinse blank.

The third segment is optional and may contain the following:

- Soil samples around the perimeter of the excavation will be collected at specific depths. The third segment will be used to denote the sample collection depth in feet below ground surface.
- Verification samples collected from sub-grids that require “re-digs” to achieve the cleanup level. The third segment will be used to denote the “re-dig” effort (e.g., R1 would represent re-dig 1, R2 would represent re-dig 2, and so on).
- Treated water samples will be tracked in the third segment using the specific date of sample collection.

For example, a soil sample obtained at soil boring location 250 from a depth of 0 to 0.5 feet below ground surface would be identified as “LM-SO-250 (0-0.5)”. The soil sample obtained at the same location at a depth of 2.0 – 2.5 feet below ground surface would be identified as “LM-SO-250 (2.0-2.5)”. A duplicate sample from this location would be identified using a fictitious code in a similar format that is identifiable to the sampler and not the laboratory, such as “LM-SO-990 (2.0-2.5)”, where the “990" is a fictitious boring number.

Similarly, a confirmation sample collected from sampling sub-grid number 7 would be identified as “LM-SO-C-07”. All confirmation samples will all be collected from approximately 0 to 3 inches below the base of excavation areas, therefore depth intervals will not be included with the verification sample IDs. If additional excavation is required within a sub-grid, and thus additional confirmation sampling, the confirmation sample number will be supplemented with an “R1” to indicate “Re-dig 1”, “R2” to indicate “Re-dig 2”, etc.

Treated water samples will be numbered so that they can be distinguished by the tank identification and the day of sampling. An example treated water sample would be LM-TW-01-061909. Where “TW” stands for treated water, “01” is the Frac tank where the sample is collected from, and “061909” is the date of sample collection in mm-dd-yy format.

Equipment rinse blanks will be numbered so that they can be distinguished by the day of sampling. An example equipment rinse blank name would be EB-061909- 1, where “EB” stands for equipment rinse blank, “061909” is the date of sampling in mm-dd-yy format, and “1” stands for the sequential number of equipment rinse blanks collected that day. Other field quality control samples will be named using a similar format.

Where necessary, the code system will be supplemented to accommodate additional sample identification information.

5. Sample Handling and Documentation

The analytical laboratory will supply appropriate sample containers for all analyses to be performed, cleaned and quality controlled in accordance with Office of Solid Waste and Emergency Response (OSWER) Directive No. 9240.0-05 *Specifications and Guidance for Obtaining Contaminant-Free Sample Containers* (July 1991). The analytical laboratories will also supply analyte-free water, sample labels, and preservatives. The field personnel will be responsible for properly labeling containers and preserving samples (as appropriate). Sample labeling procedures and sample designation system are described in Section 4 of this SAP.

5.1 Packing, Handling, and Shipping Requirements

Sample custody seals and packing materials for filled sample containers will also be provided by the analytical laboratories. The filled, labeled, and sealed containers will be placed in a cooler on ice and carefully packed to reduce the possibility of container breakage.

All samples will be packaged by the field personnel and transported by courier to Test America, Inc. located in Canton, Ohio on a daily basis.

Field personnel will provide comprehensive documentation covering all aspects of field sampling, field analysis, and chain-of-custody. This documentation constitutes a record that allows reconstruction of all field events to aid in the data review and interpretation process. All documents, records, and information relating to the performance of the fieldwork will be retained in a project file at the ARCADIS office in Pittsburgh, Pennsylvania. The various forms of documentation that will be maintained throughout the field investigation activities are briefly outlined below.

5.2 Daily Production Documentation

Each field crew will maintain field documentation consisting of a waterproof, bound notebook that will contain a record of all activities performed at the Site. The specific measurements from field testing and sampling will be recorded in the field notebook or on separate documentation forms. At the time of sampling, detailed notes of the exact site of sampling will be recorded in the field notebook.

5.3 Sampling Information

During soil sampling, detailed notes will be made as to the exact site of sampling, physical observations, sample depths, and weather conditions. These notes will be recorded in the field notebook. In addition, all sample locations will be flagged in the field and will be subsequently surveyed using either ground techniques or global positioning system (GPS) to document their final location.

5.4 Sample Chain-of-Custody

Persons will have custody of samples when the samples are in their physical possession, in their view after being in their possession, or in their physical possession and secured so they cannot be tampered with. When samples are secured in a restricted area accessible only to authorized personnel, they will be deemed to be in the custody of such authorized personnel.

Chain-of-custody forms will provide the record of responsibility for sample collection, transport, and submittal to the laboratories. The forms will be filled out at each sampling site, at a group of sampling sites, or at the end of each day of sampling by one of the field personnel designated to be responsible for sample custody. In the event that the samples are relinquished by the designated sampling person to other sampling or field personnel, the chain-of-custody form will be signed and dated by the appropriate personnel to document the sample transfer. The original chain-of-custody form will accompany the samples to the laboratories and copies will be retained in the project files.

6. Management of Investigation-Derived Waste

Investigation-derived waste (IDW) will include soil, PPE, and decontamination fluids. Soil and used PPE will be produced during soil sampling activities. Decontamination procedures associated with this investigation will produce water, solvents, and acids from cleaning sampling equipment. Health and safety equipment and disposable sampling equipment will also be generated. All liquid IDW will be containerized, sampled for laboratory analysis (if needed) and disposed offsite in accordance with applicable regulations. Disposable sampling equipment, PPE, and soil waste will be managed onsite and combined with remedial waste for offsite disposal. The procedures for handling IDW are based on the USEPA's "Guide to Management of Investigation Derived Wastes" (USEPA, 1992).

7. Quality Assurance/Quality Control

This section summarizes the Quality Assurance/Quality Control (QA/QC) requirements for all field investigation activities associated with the implementation of the field data collection activities.

7.1 QA/QC Sample Collection

QA/QC field samples to be collected include equipment rinse blanks, field duplicates, and matrix spike/matrix spike duplicates (MS/MSD). Guidance on collecting the QA/QC samples is presented below.

7.1.1 Equipment Rinse Blanks

Rinse blanks will be prepared in the field by ARCADIS personnel by collecting demonstrated analyte-free water that has been poured over decontaminated sampling equipment to check the adequacy of the decontamination procedure and to allow evaluation of potential cross-contamination of samples due to the equipment. Rinse blanks will be collected at the frequency of one per day per type of sampling equipment used. Rinse blanks will be collected from sampling equipment, including hand auger buckets or stainless steel scoops. Rinse blanks will be collected at the beginning of the day before the sampling event and must accompany the samples collected that day. Rinse blanks will not be collected if no sampling equipment was used to collect the sample.

Rinse blanks will be prepared in the field. Laboratory- or vendor-supplied analyte-free water will be poured into or over the sampling equipment and then directly into the laboratory supplied sample bottles. The intent is for the water making up the blank to follow the same path, and therefore, come in contact with, the same equipment as the samples.

7.1.2 Field Duplicates

Duplicate samples will be sent for laboratory analysis to evaluate the reproducibility of the sampling techniques used. Duplicate results also provide an indication of the variability within the site itself. Duplicate samples will be collected at a 5% frequency (1 per 20 samples collected).

7.1.3 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD samples will be used to measure the accuracy of analyte recovery from the sample matrices. MS/MSD samples will be collected at a 5% frequency (1 per 20 samples collected).

References

USEPA, 2008. Field Branches Quality System and Technical Procedures, USEPA Region 4, Athens, Georgia. February 2008.

USEPA, 1992. Guide to Management of Investigation Derived Wastes. OSWER Publication 9345.3-03FS.

USEPA, 1991. Specifications and Guidance for Obtaining Contaminant-Free Sample Containers. OSWER Publication 9240.0-5. July 1991.

Attachment A: Soil Sample Collection Procedure

Prior to commencing work, all underground utilities will be located by the Ohio Utility Protection Service, by field personnel with appropriate devices, and/or by a private utility locator.

I. Introduction

This attachment presents protocols to collect surface and subsurface soil samples.

II. Materials

The following materials will be available, as required, during soil sampling:

- Health and safety equipment (as required by the Health and Safety Plan);
- Equipment cleaning materials;
- Glass or stainless steel tray;
- Stainless steel trowels, disposable scoops, or core sampler;
- Stainless steel bucket auger;
- Ziploc®-type bags;
- Measuring device (ruler or tape measure);
- Appropriate sample containers and forms;
- Coolers with ice; and
- Field book.

III. Procedures

The following procedures will be employed to collect soil samples:

1. Don personal protective equipment (as required by the Health and Safety Plan).

2. Identify sample locations from the sample location plan and note locations in the field notebook.

3. If the sample location is a vegetated area, the vegetation should be removed prior to sample collection.

4. Samples will be collected by cutting into the soil to the desired depth with a precleaned stainless steel trowel, disposable scoop, core sampler, or stainless steel bucket auger. Once the desired sampling depth has been achieved, the sampling device will be replaced with a clean sampling device for sample collection. That sampling device can then be used to advance to the next sampling depth. A clean sampling device will then be used to collect the

sample at that depth interval. Sampling gloves will be changed between each sample collected.

5. Visually characterize the soil and record color, general moisture content, consistency, odor, and other notable physical characteristics of the soil.

6. The soil sample will be homogenized by mixing in a clean Ziploc®-type bag or decontaminated stainless steel tray or bowl using a decontaminated stainless steel scoop. Remove any rocks, twigs, leaves, or other debris if it is not considered to be a part of the sample.

7. Collect each composite aliquot from the prescribed location as specified in the SAP. Place approximately equal portions of each composite aliquot in a clean Ziploc®-type bag or decontaminated stainless steel tray or bowl using a decontaminated stainless steel scoop and homogenize as specified in step 6, above.

8. Label containers and place in a transportation cooler.

9. Duplicate samples will be obtained by dividing the sample into two sets of containers.

10. Handle, pack, and ship the samples with appropriate chain of custody procedures as specified in the SAP.

11. Record all other appropriate information in the field book.

Attachment B: Treated Water Sample Collection Procedures

I. Introduction

Treated water samples to be submitted for laboratory analysis will be collected as grab samples.

II. Materials

The following materials will be available, as required, for treated water sampling:

- Laboratory-supplied sample collection containers;
- Field notebook; and
- Appropriate transport containers and appropriate packing, labeling and shipping materials (coolers) with ice.

III. Procedures for Treated Water Grab Sample Collection

Treated water grab sample collection procedures are as follows:

1. Don appropriate health and safety equipment (as required by the Health and Safety Plan).
2. Submerge laboratory-supplied sample containers directly into the treated water to allow the bottle to fill, or place under sample port/spigot, if available. After filling, cap the bottle and place on ice in the cooler.
3. Label bottles as appropriate, and complete appropriate paperwork in the field book (date, time, location, and other pertinent information) and chain of custody.
4. Follow procedures for preservation of samples and packing, handling, and shipping with associated chain-of-custody procedures of samples.

Attachment C: Equipment Cleaning Procedures

I. Introduction

Equipment cleaning areas will be located within or adjacent to a specific area, as designated by the supervising scientist. The procedure applies only to non-dedicated, non-disposable sampling equipment that is intended for re-use.

II. Materials

The following materials, as required, shall be available during equipment cleaning:

- Personal protective equipment (PPE) (as required in the Health and Safety Plan);
- Tap water (provided by a municipal water supply);
- Non-phosphate laboratory soap (Alconox® or equivalent);
- Pesticide grade isopropanol;
- Pesticide grade hexane;
- Deionized water;
- Organic/analyte free water;
- Wash basins;
- Plastic containers for the collection of rinsate;
- Brushes;
- Polyethylene sheeting;
- Aluminum foil;
- Large heavy duty garbage bags;
- Spray bottles; and
- Disposable gloves.

III. Handling and Storage of Equipment

A. Cleaning Equipment

All storage and application containers (spray bottles) will be constructed of proper materials to ensure their integrity. Following are acceptable materials used for containing the specified cleaning solutions:

- Soap must be kept in clean plastic, metal, or glass containers until used. It should be poured directly from the container during use.

- Solvents must be stored in the unopened original containers until used and will be applied using Teflon® or polyethylene squeeze bottles.

- Tap water may be kept in clean tanks, hand pressure sprayers, squeeze bottles, or applied directly from a hose.

- Deionized water must be stored in clean glass, stainless steel, or plastic containers that can be closed prior to use. It can be applied from plastic squeeze bottles.

- Organic/analyte free water must be stored in clean glass, Teflon®, or stainless steel containers prior to use. It may be applied using Teflon® squeeze bottles.

B. Cleaned Sampling Equipment

After field cleaning, equipment should be handled only by personnel wearing clean gloves to prevent re-contamination. In addition, the equipment should be moved away (preferably upwind) from the cleaning area to prevent re-contamination. If the equipment is not to be immediately re-used, it should be covered with plastic sheeting or wrapped in aluminum foil to prevent re-contamination. The area where the equipment is kept prior to re-use must be free of contaminants.

IV. Safety Procedures During Equipment Cleaning

1. Personnel will wear the following PPE when cleaning smaller sampling equipment (e.g., split spoon sampler, trowels):

    - Safety glasses, goggles, or a splash shield; and

    - Disposable gloves/Tyvek® sleeves.

2. Personnel will wear the following additional PPE when cleaning larger equipment (e.g., geoprobe rigs) with a high pressure water/steam cleaning unit:

    - Safety glasses, goggles, or a splash shield;

    - Disposable gloves;

    - Disposable Tyvek® coveralls and chemical-resistant overboots may also be worn during steam cleaning as specified in the HASP.

3. All solvent rinsing will be conducted in an adequately ventilated area.

4. All solvents transported into the field will be stored and packaged in appropriate containers with care taken to avoid exposure to extreme heat.

5. Solvent handling will be consistent with the manufacturer's Material Safety Data Sheets (MSDS).

6. No eating, smoking, drinking, chewing, or any hand to mouth contact should be permitted during cleaning operations.

C. Reuseable Sampling Equipment

The following procedures will be used for sampling equipment (bucket augers, trowels, mixing bowls, etc.) used to collect samples undergoing constituent analyses:

- Clean with tap water and soap (Alconox®) using a brush if necessary to remove particulate matter and surface films.
- Rinse thoroughly with tap water.
- Rinse thoroughly with analyte free water.
- Rinse thoroughly with hexane.
- Rinse thoroughly with analyte free water.
- Rinse thoroughly with isopropyl alcohol.
- Rinse thoroughly with analyte free water.
- Remove the equipment from the decontamination area and allow to air dry. Equipment stored overnight should be wrapped in aluminum foil and/or covered with clean, unused plastic.

VI. Disposal Methods

Water generated during cleaning procedures will be collected and transferred to a central container for interim storage.

PPE, such as gloves, disposable clothing, and other disposable equipment resulting from personnel cleaning procedures, will be placed in plastic bags. These bags will be transferred into appropriately labeled containers and stored in a designated area. The contents will be disposed of along with excavated soil.

ARCADIS

Figures

CITY: SYRACUSE, NY DIV/GROUP: 141/ENVCAD DB: LJP LD: LJP PIC: L.MCBURNEY PM: M.HURBAN TM: M.PELTON LYR:(Opt)ON=*;OFF=*REF*
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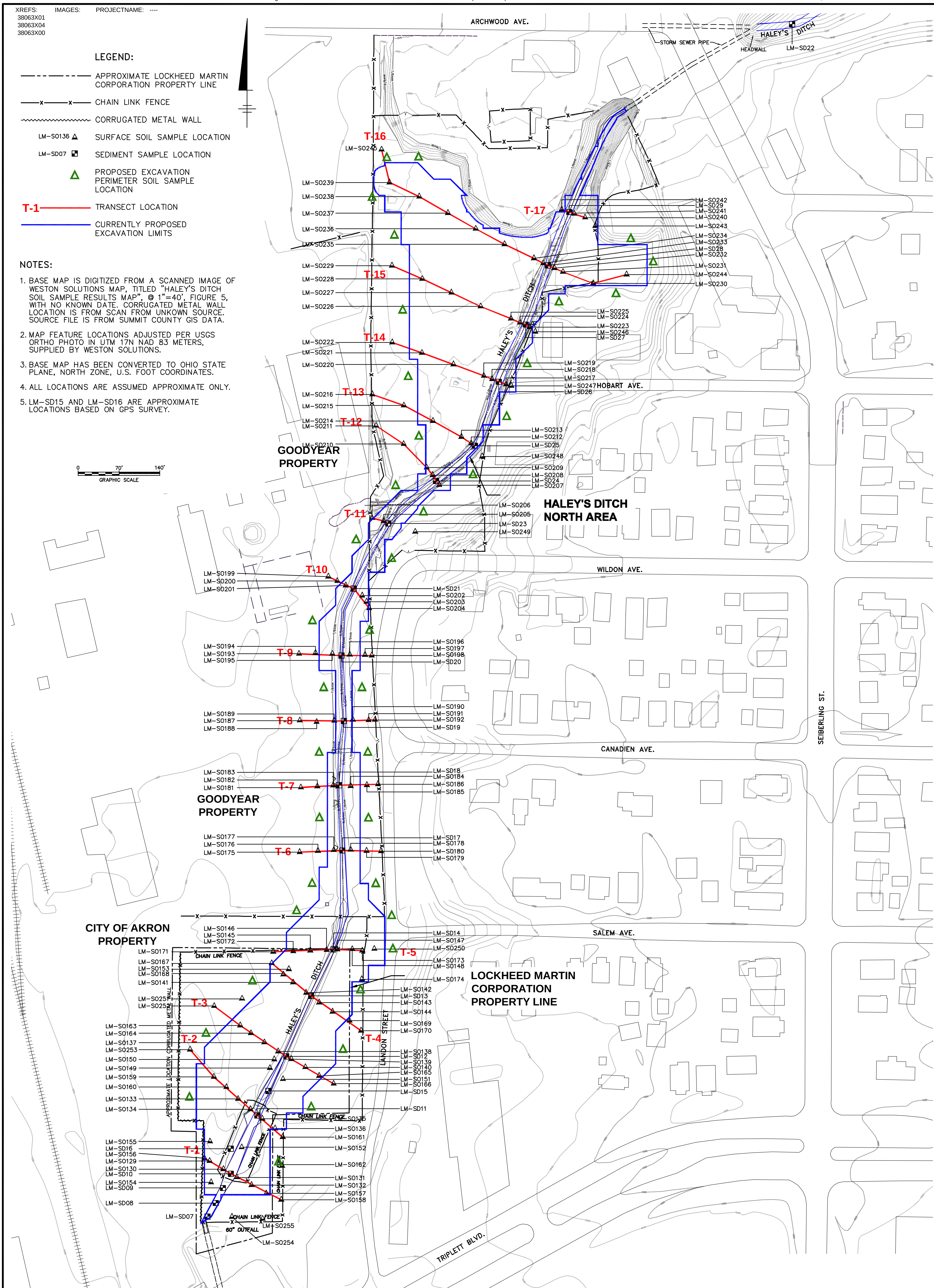

LOCKHEED MARTIN CORPORATION
AKRON, OHIO
HALEY'S DITCH SAMPLING AND ANALYSIS PLAN

HALEY'S DITCH
PROPOSED EXCAVATION PERIMETER SOIL SAMPLE LOCATIONS

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FIGURE
1

LEGEND:

- APPROXIMATE LOCKHEED MARTIN CORPORATION PROPERTY LINE
- CHAIN LINK FENCE
- CORRUGATED METAL WALL
- EXCAVATION DEPTH OF 1 FOOT
- EXCAVATION DEPTH OF 2 FOOT
- EXCAVATION DEPTH OF 3 FOOT

NOTES:

1. BASE MAP IS DIGITIZED FROM A SCANNED IMAGE OF WESTON SOLUTIONS MAP, TITLED "HALEY'S DITCH SOIL SAMPLE RESULTS MAP", @ 1"=40', FIGURE 5, WITH NO KNOWN DATE. CORRUGATED METAL WALL LOCATION IS FROM SCAN FROM UNKOWN SOURCE. SOURCE FILE IS FROM SUMMIT COUNTY GIS DATA.
2. MAP FEATURE LOCATIONS ADJUSTED PER USGS ORTHO PHOTO IN UTM 17N NAD 83 METERS, SUPPLIED BY WESTON SOLUTIONS.
3. BASE MAP HAS BEEN CONVERTED TO OHIO STATE PLANE, NORTH ZONE, U.S. FOOT COORDINATES.
4. ALL LOCATIONS ARE ASSUMED APPROXIMATE ONLY.

LOCKHEED MARTIN CORPORATION
AKRON, OHIO
HALEY'S DITCH SAMPLING AND ANALYSIS PLAN

HALEY'S DITCH SOIL/SEDIMENT REMOVAL LIMITS AND CONFIRMATION SAMPLE GRIDS

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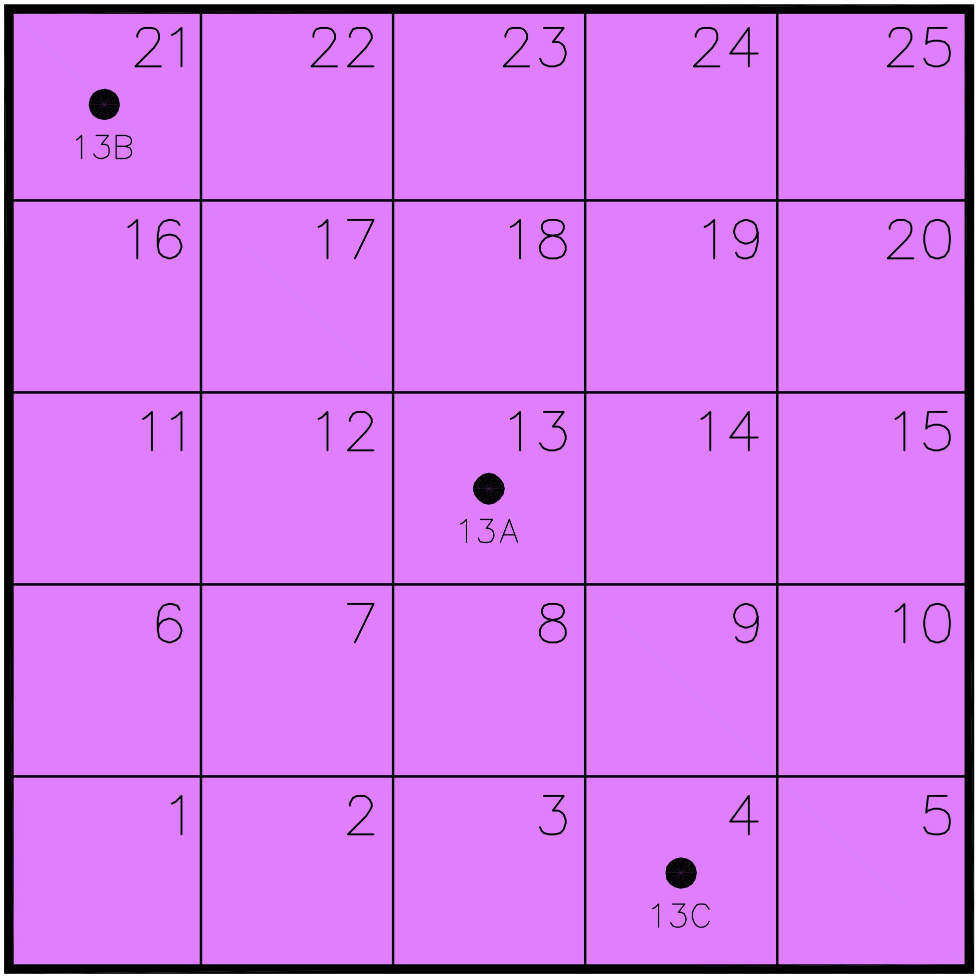
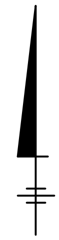
FIGURE
2





LEGEND:

13A ● CONFIRMATION SAMPLE ALIQUOT

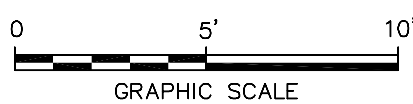
1 SUBGRID NUMBER

EXCAVATION DEPTH OF 1 FOOT

EXCAVATION DEPTH OF 2 FOOT

EXCAVATION DEPTH OF 3 FOOT

GRID 13		
ALIQUOT ID	EASTING	NORTHING
13A	2251716.797	503128.2207
13B	2251706.797	503138.2207
13C	2251721.797	503118.2207



NOTES:

1. CONFIRMATION SOIL SAMPLE ID FOR GRID 13 IS LM–SO–C–13.
2. CONFIRMATION SOIL SAMPLE COLLECTED AS A COMPOSITE OF ALIQUOTS A, B, AND C AS SHOWN. ALIQUOTS COLLECTED FROM DEPTH OF 0 TO 3 INCHES BELOW BASE OF EXCAVATION.
3. CONFIRMATION SAMPLE ALIQUOTS WILL BE COLLECTED FROM THE CENTER OF EACH SUBGRID BOX SELECTED VIA RANDOM NUMBER GENERATOR, OR FROM THE CENTER OF EXCAVATION AREAS WITHIN SUBGRID BOXES, AS NEEDED.

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AKRON AIRDOCK FACILITY
AKRON, OHIO

EXCAVATION/CONFIRMATION SAMPLE GRID 13

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FIGURE
13