MUNICIPALITY OF ANCHORAGE
Project Management and Engineering Department

MEMORANDUM

DATE: 2/07/2025

TO: Requestor

SUBJECT: PM&E 'Collection' Special Provisions for Project Manual Document

Attached is a collection of special provisions that have been compiled from PM&E's projects over the past few years. The intent is to include 'special provisions' that have the potential for re-use and may require some modifications.

These special provisions are to be used with the **2024 M.A.S.S.** only.

This collection of special provisions are not 'standard' special provisions and should not be used as such.

<u>Not all of these special provisions are applicable on all projects. Not all of these special provisions are applicable in their current wording.</u>

It is the engineer's responsibility to determine the applicability of the special provision(s) used, as well as final wording. Most of these special provisions were developed based on project-specific requirements. Please re-read the second paragraph, above.

Should you have questions, comments, or suggested revisions, please feel free to contact Brandon Telford at 343-8145 or email massupdate@muni.org.

Summary of Modifications

Date	Modification
3/22/12	Updated to Rev 2 language – removed everything inserted into Rev 2.
5/31/2012	Added Glass Cullet specials to 20.21 and 20.22; updated insurance form & 10.6.9 language
6/5/12	Modified Minimum Rates of Pay language
6/6/12	Added Sample Bid Proposal pages to show how the column spacing should be set up so the pages are actually usable.
9/10/12	Added Recycled Concrete as an alternative to Leveling Course
3/21/13	Updated for Rev 3
4/1/13	Updated Contact information
5/10/13	Updated DOL language and Bid Proposal Signature information
7/9/13	Updated Project Information Sign information & Day Labor Article #
2/21/14	Updated Contract dates and Bid Proposal Signature Page
3/28/14	Added language re: Profit & Overhead markup on Sub invoices
7/10/14	Added Line in Footer (left side) of BP pages for Contractor Name
8/12/14	Updated Utility Contact info in 10.4.17 Utilities
2/27/15	Updated for the 2015 MASS release. Removed SPs that were inserted into MASS.
3/25/15	Updated ML&P contact info. Fixed typos in the BPs.
1/6/16	Fixed years in boilerplate contract; Updated Contact info in 10.4.17
2/22/16	Deleted PW; PM&E Div to Dept; Updated 10.4.7 again; Submittal List
3/21/16	Added CEA and ENSTAR construction requirement links to 4.17
6/27/16	Added Final Rule for PHMSA link for ENSTAR requirements
7/8/16	Deleted Spenard Fence & other extra crap at the end.
3/29/17	Updated 2016 to 2017 & misc other mods to Sample Contract; published BP Excel samples (get them from the website)
4/14/17	Added “bird window” language to 20.04, 20.05, 20.06
1/31/18	Updated 2017 to 2018; added delineators to 10.4.8 and 10.5.31; changed “partially” to “fully” deteriorated pipe in 55.26; AASHTO MP-21 to AASHTO M330 in Div 55; updated Trail Clearing spec 20.05.
4/9/18	Updated OEO language and Bid Bond sheet
1/24/19	Updated to 2019 and added new Sample Contract
1/8/21	Updated Contact Information, 2021, added language to 10.04, modified Pavement Disposal note to reflect St. Maint wanting pavement.
4/1/22	Updated Contact Information; Fixed formatting issues; Modified 95.01; Updated project sign requirements in 10.4.22; Added 20.09 Removal of Pavement; Modified 20.04 and 20.06; Added 75.04 Seeding, 75.05 Sod, and 75.12 Moose Protection Fence.
5/26/23	Updated Contact Info; Fixed formatting issues; Added 30.01 thru 30.04, 30.09, 40.07 and Details 30-8A&B, 30-9, 30-16, and 40-4 thru 40-6.
4/22/24	Removed special provisions that have been incorporated into the MASS 2024 Update. Revised Section 95.03 Time of Completion provision.
2/07/25	Revisions to allow for electronic submission of bids/proposals; Updated Section 95.02, Sample Contract form, Contract Performance & Payment Bond form, and Bid Bond form; Revisions to Sections 30.02, 30.11 & 30.12; Added special detail for correction to MASS Standard Detail 30-1.

PROJECT NAME
PROJECT LIMITS

19-01b

Invitation to Bid No. ____________

PROJECT MANUAL

Municipality of Anchorage
Project Management and Engineering Department
4700 Elmore Road
Anchorage, Alaska 99507

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE
PHASE II

19-01b

MASTER INDEX

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE
PHASE II

19-01b

I

INVITATION TO BID

MUNICIPALITY OF ANCHORAGE
PURCHASING DEPARTMENT

Invitation to Bid

No. 20XXC

Paper bids must be submitted on the bid form furnished. Paper bids must be completed in ink or by typewriter and must be manually signed by an authorized person. If erasures or other changes appear on the forms, the person signing the bid must initial each erasure or change in ink.

Electronic bids may be submitted by following the submission process through BidExpress.com. All bidders planning to submit bids electronically must first register on BidExpress.com and create an Info Tech Digital ID, which is used to digitally sign bids.

If submitting a paper bid, one complete set of the bid package (which shall include the Bid Form, bid schedule, and any other required documents, if applicable) shall be completely sealed in an envelope clearly marked with the Bidder's company name and the following: <our ITB details>. Sealed bids will be received in accordance with the time schedule shown below by the Municipality of Anchorage at the Purchasing Department, 632 W. 6th Avenue, Suite 520; Anchorage, Alaska, 99501, for:

West Anchorage Snow Disposal Site

Phase II of the project consists placement of approximately 120,000 tons of fill material, removal and relocation of surcharge material, placement of geotextiles, removal of temporary and installation of permanent culverts, construction of weirs, removal of the temporary over-height detection warning system and installation of a radar over-height detection warning system, construction of trails, berms, installation of lighting and associated electrical components, signing, delineation of parking using f-shape concrete barriers, installation of fences and gates, and BMPs.

ESTIMATED CONSTRUCTION COST: Between **$6,000,000 and $8,000,000**

Site Visit(s) at ______________________________

____

Pre-Bid Conference at ______________________________

REQUEST ANY QUESTIONS BE SUBMITTED IN WRITING TO WWPUR@MUNI.ORG., BEFORE THE PRE-BID CONFERENCE. Please reference the Project Title and Invitation to Bid No. 20XXC

Bids Opened at ______________________________

Post-Bid Conference at ______________________________

An electronic (.pdf) copy of the Invitation to Bid is available at Municipality of Anchorage, Purchasing Office's website; (http://purchasing.muni.org). Should you choose to obtain a copy of the Invitation to Bid from the website; it is your responsibility to periodically check the website for addenda.

At the above-indicated time, the bids will be opened publicly and read. Bids must be received by the Purchasing Officer prior to the time fixed for opening of the bids to be considered. Time of receipt will be as determined by the time stamp in the Purchasing Office, Suite 520.

Drawings, specifications, and contract documents may be examined and will be available for pickup at 632 W. 6th Avenue, Suite 520; Anchorage, Alaska; Monday through Friday, 8 a.m. until 12 noon and 1 p.m. until 5 p.m. These documents are available for sale on a non-refundable basis at $ per set (cash or check only).

Fees stated above include parcel post charges (1st class mail). Should expedited handling be desired, Federal Express or equivalent service will be utilized on a reverse billing basis only.

The Municipality of Anchorage reserves the right to reject any and all bids and to waive any informalities in the bids. No bidder may withdraw his bid after the hour set for the opening of bids or before the Award of Contract unless said award is delayed for a period exceeding forty-five (45) days from the time of the opening.

The Municipality shall not be responsible for bid preparation costs, nor for costs, including attorney fees, associated with any (administrative, judicial, or otherwise) challenge to the determination of the lowest responsive and responsible bidder and/or award of contract, and/or rejection of bids. By submitting a bid, each bidder agrees to be bound in this respect and waives all claims to such costs and fees.

Contracts shall be awarded by written notice issued by the Purchasing Officer to the lowest responsive and responsible bidder; however, preference will be given to local bidders in compliance with Anchorage Municipal Code, Section 7.20.040.

A pre-bid conference will be held at the above-indicated time in the Purchasing Office for the purpose of answering any questions bidders may have and to consider any suggestions they may wish to make. Any changes resulting from this conference will be made by Addendum immediately following the conference. This conference is held for the benefit of the bidders. It is requested that some person of authority from the office of the prospective bidder attend this meeting.

The Municipality of Anchorage assumes no responsibility for any interpretations or presentations made by any of its officers or agents unless such interpretations or presentations are made by written addendum to this Invitation to Bid.

Bonding requirements are per M.A.S.S.B./M.A.S.S. or as per Special Provisions.

PUBLISH ONE TIME

Date ____________

____

Chris Hunter
Purchasing Director

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE
PHASE II

19-01b

II

SPECIAL PROVISIONS

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE
PHASE II

19-01b

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MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE PHASE II

19-01b

SPECIAL PROVISIONS

SECTION 95.01 LOCATION AND SCOPE

All proposed Work is located within the Municipality of Anchorage corporate limits and is more particularly located on the design drawings. The Work included under this Contract consists of furnishing all labor, materials, equipment, supervision, and other facilities necessary to successfully complete the Work set forth in the Drawings and Specifications. The Work included under this Contract consists of, but is not limited to:

- Clearing
- Excavation
- Placement of fill material
- Geotextile
- Removal of Temporary culverts and culvert installation
- Weir Construction
- Placement of BMPs
- Removal and replacement of fencing
- Soil stabilization measures, topsoil, and seeding
- Temporary truck over-height detection system removal
- Construction of over-height detection system
- Lighting, load centers, and other electrical work
- Signing

It is the responsibility of the bidder to prepare the bid so that all materials and/or fittings shall harmoniously conform to the intent of the Contract Drawings, Specifications, and Special Provisions.

Below are the schedules of Work that are presented in the Bid Proposal of this Contract:

SCHEDULE	DESCRIPTION
A	Snow Disposal Site Construction: removal and relocation of surcharge material, final construction of access road, berms, trails, and snow pad. Complete clearing, removal of temporary over height vehicle warning structure, construction of permanent over-height radar detection system,

installation of lighting and associated electrical components. Removal of temporary drainage culverts and installation of final drainage structures including weirs. Removal and installation of fencing and gates. Placement of concrete barriers, signing and striping. Topsoil and seeding. Removal of soil and erosion protection measures.

SECTION 95.02 REFERENCE TO MUNICIPALITY OF ANCHORAGE STANDARD SPECIFICATIONS

This Contract is subject to and hereby incorporates by reference the Municipality of Anchorage Standard Specifications, dated 2024, hereinafter referred to as M.A.S.S.; the 2015 Alaska Sign Design Specifications (ASDS) as adopted and amended by the Municipality; the 2016 Alaska Traffic Manual (ATM); the Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition; the 2017 National Electrical Safety Code (NESC); the 2020 National Electrical Code as amended and adopted by the Municipality of Anchorage; the most current edition of the American Association of State Highway and Transportation Officials (AASHTO) Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals as referenced in the appropriate divisions; and the Public Rights-of-Way Accessibility Guidelines (PROWAG). These references are intended to be complementary, but if conflicts exist between the references listed above, the more stringent requirement shall govern, unless directed otherwise by the Engineer.

SECTION 95.03 TIME OF COMPLETION

This Project shall be Substantially Completed within one hundred sixty (160) calendar days after the Notice-to-Proceed is issued. The Contract Completion date shall be achieved within twenty (20) calendar days after the Substantial Completion letter is issued. The total contract days for this Project is one hundred eighty (180).

SECTION 95.04 MODIFICATIONS AND/OR ADDITIONS TO MUNICIPALITY OF ANCHORAGE STANDARD SPECIFICATIONS

The following listed provisions of M.A.S.S. are amended as hereinafter stated:

A. DIVISION 10 STANDARD GENERAL PROVISIONS

Add the following Section:

SECTION 10.00 ALL APPLICABLE M.A.S.S. ARTICLES

Delete all references to and requirements for compliance with Anchorage Municipal Code Chapter 7.60 the Disadvantaged/Women Owned Business (DBE/WBE) program and specifications.

SECTION 10.02 BIDDING REQUIREMENTS AND CONDITIONS

Article 2.3 Preparation and Submission of Bids

Replace the first paragraph with the following:

Bids shall be submitted according to the instructions in the Invitation to Bid.

SECTION 10.03 AWARD AND EXECUTION OF CONTRACT

Article 3.2 Receipt and Opening of Bids

Replace the second paragraph with the following:

Modification of bids already submitted shall be considered if received by the Purchasing Officer prior to the time of bid opening fixed in the Invitation to Bid. Modifications of paper bids shall not reveal the amount of the original or revised bid. Modifications shall state a plus or minus to the affected bid item.

SECTION 10.04 SCOPE OF WORK

Article 4.8 Work Incidental to the Contract

Add the following item:

13. Installation of flexible delineators at the end of culverts, ends of retaining walls, field inlets, and other locations that may be hazardous or should be delineated for snow removal operations as determined by the Engineer.

Article 4.17 Utilities

3. Gas

Add the following paragraphs:

The Contractor shall download and follow the most current construction guidelines published by ENSTAR. Those guidelines can be downloaded from:

> https://www.enstarnaturalgas.com/safety-education/natural-gas-safety/safety-for-excavators-contractors/
>
> *Click on the link in the last sentence of the first paragraph.*

The Final Rule from the PHMSA website can be obtained from:

> https://www.phmsa.dot.gov/pipeline/excavator-final-rule/about-excavation-enforcement-final-rule
>
> *Click on the "Final Rule on Excavation Damage 80 FR 43836" link under Related Links.*

4. Electrical and Telecommunications

Add the following paragraphs:

The Contractor shall download and follow the most current construction guidelines published by Chugach Electric Association. Those guidelines can be downloaded from:

https://www.chugachelectric.com/member-services/regulations-requirements

Click on the link titled "Electrical Facility Clearance Requirements".

The following contact information is provided as a courtesy to the Contractor and is the most currently available.

Alaska Communication Systems (ACS) – William McKechnie, 564-1526 or 230-4175

Anchorage Water & Wastewater Utility (AWWU) – Jeff Hurd, 786-5526

AT&T – Mike Barsalou, 264-7325

Chugach Electric Association (CEA) – Jake Moe, 762-4720

ENSTAR Natural Gas – engineering@enstarnaturalgas.com

GCI – ospdesign@gci.com

Municipal Street and Storm Drain Maintenance – Eric Hodgson, 343-8100

Municipal Street Light Maintenance – Eric Armagost, 343-8417

Municipal Traffic Signals Section – Levi Piehl, 343-8363

Solid Waste Services (SWS) – James Armstrong, 343-6279

Matanuska Electric Association (MEA) – John Foutz, 761-9265

Matanuska Telephone Assoc. (MTA) – Robbie Nash, 761-2704 or 355-1687

Eagle River Street & Storm Drain Maintenance – Anthony Winsor, 343-1512

Alaska Waste – Josh James, 688-4446

Article 4.22 Project Information Signs

Add the following:

Contractor shall install one (1) project information sign(s) on the AWWU trail. The Contractor shall coordinate with the Engineer for placement location.

Article 4.23 Work Order Issued Under "Day Labor" Type Contracts

THE CONTRACTOR SHALL NOT ACCEPT ANY INDIVIDUAL PROJECT OR WORK ORDER UNDER THIS CONTRACT IN EXCESS OF $50,000 WITHOUT

THE PRIOR CONSENT OF THE PURCHASING OFFICER, OR HIS/HER DESIGNEE. THIS CONDITION IS A MATERIAL ASPECT OF THE CONTRACT.

Notwithstanding the notice requirements of M.A.S.S. Section 10.05, Article 5.28 - Termination of Contract by Owner violations of this provision constitute an immediate and material breach of the contract terms and may result in the termination of this contract for default by the Contractor without further administrative action.

SECTION 10.05 CONTROL OF WORK

Article 5.27 Liquidated Damages

Add the following paragraph:

> The Owner may withhold from any progress payment the sum of $<u>1,000</u> per day as Liquidated Damages for each and every calendar day that the Substantial Completion Date is delayed beyond the Contract Completion Date. The Owner may withhold out of any progress payment the sum of $500 per day as Liquidated Damages for each and every calendar day that the Final Acceptance Date is delayed beyond the Contract Completion Date. If no money is due Contractor, the Owner will have the right to recover said sums from Contractor, the Surety, or both.

Add the following

Article 5.34 Work Plan

Contractor shall submit a project Work Plan for approval by the Engineer within seven (7) calendar days after Notice-to-Proceed. Work shall not proceed until the Engineer has approved, in writing, the Work Plan. The Work Plan shall include estimated dates of completion for each segment of work. As a minimum, the Work Plan shall include the special conditions detailed in this Article.

No separate payment is made for the work described in this Article and all work required to provide an approved Work Plan is incidental to the Contract.

The following special conditions apply to the Work and this Contract:

A. Project

1. All Contractor and subcontractor employees shall attend a pre-construction safety meeting with the Owner at MOA Street Maintenance Kloep Station (5701 Northwood Drive). Attendance and participation in the meeting are incidental to the Contract and no separate payment shall be made.

2. Contractor shall attend and participate in weekly progress/ coordination meetings with the Owner. Contract shall submit an updated schedule of work anticipated within the next two weeks at the weekly progress/coordination meetings. Preparation, attendance and participation in the meeting are incidental to the Contract and no separate payment shall be made.

3. Work shall be performed in accordance with Section V – Soils Information. The Work Plan shall summarize the Contractor's understanding and approach to completing the Work in accordance with Section V – Soils Information.

4. The contractor shall plan the work in accordance with the Municipal Noise Ordinance between 6:00 AM to 10:00 PM. Work outside this timeframe may be allowed through a Contractor acquired noise permit from the Municipal Health Department.

5. Snow disposal site access road and weir surcharge fill placement Work was completed under a separate contract in the Spring of 2025. All snow disposal site pad surcharge fill shall be placed within 30 calendar days of Notice-to-Proceed. Provided completion of Surcharging in accordance with the November 19, 2024 Shannon & Wilson Surcharge included in Section V - Soils Information and/or written direction from the Engineer, the Contractor shall remove the access, road, and weir surcharge. The Contractor shall plan for access road, disposal site pad, and weir surcharge removal; and pad, weir, traffic bypass road through MOA Street Maintenance Kloep Station, access road, AWWU corridor drainage culvert, access road temporary lighting, and any required SWPPP BMP Work completion prior to October 20, 2025. All other Contract Work shall be completed in 2026 or as approved by the Engineer.

6. The Owner shall be allowed use of the snow disposal site starting October 21, 2025. MASS Article 5.30 Use of Completed or Uncompleted Portions shall apply during Owners use of the snow disposal site.

B. Haul Routes and Work/Staging Area

1. The Work Plan shall define and minimize the overall area of construction activities at any given time to minimize disruption for MOA Street Maintenance Kloep Station, AWWU corridor, Connor’s Bog Park, and Javier De La Vega Park.

2. All project access, except the AWWU corridor culvert crossing work, shall be through MOA Street Maintenance Kloep Station. The Contractor shall be limited to using the west access road extending from the northwest corner to the southwest corner of the property for

hauling operations. The Contractor shall be allowed a staging area in the southwest corner of the Kloep Station property (International East Subdivision, Tract 3B) for off-loading equipment, staging, stockpiling material, etc. This area is just south of the recycled asphalt pavement stockpile. No other areas of Kloep Station shall be used by the Contractor without the prior written approval of the Engineer.

3. The Contractor shall not exceed the maximum allowed speed of 15 miles per hour (MPH) within MOA Street Maintenance Kloep Station property.

4. The Contractor shall **not** access the snow disposal site through the AWWU corridor and/or Connor's Bog Park at any time. Connor's Bog Park is an off-leash dog park that is used year around but sees higher use in the winter months. Some of the construction area is on parts of the designated Connor's Bog Park area. The Contractor shall be required to provide pedestrian/dog control and trail/pathway closure signs as needed to limit access to the Work areas. All barriers required to limit pedestrian/dog access to the Work area shall not be measured separately and shall be considered incidental to the Contract. A map of Connor's Bog Park can be found at: https://www.muni.org/Departments/parks/PublishingImages/OffLeashDogParkAreas/ConnorsBog.pdf

4. The Contractor shall **not** access the project area through the Javier De La Vega Park (International East Subdivision, Tract 3A).

5. The Contractor shall not use, and/or store equipment, materials, etc. outside the designated Kloep Station staging area and/or Phase II project Work areas, regardless of other permit and/or easement areas included in the Project Manual and/or shown on the plans. In addition, the Contractor shall not use, and/or store equipment, materials, etc. in the areas noted as 'Areas off Limits – No Entry" or areas outside the road access, pad, berm, trail limits on Javier De La Vega Park (International East Subdivision, Tract 3A), Connor's Lake Subdivision, Tract B, and Unsubdivided NW ¼, NW ¼, Sect. 1, T12N, R4W, SM

C. Work Hours

The Contractor shall only be allowed access to MOA Street Maintenance Kloep Station during open time periods. The Contractor shall schedule Work to coincide with periods of allowable access (when facility is open). The open time periods vary for winter and summer as follows:

1. Winter (approximately October 21st to approximately May 15th) – the facility is open twenty-four (24) hours a day, seven (7) days a week.

2. Summer (approximately May 15th to approximately October 21st) – the facility is open continuously starting at 6:00 AM on Mondays through Fridays at 4:30 PM. The facility is closed from Fridays at 4:30 PM through Mondays at 6:00 AM.

D. Chugach Electric Association (CEA) Transmission Lines

1. Some of the Work is within CEA right-of-way and easements. These easements contain several above ground electrical transmission lines. The Owner has executed an agreement with CEA (included in Section VI – Temporary Construction Permits and Easements) for use of their right-of-way and easement areas. The Contractor shall follow all applicable requirements of the agreement and shall strictly follow the clearance requirements established in the National Electric Safety Code (NESC) and CEA Electrical Facility Clearance Requirements included in Exhibit A of the agreement. The Work Plan shall detail how the Contractor intends to meet the clearance requirements.

2. A Temporary Truck Over-Height Warning System was installed during Phase I Work. The Contractor shall be responsible for maintaining the Temporary Truck Over-Height Warning System until the proposed Truck Over-Height Warning System has been installed and is operational. If the Temporary Truck Over-Height Warning System is damaged or disabled, the Engineer has the right to suspend all Work until the temporary truck over-height warning system is repaired or replaced.

4. Fill material for Trail D from approximately STA 200+00 to approximately STA 201+00 shall be stockpiled on the snow disposal site pad and placed with a loader and/or similar equipment with a maximum extension/reach that meets Clearance Requirements. End dump and/or end dump and pup type dump trucks shall not be used to place embankment material on Trail D unless the Contractor can show they meet Clearance Requirements.

E. Drainage Culvert Crossing Work at the AWWU Corridor/Connor's Dog Park Trail

1. The Contractor shall be allowed a temporary closure of the AWWU Corridor / Connor's Dog Park Trail from approximately 100 feet north of the northern drainage culvert crossing to the gate at Raspberry Road for the drainage culvert crossing Work.

2. The Contractor shall prepare a Written Closure Notice. The Contractor shall submit a draft of the Written Closure Notice to the Engineer for review and comment. The Written Closure Notice shall include a map with closure area noted, dates of closure, Contractor

Project Manager and Superintendent contact information, and Owners contact information. The Contractor shall send the Written Closure Notice to Taylor Keegan, Parks & Recreation Superintendent, at Taylor.Keegan@AnchorageAK.gov; and Tanya Hickok, Parks & Recreation Project Engineer, at Tanya.Hickok@AnchorageAK.gov fourteen (14) calendar days prior to AWWU Corridor / Connor's Dog Park Trail closure. In addition, the Contractor shall laminate and post the Written Closure Notice at the Raspberry Road gate, Connor's Dog Park main parking lot public notice board, on the Project Information Sign or Street Maintenance gate adjacent to the AWWU Corridor/Connor's Dog Park Trail, and near the proposed northern drainage crossing location or point of the northern closure.

3. The Contractor shall be required to provide pedestrian/dog control and trail closure signs as needed to limit access to the Work areas. The Contractor shall also be responsible for prohibiting parking at the Raspberry Road gate. All barriers required to limit pedestrian/dog access to the Work area and prohibit parking at the Raspberry Road gate shall not be measured separately and shall be considered incidental to the Contract.

4. The Contractor shall be given a maximum of seven (7) continuous calendar days to complete the 3 culvert crossings. All work for the culvert crossings shall be completed within the seven (7) continuous calendar day closure period.

5. The Contractor may mobilize and demobilize equipment and materials for the proposed drainage culvert crossing work through the snow disposal site area and associated Trail E. The Contractor may also use the Raspberry Road gate for equipment mobilization/demobilization, material deliveries, export of unusable material, construction access, etc. Raspberry Road is Alaska Department of Transportation (ADOT) right-of-way (ROW). The Contractor shall be responsible for obtaining ADOT ROW permits as necessary. Keys for the Parks & Recreation pad lock on the Raspberry Road gate can be checked out from Parks & Recreation Administration at City Hall (632 West 6th Avenue, Suite 630). The Contractor shall be responsible for any key deposit fees/costs.

6. The Contractor shall not store equipment, materials, backfill or excavation stockpiles, etc. outside the closure area on Parcel 4 (Connor's Lake Subdivision, Tract A1) at any time.

B. DIVISION 20 STANDARD CONSTRUCTION SPECIFICATIONS FOR EARTHWORK

Add the following:

SECTION 20.10 GENERAL EXCAVATION

Article 10.5 Usable and Unusable Excavation

Add the following after the first paragraph:

After the completion of Pad surcharging, usable classified fill material shall be removed and placed on the berms and trails per plans. Excess removed pad usable excavation classified fill material shall be removed from the snow disposal site area and placed in a stockpile near the Kloep Maintenance Facility warm storage building (5901 Northwood Drive).

Add the following to the end of the second paragraph:

If landfill waste, trash, debris and/or other objectionable material, as determined by the Engineer, is encountered during excavation Work, the Contractor shall separate the landfill waste, trash, debris and/or other objectionable material from the landfill cover soils.

Article 10.7 Disposal of Unusable Material

Add the following after the last paragraph:

Unusable excavation, including but not limited to landfill cover soils, landfill waste, trash, debris and/or other objectionable material, shall be hauled to Anchorage Regional Landfill for disposal. Separated landfill waste, trash, debris and/or other objectionable material shall be hauled separately from landfill cover soils.

Article 10.8 Measurement

Replace the first sentence of the second paragraph with the following:

Usable excavation shall be measured per cubic yard by cross section.

Add the following after the last paragraph:

Unusable excavation and disposal at Anchorage Regional Landfill shall be measured per ton. Separation of landfill waste, trash, debris and/or other objectionable material from landfill cover soils shall be incidental to this this Work.

Article 10.9 Basis of Payment

Add the following pay item:

ITEM	Unit
Unusable Excavation and Disposal at Anchorage Regional Landfill	Ton
Usable Excavation Placed as Classified Fill and Backfill (Cross Section)	Cubic Yard

C. DIVISION 30 STANDARD CONSTRUCTION SPECIFICATIONS FOR PORTLAND CEMENT CONCRETE

Add the following:

SECTION 30.02 PORTLAND CEMENT CONCRETE, CURB AND GUTTER AND VALLEY GUTTER

Article 2.3 Construction

Replace the last sentence of Subparagraph 1. Expansion Joints of Subarticle E. Expansion and Contraction Joints with the following:

After the concrete has set, the expansion joints shall be filled flush to the finish concrete surface with a “Superflex” hot-applied asphalt-based sealant, “Sika-Flex” polyurethane sealant or approved equal, applied according to the manufacturer's recommendation.

Add the following:

SECTION 30.09 CONCRETE PARKING BUMPERS

Add the following after the last sentence:

Article 9.1 Description

This work includes placement of precast portable barriers (MASH F-Shape), Class B-B at the locations shown in the plans. Equip each section of barrier with at least two side-mounted retroreflective tabs placed as a continuous 4-inch wide horizontal retroreflective stripe mounted 6 inches below the top of the barrier. See Special Details included in Section IV.

Add the following

Article 9.2 Material

Portable concrete barriers must meet the following crash testing compliance criteria:

	Devices Manufactured Before Dec. 31, 2019	**Devices Manufactured after Dec. 31, 2019**	**Method of Documentation**

Portable Concrete barriers	NCHRP 350, MASH 2009, or MASH 2016	MASH 2016	FHWA eligibility letter, if available, at Test Level 3, or DOT&PF eligibility determination, unless otherwise required in the Contract

Use retroreflective sheeting that meets ASTM D4956 Type III, IV or V.

Add the following

Article 9.3 Construction

Install portable concrete as specified on the Plans to delineate the Snow Disposal access road from the parking area for 5701 Northwood Drive.

Add the following

Article 9.4 Measurement

This work shall be measured per linear feet accepted in place.

Add the following

Article 9.5 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 - Measurement and Payment and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Concrete Traffic Barrier (32 inch)	Linear Foot

Add the following:

SECTION 30.11 SIDEWALK JOINT SEALANT

Article 11.2 Materials

Replace the first sentence with the following:

Sealant materials shall be a “Superflex” hot-applied asphalt, “Super-Flex” polyurethane or approved equal.

SECTION 30.12 HIGH-PERFORMANCE CONCRETE

Article 12.2 Materials

Replace Subarticle E. Expansion Joints with the following:

Filler material shall be non-asphaltic material, one-half inch (1/2”) wide and four inches (4”) deep, with the top one inch (1”) strippable. Primer shall be “Externaflex” 1993 or approved equal. Sealant shall be “Sika-Flex” polyurethane or approved equal. Contractor shall use the appropriate sealant color to match the colored concrete, including Brick Red sealant to match the red concrete.

D. DIVISION 40 STANDARD CONSTRUCTION SPECIFICATIONS FOR ASPHALT SURFACING

Delete the Section in its entirety and replace it with the following:

SECTION 40.08 RECYCLED ASPHALT PAVING (RAP)

Article 8.1 General

The Work under this Section consists of performing all operations necessary to complete construction of a recycled asphalt paving (RAP) surface on the prepared subbase.

Article 8.2 Materials

RAP shall be Owner supplied. RAP material for the project is stockpiled at MOA Street Maintenance Kloep Station adjacent to the Contractors staging area.

Article 8.3 Construction

The RAP shall be placed to the lines, grades, and thicknesses shown on the Drawings and shall consist of the materials specified. The RAP shall provide a smooth stabilized paved surface on which motorized and non-motorized traffic use.

A. Preparation of Subbase

Subbase preparation shall be completed by others in accordance with Division 20, Section 20.11 – Grading Existing Surfaces with the compaction density modified to ninety-five percent (95%). Surfaces shall be cleaned of all foreign substances and debris. Any ruts or soft yielding spots that may appear in the subbase surface shall be corrected by loosening, removing and adding approved material, reshaping, and recompacting the affected areas to the line, grade, and to the specified density requirements.

B. Placing

The provided RAP material shall be deposited and spread uniformly on the prepared subbase in one uniform layer to the required contour and grades and to such loose depth that when compacted to the density required will achieve the specified thickness. Portions of the layer which become segregated in spreading shall be remixed to a uniform gradation.

C. Compacting

The RAP shall be compacted to at least ninety-five percent (95%) of maximum density as per AASHTO T 180 Method D. In all places not accessible to the rolling equipment, the mixture shall be compacted with tamping equipment capable of attaining the specified density. Blading, rolling, and tamping shall continue until the surface is smooth and free from waves and inequalities. If at any time the mixture is determined to be above or below optimum moisture, it shall be aerated by means of blade graders, harrows or other approved equipment or moisture added until the moisture content is such that the surface can be recompacted and finished as above. In place compaction shall be accomplished with a double-drum vibratory asphalt compactor with a minimum of fifteen thousand (15,000) pounds of dynamic force per drum. All requests for equipment substitution shall require a current certification test, identifying the capability of the equipment to meet the required specifications.

D. Smoothness Test

The surface of the RAP, when finished, shall not show any deviation more than three-eighths inch (3/8”) when tested with a ten-foot (10’) straightedge applied parallel with and at right angles to the centerline of the area to be paved. Any deviation more than this amount shall be corrected by loosening, adding, or removing material and reshaping and compacting to satisfy the above requirement.

The Contractor shall furnish a ten foot (10’) long straightedge and shall, in the presence of the Engineer, straightedge test the entire surface.

Article 8.4 Measurement

The RAP shall be measured in cubic yards by truck count of materials delivered and placed in accordance with these Specifications.

Article 8.5 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Recycled Asphalt Pavement (RAP)	Cubic Yards

F. DIVISION 55 STANDARD CONSTRUCTION SPECIFICATIONS FOR STORM DRAIN SYSTEMS

SECTION 55.26 CURED IN PLACE PIPE (CIPP) LINING

Article 26.3 Materials

Replace #1 of C. Structural Requirements with the following:

1. Pipes shall be considered fully deteriorated.

I. DIVISION 70 STANDARD CONSTRUCTION SPECIFICATIONS MISCELLANEOUS

Delete this Section in its entirety and replace with the following:

SECTION 70.07 REMOVE PIPE

Article 7.1 General

The Work under this Section consists of performing all operations pertaining to the maintenance, removal and disposal or salvage of existing pipes (of whatever size of pipe encountered), when encountered in the excavation and/or as directed by the Engineer.

Article 7.2 Construction

Contractor shall maintain and remove the existing drainage pipes as shown on the Plans. Drainage pipe maintenance shall include but may not be limited to adjusting the existing drainage pipes elevations as needed or as directed by the Engineer to facilitate drainage flow. Contractor shall remove salvageable pipes and deliver the pipes to a location as directed by the Engineer. Contractor shall provide a disposal site for non-salvageable material in accordance with the provisions of Division 10, Section 10.04, Article 4.9 - Disposal Sites. Excavation required in the maintenance and removal of the pipes is incidental to this bid item. Contractor shall backfill the excavation with existing classified Type IIA materials and compact it to not less than ninety-five percent (95%) of maximum density as directed by the Engineer.

Article 7.3 Measurement

Maintenance and removal of pipes is measured per linear foot without regard to pipe size. Removal of electrical conduit of whatever size and type is incidental to the Contract, unless provided for elsewhere in the Contract.

Article 7.4 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 - Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Maintain and Remove Existing Pipe	Linear Foot

Add the following Section:

SECTION 70.08 SILT FENCE WITH COMPOST SOCK

Article 8.1 General

The work under this Section shall consist of furnishing, installation, maintenance and removal of new silt fence and compost sock as needed, and maintenance and removal of existing silt fence and compost sock after site stabilization/SWPPP NOT and prior to Final Acceptance. Product information for existing silt fence and compost sock is included in Appendix IV - Special Details.

Article 8.2 Material

Compost socks shall be manufactured of photodegradable or biodegradable fabric netting without preservative treatment, evenly woven, free of crusted material, cuts, and tears. Manufacture stakes of photodegradable or biodegradable material (wood stakes, except as approved by the Engineer).

a. Extra Heavy weight fabric netting with a minimum strand width of 5 mils.

b. Filled with coarse compost.

c. Minimum diameter 8 inches.

Article 8.3 Construction

Install new silt fence and compost socks as directed by the Engineer. Use trenchless installation. If installing when ground is frozen, drill holes for support posts if required.

When joining to another roll, place both end posts together and wrap them with silt fence by turning them one full rotation. Drive the wrapped posts.

Install the compost sock at the base of the silt fence as shown on the plans.

The Contractor shall maintain the new and existing silt fence and compost socks as needed and/or as directed by the Engineer. Upon project completion, Contractor shall remove all new and existing silt fence and compost socks. The existing compost socks contain white spruce wood chips. The existing compost socks can be cut open and the white spruce wood chips can be spread on site. All other new and existing silt fence and compost sock materials shall be removed from the project site and properly disposed of.

Article 8.4 Measurement

The silt fence with compost sock shall be measured per Linear Foot.

Article 8.5 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Furnish, Install, Maintain, and Remove New Silt Fence with Compost Sock	Linear Foot
Maintain and Remove Existing Silt Fence with Compost Sock	Linear Foot

Add the following section:

SECTION 70.09 BONDED FIBER MATRIX WITH TACKIFIER

Article 9.1 General

The work under this Section shall consist of furnishing, installation and maintenance of a bonded fiber matrix with an added tackifier.

Article 9.2 Material

A fiber mulch matrix: biodegradable and composed of wood, straw, coconut and other fibers natural and man-made. When applied, create a continuous, porous, absorbent high water holding, flexible blanket/mat/mulch/covering making intimate contact with, and adhering to sloped soil surface; permitting water infiltration; resists erosion and promotes rapid germination and accelerated plant growth. The fibers may be thermally processed and cross-linked with a hydro-colloidal or linear anionic tackifier (curing period 24-48 hours) or mechanically-bonded (no curing period).

When agitated in slurry tanks with water the fibers shall become uniformly suspended, without clumping to form homogeneous slurry.

Tackifier, viscous overspray, generally composed of dry powered vegetable gums derived from guar gum, psyllium and sodium alginase; asphaltic emulsions; petroleum distillates; co-polymer emulsions; and lignosulfonates and used to anchor soil, compost, seed, the mulch fibers to one another, and the ground. Contain no growth or germination inhibiting materials nor significantly reduce infiltration rates. Tackifier shall hydrate in water and readily blend with other slurry material. Tackifier options include:

1. Type A. Organic tackifier with certification of plant sources; or
2. Type B. Synthetic tackifier with certification confirming product is not harmful to plants, animals, or aquatic life.

Article 9.3 Construction

Apply stabilization material, including rate of application, according to the manufacturer's requirements. Apply tacking agents according to the manufacturer's installation instructions matched to the application providing functional longevity, erosion control effectiveness, and vegetative establishment.

Article 9.4 Measurement

The Bonded Fiber Matrix with Tackifier shall be measured per 1000 Square Feet.

Article 9.5 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Bonded Fiber Matrix with Tackifier	1000 Square Feet

Add the following section:

SECTION 70.10 SETTLEMENT PLATES

Article 10.1 General

The Work under this Section consists of the performance of all Work required for furnishing and installing additional pipe onto existing settlement plates, and protecting, measuring, maintaining, and removal of existing settlement plates within the Project.

Settlement plates include all associated elements as depicted in the detail included in Appendix IV - Special Details.

Article 10.2 Material

Pipe shall be four-foot (4') in length and two-inch (2") NPS SCH 40 A53 Gr. A Type E carbon steel. Pipe shall be connected using two-inch (2") threaded couplings. Pipe shall be sleeved using four-inch (4") PVC pipe with a threaded cap as depicted in the detail.

Article 10.3 Construction

Twenty-seven (27) settlement plates, twenty (20) on the pad, four (4) on the access road, and one (1) at each of the three (3) weir locations, were installed under a separate Contract. The twenty (20) existing settlement plates installed on the pad shall require extension by adding a coupling and an additional four-foot (4') length of pipe, and extension of the PVC sleeve. Overall pipe installed length, including all additions/couplings, for each riser shall be recorded for each location. Previous recorded measurements shall be provided by the Engineer. Settlement pipes extending up from the settlement plates must have protective covers at the surface and be made highly visible so that they are not disturbed while construction is taking place. Maintain plum vertical progress of pipe throughout backfill and compaction. If a settlement plate pipe is out of plum more than 10 degrees after each lift is compacted, remove and replace the material within 5' of the pipe at the expense of the Contractor.

Only hand operated compaction equipment may be used on fill material within five (5') feet around pipes. Place and compact fill material as uniformly as possible on all sides of the settlement pipes. Do not damage settlement plates; damaged settlement plates require replacement and extended settlement periods.

Surveyors shall take the elevation readings off the top of the settlement plate pipe. Remove the cap from the pipe and take the elevation off the top rim of the pipe. The Contractors surveyors shall measure changes in settlement pipes after each lift of fill is placed daily. Survey measurement of the settlement plate pipe shall have an accuracy of 1/100 of a foot (0.01 foot). After material placement has been completed readings shall be taken weekly.

All costs associated with replacement of damaged settlement plates shall be the responsibility of the Contractor, and no extensions of Contract Time shall be granted for settlement period extensions resulting from the Contractor's negligence.

Article 10.4 Measurement

Furnishing and installing additional pipe onto existing settlement plates, and protecting, measuring, maintaining, and removal of existing settlement plates is measured per each.

Article 10.5 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following item:

ITEM	UNIT
Settlement Plates	Each

Add the following section:

SECTION 70.11 TEMPORARY TRUCK OVER-HEIGHT WARNING SYSTEM

Article 11.1 General

The Work under this Section consists of the performance of all Work required for protecting, maintaining, and removal of the existing temporary truck over-height warning system. The existing temporary truck over-height warning system consists of two wood utility poles, stabilized using a guy anchor system, a system of cable and chain suspended between the poles.

Article 11.2 Construction

The Contractor shall be responsible for monitoring and maintaining the cable and chain suspended between the poles as necessary to meet CEA Clearance Requirements.

If the temporary truck over-height warning system is damaged or disabled, the Engineer has the right to suspend all Work until the temporary truck over-height warning system is repaired or replaced. If Work is suspended by the Engineer due to temporary truck over-height warning system being damaged or disabled, the Engineer may issue a Change Order with an equitable adjustment to Contract time, but no equitable adjustment shall be made for the cost of delay, stand-by, inconvenience or damage.

Maintenance of the temporary truck over-height warning system under this Section includes modifying the elevations of the suspended cable and hanging chains to meet CEA Clearance Requirements, repair and replacement as required.

The existing temporary truck over-height warning system shall be removed after installation of the permanent over-height warning system, or as approved by the Engineer. Removal includes removal of the system of cable and chain suspended between the poles and guy wires, and removal and/or cutting two wood utility poles and guy anchors a minimum of two (2) feet below ground surface.

Article 11.4 Measurement

Protecting, maintaining, and removal (including disposal) of the existing temporary truck over-height warning system shall be measured by lump sum.

Article 11.5 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as shown in the plans and described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Maintain and Remove Temporary Truck Over-Height Warning System	Lump Sum

Add the following section:

SECTION 70.12 WIDE PAD DOZER

Article 12.1 General

Work under this item consists of furnishing a wide pad dozer for use in construction of extra or unanticipated work at the direction of the Engineer. This item is limited to the wide pad dozer and does not include support equipment such as, but not limited to, hand tools, power tools, electric power generators, welders, small air compressors and other shop equipment needed for maintenance of the wide pad dozer.

Article 12.2 Construction

The performance of the work shall be according to the instructions of the Engineer, and with recognized standards and efficient methods. The Engineer will begin recording time for payment each shift when the equipment begins work on the project.

Article 12.3 Measurement

Work performed with the wide pad dozer will be paid by the hour.

Article 12.4 Basis of Payment

Payment includes the equipment rate plus the operating costs including: furnishing, travel time, operating, maintaining/servicing and repairing the equipment along with the costs incidental to the equipment and its' operation.

Furnishing and operating equipment that is heavier, has larger capacity, or greater power than specified will not entitle the Contractor to extra compensation.

Payment for this Work shall be in accordance with Division 10, Section 10.07 –

Measurement and Payment, and will include full payment for all Work as described in this Section.

Payment is made under the following unit:

ITEM	UNIT
Wide Pad Dozer, 65 hp min.	Hour

Add the following section:

SECTION 70.24 SCREW PILE SUPPORTED WEIR

Article 24.1 General

The work under this Section shall consist of the performance of all Work and materials required for the furnishing and installation of the Screw Pile Supported Weirs as shown in the drawings.

Article 24.2 Material

Weir materials shall meet the requirements as shown on the drawings. Fiberglass Weir Plates shall have a final cured resin meeting the following:

Test	**Value (Min)**
Tensile Strength	8,900 psi
Flexural Strength	17,150 psi
Flexural Modulus	638,700 psi
Tensile Modulus	681,300 psi
Barcol Hardness, 934-1	41

Weir Plates shall have laminated physical properties meeting the following:

Test	**Value (Min)**
Tensile Strength	15,150 psi
Flexural Strength	25,250 psi
Flexural Modulus	965,000 psi

Tensile Modulus	1,108,000 psi
Barcol Hardness, 934-1	45

Construct weirs using layers of resin and Chopped Strand Mat that has been treated with TMP 900 Isophthalic Gel Coat, or approved equivalent, until a minimum of ¾" thickness and values listed above are obtained.

Article 24.3 Construction

Construct per manufactures instructions and as depicted on the drawings. Resin and work area shall be between 70 - 95 degrees Fahrenheit to have satisfactory results. Initiator levels shall be within a range of 1.0 – 2.2 percent based on weight of resin.

Resins shall be stored in closed containers at temperatures below 75 degrees Fahrenheit and away from all heat sources and sunlight.

Article 24.4 Measurement

Screw Pile Supported Weir shall be measured as per each including complete units and installation including the piles, valves, fabrication of the weir and installation. Clean sand and geotextile fabric is incidental to this pay item. Rip Rap is paid for under Section 20.24

Article 24.5 Basis of Payment

Payment for this Work shall be in accordance with Division10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Screw Pile Supported Weirs	Each

Add the following section:

SECTION 70.25 SNOW MARKER POLES

Article 25.1 General

The work under this Section shall consist of furnishing all materials, tools, and equipment and the performance of all Work required for the furnishing and installation of Snow Marker Poles around the perimeter of the snow disposal pad.

Article 25.2 Material

Contractor shall provide new, undamaged materials as specified on the drawing and in these Specifications. Contractor shall furnish assemblies of snow boundary markers consisting of perforated steel tube (PST) sleeves and 3/8-inch diameter bolts with nuts and flat washers, all galvanized. Snow Poles shall be manufactured from polyolefins conforming to the following property specifications:

Property	Test Method	Value
Specific Gravity	D1505	0.95
Hardness (min)	D1525	60D
Tensile Strength @ Break D368 (psi)	D638	652.5
Elongation 2 Break %	D638	800
Modulus of Elasticity (psi)	D638	400,050
Low Temp. Brittleness Point	D746	-60°C

Article 25.3 Construction

Construct as depicted on the drawings and at the direction of the engineer

Article 25.4 Measurement

Snow Poles shall be measured as per each complete unit installed in place and no separate payment shall be made.

Article 25.5 Basis of Payment

Payment for this Work shall be in accordance with Division10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Snow Marker Poles	Each

J. DIVISION 75 STANDARD CONSTRUCTION SPECIFICATIONS FOR LANDSCAPING IMPROVEMENTS

Add the following:

SECTION 75.04 SEEDING

Article 4.2 Materials

Add the following after the last paragraph in Subarticle A:

Schedule F: Snow Disposal Seed Mix

Application Rate: 4.5 lbs./1000 s.f.

Name	Proportion by Weight
Red Rescue *(Festuca Rubra)*	40%
Nortran Tufted Hairgrass *(Deschampsia caespitosa)*	20%
Leymus arenarius	20%
Beckmannia syzigachne	20%

Add the following

SECTION 75.10 BOLLARDS

Add the following to the first paragraph

Article 10.1 General

Weld a bracket and 36" of heavy chain with slip hook to the bollard.

Article 10.4 Measurement

Add the following after the fourth paragraph

Measurement for the bracket, chain, and slip hook will be incidental to the installation of the steel bollard and no separate payment will be made.

Add the following

SECTION 75.17 CHAIN LINK FENCE

Article 17.1 General

Add the following after the last paragraph:

C. The work under this section consists of providing all operations and furnishing all equipment pertaining to the removal and disposal of existing chain link fence and gates designated for removal of the drawings or as directed by the Engineer.

Article 17.4 Construction

Add the following after the last paragraph:

D. Contractor shall remove the fence, supporting posts, gates, foundations, and deliver then to a location as directed by the engineer. If fence, gates, supports are not salvageable the contractor shall provide a disposal site for the removed fence, gates, supporting posts, and concrete foundations in accordance with the provisions if Division 10, Section 10.04, Article 4.9 – Disposal Sites.

Article 17.5 Measurement

Add the following

Removal and salvage or disposal of the fence, posts, foundations, and all associated hardware is measured per linear foot of chain link fence. Removal and salvage or disposal of the gate, posts, foundations, and all associated hardware is measured per each. Delivery of fencing, gates, and associated components to Engineer-designated location or disposal at Contractor furnished disposal site is incidental to the pay item and no additional payment will be made.

Article 17.6 Basis of Payment

Add the following

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Removal of Chain Link Fence (Height, Type)	Linear Feet
Removal of Gate	Each

Add the following Section

SECTION 75.18 WOVEN WIRE FENCE and GATE

Article 18.1 General

The work under this section includes but is not limited to all labor, materials, transportation, testing, equipment, and services necessary to furnish and install woven wire fence and gates as shown on the drawings and specified herein. This item includes providing a KNOX Padlock.

Article 18.2 Materials

Provide brown or black fabric. Fabric shall be a fixed knot grid with a core wire size between a 12.5 and 9 gage thickness and having vertical and horizontal wire spacing of 6 inches.

Fabric shall be either painted zinc-aluminum steel fabric or vinyl coated steel fabric. Vinyl Coated Steel Fabric. Vinyl coated steel fabric shall be in accordance with either:

1. AASHTO M 181, Type IV, Class B. In addition to the referenced colors, brown or black will also be acceptable; or

2. ASTM F668-11, Class 2b (fused and adhered). Polymer coating can be PVC or Polyolefin. Color shall conform to ASTM F934-96 (2013) Colors of coated chain link systems.

Painted zinc-aluminum steel fabric shall be Bekaert Corporation Solidlock® 12.5g Game Fence, Fence Design 2096-6, Part Number 136261 or an approved equal meeting or exceeding ASTM A-116-05 and ASTM A- 856-03.

Posts, Braces, Rails and Gate Frames members shall be in accordance with AASHTO M 181, Grade 1 or Grade 2, and of the shape and dimension shown on the plans. These members may be used with either Type I, Type II, Type III or Type IV fabric.

Posts, rails, braces, and gate frames shall be galvanized steel pipe, or equivalent galvanized roll-formed sections. Tubular posts shall be fitted with a snug-fitting, galvanized metal cap. The tubing shall be galvanized inside and outside according to AASHTO M 111, using zinc of any grade according to requirements of AASHTO M 120. The zinc coating shall have a minimum average of at least 1.8 oz/sq ft of surface for schedule 40 pipe. LG-40 pipe shall have a metallic coating of zinc, plus a conversion coating and a clear organic film, conforming to ASTM F1043 Type B coating requirements. The interior of the LG-40 pipe shall be coated with a zinc rich paint conforming to ASTM F1043 Type D coating requirements.

Gates shall be of the same type material as used in the fence construction.

Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type.

Miscellaneous steel fittings and hardware shall meet AASHTO M 181, Type I, Grade 1.

Each roll of fabric shall carry a tag showing the kind of base metal, kind of coating, the gage of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal, and kind of coatings.

Finish for Posts, frames, gates, hardware, and ties shall meet the following:

1. Electrostatically applied powder coating of a pigmented, urethane-cured, polyester. The coating shall be a minimum 4 mils thickness applied over zinc galvanizing.
2. Color: Brown or black.

3. Salt spray resistance. No rusting or blistering, tested to ASTM B117 for 1000 hours.
4. Adhesion: Tested to ASTM D3359, Method B.
5. Ties: PVC - thermally fused and bonded method per ASTM F668, Class 2b or electrostatically applied powder coating of a pigmented, urethane-cured, polyester.

The specified color of the steel fabric, posts, frames, gates, hardware, and ties shall match. Non-uniform color will be considered cause for rejection by the Engineer.

Padlock model 3782_S, Exterior Use, 2-3/8 inch Shackle, Sub mastered. See Section IV Special Details for additional information that is required when acquiring padlock.

Article 18.3 Construction

Install fence in accordance with ASTM Practice 567 and to the details on the Plans and as specified herein using new materials. The Contractor shall be responsible for establishing the fence alignment as shown on the Plans. After the fence line has been staked and prior to fence installation, the Contractor shall review the alignment with the Engineer and make required adjustments to avoid conflicts.

The use of “tracked vehicles” on unfrozen soil will not be allowed within 10’ of wetland areas identified on the plans.

The excavation and installation of concrete foundations will not be allowed in classified wetlands. In wetland areas and in areas having unstable soils, all end posts, corner posts, and pull posts shall be driven to a minimum embedment depth of 5 feet or post embedment depth to firm bottom plus 1 foot, whichever is greater, as detailed on the Plans, and at the spacing shown on the Plans. Pull posts shall have a minimum spacing of 330 feet.

Outside of wetland areas and in areas having stable soils, all end posts, corner posts and pull posts shall be set in concrete at the required dimensions and depths and at spacing shown on the plans or posts may be driven to a minimum embedment depth of 5 feet. Pull posts shall have a minimum spacing of 330 feet.

Should rock be encountered at a depth less than the planned embedment depth, a hole 2 inches larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches. After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

Except in classified wetlands, the rock may be excavated to the required embedment depth, in lieu of driving or drilling.

Spread all excess excavated material neatly and uniformly. Remove excess concrete and other construction debris from the site.

The wire fabric shall be firmly attached to the posts and braced in the manner shown on the Plans. Wire tie at 12" o.c. fabric to line posts, top and bottom rails/tension wire, brace members and all gate frame members. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric on the ground surface. Except in designated wetland areas, grading shall be performed where necessary to provide a neat appearance.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts and additional wire fabric shall be used. Posts shall not be installed in drainage ditches or swales. Posts shall be located 2 feet minimum from top of ditch or swale.

Article 18.4 Measurement

Woven wire fence, posts, foundations, and all associated hardware is measured per linear foot at the base of the fence parallel to the ground, excluding gates. All work associated with installation of fence posts in wetland areas and in areas having unstable soils is subsidiary.

Knox Padlock is subsidiary to the Gate pay Item.

Woven Wire Gate will be measured by Each complete unit, including all posts, foundation, and hardware, as shown on the Plans and details.

Grading and spreading of excavated material is subsidiary to the installation of fencing and gates.

Article 18.5 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Woven Wire Fence (Height, Gage)	Linear Feet
Gate (Height, Swing, opening)	Each

K. DIVISION 80 STANDARD CONSTRUCTION SPECIFICATIONS FOR TRAFFIC SIGNALS AND ILLUMINATION

Add the following

SECTION 80.22 FLASHING BEACONS

Article 22.1 General

Add the following Item:

D. Overheight sensor:

1. Operating voltage: 120v
2. Alarm output: two 115vac 10a rated dry relay contact closures
3. Alarm time: adjustable by customer from 1 to 30 seconds
4. Maximum range: 800 feet
5. Direction selection: selection switch. No tools or adjustment required.
6. Alignment: Two Green LEDs and GO-NOGO meter provided for alignment. No special tools required.
7. Reaction speed: 1mph to 75mph for a 2.5 inch diameter object 1 inch above the height of detection.
8. Temperature range: -40° to +135° f
9. Sensor: dual beam visible red / infrared
10. Trigg Industries model # DB-R/IR-3200 or equal.

After the first paragraph, add the following paragraphs

Article 22.2 Measurement

The hazard beacon pay item includes the pole, foundation, sign, LED assembly, and all necessary mounting hardware, wiring, and conduit to provide a complete and working hazard beacon.

The flashing beacon control unit pay item includes the flasher cabinet, transformer, disconnect, over height sensor, and all necessary mounting hardware, and wiring and conduit at the pole to provide a complete and working flashing beacon control unit. The pole, foundation, j-box, wiring and conduit between poles and j-boxes, luminaire arm, and luminaire shall all be paid for separately.

The over height sensor, one height adjustment after calibration, and all labor, equipment, and material to provide a complete and working detection system shall be subsidiary to the Flashing Beacon Control Unit pay item. Initial height to be determined by the PlansE.

Add the following Section:

SECTION 80.31 TEMPORARY ILLUMINATION

Article 31.1 General

The work under this Section shall consist of furnishing, installation, maintenance and removal of temporary illumination on the access road from approximately Station 19+00 to approximately Station 29+00.

Article 31.2 Temporary Illumination System

The temporary illumination system shall meet the number of poles and illumination levels of the proposed permanent illumination system. A plan for the temporary lighting system shall be submitted to and approved by the Engineer prior to implementation. The Contractor shall furnish and install all materials and miscellaneous hardware required to provide a functional lighting system. Branch conductors may be triplex aluminum with messenger cable if they are installed overhead. Illumination conductors shall be sized so that the voltage at the most remote luminaire is not less than specified by the luminaire manufacture for equipment operation. Luminaires used in the system should have a light distribution compatible with the snow disposal site access road.

The temporary lighting systems may consist of any lighting pole types, or combinations thereof, provided the luminaires have a minimum of mounting height consistent with the proposed permanent illumination system. Mounting height is the difference in elevation between the luminaire retractor and the edge of traveled way at the same station. Any Contractor-supplied poles may be wood and shall meet 1994 AASHTO design criteria for one hundred mile per hour (100 mph) winds with gusts to one hundred thirty miles per hour (130 mph). Pole embedment shall meet the depth required for the proposed permanent illumination system.

If the Contractor deems the existing load center can supply adequate power, the Contractor may use the existing load center. The Contractor shall provide all Work to modify these load centers as required to provide functional temporary lighting system, and to install them completing all Work in accordance with the NEC.

Once the Contractor commences Work on the project, they shall provide all maintenance for the existing electrical facilities. The Contractor shall maintain electrical power to the Warm Storage building (5901 Northwood Drive) at all times. The Municipality shall pay for the electrical power for the abovementioned electrical systems. The above maintenance does not include any prior damage such as burned-out lamps, non-operative detection or other malfunctioning equipment. The Contractor shall present written documentation of all nonfunctioning and malfunctioning electrical equipment before commencing Work on the project. This malfunctioning equipment shall be inspected jointly by personnel from the Engineer's staff and the Contractor. In the event the Engineer does not receive notice in writing and the Contractor begins Work on the project, this shall suffice as evidence that all equipment is functional and operational.

The Contractor shall furnish the Engineer with the name and phone number of the person responsible for maintaining existing and temporary electrical facilities.

The temporary illumination shall be operational prior to October 21, 2025, and continue for the life of the Contract or until the permanent illumination system has been installed. Removal of temporary installations shall conform to the provisions in Section 80.28 – Salvaging Electrical Equipment. These provisions shall not relieve the Contractor in any manner of his responsibilities as provided in Division 10, Section 10.06 - Legal Relations and Responsibilities.

Article 31.3 Measurement

The temporary illumination shall be measured per Lump Sum.

Article 31.4 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Furnish, Install, Maintain, and Remove Temporary Illumination	Lump Sum

L. DIVISION 85 STANDARD CONSTRUCTION SPECIFICATIONS FOR TRAFFIC CONTROL DEVICES

SECTION 85.05 TRAFFIC MAINTENANCE

Article 5.6 Public Notice

Delete the first paragraph, inclusive of the list of local officials and transportation organizations, and replace with the following:

The following contact information is provided as a courtesy to the Contractor and is the most currently available.

The Work Site Traffic Supervisor shall give notices of changes, delays, or lane/road closures to the following local officials and transportation organizations including, but not limited to:

1. Alaska Trucking Association 276-1149
2. Alaska State Troopers 428-7200
3. Alaska Court System 264-8232
4. Anchorage Police Department 786-8500
5. Anchorage Fire Department 267-4950

6.	Local Emergency Medical Services	267-4950
7.	Anchorage Public Transportation	343-8253/8386
8.	ASD Pupil Transportation	742-1207
9.	U.S. Postal Service	266-3261
10.	MOA Parks and Recreation	343-4355
11.	Local Schools and Universities	
12.	Local Solid Waste Utilities	
13.	Alaska Railroad (where applicable)	
14.	Major Tour Operators	
15.	Volunteer Fire Departments (applicable if operating in the project area)	

END OF SPECIAL PROVISIONS

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

19-01b

III

SUBMITTAL LIST

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

19-01b

SUBMITTAL LIST

Job #: ______________________________ Contractor: ________________________

Submittal Number	Rev.	Description
10.04.9		Private Property Disposal Site Permission; Fill Permit
10.04.12		Property Owner 48-Hour Closure Notice
10.04.13		Street Closures; Traffic Control Plan
10.04.15		Temporary Erosion and Sediment Control Plan
10.04.17		Utility Notification Verification
10.04.17		Pre-Construction Utility Inspection Report
10.04.17		Post-Construction Utility Inspection Report
10.04.19		Record Drawings
10.04.20		Operating and Maintenance Manuals
10.05.3		Construction Progress Schedule
10.05.3		Schedule of Values
10.05.4		Notice of Unusual Working Hours
10.05.7		Proposed Substitutions
10.05.9		Contractor’s Authorized Representatives and Employees
10.05.10		Subcontractor’s List
10.05.31		Winter Suspension Plan
10.06.6		Contractor Obtained Permits (ROW, Noise, Electrical, Dewatering, etc.)
10.06.9		Certificate of Insurance
10.06.12		Certified Payroll
10.07.1		Material Weight Tickets
10.07.7		ADOL Notification of Compliance
10.07.7		Notarized Certificate of Compliance
20.02.4		Storm Water Pollution Prevention Plan (SWPPP)

Submittal Number	Rev.	Description
20.02.4		eNOI
20.02.14		eNOT and Final SWPPP
20.02.16		SWPPP Inspection Reports
20.10.8		Survey Cross-Section Measurement - Usable and Unusable Excavation
20.12.2		Dewatering Plan
20.13.2		Trench Excavation Notice to Engineer and AWWU.
20.30		Trench Sheeting/Shoring Submittal
30.01.9		Concrete Temperature Maintenance Procedure Proposal
30.04.2		Detectable Warning Panel
40.02.2		Certified Analysis of Asphalt for Seal Coat from Refining Laboratory
40.04.2		Certified Analysis of Asphalt for Tack Coat from Refining Laboratory
40.04.3		Tack Coat Test Strip and Notification
40.05.2		Certified Analysis of Asphalt for Crack and Joint Sealant from Laboratory
40.06.2		Certified Analysis of Asphalt for A.C. Pavement from Refining Laboratory
40.06.3		Asphalt Job Mix Formula for A.C. Pavement
40.06.4		Contractor’s Certificate of Compliance for bituminous paver segregation mechanism installation
40.06.5		Paving Plan
40.09.2		Certified Analysis of Asphalt for Bituminous Surface Treatment from Refining Laboratory
65.02.2		Survey Field Notes
65.02.3		Party Chief's Daily Diary
65.02.5		Survey Cross Sections
65.02.5		Notification Prior to Cross Section Work
65.02.13		Survey Electronic Data

Submittal Number	Rev.	Description
65.02.16		Survey Quantity Measurements (Clearing, Clearing & Grubbing, Pavement Removal, Pavement Rotomilling, Pavement Reclamation, Road Excavation, Trench Excavation, Topsoil, Seeding, and other areas of misc. final surfacing application such as asphalt, concrete, RAP, etc. which are measured in SF or SY)
75.02.2		Plant Schedule
75.02.3		Notification 5 Working Days Prior to Plant Delivery
75.02.3		Identify Tree Protection Zone
75.02.4		Landscape Maintenance Schedule
75.02.4		Landscaping Watering Schedule
75.03.2		Topsoil Analysis Test Reports
75.04.2		Seed Certification Tag
75.05.1		Sod Submittal
80.01.3		Electrical Equipment and Materials Submittal
80.01.3		Record Drawings
80.01.4		Manufacturers' Warranties, Guarantees and Instruction Sheets
80.01.5		Traffic Signal Maintenance Name and Telephone Number
80.05.1		Wind Stress Certification Submittal
80.17.2		Controller Unit Documentation
80.17.7		Controller Unit, Aux. Equipment, and Cabinet Submittal
80.18		Loop Detector Test Reports
80.23.2		Luminaire Lens Certified Compliance
80.25		Falsework Lighting Submittal
80.30.3		Heat Trace System Submittal
80.30.4		Heat Trace System Warranties, Guarantees, and Inspection Sheets
85.05.2		Traffic Control Plan (TCP)
85.05.4		Identify Work Site Traffic Supervisor/Telephone Number
85.05.6		Proof of Public Notice

Submittal Number	Rev.	Description
85.11.2		Permanent Vertical Traffic Calming Devices Cross Section Template

NOTE: The above list of submittals is not all inclusive. In addition to the above, the Contractor is required to comply with all submittal requirements as required or identified in the plans, specifications, M.A.S.S., or as directed by the Engineer.

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II
19-01b

SUBMITTAL LIST

Job #: ______________________________ Contractor: ________________________

Submittal Number	Rev.	Description

NOTE: The above list of submittals is not all-inclusive. In addition to the above, the Contractor is required to comply with all submittal requirements as required or identified in the plans, specifications, M.A.S.S., or as directed by the Engineer.

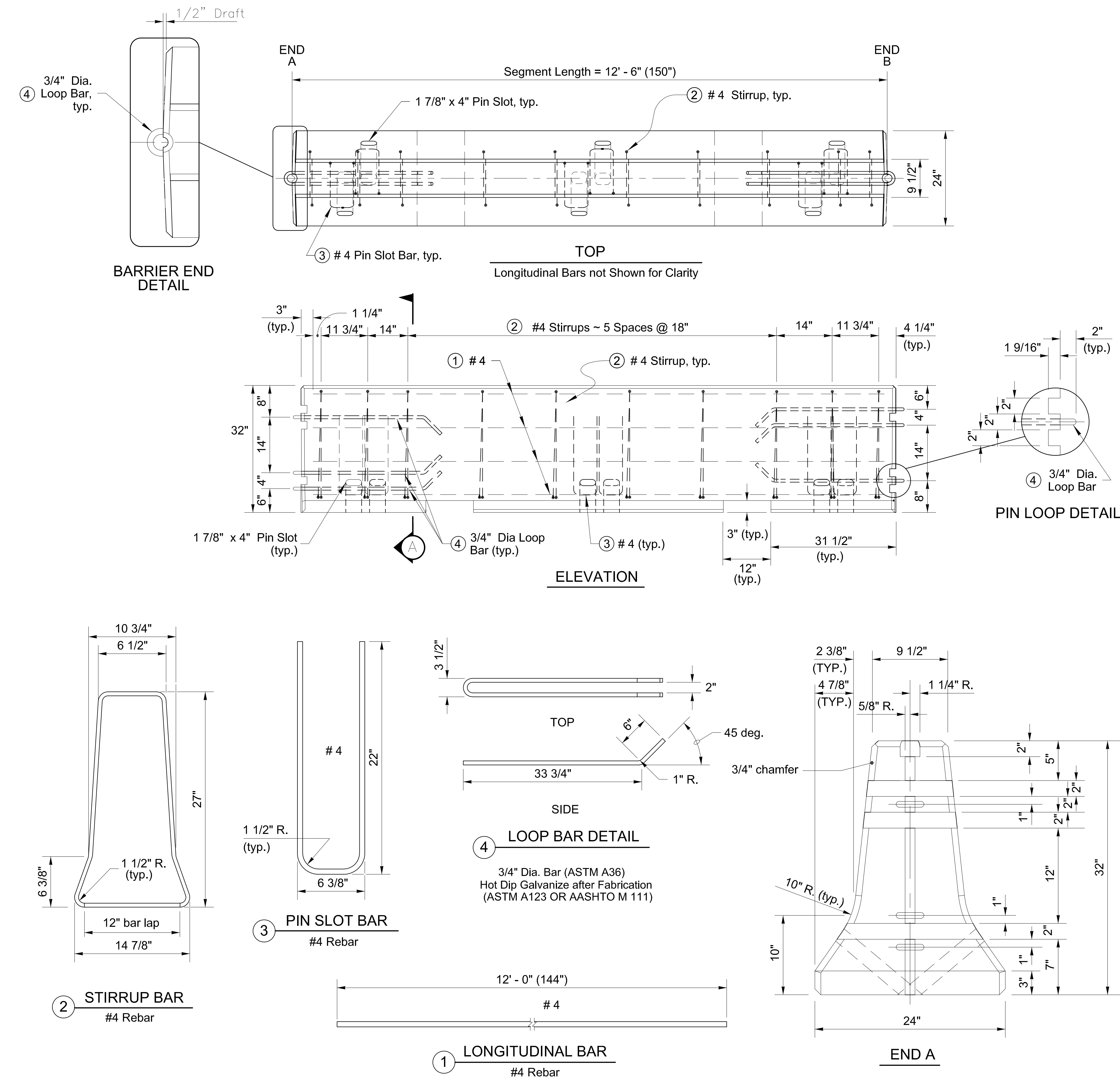
MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

19-01b IV

SPECIAL DETAILS



CONSTRUCTION NOTES

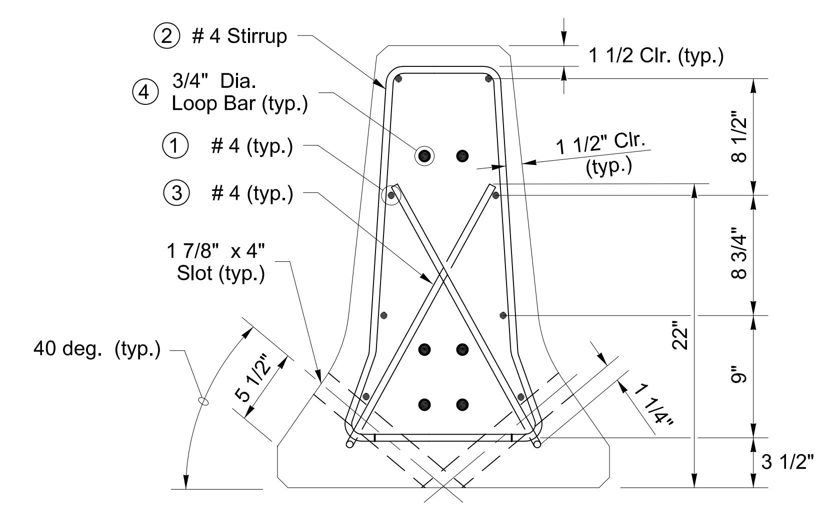
1. This concrete barrier meets MASH TL–3 and may be used for temporary and permanent applications.

2. Use Class B–B concrete (5,000 psi) meeting the requirements of Section 550 of the Standard Specifications.

3. Provide the following unobstructed smooth deflection area behind barrier:

   18" when anchored to concrete
   22" when anchored to asphalt pavement
   64" when unanchored

4. When anchored, install anchor pins on the side facing traffic. Concrete barrier used as permanent median barrier in medians less than 8' in width shall be anchored to the roadway with anchor pins on both sides of the barrier.



SECTION A

Note: Drawing not to scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

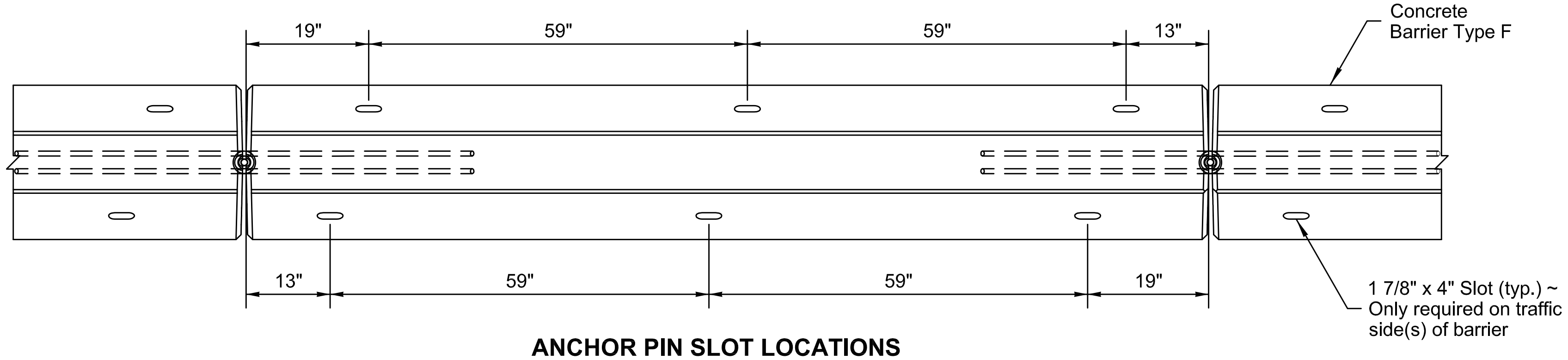
MASH "F" SHAPE CONCRETE BARRIER

Adopted as an Alaska Standard Plan by: *Carolyn Morehouse*
Carolyn Morehouse, P.E.
Chief Engineer

Adoption Date: 07/17/2020

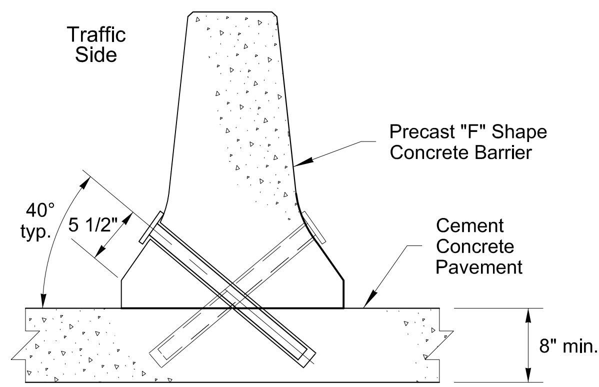
Last Code and Stds. Review
By: LRG Date: 07/17/2020

Next Code and Standards Review date:07/17/2030

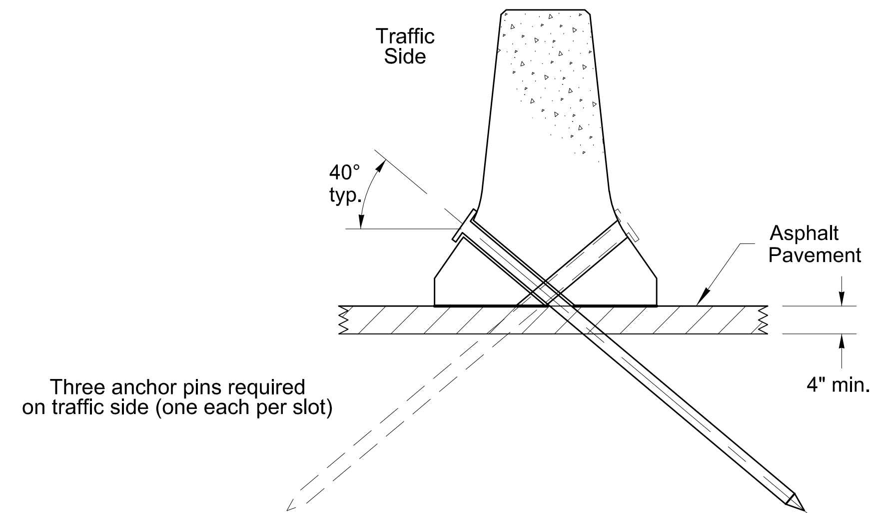


ANCHOR PIN SLOT LOCATIONS

Reinforcing steel not shown for clarity



CONCRETE ANCHOR PIN DETAILS



ASPHALT PAVEMENT ANCHOR PIN LOCATIONS

CONSTRUCTION NOTES

1. When this barrier is used as a temporary traffic control device, provide retroflective tabs or stripes meeting the requirements of Section 643 of the Standard Specifications.
2. When this barrier is used in a permanent application, provide reflector assemblies meeting the requirements of Section 614 of the Standard Specifications.

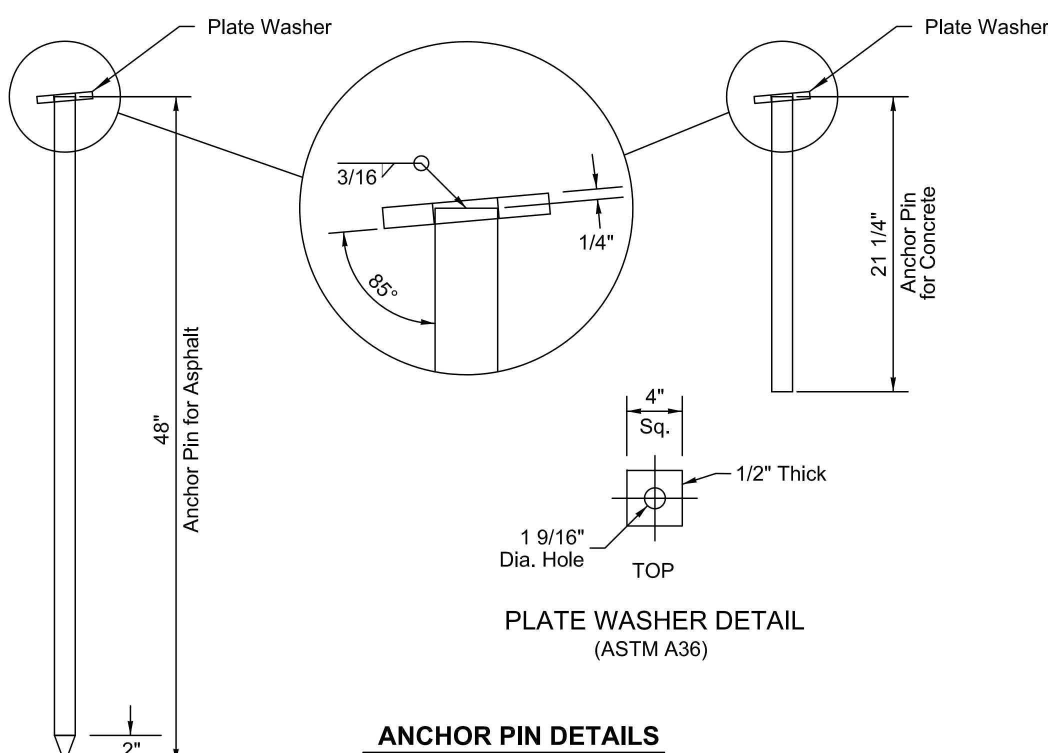
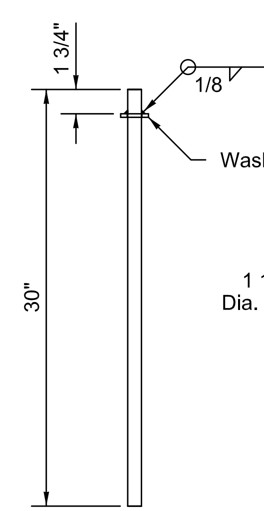


PLATE WASHER DETAIL

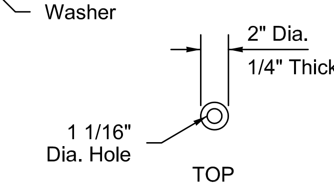
(ASTM A36)

ANCHOR PIN DETAILS

1 1/2" Dia. (ASTM A36)
Hot Dip Galvanize (ASTM A123 OR AASHTO M 111)



ELEVATION

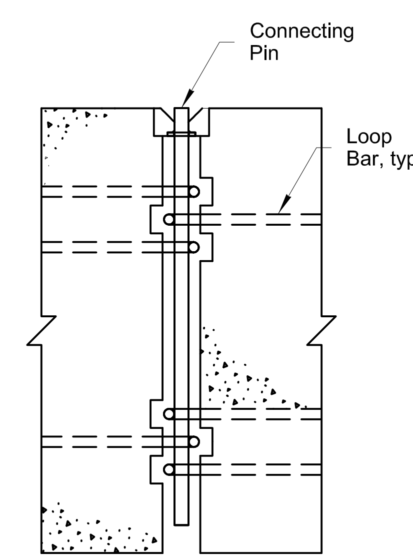


WASHER DETAIL

ASTM A572, Grade 50

CONNECTING PIN DETAILS

1" Dia. - ASTM A449
Hot Dip Galvanize



BARRIER CONNECTION DETAIL

Note: Drawing not to scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

MASH "F" SHAPE
CONCRETE BARRIER

Adopted as an Alaska Standard Plan by: Carolyn Morehouse
Carolyn Morehouse, P.E.
Chief Engineer

Adoption Date: 07/17/2020

Last Code and Stds. Review
By: LRG Date: 07/17/2020

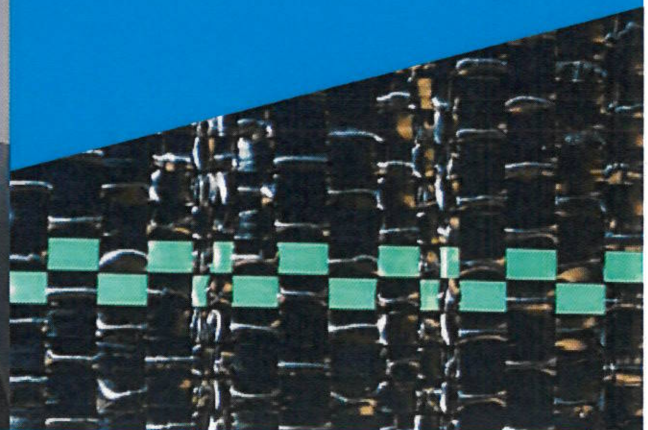
Next Code and Standards Review date:07/17/2030

WINFAB®

PRODUCT DATA SHEET
WINFAB® 105SF

REINFORCING SUCCESS

WINFAB® 105SF is manufactured using high tenacity polypropylene yarns that are woven to form a dimensionally stable network, which allows the yarns to maintain their relative position.



WINFAB® 105SF resists ultraviolet deterioration, rotting, and biological degradation and is inert to commonly encountered soil chemicals. It meets or exceeds the requirements of AASHTO M288 for unsupported silt fence and ASTM D6461 table 1.

PROPERTY	TEST METHOD	MARV ENGLISH	MARV METRIC
Tensile Strength (Grab)	ASTM D4632	125 x 124 lbs	556 x 551.6 N
Elongation (Grab)	ASTM D4632	15% x 15%	15% x 15%
Trapezoidal Tear Strength	ASTM D4533	65 x 65 lbs	289.1 x 289.1 N
CBR Puncture	ASTM D6241	325 lbs	1,445.7 N
UV Resistance (500 hrs)	ASTM D4355	70%	70%
Apparent Opening Size*	ASTM D4751	30 US Std. Sieve	0.60 mm
Permittivity	ASTM D4491	.1 sec^{-1}	.1 sec^{-1}
Water Flow Rate	ASTM D4491	10 gpm/ft^2	407.4 lpm/m^2

*Maximum Average Roll Value

PROPERTY	TEST METHOD	TYPICAL ENGLISH	TYPICAL METRIC
Roll Dimensions	Measured	36 in x 2600 yds 36 in x Custom 42 in x 2600 yds 42 in x Custom 48 in x 2600 yds 48 in x Custom	.91 m x 2377 m .91 m x Custom 1.07 m x 2377 m 1.07 m x Custom 1.22 m x 2377 m 1.22 m x Custom

WINFAB | www.winfabusa.com
1 Nashville Mills Rd. Nashville GA 31639
Ph: (912) 534-5757 • Fax: (912) 534-5533

GMA Geosynthetic Materials Association

GAI-LAP
Initials: GK #: 87
Date: 2016

Silt Sock

EROSION CONTROL PRODUCTS

www.siltsock.net
Phone: 608-438-7625

8” Ultra

Construction	Tubular Knit		
Chemical Reaction	Inert to most soil chemicals including Alkaline, weak acids and salt		
Properties	Fiber Material	Multi-Filament Polypropylene	
	Color	Black	
	Melting Point	166°c	330°F
	UV Protection	Photodegradable/ UV Stabilized	
	UV Resistance ASTM G-155	100% at 1000 hr.	
	Approx. Life Expectancy*	2 – 4 years	
	Mesh Opening	1/8”	
Roll Properties (Approx.)	Roll Weight	11.8 kg	26 lbs.
	Roll Length - Relaxed	174 m	540 ft.
Applied Roll Length (Approx.)	8” Diameter	146 m	475 ft.
Strength Properties	ASTM 6241 & ASTM 5035	222 psi	
Packaging	Package Type	Roll	

Weights and packaging may vary slightly in different production runs.

All rolls can be shipped individually or combined on a pallet

*Life Expectancy will vary with your type of application, region and local climactic conditions and should be used as a guide only.

**Measurements are obtained from tests done in lab conditions and vary depending on accuracy of infield applications

All information supplied is considered to be true and accurate. Any non-standard conditions that may affect the application of the fabrics should be consulted with Silt Sock.

www.siltsock.net
Phone: 608-438-7625
Fax: 608-742-6222

NORTHSTAR SUPPLY

PO Box 3637 · Palmer, AK 99645
907-357-1147
www.nssalaska.com

To Whom it May Concern,

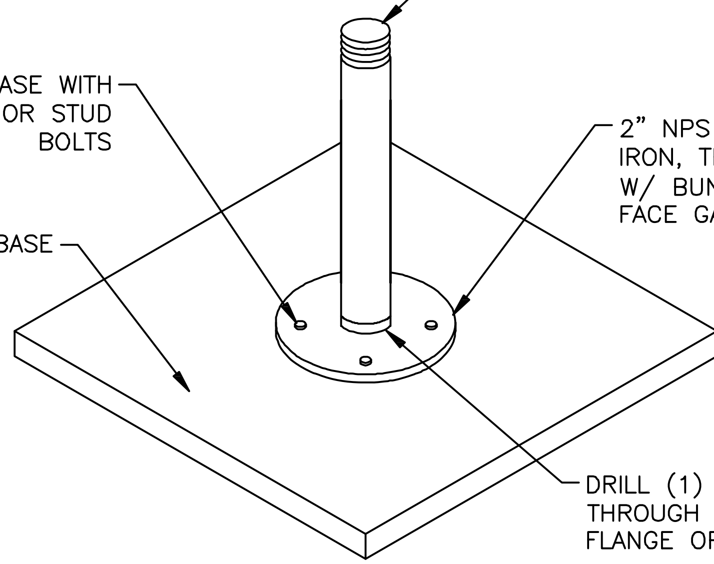
The Silt Sock that NorthStar Supply proposes to provide for West Anchorage Snow Disposal Site Phase 1 Project are filled with locally sourced white spruce wood chips.

If you have any additional questions or need further clarification, please reach out at 907-357-1147 or jason@nssalaska.com.

Regards,

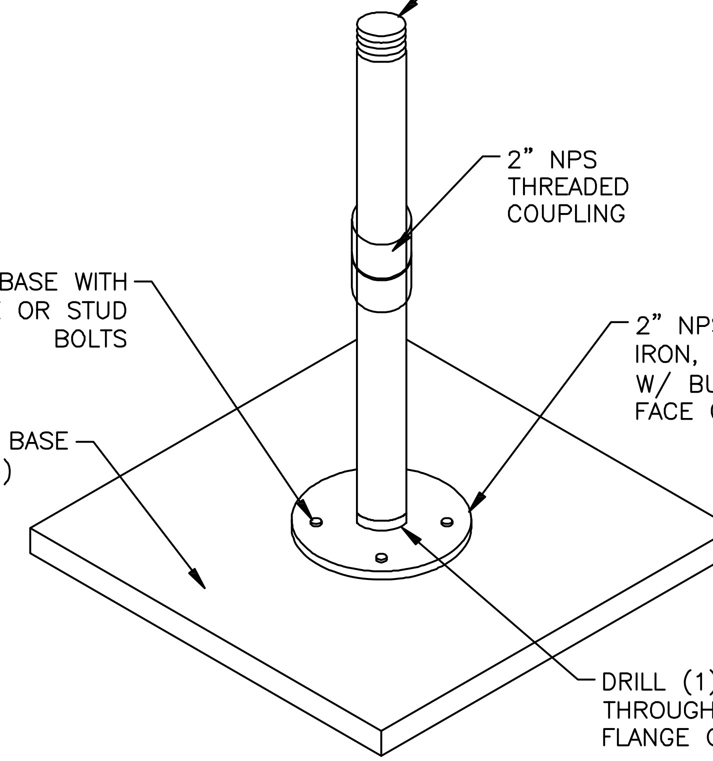
Jason Carmichael

Jason Carmichael



SETTLEMENT PLATE

20 EACH - SINGLE ASSEMBLIES



SETTLEMENT PLATE

7 EACH - DOUBLE ASSEMBLIES

U.N.O. ALL MATERIALS ARE:			
BEAMS:	ASTM A992	TUBES:	ASTM A500
STR. PLATES:	ASTM A36	PIPE:	ASTM A53 or A500
MISC. PLATES:	ASTM A36		
SHAPES:	ASTM A36		
HOLE SIZE:	BOLT SIZE:	BOLT TYPE:	
SURFACE PREP:			
PRIME:		COLOR	
TOP COAT:		COLOR	
TOP COAT:		COLOR	
WELDING CODE:	PER SPEC.		
WELD N.D.E.:	PER CODE/SPECS.		
ELECTRODES:	PER WELD PROCEDURE		

AISC CERTIFIED FABRICATOR

CATAGORIES - BU, IBR, FCEB, CCE 1

LISTED

UL 142 LISTED TANKS

NOTES:

1. SPLICE MATERIAL AS NEEDED TO MEET DIMENSIONAL REQUIREMENTS
2. ALL SPLICED MEMBERS ARE CONSIDERED TO BE STATICALLY LOADED.
3. BOLT HOLES, PER AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS SECTION 3.3, THERMALLY CUT HOLES PRODUCED BY MECHANICALLY CUT MEANS ARE PERMITTED.
4. UNLESS NOTED OTHERWISE ALL WELDS TO BE 3/16 FILLETS.

NO BACK CHARGES WILL BE ACCEPTED WITHOUT PRIOR WRITTEN AUTHORIZATION. REFER TO THE AISC MANUAL OF STEEL CONSTRUCTION ASD, 16TH EDITION, CODE OF STANDARD PRACTICE, 7.14 CORRECTION OF ERRORS.

REVISION

No.	DATE	BY	DESCRIPTION
P1	1/16/25	WAG	FOR APPROVAL

STEELFAB
STEEL SOURCE FOR ALASKA
2132 RAILROAD AVENUE
ANCHORAGE, ALASKA 99501
TELEPHONE (907) 264-2800
FAX (907) 276-3448

PROJECT	WEST ANCHORAGE SNOW DISPOSAL SETTLEMENT PLATES	
CONTRACTOR	MASS EXCAVATION, INC.	
TITLE		
DRWN BY WAG	DATE 1/16/25	SCALE NTS
CHKD BY AC	DATE 1/16/25	
JOB No. --	SHEET No. D01	REV # P1

MATERIALS ARE AS FOLLOWS (if applicable):

1) All structural steel is to conform to ASTM standards.
2) Import or Domestic materials used (STEELFAB discretion).
3) No Low Temp/ Charpy Impact Testing included (CVN material excluded).
4) Plates are mild steel (36ksi minimum).
5) Pipe is A53 Gr.A Type E carbon steel.
6) Couplings are threaded(FNPTxFNPT) Malleable Iron Low Pressure.
7) Pipe Caps are threaded(FNPT) Malleable Iron Low Pressure.
8) Flanges are Cast Iron 125# Raised Face(FNPT).
9) Gaskets are 150# Non-ASB(Fiber/Buna Blend) Full Face 1/16"thk.
10) Fasteners are A307 with matched nuts and washers.

Mass Excavation will provide the 4" PVC pipe sleeve during installation

Model 3782_S – Knox Padlock, Exterior Use, 2-3/8 inch Shackle, Submastered

Gate & Key Switches

Knox Padlock

Model: 3782_S

Price: $161.00

1. Usage

- ○ Interior
- ◉ Exterior

2. Shrouded Shackle

- ◉ No
- ○ Yes

3. Shackle Length

- ◉ 2"
- ○ 1"
- ○ 3"

For Ordering Support

Call: 800-552-5669
6:00 AM - 4:00 PM MST

Installation Address

The installation address is where this product will be installed. Do not enter the shipping address here.

Available for:
Anchorage (Muni) Fire Dept - Anchorage, AK

Business Name

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE
PHASE II

19-01b

IV

SOILS INFORMATION

West Anchorage Snow Disposal Site Geotechnical Engineering Report, May 2024
Kloep Station Improvements, Berm Characterization Report, Feb 2023

SUBMITTED TO:
HDR Engineering, Inc.
582 East 36th Avenue, Suite 500
Anchorage, Alaska 99503

BY:
Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518

(907)561-2120
www.shannonwilson.com
AECC 125

GEOTECHNICAL ENGINEERING REPORT

West Anchorage Snow Disposal Site

ANCHORAGE, ALASKA

Prepared for:
Municipality of Anchorage
Project Management & Engineering

PM&E Project Number: 19-01

SHANNON & WILSON

May 2024
Shannon & Wilson No: 106424-001

PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Submitted To: HDR Engineering, Inc.
582 East 36th Avenue, Suite 500
Anchorage, Alaska 99503
Attn: Edith McKee, PE

Subject: GEOTECHNICAL ENGINEERING REPORT, WEST ANCHORAGE SNOW DISPOSAL SITE, ANCHORAGE, ALASKA

Shannon & Wilson prepared this report and participated in this project as a consultant to the Municipality of Anchorage (MOA). Our work was authorized in Purchase Order Number (PO #) 2021000725 with MOA dated March 9, 2021, and our scope of work is described in our January 22, 2021, proposal. Additional work was authorized in PO #2024000427 with MOA dated February 7, 2024, and our scope of work described in our December 15, 2023, proposal. This report presents the results of subsurface explorations, laboratory testing, and geotechnical engineering studies conducted by Shannon & Wilson, Inc. for the proposed relocation of the West Anchorage Snow Disposal Site in Anchorage, Alaska. This geotechnical engineering report was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON, INC.

Russell Hepner, E.I.T.
Geotechnical Engineering Staff

STATE OF ALASKA
49TH
Kyle Brennan
CE-11122
5-24-24
REGISTERED PROFESSIONAL ENGINEER

Kyle Brennan, PE
Vice President

RCH:SKD/KLB

CONTENTS

Figures

Appendices

CONTENTS

1 INTRODUCTION

This report presents the results of subsurface explorations, laboratory testing, and geotechnical engineering studies conducted by Shannon & Wilson for the proposed relocation of the West Anchorage snow disposal site. The purpose of this geotechnical study was to gather subsurface geotechnical information and provide geotechnical engineering recommendations needed to design and construct the proposed snow disposal site, access road, and other improvements near the existing Municipality of Anchorage (MOA) Northwood Maintenance Facility. To accomplish this, 14 soil borings and 13 peat probes were advanced near the proposed new snow disposal site and access road. Soil samples recovered from the borings were tested in our geotechnical laboratory. Presented in this report are descriptions of the site and project, subsurface explorations and laboratory test procedures, an interpretation of subsurface conditions, and conclusions and recommendations from our engineering studies.

Authorization to proceed with this work was received in the form of a Purchase Order (PO Contract No. 4400000636) requested by Mr. Ernest Gray III and approved by Mr. Ronald S. Hadden, both from MOA, dated March 9, 2021. Additional work was authorized in PO #2024000427 requested by Mr. Ernest Gray III and approved by Ms. Rachelle Alger, with MOA, dated February 7, 2024. Our work was conducted in general accordance with our January 22, 2021, proposal, and our additional work in general accordance with our December 15, 2023, proposal. This report is intended for use by the project design engineering staff, MOA, and their representatives.

2 SITE AND PROJECT DESCRIPTION

According to parcel information available on the MOA GIS mapping website, the site is located on an unsubdivided portion of the northwest ¼ of the northwest ¼ of Section 1 of Township 12 North, Range 4 West, in Anchorage, Alaska. The site is on an undeveloped bog located south of the existing MOA Northwood Maintenance Facility and Javier de la Vega Park, east of Connor's Lake, and west of Minnesota Boulevard in Anchorage, Alaska. The property adjacent to the existing access road was previously developed as a municipal landfill and currently houses the MOA Northwood Maintenance station, including several structures, paved and unpaved parking and driving areas, and storage for a variety of construction related materials. The site proposed for the snow disposal site is covered with tall grasses, shrubs, and spruce trees. Additionally, standing water was observed at the surface in some areas during spring and summer-time field activities. Telephone, electric, and natural gas easements are located within approximately 100 feet of the west and/or south property lines of the site.

There are overhead transmission lines running east-west along the northern side of the site, generally along the embankment slope between the MOA Northwood Maintenance Facility and the proposed new snow disposal site. These overhead lines include transmission lines that supply power to the nearby Chugach Electric Association (CEA) facility. Therefore, we understand that a detection system is planned for the snow disposal site to reduce the risk of dump trucks damaging the lines by leaving their dump beds open as they leave the site.

Except for several small, vegetated mounds, the site is generally flat though the area of the proposed pad. The existing access road at the facility is relatively flat, but gently slopes down to the north and west. The proposed access road is approximately 9 to 21 feet above the surface of Connor's Bog. A vicinity map indicating the general project location is presented as Figure 1. The site plan, included as Figure 2, shows prominent site features and the approximate boring and probe locations.

We understand that the project consists of constructing an approximately 14-acre gravel pad on which snow will be stored seasonally from snow removal work conducted within the western portion of the MOA. We also understand that a containment berm with up to four weirs will be constructed around the gravel pad. Improvements to existing infrastructure near the Northwood Maintenance Facility include a reconfigured parking area, a truck bypass route to the west of the reconfigured parking area, and other potential improvements to the existing access road. Development of a new access road approaching the pad from the northwest, from the southwest corner of the existing access road, will connect the new snow pad to the western boundary of the Northwood Maintenance Facility.

3 SUBSURFACE EXPLORATIONS

Subsurface explorations for this study consisted of drilling and sampling 14 borings, designated Borings B-01 through B-14, and 13 peat probes, designated Probes P-01 through P-13, in the project area from March 29 through April 5 and on April 30, 2021. The general boring and probe locations were selected to provide relatively even coverage of subsurface data across the undeveloped site and at road and parking improvement areas. The boring and probe locations, shown on Figure 2, were recorded with a handheld global positioning system (GPS) capable of horizontal accuracies of ±20 feet. It should be noted that GPS accuracy may be affected by tree canopies, geographic features, and other atmospheric anomalies. Elevations shown on the boring logs were extrapolated from topographic contours provided by the MOA GIS department. Therefore, the boring locations shown on the site plan and the elevations reported on the boring and probe logs should be considered approximate.

Drilling services for this project were provided by Discovery Drilling of Anchorage, Alaska, using a track-mounted, 6712DT Geoprobe and Nodwell CME-850 drill rigs. A geotechnical professional from our firm was present during drilling to locate the borings and probes, observe drill action, collect samples, log subsurface conditions, and observe groundwater conditions. We coordinated with the Call Locate Center for buried public utility locating services prior to drilling.

The borings were advanced with 3 ¼-inch inner diameter (ID), continuous flight, hollow-stem augers to a depth of between 16.5 and 31.5 feet below ground surface (bgs). As the borings were advanced, samples were recovered using standard penetration test (SPT) methods at 2.5-foot intervals to 10 feet bgs and at 5-foot intervals after that to the bottom of the borings. In the SPT method, samples are recovered by driving a 2-inch outer diameter (OD) split-spoon sampler into the bottom of the advancing hole with blows of a 140-pound hammer free falling 30 inches onto the drill rod. For each sample, the number of blows required to drive the sampler the final 12 inches of an 18-inch penetration into undisturbed soil is recorded. Blow counts are shown graphically on the boring log figures as "penetration resistance" and are displayed adjacent to sample depth. Where the sampler did not penetrate the full 18 inches, our log reports sampler refusal as the blow count and corresponding penetration in inches. The penetration resistance values give a measure of the relative density (compactness) or consistency (stiffness) of cohesionless or cohesive soils, respectively. In addition to the split spoon samples, a grab sample of the near-surface soils was collected from the auger cuttings in the upper 2 feet of borings advanced through suspected fill materials.

The peat probes were advanced to a depth of between 5.5 and 9 feet bgs. They were advanced by using the drill rig to push 2 ¾-inch drill rod from the ground surface to refusal. The rods were over-drilled with augers to the depth of probe refusal and a sample of the soil layer that caused refusal was recovered using SPT sampling techniques.

The soil samples recovered during drilling were observed and described in the field in general accordance with the classification system described by ASTM International (ASTM) D2488. Selected samples recovered during drilling were tested in our laboratory to refine our soil descriptions in general accordance with the Unified Soil Classification System (USCS) described in Appendix A, Figure A-1 (3 sheets). Frost classifications were also estimated for samples based on laboratory testing (sieve analyses and percent passing the No. 200 sieve) and are shown on the boring logs. The frost classification system is presented in Appendix A as Figure A-2 and summary logs of the borings and probes are presented in Appendix A as Figures A-3 through A-29.

At the completion of Borings B-03, B-06, B-09, B-10, B-11, B-13, and B-14; 1-inch, polyvinyl chloride (PVC) casing with hand-slotted sections was installed in the open borehole to facilitate observation of groundwater levels at a later date. The annular space between the borehole wall and casing was backfilled with cuttings produced during drilling and the PVC was allowed to stick up. The remaining borings were backfilled with cuttings produced during drilling. The ground surface surrounding Boring B-02 was repaired with asphalt cold patch.

4 LABORATORY TESTING

Laboratory tests were performed on selected soil samples recovered from the borings to confirm our field classifications and to estimate the index properties of the typical materials encountered at the site. The laboratory testing was formulated with emphasis on determining gradation properties, natural water content, and frost characteristics.

Water content tests were performed in general accordance with ASTM D2216. The results of the water content measurements are presented graphically on the boring logs in Appendix A.

Grain size classification (gradation) testing was performed to estimate the particle size distribution of selected samples from the borings. The gradation testing generally followed the procedures described in ASTM C136. The test results are presented in Appendix A as Figure A-30 (10 sheets) and summarized on the boring logs as percent gravel, percent sand, and percent fines. Percent fines on the boring logs are equal to the sum of the silt and clay fractions indicated by the percent passing the No. 200 sieve. Note that gradation testing indicates particle size only and visual classification under USCS designates the entire fraction of soil finer than the No. 200 sieve as silt. Plasticity characteristics (Atterberg Limits results) are required to differentiate between silt and clay soils under USCS.

5 SUBSURFACE CONDITIONS

The subsurface conditions encountered in our explorations are presented graphically on the summary logs in Appendix A. In general, our borings encountered peat and/or granular fill soils overlying native granular and occasional fine-grained material. Peat was generally encountered at the surface to depths of between 4 and 7.5 feet bgs. Borings B-01 through B-05 were advanced through an existing fill pad around the MOA Northwood Maintenance

Facility. These borings generally encountered between approximately 4.5 and 9.5 feet of fill material above the peat and/or native soils; however, Boring B-04, advanced through the top of an existing berm along the south side of the access road, found fill material throughout its depth (16.5 feet). Based on penetration resistance values ranging from 2 to 47 blows per foot (bpf) in samples where the ground was not frozen and our observations of drill action, the fill soils encountered during drilling are considered loose to dense. Note that soft to medium stiff, intermingled peat, wood, silt, and sand were encountered within the fill material, between roughly 4.5 and 9.5 feet bgs, in Boring B-05. Based on our laboratory testing, estimated fines contents of the fill material ranged from approximately 17 to 21 percent. Moisture contents of the fill material ranged from about 5 to 35 percent, with the highest moisture contents found within the intermingled soil and organics observed in Boring B-05.

Native soils encountered beneath the fill and peat generally consisted of sands with varying amounts of fines and occasional gravels. However, fine-grained soils were encountered at varying depths in Borings B-01, B-08, B-13, and B-14. Native sands contained approximately 4 to 46 percent fines, with an average of about 10 percent, and the one silt sample tested was found to contain approximately 85 percent fines. Moisture contents of the granular native soils encountered above the groundwater table ranged from about 4 to 21 percent, with the higher percentages generally found in the soils with higher fines contents. Fine-grained materials encountered across the site generally consisted of silt to sandy silt with rapid dilatancy. Penetration resistance values ranged from 9 to 65 bpf where sampler refusal or significant heaving sand was not encountered. However, it is possible that some of the higher blow count samples may have been effected by heave that wasn't obvious during sampling. Based on our observations during drilling and the depositional environment, it is our opinion that native soils are, on average, medium dense or stiff to very stiff for granular and fine-grained soils, respectively. Isolated areas of loose and dense soils also likely exist.

Based on our probes and borings, peat depths in the area of the snow disposal pad vary between approximately 4 (Probe P-09) and 7.5 (Probes P-02 and P-05) feet, with an average of approximately 6 feet in depth. Figure 3 presents a peat thickness contour map that shows the approximate distribution of peat thickness across the site based on our borings and probes. The contours indicate that peat is thickest on the east side of the site with thinner peat soils in the southwest portion of the site. The peat and organic soils had moisture contents ranging from approximately 21 to 126 percent where underlying existing fill soils, and about 150 to 517 percent where exposed at the ground surface. The peat was predominantly very soft to soft where it wasn't frozen.

Groundwater, where observed, was encountered during drilling at depths ranging between approximately 12 and 25.5 feet bgs in borings advanced through the existing fill pad around the MOA Northwood Maintenance Facility, and at depths ranging between approximately 7 and 10 feet bgs in borings advanced in Connor's Bog. On April 13, 2021, approximately two weeks after our initial drilling, water was measured at depths ranging between 6.3 and 9.6 feet bgs in the observation wells installed in Borings B-06, B-09, B-10, B-11, B-13, and B-14. Groundwater was again measured on July 11, 2021, approximately 3.5 months after drilling, and water was measured at depths ranging between 5.2 and 8.1 feet bgs. The groundwater level was also measured in Boring B-03, advanced through the fill pad, on April 13 and July 11, 2021, and water was measured at 25.6 and 24.3 feet bgs, respectively. Note that measured groundwater levels were approximately 1 to 1.5 feet shallower when measured in July as compared to April. Also note that water levels may fluctuate by several feet seasonally and may vary during periods of high precipitation and rapid snow melt.

6 ENGINEERING RECOMMENDATIONS

Geotechnical considerations for this project include developing an appropriate structural section for the gravel access road, truck bypass route, and new gravel snow disposal pad. We assume that the truck bypass route, access road, and gravel pad will not need to meet the MOA Design Criteria Manual (DCM) requirements, but will need to support truck traffic throughout the year. We understand that the snow pad will need to support snow piles that may be more than 30 feet high, and that some differential settlements are tolerable for the pad. We also understand that a containment berm is planned to be constructed around the snow disposal pad and that preliminary plans call for up to four weirs to be constructed within the berm to control water going from the snow disposal pad area to the surrounding Connor's Bog. The approximate locations of these weirs are shown on our site plan, presented as Figure 2.

Design of the gravel access road must consider the support capabilities of the underlying materials. The new access road and snow pad will be developed atop existing organic material at the site. Peat depths in the area of the snow disposal pad vary between approximately 4 (Probe P-09) and 7.5 (Probes P-02 and P-05) feet, with an average of approximately 6 feet in depth. Underlying soils generally consist of medium dense to dense sands with varying amounts of fines. Groundwater depths generally ranged between approximately 6 and 9 feet bgs when encountered during our March and April 2021 explorations and rose to between approximately 5 and 8 feet bgs during our July 2021 groundwater measurements.

In general, we understand that the snow disposal pad will be constructed with an approximately 0.5 percent crown with the high point in the approximate center of the pad to allow water to drain off in all directions. We understand that the crown will be on the order of 3 to 4 feet above the outer edges of the pad. We also understand that the containment berm will be constructed to an approximate height of 4 to 6 feet above the surrounding ground surface, and that the height will likely vary around the berm (i.e., there will not be a consistent design height and the berm is not planned to be surcharged). Note that, depending on project schedule, the area that will receive the new gravel access road and snow pad is well suited for a portion of the work to be constructed during winter/frozen ground conditions.

6.1 Gravel Access Road, Snow Pad, and Containment Berm

We understand that embankment fills will be floated over the existing surface organic soils and peat for the new access road, gravel snow disposal pad, and containment berm. We also understand that the road and pad will be able to tolerate differential movements with maintenance as needed as peat consolidates. The sections below describe general embankment development which consists of the following three components: an embankment base resting on the existing ground surface, a base structural section to establish the new working surface, and embankment fill between the base and surface structural section.

The access road construction will likely require excavation through the existing berm on the north side of the snow disposal site. Our borings indicate that the material that will likely be exposed will consist of a mixture of silty sand and silty gravel down to approximate elevation 87 feet. Below this elevation we encountered mineral soil mixed with peat and other debris. Cut slopes in these materials should be established at slopes no steeper than 3 horizontal (H) to 1 vertical (V). Care should be taken to not undermine overhead power line poles with road excavations in this area. The pole foundations in this area are unknown, but if cut slopes are maintained at not steeper than 3H to 1V, undermining should not be an issue as long as the top of slope cut line is greater than 20 feet from the base of the overhead utility tower base. We recommend that an experienced geotechnical engineer be present on site to confirm these conditions during construction and help adjust the design if necessary.

6.1.1 Embankment Base Preparation

Initial site preparation of the existing grade for development of embankments (i.e., access road, snow pad, and containment berm) over surface organics should disturb the organic surface as little as possible. Trees and shrubs should be cut approximately 6 inches above the ground surface, leaving the surface mat largely intact. After the cut vegetation has been removed, embankments can be developed as recommended below.

We understand that the current plan is for initial pad laydown to begin during the winter of 2024-2025 (see Section 6.1.1.2 for winter construction recommendations). Further pad construction and surcharging is planned for the summer of 2025, and then final grading and compaction would take place after surcharging is complete. Assuming that surcharging will occur, settlement plates should be installed as described in Section 6.1.3 after placement of geofabric and prior to placement of fill materials.

6.1.1.1 Summer Construction

After the base has been prepared as described above, the fill areas should be overlain by a separation geofabric (see Section 6.1.6.1) placed on the organic surface. The fabric should extend a minimum of 2 feet beyond the outer edge of the toe of the embankment. After the fabric is in place, we recommend that at least 24 inches of Type II material be placed and compacted by tracking with equipment and static rollers. After the initial lift is placed, a layer of biaxial geogrid should be placed within the access road and snow pad embankments as described in Section 6.1.6.2. If the grade is firm and workable, an additional 18 inches of Type II fill should be placed and compacted with moisture/density control as described in Section 6.3. If the grade experiences significant rutting and pumping under construction traffic, additional material can be placed until a firm, unyielding surface is achieved.

Filling over soft organic soils with unfrozen ground conditions will require a systematic approach to reduce the risk of developing mud waves (upheaval of organic soils at the toe of an advancing fill) and shearing failure of the organic mat beneath the fill. Mud waves in the subgrade can form if the fill pad is advanced uniformly in one direction over the pad limits. The initial lift of fill should be placed in a staggered manner using a combination of excavators to drop fill on the prepared surface ahead of the advancing fill front and pushing/spreading fill with a light weight/low ground pressure dozer. If a mud wave begins to form, the fill pad should be advanced in a different area to approach the mud wave with the fill from a different direction. To avoid shearing of the organic mat, fill should be placed at a metered rate. We recommend limiting the rate fill such that the elevation of the pad does not increase more than 2 feet every two weeks. Once the base is established, embankment construction can continue as described in Section 6.1.2.

6.1.1.2 Winter Construction

The embankment base may be constructed in the winter months to take advantage of firm ground conditions. We believe that this is a viable approach as long as the conditions described in this section are met during construction. Preparation of the ground surface should be carried out as described in Section 6.1.1 and should include snow removal. Snow should be removed from the ground surface to the extent practicable so as not to disturb the organic mat. No more than 6 inches of loose or packed snow should be left on the ground surface prior to embankment development. If ice is present, the snow should be cleared to the ice surface. We recommend drilling through the ice in a few locations to establish an average ice thickness in areas where ice is on top of the ground surface. If the ice thickness is greater than 1 foot, effort should be undertaken to remove the ice so there is not more than 1 foot of ice over organic surface materials.

After snow is removed, a woven geotextile should be spread on the ground surface as recommended in Section 6.1.6.1. The base of the embankment fill should then be constructed as described above in Section 6.1.1.1 for summer construction. Type II material should continue to be placed to a height to ensure that initial consolidation of peat during the spring/early summer does not result in the pad surface being below the anticipated water level resulting from melting snow. The final lift of Type II material should be placed over the geogrid and crowned/graded to drain water off the embankment. A smooth drum roller should be used to condition the surface to as smooth a state as practicable. Snow can fall and accumulate on the resultant embankment surface over the winter months, but it should be removed prior to breakup to encourage thawing of the embankment base fill and subgrade. After the upper 2 feet of fill has thawed, the embankment surface should be bladed to a relatively smooth and level state and compacted with moisture density control as described in Section 6.3. From this point, embankment construction may commence as recommended in Section 6.1.2. Note that if winter construction is conducted, peat consolidation and settlement will be spread over a longer period of time as the materials thaw. As such, the contractor should be prepared to accommodate additional re-leveling of the embankment surface as it is developed.

6.1.2 Embankment Construction

The new embankments for the access road, the snow pad, and containment berm should provide a stable, supportive subgrade for the structural section of the new surface. Embankment fills above the base described in Section 6.1.1 should generally consist of Type III or better material that is placed and compacted as described below in Section 6.3. However, we understand that the MOA plans to utilize unclassified fill soils within the embankments for this project. This may be acceptable between the embankment base (see Section 6.1.1) and the structural section described in Section 6.1.4 for the access road and snow pad provided that the unclassified material can be placed and compacted with moisture density control as described in Section 6.3. However, we recommend concentrating the unclassified fill soils within the containment berms to the extent practicable since they will not need to support truck traffic. Additionally, unclassified fills typically contain elevated fines, which can make them difficult to compact with moisture density control during wet conditions.

In order to estimate fill quantities, it will be important to account for consolidation of the peat soils under fill loading. Embankment settlement and total expected settlement under fills is discussed in Section 6.1.5. It is important to note that consolidation of the peat soils will begin as soon as filling occurs and a substantial of consolidation may occur before the filling activities are complete.

6.1.2.1 Access Road and Snow Pad Embankment Construction

Embankment fill slopes of the access road and snow disposal pad should be established at angles not steeper than 2H to 1V. The thickness of the embankment will vary (thicker near the crowned center of the roadway and pad) and should accommodate for settlement described in Section 6.1.5 as well as the desired final grade of the roadway and pad. As filling takes place, the surface grade should maintain a crown to allow for drainage of surface water off of the fill/embankment surface.

We understand that the planned crown slopes of the snow pad are on the order of 0.5 percent to limit the volume of fill material needed for the project. We typically recommend establishing the embankment surface crown slopes at a minimum of 2 percent; however, we believe that the 0.5 percent slope will be sufficient for this project since truck traffic over the embankments will generally be conducted during the winter months, after the road and pad surfaces are partially frozen. Note that the shallower crown slope will likely result in a wet embankment during times of heavy precipitation and snow melting, so a soft driving surface and rutting should be anticipated when travelling over the embankments during the summer and fall months. It is likely that re-grading on a seasonal basis will be needed to re-establish the crown and maintain the desired drainage off the pad surface.

6.1.2.2 Containment Berm Embankment Construction

Embankment fill slopes of the containment berm should also be established at an angle not steeper than 2H to 1V but may need to be flatter depending on the quality of the unclassified fill soils. We understand that the thickness of the berm will vary along its length, but that it will generally be about 4 (north and west berms) to 6 (south and east) feet above the surrounding ground surface. While we understand that berms will not necessarily be surcharged as described in Section 6.1.3, construction should accommodate for settlement described in Section 6.1.5 by adding embankment fill material above the desired final height of the berm during initial construction. Likewise, the surface grade should maintain a crown to allow for drainage of surface water off the top of the berm as filling takes place.

Since unclassified soils are anticipated to be used to construct a significant portion of the containment berm and the berms will be allowed to settle as the underlying peat consolidates, we recommend that all exposed surfaces of the berm are constructed with a minimum crowned slope of 5 percent to drain water off the likely silty material. We also recommend that temporary culverts are installed around the containment berm to reduce the amount of water that is able to pond in the area between the snow disposal pad and containment berm prior to the construction of the weirs. Once the weirs are installed, these temporary culverts may be removed and the berm regraded as necessary.

While unclassified soils are generally acceptable overlying the embankment base for the berms, we recommend that Type II/IIA classified soils are used within approximately 10 feet of the sheet pile weirs that are planned to be installed in up to four locations around the site. We understand that a critical design component of the project is to keep each of the weirs at the same elevation to encourage excess water to drain evenly around the sides of the snow disposal site. The relatively high fines contents of unclassified soils typically make them more frost susceptible than the non frost susceptible Type II/IIA soils. Therefore, unclassified soils would likely add frost jacking forces to the sheet piles used to construct the weirs and increase the risk of frost related movements that would result in differential movements (i.e., different weir elevations) between the individual weirs.

6.1.3 Embankment Surcharging

Based on our borings and probes, peat depths at the snow disposal pad site vary between approximately 4 (Probe P-09) and 7.5 feet (Probes P-02 and P-05), with an average of approximately 6 feet in depth. Native soils underlying the peat generally consisted of medium dense to dense sands with varying amounts of fines. The magnitude of the settlements that will develop at the site are dependent upon the applied loads and density of the support material. If a surcharge load significantly higher than expected operational loads is stored on the site as described below, much of the primary settlement could be achieved such that additional settlements would be comparatively small, depending on the existing surcharged soil thickness, surcharge load, and length of time surcharged.

The purpose of preloading is to consolidate the compressible peat soils before the access road, snow pad, and containment berm are constructed. Surcharge loads are generally applied by placing a fill embankment over the site to a load greater than will be expected to be constructed on the site. This will produce, in a shorter period of time, a large amount of settlement that would have occurred under the lighter long-term, design loads. Post-construction differential settlements, with the use of a properly completed preload program, should be more uniform across the site. These differential settlements should also be relatively small and within tolerable limits for the project; with the amount generally depending upon the degree of surcharging and the variability in pre-surcharge site conditions.

6.1.3.1 Surcharging Access Road and Snow Pad Areas

In developing surcharge embankments over surface organics, the surcharge fill should be a minimum of 3 feet thick (relative to the proposed final elevation). We expect total settlements will be on the order of 40 percent of the peat layer thickness, which varies between approximately 4 and 7.5 feet across the site. With preloading, additional settlements after the surcharge is removed should be small, probably less than 3 to 4 inches, and the settlement pattern should be more uniform across the site to reduce the frequency of maintenance. Note that consolidation of the peat soils will begin as soon as fills are placed on top of them and will likely continue for up to approximately 6 months after filling is complete.

We recommend that Type II/IIA material be used to surcharge the access road and snow pad areas so that it can be used on other projects as the excess material is removed. We recommend that the crown slope should be maintained at the ground surface during surcharging. The surcharge fill should be allowed to stay in place for at least 6 months, at which point it can be removed and the structural section graded to develop final grade. A shorter surcharge time length may be possible, which could be determined with settlement and pore pressure monitoring. This program would include installation settlement plates that are monitored to detect stabilization and transition from primary to secondary consolidation in the organic soils, as described in Section 6.1.3.3.

6.1.3.2 Surcharging Containment Berm Areas

We understand that the containment berm will generally not be surcharged, per se, but the settlement results of surcharging will still be experienced by the berm. We also understand that a uniform height is not necessary around the perimeter of the berm and that the final height of the berm will generally vary between about 4 and 6 feet, with the highest points generally being in the southern and eastern berms. Therefore, we assume that an unclassified surcharge fill will generally remain in place (i.e., fill will not be removed, and the berm will not be constructed to a design shape), although landscaping vegetation may be placed over the berm after construction. As such, the surcharge fill thickness may vary along the berm, depending on the peat layer thickness around the site, which varies between approximately 4 and 7.5 feet across the site. In our opinion, a minimum of 2 feet of additional unclassified fill (relative to the proposed final elevation) should be placed over the berms during construction. We expect total settlements of the berm to be on the order of 40 percent of the peat layer thickness. With modified preloading, additional settlements after site construction is complete should be small to moderate, likely less than roughly 6 inches.

While most of the berm will not be surcharged, we recommend that the areas around the weirs are surcharged as recommended in Section 6.1.3.1. The surcharge fill area should extend out the full width of the berm or a minimum of 10 feet from the outer edges on all sided of the sheet pile weirs. We recommend that Type II/IIA classified soils are used to construct the full height of the containment berm embankment, including the surcharge load, in these areas to reduce the risk of frost jacking and/or downdrag forces that could lead to differential settlements between the drain height of the individual weirs. A surcharge monitoring program is also recommended at the weir locations to detect stabilization and transition from primary to secondary consolidation in the organic soils, as described in Section 6.1.3.3.

6.1.3.3 Surcharge Monitoring

As part of an effort to monitor the consolidation of the peat soil under the surcharge placed, we recommend installing settlement plates to monitor consolidation of the compressible peat soils under fill soils loads. These plates should be installed and monitored by a professional surveyor. The locations of the settlement monitoring points should be laid out on an approximate 200-foot grid within the area of the snow disposal pad and along the length of the access road. We also recommend that monitoring points are installed adjacent to each of the proposed weirs. PVC casing to house a thermistor string is recommended at occasional locations in the embankment to monitor ground temperatures where the ground was frozen at the time of fill placement. This would be the case within embankment bases that are constructed using winter construction recommendations (see Section 6.1.1.2).

Settlement plates should be installed on top of the ground surface and surveyed prior to placement of fill to establish the baseline condition. Rods extending up from the settlement plates should be extended up vertically as the fill is placed so that continued monitoring can be conducted after filling is completed. After filling, we recommend surveying the vertical locations once per week until it appears that the rate of settlement is approaching the project criteria for removal of the surcharge load (see discussion below).

Data from surveying elevation changes in the settlement plates and the ground temperatures (if the embankment base is initiated in the winter season) should be used to analyze the progress of the surcharge load. Note that since water must be removed from the soil for consolidation to occur, frozen grounds will not consolidate until thawed. Additionally, as thawing of the ground under the fill will not occur in a homogenous manner, soils near the edge of the fill will likely thaw faster than those in the center. The thawing and consolidation process of soil under a fill will behave in a somewhat unpredictable manner.

The rate of settlement will decrease over time and become linear at a relatively slow rate, indicative of primary consolidation being achieved. Once it is determined that primary consolidation of the peat has been achieved, the surcharge fill can be removed. See our Surcharging Plan (being prepared as of the date of this report) for more information on applying, monitoring, and removing the surcharge load for this project. Some general criteria for the completion of surcharging include:

- Total compression of the peat reaches at least 35 to 40 percent of its original thickness (see Figure 3 for our estimated Peat Contour Map).
- The rate of settlement is less than 0.1 inches per week for three consecutive weeks. Note that this rate of settlement is an estimate of what will likely indicate primary consolidation has occurred. Examination of the actual survey data may necessitate adjustment of this criteria after placement of the fill.
- Frozen soils, throughout the entire embankments and into the underlying peat soils should be fully thawed.

Note that we also recommend that the contractor submits the necessary data (i.e., survey, temperature, etc.) to the design engineer as it is collected. Once the contractor believes that all criteria has been met for primary consolidation, they should work with the design engineer for agreement and approval to remove the surcharge materials.

6.1.4 Structural Section

We understand that the access road and pad will remain gravel surfaced (i.e., paving is not planned for this project). The design of the driving surface for the road improvements should take into account the traffic loading and subgrade characteristics. We understand that the access road and gravel pad will likely experience loads from heavy equipment and dump trucks carrying loads of snow. The structural section to be constructed on top of the embankment should consist of at least 18 inches of Type IIA and 6 inches of either MOA leveling course (i.e., D-1) or E-1 surface course. The use of a wicking geotextile fabric may be incorporated into the design of the structural section (i.e., beneath the 18-inch layer of Type IIA), but is not required for the access road and snow disposal pad. A wicking fabric would actively pull water out of the upper portion of the embankment so that it would drain down the embankment slopes. This would result in a somewhat drier and more stable driving surface for vehicles to travel over. In order for the wicking fabric to function as intended, it would need to be positioned in the fill above the elevation of the surrounding bog.

Note that we recommend using Type IIA to surcharge the embankment, as described in Section 6.1.3, so that as it is removed to final elevation, the Type IIA layer is already in place.

We also recommend placing the leveling/surface course layer at the end of the project to allow the embankment materials and subgrade to consolidate and settle as much as practicable from the surcharge. Prior to placement of the structural section, the embankment surface should be graded and compacted with the appropriate crown slope for drainage.

The performance of the road and snow disposal pad will be controlled by the details of construction and by the quality (gradation and durability characteristics) of the materials that are placed and compacted to develop the needed structural section. Fill placement and compaction procedures are described in Section 6.3. Quality control inspection is strongly recommended when placing structural support soils. To reduce the maintenance needed after construction, we recommend including strict quality control/assurance provisions in the construction specifications. If constructed as recommended, we anticipate the road will require periodic maintenance including grading and pothole repair (depending on traffic loading/volume and weather conditions).

6.1.5 Embankment Settlement

Constructing the new access road, snow disposal pad, and containment berm over peat will result in measurable consolidation of the soft, organic material. This will result in differential settlement as the filled is placed and from secondary consolidation, after surcharging is complete. The actual magnitude of settlement of peat soils is difficult to estimate due to material variability and is dependent on the preloaded degree of consolidation, nature of the peat soils, and the amount of fill placed over the peat. For rough estimating purposes, the total settlement of new embankments over peat soils can be up to 40 percent of the original peat thickness under the fill. Based on the peat thicknesses encountered by our borings and probes, we estimate that the amount of primary settlement that the embankments could experience will likely be on the order of 1.6 to 3 feet, with an average of about 2.5 feet. Consolidation will take place over the life of the embankments and will begin during fill placement, but the rate of consolidation will be highest within approximately six months of construction (i.e., surcharging), depending on loading and traffic volume. Secondary settlements would likely be on the order of 3 to 4 inches for the access road and snow disposal pad; depending on the existing surcharged soil thickness, surcharge load, and length of time that the surcharge load remains in place.

It should be noted that as the embankments settle, they will likely need additional fill material to achieve a final grade above the existing ground surface and the desired crown slopes. Embankment material should be allowed to settle as much as practicable before development of the structural section to mitigate additional fill placement for maintenance of the desired road and pad grades.

6.1.6 Reinforcing Geofabric and Geogrid

Generalized guidelines for construction and recommended material types are listed above. Note that the recommended applications of these materials are to be used as guidelines in the final design. The manufacturer of the product selected can provide additional use and design guidelines for the specific product and application.

6.1.6.1 Geofabric

The geotextile recommended within the structural section should increase the strength and stability of the supporting material. By increasing the tensile strength of the soils, differential settlement should be decreased both longitudinally and laterally from the center to the edges of the road and pad section. We recommend using Mirafi RS580i or equivalent for the applications described above.

Sections of geotextile should be unrolled smoothly and perpendicular to the access road alignment on the grade surface so that it covers the entire exposed grade evenly. Geofabric should extend beyond the toe of the embankment slopes at least 2 feet to accommodate for future settlement. Alternatively, the geofabric may be wrapped in a perpendicular fashion around the bottom layer of fill to provide additional support and reduce lateral loss of material into the existing peat. There should also be at least 3 feet of overlap between grid sheets, with seams sewn as recommended in the standard specifications from the product manufacturer. Traffic on top of the initial lift over the geotextile should travel in straight lines to prevent damage.

6.1.6.2 Geogrid

The geogrid recommended within the structural section should increase the strength and stability of the embankment bases. By increasing the tensile strength of the soils, differential settlement should be decreased both longitudinally and laterally from the center to the edges of the road and pad sections. We recommend using a Type B Geotextile grid as specified in the Municipality of Anchorage Standard Specifications (MASS).

Sections of geogrid should be unrolled smoothly on the grade surface so that it covers the entire exposed grade evenly. There should also be at least 3 foot of overlap between grid sheets, with seams sewn as recommended in the standard specifications from the product manufacturer. Traffic on top of the initial lift over the geogrid should travel in straight lines to prevent damage.

6.2 Foundation (Pile) Recommendations

We understand that structures associated with this project include weirs at various locations around the containment berm and a detection system installed along the access road, near the northwest corner of the snow disposal pad. We also understand that preliminary plans call for up to four weirs to be installed within the containment berm and that sheet piles will likely be used to construct the weirs. The detection system is planned for the snow disposal site to reduce the risk of dump trucks damaging the lines by leaving their dump beds open as they exit the site. We assume that steel pipe piles will be constructed with poles or mastarms located near the top of the vertical support pile and extending over the outbound lane access road at a minimum.

6.2.1 Sheet Pile Weirs

Based on the subsurface conditions encountered near the planned weir locations (see Borings B-07, B-10, B-13, B-14, and Probe P-13), it is our opinion that sheet pile weir structures are appropriate for this project. Design of the sheet pile weirs must consider the depth of retained water, embedment depth of the sheet pile, pile section strength, effects on the containment berm due to seepage around the sheets, and constructability. We understand that the weirs will generally be designed by others; therefore, the discussions included in this report are primarily focused on embedment depths and constructability aspects of the design.

6.2.1.1 Design Considerations

We understand that sheet pile weirs will be installed at up to four locations within the containment berm (see site plan for approximate locations), and that a uniform height is not necessary around the perimeter of the berm. The final height of the berm will generally vary between about 4 and 6 feet, with the highest points generally being in the southern and eastern berms. We also understand that a critical design component of the project is to keep each of the weirs at the same elevation to encourage excess water to drain evenly around the snow disposal site to the extent practicable.

While unclassified soils are generally acceptable overlying the embankment base for the berms, we recommend that Type II/IIA classified soils are used within approximately 10 feet of each of the proposed sheet pile weirs. The relatively high fines contents of unclassified soils make them more frost susceptible than the generally non frost susceptible Type II/IIA soils. Therefore, unclassified soils would likely add frost jacking forces to the sheet piles used to construct the weirs and greatly increase the risk of frost related movements that would result in differential movements (i.e., different weir elevations) between the individual weirs.

Due to the sensitive nature of the weirs to movement, we recommend that sheet piles be driven to a depth of at least 18 feet below the surrounding ground surface, or to a minimum of 10 feet into the medium dense to dense native sands underlying the peat at the site. Additionally, sheet piles for the weirs should not be driven until primary consolidation of the peat has taken place to reduce the downdrag forces on the sheet piles. Based on the peat thicknesses observed in our borings, the anticipated surcharge settlements, and the containment berm heights; we believe that sheet piles may need to be driven on the order of 18 to 20 feet below the top of the containment berm.

6.2.1.2 Weir Materials

Based on preliminary design conversations, we understand that fiberglass or PVC sheet piles are being considered for the project to reduce the risk of corrosion due to the potentially high chloride content of the snow melt water. While we believe that either material would be viable for the project, we recommend using fiberglass. We believe that fiberglass is a stronger material than PVC, so it would likely provide more lateral resistance and may be easier to install without damaging the sheet pile. Our primary concerns with using either fiberglass or PVC is that they may require special driving equipment/considerations to install them properly. A special driving shoe/pad may be needed to drive these types of sheet piles without damaging the weaker materials (as compared to steel). Additionally, finding a skilled contractor to do the work could increase construction costs of the project.

6.2.2 Detection System Steel Pipe Piles

Based on the subsurface conditions encountered near the northwest corner of the snow disposal pad (see Boring B-07), it is our opinion that steel pipe piles are appropriate for the planned detection system structure. Design of the pipe piles must consider the embedment depth of the pile, pile strength, and constructability. We understand that the detection system support piles will generally be designed by others; therefore, the discussions included in this report are primarily focused on embedment depths and constructability aspects of the design.

6.2.2.1 Design Considerations

We understand that pipe piles will be installed for a detection system along the outbound lane of the access road, near the northwest corner of the snow disposal pad. We also understand that a critical design component for this structure is to maintain a set height (determined by others) for the pole/mastarm for the detection system to operate properly. While the exact location of the detection system has yet to be determined, we assume that the vertical support pile may be installed through a portion of the new access road embankment. To reduce frost jacking forces on the pipe piles used to support the detection system we recommend limiting the amount of unclassified soils around the piles to the extent practicable.

Due to the sensitive nature of the detection system to movement, we recommend that piles be driven to a depth of at least 20 feet into the medium dense to dense native sands underlying the peat at the site. Based on the conditions encountered in Boring B-07, we estimate that approximately 6 feet of peat should be anticipated to be encountered in the area of the detection system. Additionally, these piles should not be driven until primary consolidation of the peat has taken place to reduce the downdrag forces on the detection system support piles. The actual depth necessary of these piles will depend on the peat thicknesses at the location of the detection system, the height of embankment soils where the vertical piles are driven, and the surcharge accomplished by the unknown height of the embankment soils.

6.2.2.2 Detection System Materials

Based on preliminary design conversations, we understand that steel pile piles are being considered for the proposed detection system. We assume that the detection system for this project will generally be designed and constructed similar to a driven pile luminaire on a pole foundation. Therefore, based on MASS detail #80-13, we recommend that a minimum 8-inch steel pipe pile is used for design of the detection system. These vertical support piles should generally use standard steel pipe piles with a wall thickness of approximately 0.322 inches. Note that these recommended vertical support piles and pole/mastarms will also need to be designed by others to ensure that they will support the design loads of the system. The design height of the pole/mastarm connection with the vertical support pile will also need to account for potential bending of all elements of the structure to ensure that it is set at a height to operate as intended.

6.2.3 Pile Driving

The contractor should be responsible for developing a pile driving plan that will achieve the goals of the project. This plan should include a list of the equipment that is to be used and general procedures for conducting the pile driving, particularly if fiberglass or PVC sheet piles are selected. Axial loads will generally not be applied to the proposed sheet pile weirs, so the depth that the piles are driven into the medium dense to dense soils beneath the existing peat will be the driving criteria during construction. Based on the subsurface conditions and our analyses, the following criteria and procedures should be established for sheet pile driving:

- The sheet piles should be driven to a minimum depth of 18 feet below the surrounding ground surface, or at least 10 feet below the bottom of the surcharged peat soils.
- Detection system piles should be driven to a minimum depth of 20 feet into the medium dense to dense native sands underlying the peat at the site. Note that this depth does not include the embankment fill soils overlying the peat.
- A continuous driving record, including the depth of the bottom of the peat soils encountered, should be taken for the entire depth of the sheet piles.
- Acceptance criteria should be based on achieving target tip embedment.

During driving, the contractor should be made responsible for keeping pile driving records to include pile location, penetration rates or blow counts, time of driving, length of driving, length of pile, and the finish tip elevation. The records should highlight problems or difficulties encountered during driving and the methods or measures taken to overcome the issues. We recommend that a qualified geotechnical engineer be on site during pile installation to observe the construction effort on behalf of the project owner to verify that the construction is carried out per plan and the actual detection system and sheet pile weir design.

6.3 Structural Fill and Compaction

Structural fill will be needed to construct a new access road, snow disposal pad, and portions of the containment berm. Structural fill that is imported should be clean, granular soil free of organic material and meet the gradation properties for Type II/IIA as specified by the MASS, which is presented as Figure 3. We also understand that unclassified fill materials will also be imported to construction portions of the embankments and a large portion of the containment berm. While these unclassified materials are not necessarily subject to gradation specifications, they must be able to be placed and compacted as follows.

We understand that existing soils from the project area will likely not be excavated during construction activities. If minor grading is conducted along the existing access road and parking area, the granular soils do not meet the gradation requirements for Type II/IIA fill based on the results of our laboratory testing. In our opinion, these materials are unsuitable for reuse in the pavement structural section but may be reused as unclassified fill in areas of the embankments and containment berm that will receive unclassified fills, provided the contractor can demonstrate the ability to place and compact the material with proper moisture density control.

Structural fills below roadways should be placed in lifts not to exceed 10 to 12 inches loose thickness, and compacted to at least 95 percent of the maximum dry density as determined by the Modified Proctor compaction procedure (ASTM D1557). Non-structural fills, including portions of the containment that are not subject to traffic loads or adjacent to weirs, should be compacted to at least 90 percent of the Modified Proctor optimum dry density. Bulking of backfill should be discouraged as this can cause voids and lead to large future surface settlements. During fill placement, we recommend that large cobbles or boulders with dimensions in excess of 8 inches be removed from any structural fills.

7 CLOSURE AND LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives for evaluating the site as it relates to the geotechnical aspects discussed herein. The conclusions and interpretation contained in this report are based on site conditions as they presently exist. It is assumed that the exploratory borings are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions everywhere are not significantly different from those disclosed by the explorations.

If there is a substantial lapse of time between the submittal of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, it is recommended that this report be reviewed to determine the applicability of the conclusions considering the changed conditions and time lapse. Unanticipated soil conditions are commonly encountered and cannot fully be determined by merely taking soil samples or advancing test holes. Please read the Important Information section at the back of this report to reduce your project risks.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information obtained or derived from such electronic files shall be at the user’s sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report please contact us.

Map adapted from files provided by the Alaska Department of Natural Resources

N

0 1.5 3

Miles

West Anchorage Snow Disposal Site
Anchorage, Alaska

VICINITY MAP

May 2024 106424-003

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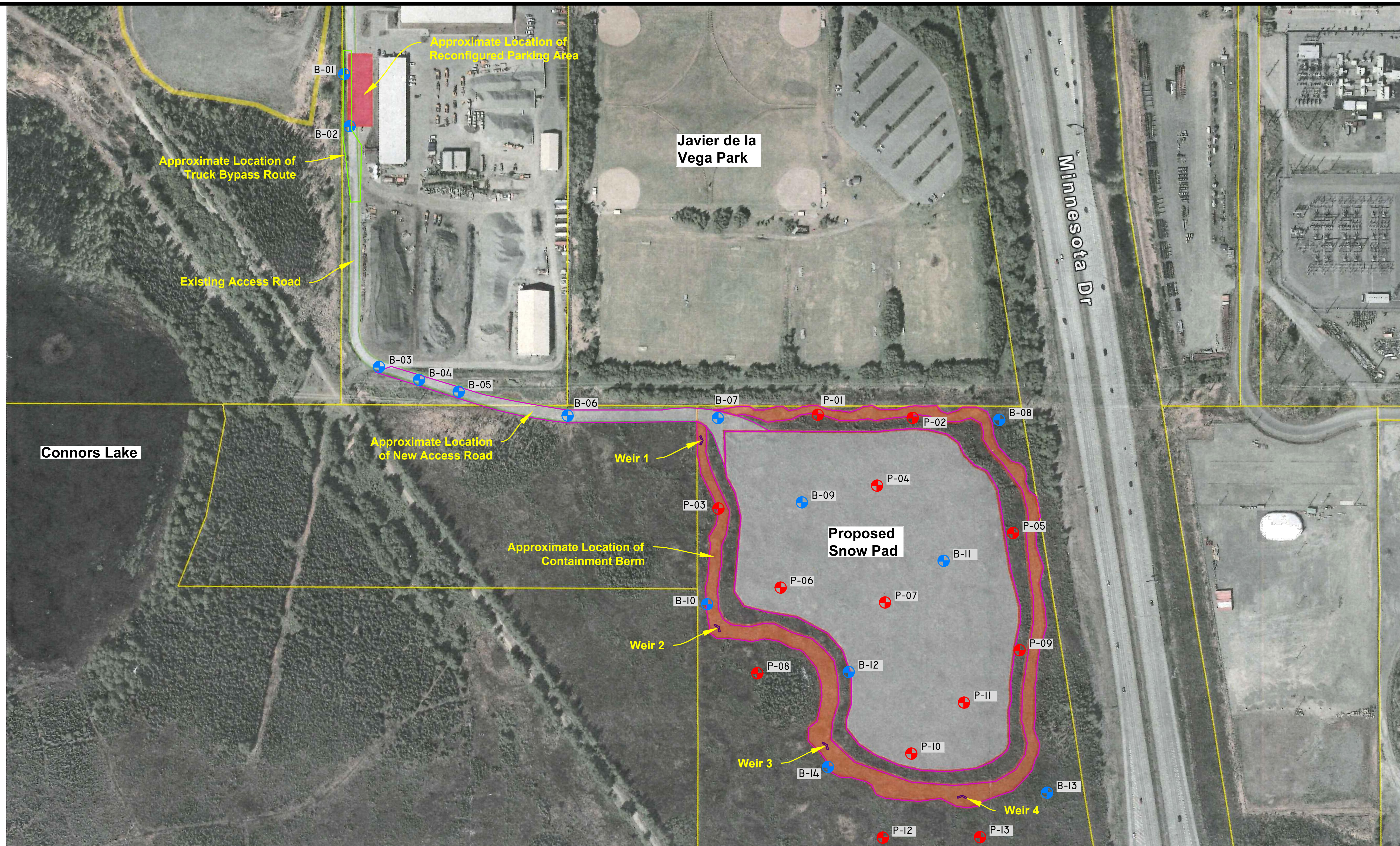
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1



LEGEND

P-01 Approximate Location of Geotechnical Probe P-01, Advanced by Shannon & Wilson, March and April 2021.

B-01 Approximate Location of Geotechnical Boring B-01, Advanced by Shannon & Wilson, March and April 2021.

NOTES

1. Base map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google EarthTM/ Mapping Service.

West Anchorage Snow Disposal Site
Anchorage, Alaska

SITE PLAN

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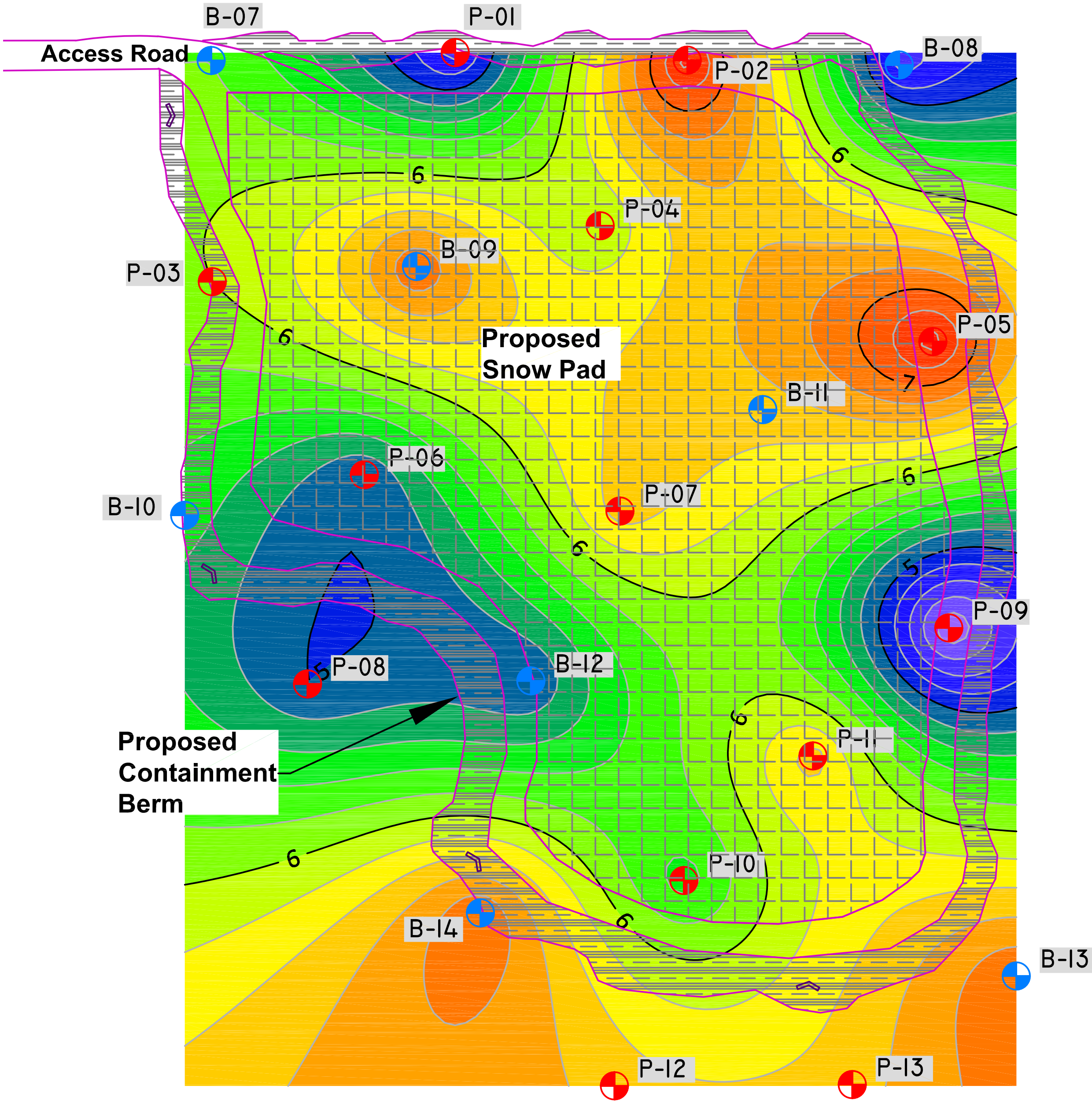
FIG. 2



LEGEND

P-01 Approximate Location of Geotechnical Probe P-01, Advanced by Shannon & Wilson, March and April 2021.

B-01 Approximate Location of Geotechnical Boring B-01, Advanced by Shannon & Wilson, March and April 2021.

5 6 7 Peat thickness in feet. Cooler blue colors indicate thinner peat deposits, warmer red colors indicate thicker peat deposits.

NOTES

1. Major peat thickness contour intervals = 1 foot.
2. Peat contours taken from peat thicknesses provided in boring and probe logs.

West Anchorage Snow Disposal Site
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PEAT CONTOUR MAP

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FIG. 3

GRADATION REQUIREMENTS

(Adapted from Municipality of Anchorage Standard Specifications, 2024)

LEVELING COURSE

U.S. STANDARD SIEVE SIZE English	Metric	PERCENT PASSING BY WEIGHT
1 in.	25.0 mm	100
3/4 in.	19.0 mm	70 - 100
3/8 in.	9.5 mm	50 - 80
No. 4	4.75 mm	35 - 65
No. 8	2.36 mm	20 - 50
No. 50	0.30 mm	8 - 28
No. 200	0.075 mm	0 - 6*

TYPE II BACKFILL

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
8 in.	-	100
3 in.	75 mm	70 - 100
1-1/2 in.	37.5 mm	55 - 100
3/4 in.	19.0 mm	45 - 85
No. 4	4.75 mm	20 - 60
No. 10	2.00 mm	12 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6**

TYPE IIA BACKFILL

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
3 in.	75 mm	100
3/4 in.	19.0 mm	50 - 100
No. 4	4.75 mm	25 - 60
No. 10	2.00 mm	15 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6***

TYPE III BACKFILL

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
8 in.	-	100
No. 200	0.075 mm	10 max.

E-1 SURFACE COURSE

(Adapted from Alaska DOT Standard Specifications, 2017)

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
1 in.	25 mm	100
3/4 in.	19 mm	70-100
3/8 in.	9.5 mm	50 - 85
No. 4	4.75 mm	35 - 65
No. 8	2.36 mm	20 - 50
No. 50	0.30 mm	15 - 30
No. 200	0.075 mm	8 - 15

* The fraction passing the No. 200 sieve shall not exceed 75 percent of the fraction passing the No. 50 sieve.

** The fraction passing the No. 200 sieve shall not exceed 15 percent of the fraction passing the No. 4 sieve.

*** The fraction passing the No. 200 sieve shall not exceed 20 percent of the fraction passing the No. 4 sieve.

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GRADATION REQUIREMENTS

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FIG. 4

Appendix A

Boring Logs and Laboratory Test Results

Subtitle if Applicable

APPENDIX A: BORING LOGS AND LABORATORY TEST RESULTS

CONTENTS

Shannon & Wilson, Inc. (S&W), uses a soil identification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following pages. Soil descriptions are based on visual-manual procedures (ASTM D2488) and laboratory testing procedures (ASTM D2487), if performed.

S&W INORGANIC SOIL CONSTITUENT DEFINITIONS

CONSTITUENT[2]	FINE-GRAINED SOILS (50% or more fines)[1]	COARSE-GRAINED SOILS (less than 50% fines)[1]
Major	***Silt, Lean Clay, Elastic Silt,*** or ***Fat Clay***[3]	***Sand*** or ***Gravel***[4]
Modifying (Secondary) Precedes major constituent	30% or more coarse-grained: ***Sandy*** or ***Gravelly***[4]	More than 12% fine-grained: ***Silty*** or ***Clayey***[3]
Minor Follows major constituent	15% to 30% coarse-grained: ***with Sand*** or ***with Gravel***[4]	5% to 12% fine-grained: ***with Silt*** or ***with Clay***[3]
	30% or more total coarse-grained *and* lesser coarse-grained constituent is 15% or more: ***with Sand*** or ***with Gravel***[5]	15% or more of a second coarse-grained constituent: ***with Sand*** or ***with Gravel***[5]

[1]All percentages are by weight of total specimen passing a 3-inch sieve.
[2]The order of terms is: *Modifying Major with Minor*.
[3]Determined based on behavior.
[4]Determined based on which constituent comprises a larger percentage.
[5]Whichever is the lesser constituent.

MOISTURE CONTENT TERMS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

STANDARD PENETRATION TEST (SPT) SPECIFICATIONS

Hammer:	140 pounds with a 30-inch free fall. Rope on 6- to 10-inch-diam. cathead 2-1/4 rope turns, > 100 rpm NOTE: If automatic hammers are used, blow counts shown on boring logs should be adjusted to account for efficiency of hammer.
Sampler:	10 to 30 inches long Shoe I.D. = 1.375 inches Barrel I.D. = 1.5 inches Barrel O.D. = 2 inches
N-Value:	Sum blow counts for second and third 6-inch increments. Refusal: 50 blows for 6 inches or less; 10 blows for 0 inches.

NOTE: Penetration resistances (N-values) shown on boring logs are as recorded in the field and have not been corrected for hammer efficiency, overburden, or other factors.

PARTICLE SIZE DEFINITIONS

DESCRIPTION	SIEVE NUMBER AND/OR APPROXIMATE SIZE
FINES	< #200 (0.075 mm = 0.003 in.)
SAND	
Fine	#200 to #40 (0.075 to 0.4 mm; 0.003 to 0.02 in.)
Medium	#40 to #10 (0.4 to 2 mm; 0.02 to 0.08 in.)
Coarse	#10 to #4 (2 to 4.75 mm; 0.08 to 0.187 in.)
GRAVEL	
Fine	#4 to 3/4 in. (4.75 to 19 mm; 0.187 to 0.75 in.)
Coarse	3/4 to 3 in. (19 to 76 mm)
COBBLES	3 to 12 in. (76 to 305 mm)
BOULDERS	> 12 in. (305 mm)

RELATIVE DENSITY / CONSISTENCY

COHESIONLESS SOILS: N, SPT, BLOWS/FT.	RELATIVE DENSITY	COHESIVE SOILS: N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
< 4	Very loose	< 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
> 50	Very dense	15 - 30	Very stiff
		> 30	Hard

WELL AND BACKFILL SYMBOLS

Bentonite Cement Grout	Surface Cement Seal
Bentonite Grout	Asphalt or Cap
Bentonite Chips	Slough
Silica Sand	Inclinometer or Non-perforated Casing
Perforated or Screened Casing	Vibrating Wire Piezometer

PERCENTAGES TERMS[1, 2]

Trace	< 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

[1]Gravel, sand, and fines estimated by mass. Other constituents, such as organics, cobbles, and boulders, estimated by volume.

[2]Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

West Anchorage Snow Disposal Site
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SOIL DESCRIPTION AND LOG KEY

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SHANNON & WILSON, INC.
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FIG. A-1
Sheet 1 of 3

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(Modified From USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL	TYPICAL IDENTIFICATIONS
COARSE-GRAINED SOILS *(more than 50% retained on No. 200 sieve)*	Gravels *(more than 50% of coarse fraction retained on No. 4 sieve)*	Gravel *(less than 5% fines)*	GW	Well-Graded Gravel; Well-Graded Gravel with Sand
			GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel *(more than 12% fines)*	GM	Silty Gravel; Silty Gravel with Sand
			GC	Clayey Gravel; Clayey Gravel with Sand
	Sands *(50% or more of coarse fraction passes the No. 4 sieve)*	Sand *(less than 5% fines)*	SW	Well-Graded Sand; Well-Graded Sand with Gravel
			SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand *(more than 12% fines)*	SM	Silty Sand; Silty Sand with Gravel
			SC	Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS *(50% or more passes the No. 200 sieve)*	Silts and Clays *(liquid limit less than 50)*	Inorganic	ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
		Organic	OL	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
	Silts and Clays *(liquid limit 50 or more)*	Inorganic	MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
			CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
		Organic	OH	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat or other highly organic soils (see ASTM D4427)

NOTE: No. 4 size = 4.75 mm = 0.187 in.; No. 200 size = 0.075 mm = 0.003 in.

NOTES

1. Dual symbols *(symbols separated by a hyphen, i.e., SP-SM, Sand with Silt)* are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart. Graphics shown on the logs for these soil types are a combination of the two graphic symbols (e.g., SP and SM).

2. Borderline symbols *(symbols separated by a slash, i.e., CL/ML, Lean Clay to Silt; SP-SM/SM, Sand with Silt to Silty Sand)* indicate that the soil properties are close to the defining boundary between two groups.

West Anchorage Snow Disposal Site
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SOIL DESCRIPTION AND LOG KEY

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FIG. A-1
Sheet 2 of 3

GRADATION TERMS

Poorly Graded	Narrow range of grain sizes present or, within the range of grain sizes present, one or more sizes are missing (Gap Graded). Meets criteria in ASTM D2487, if tested.
Well-Graded	Full range and even distribution of grain sizes present. Meets criteria in ASTM D2487, if tested.

CEMENTATION TERMS[1]

Weak	Crumbles or breaks with handling or slight finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

PLASTICITY[2]

DESCRIPTION	VISUAL-MANUAL CRITERIA	APPROX. PLASITICTY INDEX RANGE
Nonplastic	A 1/8-in. thread cannot be rolled at any water content.	< 4
Low	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.	4 to 10
Medium	A thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.	10 to 20
High	It take considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.	> 20

ADDITIONAL TERMS

Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

PARTICLE ANGULARITY AND SHAPE TERMS[1]

Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width/thickness ratio > 3.
Elongated	Length/width ratio > 3.

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ACRONYMS AND ABBREVIATIONS

ATD	At Time of Drilling
Diam.	Diameter
Elev.	Elevation
ft.	Feet
FeO	Iron Oxide
gal.	Gallons
Horiz.	Horizontal
HSA	Hollow Stem Auger
I.D.	Inside Diameter
in.	Inches
lbs.	Pounds
MgO	Magnesium Oxide
mm	Millimeter
MnO	Manganese Oxide
NA	Not Applicable or Not Available
NP	Nonplastic
O.D.	Outside Diameter
OW	Observation Well
pcf	Pounds per Cubic Foot
PID	Photo-Ionization Detector
PMT	Pressuremeter Test
ppm	Parts per Million
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
rpm	Rotations per Minute
SPT	Standard Penetration Test
USCS	Unified Soil Classification System
q_u	Unconfined Compressive Strength
VWP	Vibrating Wire Piezometer
Vert.	Vertical
WOH	Weight of Hammer
WOR	Weight of Rods
Wt.	Weight

STRUCTURE TERMS[1]

Interbedded	Alternating layers of varying material or color with layers at least 1/4-inch thick; singular: bed.
Laminated	Alternating layers of varying material or color with layers less than 1/4-inch thick; singular: lamination.
Fissured	Breaks along definite planes or fractures with little resistance.
Slickensided	Fracture planes appear polished or glossy; sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Homogeneous	Same color and appearance throughout.

West Anchorage Snow Disposal Site
Anchorage, Alaska

SOIL DESCRIPTION AND LOG KEY

May 2024 106424-003

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 3 of 3

2013 BORING CLASS3 106424 GINT TEMPLATE7.GPJ SWNEW.GDT 5/21/24

FROST CLASSIFICATION

(after Municipality of Anchorage, 2007)

GROUP		0.02 Mil.	P-200*	USC SYSTEM (based on P-200 results)
NFS	Sandy Soils	0 to 3	0 to 6	SW, SP, SW-SM, SP-SM
	Gravelly Soils	0 to 3	0 to 6	GW, GP, GW-GM, GP-GM
F1	Gravelly Soils	3 to 10	6 to 13	GM, GW-GM, GP-GM
F2	Sandy Soils	3 to 15	6 to 19	SP-SM, SW-SM, SM
	Gravelly Soils	10 to 20	13 to 25	GM
F3	Sands, except very fine silty sands**	Over 15	Over 19	SM, SC
	Gravelly Soils	Over 20	Over 25	GM, GC
	Clays, PI>12			CL, CH
F4	All Silts	Over 15	Over 19	ML, MH
	Very fine silty sands**			SM, SC
	Clays, PI<12			CL, CL-ML
	Varved clays and other fined grained, banded sediments			CL and ML CL, ML, and SM; SL, SH, and ML; CL, CH, ML, and SM

PI = Plasticity Index
P-200 = Percent passing the number 200 sieve
0.02 Mil. = Percent material below 0.02 millimeter grain size

*Approximate P-200 value equivalent for frost classification.
Value range based on typical, well-graded soil curves.

** Very fine sand : greater than 50% of sand fraction passing the number 100 sieve

West Anchorage Snow Disposal Site
Anchorage, Alaska

FROST CLASSIFICATION LEGEND

May 2024 106424-003

SHANNON & WILSON, INC.
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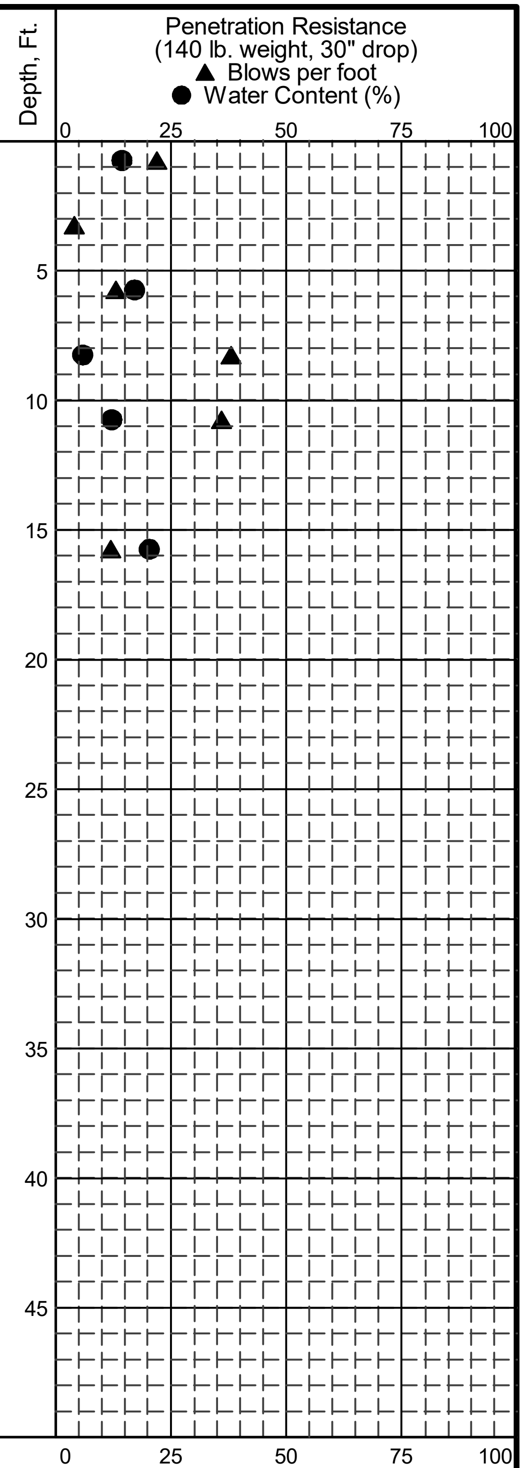
FIG. A-2

MATERIAL DESCRIPTION Lat.: 61.16909 N Long.: 149.9278 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Medium stiff, dark brown, *Organic Silt (OL)*; moist [Organic Mat]	0.5		S1	
Loose to medium dense, dark brown, *Silty Sand with Gravel (SM)*; moist; few organics [FILL?]	4.5		S2 *	
Medium dense, brown, interbedded *Silt (ML)* and *Poorly Graded Sand with Silt (SP-SM)*; moist	7.0		S3	
S4: 11% Gravel, 84% Sand, 5% Fines (NFS) Dense, gray-brown to brown, *Poorly Graded Sand (SP)* to *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist to wet	13.0		S4, S5	4/30/21 ▽
Stiff, gray *Silt with Sand (ML)*; wet	16.5		S6	

Bottom of Boring
Boring Completed 4/30/2021



● Water Content (%)
Plastic Limit Liquid Limit
Natural Water Content

LEGEND

* Sample Not Recovered
2" O.D. Split Spoon Sample
Grab Sample
Ground Water Level At Time Of Drilling

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-01

May 2024 106424-003

SHANNON & WILSON, INC.
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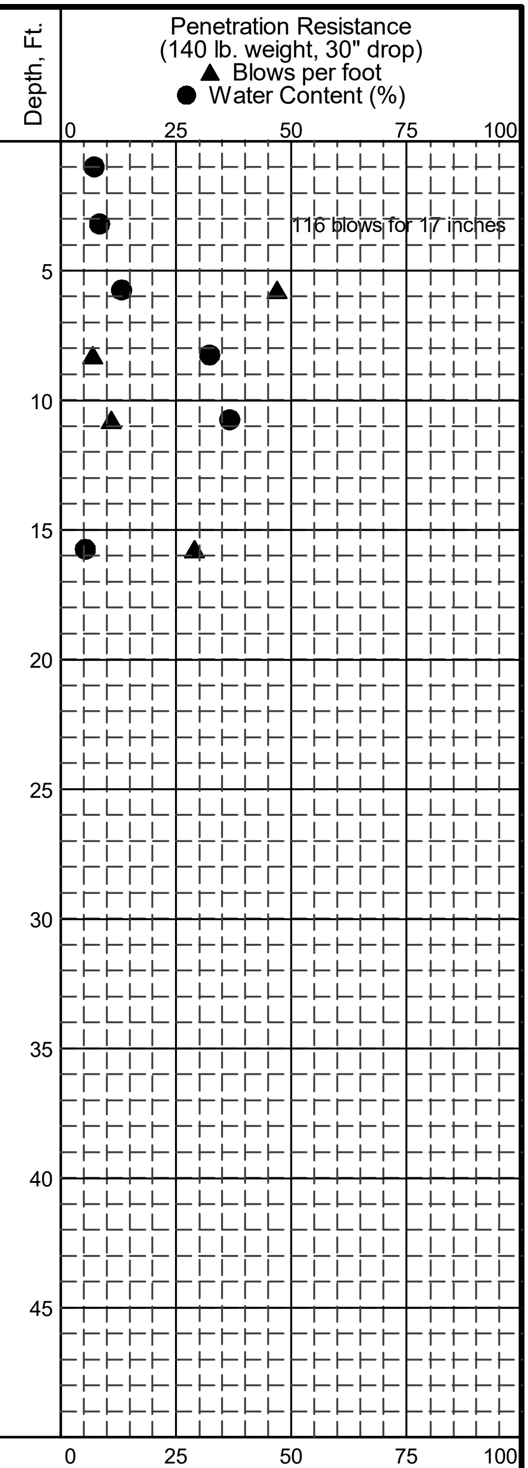
FIG. A-3

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples
Lat.: 61.16865 N Long.: 149.9278 W Approx. Elevation: 91 Ft. Datum: WGS 84			
2 inches Asphalt	0.2		S1
S2: 34% Gravel, 49% Sand, 17% Fines (F2) Frozen, gray to dark brown, *Silty Sand with Gravel (SM)*; moist; trace organics from approximately 4.5 to 7 feet bgs [FILL]	7.0		S2, S3
Medium stiff, brown, *Organic Soil with Sand (OL)*; moist	9.5		S4
Stiff, brown *Peat (PT)*; moist; occasional granular soil pockets	12.0		S5
Medium dense, gray-brown, *Poorly Graded Sand with Silt (SP-SM)*; moist	16.5		S6

Bottom of Boring
Boring Completed 4/5/2021

Ground Water: Groundwater not encountered during drilling on 4/5/2021



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- ■ Frozen

● Water Content (%)

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-02

May 2024 106424-003

SHANNON & WILSON, INC.
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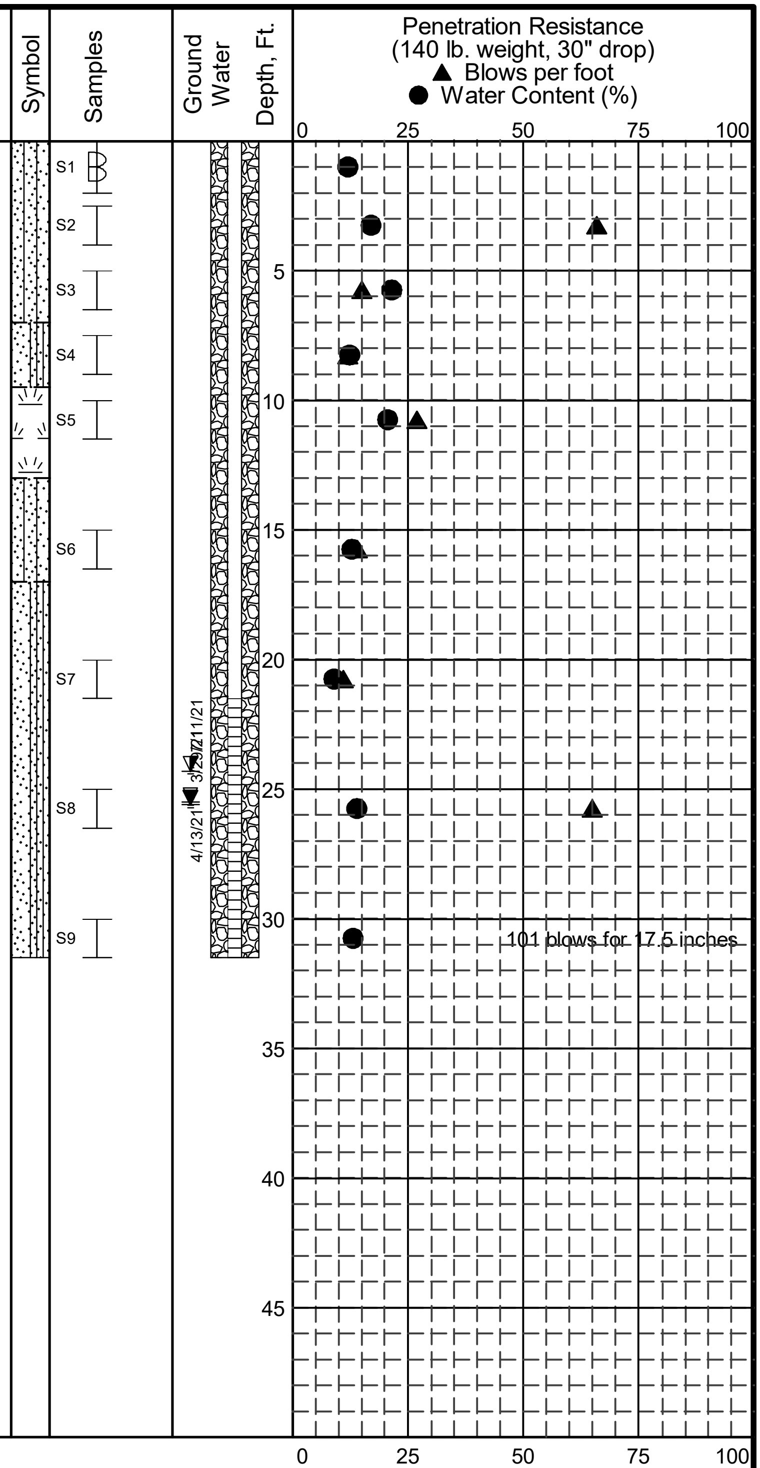
FIG. A-4

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

LOG OF BORING B-03

MATERIAL DESCRIPTION	Depth, Ft.
Lat.: 61.16669 N Long.: 149.9272 W Approx. Elevation: 95 Ft. Datum: WGS 84	
Frozen to medium dense, gray-brown to brown, *Silty Sand with Gravel (SM)*; moist [FILL] S2: 25% Gravel, 54% Sand, 21% Fines (F3)	7.0
Medium dense, gray, *Poorly Graded Sand with Silt (SP-SM)*; moist [FILL]	9.5
Very stiff to medium dense, gray to brown, interbedded *Peat (PT)* and *Poorly Graded Sand with Silt (SP-SM)*; moist; occasional trash/debris	13.0
Medium dense, gray to brown, interbedded *Silty Sand (SM)* and *Poorly Graded Sand with Silt (SP-SM)*; moist; trace trash/debris	17.0
Medium dense to very dense, gray, *Poorly Graded Sand with Silt (SP-SM)*; moist to wet S7: 4% Gravel, 88% Sand, 8% Fines (F2)	31.5
Bottom of Boring Boring Completed 3/29/2021	



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen
- Ground Water Level At Time Of Drilling
- Static Water Level
- Blank Section, Cuttings Backfill
- Slotted Section, Cuttings Backfill
- VWP Ground Water Level

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-03

May 2024 106424-003

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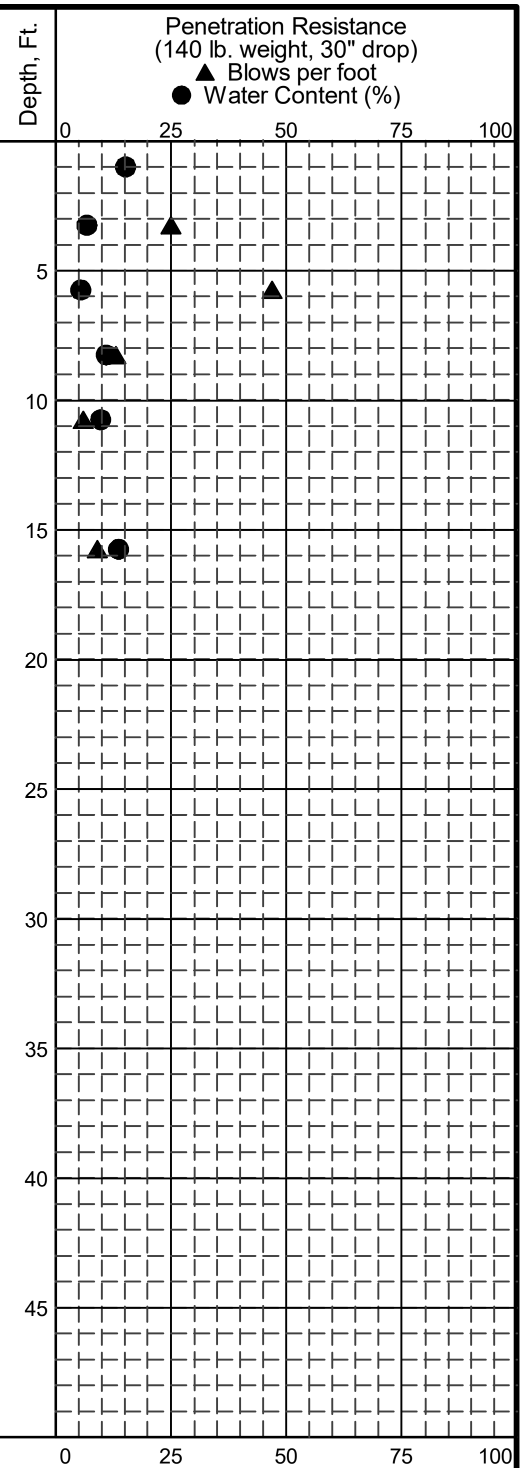
FIG. A-5

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water
Lat.: 61.1666 N Long.: 149.9266 W Approx. Elevation: 103 Ft. Datum: WGS 84				
Stiff, brown, *Sandy Silt (ML)*; moist; trace organics [FILL]	2.2		S1	
S2: 7% Gravel, 73% Sand, 20% Fines (F3) Medium dense to dense, brown to dark gray, *Silty Sand* to *Silty Sand with Gravel (SM)*; moist; trace organics [FILL]	9.5		S2, S3, S4	
Loose, gray, *Silty Sand (SM)*; moist [FILL]	13.0		S5	
Loose, gray, *Silty Sand with Gravel (SM)*; moist; few organics [FILL]	16.5		S6	
Bottom of Boring Boring Completed 4/30/2021				Groundwater not encountered during drilling on 4/30/2021



LEGEND

* Sample Not Recovered
2" O.D. Split Spoon Sample
Grab Sample

● Water Content (%)
Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-04

May 2024 106424-003

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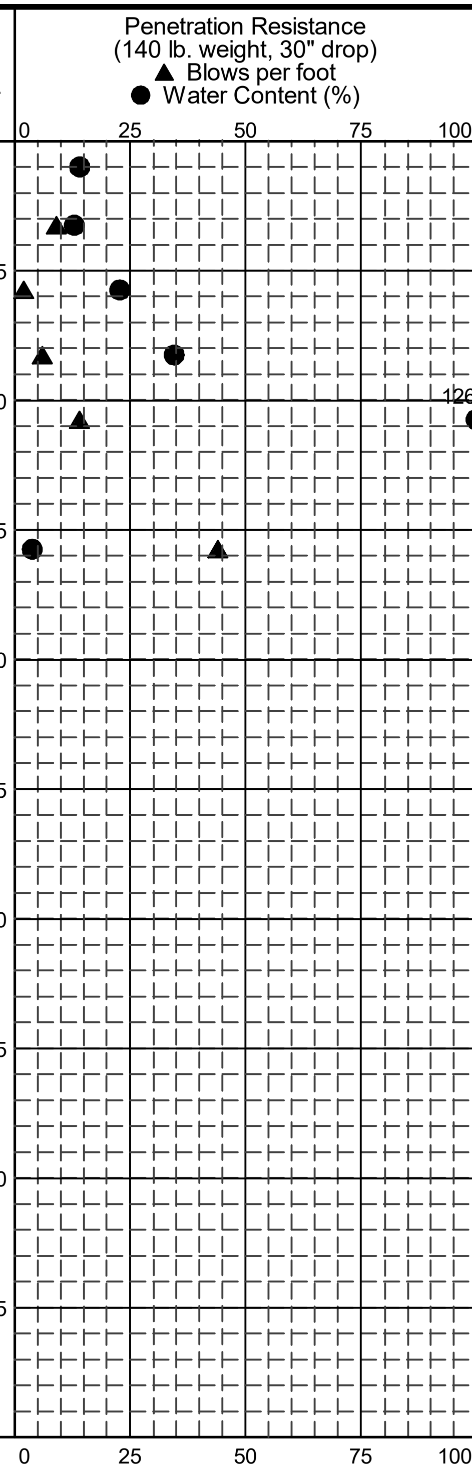
FIG. A-6

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water
Lat.: 61.1665 N Long.: 149.9259 W Approx. Elevation: 91 Ft. Datum: WGS 84				
Loose to medium dense, brown, *Silty Sand with Gravel (SM)*; moist; little grass and organics [FILL]			S1, S2	
Soft to medium stiff, gray and brown, intermingled *Peat (PT), Wood, Silt (ML), and Poorly Graded Sand (SP)*; moist [FILL]	4.5		S3, S4	
Stiff, brown, *Peat (PT)*; moist	9.5		S5	
S6: 7% Gravel, 84% Sand, 9% Fines (F2) Dense, gray, *Well-Graded Sand with Silt (SW-SM)*; moist	15.5		S6	
Bottom of Boring Boring Completed 4/30/2021	16.5			Groundwater not encountered during drilling on 4/30/2021



● Water Content (%)
Plastic Limit ├─●─┤ Liquid Limit
Natural Water Content

LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-05

May 2024 106424-003

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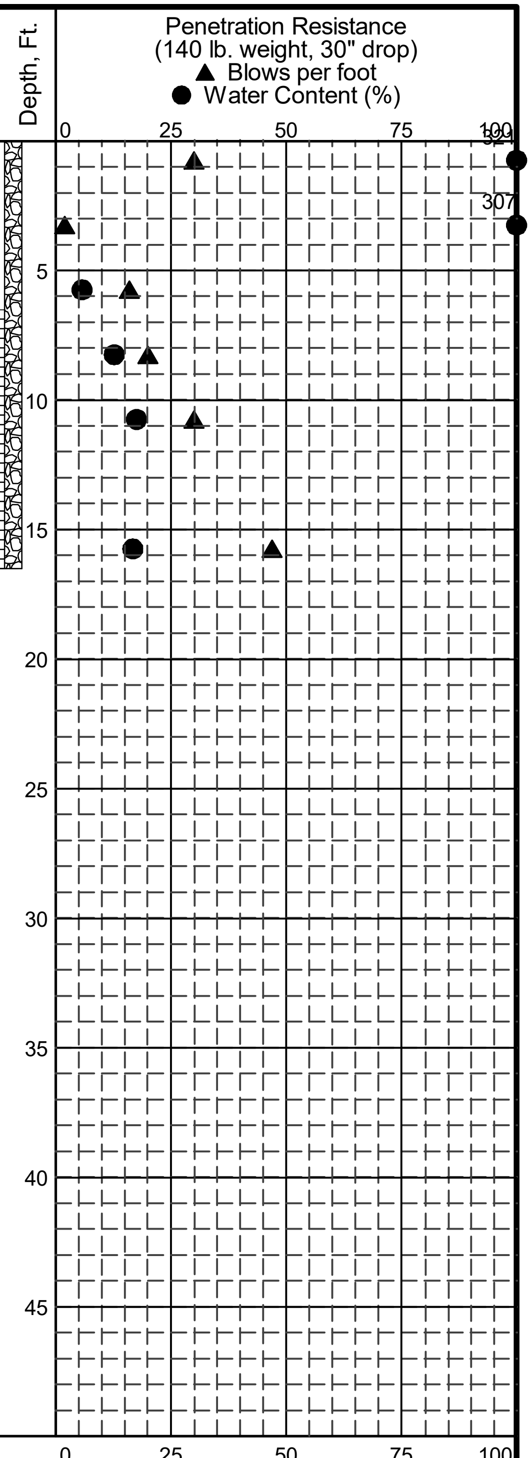
FIG. A-7

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION Lat.: 61.16631 N Long.: 149.9241 W Approx. Elevation: 82 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to soft, brown *Peat (PT)*; moist			S1 S2	
Medium dense to dense, gray, *Poorly Graded Sand with Silt (SP-SM)* to *Poorly Graded Sand (SP)*; moist to wet S5: 10% Gravel, 85% Sand, 5% Fines (NFS)	5.5		S3 S4 S5 S6	4/13/21 4/1/21 3/30/21
Bottom of Boring Boring Completed 3/30/2021	16.5			



LEGEND

* Sample Not Recovered
2" O.D. Split Spoon Sample
Grab Sample
Frozen

Ground Water Level At Time Of Drilling
Static Water Level
Blank Section, Cuttings Backfill
Slotted Section, Cuttings Backfill

VWP Ground Water Level

● Water Content (%)
Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-06

May 2024 106424-003

SHANNON & WILSON, INC.
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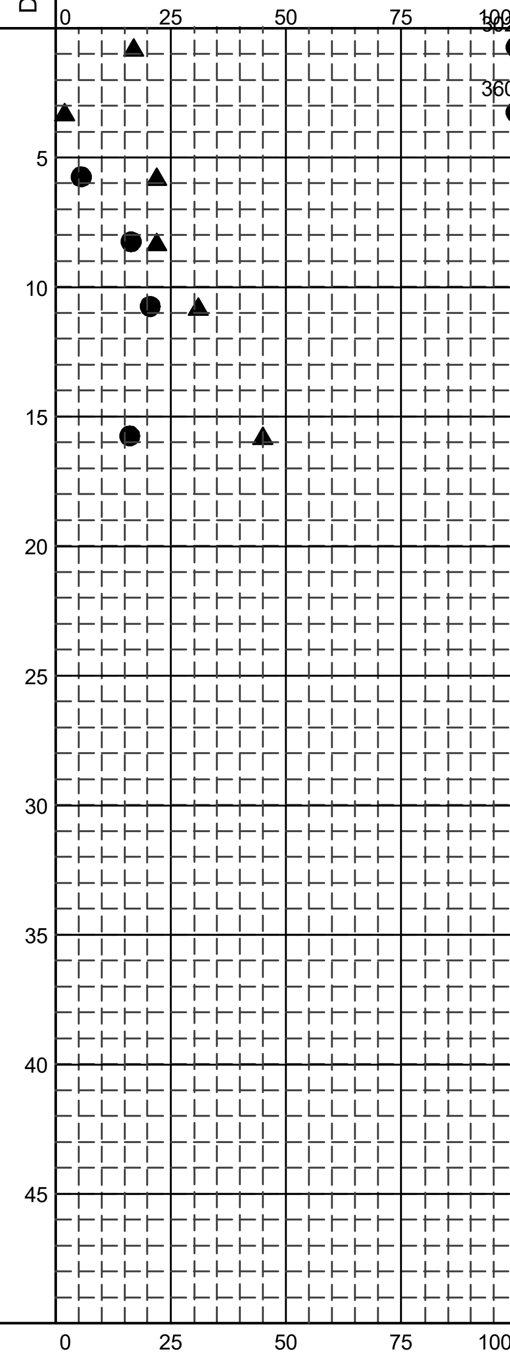
FIG. A-8

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION Lat.: 61.16629 N Long.: 149.9217 W Approx. Elevation: 82 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to soft, brown *Peat (PT)*; moist			S1 S2	
Medium dense to dense, gray to black, *Poorly Graded Sand with Silt and Gravel (SP-SM)* to *Poorly Graded Sand (SP)*; moist to wet S4: 15% Gravel, 79% Sand, 6% Fines (F2)	5.8		S3 S4 S5 S6	3/30/21
Bottom of Boring Boring Completed 3/30/2021	16.5			

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

* Sample Not Recovered
2" O.D. Split Spoon Sample
Grab Sample
Frozen
Ground Water Level At Time Of Drilling

● Water Content (%)
Plastic Limit ——●—— Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-07

May 2024 106424-003

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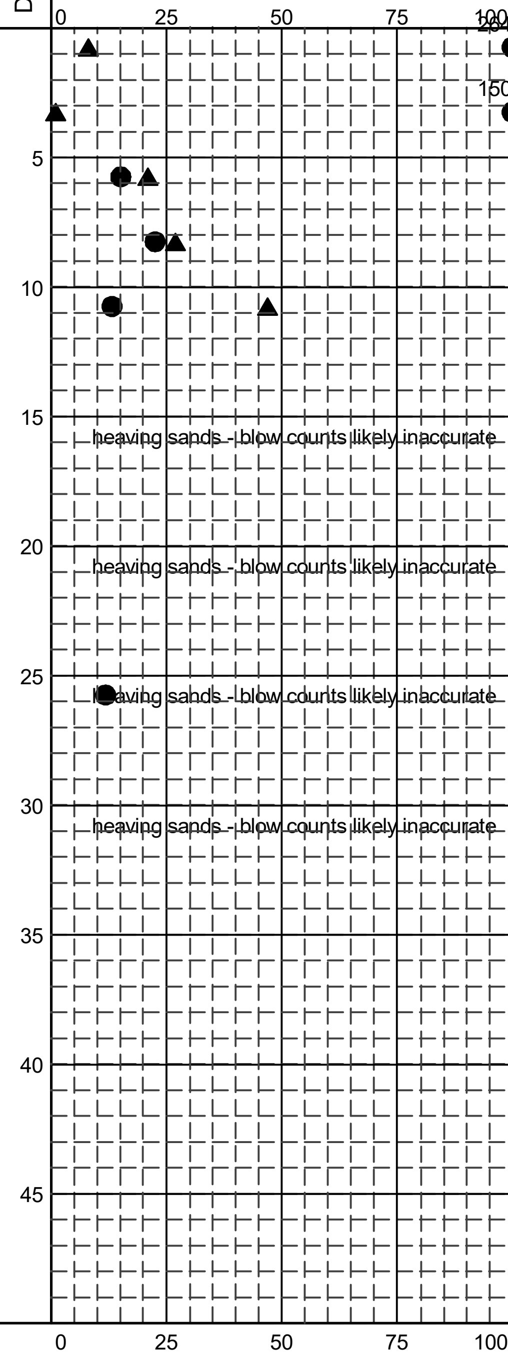
FIG. A-9

MATERIAL DESCRIPTION Lat.: 61.16627 N Long.: 149.917 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to very soft, brown *Peat (PT)*; moist			S1, S2	
Medium dense to dense, gray, *Poorly Graded Sand (SP)* to *Poorly Graded Sand with Silt (SP-SM)*; moist to wet S4: 0% Gravel, 94% Sand, 6% Fines (F2)	4.5		S3, S4, S5, S6, S7	3/30/21 ▽
Stiff, gray *Silt with Sand (ML)*; moist	23.0		S8, S9	
Bottom of Boring Boring Completed 3/30/2021	31.5			

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- ▽ Ground Water Level At Time Of Drilling
- ■ Frozen

● Water Content (%)

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-08

May 2024 106424-003

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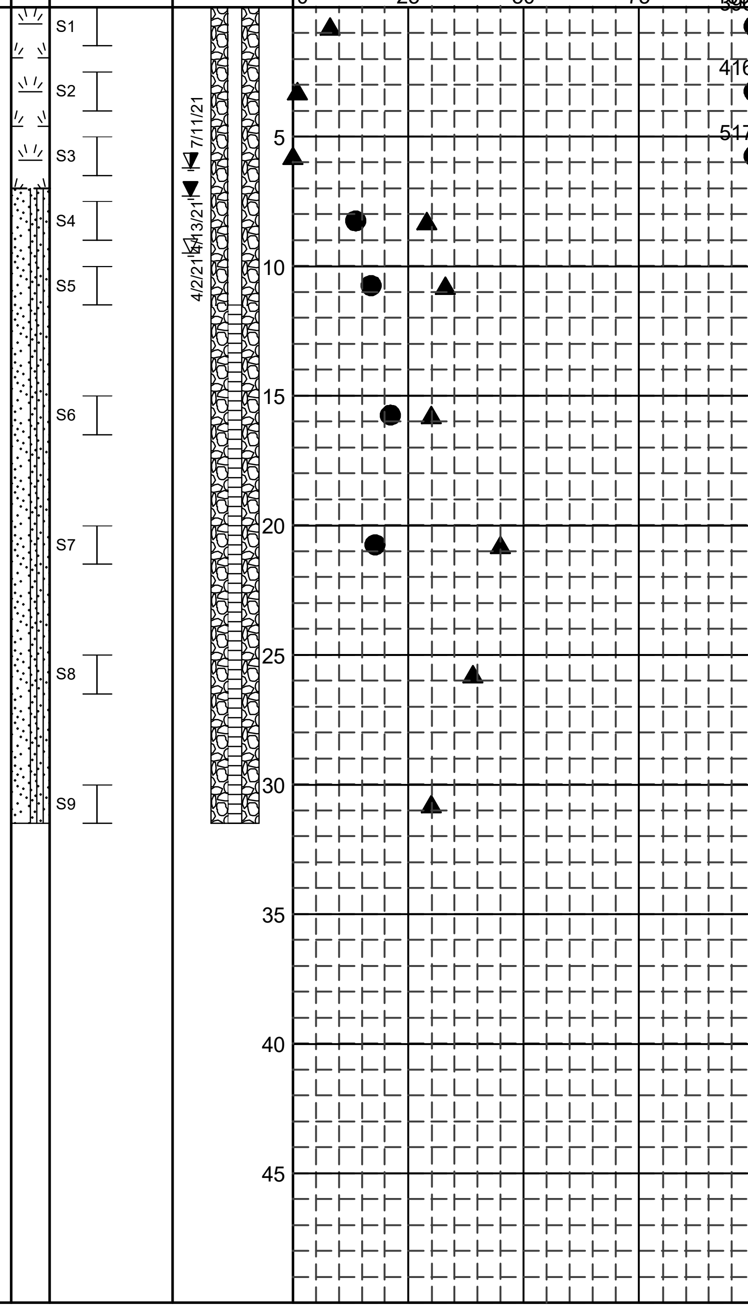
FIG. A-10

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION Lat.: 61.16562 N Long.: 149.9203 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.
Frozen to soft to very soft, brown *Peat (PT)*; moist	
Medium dense to dense, gray, *Poorly Graded Sand with Silt* to *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist to wet S6: 1% Gravel, 89% Sand, 11% Fines (F2) S7: 8% Gravel, 87% Sand, 6% Fines (F2)	7.0
Bottom of Boring Boring Completed 4/2/2021	31.5



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen
- Ground Water Level At Time Of Drilling
- Static Water Level
- Blank Section, Cuttings Backfill
- Slotted Section, Cuttings Backfill
- VWP Ground Water Level

● Water Content (%)

Plastic Limit —●— Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-09

May 2024 106424-003

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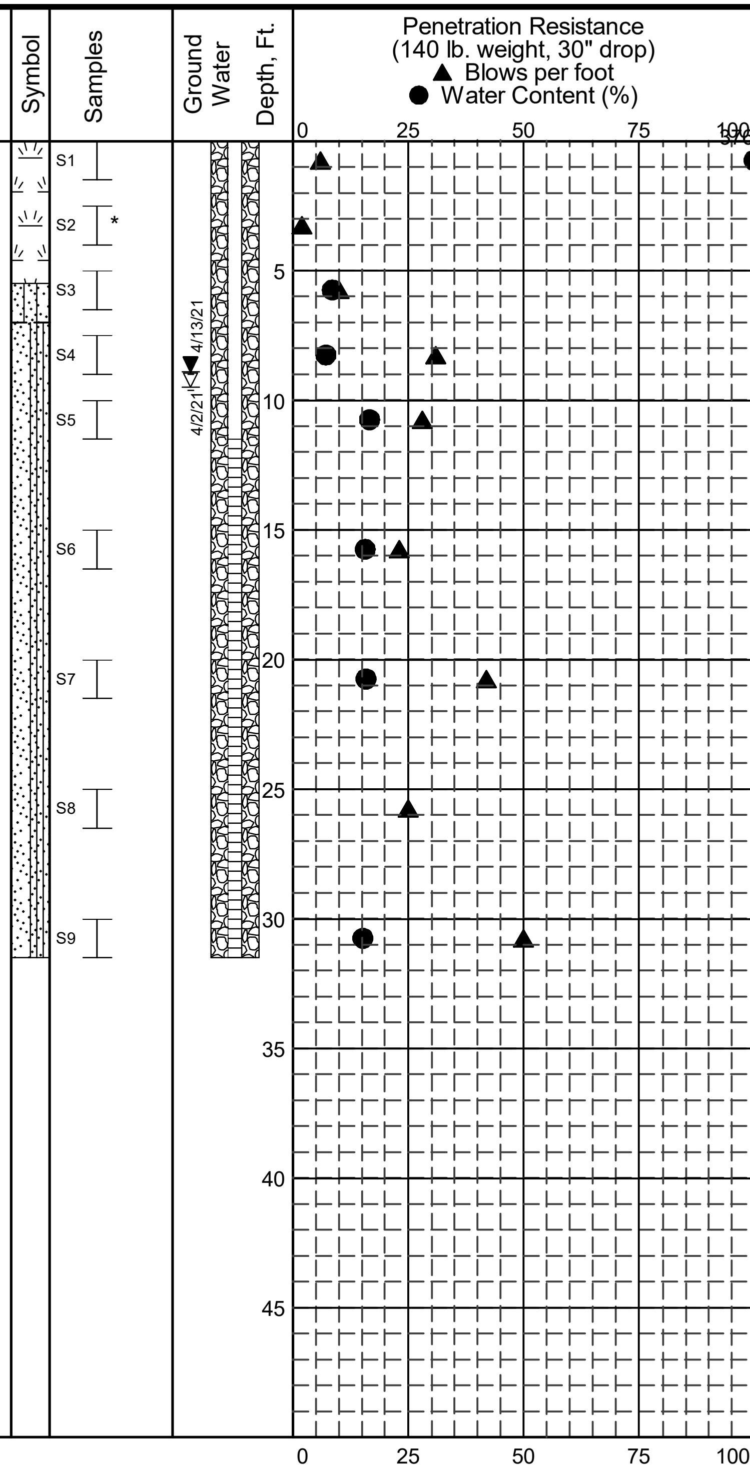
FIG. A-11

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION	Depth, Ft.
Lat.: 61.16481 N Long.: 149.9218 W Approx. Elevation: 83 Ft. Datum: WGS 84	
Frozen to very soft to soft, brown *Peat (PT)*; moist	
Medium dense, gray, *Silty Sand (SM)*; moist; trace organics	5.5
Medium dense to dense, gray, *Poorly Graded Sand with Silt* to *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist to wet	7.0
S9: 14% Gravel, 79% Sand, 7% Fines (F2)	
Bottom of Boring Boring Completed 4/2/2021	31.5



LEGEND

* Sample Not Recovered
2" O.D. Split Spoon Sample
Grab Sample
Frozen

Ground Water Level At Time Of Drilling
Static Water Level
Blank Section, Cuttings Backfill
Slotted Section, Cuttings Backfill

● Water Content (%)
Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-10

May 2024 106424-003

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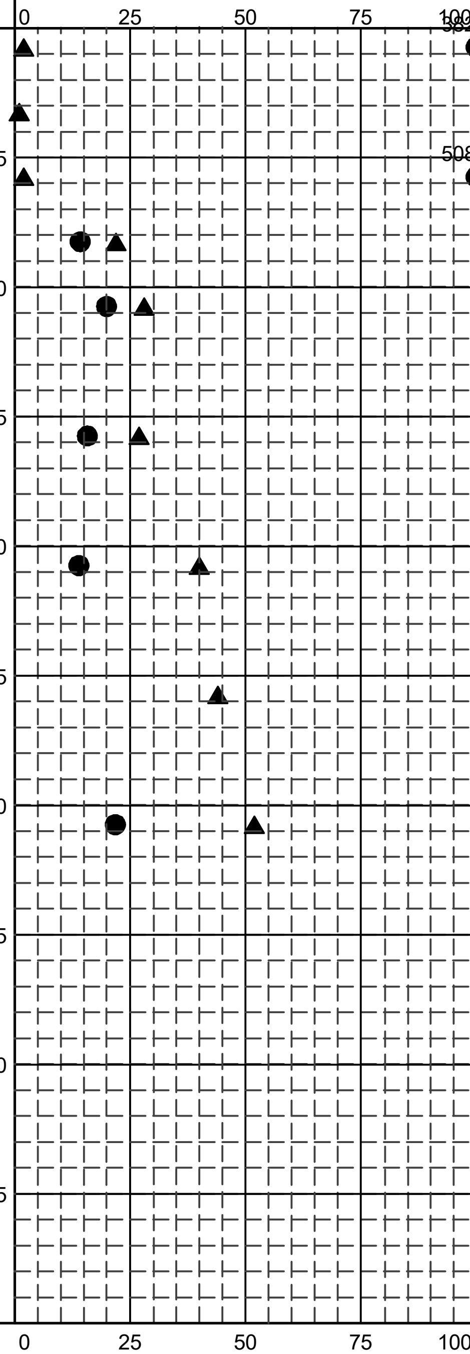
FIG. A-12

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.
Lat.: 61.16515 N Long.: 149.918 W Approx. Elevation: 83 Ft. Datum: WGS 84					
Frozen to very soft to soft, brown *Peat (PT)*; moist			S1, S2 *, S3		5
Medium dense, gray, *Silty Sand (SM)*; wet S4: 14% Gravel, 71% Sand, 16% Fines (F2)	6.5		S4	4/2/21	
Medium dense to dense, gray, *Poorly Graded Sand with Gravel (SP)* to *Poorly Graded Sand with Silt and Gravel (SP-SM)*; wet S7: 19% Gravel, 77% Sand, 4% Fines (NFS)	9.5		S5, S6, S7, S8		10, 15, 20, 25
Very dense, gray, *Silty Sand (SM)*; wet	28.0		S9		30
Bottom of Boring Boring Completed 4/2/2021	31.5				35, 40, 45

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen
- Ground Water Level At Time Of Drilling
- Static Water Level
- Blank Section, Cuttings Backfill
- Slotted Section, Cuttings Backfill
- VWP Ground Water Level

● Water Content (%)
Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-11

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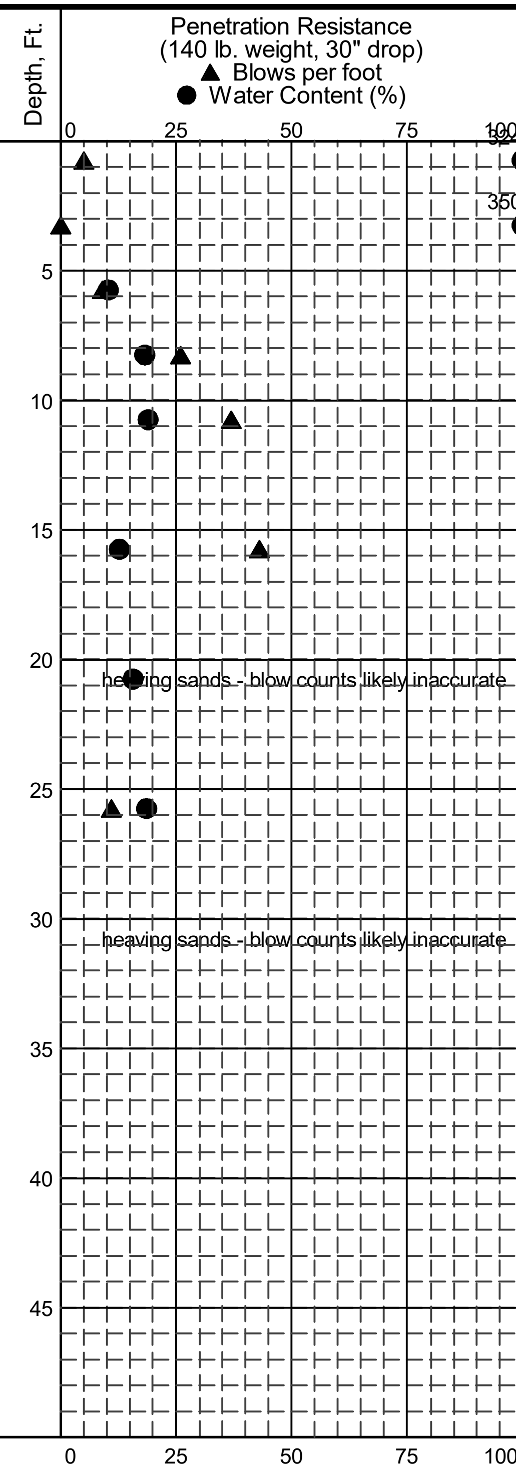
FIG. A-13

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION Lat.: 61.16427 N Long.: 149.9195 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to soft to very soft, brown *Peat (PT)*; moist			S1 S2	
Loose to dense, gray, *Poorly Graded Sand (SP)* to *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist to wet; trace organics from approximately 5 to 7 feet bgs S5: 5% Gravel, 88% Sand, 7% Fines (F2)	5.0		S3 S4 S5 S6 S7 S8 S9	4/1/21 ∇
Bottom of Boring Boring Completed 4/1/2021	31.5			



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- ∇ Ground Water Level At Time Of Drilling
- ■ Frozen

● Water Content (%)

Plastic Limit ├──●──┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-12

May 2024 106424-003

SHANNON & WILSON, INC.
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FIG. A-14

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION

Lat.: 61.16331 N   Long.: 149.9163 W

Approx. Elevation: 83 Ft.   Datum: WGS 84

Frozen to very soft, brown *Peat (PT)*; moist

7.0

Medium dense, gray, *Well-Graded Sand with Silt* to *Well-Graded Sand with Silt and Gravel (SW-SM)*; moist to wet

3-inch Silty Sand lense at approximately 8 feet bgs

15.0

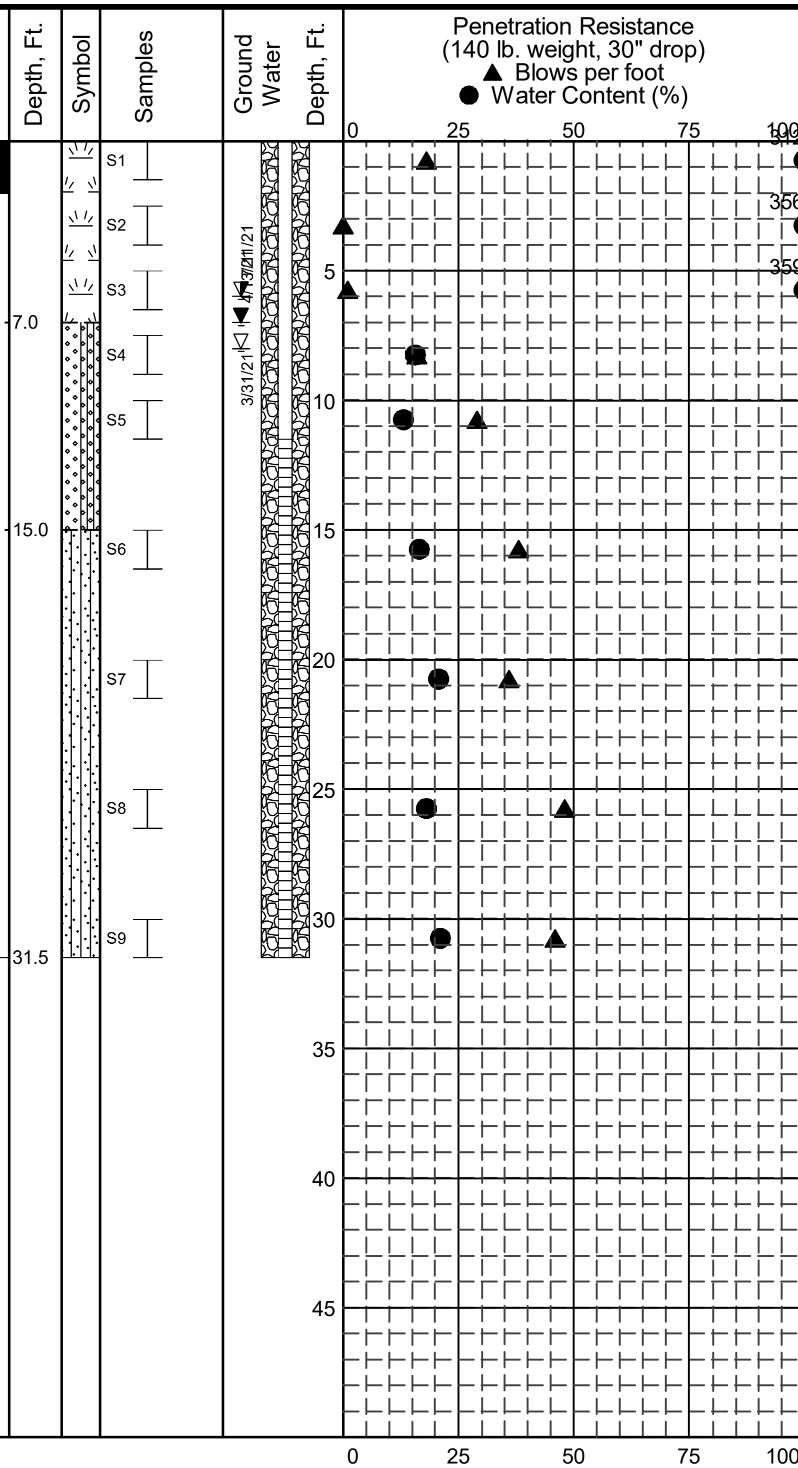
Dense, gray, *Silt* to *Sandy Silt (ML)*; moist to wet

S7: 1% Gravel, 14% Sand, 85% Fines (F4)

31.5

Bottom of Boring

Boring Completed 3/31/2021



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen
- Ground Water Level At Time Of Drilling
- Static Water Level
- Blank Section, Cuttings Backfill
- Slotted Section, Cuttings Backfill
- VWP Ground Water Level

● Water Content (%)

Plastic Limit ├──●──┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-13

May 2024   106424-003

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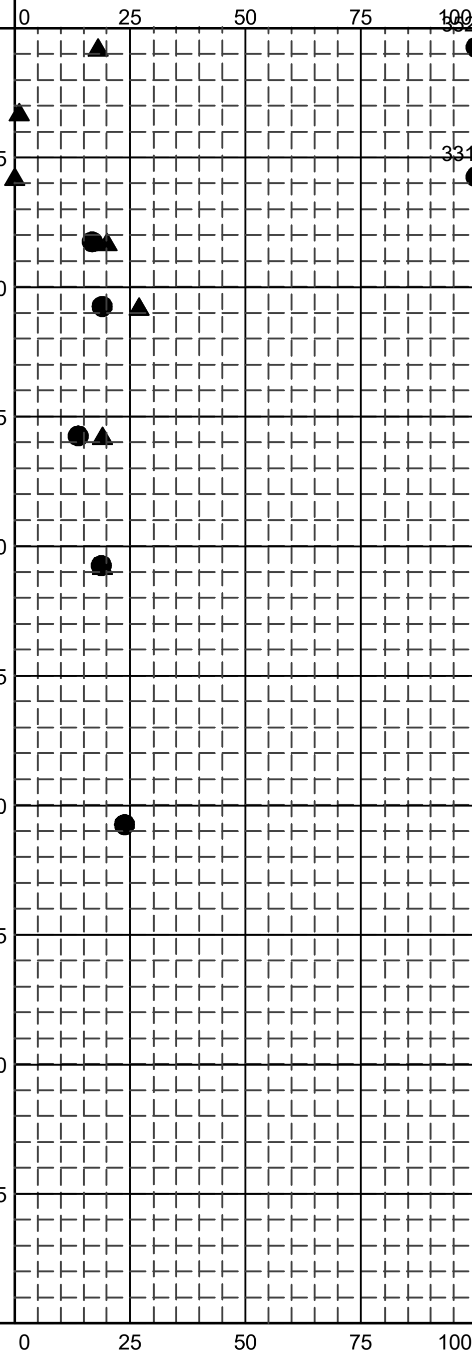
FIG. A-15

Version 1.0 - FINAL

MATERIAL DESCRIPTION Lat.: 61.16352 N Long.: 149.9198 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to very soft, brown *Peat (PT)*; moist			S1 S2 * S3	
Medium dense, gray, *Silty Sand (SM)*; moist to wet; trace organics	7.0		S4	4/1/21
S5: 9% Gravel, 87% Sand, 4% Fines (NFS) Medium dense, gray, *Poorly Graded Sand (SP)* to *Poorly Graded Sand with Silt (SP-SM)*; wet	9.5		S5 S6 S7 S8 *	
Medium dense, gray, *Silt with Sand (ML)*; moist	28.0		S9	
Bottom of Boring Boring Completed 4/1/2021	31.5			

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen
- Ground Water Level At Time Of Drilling
- Static Water Level
- Blank Section, Cuttings Backfill
- Slotted Section, Cuttings Backfill
- VWP Ground Water Level

● Water Content (%)

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF BORING B-14

May 2024 106424-003

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FIG. A-16

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION Lat.: 61.16631 N Long.: 149.92 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.	Penetration Resistance (140 lb. weight, 30" drop) ▲ Blows per foot ● Water Content (%) 0 25 50 75 100
Frozen to very soft to soft, brown *Peat (PT)*; moist						
S1: 4% Gravel, 91% Sand, 5% Fines (NFS) Medium dense, dark gray, *Poorly Graded Sand with Silt (SP-SM)*; moist	4.5		S1		5	
Bottom of Boring Boring Completed 3/30/2021	6.5			Groundwater not encountered during drilling on 3/30/2021	10 15 20 25 30 35 40 45	

0 25 50 75 100

● Water Content (%)

Plastic Limit ├──●──┤ Liquid Limit

Natural Water Content

LEGEND

* Sample Not Recovered

2" O.D. Split Spoon Sample

Grab Sample

Frozen

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-01

May 2024 106424-003

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FIG. A-17

Version 1.0 - FINAL

MATERIAL DESCRIPTION Lat.: 61.16628 N Long.: 149.9185 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.	Penetration Resistance (140 lb. weight, 30" drop) ▲ Blows per foot ● Water Content (%)
Frozen to very soft to soft, brown *Peat (PT)*; moist						
S1: 3% Gravel, 92% Sand, 5% Fines (NFS) Medium dense, gray, *Poorly Graded Sand with Silt (SP-SM)*; moist	7.5 9.0		S1			
Bottom of Boring Boring Completed 3/30/2021				Groundwater not encountered during drilling on 3/30/2021		

Depth scale: 5, 10, 15, 20, 25, 30, 35, 40, 45

Water content scale: 0, 25, 50, 75, 100

LEGEND

* Sample Not Recovered

2" O.D. Split Spoon Sample

Grab Sample

Frozen

● Water Content (%)

Plastic Limit —●— Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-02

May 2024 106424-003

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FIG. A-18

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

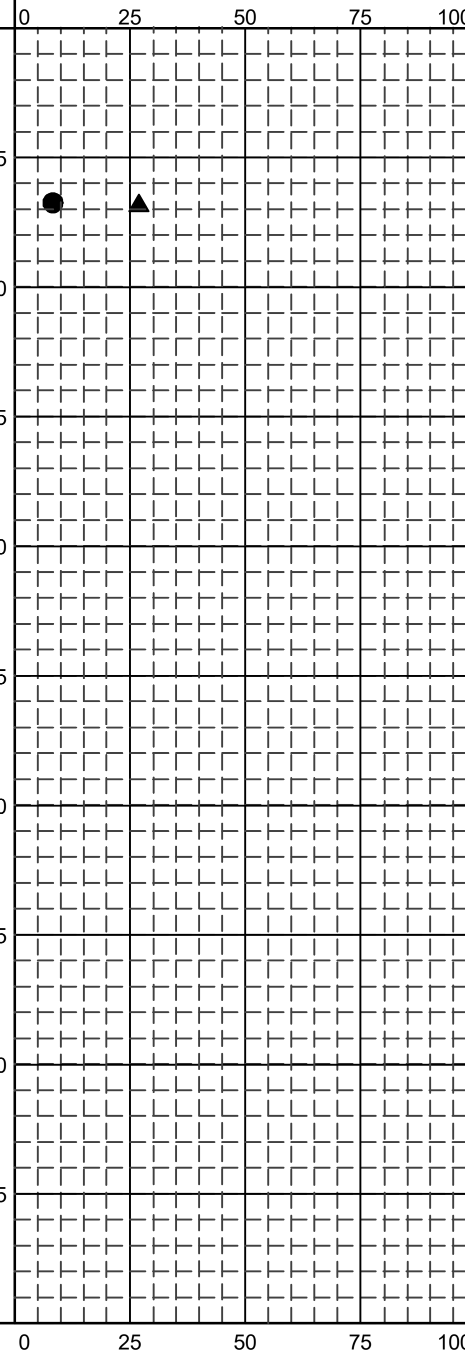
MATERIAL DESCRIPTION

Lat.: 61.16557 N   Long.: 149.9216 W

Approx. Elevation: 83 Ft.   Datum: WGS 84

Material Description	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to very soft to soft, brown *Peat (PT)*; moist				
S1: 13% Gravel, 82% Sand, 5% Fines (NFS) Medium dense, gray, *Poorly Graded Sand with Silt (SP-SM)*; moist	6.0		S1	
Bottom of Boring Boring Completed 4/5/2021	7.5			Groundwater not encountered during drilling on 4/5/2021

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

* Sample Not Recovered

2" O.D. Split Spoon Sample

Grab Sample

Frozen

● Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-03

May 2024   106424-003

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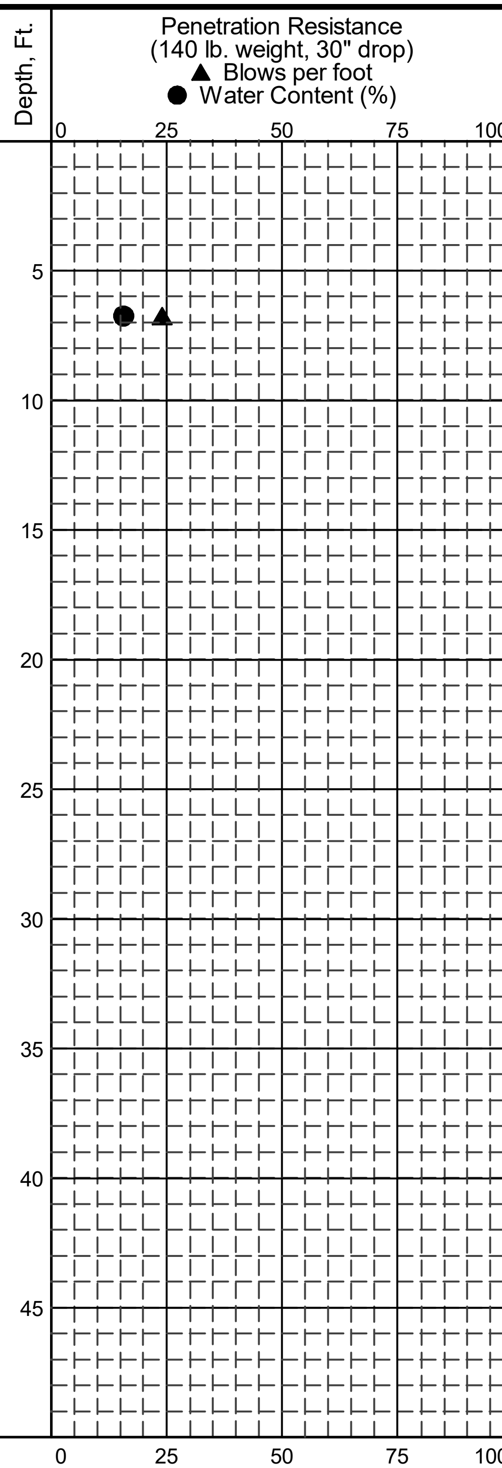
FIG. A-19

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.
Lat.: 61.16575 N Long.: 149.9191 W Approx. Elevation: 83 Ft. Datum: WGS 84					
Frozen to very soft to soft, brown *Peat (PT)*; moist	6.0				
S1: 6% Gravel, 84% Sand, 10% Fines (F2) Medium dense, gray, *Well-Graded Sand with Silt (SW-SM)*; moist	7.5		S1		
Bottom of Boring Boring Completed 4/5/2021				Groundwater not encountered during drilling on 4/5/2021	



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

● Water Content (%)
Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-04

May 2024 106424-003

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FIG. A-20

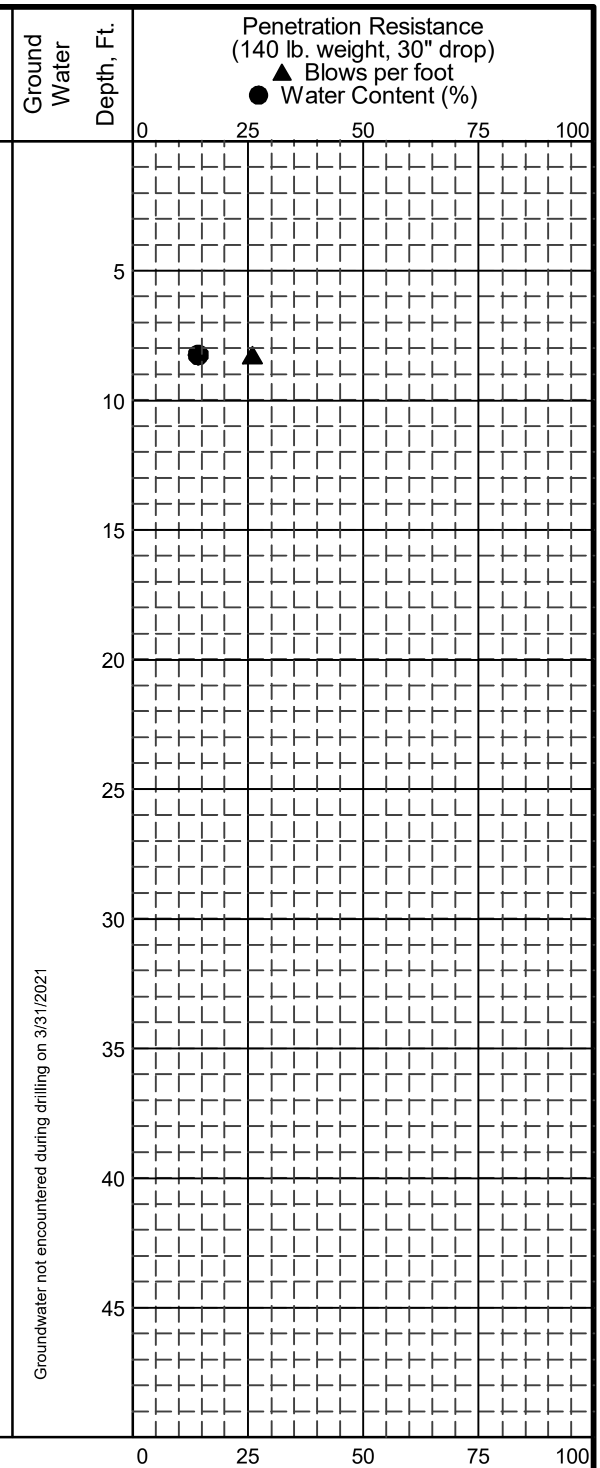
MATERIAL DESCRIPTION

Lat.: 61.16537 N Long.: 149.9168 W

Approx. Elevation: 83 Ft. Datum: WGS 84

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples
Frozen to very soft to soft, brown *Peat (PT)*; moist			
S1: 9% Gravel, 86% Sand, 4% Fines (NFS) Medium dense, gray, *Poorly Graded Sand (SP)*; moist	7.5		S1
	9.0		

Bottom of Boring
Boring Completed 3/31/2021



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

● Water Content (%)

Plastic Limit —●— Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-05

May 2024 106424-003

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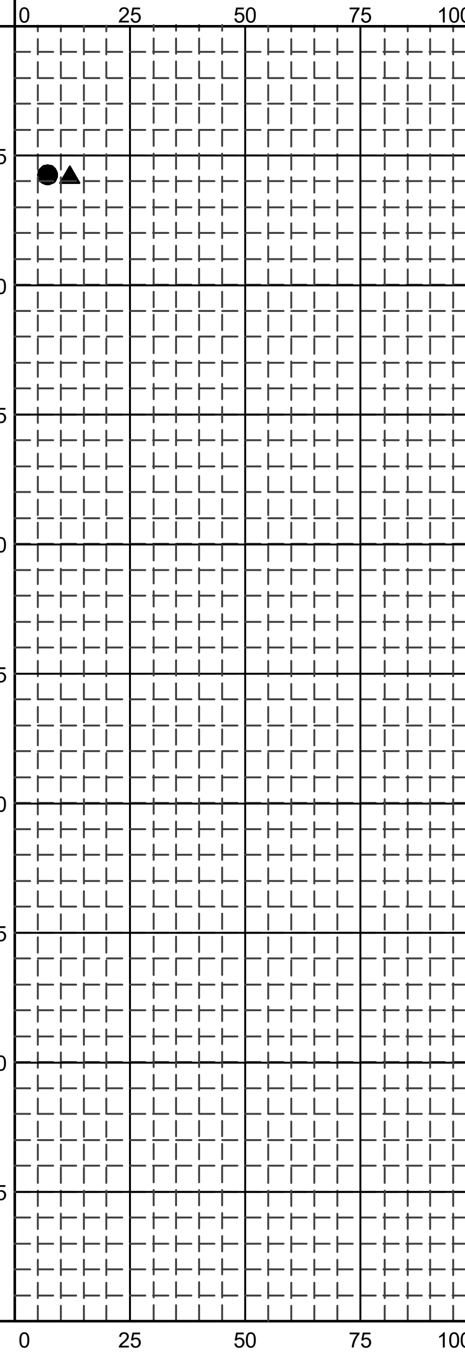
FIG. A-21

MATERIAL DESCRIPTION Lat.: 61.16495 N Long.: 149.9206 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.
Frozen to very soft to soft, brown *Peat (PT)*; moist					
S1: 14% Gravel, 79% Sand, 7% Fines (F2) Medium dense, gray, *Poorly Graded Sand with Silt (SP-SM)*; moist	5.0 6.5		S1		5
Bottom of Boring Boring Completed 4/5/2021				Groundwater not encountered during drilling on 4/5/2021	10 15 20 25 30 35 40 45

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



● Water Content (%)
Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-06

May 2024 106424-003

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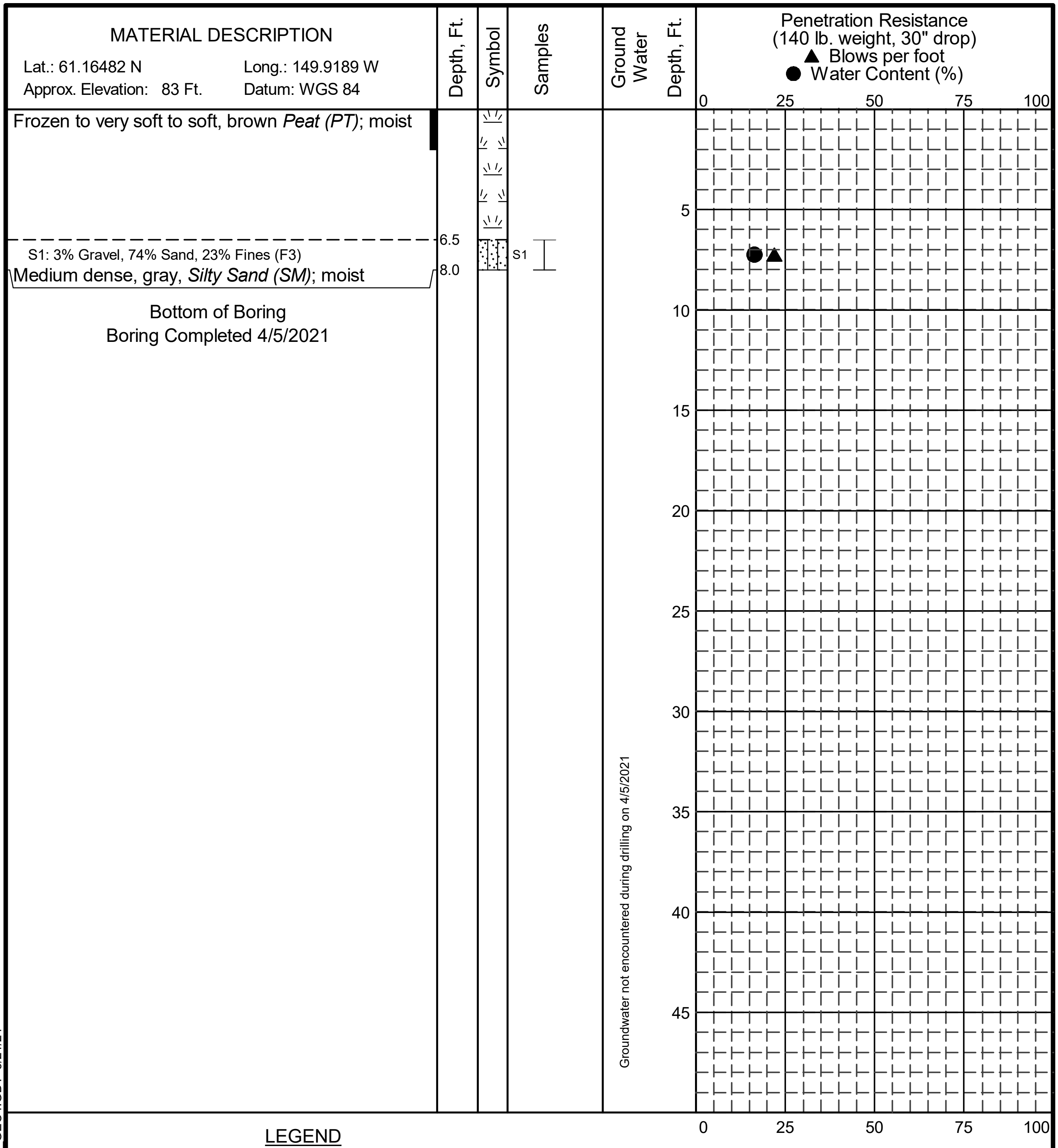
FIG. A-22

MATERIAL DESCRIPTION

Lat.: 61.16482 N | Long.: 149.9189 W
Approx. Elevation: 83 Ft. | Datum: WGS 84



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

● Water Content (%)
Plastic Limit —●— Liquid Limit
Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-07

May 2024 | 106424-003

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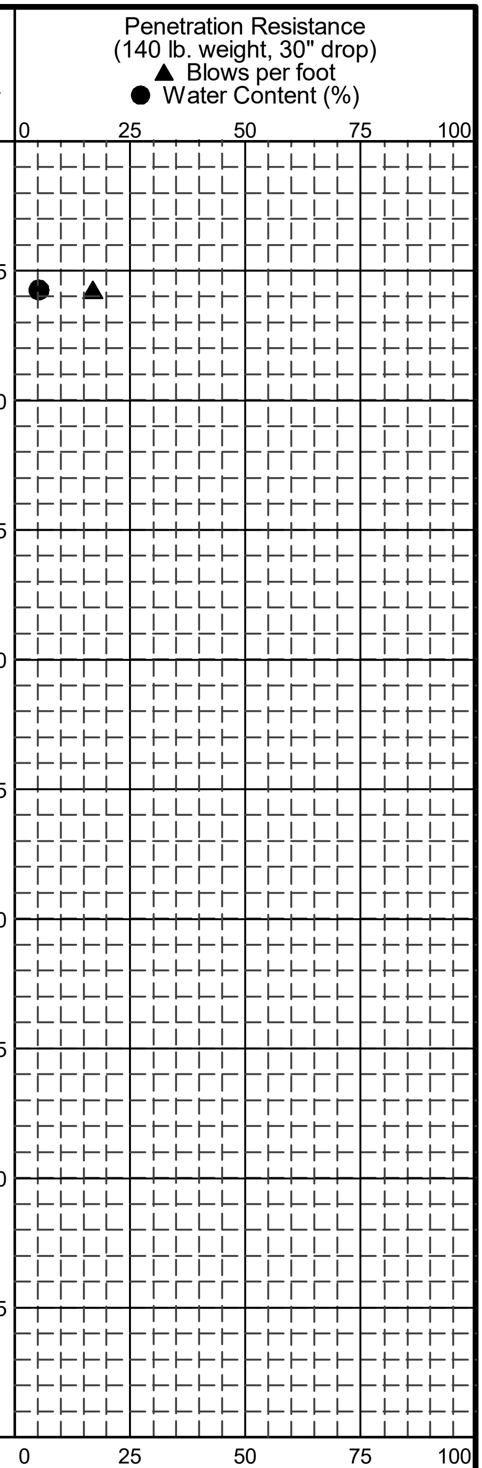
FIG. A-23

MATERIAL DESCRIPTION Lat.: 61.16426 N Long.: 149.921 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.
Frozen to very soft to soft, brown *Peat (PT)*; moist					
S1: 13% Gravel, 81% Sand, 6% Fines (F2) Medium dense, gray, *Poorly Graded Sand with Silt (SP-SM)*; moist; trace organics	5.0 6.5		S1		5
Bottom of Boring Boring Completed 4/5/2021				Groundwater not encountered during drilling on 4/5/2021	



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-08

May 2024 106424-003

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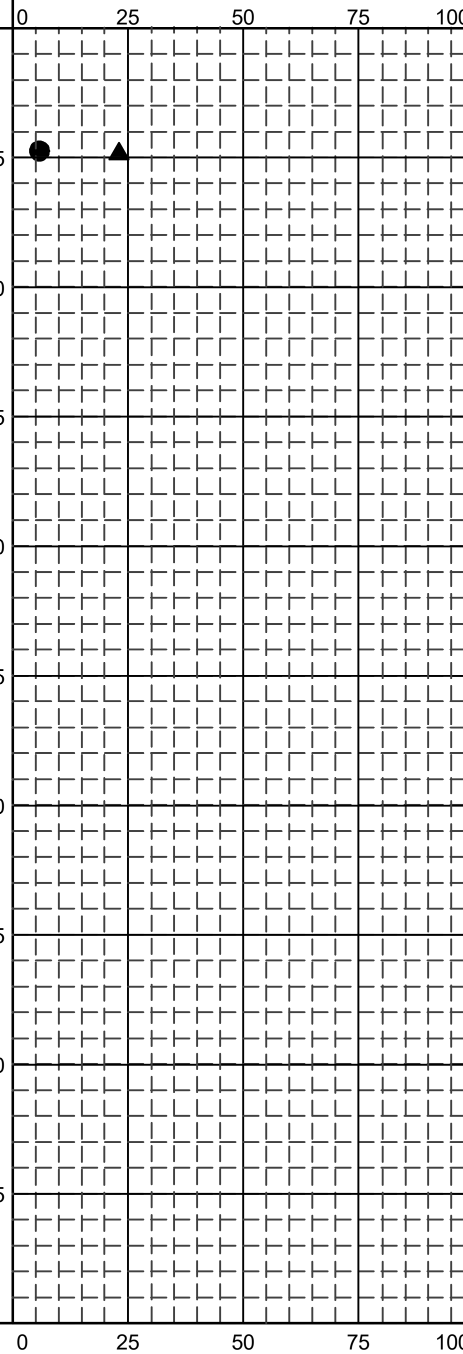
FIG. A-24

Version 1.0 - FINAL

MATERIAL DESCRIPTION Lat.: 61.16444 N Long.: 149.9167 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to very soft to soft, brown *Peat (PT)*; moist				
	4.0			
S1: 10% Gravel, 83% Sand, 7% Fines (F2) Medium dense, dark gray, *Poorly Graded Sand with Silt (SP-SM)*; moist			S1	
	5.5			
Bottom of Boring Boring Completed 3/31/2021				Groundwater not encountered during drilling on 3/31/2021

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

● Water Content (%)

Plastic Limit ├──●──┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-09

May 2024 106424-003

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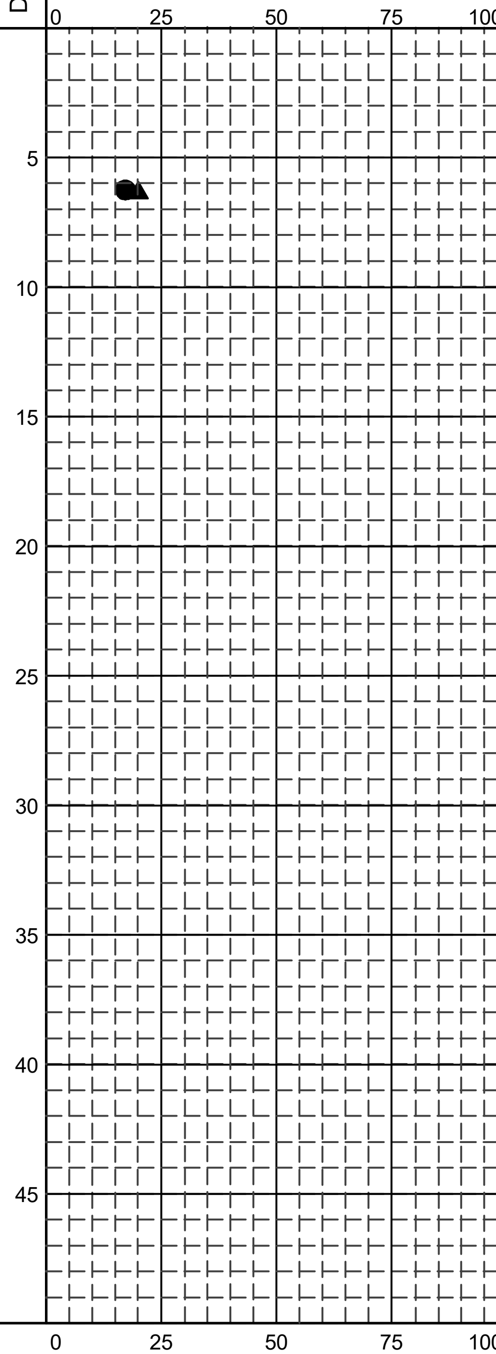
FIG. A-25

MATERIAL DESCRIPTION Lat.: 61.16364 N Long.: 149.9185 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to very soft to soft, brown *Peat (PT)*; moist				
S1: 5% Gravel, 71% Sand, 24% Fines (F3) Medium dense, gray, *Silty Sand (SM)*; moist	5.5 7.0		S1	
Bottom of Boring Boring Completed 3/31/2021				Groundwater not encountered during drilling on 3/31/2021

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

● Water Content (%)

Plastic Limit ├──●──┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-10

May 2024 106424-003

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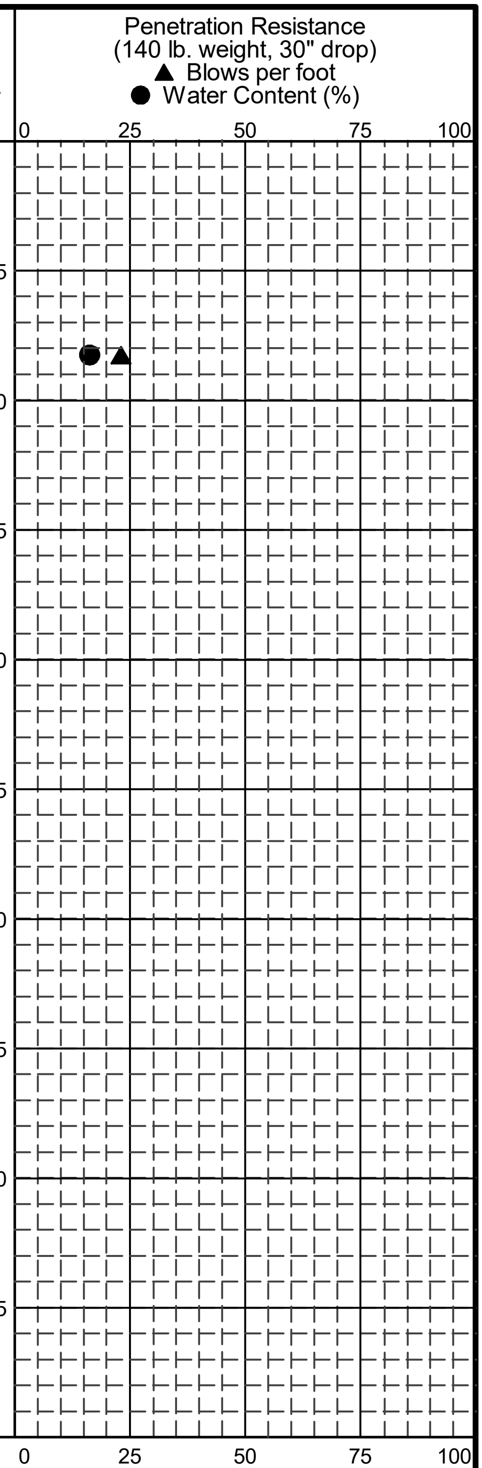
FIG. A-26

MATERIAL DESCRIPTION Lat.: 61.1641 N Long.: 149.9176 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to very soft to soft, brown *Peat (PT)*; moist				Groundwater not encountered during drilling on 4/5/2021
S1: 7% Gravel, 88% Sand, 5% Fines (NFS) Medium dense, gray, *Poorly Graded Sand with Silt (SP-SM)*; wet	6.5 9.0		S1	
Bottom of Boring Boring Completed 4/5/2021				



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

● Water Content (%)

Plastic Limit ─●─ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-11

May 2024 106424-003

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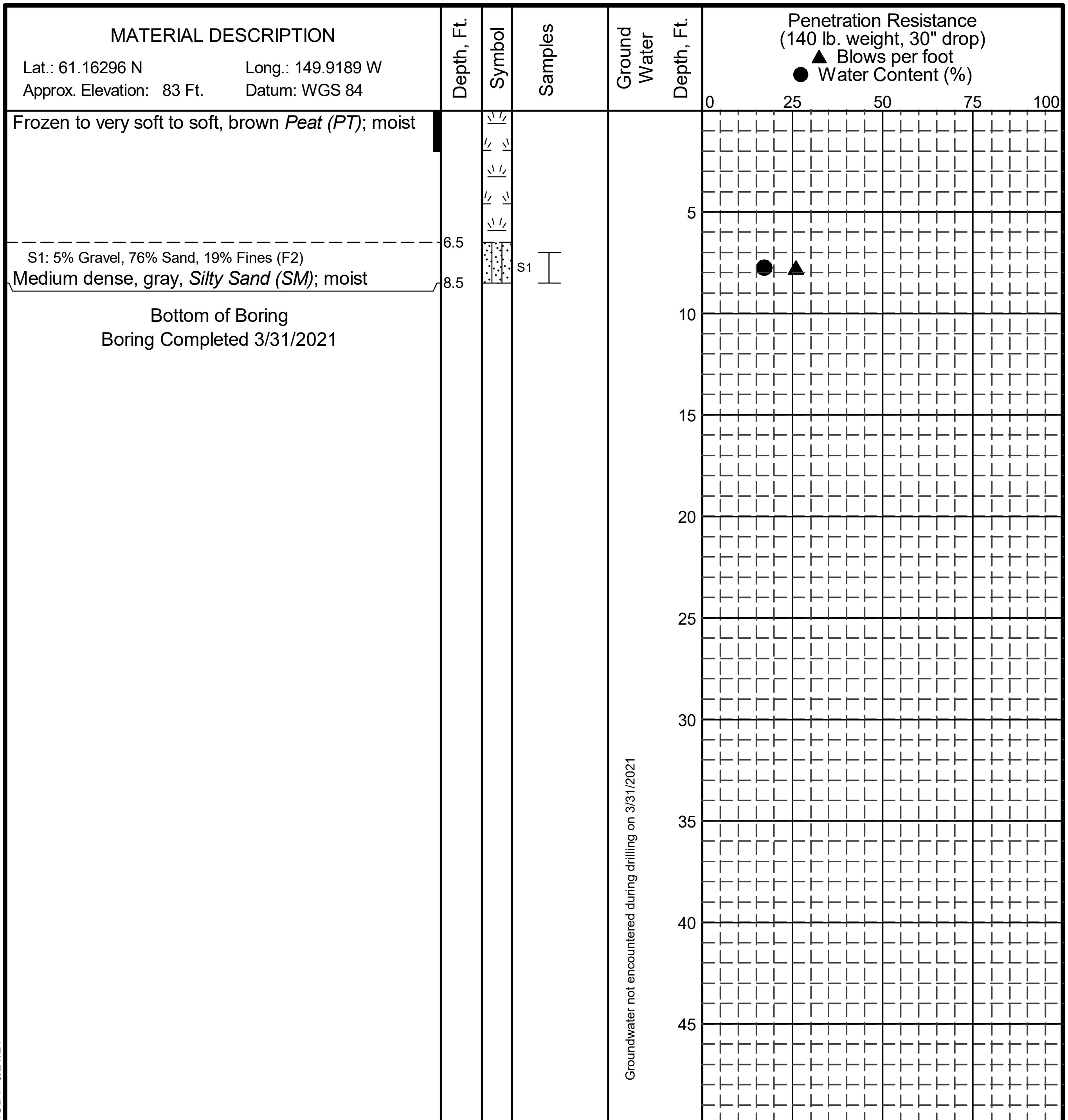
FIG. A-27



LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- Frozen

● Water Content (%)

Plastic Limit ├──●──┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-12

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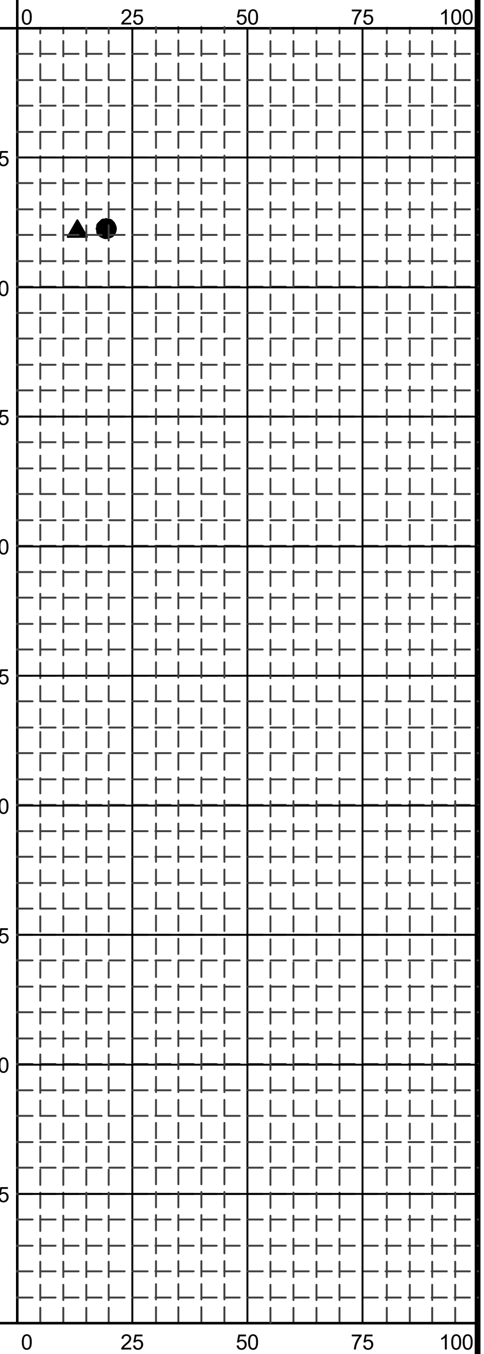
FIG. A-28

Version 1.0 - FINAL

GEOTECHNICAL LOG 106424 GINT TEMPLATE7.GPJ S&W GEO1.GDT 5/21/24

MATERIAL DESCRIPTION Lat.: 61.16297 N Long.: 149.9174 W Approx. Elevation: 83 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water
Frozen to very soft to soft, brown *Peat (PT)*; moist	6.5			
S1: 0% Gravel, 53% Sand, 46% Fines (F3) Medium dense, gray, *Silty Sand (SM)*; moist; trace organics	8.5		S1	
Bottom of Boring Boring Completed 3/31/2021				Groundwater not encountered during drilling on 3/31/2021

Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



● Water Content (%)
Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

- * Sample Not Recovered
- 2" O.D. Split Spoon Sample
- Grab Sample
- ▮ Frozen

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

West Anchorage Snow Disposal Site
Anchorage, Alaska

LOG OF PROBE P-13

May 2024 106424-003

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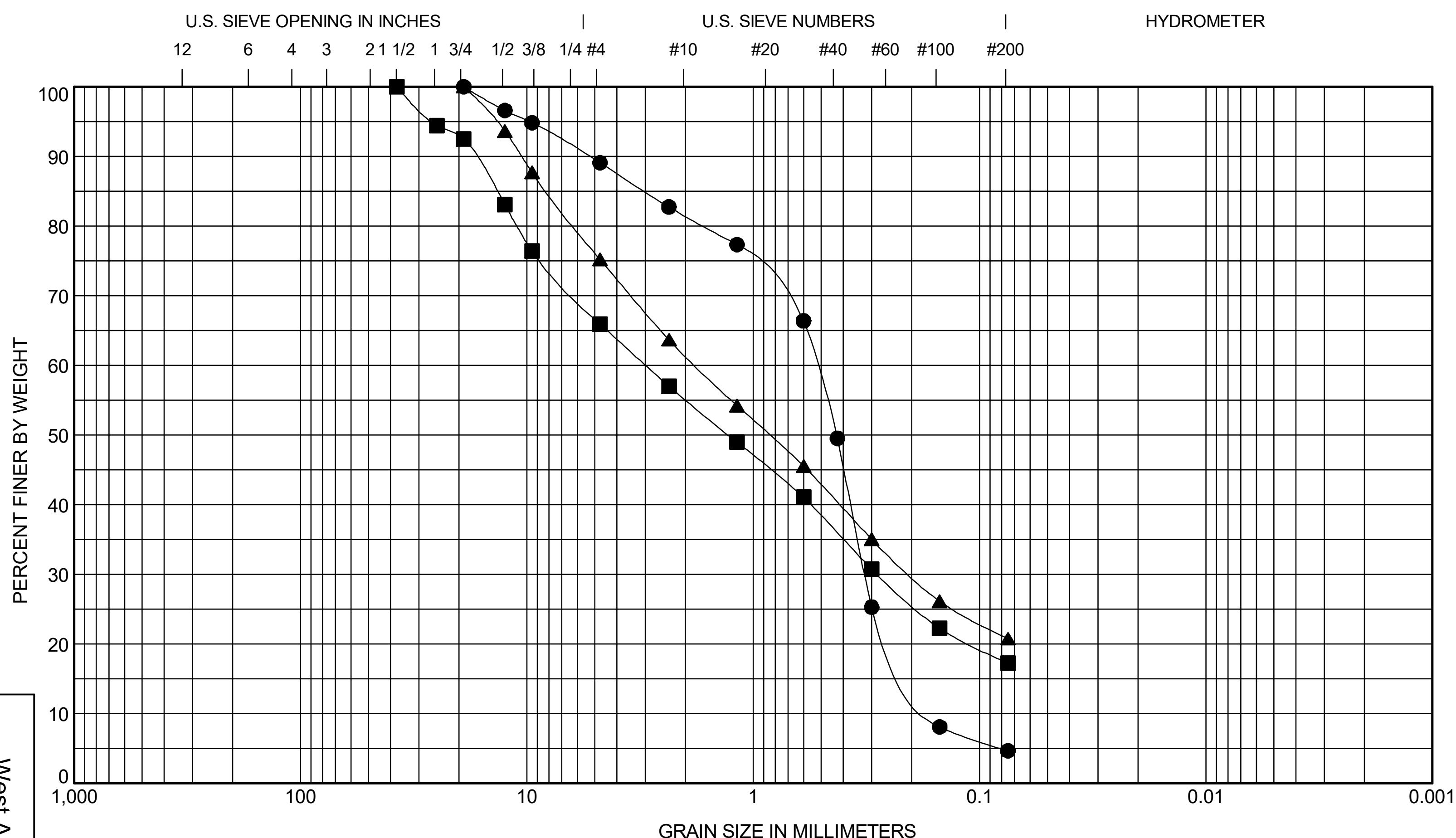
FIG. A-29



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample		Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	B-01 S4	7.5 - 9.0	**Poorly Graded Sand (SP)**				1.2	3.2
■	B-02 S2	2.5 - 4.0	**Silty Sand with Gravel (SM)**					
▲	B-03 S2	2.5 - 4.0	**Silty Sand with Gravel (SM)**					

Sample		Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-01 S4	7.5 - 9.0	19	0.53	0.32	0.16	11	84	5	
■	B-02 S2	2.5 - 4.0	37.5	2.98	0.28		34	49	17	
▲	B-03 S2	2.5 - 4.0	19	1.8	0.2		25	54	21	

West Anchorage Snow Disposal Site
Anchorage, Alaska

GRAIN SIZE CLASSIFICATION

May 2024

106424-003

SHANNON & WILSON, INC.
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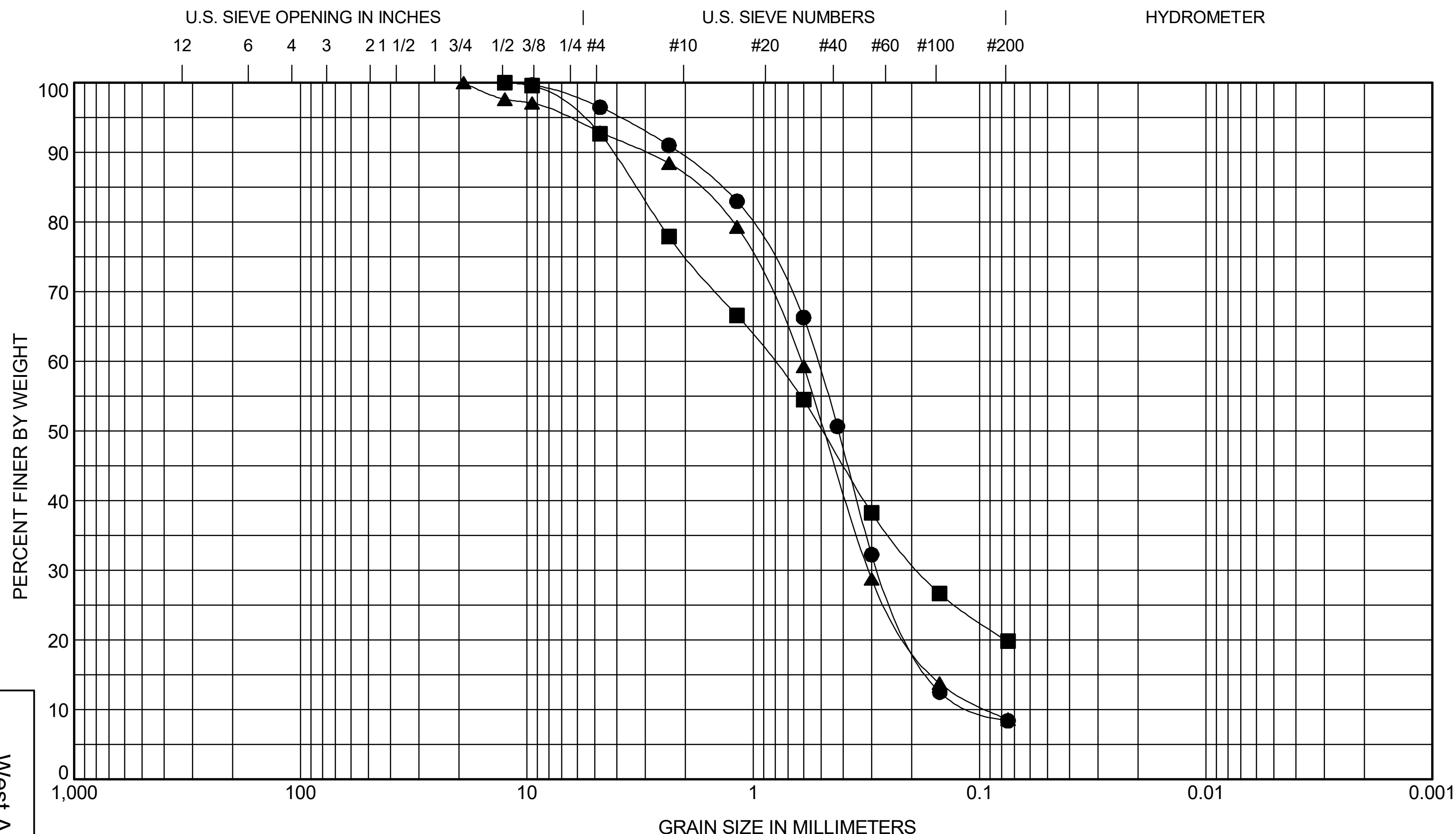
FIG. A-30
Sheet 1 of 10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	**B-03 S7**	**20.0 - 21.5**	**Poorly Graded Sand with Silt (SP-SM)**				**1.5**	**5.3**
■	**B-04 S2**	**2.5 - 4.0**	**Silty Sand (SM)**					
▲	**B-05 S6**	**15.0 - 16.5**	**Well-Graded Sand with Silt (SW-SM)**				**1.7**	**6.8**

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-03 S7**	**20.0 - 21.5**	**12.5**	**0.52**	**0.28**	**0.1**	**4**	**88**	**8**	
■	**B-04 S2**	**2.5 - 4.0**	**12.5**	**0.82**	**0.18**		**7**	**73**	**20**	
▲	**B-05 S6**	**15.0 - 16.5**	**19**	**0.61**	**0.31**	**0.09**	**7**	**84**	**9**	

SHANNON & WILSON, INC.
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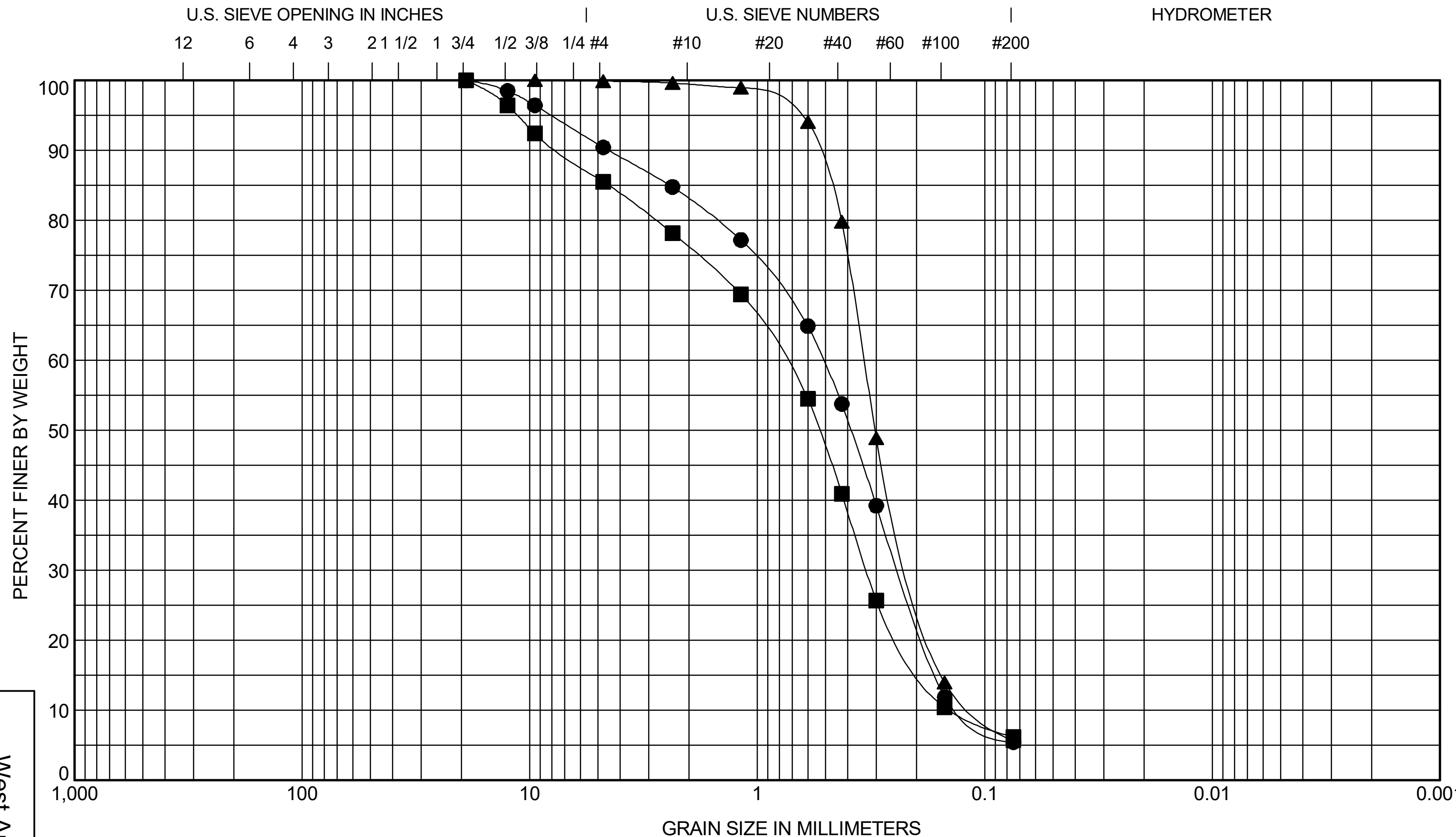
May 2024

GRAIN SIZE CLASSIFICATION

West Anchorage Snow Disposal Site
Anchorage, Alaska

106424-003

FIG. A-30
Sheet 2 of 10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
● **B-06 S5**	**10.0 - 11.5**	**Poorly Graded Sand with Silt (SP-SM)**				**0.9**	**4.2**
■ **B-07 S4**	**7.5 - 9.0**	**Poorly Graded Sand with Silt (SP-SM)**				**1.0**	**5.5**
▲ **B-08 S4**	**7.5 - 9.0**	**Poorly Graded Sand with Silt (SP-SM)**				**1.2**	**3.1**

Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **B-06 S5**	**10.0 - 11.5**	**19**	**0.52**	**0.24**	**0.12**	**10**	**85**	**5**	
■ **B-07 S4**	**7.5 - 9.0**	**19**	**0.77**	**0.33**	**0.14**	**15**	**79**	**6**	
▲ **B-08 S4**	**7.5 - 9.0**	**9.5**	**0.34**	**0.21**	**0.11**	**0**	**94**	**6**	

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GRAIN SIZE CLASSIFICATION

West Anchorage Snow Disposal Site
Anchorage, Alaska

106424-003

FIG. A-30
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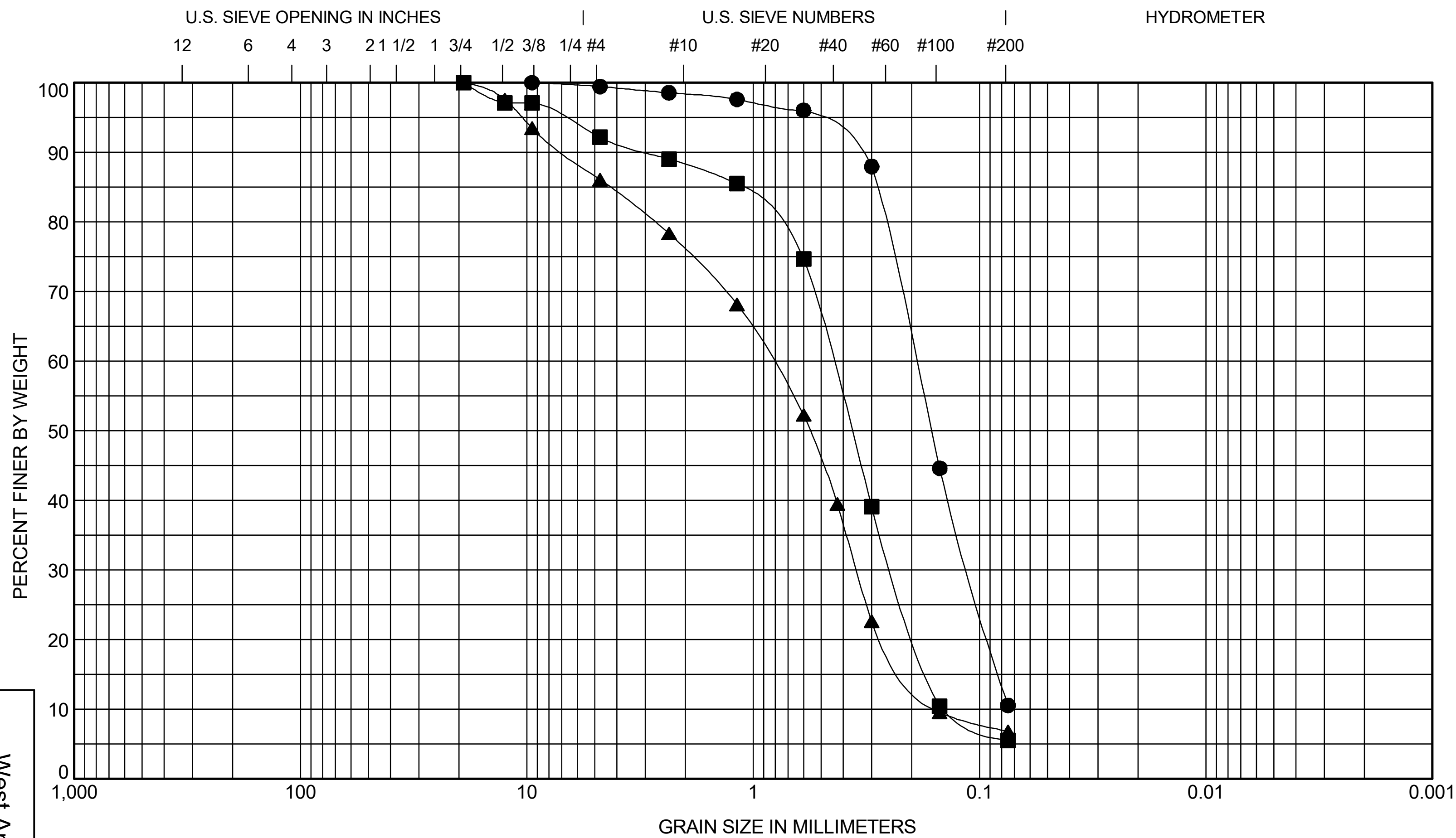

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	**B-09 S6**	**15.0 - 16.5**	**Poorly Graded Sand with Silt (SP-SM)**				**0.9**	**2.6**
■	**B-09 S7**	**20.0 - 21.5**	**Poorly Graded Sand with Silt (SP-SM)**				**0.9**	**3.2**
▲	**B-10 S9**	**30.0 - 31.5**	**Poorly Graded Sand with Silt (SP-SM)**				**1.0**	**5.4**

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-09 S6**	**15.0 - 16.5**	**9.5**	**0.19**	**0.11**		**1**	**89**	**11**	
■	**B-09 S7**	**20.0 - 21.5**	**19**	**0.45**	**0.24**	**0.14**	**8**	**87**	**6**	
▲	**B-10 S9**	**30.0 - 31.5**	**19**	**0.83**	**0.35**	**0.15**	**14**	**79**	**7**	

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Anchorage, Alaska

GRAIN SIZE CLASSIFICATION

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FIG. A-30
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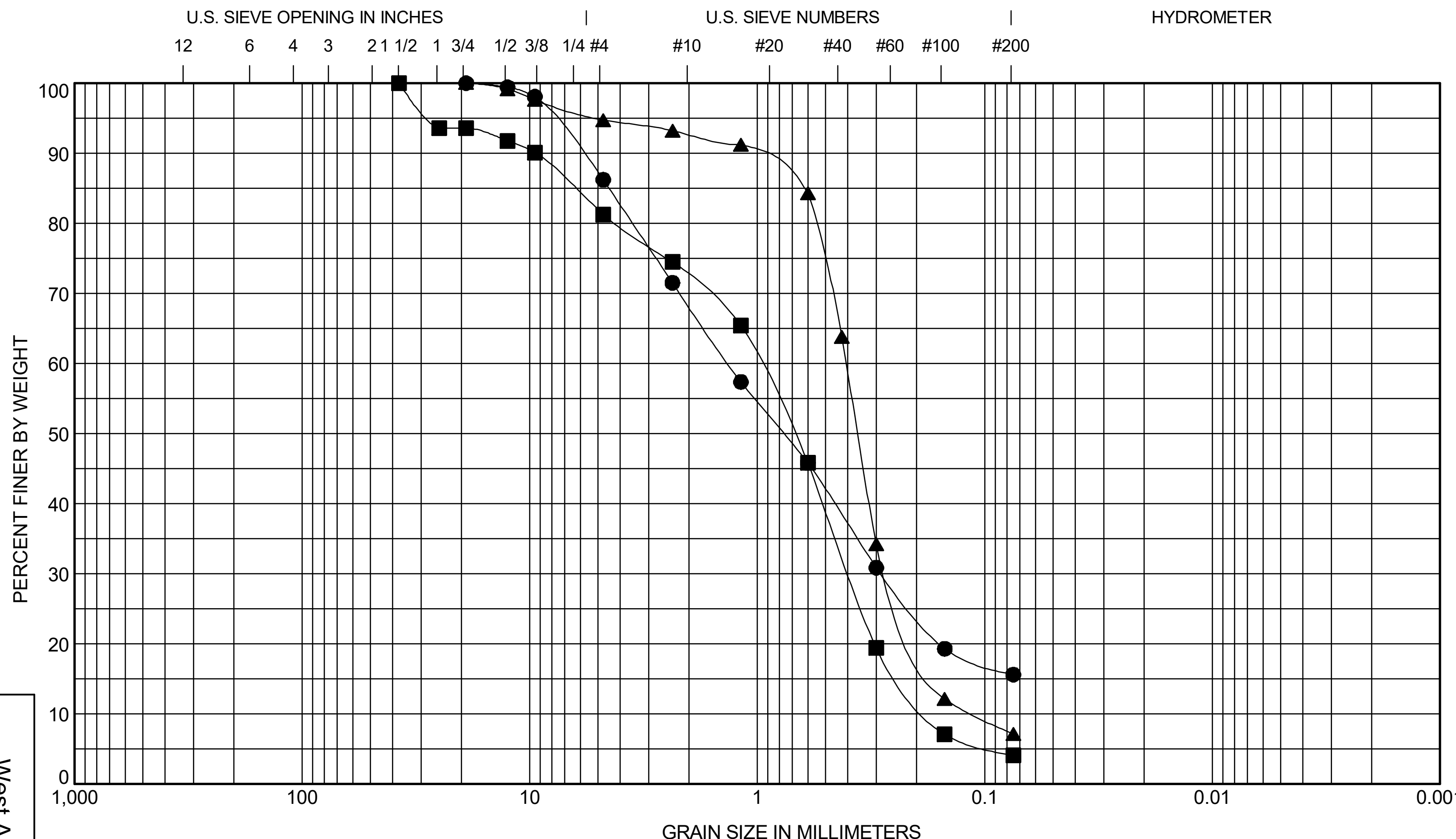

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample		Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	**B-11 S4**	**7.5 - 9.0**	**Silty Sand (SM)**					
■	**B-11 S7**	**20.0 - 21.5**	**Poorly Graded Sand with Gravel (SP)**				**0.9**	**5.5**
▲	**B-12 S5**	**10.0 - 11.5**	**Poorly Graded Sand with Silt (SP-SM)**				**1.5**	**3.6**

Sample		Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt / %Clay
●	**B-11 S4**	**7.5 - 9.0**	**19**	**1.34**	**0.28**		**14**	**71**	**16**
■	**B-11 S7**	**20.0 - 21.5**	**37.5**	**0.98**	**0.4**	**0.18**	**19**	**77**	**4**
▲	**B-12 S5**	**10.0 - 11.5**	**19**	**0.41**	**0.26**	**0.11**	**5**	**88**	**7**

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FIG. A-30
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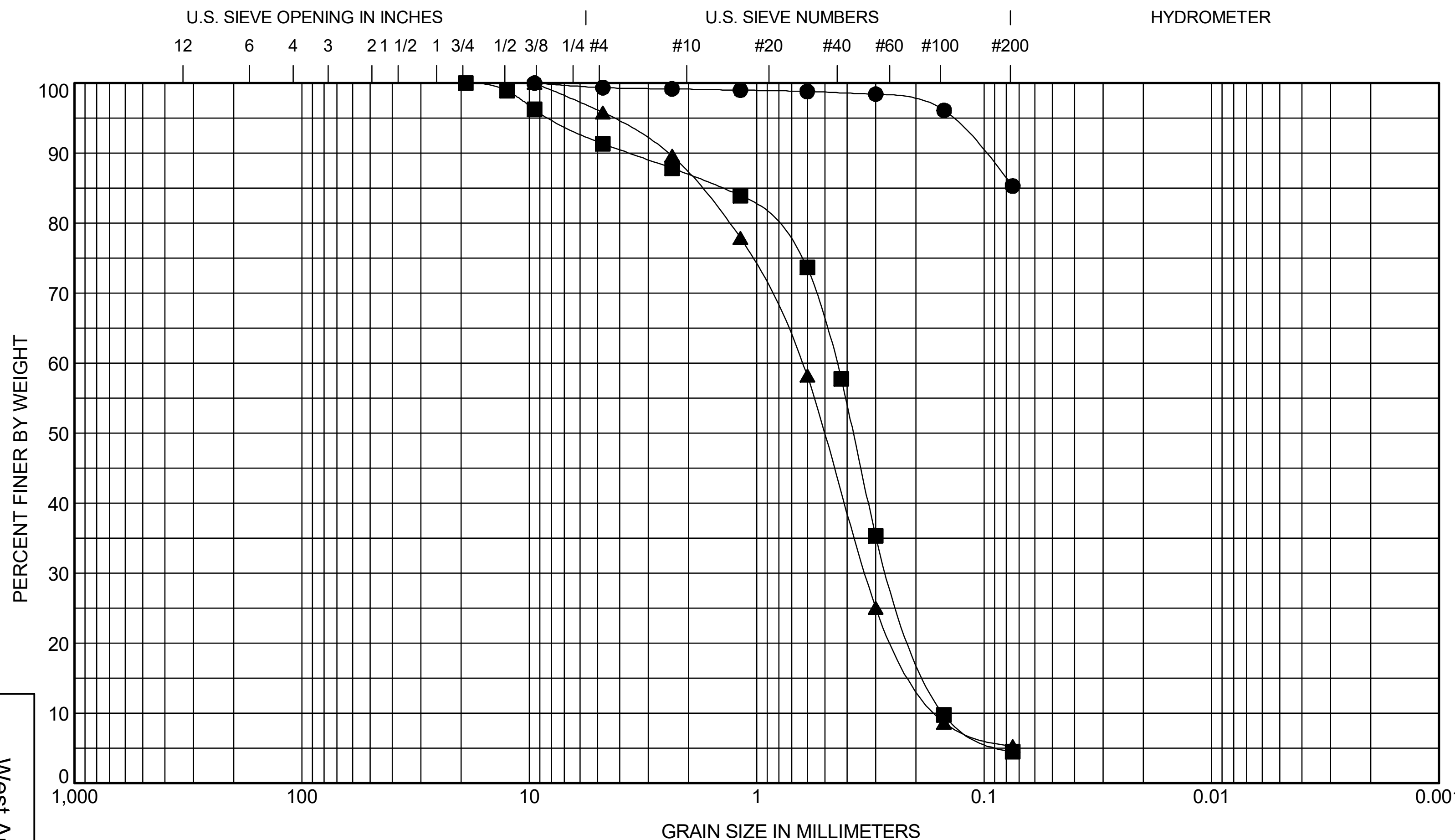

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	**B-13 S7**	**20.0 - 21.5**	**Silt (ML)**					
■	**B-14 S5**	**10.0 - 11.5**	**Poorly Graded Sand (SP)**				**1.0**	**3.0**
▲	**P-01 S1**	**5.0 - 6.5**	**Poorly Graded Sand with Silt (SP-SM)**				**1.1**	**4.0**

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-13 S7**	**20.0 - 21.5**	**9.5**				**1**	**14**	**85**	
■	**B-14 S5**	**10.0 - 11.5**	**19**	**0.45**	**0.26**	**0.15**	**9**	**87**	**4**	
▲	**P-01 S1**	**5.0 - 6.5**	**9.5**	**0.64**	**0.33**	**0.16**	**4**	**91**	**5**	

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FIG. A-30
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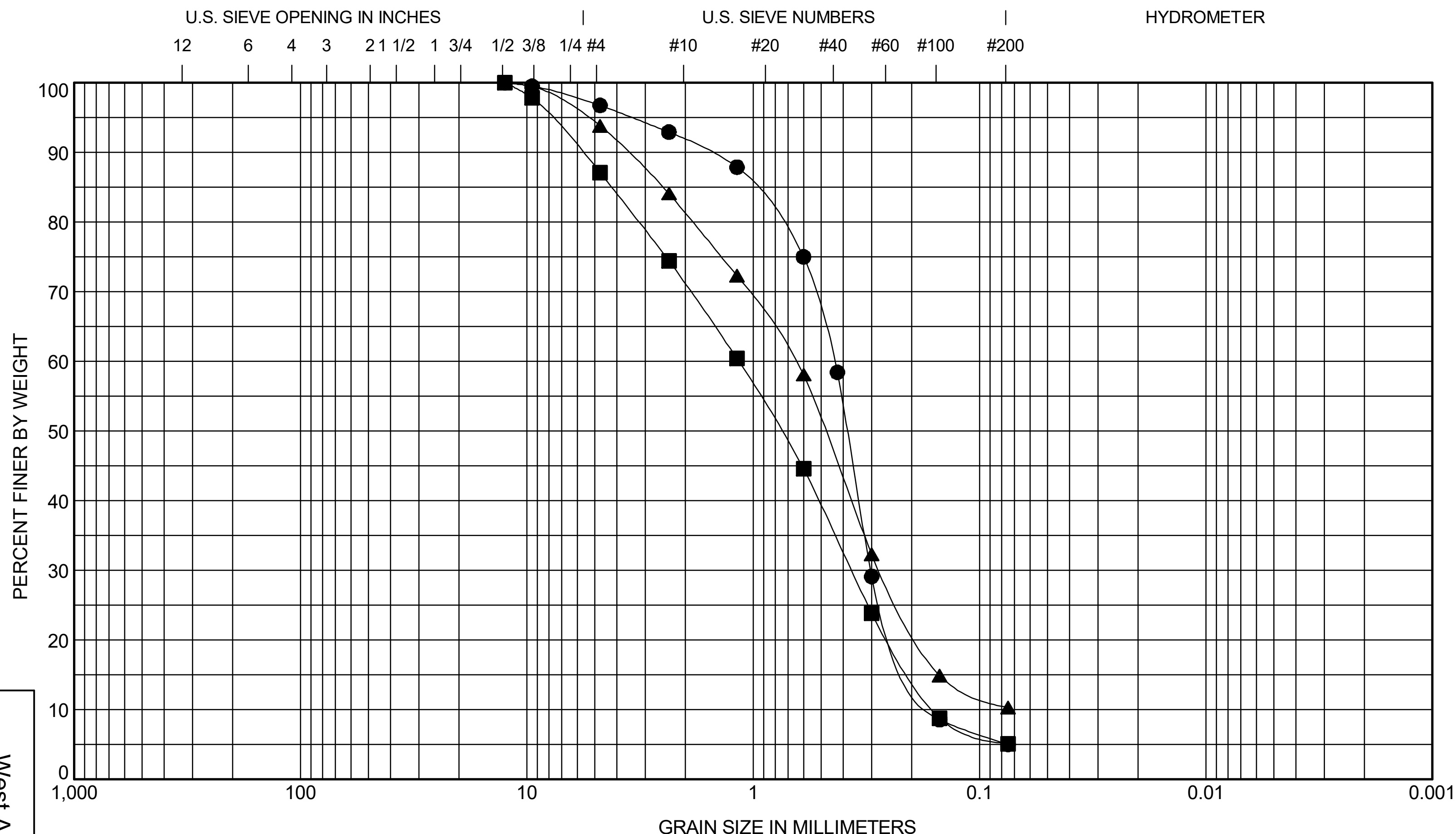

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	**P-02 S1**	**7.5 - 9.0**	**Poorly Graded Sand with Silt (SP-SM)**				**1.3**	**2.8**
■	**P-03 S1**	**6.0 - 7.5**	**Poorly Graded Sand with Silt (SP-SM)**				**0.7**	**7.3**
▲	**P-04 S1**	**6.0 - 7.5**	**Well-Graded Sand with Silt (SW-SM)**				**1.6**	**9.1**

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P-02 S1**	**7.5 - 9.0**	**12.5**	**0.44**	**0.3**	**0.16**	**3**	**92**	**5**	
■	**P-03 S1**	**6.0 - 7.5**	**12.5**	**1.16**	**0.37**	**0.16**	**13**	**82**	**5**	
▲	**P-04 S1**	**6.0 - 7.5**	**12.5**	**0.66**	**0.27**		**6**	**84**	**10**	

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FIG. A-30
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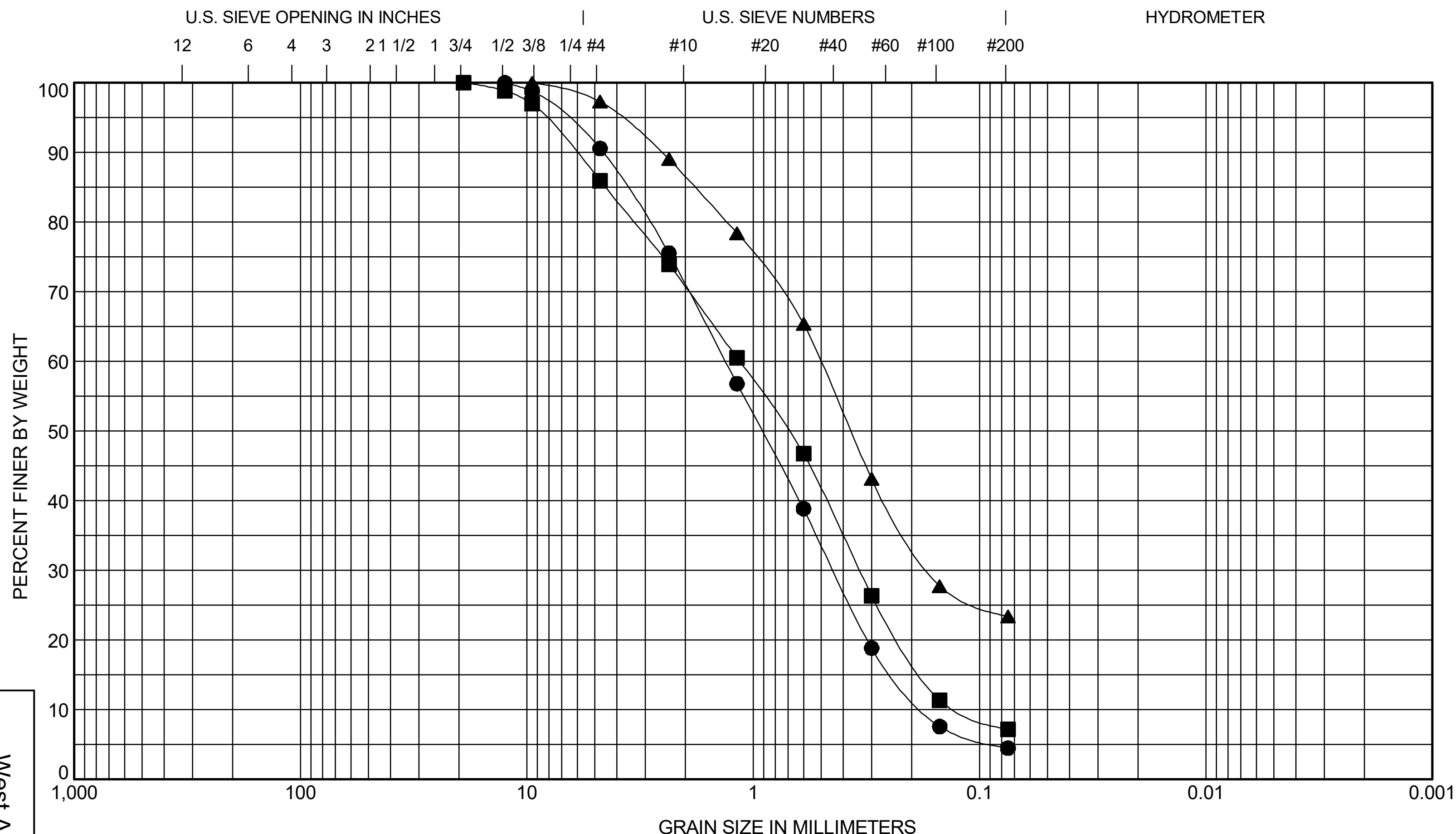

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	**P-05 S1**	**7.5 - 9.0**	**Poorly Graded Sand (SP)**				**0.8**	**7.6**
■	**P-06 S1**	**5.0 - 6.5**	**Poorly Graded Sand with Silt (SP-SM)**				**0.8**	**9.6**
▲	**P-07 S1**	**6.5 - 8.0**	**Silty Sand (SM)**					

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P-05 S1**	**7.5 - 9.0**	**12.5**	**1.33**	**0.44**	**0.17**	**9**	**86**	**4**	
■	**P-06 S1**	**5.0 - 6.5**	**19**	**1.15**	**0.34**	**0.12**	**14**	**79**	**7**	
▲	**P-07 S1**	**6.5 - 8.0**	**9.5**	**0.51**	**0.17**		**3**	**74**	**23**	

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FIG. A-30
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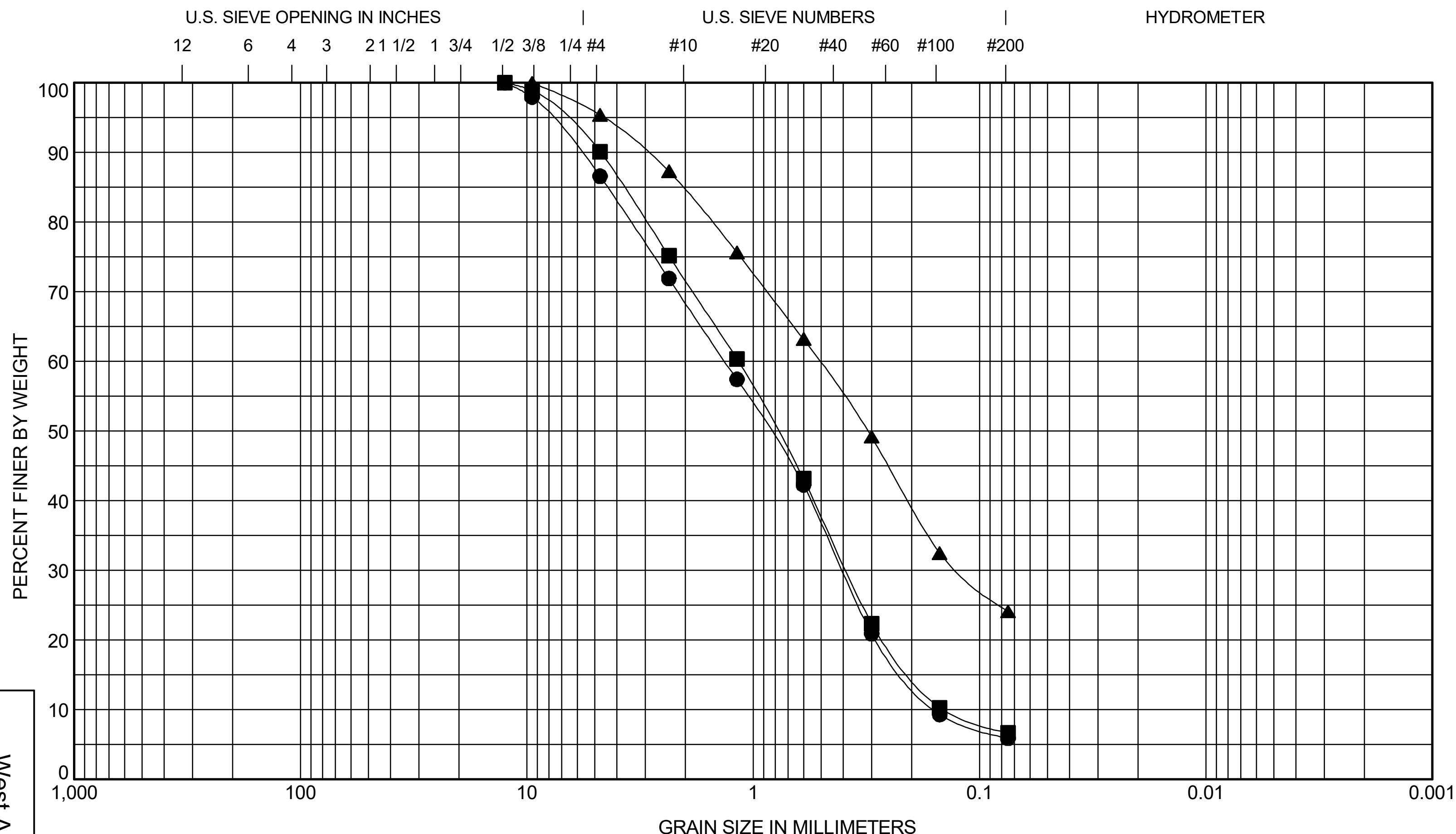

Sample		Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	P-08 S1	5.0 - 6.5	**Poorly Graded Sand with Silt (SP-SM)**				0.8	8.5
■	P-09 S1	4.0 - 5.5	**Poorly Graded Sand with Silt (SP-SM)**				0.9	8.2
▲	P-10 S1	5.5 - 7.0	**Silty Sand (SM)**					

Sample		Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	P-08 S1	5.0 - 6.5	12.5	1.34	0.4	0.16	13	81	6	
■	P-09 S1	4.0 - 5.5	12.5	1.17	0.39	0.14	10	83	7	
▲	P-10 S1	5.5 - 7.0	9.5	0.51	0.12		5	71	24	

West Anchorage Snow Disposal Site
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FIG. A-30
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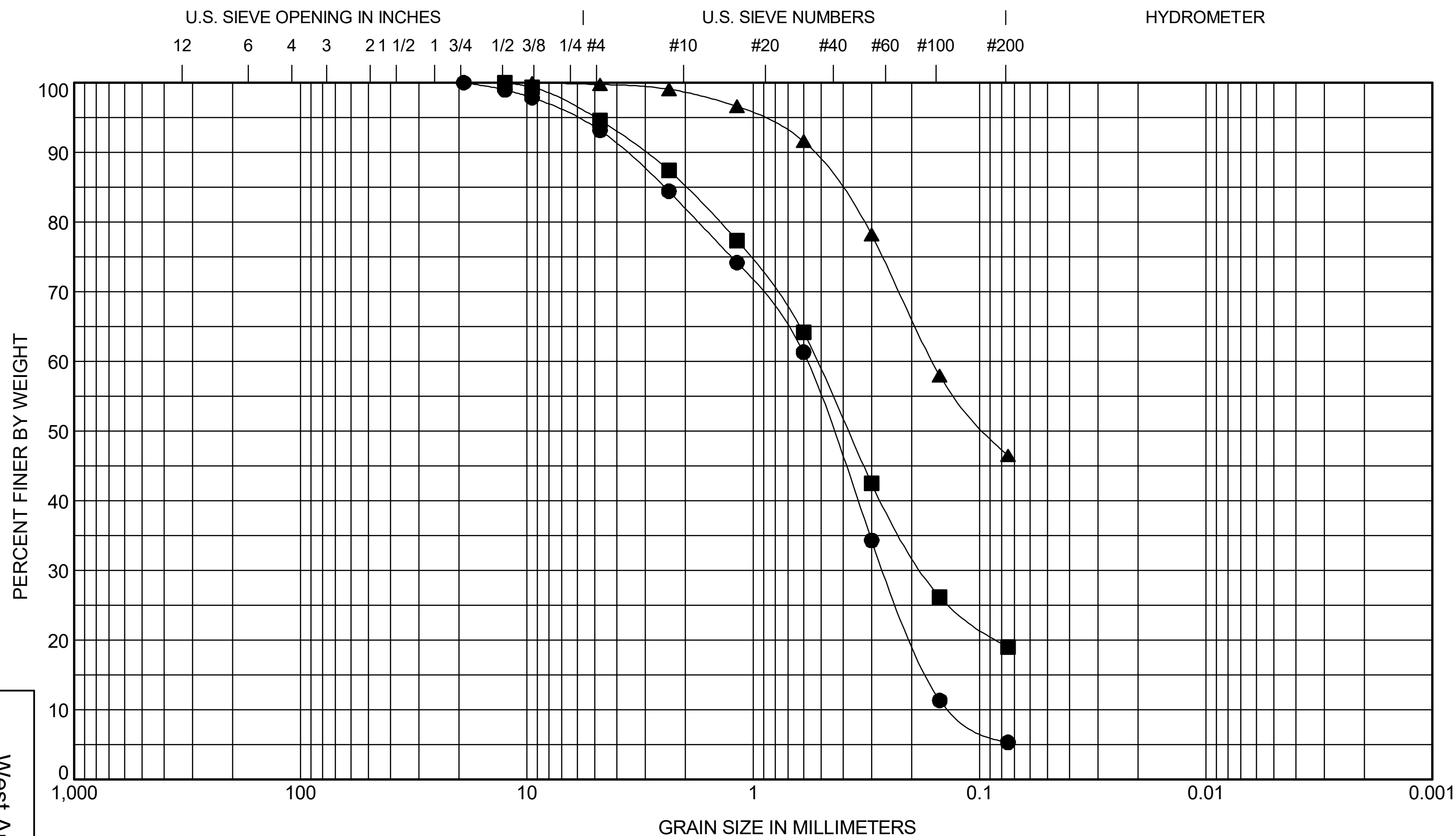

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	USCS Classification	LL	PL	PI	Cc	Cu
●	**P-11 S1**	**7.5 - 9.0**	**Poorly Graded Sand with Silt (SP-SM)**				**0.9**	**4.5**
■	**P-12 S1**	**7.0 - 8.5**	**Silty Sand (SM)**					
▲	**P-13 S1**	**7.0 - 8.5**	**Silty Sand (SM)**					

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P-11 S1**	**7.5 - 9.0**	**19**	**0.58**	**0.26**	**0.13**	**7**	**88**	**5**	
■	**P-12 S1**	**7.0 - 8.5**	**12.5**	**0.53**	**0.18**		**5**	**76**	**19**	
▲	**P-13 S1**	**7.0 - 8.5**	**9.5**	**0.16**			**0**	**53**	**46**	

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FIG. A-30
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Important Information

About Your Geotechnical/Environmental Report

IMPORTANT INFORMATION

IMPORTANT INFORMATION

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining

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your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

IMPORTANT INFORMATION

being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

February 28, 2023

Mr. Timothy Huntting, P.E.
Municipality of Anchorage
Project Management and Engineering
4700 Elmore Road
Anchorage, AK 99507

RE: SITE CHARACTERIZATION ACTIVITIES, KLEOP STATION, ANCHORAGE, ALASKA

Dear Mr. Huntting, P.E.:

This letter presents the results of our site characterization activities conducted in support of the Municipality of Anchorage's (MOA's) Kleop Station facility improvements and the West Anchorage Snow Disposal Site, which are located near Connor's Bog in Anchorage, Alaska. A vicinity map indicating the general project location is presented as Figure 1. The site plan, included as Figure 2, shows prominent site features and the approximate test pit locations.

The activities for this phase of the project included geotechnical and environmental services to support parking area improvements along the west side of the Kleop Station Maintenance & Operations (M&O) office building and the characterization of the soils contained within the existing soil berms along the west (Berm 1) and south edges (Berm 2) of the Kleop Station site. Presented in this report are descriptions of subsurface explorations and laboratory test procedures, an interpretation of the soils within the existing berms, and an evaluation for the berm materials for reuse during construction in other areas of the Kleop Station improvements and/or for the West Anchorage snow disposal site proposed to be located south of the Kleop Station.

Authorization to proceed with this work was received in the form of Purchase Order 2022000732 for Contract No. 4400000636, approved by Ms. Rachelle A. Alger, of the Municipality of Anchorage (MOA), dated July 1, 2022. Our work was conducted in general accordance with our March 9, 2022, proposal. This report is intended for use by the project design engineering staff, the MOA, and their representatives.

FIELD ACTIVITIES

Field activities for the berm characterization consisted of advancing 21 test pits through the existing berms, collecting geotechnical and analytical soil samples, and preparing this summary report. We coordinated with the Call Locate Center for buried public utility

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locating services prior to excavating. The test pits, designated as Test Pits TP-02 through TP-22, were advanced through the existing berms that border the outer edges of the access road that travels through the outer areas of the southern portion of the Kleop Station site. Test Pits TP-02 through TP-14 were advanced along Berm 1 and Test Pits TP-15 through TP-22 were advanced along Berm 2, as shown in Figure 2. Test Pits were spaced at approximately 50-foot intervals. Test pits were generally advanced through the height of the berms, which resulted in depths ranging from approximately 4 to 5 feet below the top of berm (BTOB). Field screening samples were collected at approximately 2 to 2.5-foot intervals.

The MOA provided a Kubota KX080-4 backhoe and operator to advance the test pits. Test pits were generally advanced through the berms to the approximate elevation of the adjacent access road. Geotechnical and environmental professionals from our firm were present during excavation to locate the test pits, observe dig action, collect geotechnical and analytical samples, and log subsurface conditions. At the completion excavation, test pits were backfilled using soils excavated for the test pits that were periodically tamped with the excavator bucket to compact them as they were replaced.

The soil samples recovered during excavation were observed and described in the field in general accordance with the classification system described by ASTM International (ASTM) D2488. Selected samples recovered during the subsurface explorations were tested in our laboratory to refine our soil descriptions in general accordance with the Unified Soil Classification System (USCS) described in Figure A-1 (3 sheets) of Attachment 2. Frost classifications were also estimated for samples based on laboratory testing (sieve analyses) and are shown on the test pit logs. The frost classification system is presented in Attachment 2 as Figure A-2 and summary logs of the test pits are presented in Attachment 2 as Figures A-3 through A-23.

Immediately following excavation of the test pits; geotechnical, analytical, and field screening samples were collected. The analytical sample jars for volatile analyses were collected first, followed by the non-volatile analytical sample jars, the field screening sample, and finally the geotechnical sample. The soil samples were “screened” for volatile organic vapors using a Thermo Instruments OVM 580B photoionization detector (PID) and an Alaska Department of Environmental Conservation (ADEC)-approved headspace screening technique throughout the berm at approximately 2 to 2.5-foot intervals. The PID was calibrated before screening activities with 100 parts per million (ppm) isobutylene standard gas. The field screening samples were collected in re-sealable plastic bags by filling them with freshly exposed soil to one-half of their volumes, sealing the top, warmed to at least 40 degrees Fahrenheit, and screened within 10 minutes to one hour of collection. Screening was accomplished by inserting the PID sampling probe into the air space above the soil in the bag and recording the maximum PID reading. The field screening results are presented in Table 1 and Attachment 1.

The analytical samples were generally collected from the field screening samples with the highest field PID measurements. Soil samples for laboratory analysis were collected in laboratory-supplied jars in decreasing order of volatility. For each volatile sample, at least 25 grams of soil, but no more than what can be completely submerged with 25-milliliters of methanol, was placed into a pre-weighted, 4-ounce jar with a septa lid. A 25-milliliter aliquot of methanol containing laboratory-added surrogates was added to the sample jar to submerge the soil sample. For each non-volatile sample, the laboratory-supplied jar was filled with soil taking care to avoid pieces of gravel and debris. Sample jars were filled using decontaminated stainless-steel spoons, placed in coolers with ice packs, and transferred to the laboratory using chain-of-custody procedures.

Six analytical soil samples were collected from these 21 test pits and submitted for to SGS North America Inc. (SGS) for laboratory analysis. Field notes from our explorations are included in Attachment 1. Summary logs of the test pits are provided in Attachment 2. Tables 1 through 2, and the test pit logs presented in Attachment 2 represent our interpretation of the field data and take precedent over the field notes.

LABORATORY ANALYSIS

Geotechnical and analytical laboratory analyses were performed on selected soil samples collected from the test pits. The testing was formulated with emphasis on determining gradation properties and potential contamination within the berm soils.

Analytical Laboratory Analysis

The analytical soil samples were submitted to SGS using chain-of-custody procedures. The samples were analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101, diesel range organics (DRO) by AK 102, residual range organics (RRO) by AK 103, volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method 8260D, polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D selective ion method (SIM), and Resource Conservation Recovery Act (RCRA) metals by EPA Method 6020B. For quality control purposes, one methanol soil trip blank was submitted with the test pit samples to the laboratory and analyzed for GRO and VOCs. The laboratory reports and completed ADEC Laboratory Data Review Checklists (LDRCs) are provided in Attachment 3. The analytical soil sample results for the test pits are summarized in Table 2.

Geotechnical Laboratory Analysis

Water content tests were performed in general accordance with ASTM D2216. The results of the water content measurements are presented graphically on the test pit logs presented as Figures A-3 through A-23 in Attachment 2.

Grain size classification (gradation) testing was performed to estimate the particle size distribution of selected samples from the borings and test pits. The gradation testing generally followed the procedures described in ASTM C136. The test results are presented in Attachment 2 as Figure A-24 (4 sheets) and summarized on the summary logs as percent gravel, percent sand, and percent fines. Percent fines on the test pit logs are equal to the sum of the silt and clay fractions indicated by the percent passing the No. 200 sieve. Note that gradation testing indicates particle size only and visual classification under USCS designates the entire fraction of soil finer than the No. 200 sieve as silt. Plasticity characteristics (Atterberg Limits results) are required to differentiate between silt and clay soils under USCS.

SUBSURFACE CONDITIONS

The subsurface conditions encountered in our explorations are presented graphically on the summary logs presented in Attachment 2 as Figures A-3 through A-23. In general, our test pits through the berms encountered an organic mat (grass) overlying granular soils within the berms. For the purposes of this discussion, the north-south berm that runs along the western edge of the Kleop facility embankment is Berm 1, and the east-west berm along the south end of the facility is Berm 2.

Soil

Test pits for the berm characterization were advanced through existing berms around the western and southern edges of the Kleop facility. These test pits generally encountered a relatively thin layer of organics overlying relatively clean (low fines contents) sands and gravels; however silty soils were encountered near the south end of Berm 1 and in portions of the west half of Berm 2. Silt with varying amounts of sand and gravel was observed in the upper portions (roughly to 1 to 2.5 feet BTOB) of Test Pits TP-13 and Test Pits TP-16 through TP-18. Note that while significant portions of the berm soils were relatively clean, varying amounts of organics, construction debris (asphalt or concrete), and assorted trash was observed in nearly all of our test pits (TP-19 in Berm 2 was the only one where this was not noted).

Based on our laboratory testing, estimated fines contents of the material in Berm 1 ranged from approximately 8 to 10 percent, except for in the silt layer in the upper 1.5 feet of Test Pit TP-13. Moisture contents of the soils in Berm 1 ranged from about 3 to 10 percent, except for the silt layer that had approximately 19 percent moisture.

Based on our laboratory testing, estimated fines contents of the material in Berm 2 ranged from approximately 8 to 87 percent, with silt samples being tested in the upper 1.5 to 2.5 feet of Test Pits TP-16 and TP-18, respectively. Note that there appeared to be more variation in the berm material in roughly the western half of Berm 2. Moisture contents of the soils in Berm 2 generally ranged from about 3 to 8 percent in the coarse grained soils and from about 17 to 25 percent in the fine-grained material.

Groundwater

Test pits through the berms generally did not extend below the depth of the surrounding embankment or access road. Therefore, groundwater was not observed during these test pit explorations.

DISCUSSION OF ANALYTICAL RESULTS

The sample results were compared to the ADEC cleanup levels presented in the November 2021, 18 Alaska Administrative Code (AAC) 75 regulations. The applicable soil criteria consist of the most stringent ADEC Method Two cleanup levels listed in Tables B1 and B2 of 18 AAC 75.341, for the "under 40-inch (precipitation) zone". Groundwater cleanup levels are established in Table C of 18 AAC 75.345. The applicable soil cleanup levels are listed in Table 2.

Test Pit Analytical Samples

Test Pit Sample TP21S2, collected in Berm 2 near the southeast corner of the Kleop Station, contained a concentration of DRO (295 mg/kg) that exceeds the ADEC Method Two cleanup level of 250 mg/kg. All test pit samples contained concentrations of arsenic (maximum 4.99 mg/kg) that exceed the ADEC Method Two cleanup level of 0.20 mg/kg. However, in our opinion, these concentrations are likely consistent with background arsenic concentrations in the Anchorage area. DRO, RRO, toluene, 14 PAH compounds, barium, cadmium, chromium, and lead were detected at concentrations less than the most stringent ADEC

Method Two cleanup levels in at least one soil sample. The remaining target analytes were not detected. A summary of the soil analytical results is included in Table 2.

Quality Control Samples

The project laboratory follows on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). Internal laboratory controls to assess data quality for this project include surrogates, method blanks, matrix spike/matrix spike duplicates (MS/MSD), and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to assess precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a brief narrative concerning the problem in the case narrative of their laboratory report (see Attachment 3).

External quality controls for this project included a laboratory-prepared soil trip blank. The trip blank accompanied the sample jars for the test pit samples from the laboratory to the site during sampling activities and back again to SGS. Note that a duplicate soil sample was inadvertently not submitted to SGS

Although less than the limit of quantitation (LOQ), an estimated concentration of GRO (1.12 J mg/kg) (associated with all test pit samples) was detected in the method blank. Additionally, although less than the LOQ, an estimated concentration of GRO (1.15 J mg/kg) (associated with Sample STB) was detected in the method blank. Although less than the LOQ, samples are flagged “B” in Table 2 when the reported sample concentrations are within 10x the reported method blank concentrations. If both the sample and method blank concentrations are reported at levels less than the LOQ, the sample concentration is reported as non-detect at the LOQ and flagged “B”. Therefore, all project samples were reported as non-detect at the LOQ and flagged “B” in Table 2.

EVALUATION OF BERM MATERIAL FOR REUSE

We understand that you would like to reuse as much of the existing fill as possible for structural fill to limit the amount of soil that will need to be disposed and/or imported. In general the berm soils that we tested contain more than 6 percent fines and do not meet the requirements, as specified by the Municipality of Anchorage Standard Specifications (MASS), for leveling course, Type IIA base, or Type II subbase material. However, significant portions of the berms appear to be comprised of material that is less than 10 percent fines and, geotechnically speaking, may be reused for Type III material in areas outside of the structural sections for the project provided that it can be placed and compacted with moisture-density control.

While much of the berm material appears to meet the gradation requirements to be reused as Type III or unsuitable material (see Figure 3), varying amounts of organics, construction debris (asphalt or concrete), and assorted trash was observed in nearly all of our test pits (except for TP-19 in Berm 2). Additionally, Sample TP21S2, collected from near the southeast corner of the Kleop Station, contained a concentration of DRO (295 mg/kg) that exceeds the ADEC cleanup level of 250 mg/kg. For these reasons, screening of soils for hydrocarbon contamination, organics, debris, and assorted trash will be needed before the material is suitable to be reused. Coordination with the ADEC, EPA, or other agencies may also be required and may result in the need to haul away and dispose of undeterminable amounts of berm materials.

For material that is able to be reused for the Kleop Station projects, Type III or better material is specified to be used in portions of the new embankments for the snow disposal pad and new access road to it. Additionally, unsuitable material can also be reused during construction of new access road embankments, the snow disposal pad, and a large portion of the containment berm around the disposal pad. While these unclassified materials are not necessarily subject to gradation specifications, they must be able to be placed and compacted with moisture-density control as described in our September 2021 snow disposal site and February 2023 parking area improvement geotechnical engineering reports. It is also our opinion that unsuitable mineral soils that are free from organics, trash, frozen, and other deleterious material may be reused for the project in the embankment base of the proposed access road to the snow disposal pad, the snow disposal pad itself, and in the berms surrounding the snow disposal pad.

Due to the DRO concentration in Sample TP21S2, we recommend preparing an Environmental Management Plan (EMP) to specify methods for handling potentially contaminated soil generated during construction of the snow disposal site. Additionally, based on the results of the geotechnical soil samples, the berms may not be appropriate to use as a base layer within a wetland.

CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives in the study of this site. The findings presented within this report are based on the limited research, sampling, and analyses that were conducted. They should not be construed as definite conclusions regarding the site's soil quality. As a result, the sampling, analyses, and data interpretations can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantee that an agency or its staff

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will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our sampling activities. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study unless specifically requested and authorized by you, or as required by law.

Shannon & Wilson has prepared the information in Attachment 4, "Important Information About Your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of our report.

Sincerely,

SHANNON & WILSON

Prepared by:

Chris Pepe
Environmental Staff

Reviewed by:

STATE OF ALASKA
49TH
Kyle Brennan
CE-11122
2-28-23
REGISTERED PROFESSIONAL ENGINEER

Kyle Brennan, PE
Vice President

Enc. Tables 1 and 2, Figures 1 and 2, and Attachments 1 through 4

RCP:RCH/dxm:klb

TABLE 1 - SAMPLE DETAILS

Screening Sample ID	Analytical Sample ID^	Date	Screening Sample Location	Depth (feet*)	Headspace (ppm)^^
Test Pit Samples					
Test Pit TP-02					
TP2-HS1	-	8/18/2022	Test Pit TP-02, Sample HS1	0-2.5	0.0
TP2-HS2	TP2S2	8/18/2022	Test Pit TP-02, Sample HS2	2.5-5	0.3
Test Pit TP-03					
TP3-HS1	-	8/18/2022	Test Pit TP-03, Sample HS1	0-2.5	0.4
TP3-HS2	-	8/18/2022	Test Pit TP-03, Sample HS2	2.5-5	0.3
Test Pit TP-04					
TP4-HS1	-	8/18/2022	Test Pit TP-04, Sample HS1	0-2.5	0.1
TP4-HS2	-	8/18/2022	Test Pit TP-04, Sample HS2	2.5-5	0.0
Test Pit TP-05					
TP5-HS1	-	8/18/2022	Test Pit TP-05, Sample HS1	0-2.5	0.1
TP5-HS2	-	8/18/2022	Test Pit TP-05, Sample HS2	2.5-5	0.1
Test Pit TP-06					
TP6-HS1	-	8/18/2022	Test Pit TP-06, Sample HS1	0-2.5	0.0
TP6-HS2	TP6S2	8/18/2022	Test Pit TP-06, Sample HS2	2.5-5	0.3
Test Pit TP-07					
TP7-HS1	-	8/18/2022	Test Pit TP-07, Sample HS1	0-2.5	0.1
TP7-HS2	-	8/18/2022	Test Pit TP-07, Sample HS2	2.5-5	0.0
Test Pit TP-08					
TP8-HS1	-	8/18/2022	Test Pit TP-08, Sample HS1	0-2	0.1
TP8-HS2	-	8/18/2022	Test Pit TP-08, Sample HS2	2-4	0.0
Test Pit TP-09					
TP9-HS1	-	8/18/2022	Test Pit TP-09, Sample HS1	0-2	0.0
TP9-HS2	TP9S2	8/18/2022	Test Pit TP-09, Sample HS2	2-4	0.0
Test Pit TP-10					
TP10-HS1	-	8/18/2022	Test Pit TP-10, Sample HS1	0-2	0.1
TP10-HS2	-	8/18/2022	Test Pit TP-10, Sample HS2	2-4	0.0
Test Pit TP-11					
TP11-HS1	-	8/18/2022	Test Pit TP-11, Sample HS1	0-2	0.1
TP11-HS2	-	8/18/2022	Test Pit TP-11, Sample HS2	2-4	0.0
Test Pit TP-12					
TP12-HS1	-	8/18/2022	Test Pit TP-12, Sample HS1	0-2.25	0.0
TP12-HS2	-	8/18/2022	Test Pit TP-12, Sample HS2	2.25- 4.5	0.0
Test Pit TP-13					
TP13-HS1	TP13S1	8/18/2022	Test Pit TP-13, Sample HS1	0-2	0.4
TP13-HS2	-	8/18/2022	Test Pit TP-13, Sample HS2	2-4	0.1

NOTES: Located on the following page

TABLE 1 - SAMPLE DETAILS

Screening Sample ID	Analytical Sample ID^	Date	Screening Sample Location	Depth (feet*)	Headspace (ppm)^^
Test Pit TP-14					
TP14-HS1	-	8/18/2022	Test Pit TP-14, Sample HS1	0-2	0.0
TP14-HS2	-	8/18/2022	Test Pit TP-14, Sample HS2	2-4	0.1
Test Pit TP-15					
TP15-HS1	-	8/18/2022	Test Pit TP-15, Sample HS1	0-2.5	0.0
TP15-HS2	-	8/18/2022	Test Pit TP-15, Sample HS2	2.5-5	0.0
Test Pit TP-16					
TP16-HS1	TP16S1	8/18/2022	Test Pit TP-16, Sample HS1	0-2	0.5
TP16-HS2	-	8/18/2022	Test Pit TP-16, Sample HS2	2-4	0.4
Test Pit TP-17					
TP17-HS1	-	8/18/2022	Test Pit TP-17, Sample HS1	0-2	0.3
TP17-HS2	-	8/18/2022	Test Pit TP-17, SampleHS2	2-4	0.4
Test Pit TP-18					
TP18-HS1	-	8/18/2022	Test Pit TP-18, Sample HS1	0-2	0.3
TP18-HS2	-	8/18/2022	Test Pit TP-18, Sample HS2	2-4 ft	0.1
Test Pit TP-19					
TP19-HS1	-	8/18/2022	Test Pit TP-19, Sample HS1	0-2	0.0
TP19-HS2	-	8/18/2022	Test Pit TP-19, Sample HS2	2-4	0.1
Test Pit TP-20					
TP20-HS1	-	8/18/2022	Test Pit TP-20, Sample HS1	0-2	0.4
TP20-HS2	-	8/18/2022	Test Pit TP-20, Sample HS2	2-4	0.3
Test Pit TP-21					
TP21-HS1	-	8/18/2022	Test Pit TP-21, Sample HS1	0-1.75	0.1
TP21-HS2	TP21S2	8/18/2022	Test Pit TP-21, Sample HS2	1.75-3.5	0.3
Test Pit TP-22					
TP22-HS1	-	8/18/2022	Test Pit TP-20, Sample HS1	0-2	0.1
TP22-HS2	-	8/18/2022	Test Pit TP-20, Sample HS2	2-4	0.3
Quality Control Sample					
STB	-	8/18/2022	Trip Blank	-	-

NOTES:

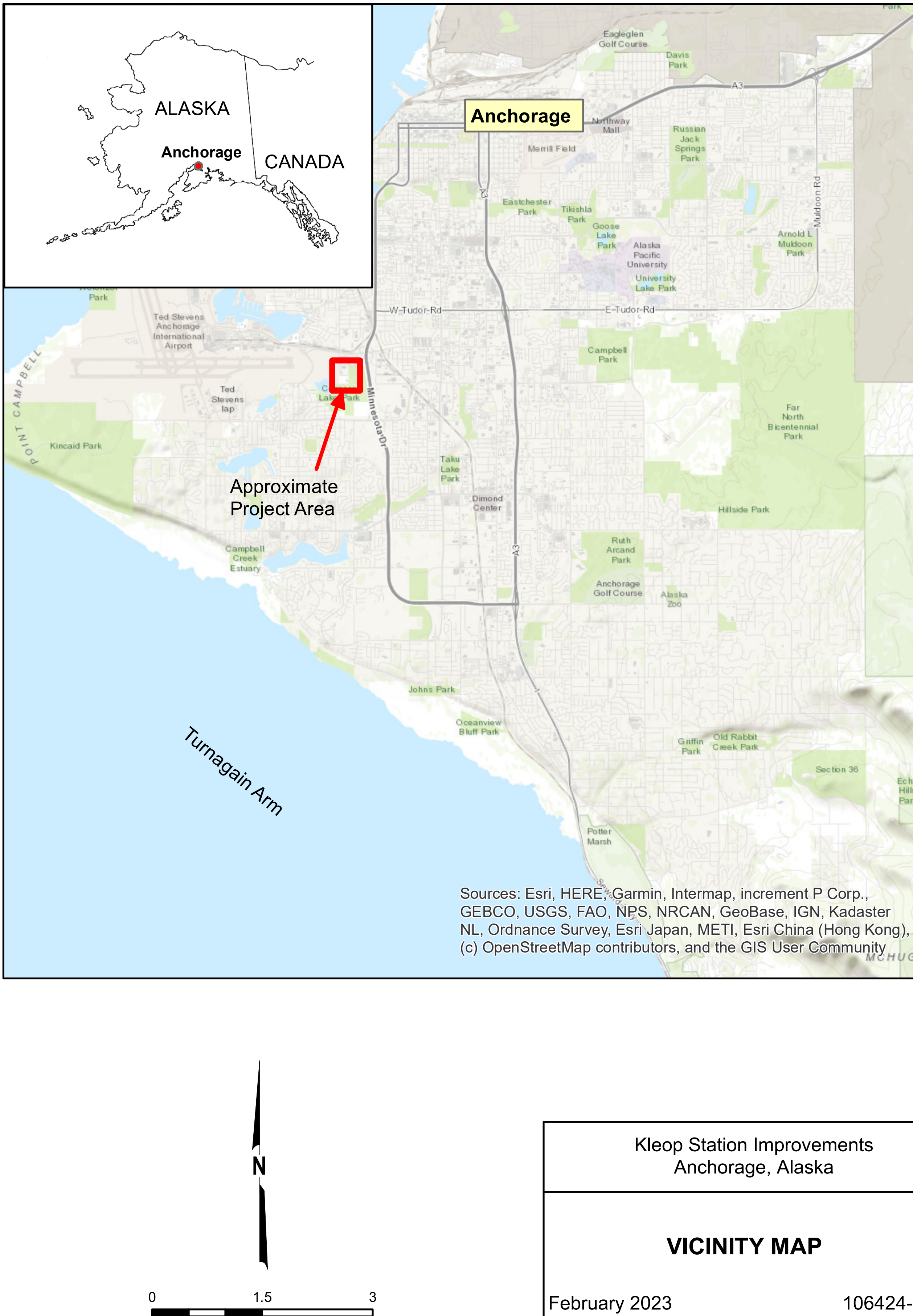
^ = Sample ID number preceded by "106424-" on the chain of custody form
^^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID)
ppm = parts per million
ft = feet
* = Sample depth below top of berm
- = not applicable

TABLE 2 - SUMMARY OF SOIL ANALYTICAL RESULTS

Analytical Method	Analyte	ADEC Cleanup Level	Units	Test Pit 2 TP2S2 2.5-5	Test Pit 6 TP6S2 2.5-5	Test Pit 9 TP9S2 44961	Test Pit 13 TP13S1 0-2	Test Pit 16 TP16S1 0-2	Test Pit 21 TP21S2 1.75-3.5	Quality Control Trip Blank STB -
				Test Pit ID, Sample ID^ and Depth in Feet Below Top of Berm (See Table 1 and Figure 2)						
580B PID	PID Headspace Reading	-	ppm	0.3	0.3	0.0	0.4	0.5	0.3	-
AK 101	Gasoline Range Organics (GRO)	300	mg/kg	<2.16 B	<2.03 B	<1.89 B	<2.47 B	<3.17 B	<1.90 B	<2.51 B
AK 102	Diesel Range Organics (DRO)	250	mg/kg	**52.8 J**	**43.1 J**	**65.1 J**	**43.0 J**	**77.8 J**	**295**	-
AK 103	Residual Range Organics (RRO)	10,000	mg/kg	**956**	**891**	**1,450**	**1,070**	**820**	**6,730**	-
Volotile Oragnic Compounds VOCs										
EPA 8260D	Benzene	0.022	mg/kg	<0.00540	<0.00505	<0.00472	<0.00615	<0.00790	<0.00475	<0.00625
	Toluene	6.7	mg/kg	**0.00949 J**	<0.0102	<0.00945	<0.0124	<0.0159	<0.00950	<0.0126
	Ethylbenzene	0.13	mg/kg	<0.0108	<0.0102	<0.00945	<0.0124	<0.0159	<0.00950	<0.0126
	Xylenes (total)	1.5	mg/kg	<0.0324	<0.0304	<0.0284	<0.0370	<0.0475	<0.0284	<0.0376
	Other VOCs	Various	mg/kg	ND	ND	ND	ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons (PAHs)										
EPA 8270D SIM	Acenaphthene	37	mg/kg	**0.0547 J**	<0.0665	<0.0670	**0.0360 J**	<0.0775	<0.0655	-
	Anthracene	390	mg/kg	**0.200**	**0.121 J**	**0.106 J**	**0.113 J**	<0.0775	<0.0655	-
	Benzo(a)anthracene	0.70	mg/kg	**0.609**	**0.338**	**0.340**	**0.327**	<0.0775	**0.0621 J**	-
	Benzo[a]pyrene	1.5	mg/kg	**0.776**	**0.430**	**0.433**	**0.373**	<0.0775	**0.112 J**	-
	Benzo[b]fluoranthene	15	mg/kg	**1.01**	**0.559**	**0.592**	**0.503**	<0.0775	<0.0655	-
	Benzo[g,h,i]perylene	2,300	mg/kg	**0.624**	**0.346**	**0.368**	**0.273**	<0.0775	**0.177**	-
	Benzo[k]fluoranthene	150	mg/kg	**0.366**	**0.183**	**0.168**	**0.163**	<0.0775	<0.0655	-
	Chrysene	600	mg/kg	**0.746**	**0.409**	**0.414**	**0.373**	<0.0775	**0.0619 J**	-
	Dibenzo[a,h]anthracene	1.5	mg/kg	**0.105 J**	**0.0552 J**	**0.0606 J**	**0.0471 J**	<0.0775	**0.0452 J**	-
	Fluoranthene	590	mg/kg	**1.77**	**0.901**	**0.905**	**0.918**	<0.0775	**0.146**	-
	Fluorene	36	mg/kg	**0.0645 J**	**0.0394 J**	<0.0670	**0.0411 J**	<0.0775	<0.0655	-
	Indeno[1,2,3-c,d] pyrene	15	mg/kg	**0.512**	**0.273**	**0.284**	**0.221**	<0.0775	<0.0655	-
	Phenanthrene	39	mg/kg	**0.939**	**0.482**	**0.435**	**0.548**	<0.0775	**0.0615 J**	-
	Pyrene	87	mg/kg	**1.38**	**0.751**	**0.727**	**0.732**	<0.0775	**0.121 J**	-
	Other PAHs	Various	mg/kg	ND	ND	ND	ND	ND	ND	-
Metals										
EPA 6020B	Arsenic	0.20	mg/kg	**2.55**	**3.75**	**3.31**	**2.66**	**4.99**	**3.63**	-
	Barium	2,100	mg/kg	**48.7**	**61.2**	**49.9**	**33.2**	**69.7**	**61.4**	-
	Cadmium	9.1	mg/kg	**0.212**	**0.235**	**0.211**	**0.109 J**	**0.139 J**	**0.178 J**	-
	Chromium	100,000	mg/kg	**16.1**	**30.0**	**18.8**	**15.0**	**19.1**	**21.2**	-
	Lead	400	mg/kg	**15.2**	**9.71**	**13.1**	**6.37**	**4.26**	**6.91**	-
	Mercury	0.36	mg/kg	<0.155	<0.147	<0.155	<0.163	<0.185	<0.150	-
	Selenium	6.9	mg/kg	<1.03	<0.985	<1.03	<1.09	<1.23	<1.00	-
	Silver	11	mg/kg	<0.258	<0.246	<0.259	<0.271	<0.308	<0.251	-

Notes:

^	= Sample ID number preceded by "106424-" on the chain of custody form
*	= ADEC soil cleanup level is the Method Two standard listed in Table B1 or B2, 18 AAC 75 (November 2021)
ADEC	= Alaska Department of Environmental Conservation
EPA	= Environmental Protection Agency
ND	= Analyte not detected
mg/kg	= Milligrams per kilogram
PID	= Photoionization detector
ppm	= Parts per million
<1.03	= Analyte not detected; laboratory limit of detection of 0.108 mg/kg
0.609	= Analyte detected
295	= Reported concentration exceeds the regulatory cleanup level
-	= Not applicable or sample not tested for this analyte
J	= Estimated concentration less than the limit of quantitation.
B	= Analyte concentration is potentially affected by a method blank detection.



Kleop Station Improvements
Anchorage, Alaska

VICINITY MAP

February 2023 | 106424-002

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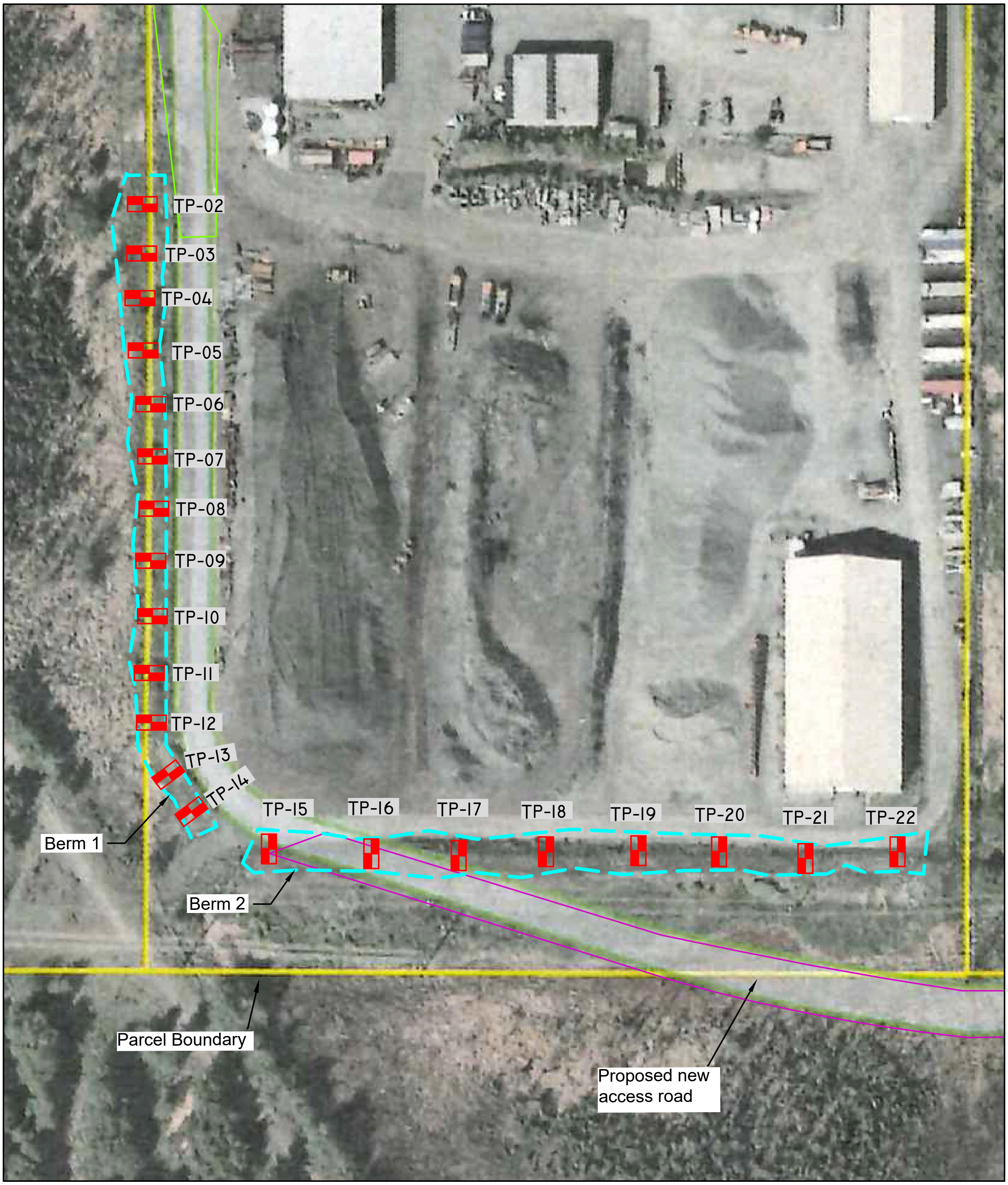
FIG. 1



LEGEND

TP-02 Approximate Location of Test Pit TP-02, Advanced by Shannon & Wilson, August 2022

0 60 120 240

APPROXIMATE SCALE IN FEET

N

Kleop Station Improvements
Anchorage, Alaska

SITE PLAN

February 2023 106424-002

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FIG. 2

GRADATION REQUIREMENTS

(Adapted from Municipality of Anchorage Standard Specifications, 2015)

LEVELING COURSE

U.S. STANDARD SIEVE SIZE English	Metric	PERCENT PASSING BY WEIGHT
1 in.	25.0 mm	100
3/4 in.	19.0 mm	70 - 100
3/8 in.	9.5 mm	50 - 80
No. 4	4.75 mm	35 - 65
No. 8	2.36 mm	20 - 50
No. 50	0.30 mm	8 - 28
No. 200	0.075 mm	0 - 6*

TYPE II BACKFILL

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
8 in.	-	100
3 in.	75 mm	70 - 100
1-1/2 in.	37.5 mm	55 - 100
3/4 in.	19.0 mm	45 - 85
No. 4	4.75 mm	20 - 60
No. 10	2.00 mm	12 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6**

TYPE II-A BACKFILL

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
3 in.	75 mm	100
3/4 in.	19.0 mm	50 - 100
No. 4	4.75 mm	25 - 60
No. 10	2.00 mm	15 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6***

TYPE III BACKFILL

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
8 in.	-	100
No. 200	0.075 mm	10 max.

* The fraction passing the No. 200 sieve shall not exceed 75 percent of the fraction passing the No. 50 sieve.

** The fraction passing the No. 200 sieve shall not exceed 15 percent of the fraction passing the No. 4 sieve.

*** The fraction passing the No. 200 sieve shall not exceed 20 percent of the fraction passing the No. 4 sieve.

Kleop Station Improvements
Anchorage, Alaska

GRADATION REQUIREMENTS

February 2023 106424-002

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FIG. 3

ATTACHMENT 1

Field Notes

SAMPLE COLLECTION LOG

Project Number: 106424-002 Location: 5701 Northwood Drive

Date: 8/18/22

Sampler: ZJT

Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
TP1-S1	West side of MOA bldg	7:46	0	2	Soil	Grab	ES	0.0	GRO, VOCs, DRO, RRO, PAHs, RCRA
TP1-S2	" "	750	2	4				0.0	
TP2-S1	1st berm TP, NW leg of berm	8:15	0	2.5				0.0	
TP2-S2	" "	8:20	2.5	5.0				0.0	
TP3-S1	2nd TP on NW leg of Berm	8:35	0	2.5				0.3	
TP3-S2	" "	8:40	2.5	5.0				0.4	
TP4-S1	3rd TP on NW leg of berm	8:50	0	2.5				0.3	
TP4-S2	" "	8:55	2.5	5.0				0.1	
TP5-S1	4th TP along NW leg of berm going South	9:05	0	2.5				0.0	
TP5-S2	" "	9:10	2.5	5.0				0.1	
TP6-S1	5th TP on NW berm going South	9:15	0	2.5				0.1	
TP6-S2	" "	9:18	2.5	5.0				0.0	
TP7-S1	6th TP on NW berm going South	9:29	0	2.5				0.3	
TP7-S2	" "	9:34	2.5	5.0				0.1	
TP8-S1	7th TP on NW berm going South	9:45	0	2				0.0	
TP8-S2	" "	9:50	2	4				0.1	
TP9-S1	8th TP on NW berm going South	10:00	0	2				0.0	
TP9-S2	" "	10:05	2	4				0.0	
TP9-S12 - Dup	" "	10:08	2	4				0.0	
TP10-S1	9th TP on NW berm going South	10:20	0	2				0.0	
TP10-S2	" "	10:24	2	4				0.1	
TP11-S1	10th TP on NW berm. Last TP on line	10:30	0	2				0.0	
TP11-S2	" "	10:33	2	4				0.1	
TP12-S1	1st TP on South berm	1045	0	2.25				0.0	
TP12-S2	" "	10:50	2.25	4.5				0.0	

Matrix Type	
AR	Air
GW	Groundwater
PR	Product
SB	Subsurf. soil
SE	Sediment
SG	Sludge
SS	Surface soil
SW	Surface water
WR	Water

Sampling Method	
B	Bailer/Coliwas
D	Drill cuttings
G	Grab sampling
H	Hand auger
L	Tube liner
P	Pump (liquid)
SS	Split spoon
T	Shelby tube
V	Vacuum (gas)
W	Wipe sampling

Sample Type	
ES	Environmental sample
ER	Equipment rinsate
FB	Field blank
FD	Field duplicate
FM	Field measurement
FR	Field replicate
MD	Matrix spike duplicate
MS	Matrix spike duplicate
TB	Trip blank

SAMPLE COLLECTION LOG

Project Number: 106424-002 Location: Kleop Station 5701 Northwood Dr.
Date: 8/18/22 + 8/22/22
Sampler: ZJT

Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
TP13-S1	2nd TP on South berm going E	12:05	0	2	G	Soil	ES	0.4	GRO, VOCs, DRO, RRO, PAHs, RCRA
TP13-S2	" "	12:10	2	4				0.1	
TP14-S1	3rd TP on South berm going E	12:21	0	2				0.0	
TP14-S2	" "	12:26	2	4				0.1	
TP15-S1	4th TP on South berm going E	12:40	0	2.5				0.0	
TP15-S2	" "	12:45	2.5	5.0				0.0	
TP16-S1	5th TP on South berm going E	1300	0	2				0.5	
TP16-S2	" "	1310	2	4				0.4	
TP17-S1	6th TP on South berm going E	1320	0	2				0.3	
TP17-S2	" "	1325	2	4				0.4	
TP18-S1	7th TP on South berm going E	1338	0	2				0.3	
TP18-S2	" "	13:43	2	4				0.1	
TP19-S1	8th TP South berm	1358	0	2				0.0	
TP19-S2	" "	14:03	2	4				0.1	
TP20-S1	9th TP South berm	14/3	0	2				0.4	
TP20-S2	" "	14/8	2	4				0.3	
TP21-S1	10th TP South berm	14:30	0	1.75				0.1	
TP21-S2	" "	14:35	1.75	3.5				0.3	
TP-22-S1	11th TP South berm	14:47	0	2				0.1	
TP-22-S2	" "	14:52	2	4				0.3	
TP23-S1	Across road from bldg west 8/22	7:15	0	2				1.4	
TP23-S2	" " 8/22	7:23	2	4				0.6	

Matrix Type
- AR Air
- GW Groundwater
- PR Product
- SB Subsurf. soil
- SE Sediment
- SG Sludge
- SS Surface soil
- SW Surface water
- WR Water

Sampling Method
- B Bailer/Coliwas
- D Drill cuttings
- G Grab sampling
- H Hand auger
- L Tube liner
- P Pump (liquid)
- SS Split spoon
- T Shelby tube
- V Vacuum (gas)
- W Wipe sampling

Sample Type
- ES Environmental sample
- ER Equipment rinsate
- FB Field blank
- FD Field duplicate
- FM Field measurement
- FR Field replicate
- MD Matrix spike duplicate
- MS Matrix spike duplicate
- TB Trip blank

CONTENTS

PAGE	REFERENCE	DATE

SKD

10331- Cordova ARFF/SREB

3/2/2021

snowing yesterday so Robbie unable to badge on landing
06:30 - call Robbie, pushed badging to tentative
10:00 based on snow
08:15 - meet Ryan + well drillers at gate, setup
09:00 - call Robbie, push badging again
10:00-11:15 - pause while well drillers work
since Ryan can't watch us at
the same time
11:15 - continue to setup site w/ Disco
12:15 - 2:00 - SKD badge w/ Robbie Disco continue
setup
2:23 start turning the bit
5:15 drain hoses + get set for the night
@20'
6:00 leave site

3/3/2021

08:30 on site, thaw frozen tanks + equip
09:00 drilling
12:30-1:00 lunch break
4:30 clean mud, drain tanks, stop for day bc need
have to make new mud @ 75'
5:30 leave site

Scale: 1 square = ______

Rite in the Rain

3/4/2021

07:00 Robbie calls - badge Derek nw
08:00 submit locates @ police station
09:00 at site setting up, hose spigot frozen,
repair hydraulic, warm up equip 13°F out
10:30 turning bit, clean hole etc
11:00 start penetrating formation
1:30-2:00 lunch
various downtime to make a plan to fight
heave + hole cleaning problems.
06:00 pull casing out of hole to prevent locking up
@ 105' (last sample)
07:15 leave site

3/5/2021

08:30 meet at site
10:00 finish planning/strategy meetings w/ Ryan,
Keeler, drillers, get stuff thawed, found loose
bolt on pump - fix that
12:15 back on bottom w/ new bit, fixed pump, fresh mud
ready to rock + roll
2:15-2:45 lunch
6:45 start shutting down for the night
7:45 leave

Scale: 1 square = ____________

3/6/2021

8:30 on site
9:30 turning pipe, A to 10' sample interval
11:00 need to add more cable to winch
1:30 out of winch, a longer one is at air cargo, will
be on ~~which~~ tommorrows flight
- going to core w/ NWJ (regular) rods
3:00 cargo called 8:30-12 or 3-5 open
4:00 boys run to town for stuff for longer
winch cable swap
4:40 swap over, run in with coring casing, clean up
7:00 leave site

3/7/2021

8:30 pick up enviro stuff from Air Cargo and go to site
1:00 lunch
3:00 20.3' of core ∴ done
5:45 grout to surface, start pulling casing ~150 gal
7:30 all casing out, grout topped off, heading home

Scale: 1 square = ____________

106424-002 Kloep Station 8/18/22

operator: Bob equip: Kubota KX080-4 company: MOA

TP-01 61° 10.127 -149°55.641

OL 0.4' grass mat

SM

1 asphalt chunk

2.5' seep (S1) @ 3'

4'

(S1) m dense, brn, silty sd w/ gr, moist to wet
30/55/15

TP-02 61° 10.087 -149° 55.664

0
0.2 OL grass mat

aluminum cans, plastic, log chunks

(S1) @ 3'

5' 5'

(S1) loose, brn, PG sd w/ silt + gr, moist, tr roots
15/80/5

Scale: 1 square = ___________

106424-002 8/18/22

TP-03 61° 10.079 -149° 55.665

0
0.2 OL grass mat

(S1) @ 2' paper, plastic, lighter, soda can

occ. gr up to 6" (<5%)

5

(S1) loose to m dense, brn, PG sd w/ silt + gr, moist, tr roots
15/80/5

TP-04 61° 10.070 -149° 55.661

0
0.2 OL grass mat

straws, plastic, paper, soda cans,

(S1) @ 3' org. debris - leaves/needles

5

(S1) loose to m dense, brn, PG sd w/ silty moist tr org debris
10/80/10

Scale: 1 square = ___________

Rite in the Rain

106424-002 8/18/22

TP-05 61° 10.061 -149° 55.662

0
0.2 OL grassmat

soda can, asphalt chunks, paper, broken taillight, lotion bottle

S1 @ 4'

5

S1 loose to mdense, grbrn, PG sd w/ silt & gr, moist tr roots 15/80/5

TP-06 61° 10.053 -149° 55.664

0
0.2 OL grassmat

loose to mdense, brn, PG sd w/ silt, moist tr roots
10/
glass, paper, plastic, wires

4.5
5 S1 @ 4.5'

S1 mdense, grbrn, WG sd w/ gr, moist 30/65/<5

Scale: 1 square = ________

106424-002 8/18/22

TP-07 61° 10.045 -149° 55.663

0
0.2 OL grass mat

plastic, paper, concrete block, foam, hockey stick

S1 @ 2.5'

5

S1 mdense, dk brn, PG sd w/ silt & gr, moist tr roots 20/70/10

TP-08 61° 10.037 -149° 55.667

0
0.2 OL grassmat

small plastic/paper (<1%)

S1 @ 3'

4

S1 loose to mdense, brn, PG sd w/ silt & gr, moist tr roots 15/75/10

Scale: 1 square = ________

Rite in the Rain

106424-002 8/18/22

TP-09 61°10.029 -149°55.665

0
0.2 OL grass mat

turkey trusser, cup lid, plastic
concrete, soda can, moisturizer jar

4 S1 @4'

S1 loose, brn, PG sd w/ silt tgr, moist,
tr roots 20/70/10

TP-10 61° 10.020 -149°55.663

0
0.2 OL grass mat

S1 @2' plastic cup, sheeting, tailight

4

S1 m dense, dk brn, PG sd w/ silt tgr
moist, tr roots
20/70/10

Scale: 1 square = ______

106424-002 8/18/22

TP-11 61° 10.011 -149°55,665

0
0.2 OL grass mat

S1 @2' plastic water bottles, cup, string,
rubber, asphalt

3 S2 @3.5' a few 6-8" gravel/cobbles (<5%)
4

S1 loose, orgbrn, PG sd w/ silty moist
tr roots 0/90/10

S2 m dense, gr, PG sd w/ silt tgr, moist
tr roots 20/80/10

turn the corner

TP-12 61°10.998 -149°55.636

0
0.2 OL grass mat

S1 @2' bolt, wood, plastic

more dense than other berm

4.5

S1 m dense, brn, silty? sd w/ gr, moist
20/65/10 15

Scale: 1 square = ______

106424-002 8/18/22

TP-13

61° 09.998 -149° 55.619

0
0.5 OL grass mat
S1 @ 1
1.5
S2 @ 3' asphalt + metal
4

S1 mdense, tan silty sd w/ gr, moist
15/65/20

S2 mdense gr brn, PG sd w/ silt + gr, moist
tr needles/sticks 15/75/10

TP-14 61° 09.999 -149° 55.602

0
0.5 OL mat
tan silty sd w/ gr, moist
1
big asphalt chunk, pet, McDonalds
S1 @ 3'
4

S1 mdense gr brn, PG sd w/ silt + gr, moist
tr roots 15/75/10

Scale: 1 square = ____________

106424-002 8/18/22

TP-15 61° 09.998 -149° 55.583

0
0.5 OL grass mat
tan silty sd w/ gr
1
S1 @ 3' cloth, paper, soda can, asphalt
5

S1 mdense to dense gr brn, PG gr w/ silt + sd,
moist tr roots 45/45/10

TP-16 61° 09.998 -149° 55.563

0
0.5 OL grass mat
1 S1 @ 1'
plastic, bottle
S2 @ 3'
4

S1 mstiff yellow brn, silt w/ sd, moist
5/15/80

S2 mdense gr brn, PG sd w/ silt + gr, moist
15/75/10

Scale: 1 square = ____________

Rite in the Rain

106424-002 8/18/22

TP-17 61°09.998 -149°55.548

0
OL
1
1.2 tan silt w/sd, moist
asphalt
4 S1 @4

S1 m dense, dk gr, PG sd w/silt & gr, moist
asphalt chunks, tr roots

TP-18 61°09.998' -149°55.529'

0 grass
0.1 pea gravel
0.5 OL
1 pea gravel
1.5
2.5 S1 @ 2.0'
4 S2 @4
plastic, asphalt

S1 m stiff, gr to tan, silt w/sd, moist
tr asphalt chunks

S2 m dense, dk gr, silty sd w/gr, moist
asphalt chunks

Scale: 1 square = ____________

106424-002 8/18/22

TP-19 61°09.998 -149°55.511

0
0.5 OL/grass mat
no garbage?
S1 @4
4

S1 m dense, brn, PG sd w/silt & gr, moist
20/70/10

TP-20 61°09.998 -149°55.494

0
0.2 grass mat
0.6 pea gravel
asphalt, fabric, plastic traffic cone
S1 @ 2'
4

S1 m dense, brn, PG sd w/silt & gr, moist
tr roots 15/80/5

Scale: 1 square = ____________

Rite in the Rain

106424-002 8/18/22

TP-21 61°09.999 -149°55.478

0 — 0.1 OL grass mat
0.5 — pea gravel
big asphalt chunks
concrete
(S1) @ 3'
3.5

(S1) m dense, brn, PG sd w/si + gravel
tr asphalt

TP-22 61°09.997 -149°55.463

0 — OL grass mat
0.2
fabric, rope, tubing, plastic
asphalt
(S1) @ 2
4

(S1) m dense, dk gr, PG sd w/silt & gr
moist, tr asphalt
20/20/10

106424-002 8/22/22

TP-23 61°10.133 -149°55.669

0 — OL grass mat
0.2
glass, soda can, metal rod,
plastic, chain link fence,
asphalt chunks, tree roots
(S1) @ 2.5'
4

(S1) m dense, dk brn, PG sd w/silt & gr,
moist, tr organics (roots) (wood)

Scale: 1 square = ______

Scale: 1 square = ______

Rite in the Rain

ATTACHMENT 2

Test Pit Logs

Shannon & Wilson, Inc. (S&W), uses a soil identification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following pages. Soil descriptions are based on visual-manual procedures (ASTM D2488) and laboratory testing procedures (ASTM D2487), if performed.

S&W INORGANIC SOIL CONSTITUENT DEFINITIONS

CONSTITUENT[2]	FINE-GRAINED SOILS (50% or more fines)[1]	COARSE-GRAINED SOILS (less than 50% fines)[1]
Major	***Silt, Lean Clay, Elastic Silt,*** or ***Fat Clay***[3]	***Sand*** or ***Gravel***[4]
Modifying (Secondary) Precedes major constituent	30% or more coarse-grained: ***Sandy*** or ***Gravelly***[4]	More than 12% fine-grained: ***Silty*** or ***Clayey***[3]
Minor Follows major constituent	15% to 30% coarse-grained: ***with Sand*** or ***with Gravel***[4]	5% to 12% fine-grained: ***with Silt*** or ***with Clay***[3]
	30% or more total coarse-grained *and* lesser coarse-grained constituent is 15% or more: ***with Sand*** or ***with Gravel***[5]	15% or more of a second coarse-grained constituent: ***with Sand*** or ***with Gravel***[5]

[1]All percentages are by weight of total specimen passing a 3-inch sieve.
[2]The order of terms is: *Modifying Major with Minor*.
[3]Determined based on behavior.
[4]Determined based on which constituent comprises a larger percentage.
[5]Whichever is the lesser constituent.

MOISTURE CONTENT TERMS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

STANDARD PENETRATION TEST (SPT) SPECIFICATIONS

Hammer:	140 pounds with a 30-inch free fall. Rope on 6- to 10-inch-diam. cathead 2-1/4 rope turns, > 100 rpm NOTE: If automatic hammers are used, blow counts shown on boring logs should be adjusted to account for efficiency of hammer.
Sampler:	10 to 30 inches long Shoe I.D. = 1.375 inches Barrel I.D. = 1.5 inches Barrel O.D. = 2 inches
N-Value:	Sum blow counts for second and third 6-inch increments. Refusal: 50 blows for 6 inches or less; 10 blows for 0 inches.

NOTE: Penetration resistances (N-values) shown on boring logs are as recorded in the field and have not been corrected for hammer efficiency, overburden, or other factors.

PARTICLE SIZE DEFINITIONS

DESCRIPTION	SIEVE NUMBER AND/OR APPROXIMATE SIZE
FINES	< #200 (0.075 mm = 0.003 in.)
SAND	
Fine	#200 to #40 (0.075 to 0.4 mm; 0.003 to 0.02 in.)
Medium	#40 to #10 (0.4 to 2 mm; 0.02 to 0.08 in.)
Coarse	#10 to #4 (2 to 4.75 mm; 0.08 to 0.187 in.)
GRAVEL	
Fine	#4 to 3/4 in. (4.75 to 19 mm; 0.187 to 0.75 in.)
Coarse	3/4 to 3 in. (19 to 76 mm)
COBBLES	3 to 12 in. (76 to 305 mm)
BOULDERS	> 12 in. (305 mm)

RELATIVE DENSITY / CONSISTENCY

COHESIONLESS SOILS		COHESIVE SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
< 4	Very loose	< 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
> 50	Very dense	15 - 30	Very stiff
		> 30	Hard

WELL AND BACKFILL SYMBOLS

Bentonite Cement Grout
Bentonite Grout
Bentonite Chips
Silica Sand
Perforated or Screened Casing
Surface Cement Seal
Asphalt or Cap
Slough
Inclinometer or Non-perforated Casing
Vibrating Wire Piezometer

PERCENTAGES TERMS[1, 2]

Trace	< 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

[1]Gravel, sand, and fines estimated by mass. Other constituents, such as organics, cobbles, and boulders, estimated by volume.

[2]Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

Kleop Station Improvements
Anchorage, Alaska

SOIL DESCRIPTION AND LOG KEY

February 2023 106424-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 1 of 3

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(Modified From USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL	TYPICAL IDENTIFICATIONS
COARSE-GRAINED SOILS *(more than 50% retained on No. 200 sieve)*	Gravels *(more than 50% of coarse fraction retained on No. 4 sieve)*	Gravel *(less than 5% fines)*	GW	Well-Graded Gravel; Well-Graded Gravel with Sand
			GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel *(more than 12% fines)*	GM	Silty Gravel; Silty Gravel with Sand
			GC	Clayey Gravel; Clayey Gravel with Sand
	Sands *(50% or more of coarse fraction passes the No. 4 sieve)*	Sand *(less than 5% fines)*	SW	Well-Graded Sand; Well-Graded Sand with Gravel
			SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand *(more than 12% fines)*	SM	Silty Sand; Silty Sand with Gravel
			SC	Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS *(50% or more passes the No. 200 sieve)*	Silts and Clays *(liquid limit less than 50)*	Inorganic	ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
		Organic	OL	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
	Silts and Clays *(liquid limit 50 or more)*	Inorganic	MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
			CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
		Organic	OH	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat or other highly organic soils (see ASTM D4427)

NOTE: No. 4 size = 4.75 mm = 0.187 in.; No. 200 size = 0.075 mm = 0.003 in.

NOTES

1. Dual symbols *(symbols separated by a hyphen, i.e., SP-SM, Sand with Silt)* are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart. Graphics shown on the logs for these soil types are a combination of the two graphic symbols (e.g., SP and SM).

2. Borderline symbols *(symbols separated by a slash, i.e., CL/ML, Lean Clay to Silt; SP-SM/SM, Sand with Silt to Silty Sand)* indicate that the soil properties are close to the defining boundary between two groups.

Kleop Station Improvements
Anchorage, Alaska

SOIL DESCRIPTION AND LOG KEY

February 2023 106424-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 2 of 3

2013 BORING CLASS2 106424-002 TP LOGS GINT TEMPLATE7.GPJ SWNEW.GDT 1/25/23

GRADATION TERMS

Poorly Graded	Narrow range of grain sizes present or, within the range of grain sizes present, one or more sizes are missing (Gap Graded). Meets criteria in ASTM D2487, if tested.
Well-Graded	Full range and even distribution of grain sizes present. Meets criteria in ASTM D2487, if tested.

CEMENTATION TERMS[1]

Weak	Crumbles or breaks with handling or slight finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

PLASTICITY[2]

DESCRIPTION	VISUAL-MANUAL CRITERIA	APPROX. PLASITICTY INDEX RANGE
Nonplastic	A 1/8-in. thread cannot be rolled at any water content.	< 4
Low	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.	4 to 10
Medium	A thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.	10 to 20
High	It take considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.	> 20

ADDITIONAL TERMS

Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

PARTICLE ANGULARITY AND SHAPE TERMS[1]

Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width/thickness ratio > 3.
Elongated	Length/width ratio > 3.

[1]Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.
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ACRONYMS AND ABBREVIATIONS

ATD	At Time of Drilling
Diam.	Diameter
Elev.	Elevation
ft.	Feet
FeO	Iron Oxide
gal.	Gallons
Horiz.	Horizontal
HSA	Hollow Stem Auger
I.D.	Inside Diameter
in.	Inches
lbs.	Pounds
MgO	Magnesium Oxide
mm	Millimeter
MnO	Manganese Oxide
NA	Not Applicable or Not Available
NP	Nonplastic
O.D.	Outside Diameter
OW	Observation Well
pcf	Pounds per Cubic Foot
PID	Photo-Ionization Detector
PMT	Pressuremeter Test
ppm	Parts per Million
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
rpm	Rotations per Minute
SPT	Standard Penetration Test
USCS	Unified Soil Classification System
q_u	Unconfined Compressive Strength
VWP	Vibrating Wire Piezometer
Vert.	Vertical
WOH	Weight of Hammer
WOR	Weight of Rods
Wt.	Weight

STRUCTURE TERMS[1]

Interbedded	Alternating layers of varying material or color with layers at least 1/4-inch thick; singular: bed.
Laminated	Alternating layers of varying material or color with layers less than 1/4-inch thick; singular: lamination.
Fissured	Breaks along definite planes or fractures with little resistance.
Slickensided	Fracture planes appear polished or glossy; sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Homogeneous	Same color and appearance throughout.

Kleop Station Improvements
Anchorage, Alaska

SOIL DESCRIPTION AND LOG KEY

February 2023 106424-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 3 of 3

FROST CLASSIFICATION

(after Municipality of Anchorage, 2007)

GROUP		0.02 Mil.	P-200*	USC SYSTEM (based on P-200 results)
NFS	Sandy Soils	0 to 3	0 to 6	SW, SP, SW-SM, SP-SM
	Gravelly Soils	0 to 3	0 to 6	GW, GP, GW-GM, GP-GM
F1	Gravelly Soils	3 to 10	6 to 13	GM, GW-GM, GP-GM
F2	Sandy Soils	3 to 15	6 to 19	SP-SM, SW-SM, SM
	Gravelly Soils	10 to 20	13 to 25	GM
F3	Sands, except very fine silty sands**	Over 15	Over 19	SM, SC
	Gravelly Soils	Over 20	Over 25	GM, GC
	Clays, PI>12			CL, CH
F4	All Silts	Over 15	Over 19	ML, MH
	Very fine silty sands**			SM, SC
	Clays, PI<12			CL, CL-ML
	Varved clays and other fined grained, banded sediments			CL and ML CL, ML, and SM; SL, SH, and ML; CL, CH, ML, and SM

PI = Plasticity Index
P-200 = Percent passing the number 200 sieve
0.02 Mil. = Percent material below 0.02 millimeter grain size

*Approximate P-200 value equivalent for frost classification.
Value range based on typical, well-graded soil curves.

** Very fine sand : greater than 50% of sand fraction passing the number 100 sieve

Kleop Station Improvements
Anchorage, Alaska

FROST CLASSIFICATION LEGEND

February 2023 106424-002

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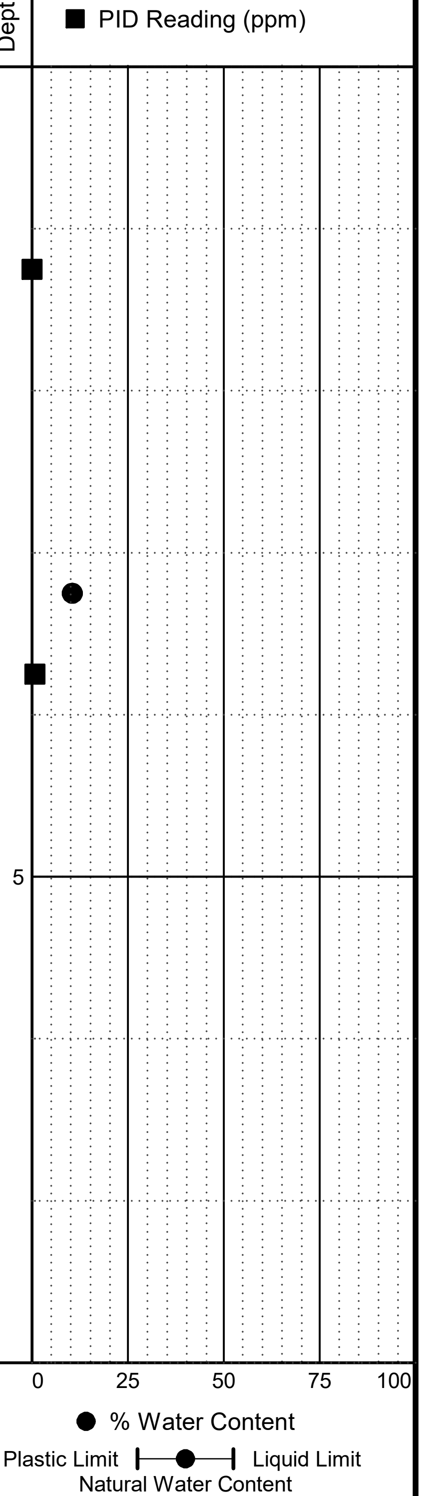
FIG. A-2

MATERIAL DESCRIPTION Lat.: 61°10.087' N Long.: 149°55.664' W Approx. Elevation: 97 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2			Groundwater Not Encountered During Excavation on 8/18/2022
Loose, brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace roots and assorted trash			HS1	
			S2	
Analytical Sample TP2S2 collected from 2.5 to 5' below top of berm			HS2	
Bottom of Test Pit Observed on 8/18/2022	5.0			5



LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Kleop Station Improvements
Anchorage, Alaska

LOG OF TEST PIT TP-02

February 2023 106424-002

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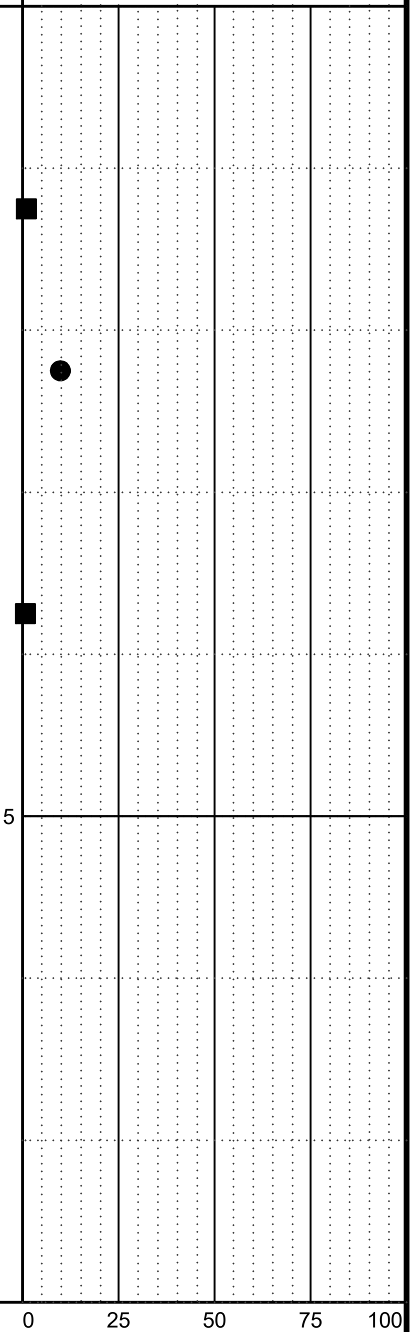
FIG. A-3

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°10.079' N Long.: 149°55.665' W Approx. Elevation: 96 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2			
Loose to medium dense, brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace roots and assorted trash; trace gravels up to approximately 6" diameter			HS1	Groundwater Not Encountered During Excavation on 8/18/2022
S1: 21% Gravel, 68% Sand, 10% Fines (F2 [P200])			S1	
			HS2	
Bottom of Test Pit Observed on 8/18/2022	5.0			5

■ PID Reading (ppm)



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
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LOG OF TEST PIT TP-03

February 2023 106424-002

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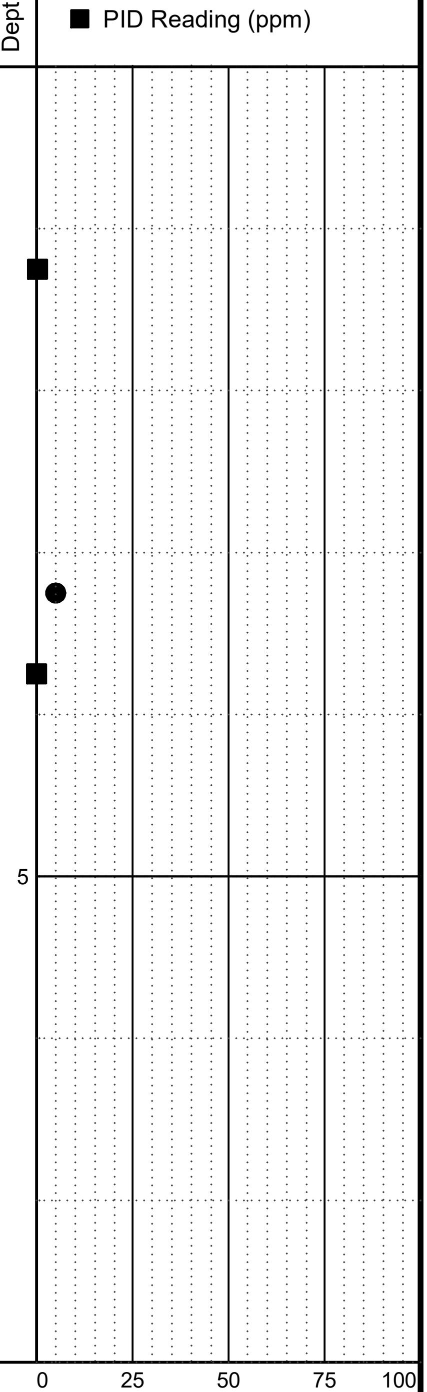
FIG. A-4

REV 3 - Approved for Submittal

MATERIAL DESCRIPTION Lat.: 61°10.070' N Long.: 149°55.661' W Approx. Elevation: 99 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2			Groundwater Not Encountered During Excavation on 8/18/2022
Loose to medium dense, brown, *Poorly Graded Sand with Silt (SP-SM)*; moist; trace organic debris and assorted trash			HS1 S2 HS2	
Bottom of Test Pit Observed on 8/18/2022	5.0			5



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
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LOG OF TEST PIT TP-04

February 2023 106424-002

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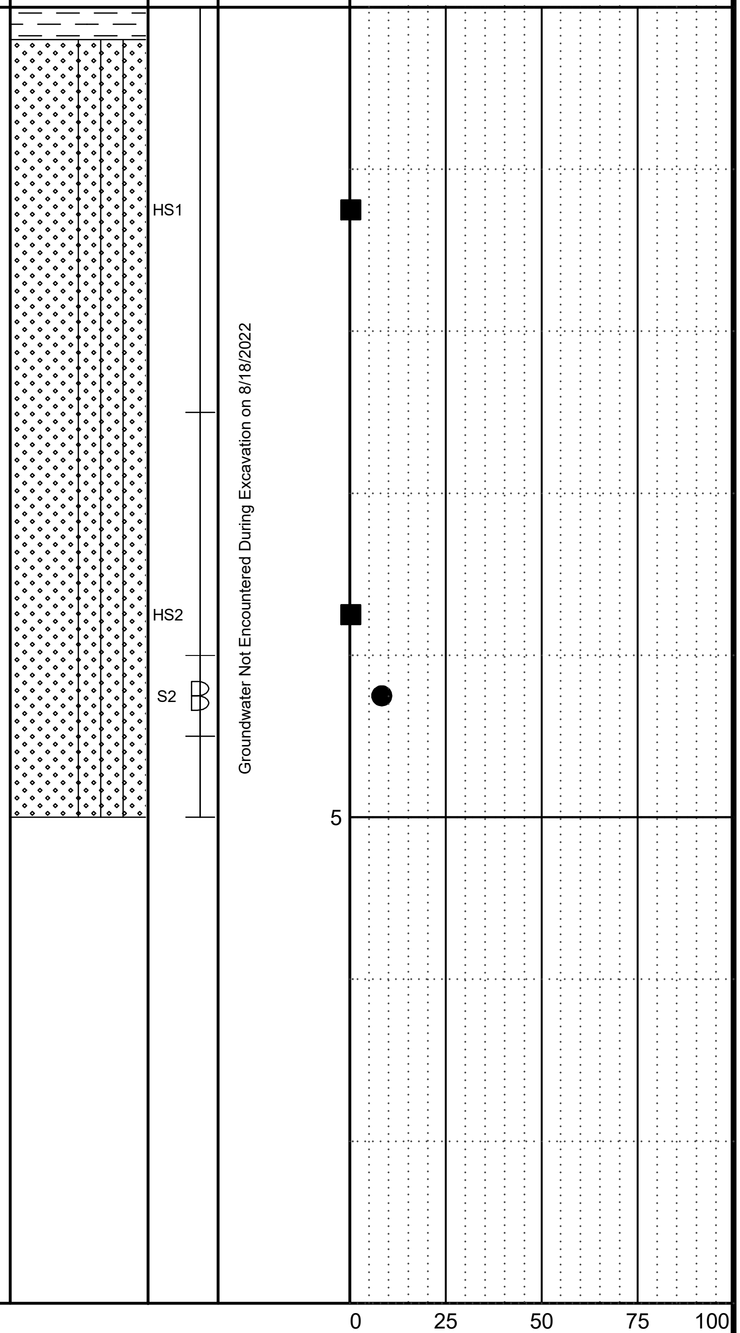
FIG. A-5

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°10.061' N Long.: 149°55.662' W Approx. Elevation: 99 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.	■ PID Reading (ppm)
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2				
Loose to medium dense, gray-brown, *Well-Graded Sand with Silt and Gravel (SW-SM)*; moist; trace roots, asphalt chunks, and assorted trash			HS1		
			HS2	Groundwater Not Encountered During Excavation on 8/18/2022	
S2: 21% Gravel, 70% Sand, 9% Fines (F2 [0.02 mm])			S2		
Bottom of Test Pit Observed on 8/18/2022	5.0			5	



LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
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LOG OF TEST PIT TP-05

February 2023 106424-002

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FIG. A-6

REV 3 - Approved for Submittal

MATERIAL DESCRIPTION Lat.: 61°10.053' N Long.: 149°55.664' W Approx. Elevation: 98 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.	■ PID Reading (ppm)
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2				
Loose to medium dense, brown, *Poorly Graded Sand with Silt (SP-SM)*; moist; trace roots and assorted trash			HS1	Groundwater Not Encountered During Excavation on 8/18/2022	
Analytical Sample TP6S2 collected from 2.5 to 5' below top of berm			HS2		
S2: 39% Gravel, 53% Sand, 8% Fines (F2 [P200]) Medium dense, gray-brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist	4.5		S2		
Bottom of Test Pit Observed on 8/18/2022	5.0			5	

0 25 50 75 100

● % Water Content

Plastic Limit ├──●──┤ Liquid Limit

Natural Water Content

LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

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2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
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LOG OF TEST PIT TP-06

February 2023 106424-002

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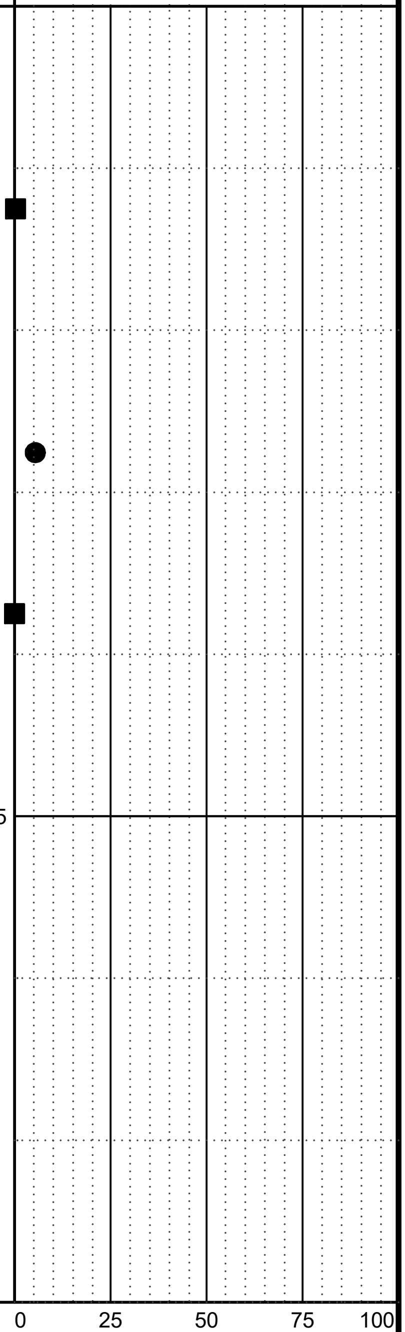
FIG. A-7

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°10.045' N Long.: 149°55.663' W Approx. Elevation: 98 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.	■ PID Reading (ppm)
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2			Groundwater Not Encountered During Excavation on 8/18/2022	
Medium dense, dark brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace roots, concrete, and assorted trash			HS1 S2 HS2		
Bottom of Test Pit Observed on 8/18/2022	5.0			5	



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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Anchorage, Alaska

LOG OF TEST PIT TP-07

February 2023 106424-002

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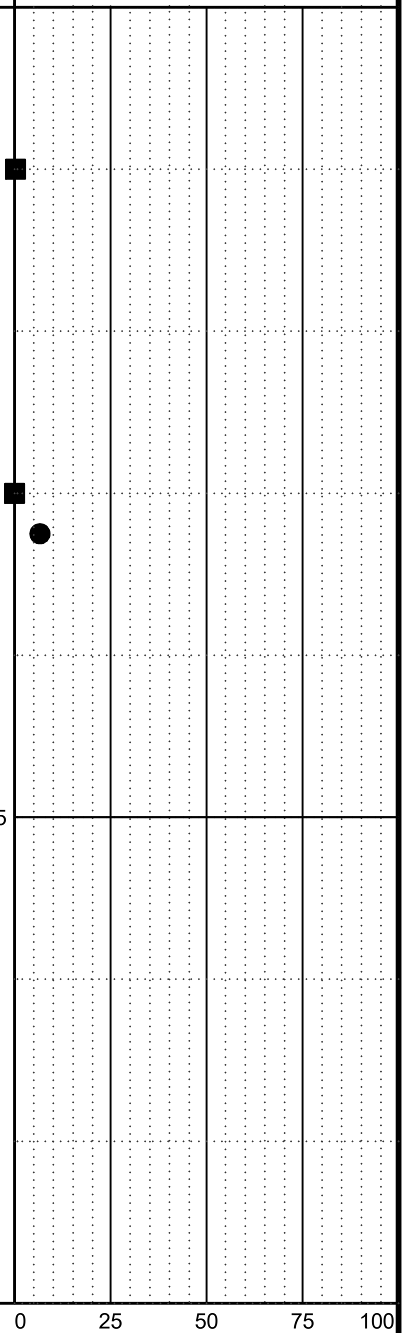
FIG. A-8

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Lat.: 61°10.037' N Long.: 149°55.667' W Approx. Elevation: 97 Ft. Datum: WGS 84				
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2			
Loose to medium dense, brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace roots and assorted trash			HS1 HS2 S2	Groundwater Not Encountered During Excavation on 8/18/2022
Bottom of Test Pit Observed on 8/18/2022	4.0			



LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Kleop Station Improvements
Anchorage, Alaska

LOG OF TEST PIT TP-08

February 2023 106424-002

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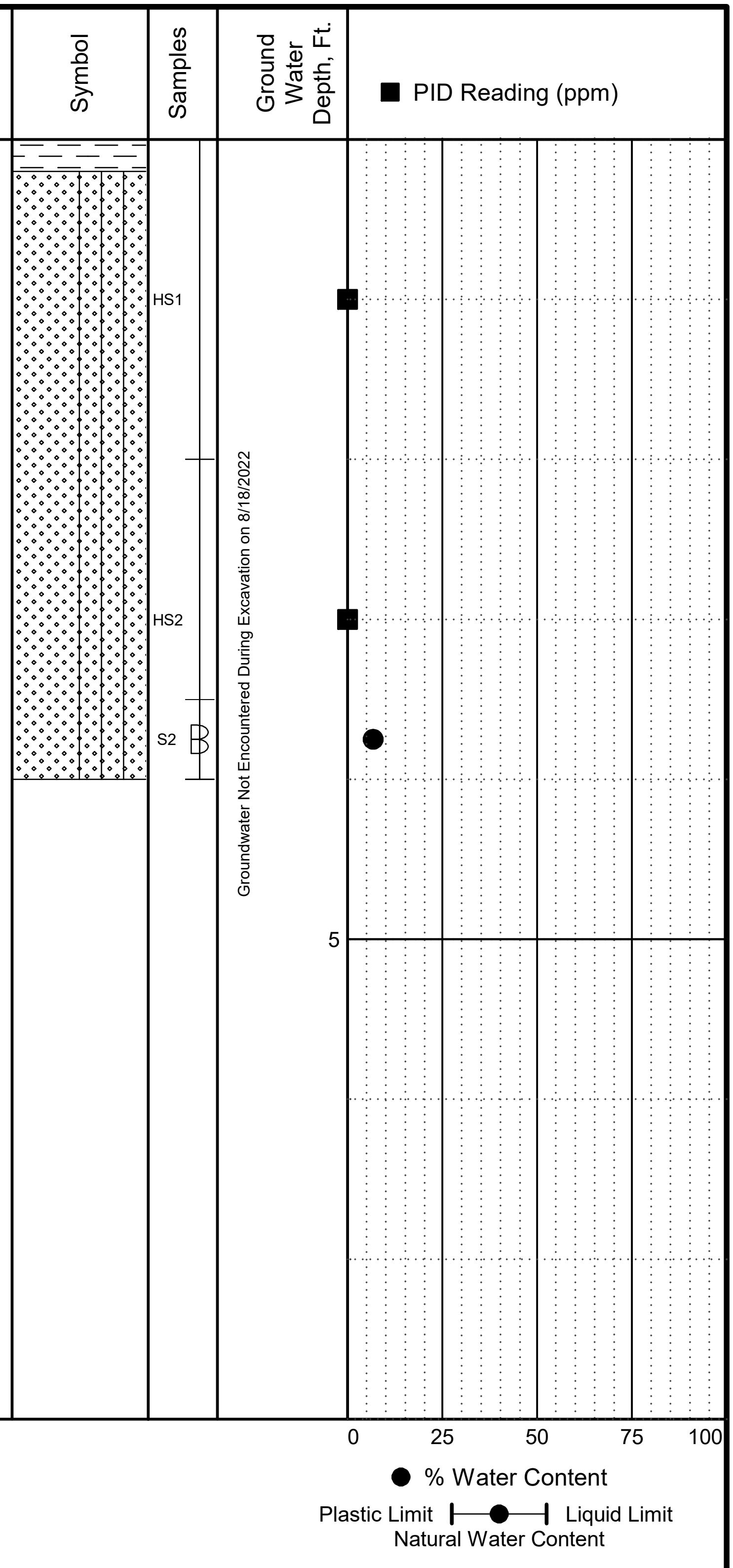
FIG. A-9

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°10.029' N Long.: 149°55.665' W Approx. Elevation: 97 Ft. Datum: WGS 84	Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2
Loose, brown, *Well-Graded Sand with Silt and Gravel (SW-SM)*; moist; trace roots, concrete, and assorted trash Analytical Sample TP9S2 collected from 2 to 4' below top of berm S2: 29% Gravel, 62% Sand, 10% Fines (F2 [0.02 mm])	4.0
Bottom of Test Pit Observed on 8/18/2022	



LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-09

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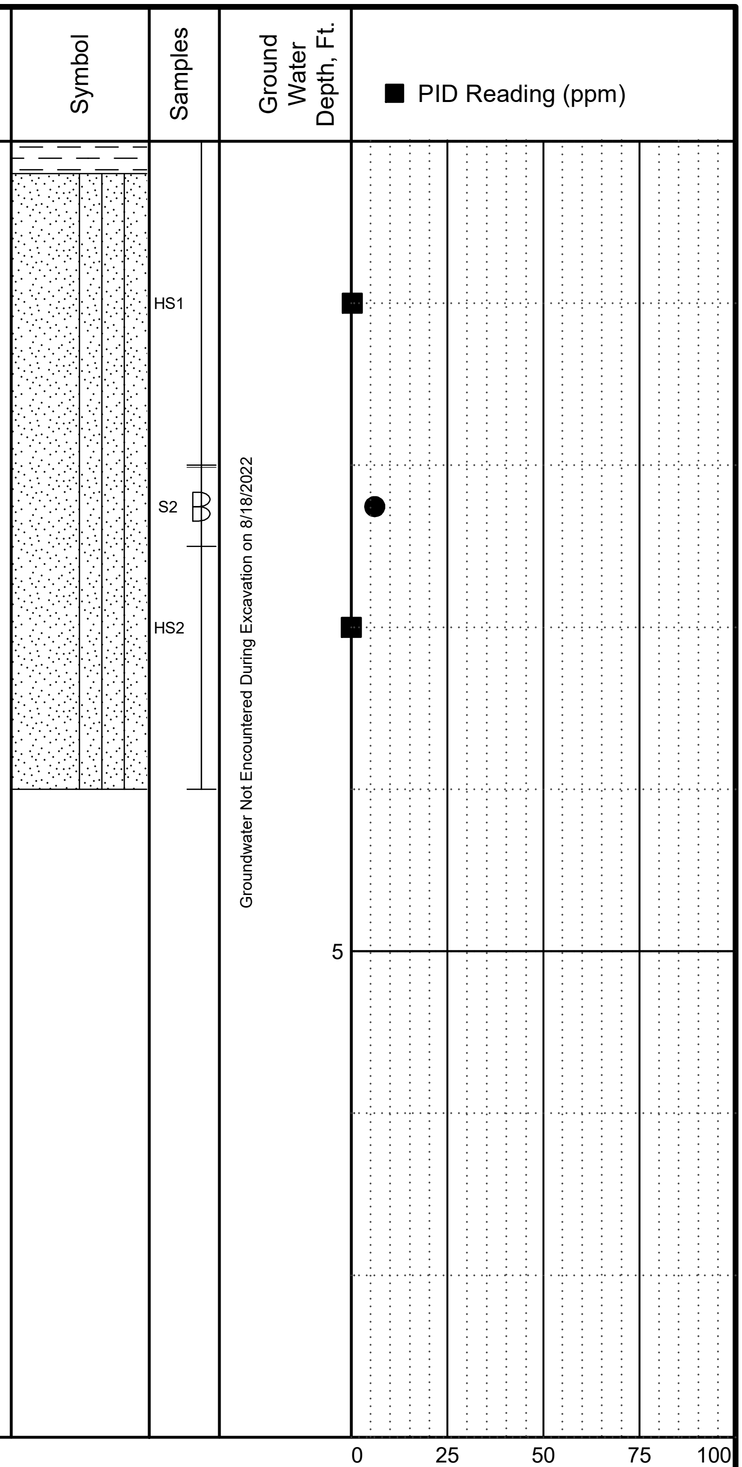
FIG. A-10

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°10.020' N Long.: 149°55.663' W Approx. Elevation: 97 Ft. Datum: WGS 84	Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2
Medium dense, dark brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace roots and assorted trash	4.0
Bottom of Test Pit Observed on 8/18/2022	



LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
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LOG OF TEST PIT TP-10

February 2023 106424-002

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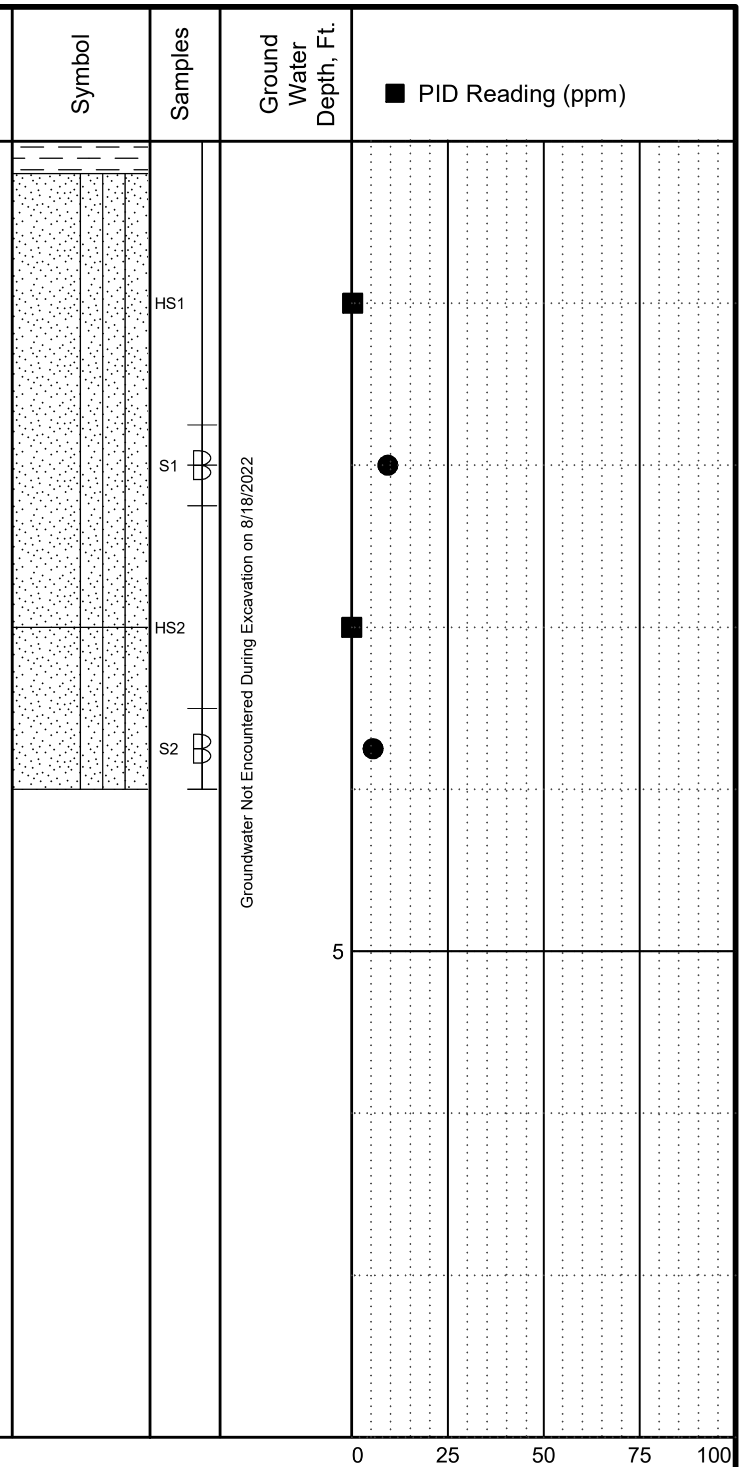
FIG. A-11

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°10.011' N Long.: 149°55.665' W Approx. Elevation: 96 Ft. Datum: WGS 84	Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2
Loose, orange-brown, *Poorly Graded Sand with Silt (SP-SM)*; moist; trace roots, asphalt chunks, and assorted trash S1: 5% Gravel, 87% Sand, 8% Fines (F2 [P200])	3.0
Medium dense, gray, *Poorly Graded Sand with SIlt and Gravel (SP-SM)*; moist; trace roots and cobbles up to appoximately 8" diameter	4.0
Bottom of Test Pit Observed on 8/18/2022	



LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
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Anchorage, Alaska

LOG OF TEST PIT TP-11

February 2023 106424-002

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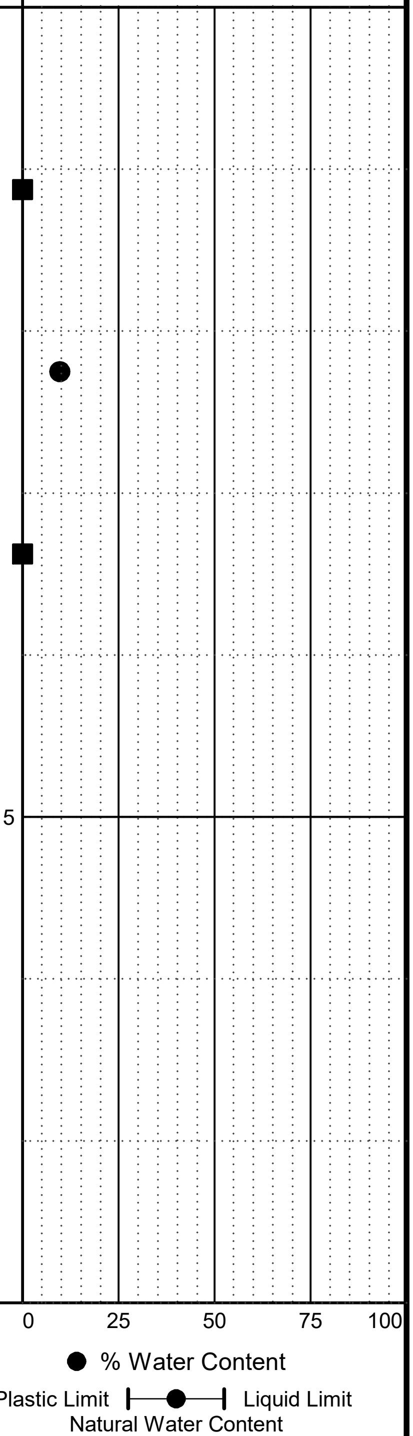
FIG. A-12

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.998' N Long.: 149°55.636' W Approx. Elevation: 101 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.	■ PID Reading (ppm)
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2				
Medium dense, brown, *Silty Sand with Gravel (SM)*; moist; trace wood and assorted trash			HS1 S1 HS2	Groundwater Not Encountered During Excavation on 8/18/2022	
Bottom of Test Pit Observed on 8/18/2022	4.5			5	



LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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Anchorage, Alaska

LOG OF TEST PIT TP-12

February 2023 106424-002

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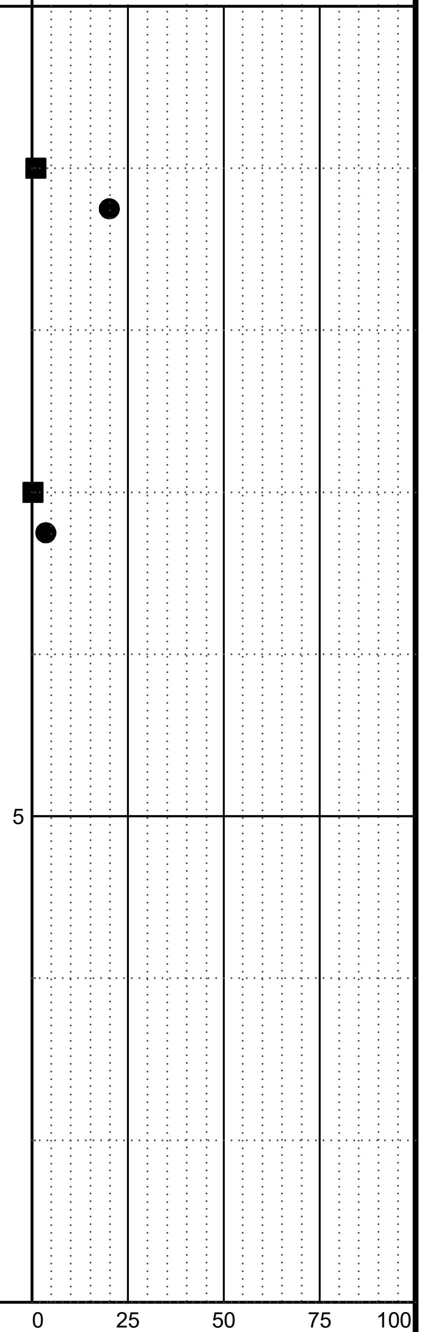
FIG. A-13

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.998' N Long.: 149°55.619' W Approx. Elevation: 102 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]				
Medium dense, tan, *Sandy Silt with Gravel (ML)*; moist Analytical Sample TP13S1 collected from 0 to 2' below top of berm S1: 17% Gravel, 27% Sand, 56% Fines (F4 [P200])	0.5		HS1 S1	
Medium dense, gray-brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace organic debris, asphalt chunks, and assorted trash	1.5		HS2 S2	Groundwater Not Encountered During Excavation on 8/18/2022
Bottom of Test Pit Observed on 8/18/2022	4.0			5

■ PID Reading (ppm)



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Kleop Station Improvements
Anchorage, Alaska

LOG OF TEST PIT TP-13

February 2023 106424-002

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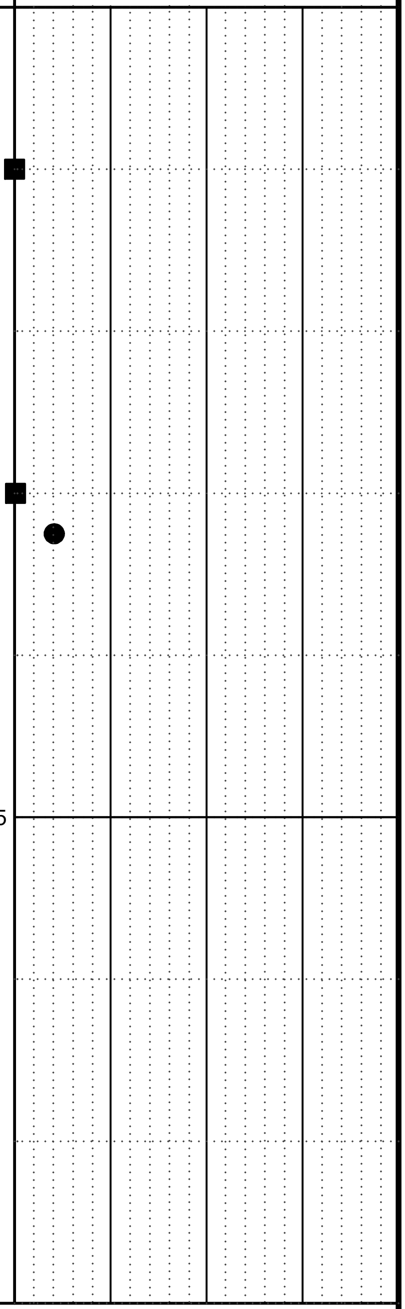
FIG. A-14

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.999' N Long.: 149°55.602' W Approx. Elevation: 104 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.	■ PID Reading (ppm)
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]					
Medium dense, tan, *Silty Sand with Gravel (SM)*; moist	0.5				
Medium dense, gray-brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace roots, asphalt chunks, and assorted trash	1.0		HS1 HS2 S2	Groundwater Not Encountered During Excavation on 8/18/2022	
Bottom of Test Pit Observed on 8/18/2022	4.0			5	



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-14

February 2023 106424-002

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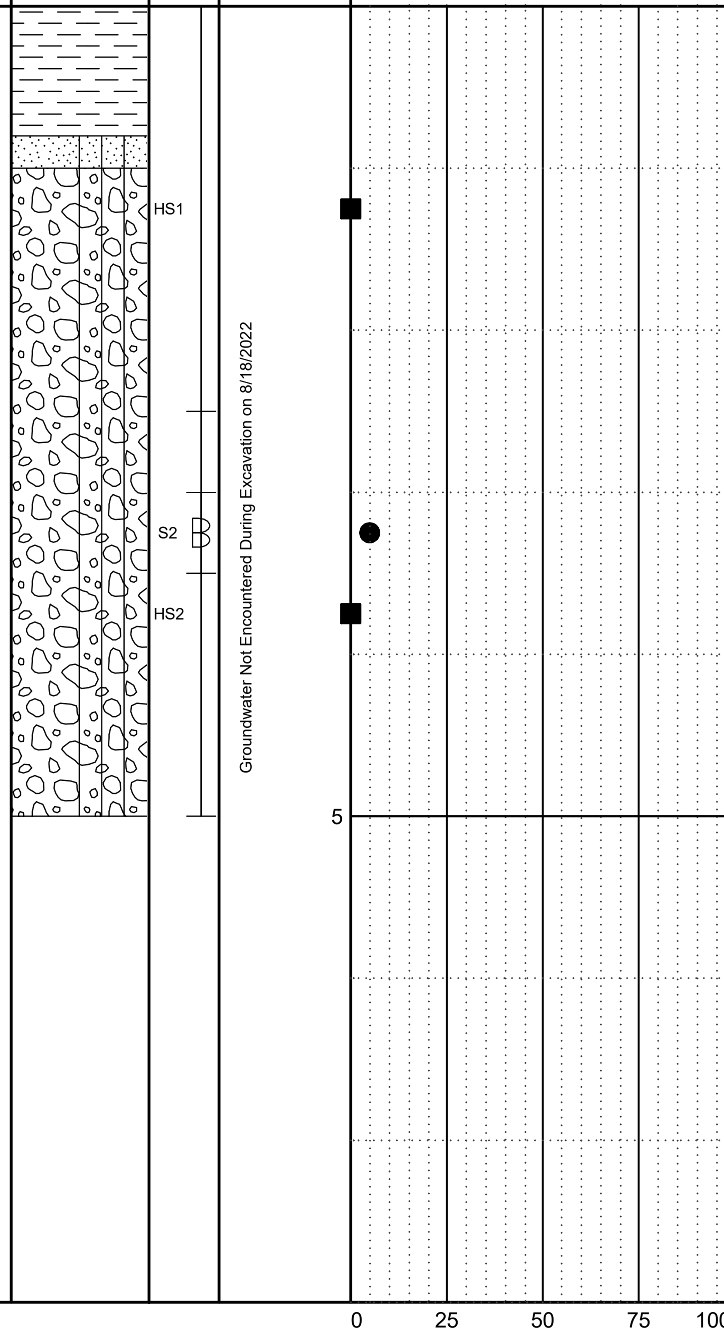
FIG. A-15

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.998' N Long.: 149°55.583' W Approx. Elevation: 105 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.	■ PID Reading (ppm)
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]					
Medium dense, tan, *Silty Sand with Gravel (SM)*; moist	0.8				
Medium dense to dense, gray-brown, *Poorly Graded Gravel with Silt and Sand (GP-GM)*; moist; trace roots, asphalt chunks, and assorted trash	1.0				
Bottom of Test Pit Observed on 8/18/2022	5.0				



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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Anchorage, Alaska

LOG OF TEST PIT TP-15

February 2023 106424-002

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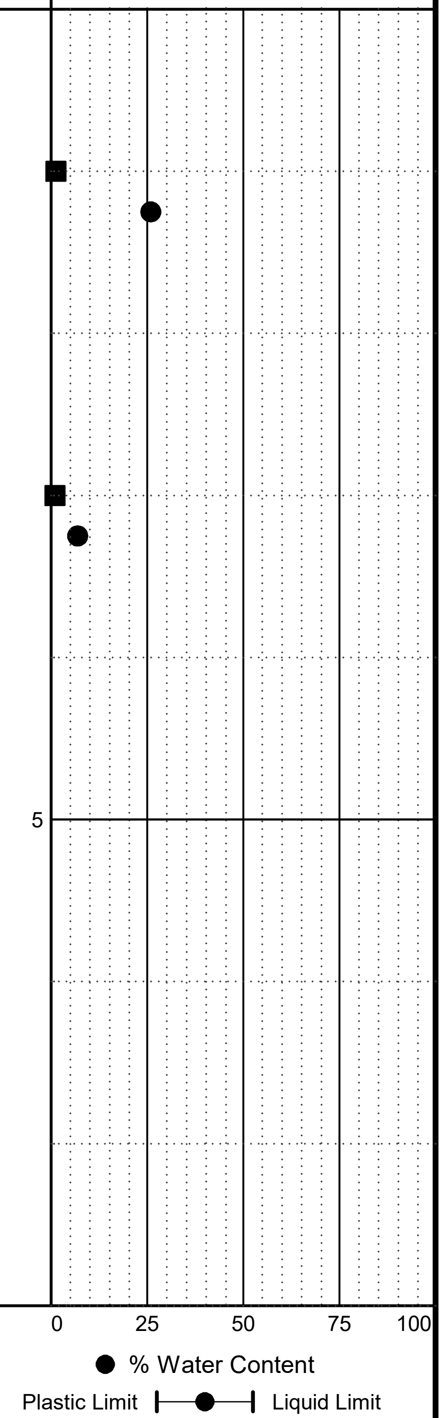
FIG. A-16

REV 3 - Approved for Submittal

MATERIAL DESCRIPTION Lat.: 61°09.998' N Long.: 149°55.563' W Approx. Elevation: 106 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]				
Medium stiff, yellow-brown *Silt (ML)*; moist Analytical Sample TP16S1 collected from 0 to 2' below top of berm S1: 2% Gravel, 12% Sand, 87% Fines (F4 [0.02 mm])	0.5		HS1 S1	
Medium dense, gray-brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace assorted trash	1.5		HS2 S2	Groundwater Not Encountered During Excavation on 8/18/2022
Bottom of Test Pit Observed on 8/18/2022	4.0			



LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
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LOG OF TEST PIT TP-16

February 2023 106424-002

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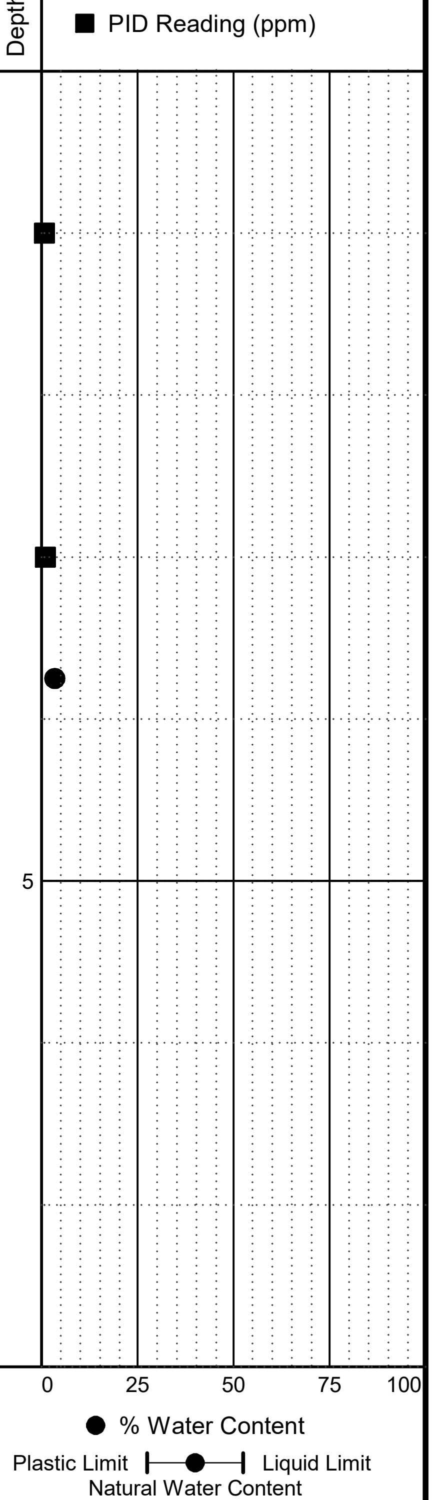
FIG. A-17

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.998' N Long.: 149°55.548' W Approx. Elevation: 106 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]				
Medium stiff, tan, *Silt with Sand (ML)*; moist	1.0		HS1	
Medium dense, dark gray, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; asphalt chunks; trace roots and assorted trash	1.2		HS2 S2	Groundwater Not Encountered During Excavation on 8/18/2022
Bottom of Test Pit Observed on 8/18/2022	4.0			5



LEGEND

Geotechnical Grab Sample

Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-17

February 2023 106424-002

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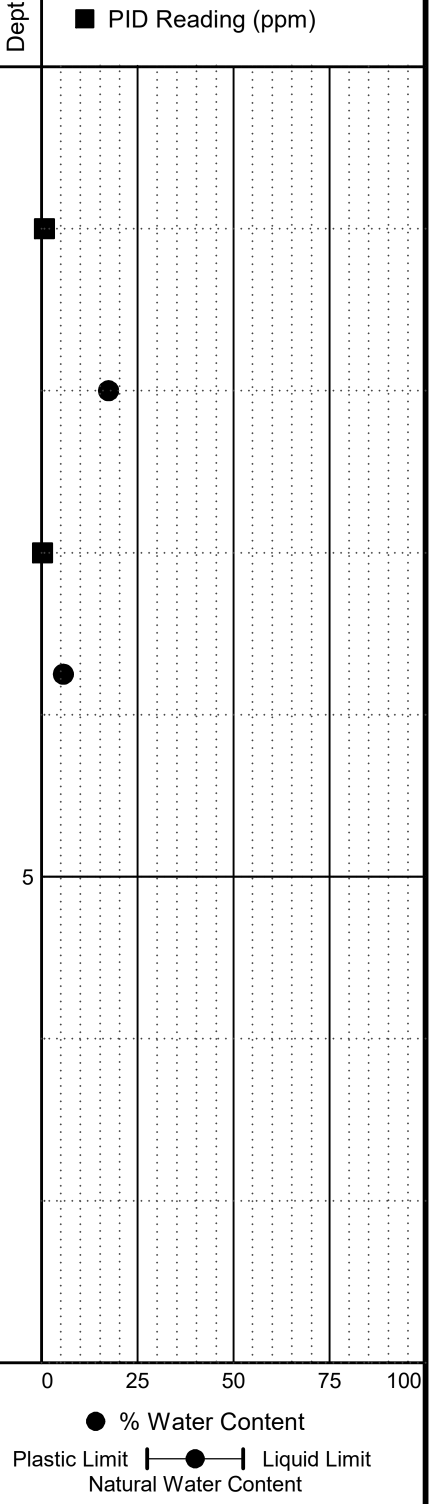
FIG. A-18

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.998' N Long.: 149°55.529' W Approx. Elevation: 105 Ft. Datum: WGS 84	Depth, Ft.	Samples
Medium stiff, brown, *Organic Silt (OL)*; moist [1-inch Grass Mat]	0.1	
Loose, gray, *Poorly Graded Gravel (GP)*; moist [Pea Gravel]	0.5	
Medium stiff, brown, *Organic Soil (OL)*; moist		
Loose, gray, *Poorly Graded Gravel (GP)*; moist [Pea Gravel]	1.0	HS1
Medium stiff, gray to tan, *Silt with Sand (ML)*; moist; trace asphalt chunks S1: 12% Gravel, 19% Sand, 70% Fines (F4 [P200])	1.5	S1
Medium dense, drak gray, *Silty Sand with Gravel (SM)*; moist; asphalt chunks; trace assorted trash	2.5	HS2, S2
Bottom of Test Pit Observed on 8/18/2022	4.0	

Ground Water Depth, Ft.: Groundwater Not Encountered During Excavation on 8/18/2022



LEGEND

Geotechnical Grab Sample
Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Kleop Station Improvements
Anchorage, Alaska

LOG OF TEST PIT TP-18

February 2023 106424-002

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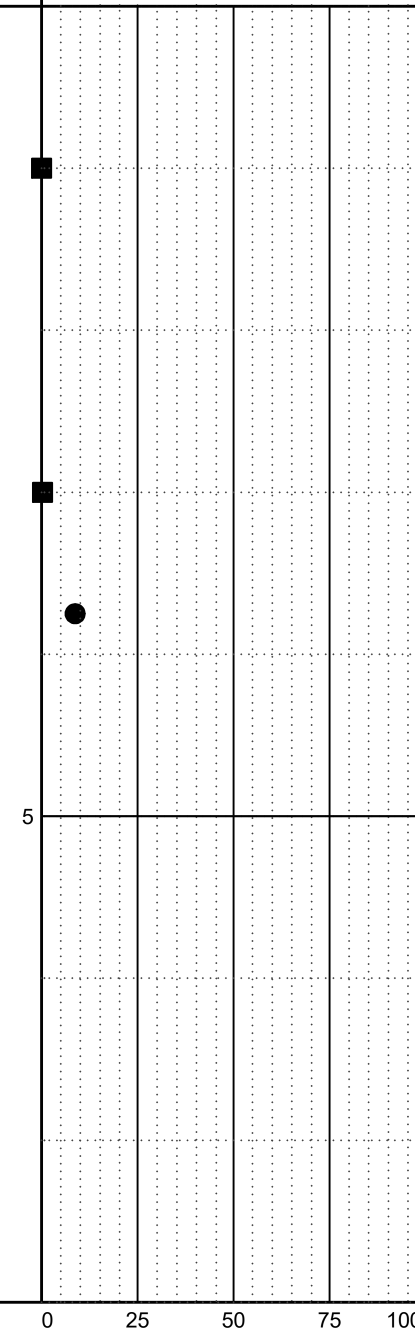
FIG. A-19

REV 3 - Approved for Submittal

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Lat.: 61°09.998' N Long.: 149°55.511' W Approx. Elevation: 105 Ft. Datum: WGS 84				
Medium stiff, brown, *Organic Silt (OL)*; moist [6-inch Grass Mat]	0.5			Groundwater Not Encountered During Excavation on 8/18/2022
Medium dense, brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist			HS1	
			HS2	
S2: 40% Gravel, 49% Sand, 11% Fines (F2 [0.02mm])	4.0		S2	
Bottom of Test Pit Observed on 8/18/2022				

■ PID Reading (ppm)



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-19

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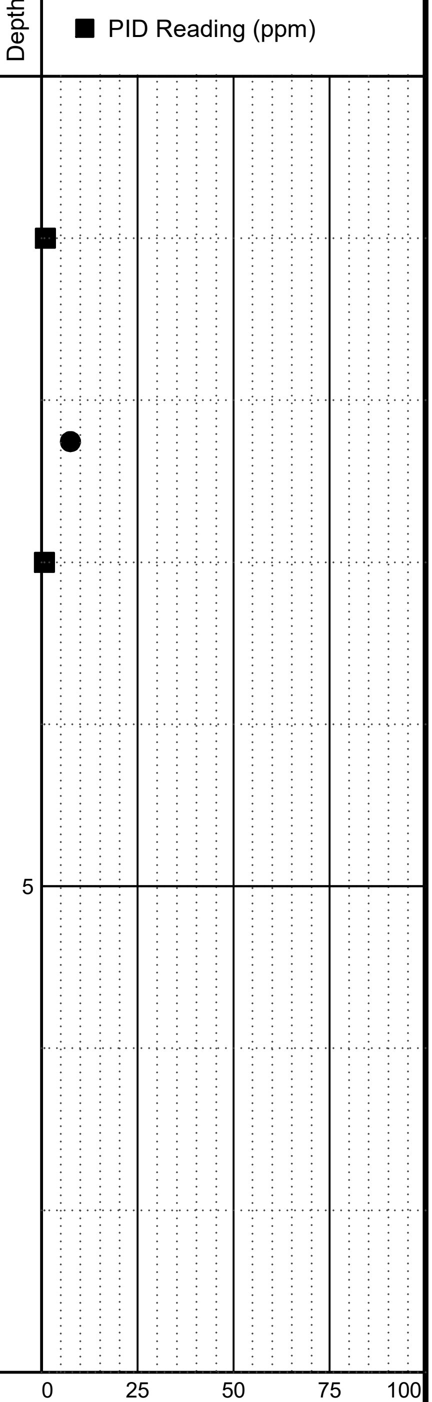
FIG. A-20

REV 3 - Approved for Submittal

MATERIAL DESCRIPTION Lat.: 61°09.998' N Long.: 149°55.494' W Approx. Elevation: 105 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2			
Loose, gray, *Poorly Graded Gravel (GP)*; moist [Pea Gravel]	0.6			
Medium dense, brown, *Poorly Graded Sand with Gravel (SP-SM)*; moist; trace roots, asphalt chunks, and assorted trash	4.0		HS1 S2 HS2	Groundwater Not Encountered During Excavation on 8/18/2022
Bottom of Test Pit Observed on 8/18/2022				5



● % Water Content

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-20

February 2023 106424-002

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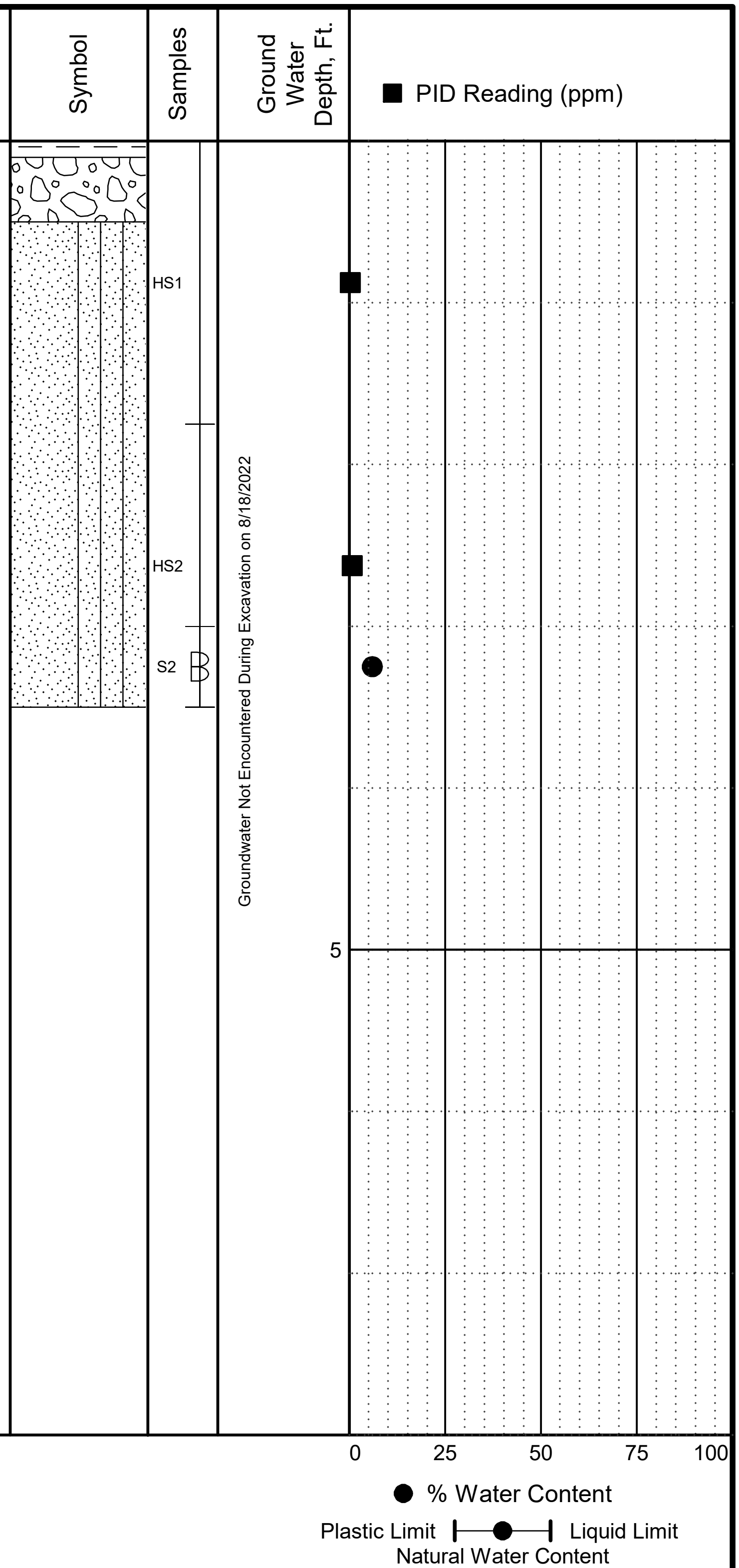
FIG. A-21

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.999' N Long.: 149°55.478' W Approx. Elevation: 105 Ft. Datum: WGS 84	Depth, Ft.
Medium stiff, brown, *Organic Silt (OL)*; moist [1-inch Grass Mat]	0.1
Loose, gray, *Poorly Graded Gravel (GP)*; moist [Pea Gravel]	0.5
Medium dense, brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace asphalt and concrete chunks Analytical Sample TP21S2 collected from 1.75 to 3.5' below top of berm S2: 37% Gravel, 55% Sand, 8% Fines (F2 [P200])	3.5
Bottom of Test Pit Observed on 8/18/2022	



LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-21

February 2023 106424-002

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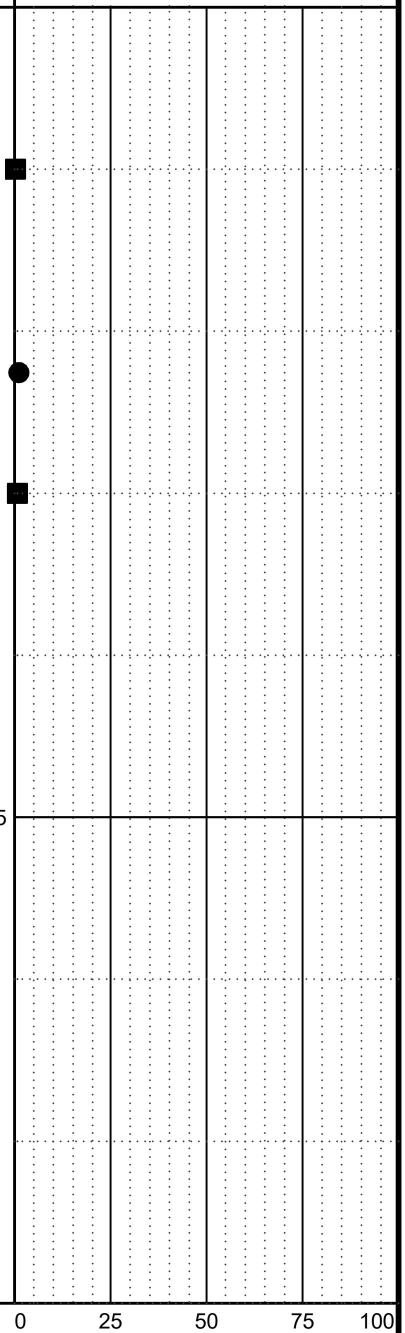
FIG. A-22

REV 3 - Approved for Submittal

TEST_PIT 106424-002 TP LOGS_GINT TEMPLATE7.GPJ S&W_GEO.GDT 2/1/23

MATERIAL DESCRIPTION Lat.: 61°09.997' N Long.: 149°55.463' W Approx. Elevation: 104 Ft. Datum: WGS 84	Depth, Ft.	Symbol	Samples	Ground Water Depth, Ft.	■ PID Reading (ppm)
Medium stiff, brown, *Organic Silt (OL)*; moist [2-inch Grass Mat]	0.2				
Medium dense, dark gray, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; trace assorted trash and asphalt chunks			HS1 S2 HS2	Groundwater Not Encountered During Excavation on 8/18/2022	
Bottom of Test Pit Observed on 8/18/2022	4.0			5	



● % Water Content

Plastic Limit ├─●─┤ Liquid Limit
Natural Water Content

LEGEND

- Geotechnical Grab Sample
- Headspace Sample

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-22

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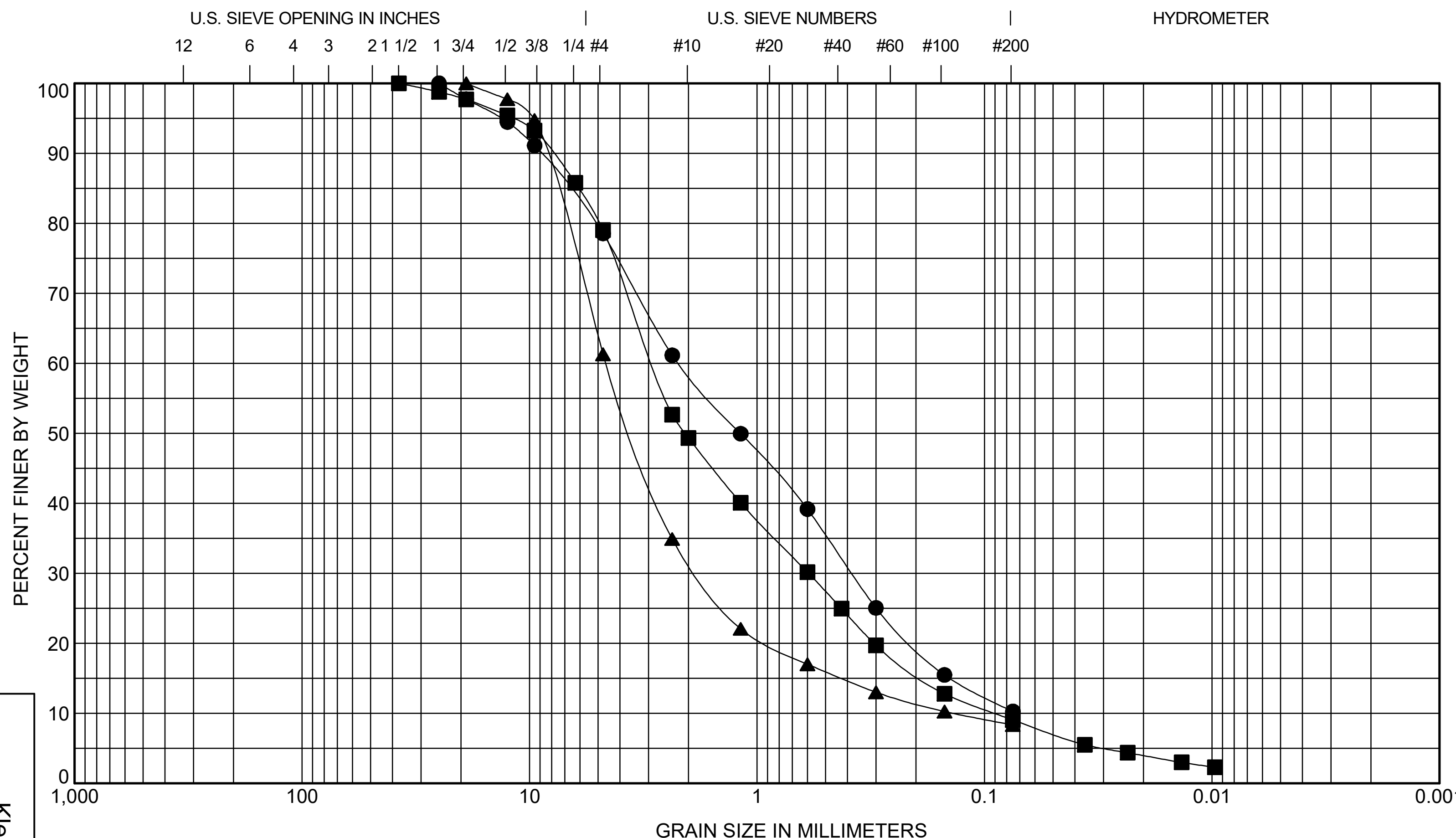
FIG. A-23

REV 3 - Approved for Submittal



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample		Depth, Ft	Classification	LL	PL	PI	Cc	Cu
●	**TP-03 S1**	**2.0 - 2.5**	**Poorly Graded Sand with Silt and Gravel (SP-SM)**				**0.9**	**30.4**
■	**TP-05 S2**	**4.0 - 4.5**	**Well-Graded Sand with Silt and Gravel (SW-SM)**				**1.4**	**32.1**
▲	**TP-06 S2**	**4.5 - 5.0**	**Poorly Graded Sand with Silt and Gravel (SP-SM)**				**5.2**	**33.5**

Sample		Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-03 S1**	**2.0 - 2.5**	**25**	**2.2**	**0.38**		**21**	**68**	**10**	
■	**TP-05 S2**	**4.0 - 4.5**	**37.5**	**2.87**	**0.59**	**0.09**	**21**	**70**	**9**	
▲	**TP-06 S2**	**4.5 - 5.0**	**19**	**4.59**	**1.81**	**0.14**	**39**	**53**	**8**	

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GRAIN SIZE CLASSIFICATION

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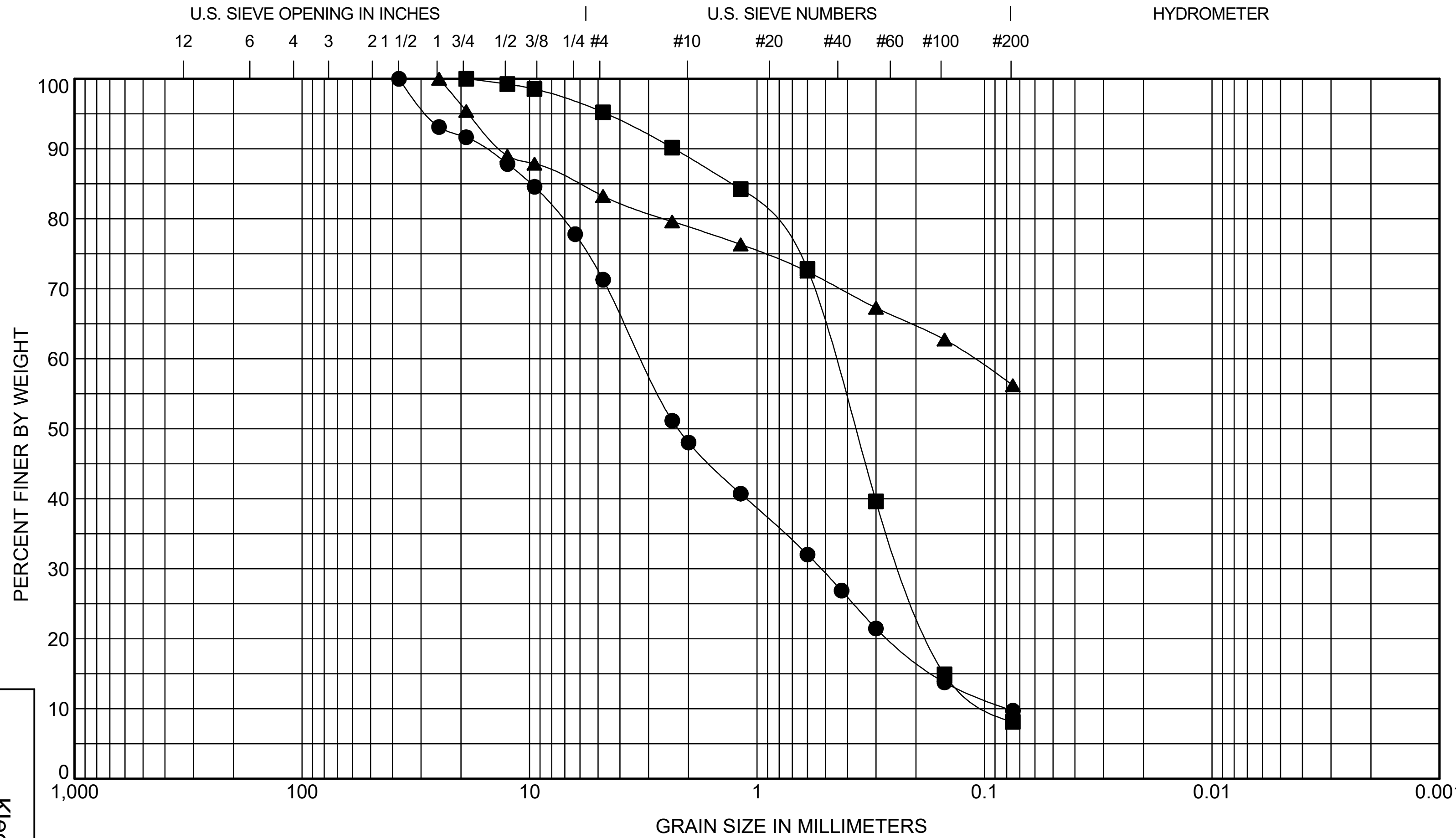
Anchorage, Alaska

FIG. A-24
Sheet 1 of 4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	Classification	LL	PL	PI	Cc	Cu
●	**TP-09 S2**	**3.5 - 4.0**	**Well-Graded Sand with Silt and Gravel (SW-SM)**				**1.1**	**40.7**
■	**TP-11 S1**	**1.8 - 2.3**	**Poorly Graded Sand with Silt (SP-SM)**				**1.3**	**5.0**
▲	**TP-13 S1**	**1.0 - 1.5**	**Sandy Silt with Gravel (ML)**					

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-09 S2**	**3.5 - 4.0**	**37.5**	**3.21**	**0.52**	**0.08**	**29**	**62**	**10**	
■	**TP-11 S1**	**1.8 - 2.3**	**19**	**0.46**	**0.23**	**0.09**	**5**	**87**	**8**	
▲	**TP-13 S1**	**1.0 - 1.5**	**25**	**0.11**			**17**	**27**	**56**	

Kleop Station Improvements
Anchorage, Alaska

GRAIN SIZE CLASSIFICATION

February 2023

106424-002

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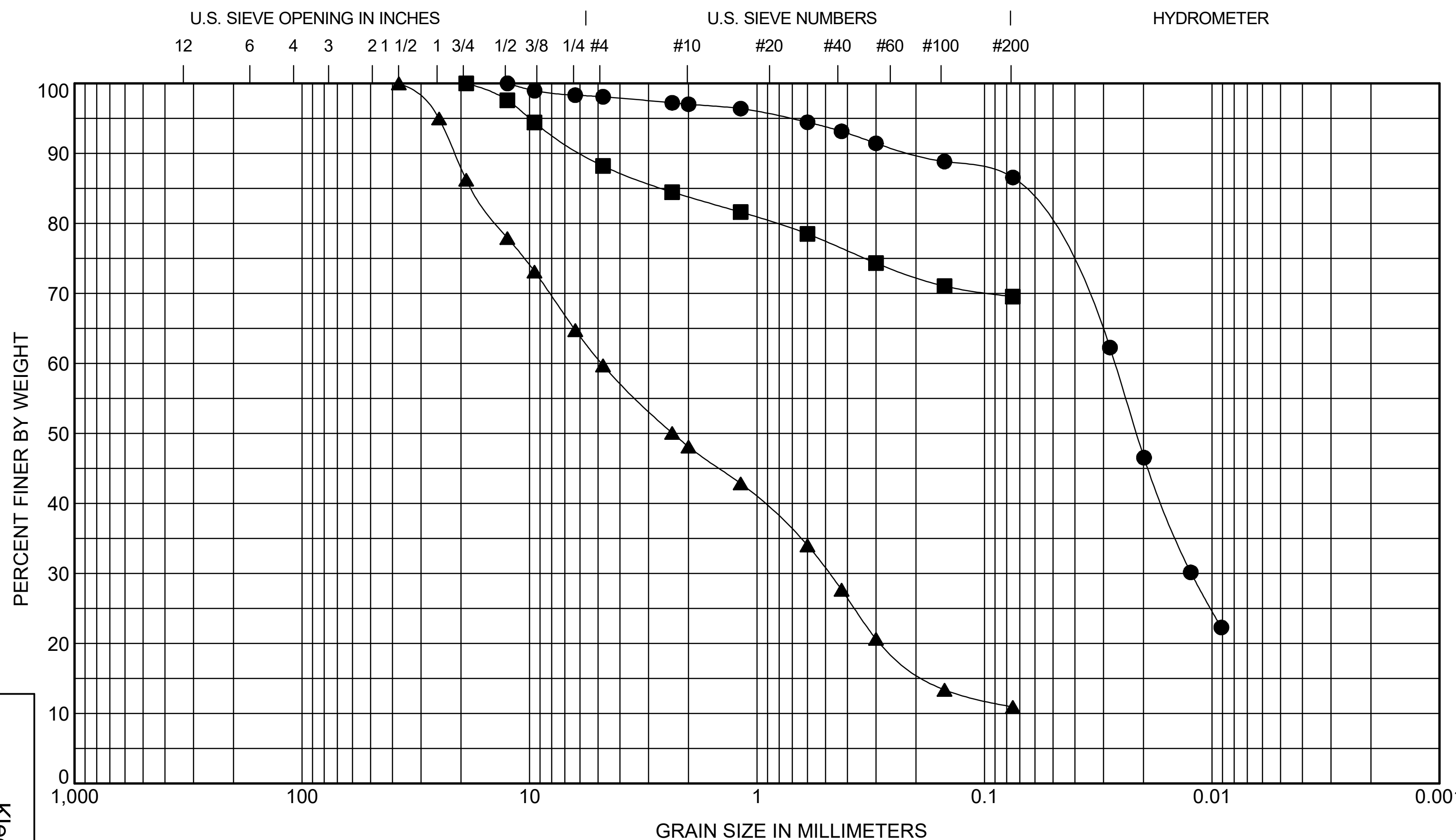
FIG. A-24
Sheet 2 of 4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	Classification	LL	PL	PI	Cc	Cu
●	**TP-16 S1**	**1.0 - 1.5**	**Silt (ML)**					
■	**TP-18 S1**	**1.8 - 2.3**	**Silt with Sand (ML)**					
▲	**TP-19 S2**	**3.5 - 4.0**	**Poorly Graded Sand with Silt and Gravel (SP-SM)**				**0.8**	**83.4**

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-16 S1**	**1.0 - 1.5**	**12.5**	**0.03**	**0.01**		**2**	**12**	**87**	
■	**TP-18 S1**	**1.8 - 2.3**	**19**				**12**	**19**	**70**	
▲	**TP-19 S2**	**3.5 - 4.0**	**37.5**	**4.83**	**0.48**		**40**	**49**	**11**	

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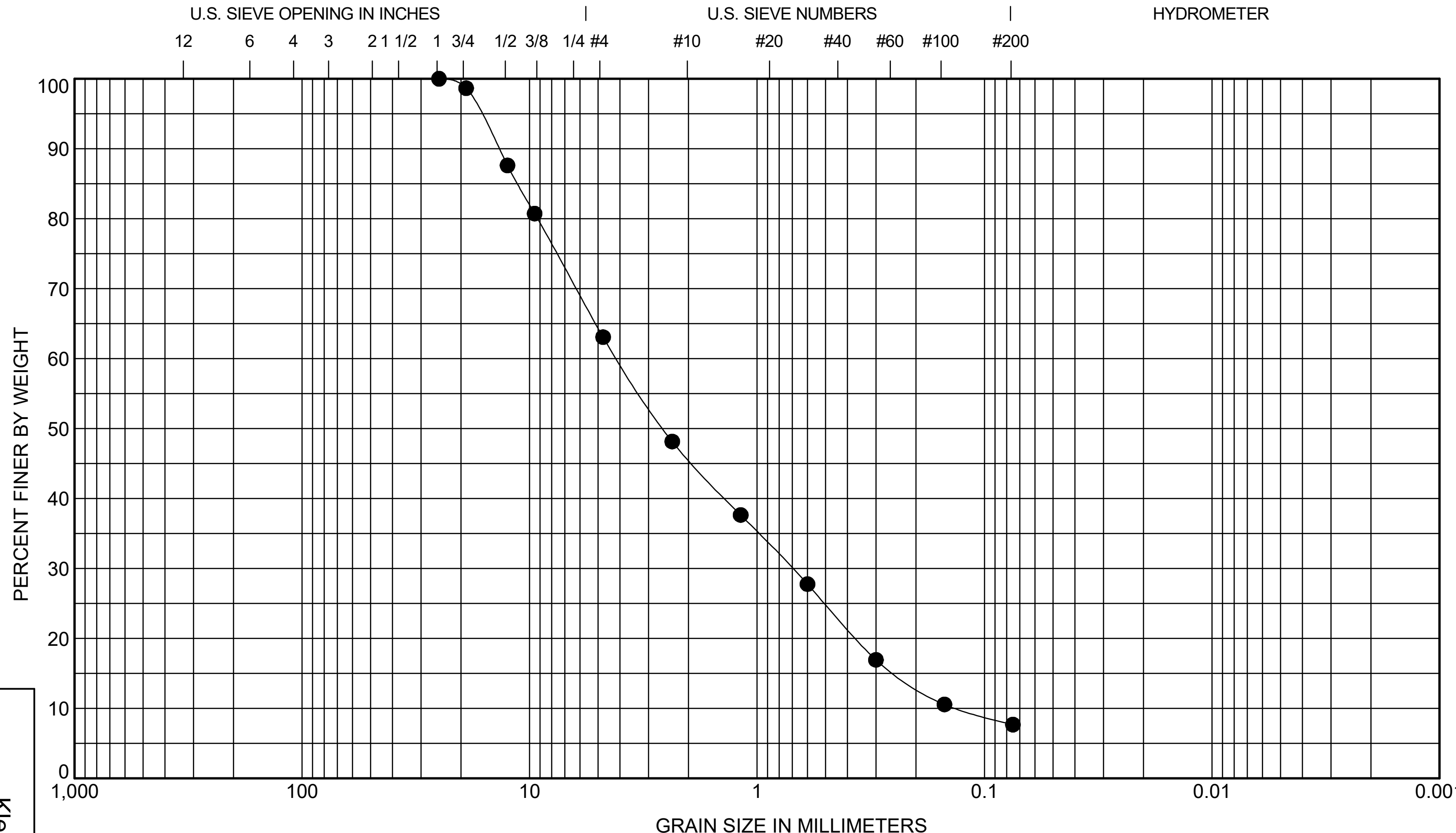
GRAIN SIZE CLASSIFICATION

Kleop Station Improvements
Anchorage, Alaska

FIG. A-24
Sheet 3 of 4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	Classification	LL	PL	PI	Cc	Cu
●	**TP-21 S2**	**3.0 - 3.5**	**Poorly Graded Sand with Silt and Gravel (SP-SM)**				**0.9**	**31.3**

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP-21 S2**	**3.0 - 3.5**	**25**	**4.11**	**0.7**	**0.13**	**37**	**55**	**8**	

Kleop Station Improvements
Anchorage, Alaska

GRAIN SIZE CLASSIFICATION

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FIG. A-24
Sheet 4 of 4

ATTACHMENT 3

RESULTS OF ANALYTICAL TESTING

AND

ADEC LABORATORY DATA REVIEW CHECKLIST

ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Chris Pepe	**CS Site Name:**	N/A	**Lab Name:**	SGS North America Inc.
Title:	Environmental Staff	**ADEC File No.:**	N/A	**Lab Report No.:**	1225228
Consulting Firm:	Shannon & Wilson, Inc.	**Hazard ID No.:**	N/A	**Lab Report Date:**	9-15-22

Note: *Any N/A or No box checked must have an explanation in the comments box.*

1. **Laboratory**

   a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?
   Yes ☒ No ☐ N/A ☐
   Comments:

   b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?
   Yes ☐ No ☐ N/A ☒
   Comments: *The samples were not transferred to another "network" laboratory or sub-contracted to an alternate laboratory.*

2. **Chain of Custody (CoC)**

   a. Is the CoC information completed, signed, and dated (including released/received by)?
   Yes ☒ No ☐ N/A ☐
   Comments:

   b. Were the correct analyses requested?
   Yes ☒ No ☐ N/A ☐
   Analyses requested: *GRO, VOCs, DRO/RRO, PAHs, RCRA Metals*
   Comments:

CS Site Name: N/A
Lab Report No.: 1225228

3. **Laboratory Sample Receipt Documentation**

   a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?
   Yes ☒ No ☐ N/A ☐
   Cooler temperature(s): *3.8° Celsius*
   Sample temperature(s):
   Comments:

   b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?
   Yes ☒ No ☐ N/A ☐
   Comments:

   c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?
   Yes ☒ No ☐ N/A ☐
   Comments:

   d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.?
   Yes ☐ No ☐ N/A ☒
   Comments: *No discrepancies were noted.*

   e. Is the data quality or usability affected?
   Yes ☐ No ☒ N/A ☐
   Comments: *See above*

4. **Case Narrative**

   a. Is the case narrative present and understandable?
   Yes ☒ No ☐ N/A ☐
   Comments:

CS Site Name: N/A
Lab Report No.: 1225228

b. Are there discrepancies, errors, or QC failures identified by the lab?
Yes ☒ No ☐ N/A ☐
Comments:
AK102/103-Sample TP1S2- The LOQ for DRO/RRO is elevated. The sample was diluted due to the dark color extract.
8270D SIM- PAH (all project samples) The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.
8270D SIM- PAH- (Sample TP23S1) Surrogate recovery for 2-methylnaphthalene does not meet QC criteria due to dilution
AK102/103- (Sample TP23S1) The LOQ for DRO /RRO is elevated. The sample was diluted due to the dark color of the extract.
MS/MSD- 8270D SIM PAH MS/MSD the surrogate recovery for 2-methylnaphthalene-d10 do not meet QC criteria due to matrix interference.
MS/MSD- 8270D SIM PAH MS/MSD recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
MS/MSD- 6020B- Metals MS/MSD recoveries for barium, lead, and vanadium do not meet QC criteria. The post digestion spike was successful.
MS/MSD- 6020B- Metals MS/MSD RPD for lead does not meet QC criteria. Refer to sample duplicate for RPD requirements.
MS/MSD- 6020B- Metals BMS/BMSD and PS/Dup RPD for lead does not meet QC criteria. Sample is non-homogeneous for lead.
LCS 8260D- LCS recoveries for carbon disulfide, benzene, and n-hexane do not meet QC criteria. These analytes are not being reported above the LOQ in the associated samples.
MSD 8260D- MSD recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

c. Were all the corrective actions documented?
Yes ☒ No ☐ N/A ☐
Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments: See above

5. Sample Results

a. Are the correct analyses performed/reported as requested on CoC?
Yes ☒ No ☐ N/A ☐
Comments:

b. Are all applicable holding times met?
Yes ☒ No ☐ N/A ☐
Comments:

c. Are all soils reported on a dry weight basis?
Yes ☒ No ☐ N/A ☐
Comments:

d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?
Yes ☐ No ☒ N/A ☐
Comments: *The LOQs for 1,2,3-trichloropropane, naphthalene (8270D SIM), and 1,2-dibromoethane exceed the ADEC cleanup levels for every project sample (except for naphthalene in Sample STB). The LOQ for dibromochloromethane exceeds the ADEC cleanup level in Samples TP1S2 (under a separate cover), TP16S1, and TP23S1 (under a separate cover).*

e. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: *There is a potential that the target analytes are present at concentrations greater than the ADEC cleanup levels, but less than the LOQs.*

6. QC Samples

a. Method Blank

i. Was one method blank reported per matrix, analysis, and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments:

ii. Are all method blank results less than LOQ (or RL)?
Yes ☐ No ☒
Comments: *Although less than the LOQ, an estimated concentration of GRO (1.12 J mg/kg) (associated with all project samples except Sample STB) was detected in the method blank. Additionally, although less than the LOQ, an estimated concentration of GRO (1.15 J mg/kg) (associated with Sample STB) was detected in the method blank.*

iii. If above LoQ or RL, what samples are affected?
Comments: *All project samples*

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: *Although less than the LOQ, samples are flagged "B" in Table 2 when the reported sample concentrations are within 10x the reported method blank concentrations. If both the sample and method blank concentrations are reported at levels less than the LOQ, the sample concentration is reported as non-detect at the LOQ and flagged "B" in Table 2. Therefore, all project samples were reported as non-detect at the LOQ and flagged "B" in Table 2.*

v. Data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: *see above*

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – Are one LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
Yes ☒ No ☐ N/A ☐
Comments:

ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments:

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
Yes ☒ No ☒ N/A ☐
Comments: *8260D - The percent recoveries for carbon disulfide, benzene, and n-hexane do not meet QC criteria. These analytes were not reported above the LOQ in the associated samples.*

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the RPD reported from LCS/LCSD, and or sample/sample duplicate? (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
Yes ☒ No ☐ N/A ☐
Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: *Sample TP1S2 (under a separate cover)*

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☐ No ☒ N/A ☐
Comments: *The associated analytes were not detected in the project sample, therefore flagging is not required.*

vii. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: *see above*

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments:

ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments:

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?
Yes ☐ No ☒ N/A ☐
Comments: *MS/MSD- 8270D SIM PAH MS/MSD the surrogate recoveries for 2-methylnahthalene-d10 does not meet QC criteria due to matrix interference.*
MS/MSD- 8270D SIM PAH MS/MSD recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
MS/MSD- 6020B- Metals MS/MSD recoveries for barium, lead, and vanadium do not meet QC criteria. The post digestion spike was successful.
MSD 8260D- MSD recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes ☐ No ☒ N/A ☐

Comments: *MS/MSD- 6020B- Metals MS/MSD RPD for lead does not meet QC criteria. Refer to sample duplicate for RPD requirements. BMS/BMSD- 6020B- Metals MS/MSD and PS/Dup RPD for lead does not meet QC criteria. Sample is non-homogeneous for lead.*

If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: All project samples

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments: *The MS/MSD samples analyzed was taken from another work order. Therefore, flagging is not required. In addition, the case narrative noted to refer to the LCS for accuracy.*

vi. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: see above

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC, and laboratory samples?

Yes ☒ No ☐ N/A ☐

Comments:

ii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes ☐ No ☒ N/A ☐

Comments: *MS/MSD- 8270D SIM PAH- (Sample TP23S1 [under a separate cover]) MS/MSD Surrogate recovery for 2-methylnaphthalene-d10 is greater than the QC criteria due to matrix interference.*

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?
Yes ☐ No ☐ N/A ☒
Comments: *Samples with flagging are presented under a separate cover.*

iv. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: *See above*

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes ☒ No ☐ N/A ☐
Comments:

ii. Are all results less than LoQ or RL?
Yes ☒ No ☐ N/A ☐
Comments:

iii. If above LoQ or RL, what samples are affected?
Comments:

iv. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments:

f. Field Duplicate

i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?
Yes ☐ No ☒ N/A ☐
Comments: *A field duplicate was inadvertently not submitted with the project samples.*

ii. Was the duplicate submitted blind to lab?
Yes ☐ No ☐ N/A ☒
Comments:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD\ (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| X\ 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

iv. Is the data quality or usability affected? (Explain)
Yes ☒ No ☐ N/A ☐
Comments: *No duplicate was submitted, therefore, precision could not be calculated.*

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?
Yes ☐ No ☐ N/A ☒
Comments: *A decontamination or equipment blank was not a part of this project.*

ii. Are all results less than LoQ or RL?
Yes ☐ No ☐ N/A ☒
Comments:

iii. If above LoQ or RL, specify what samples are affected.
Comments:

iv. Are data quality or usability affected?
Yes ☐ No ☐ N/A ☒
Comments: *See above*

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Are they defined and appropriate?
Yes ☒ No ☐ N/A ☐
Comments: A key is provided on Page 5 of the SGS laboratory report.

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907)433-3223

Report Number: **1225228**

Client Project: **106424-002 Kleop Station Impro**

Dear Dan McMahon,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1225228**
Project Name/Site: **106424-002 Kleop Station Impro**
Project Contact: **Dan McMahon**

Revised Report - The case narrative has been changed to remove incorrect comments.
Refer to sample receipt form for information on sample condition.

106424-TP1S2 (1225228001) PS

AK102/103 - The LOQ for DRO/RRO is elevated. The sample was diluted due to the dark color of the extract.
8270D SIM- PAH The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.

106424-TP2S2 (1225228002) PS

8270D SIM- PAH The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.

106424-TP6S2 (1225228003) PS

8270D SIM- PAH The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.

106424-TP9S2 (1225228004) PS

8270D SIM- PAH The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.

106424-TP13S1 (1225228005) PS

8270D SIM- PAH The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.

106424-TP16S1 (1225228006) PS

8270D SIM- PAH The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.

106424-TP21S2 (1225228007) PS

8270D SIM - PAH The LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.

106424-TP23S1 (1225228008) PS

8270D SIM - PAH Surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to dilution.
8270D SIM - PAH the LOQs are elevated due to sample dilution. The sample was diluted due to the dark color of the extract.
AK102/103 - The LOQ for DRO/RRO is elevated. The sample was diluted due to the dark color of the extract.

1225021001MS (1682568) MS

8270D SIM- PAH MS surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to matrix interference.
8270D SIM- PAH MS recoveries for acenaphthene, 1-methylnaphthalene, and 2-methlynaphthalene do not meet QC criteria. Refer to LCS for accuracy requirements.

1225021001MSD (1682569) MSD

8270D SIM- PAH MSD surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to matrix interference.
8270D SIM- PAH MSD recoveries for acenaphthene does not meet QC criteria. Refer to LCS for accuracy requirements.

1225126001(1682784MS) (1682788) MS

6020B- Metals MS recoveries for Barium and Lead do not meet QC criteria. The post digestion spike was successful.

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Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1225228**
Project Name/Site: **106424-002 Kleop Station Impro**
Project Contact: **Dan McMahon**

1225126001(1682784MSD) (1682789) MSD

6020B- Metals MSD recoveries for Barium and Lead do not meet QC criteria. The post digestion spike was successful.
6020B - Metals MS/MSD RPD for Lead does not meet QC criteria. Refer to sample duplicate for RPD requirements.

1225126001(1682784DUP) (1682790) DUP

6020B - Metals MS/MSD and PS/DUP RPD for Lead does not meet QC criteria. Sample is non - homogeneous for Lead.

LCS for HBN 1842571 [VXX/39095 (1682969) LCS

8260D - LCS recoveries for Carbon disulfide and Benzene do not meet QC criteria. These analytes are not being reported above the LOQ in the associated samples.

1225228001(1682970MSD) (1682972) MSD

8260D - MSD recovery for Hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1225228002	106424-TP2S2	XMS13325	Benzo[k]fluoranthene	RP
1225228002	106424-TP2S2	XMS13325	Dibenzo[a,h]anthracene	BLC
1225228003	106424-TP6S2	XMS13325	Benzo[k]fluoranthene	RP
1225228003	106424-TP6S2	XMS13325	Dibenzo[a,h]anthracene	BLC
1225228004	106424-TP9S2	XMS13325	Benzo[k]fluoranthene	RP
1225228004	106424-TP9S2	XMS13325	Dibenzo[a,h]anthracene	BLC
1225228005	106424-TP13S1	XMS13325	Benzo[k]fluoranthene	RP
1225228005	106424-TP13S1	XMS13325	Dibenzo[a,h]anthracene	BLC
1225228007	106424-TP21S2	XMS13331	Benzo[g,h,i]perylene	RP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
106424-TP1S2	1225228001	08/18/2022	08/30/2022	Soil/Solid (dry weight)
106424-TP2S2	1225228002	08/18/2022	08/30/2022	Soil/Solid (dry weight)
106424-TP6S2	1225228003	08/18/2022	08/30/2022	Soil/Solid (dry weight)
106424-TP9S2	1225228004	08/18/2022	08/30/2022	Soil/Solid (dry weight)
106424-TP13S1	1225228005	08/18/2022	08/30/2022	Soil/Solid (dry weight)
106424-TP16S1	1225228006	08/18/2022	08/30/2022	Soil/Solid (dry weight)
106424-TP21S2	1225228007	08/18/2022	08/30/2022	Soil/Solid (dry weight)
106424-TP23S1	1225228008	08/22/2022	08/30/2022	Soil/Solid (dry weight)
106424-STB	1225228009	08/18/2022	08/30/2022	Soil/Solid (dry weight)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SW6020B	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW8260D	VOC 8260 (S) Field Extracted

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Detectable Results Summary

Client Sample ID: **106424-TP1S2**
Lab Sample ID: 1225228001

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	5.90	mg/kg
	Barium	63.9	mg/kg
	Cadmium	0.333	mg/kg
	Chromium	24.5	mg/kg
	Lead	17.3	mg/kg
Semivolatile Organic Fuels	Residual Range Organics	415J	mg/kg
Volatile Fuels	Gasoline Range Organics	1.31J	mg/kg

Client Sample ID: **106424-TP2S2**
Lab Sample ID: 1225228002

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	2.55	mg/kg
	Barium	48.7	mg/kg
	Cadmium	0.212	mg/kg
	Chromium	16.1	mg/kg
	Lead	15.2	mg/kg
Polynuclear Aromatics GC/MS	Acenaphthene	54.7J	ug/kg
	Anthracene	200	ug/kg
	Benzo(a)Anthracene	609	ug/kg
	Benzo[a]pyrene	776	ug/kg
	Benzo[b]Fluoranthene	1010	ug/kg
	Benzo[g,h,i]perylene	624	ug/kg
	Benzo[k]fluoranthene	366	ug/kg
	Chrysene	746	ug/kg
	Dibenzo[a,h]anthracene	105J	ug/kg
	Fluoranthene	1770	ug/kg
	Fluorene	64.5J	ug/kg
	Indeno[1,2,3-c,d] pyrene	512	ug/kg
	Phenanthrene	939	ug/kg
	Pyrene	1380	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	52.8J	mg/kg
	Residual Range Organics	956	mg/kg
Volatile Fuels	Gasoline Range Organics	0.985J	mg/kg
Volatile GC/MS	Toluene	9.49J	ug/kg

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Detectable Results Summary

Client Sample ID: **106424-TP6S2**
Lab Sample ID: 1225228003

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	3.75	mg/kg
	Barium	61.2	mg/kg
	Cadmium	0.235	mg/kg
	Chromium	30.0	mg/kg
	Lead	9.71	mg/kg
Polynuclear Aromatics GC/MS	Anthracene	121J	ug/kg
	Benzo(a)Anthracene	338	ug/kg
	Benzo[a]pyrene	430	ug/kg
	Benzo[b]Fluoranthene	559	ug/kg
	Benzo[g,h,i]perylene	346	ug/kg
	Benzo[k]fluoranthene	183	ug/kg
	Chrysene	409	ug/kg
	Dibenzo[a,h]anthracene	55.2J	ug/kg
	Fluoranthene	901	ug/kg
	Fluorene	39.4J	ug/kg
	Indeno[1,2,3-c,d] pyrene	273	ug/kg
	Phenanthrene	482	ug/kg
	Pyrene	751	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	43.1J	mg/kg
	Residual Range Organics	891	mg/kg
Volatile Fuels	Gasoline Range Organics	0.912J	mg/kg

Client Sample ID: **106424-TP9S2**
Lab Sample ID: 1225228004

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	3.31	mg/kg
	Barium	49.9	mg/kg
	Cadmium	0.211	mg/kg
	Chromium	18.8	mg/kg
	Lead	13.1	mg/kg
Polynuclear Aromatics GC/MS	Anthracene	106J	ug/kg
	Benzo(a)Anthracene	340	ug/kg
	Benzo[a]pyrene	433	ug/kg
	Benzo[b]Fluoranthene	592	ug/kg
	Benzo[g,h,i]perylene	368	ug/kg
	Benzo[k]fluoranthene	168	ug/kg
	Chrysene	414	ug/kg
	Dibenzo[a,h]anthracene	60.6J	ug/kg
	Fluoranthene	905	ug/kg
	Indeno[1,2,3-c,d] pyrene	284	ug/kg
	Phenanthrene	435	ug/kg
	Pyrene	727	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	65.1J	mg/kg
	Residual Range Organics	1450	mg/kg
Volatile Fuels	Gasoline Range Organics	0.893J	mg/kg

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Detectable Results Summary

Client Sample ID: **106424-TP13S1**
Lab Sample ID: 1225228005

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	2.66	mg/kg
	Barium	33.2	mg/kg
	Cadmium	0.109J	mg/kg
	Chromium	15.0	mg/kg
	Lead	6.37	mg/kg
Polynuclear Aromatics GC/MS	Acenaphthene	36.0J	ug/kg
	Anthracene	113J	ug/kg
	Benzo(a)Anthracene	327	ug/kg
	Benzo[a]pyrene	373	ug/kg
	Benzo[b]Fluoranthene	503	ug/kg
	Benzo[g,h,i]perylene	273	ug/kg
	Benzo[k]fluoranthene	163	ug/kg
	Chrysene	373	ug/kg
	Dibenzo[a,h]anthracene	47.1J	ug/kg
	Fluoranthene	918	ug/kg
	Fluorene	41.1J	ug/kg
	Indeno[1,2,3-c,d] pyrene	221	ug/kg
	Phenanthrene	548	ug/kg
	Pyrene	732	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	43.0J	mg/kg
	Residual Range Organics	1070	mg/kg
Volatile Fuels	Gasoline Range Organics	0.975J	mg/kg

Client Sample ID: **106424-TP16S1**
Lab Sample ID: 1225228006

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	4.99	mg/kg
	Barium	69.7	mg/kg
	Cadmium	0.139J	mg/kg
	Chromium	19.1	mg/kg
	Lead	4.26	mg/kg
Semivolatile Organic Fuels	Diesel Range Organics	77.8J	mg/kg
	Residual Range Organics	820	mg/kg
Volatile Fuels	Gasoline Range Organics	2.57J	mg/kg

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Detectable Results Summary

Client Sample ID: **106424-TP21S2**
Lab Sample ID: 1225228007

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	3.63	mg/kg
	Barium	61.4	mg/kg
	Cadmium	0.178J	mg/kg
	Chromium	21.2	mg/kg
	Lead	6.91	mg/kg
Polynuclear Aromatics GC/MS	Benzo(a)Anthracene	62.1J	ug/kg
	Benzo[a]pyrene	112J	ug/kg
	Benzo[g,h,i]perylene	177	ug/kg
	Chrysene	61.9J	ug/kg
	Dibenzo[a,h]anthracene	45.2J	ug/kg
	Fluoranthene	146	ug/kg
	Phenanthrene	61.5J	ug/kg
	Pyrene	121J	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	295	mg/kg
	Residual Range Organics	6730	mg/kg
Volatile Fuels	Gasoline Range Organics	0.798J	mg/kg

Client Sample ID: **106424-TP23S1**
Lab Sample ID: 1225228008

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	5.53	mg/kg
	Barium	42.6	mg/kg
	Cadmium	0.370	mg/kg
	Chromium	22.7	mg/kg
	Lead	7.44	mg/kg
Polynuclear Aromatics GC/MS	Benzo(a)Anthracene	50.2J	ug/kg
	Benzo[a]pyrene	92.5J	ug/kg
	Benzo[b]Fluoranthene	99.3J	ug/kg
	Benzo[g,h,i]perylene	103J	ug/kg
	Chrysene	47.2J	ug/kg
	Fluoranthene	126J	ug/kg
	Indeno[1,2,3-c,d] pyrene	63.7J	ug/kg
	Phenanthrene	75.8J	ug/kg
	Pyrene	106J	ug/kg
Semivolatile Organic Fuels	Residual Range Organics	1990	mg/kg
Volatile Fuels	Gasoline Range Organics	1.26J	mg/kg
Volatile GC/MS	Acetone	133J	ug/kg

Client Sample ID: **106424-STB**
Lab Sample ID: 1225228009

	Parameter	Result	Units
Volatile Fuels	Gasoline Range Organics	1.24J	mg/kg

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Results of **106424-TP1S2**

Client Sample ID: **106424-TP1S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228001
Lab Project ID: 1225228

Collection Date: 08/18/22 07:50
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):85.8
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	5.90	1.11	0.343	mg/kg	10		09/01/22 17:40
Barium	63.9	0.332	0.104	mg/kg	10		09/01/22 17:40
Cadmium	0.333	0.221	0.0686	mg/kg	10		09/01/22 17:40
Chromium	24.5	1.11	0.343	mg/kg	10		09/01/22 17:40
Lead	17.3	0.221	0.0686	mg/kg	10		09/01/22 17:40
Mercury	0.166 U	0.332	0.111	mg/kg	10		09/01/22 17:40
Selenium	1.11 U	2.21	0.686	mg/kg	10		09/01/22 17:40
Silver	0.277 U	0.553	0.166	mg/kg	10		09/01/22 17:40

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 17:40
Container ID: 1225228001-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.054 g
Prep Extract Vol: 50 mL

Print Date: 09/15/2022 7:58:40AM

J flagging is activated

Results of **106424-TP1S2**

Client Sample ID: **106424-TP1S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228001
Lab Project ID: 1225228

Collection Date: 08/18/22 07:50
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):85.8
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
2-Methylnaphthalene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Acenaphthene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Acenaphthylene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Anthracene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Benzo(a)Anthracene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Benzo[a]pyrene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Benzo[b]Fluoranthene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Benzo[g,h,i]perylene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Benzo[k]fluoranthene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Chrysene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Dibenzo[a,h]anthracene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Fluoranthene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Fluorene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Indeno[1,2,3-c,d] pyrene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Naphthalene	58.0 U	116	29.0	ug/kg	5		09/02/22 22:54
Phenanthrene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Pyrene	72.5 U	145	36.3	ug/kg	5		09/02/22 22:54
Surrogates							
2-Methylnaphthalene-d10 (surr)	82.5	58-103		%	5		09/02/22 22:54
Fluoranthene-d10 (surr)	90.1	54-113		%	5		09/02/22 22:54

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/02/22 22:54
Container ID: 1225228001-A

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 08/31/22 08:31
Prep Initial Wt./Vol.: 22.607 g
Prep Extract Vol: 5 mL

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Results of **106424-TP1S2**

Client Sample ID: **106424-TP1S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228001
Lab Project ID: 1225228

Collection Date: 08/18/22 07:50
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):85.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	46.3 U	92.5	41.6	mg/kg	4		09/01/22 08:27
Surrogates							
5a Androstane (surr)	97.2	50-150		%	4		09/01/22 08:27

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/01/22 08:27
Container ID: 1225228001-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.251 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	415 J	463	199	mg/kg	4		09/01/22 08:27
Surrogates							
n-Triacontane-d62 (surr)	91.8	50-150		%	4		09/01/22 08:27

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/01/22 08:27
Container ID: 1225228001-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.251 g
Prep Extract Vol: 5 mL

J flagging is activated

Results of **106424-TP1S2**

Client Sample ID: **106424-TP1S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228001
Lab Project ID: 1225228

Collection Date: 08/18/22 07:50
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):85.8
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.31 J	3.03	0.908	mg/kg	1		09/08/22 05:29
Surrogates							
4-Bromofluorobenzene (surr)	104	50-150		%	1		09/08/22 05:29

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 05:29
Container ID: 1225228001-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/18/22 07:50
Prep Initial Wt./Vol.: 66.38 g
Prep Extract Vol: 34.4525 mL

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Results of **106424-TP1S2**

Client Sample ID: **106424-TP1S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228001
Lab Project ID: 1225228

Collection Date: 08/18/22 07:50
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):85.8
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	12.1 U	24.2	7.50	ug/kg	1		08/31/22 15:00
1,1,1-Trichloroethane	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,1,2,2-Tetrachloroethane	1.21 U	2.42	0.750	ug/kg	1		08/31/22 15:00
1,1,2-Trichloroethane	0.605 U	1.21	0.605	ug/kg	1		08/31/22 15:00
1,1-Dichloroethane	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,1-Dichloroethene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,1-Dichloropropene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,2,3-Trichlorobenzene	60.5 U	121	36.3	ug/kg	1		08/31/22 15:00
1,2,3-Trichloropropane	1.21 U	2.42	0.750	ug/kg	1		08/31/22 15:00
1,2,4-Trichlorobenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,2,4-Trimethylbenzene	60.5 U	121	36.3	ug/kg	1		08/31/22 15:00
1,2-Dibromo-3-chloropropane	60.5 U	121	37.5	ug/kg	1		08/31/22 15:00
1,2-Dibromoethane	0.910 U	1.82	0.908	ug/kg	1		08/31/22 15:00
1,2-Dichlorobenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,2-Dichloroethane	1.21 U	2.42	0.847	ug/kg	1		08/31/22 15:00
1,2-Dichloropropane	6.05 U	12.1	6.05	ug/kg	1		08/31/22 15:00
1,3,5-Trimethylbenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,3-Dichlorobenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
1,3-Dichloropropane	6.05 U	12.1	3.75	ug/kg	1		08/31/22 15:00
1,4-Dichlorobenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
2,2-Dichloropropane	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
2-Butanone (MEK)	152 U	303	94.4	ug/kg	1		08/31/22 15:00
2-Chlorotoluene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
2-Hexanone	72.5 U	145	72.6	ug/kg	1		08/31/22 15:00
4-Chlorotoluene	12.1 U	24.2	12.1	ug/kg	1		08/31/22 15:00
4-Isopropyltoluene	48.4 U	96.8	48.4	ug/kg	1		08/31/22 15:00
4-Methyl-2-pentanone (MIBK)	152 U	303	94.4	ug/kg	1		08/31/22 15:00
Acetone	152 U	303	133	ug/kg	1		08/31/22 15:00
Benzene	7.55 U	15.1	4.72	ug/kg	1		08/31/22 15:00
Bromobenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Bromochloromethane	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Bromodichloromethane	1.21 U	2.42	0.750	ug/kg	1		08/31/22 15:00
Bromoform	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Bromomethane	12.1 U	24.2	9.68	ug/kg	1		08/31/22 15:00
Carbon disulfide	60.5 U	121	37.5	ug/kg	1		08/31/22 15:00
Carbon tetrachloride	7.55 U	15.1	4.72	ug/kg	1		08/31/22 15:00
Chlorobenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00

Results of **106424-TP1S2**

Client Sample ID: **106424-TP1S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228001
Lab Project ID: 1225228

Collection Date: 08/18/22 07:50
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):85.8
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	121 U	242	75.0	ug/kg	1		08/31/22 15:00
Chloroform	3.63 U	7.26	3.63	ug/kg	1		08/31/22 15:00
Chloromethane	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
cis-1,2-Dichloroethene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
cis-1,3-Dichloropropene	7.55 U	15.1	4.72	ug/kg	1		08/31/22 15:00
Dibromochloromethane	3.02 U	6.05	1.82	ug/kg	1		08/31/22 15:00
Dibromomethane	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Dichlorodifluoromethane	60.5 U	121	36.3	ug/kg	1		08/31/22 15:00
Ethylbenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Freon-113	60.5 U	121	37.5	ug/kg	1		08/31/22 15:00
Hexachlorobutadiene	12.1 U	24.2	7.50	ug/kg	1		08/31/22 15:00
Isopropylbenzene (Cumene)	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Methylene chloride	60.5 U	121	37.5	ug/kg	1		08/31/22 15:00
Methyl-t-butyl ether	60.5 U	121	37.5	ug/kg	1		08/31/22 15:00
Naphthalene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
n-Butylbenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
n-Propylbenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
o-Xylene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
P & M -Xylene	30.3 U	60.5	18.2	ug/kg	1		08/31/22 15:00
sec-Butylbenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Styrene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
tert-Butylbenzene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
Tetrachloroethene	7.55 U	15.1	4.72	ug/kg	1		08/31/22 15:00
Toluene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
trans-1,2-Dichloroethene	15.2 U	30.3	9.44	ug/kg	1		08/31/22 15:00
trans-1,3-Dichloropropene	7.55 U	15.1	4.72	ug/kg	1		08/31/22 15:00
Trichloroethene	6.05 U	12.1	3.87	ug/kg	1		08/31/22 15:00
Trichlorofluoromethane	30.3 U	60.5	18.2	ug/kg	1		08/31/22 15:00
Vinyl acetate	60.5 U	121	37.5	ug/kg	1		08/31/22 15:00
Vinyl chloride	0.484 U	0.968	0.303	ug/kg	1		08/31/22 15:00
Xylenes (total)	45.4 U	90.8	27.6	ug/kg	1		08/31/22 15:00
Surrogates							
1,2-Dichloroethane-D4 (surr)	107	71-136		%	1		08/31/22 15:00
4-Bromofluorobenzene (surr)	109	55-151		%	1		08/31/22 15:00
Toluene-d8 (surr)	98.9	85-116		%	1		08/31/22 15:00

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Results of **106424-TP1S2**

Client Sample ID: **106424-TP1S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228001
Lab Project ID: 1225228

Collection Date: 08/18/22 07:50
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):85.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 15:00
Container ID: 1225228001-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 07:50
Prep Initial Wt./Vol.: 66.38 g
Prep Extract Vol: 34.4525 mL

Results of **106424-TP2S2**

Client Sample ID: **106424-TP2S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228002
Lab Project ID: 1225228

Collection Date: 08/18/22 08:20
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):92.3
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	2.55	1.03	0.319	mg/kg	10		09/01/22 17:43
Barium	48.7	0.309	0.0968	mg/kg	10		09/01/22 17:43
Cadmium	0.212	0.206	0.0638	mg/kg	10		09/01/22 17:43
Chromium	16.1	1.03	0.319	mg/kg	10		09/01/22 17:43
Lead	15.2	0.206	0.0638	mg/kg	10		09/01/22 17:43
Mercury	0.155 U	0.309	0.103	mg/kg	10		09/01/22 17:43
Selenium	1.03 U	2.06	0.638	mg/kg	10		09/01/22 17:43
Silver	0.258 U	0.515	0.154	mg/kg	10		09/01/22 17:43

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 17:43
Container ID: 1225228002-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.053 g
Prep Extract Vol: 50 mL

Print Date: 09/15/2022 7:58:40AM

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Results of **106424-TP2S2**

Client Sample ID: **106424-TP2S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228002
Lab Project ID: 1225228

Collection Date: 08/18/22 08:20
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):92.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	67.5 U	135	33.6	ug/kg	5		09/02/22 23:10
2-Methylnaphthalene	67.5 U	135	33.6	ug/kg	5		09/02/22 23:10
Acenaphthene	54.7 J	135	33.6	ug/kg	5		09/02/22 23:10
Acenaphthylene	67.5 U	135	33.6	ug/kg	5		09/02/22 23:10
Anthracene	200	135	33.6	ug/kg	5		09/02/22 23:10
Benzo(a)Anthracene	609	135	33.6	ug/kg	5		09/02/22 23:10
Benzo[a]pyrene	776	135	33.6	ug/kg	5		09/02/22 23:10
Benzo[b]Fluoranthene	1010	135	33.6	ug/kg	5		09/02/22 23:10
Benzo[g,h,i]perylene	624	135	33.6	ug/kg	5		09/02/22 23:10
Benzo[k]fluoranthene	366	135	33.6	ug/kg	5		09/02/22 23:10
Chrysene	746	135	33.6	ug/kg	5		09/02/22 23:10
Dibenzo[a,h]anthracene	105 J	135	33.6	ug/kg	5		09/02/22 23:10
Fluoranthene	1770	135	33.6	ug/kg	5		09/02/22 23:10
Fluorene	64.5 J	135	33.6	ug/kg	5		09/02/22 23:10
Indeno[1,2,3-c,d] pyrene	512	135	33.6	ug/kg	5		09/02/22 23:10
Naphthalene	54.0 U	108	26.9	ug/kg	5		09/02/22 23:10
Phenanthrene	939	135	33.6	ug/kg	5		09/02/22 23:10
Pyrene	1380	135	33.6	ug/kg	5		09/02/22 23:10
Surrogates							
2-Methylnaphthalene-d10 (surr)	87.7	58-103		%	5		09/02/22 23:10
Fluoranthene-d10 (surr)	98.3	54-113		%	5		09/02/22 23:10

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/02/22 23:10
Container ID: 1225228002-A

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 08/31/22 08:31
Prep Initial Wt./Vol.: 22.656 g
Prep Extract Vol: 5 mL

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Results of **106424-TP2S2**

Client Sample ID: **106424-TP2S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228002
Lab Project ID: 1225228

Collection Date: 08/18/22 08:20
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):92.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	52.8 J	86.4	38.9	mg/kg	4		09/01/22 08:37
Surrogates							
5a Androstane (surr)	98.2	50-150		%	4		09/01/22 08:37

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/01/22 08:37
Container ID: 1225228002-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.101 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	956	432	186	mg/kg	4		09/01/22 08:37
Surrogates							
n-Triacontane-d62 (surr)	98.7	50-150		%	4		09/01/22 08:37

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/01/22 08:37
Container ID: 1225228002-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.101 g
Prep Extract Vol: 5 mL

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Results of **106424-TP2S2**

Client Sample ID: **106424-TP2S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228002
Lab Project ID: 1225228

Collection Date: 08/18/22 08:20
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):92.3
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.985 J	2.16	0.648	mg/kg	1		09/08/22 05:47
Surrogates							
4-Bromofluorobenzene (surr)	99.4	50-150		%	1		09/08/22 05:47

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 05:47
Container ID: 1225228002-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/18/22 08:20
Prep Initial Wt./Vol.: 77.806 g
Prep Extract Vol: 31.0198 mL

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Results of **106424-TP2S2**

Client Sample ID: **106424-TP2S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228002
Lab Project ID: 1225228

Collection Date: 08/18/22 08:20
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):92.3
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	8.65 U	17.3	5.36	ug/kg	1		08/31/22 15:17
1,1,1-Trichloroethane	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,1,2,2-Tetrachloroethane	0.865 U	1.73	0.536	ug/kg	1		08/31/22 15:17
1,1,2-Trichloroethane	0.432 U	0.864	0.432	ug/kg	1		08/31/22 15:17
1,1-Dichloroethane	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,1-Dichloroethene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,1-Dichloropropene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,2,3-Trichlorobenzene	43.2 U	86.4	25.9	ug/kg	1		08/31/22 15:17
1,2,3-Trichloropropane	0.865 U	1.73	0.536	ug/kg	1		08/31/22 15:17
1,2,4-Trichlorobenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,2,4-Trimethylbenzene	43.2 U	86.4	25.9	ug/kg	1		08/31/22 15:17
1,2-Dibromo-3-chloropropane	43.2 U	86.4	26.8	ug/kg	1		08/31/22 15:17
1,2-Dibromoethane	0.650 U	1.30	0.648	ug/kg	1		08/31/22 15:17
1,2-Dichlorobenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,2-Dichloroethane	0.865 U	1.73	0.605	ug/kg	1		08/31/22 15:17
1,2-Dichloropropane	4.32 U	8.64	4.32	ug/kg	1		08/31/22 15:17
1,3,5-Trimethylbenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,3-Dichlorobenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
1,3-Dichloropropane	4.32 U	8.64	2.68	ug/kg	1		08/31/22 15:17
1,4-Dichlorobenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
2,2-Dichloropropane	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
2-Butanone (MEK)	108 U	216	67.4	ug/kg	1		08/31/22 15:17
2-Chlorotoluene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
2-Hexanone	52.0 U	104	51.9	ug/kg	1		08/31/22 15:17
4-Chlorotoluene	8.65 U	17.3	8.64	ug/kg	1		08/31/22 15:17
4-Isopropyltoluene	34.5 U	69.1	34.6	ug/kg	1		08/31/22 15:17
4-Methyl-2-pentanone (MIBK)	108 U	216	67.4	ug/kg	1		08/31/22 15:17
Acetone	108 U	216	95.1	ug/kg	1		08/31/22 15:17
Benzene	5.40 U	10.8	3.37	ug/kg	1		08/31/22 15:17
Bromobenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Bromochloromethane	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Bromodichloromethane	0.865 U	1.73	0.536	ug/kg	1		08/31/22 15:17
Bromoform	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Bromomethane	8.65 U	17.3	6.91	ug/kg	1		08/31/22 15:17
Carbon disulfide	43.2 U	86.4	26.8	ug/kg	1		08/31/22 15:17
Carbon tetrachloride	5.40 U	10.8	3.37	ug/kg	1		08/31/22 15:17
Chlorobenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17

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Results of **106424-TP2S2**

Client Sample ID: **106424-TP2S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228002
Lab Project ID: 1225228

Collection Date: 08/18/22 08:20
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):92.3
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	86.5 U	173	53.6	ug/kg	1		08/31/22 15:17
Chloroform	2.60 U	5.19	2.59	ug/kg	1		08/31/22 15:17
Chloromethane	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
cis-1,2-Dichloroethene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
cis-1,3-Dichloropropene	5.40 U	10.8	3.37	ug/kg	1		08/31/22 15:17
Dibromochloromethane	2.16 U	4.32	1.30	ug/kg	1		08/31/22 15:17
Dibromomethane	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Dichlorodifluoromethane	43.2 U	86.4	25.9	ug/kg	1		08/31/22 15:17
Ethylbenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Freon-113	43.2 U	86.4	26.8	ug/kg	1		08/31/22 15:17
Hexachlorobutadiene	8.65 U	17.3	5.36	ug/kg	1		08/31/22 15:17
Isopropylbenzene (Cumene)	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Methylene chloride	43.2 U	86.4	26.8	ug/kg	1		08/31/22 15:17
Methyl-t-butyl ether	43.2 U	86.4	26.8	ug/kg	1		08/31/22 15:17
Naphthalene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
n-Butylbenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
n-Propylbenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
o-Xylene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
P & M -Xylene	21.6 U	43.2	13.0	ug/kg	1		08/31/22 15:17
sec-Butylbenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Styrene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
tert-Butylbenzene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
Tetrachloroethene	5.40 U	10.8	3.37	ug/kg	1		08/31/22 15:17
Toluene	9.49 J	21.6	6.74	ug/kg	1		08/31/22 15:17
trans-1,2-Dichloroethene	10.8 U	21.6	6.74	ug/kg	1		08/31/22 15:17
trans-1,3-Dichloropropene	5.40 U	10.8	3.37	ug/kg	1		08/31/22 15:17
Trichloroethene	4.32 U	8.64	2.77	ug/kg	1		08/31/22 15:17
Trichlorofluoromethane	21.6 U	43.2	13.0	ug/kg	1		08/31/22 15:17
Vinyl acetate	43.2 U	86.4	26.8	ug/kg	1		08/31/22 15:17
Vinyl chloride	0.345 U	0.691	0.216	ug/kg	1		08/31/22 15:17
Xylenes (total)	32.4 U	64.8	19.7	ug/kg	1		08/31/22 15:17
Surrogates							
1,2-Dichloroethane-D4 (surr)	107	71-136		%	1		08/31/22 15:17
4-Bromofluorobenzene (surr)	101	55-151		%	1		08/31/22 15:17
Toluene-d8 (surr)	98.2	85-116		%	1		08/31/22 15:17

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Results of **106424-TP2S2**

Client Sample ID: **106424-TP2S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228002
Lab Project ID: 1225228

Collection Date: 08/18/22 08:20
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):92.3
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 15:17
Container ID: 1225228002-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 08:20
Prep Initial Wt./Vol.: 77.806 g
Prep Extract Vol: 31.0198 mL

Print Date: 09/15/2022 7:58:40AM

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Results of **106424-TP6S2**

Client Sample ID: **106424-TP6S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228003
Lab Project ID: 1225228

Collection Date: 08/18/22 09:18
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	3.75	0.985	0.305	mg/kg	10		09/01/22 17:46
Barium	61.2	0.295	0.0926	mg/kg	10		09/01/22 17:46
Cadmium	0.235	0.197	0.0611	mg/kg	10		09/01/22 17:46
Chromium	30.0	0.985	0.305	mg/kg	10		09/01/22 17:46
Lead	9.71	0.197	0.0611	mg/kg	10		09/01/22 17:46
Mercury	0.147 U	0.295	0.0985	mg/kg	10		09/01/22 17:46
Selenium	0.985 U	1.97	0.611	mg/kg	10		09/01/22 17:46
Silver	0.246 U	0.492	0.148	mg/kg	10		09/01/22 17:46

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 17:46
Container ID: 1225228003-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.089 g
Prep Extract Vol: 50 mL

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Results of **106424-TP6S2**

Client Sample ID: **106424-TP6S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228003
Lab Project ID: 1225228

Collection Date: 08/18/22 09:18
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	66.5 U	133	33.3	ug/kg	5		09/02/22 23:26
2-Methylnaphthalene	66.5 U	133	33.3	ug/kg	5		09/02/22 23:26
Acenaphthene	66.5 U	133	33.3	ug/kg	5		09/02/22 23:26
Acenaphthylene	66.5 U	133	33.3	ug/kg	5		09/02/22 23:26
Anthracene	121 J	133	33.3	ug/kg	5		09/02/22 23:26
Benzo(a)Anthracene	338	133	33.3	ug/kg	5		09/02/22 23:26
Benzo[a]pyrene	430	133	33.3	ug/kg	5		09/02/22 23:26
Benzo[b]Fluoranthene	559	133	33.3	ug/kg	5		09/02/22 23:26
Benzo[g,h,i]perylene	346	133	33.3	ug/kg	5		09/02/22 23:26
Benzo[k]fluoranthene	183	133	33.3	ug/kg	5		09/02/22 23:26
Chrysene	409	133	33.3	ug/kg	5		09/02/22 23:26
Dibenzo[a,h]anthracene	55.2 J	133	33.3	ug/kg	5		09/02/22 23:26
Fluoranthene	901	133	33.3	ug/kg	5		09/02/22 23:26
Fluorene	39.4 J	133	33.3	ug/kg	5		09/02/22 23:26
Indeno[1,2,3-c,d] pyrene	273	133	33.3	ug/kg	5		09/02/22 23:26
Naphthalene	53.5 U	107	26.7	ug/kg	5		09/02/22 23:26
Phenanthrene	482	133	33.3	ug/kg	5		09/02/22 23:26
Pyrene	751	133	33.3	ug/kg	5		09/02/22 23:26
Surrogates							
2-Methylnaphthalene-d10 (surr)	94.8	58-103		%	5		09/02/22 23:26
Fluoranthene-d10 (surr)	105	54-113		%	5		09/02/22 23:26

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/02/22 23:26
Container ID: 1225228003-A

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 08/31/22 08:31
Prep Initial Wt./Vol.: 22.619 g
Prep Extract Vol: 5 mL

Print Date: 09/15/2022 7:58:40AM

J flagging is activated

Results of **106424-TP6S2**

Client Sample ID: **106424-TP6S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228003
Lab Project ID: 1225228

Collection Date: 08/18/22 09:18
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	43.1 J	84.8	38.1	mg/kg	4		09/01/22 08:47
Surrogates							
5a Androstane (surr)	95.9	50-150		%	4		09/01/22 08:47

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/01/22 08:47
Container ID: 1225228003-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.376 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	891	424	182	mg/kg	4		09/01/22 08:47
Surrogates							
n-Triacontane-d62 (surr)	96	50-150		%	4		09/01/22 08:47

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/01/22 08:47
Container ID: 1225228003-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.376 g
Prep Extract Vol: 5 mL

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Results of **106424-TP6S2**

Client Sample ID: **106424-TP6S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228003
Lab Project ID: 1225228

Collection Date: 08/18/22 09:18
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.912 J	2.03	0.608	mg/kg	1		09/08/22 06:05
Surrogates							
4-Bromofluorobenzene (surr)	106	50-150		%	1		09/08/22 06:05

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 06:05
Container ID: 1225228003-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/18/22 09:18
Prep Initial Wt./Vol.: 80.535 g
Prep Extract Vol: 30.4555 mL

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Results of **106424-TP6S2**

Client Sample ID: **106424-TP6S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228003
Lab Project ID: 1225228

Collection Date: 08/18/22 09:18
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	8.10 U	16.2	5.03	ug/kg	1		08/31/22 15:34
1,1,1-Trichloroethane	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,1,2,2-Tetrachloroethane	0.810 U	1.62	0.503	ug/kg	1		08/31/22 15:34
1,1,2-Trichloroethane	0.406 U	0.811	0.406	ug/kg	1		08/31/22 15:34
1,1-Dichloroethane	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,1-Dichloroethene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,1-Dichloropropene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,2,3-Trichlorobenzene	40.5 U	81.1	24.3	ug/kg	1		08/31/22 15:34
1,2,3-Trichloropropane	0.810 U	1.62	0.503	ug/kg	1		08/31/22 15:34
1,2,4-Trichlorobenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,2,4-Trimethylbenzene	40.5 U	81.1	24.3	ug/kg	1		08/31/22 15:34
1,2-Dibromo-3-chloropropane	40.5 U	81.1	25.1	ug/kg	1		08/31/22 15:34
1,2-Dibromoethane	0.610 U	1.22	0.608	ug/kg	1		08/31/22 15:34
1,2-Dichlorobenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,2-Dichloroethane	0.810 U	1.62	0.568	ug/kg	1		08/31/22 15:34
1,2-Dichloropropane	4.05 U	8.11	4.06	ug/kg	1		08/31/22 15:34
1,3,5-Trimethylbenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,3-Dichlorobenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
1,3-Dichloropropane	4.05 U	8.11	2.51	ug/kg	1		08/31/22 15:34
1,4-Dichlorobenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
2,2-Dichloropropane	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
2-Butanone (MEK)	102 U	203	63.3	ug/kg	1		08/31/22 15:34
2-Chlorotoluene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
2-Hexanone	48.7 U	97.4	48.7	ug/kg	1		08/31/22 15:34
4-Chlorotoluene	8.10 U	16.2	8.11	ug/kg	1		08/31/22 15:34
4-Isopropyltoluene	32.5 U	64.9	32.5	ug/kg	1		08/31/22 15:34
4-Methyl-2-pentanone (MIBK)	102 U	203	63.3	ug/kg	1		08/31/22 15:34
Acetone	102 U	203	89.2	ug/kg	1		08/31/22 15:34
Benzene	5.05 U	10.1	3.16	ug/kg	1		08/31/22 15:34
Bromobenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Bromochloromethane	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Bromodichloromethane	0.810 U	1.62	0.503	ug/kg	1		08/31/22 15:34
Bromoform	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Bromomethane	8.10 U	16.2	6.49	ug/kg	1		08/31/22 15:34
Carbon disulfide	40.5 U	81.1	25.1	ug/kg	1		08/31/22 15:34
Carbon tetrachloride	5.05 U	10.1	3.16	ug/kg	1		08/31/22 15:34
Chlorobenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34

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Results of **106424-TP6S2**

Client Sample ID: **106424-TP6S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228003
Lab Project ID: 1225228

Collection Date: 08/18/22 09:18
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	81.0 U	162	50.3	ug/kg	1		08/31/22 15:34
Chloroform	2.44 U	4.87	2.43	ug/kg	1		08/31/22 15:34
Chloromethane	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
cis-1,2-Dichloroethene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
cis-1,3-Dichloropropene	5.05 U	10.1	3.16	ug/kg	1		08/31/22 15:34
Dibromochloromethane	2.03 U	4.06	1.22	ug/kg	1		08/31/22 15:34
Dibromomethane	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Dichlorodifluoromethane	40.5 U	81.1	24.3	ug/kg	1		08/31/22 15:34
Ethylbenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Freon-113	40.5 U	81.1	25.1	ug/kg	1		08/31/22 15:34
Hexachlorobutadiene	8.10 U	16.2	5.03	ug/kg	1		08/31/22 15:34
Isopropylbenzene (Cumene)	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Methylene chloride	40.5 U	81.1	25.1	ug/kg	1		08/31/22 15:34
Methyl-t-butyl ether	40.5 U	81.1	25.1	ug/kg	1		08/31/22 15:34
Naphthalene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
n-Butylbenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
n-Propylbenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
o-Xylene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
P & M -Xylene	20.3 U	40.6	12.2	ug/kg	1		08/31/22 15:34
sec-Butylbenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Styrene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
tert-Butylbenzene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
Tetrachloroethene	5.05 U	10.1	3.16	ug/kg	1		08/31/22 15:34
Toluene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
trans-1,2-Dichloroethene	10.2 U	20.3	6.33	ug/kg	1		08/31/22 15:34
trans-1,3-Dichloropropene	5.05 U	10.1	3.16	ug/kg	1		08/31/22 15:34
Trichloroethene	4.05 U	8.11	2.60	ug/kg	1		08/31/22 15:34
Trichlorofluoromethane	20.3 U	40.6	12.2	ug/kg	1		08/31/22 15:34
Vinyl acetate	40.5 U	81.1	25.1	ug/kg	1		08/31/22 15:34
Vinyl chloride	0.325 U	0.649	0.203	ug/kg	1		08/31/22 15:34
Xylenes (total)	30.4 U	60.8	18.5	ug/kg	1		08/31/22 15:34
Surrogates							
1,2-Dichloroethane-D4 (surr)	108	71-136		%	1		08/31/22 15:34
4-Bromofluorobenzene (surr)	111	55-151		%	1		08/31/22 15:34
Toluene-d8 (surr)	99.3	85-116		%	1		08/31/22 15:34

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Results of **106424-TP6S2**

Client Sample ID: **106424-TP6S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228003
Lab Project ID: 1225228

Collection Date: 08/18/22 09:18
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 15:34
Container ID: 1225228003-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 09:18
Prep Initial Wt./Vol.: 80.535 g
Prep Extract Vol: 30.4555 mL

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Results of **106424-TP9S2**

Client Sample ID: **106424-TP9S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228004
Lab Project ID: 1225228

Collection Date: 08/18/22 10:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	3.31		1.03	0.320	mg/kg	10		09/01/22 17:49
Barium	49.9		0.310	0.0971	mg/kg	10		09/01/22 17:49
Cadmium	0.211		0.207	0.0641	mg/kg	10		09/01/22 17:49
Chromium	18.8		1.03	0.320	mg/kg	10		09/01/22 17:49
Lead	13.1		0.207	0.0641	mg/kg	10		09/01/22 17:49
Mercury	0.155	U	0.310	0.103	mg/kg	10		09/01/22 17:49
Selenium	1.03	U	2.07	0.641	mg/kg	10		09/01/22 17:49
Silver	0.259	U	0.517	0.155	mg/kg	10		09/01/22 17:49

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 17:49
Container ID: 1225228004-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.037 g
Prep Extract Vol: 50 mL

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Results of **106424-TP9S2**

Client Sample ID: **106424-TP9S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228004
Lab Project ID: 1225228

Collection Date: 08/18/22 10:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	67.0 U	134	33.5	ug/kg	5		09/02/22 23:42
2-Methylnaphthalene	67.0 U	134	33.5	ug/kg	5		09/02/22 23:42
Acenaphthene	67.0 U	134	33.5	ug/kg	5		09/02/22 23:42
Acenaphthylene	67.0 U	134	33.5	ug/kg	5		09/02/22 23:42
Anthracene	106 J	134	33.5	ug/kg	5		09/02/22 23:42
Benzo(a)Anthracene	340	134	33.5	ug/kg	5		09/02/22 23:42
Benzo[a]pyrene	433	134	33.5	ug/kg	5		09/02/22 23:42
Benzo[b]Fluoranthene	592	134	33.5	ug/kg	5		09/02/22 23:42
Benzo[g,h,i]perylene	368	134	33.5	ug/kg	5		09/02/22 23:42
Benzo[k]fluoranthene	168	134	33.5	ug/kg	5		09/02/22 23:42
Chrysene	414	134	33.5	ug/kg	5		09/02/22 23:42
Dibenzo[a,h]anthracene	60.6 J	134	33.5	ug/kg	5		09/02/22 23:42
Fluoranthene	905	134	33.5	ug/kg	5		09/02/22 23:42
Fluorene	67.0 U	134	33.5	ug/kg	5		09/02/22 23:42
Indeno[1,2,3-c,d] pyrene	284	134	33.5	ug/kg	5		09/02/22 23:42
Naphthalene	53.5 U	107	26.8	ug/kg	5		09/02/22 23:42
Phenanthrene	435	134	33.5	ug/kg	5		09/02/22 23:42
Pyrene	727	134	33.5	ug/kg	5		09/02/22 23:42
Surrogates							
2-Methylnaphthalene-d10 (surr)	91.3	58-103		%	5		09/02/22 23:42
Fluoranthene-d10 (surr)	101	54-113		%	5		09/02/22 23:42

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/02/22 23:42
Container ID: 1225228004-A

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 08/31/22 08:31
Prep Initial Wt./Vol.: 22.513 g
Prep Extract Vol: 5 mL

Print Date: 09/15/2022 7:58:40AM

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Results of **106424-TP9S2**

Client Sample ID: **106424-TP9S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228004
Lab Project ID: 1225228

Collection Date: 08/18/22 10:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	65.1 J	85.4	38.4	mg/kg	4		09/01/22 08:57
Surrogates							
5a Androstane (surr)	97	50-150		%	4		09/01/22 08:57

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/01/22 08:57
Container ID: 1225228004-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.122 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1450	427	184	mg/kg	4		09/01/22 08:57
Surrogates							
n-Triacontane-d62 (surr)	105	50-150		%	4		09/01/22 08:57

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/01/22 08:57
Container ID: 1225228004-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.122 g
Prep Extract Vol: 5 mL

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Results of **106424-TP9S2**

Client Sample ID: **106424-TP9S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228004
Lab Project ID: 1225228

Collection Date: 08/18/22 10:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.893 J	1.89	0.567	mg/kg	1		09/08/22 06:24
Surrogates							
4-Bromofluorobenzene (surr)	103	50-150		%	1		09/08/22 06:24

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 06:24
Container ID: 1225228004-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/18/22 10:05
Prep Initial Wt./Vol.: 87.545 g
Prep Extract Vol: 30.8558 mL

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Results of **106424-TP9S2**

Client Sample ID: **106424-TP9S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228004
Lab Project ID: 1225228

Collection Date: 08/18/22 10:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	7.55 U	15.1	4.68	ug/kg	1		08/31/22 15:51
1,1,1-Trichloroethane	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,1,2,2-Tetrachloroethane	0.755 U	1.51	0.468	ug/kg	1		08/31/22 15:51
1,1,2-Trichloroethane	0.378 U	0.755	0.378	ug/kg	1		08/31/22 15:51
1,1-Dichloroethane	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,1-Dichloroethene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,1-Dichloropropene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,2,3-Trichlorobenzene	37.8 U	75.5	22.7	ug/kg	1		08/31/22 15:51
1,2,3-Trichloropropane	0.755 U	1.51	0.468	ug/kg	1		08/31/22 15:51
1,2,4-Trichlorobenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,2,4-Trimethylbenzene	37.8 U	75.5	22.7	ug/kg	1		08/31/22 15:51
1,2-Dibromo-3-chloropropane	37.8 U	75.5	23.4	ug/kg	1		08/31/22 15:51
1,2-Dibromoethane	0.565 U	1.13	0.567	ug/kg	1		08/31/22 15:51
1,2-Dichlorobenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,2-Dichloroethane	0.755 U	1.51	0.529	ug/kg	1		08/31/22 15:51
1,2-Dichloropropane	3.77 U	7.55	3.78	ug/kg	1		08/31/22 15:51
1,3,5-Trimethylbenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,3-Dichlorobenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
1,3-Dichloropropane	3.77 U	7.55	2.34	ug/kg	1		08/31/22 15:51
1,4-Dichlorobenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
2,2-Dichloropropane	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
2-Butanone (MEK)	94.5 U	189	58.9	ug/kg	1		08/31/22 15:51
2-Chlorotoluene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
2-Hexanone	45.4 U	90.7	45.3	ug/kg	1		08/31/22 15:51
4-Chlorotoluene	7.55 U	15.1	7.55	ug/kg	1		08/31/22 15:51
4-Isopropyltoluene	30.2 U	60.4	30.2	ug/kg	1		08/31/22 15:51
4-Methyl-2-pentanone (MIBK)	94.5 U	189	58.9	ug/kg	1		08/31/22 15:51
Acetone	94.5 U	189	83.1	ug/kg	1		08/31/22 15:51
Benzene	4.72 U	9.44	2.95	ug/kg	1		08/31/22 15:51
Bromobenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Bromochloromethane	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Bromodichloromethane	0.755 U	1.51	0.468	ug/kg	1		08/31/22 15:51
Bromoform	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Bromomethane	7.55 U	15.1	6.04	ug/kg	1		08/31/22 15:51
Carbon disulfide	37.8 U	75.5	23.4	ug/kg	1		08/31/22 15:51
Carbon tetrachloride	4.72 U	9.44	2.95	ug/kg	1		08/31/22 15:51
Chlorobenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51

Print Date: 09/15/2022 7:58:40AM

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Results of **106424-TP9S2**

Client Sample ID: **106424-TP9S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228004
Lab Project ID: 1225228

Collection Date: 08/18/22 10:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	75.5 U	151	46.8	ug/kg	1		08/31/22 15:51
Chloroform	2.27 U	4.53	2.27	ug/kg	1		08/31/22 15:51
Chloromethane	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
cis-1,2-Dichloroethene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
cis-1,3-Dichloropropene	4.72 U	9.44	2.95	ug/kg	1		08/31/22 15:51
Dibromochloromethane	1.89 U	3.78	1.13	ug/kg	1		08/31/22 15:51
Dibromomethane	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Dichlorodifluoromethane	37.8 U	75.5	22.7	ug/kg	1		08/31/22 15:51
Ethylbenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Freon-113	37.8 U	75.5	23.4	ug/kg	1		08/31/22 15:51
Hexachlorobutadiene	7.55 U	15.1	4.68	ug/kg	1		08/31/22 15:51
Isopropylbenzene (Cumene)	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Methylene chloride	37.8 U	75.5	23.4	ug/kg	1		08/31/22 15:51
Methyl-t-butyl ether	37.8 U	75.5	23.4	ug/kg	1		08/31/22 15:51
Naphthalene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
n-Butylbenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
n-Propylbenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
o-Xylene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
P & M -Xylene	18.9 U	37.8	11.3	ug/kg	1		08/31/22 15:51
sec-Butylbenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Styrene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
tert-Butylbenzene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
Tetrachloroethene	4.72 U	9.44	2.95	ug/kg	1		08/31/22 15:51
Toluene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
trans-1,2-Dichloroethene	9.45 U	18.9	5.89	ug/kg	1		08/31/22 15:51
trans-1,3-Dichloropropene	4.72 U	9.44	2.95	ug/kg	1		08/31/22 15:51
Trichloroethene	3.77 U	7.55	2.42	ug/kg	1		08/31/22 15:51
Trichlorofluoromethane	18.9 U	37.8	11.3	ug/kg	1		08/31/22 15:51
Vinyl acetate	37.8 U	75.5	23.4	ug/kg	1		08/31/22 15:51
Vinyl chloride	0.302 U	0.604	0.189	ug/kg	1		08/31/22 15:51
Xylenes (total)	28.4 U	56.7	17.2	ug/kg	1		08/31/22 15:51
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	71-136		%	1		08/31/22 15:51
4-Bromofluorobenzene (surr)	107	55-151		%	1		08/31/22 15:51
Toluene-d8 (surr)	97.5	85-116		%	1		08/31/22 15:51

Print Date: 09/15/2022 7:58:40AM

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Results of **106424-TP9S2**

Client Sample ID: **106424-TP9S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228004
Lab Project ID: 1225228

Collection Date: 08/18/22 10:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 15:51
Container ID: 1225228004-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 10:05
Prep Initial Wt./Vol.: 87.545 g
Prep Extract Vol: 30.8558 mL

Results of **106424-TP13S1**

Client Sample ID: **106424-TP13S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228005
Lab Project ID: 1225228

Collection Date: 08/18/22 12:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	2.66	1.08	0.336	mg/kg	10		09/01/22 17:51
Barium	33.2	0.325	0.102	mg/kg	10		09/01/22 17:51
Cadmium	0.109 J	0.217	0.0673	mg/kg	10		09/01/22 17:51
Chromium	15.0	1.08	0.336	mg/kg	10		09/01/22 17:51
Lead	6.37	0.217	0.0673	mg/kg	10		09/01/22 17:51
Mercury	0.163 U	0.325	0.108	mg/kg	10		09/01/22 17:51
Selenium	1.09 U	2.17	0.673	mg/kg	10		09/01/22 17:51
Silver	0.271 U	0.542	0.163	mg/kg	10		09/01/22 17:51

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 17:51
Container ID: 1225228005-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.059 g
Prep Extract Vol: 50 mL

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Results of **106424-TP13S1**

Client Sample ID: **106424-TP13S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228005
Lab Project ID: 1225228

Collection Date: 08/18/22 12:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	71.5 U	143	35.7	ug/kg	5		09/02/22 23:58
2-Methylnaphthalene	71.5 U	143	35.7	ug/kg	5		09/02/22 23:58
Acenaphthene	36.0 J	143	35.7	ug/kg	5		09/02/22 23:58
Acenaphthylene	71.5 U	143	35.7	ug/kg	5		09/02/22 23:58
Anthracene	113 J	143	35.7	ug/kg	5		09/02/22 23:58
Benzo(a)Anthracene	327	143	35.7	ug/kg	5		09/02/22 23:58
Benzo[a]pyrene	373	143	35.7	ug/kg	5		09/02/22 23:58
Benzo[b]Fluoranthene	503	143	35.7	ug/kg	5		09/02/22 23:58
Benzo[g,h,i]perylene	273	143	35.7	ug/kg	5		09/02/22 23:58
Benzo[k]fluoranthene	163	143	35.7	ug/kg	5		09/02/22 23:58
Chrysene	373	143	35.7	ug/kg	5		09/02/22 23:58
Dibenzo[a,h]anthracene	47.1 J	143	35.7	ug/kg	5		09/02/22 23:58
Fluoranthene	918	143	35.7	ug/kg	5		09/02/22 23:58
Fluorene	41.1 J	143	35.7	ug/kg	5		09/02/22 23:58
Indeno[1,2,3-c,d] pyrene	221	143	35.7	ug/kg	5		09/02/22 23:58
Naphthalene	57.0 U	114	28.5	ug/kg	5		09/02/22 23:58
Phenanthrene	548	143	35.7	ug/kg	5		09/02/22 23:58
Pyrene	732	143	35.7	ug/kg	5		09/02/22 23:58
Surrogates							
2-Methylnaphthalene-d10 (surr)	101	58-103		%	5		09/02/22 23:58
Fluoranthene-d10 (surr)	105	54-113		%	5		09/02/22 23:58

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/02/22 23:58
Container ID: 1225228005-A

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 08/31/22 08:31
Prep Initial Wt./Vol.: 22.654 g
Prep Extract Vol: 5 mL

J flagging is activated

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Results of **106424-TP13S1**

Client Sample ID: **106424-TP13S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228005
Lab Project ID: 1225228

Collection Date: 08/18/22 12:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	43.0 J	90.7	40.8	mg/kg	4		09/01/22 09:07
Surrogates							
5a Androstane (surr)	100	50-150		%	4		09/01/22 09:07

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/01/22 09:07
Container ID: 1225228005-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.408 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1070	453	195	mg/kg	4		09/01/22 09:07
Surrogates							
n-Triacontane-d62 (surr)	101	50-150		%	4		09/01/22 09:07

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/01/22 09:07
Container ID: 1225228005-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.408 g
Prep Extract Vol: 5 mL

Results of **106424-TP13S1**

Client Sample ID: **106424-TP13S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228005
Lab Project ID: 1225228

Collection Date: 08/18/22 12:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.975 J	2.47	0.741	mg/kg	1		09/08/22 06:42
Surrogates							
4-Bromofluorobenzene (surr)	89.9	50-150		%	1		09/08/22 06:42

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 06:42
Container ID: 1225228005-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/18/22 12:05
Prep Initial Wt./Vol.: 83.18 g
Prep Extract Vol: 35.7694 mL

Results of **106424-TP13S1**

Client Sample ID: **106424-TP13S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228005
Lab Project ID: 1225228

Collection Date: 08/18/22 12:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	9.90 U	19.8	6.13	ug/kg	1		08/31/22 16:08
1,1,1-Trichloroethane	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,1,2,2-Tetrachloroethane	0.990 U	1.98	0.613	ug/kg	1		08/31/22 16:08
1,1,2-Trichloroethane	0.494 U	0.988	0.494	ug/kg	1		08/31/22 16:08
1,1-Dichloroethane	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,1-Dichloroethene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,1-Dichloropropene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,2,3-Trichlorobenzene	49.4 U	98.8	29.6	ug/kg	1		08/31/22 16:08
1,2,3-Trichloropropane	0.990 U	1.98	0.613	ug/kg	1		08/31/22 16:08
1,2,4-Trichlorobenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,2,4-Trimethylbenzene	49.4 U	98.8	29.6	ug/kg	1		08/31/22 16:08
1,2-Dibromo-3-chloropropane	49.4 U	98.8	30.6	ug/kg	1		08/31/22 16:08
1,2-Dibromoethane	0.740 U	1.48	0.741	ug/kg	1		08/31/22 16:08
1,2-Dichlorobenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,2-Dichloroethane	0.990 U	1.98	0.692	ug/kg	1		08/31/22 16:08
1,2-Dichloropropane	4.94 U	9.88	4.94	ug/kg	1		08/31/22 16:08
1,3,5-Trimethylbenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,3-Dichlorobenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
1,3-Dichloropropane	4.94 U	9.88	3.06	ug/kg	1		08/31/22 16:08
1,4-Dichlorobenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
2,2-Dichloropropane	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
2-Butanone (MEK)	124 U	247	77.1	ug/kg	1		08/31/22 16:08
2-Chlorotoluene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
2-Hexanone	59.5 U	119	59.3	ug/kg	1		08/31/22 16:08
4-Chlorotoluene	9.90 U	19.8	9.88	ug/kg	1		08/31/22 16:08
4-Isopropyltoluene	39.5 U	79.0	39.5	ug/kg	1		08/31/22 16:08
4-Methyl-2-pentanone (MIBK)	124 U	247	77.1	ug/kg	1		08/31/22 16:08
Acetone	124 U	247	109	ug/kg	1		08/31/22 16:08
Benzene	6.15 U	12.3	3.85	ug/kg	1		08/31/22 16:08
Bromobenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Bromochloromethane	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Bromodichloromethane	0.990 U	1.98	0.613	ug/kg	1		08/31/22 16:08
Bromoform	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Bromomethane	9.90 U	19.8	7.90	ug/kg	1		08/31/22 16:08
Carbon disulfide	49.4 U	98.8	30.6	ug/kg	1		08/31/22 16:08
Carbon tetrachloride	6.15 U	12.3	3.85	ug/kg	1		08/31/22 16:08
Chlorobenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08

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Results of **106424-TP13S1**

Client Sample ID: **106424-TP13S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228005
Lab Project ID: 1225228

Collection Date: 08/18/22 12:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	99.0 U	198	61.3	ug/kg	1		08/31/22 16:08
Chloroform	2.96 U	5.93	2.96	ug/kg	1		08/31/22 16:08
Chloromethane	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
cis-1,2-Dichloroethene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
cis-1,3-Dichloropropene	6.15 U	12.3	3.85	ug/kg	1		08/31/22 16:08
Dibromochloromethane	2.47 U	4.94	1.48	ug/kg	1		08/31/22 16:08
Dibromomethane	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Dichlorodifluoromethane	49.4 U	98.8	29.6	ug/kg	1		08/31/22 16:08
Ethylbenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Freon-113	49.4 U	98.8	30.6	ug/kg	1		08/31/22 16:08
Hexachlorobutadiene	9.90 U	19.8	6.13	ug/kg	1		08/31/22 16:08
Isopropylbenzene (Cumene)	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Methylene chloride	49.4 U	98.8	30.6	ug/kg	1		08/31/22 16:08
Methyl-t-butyl ether	49.4 U	98.8	30.6	ug/kg	1		08/31/22 16:08
Naphthalene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
n-Butylbenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
n-Propylbenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
o-Xylene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
P & M -Xylene	24.7 U	49.4	14.8	ug/kg	1		08/31/22 16:08
sec-Butylbenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Styrene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
tert-Butylbenzene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
Tetrachloroethene	6.15 U	12.3	3.85	ug/kg	1		08/31/22 16:08
Toluene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
trans-1,2-Dichloroethene	12.4 U	24.7	7.71	ug/kg	1		08/31/22 16:08
trans-1,3-Dichloropropene	6.15 U	12.3	3.85	ug/kg	1		08/31/22 16:08
Trichloroethene	4.94 U	9.88	3.16	ug/kg	1		08/31/22 16:08
Trichlorofluoromethane	24.7 U	49.4	14.8	ug/kg	1		08/31/22 16:08
Vinyl acetate	49.4 U	98.8	30.6	ug/kg	1		08/31/22 16:08
Vinyl chloride	0.395 U	0.790	0.247	ug/kg	1		08/31/22 16:08
Xylenes (total)	37.0 U	74.1	22.5	ug/kg	1		08/31/22 16:08
Surrogates							
1,2-Dichloroethane-D4 (surr)	108	71-136		%	1		08/31/22 16:08
4-Bromofluorobenzene (surr)	92.2	55-151		%	1		08/31/22 16:08
Toluene-d8 (surr)	98.8	85-116		%	1		08/31/22 16:08

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Results of **106424-TP13S1**

Client Sample ID: **106424-TP13S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228005
Lab Project ID: 1225228

Collection Date: 08/18/22 12:05
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 16:08
Container ID: 1225228005-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 12:05
Prep Initial Wt./Vol.: 83.18 g
Prep Extract Vol: 35.7694 mL

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Results of **106424-TP16S1**

Client Sample ID: **106424-TP16S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228006
Lab Project ID: 1225228

Collection Date: 08/18/22 13:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):79.8
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	4.99	1.23	0.381	mg/kg	10		09/01/22 17:54
Barium	69.7	0.369	0.116	mg/kg	10		09/01/22 17:54
Cadmium	0.139 J	0.246	0.0763	mg/kg	10		09/01/22 17:54
Chromium	19.1	1.23	0.381	mg/kg	10		09/01/22 17:54
Lead	4.26	0.246	0.0763	mg/kg	10		09/01/22 17:54
Mercury	0.185 U	0.369	0.123	mg/kg	10		09/01/22 17:54
Selenium	1.23 U	2.46	0.763	mg/kg	10		09/01/22 17:54
Silver	0.308 U	0.615	0.185	mg/kg	10		09/01/22 17:54

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 17:54
Container ID: 1225228006-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.019 g
Prep Extract Vol: 50 mL

Print Date: 09/15/2022 7:58:40AM

J flagging is activated

Results of **106424-TP16S1**

Client Sample ID: **106424-TP16S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228006
Lab Project ID: 1225228

Collection Date: 08/18/22 13:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):79.8
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
2-Methylnaphthalene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Acenaphthene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Acenaphthylene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Anthracene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Benzo(a)Anthracene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Benzo[a]pyrene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Benzo[b]Fluoranthene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Benzo[g,h,i]perylene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Benzo[k]fluoranthene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Chrysene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Dibenzo[a,h]anthracene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Fluoranthene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Fluorene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Indeno[1,2,3-c,d] pyrene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Naphthalene	62.0 U	124	31.1	ug/kg	5		09/03/22 00:14
Phenanthrene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Pyrene	77.5 U	155	38.8	ug/kg	5		09/03/22 00:14
Surrogates							
2-Methylnaphthalene-d10 (surr)	90.4	58-103		%	5		09/03/22 00:14
Fluoranthene-d10 (surr)	95.2	54-113		%	5		09/03/22 00:14

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/03/22 00:14
Container ID: 1225228006-A

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 08/31/22 08:31
Prep Initial Wt./Vol.: 22.696 g
Prep Extract Vol: 5 mL

Print Date: 09/15/2022 7:58:40AM

J flagging is activated

Results of **106424-TP16S1**

Client Sample ID: **106424-TP16S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228006
Lab Project ID: 1225228

Collection Date: 08/18/22 13:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):79.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	77.8 J	99.9	44.9	mg/kg	4		09/01/22 09:37
Surrogates							
5a Androstane (surr)	89.8	50-150		%	4		09/01/22 09:37

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/01/22 09:37
Container ID: 1225228006-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.128 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	820	499	215	mg/kg	4		09/01/22 09:37
Surrogates							
n-Triacontane-d62 (surr)	91	50-150		%	4		09/01/22 09:37

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/01/22 09:37
Container ID: 1225228006-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.128 g
Prep Extract Vol: 5 mL

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Results of **106424-TP16S1**

Client Sample ID: **106424-TP16S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228006
Lab Project ID: 1225228

Collection Date: 08/18/22 13:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):79.8
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.57 J	3.17	0.950	mg/kg	1		09/08/22 07:00
Surrogates							
4-Bromofluorobenzene (surr)	93.4	50-150		%	1		09/08/22 07:00

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 07:00
Container ID: 1225228006-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/18/22 13:00
Prep Initial Wt./Vol.: 82.571 g
Prep Extract Vol: 41.7196 mL

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Results of 106424-TP16S1

Client Sample ID: **106424-TP16S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228006
Lab Project ID: 1225228

Collection Date: 08/18/22 13:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):79.8
Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	12.7 U	25.3	7.86	ug/kg	1		08/31/22 16:25
1,1,1-Trichloroethane	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,1,2,2-Tetrachloroethane	1.26 U	2.53	0.786	ug/kg	1		08/31/22 16:25
1,1,2-Trichloroethane	0.635 U	1.27	0.634	ug/kg	1		08/31/22 16:25
1,1-Dichloroethane	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,1-Dichloroethene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,1-Dichloropropene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,2,3-Trichlorobenzene	63.5 U	127	38.0	ug/kg	1		08/31/22 16:25
1,2,3-Trichloropropane	1.26 U	2.53	0.786	ug/kg	1		08/31/22 16:25
1,2,4-Trichlorobenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,2,4-Trimethylbenzene	63.5 U	127	38.0	ug/kg	1		08/31/22 16:25
1,2-Dibromo-3-chloropropane	63.5 U	127	39.3	ug/kg	1		08/31/22 16:25
1,2-Dibromoethane	0.950 U	1.90	0.950	ug/kg	1		08/31/22 16:25
1,2-Dichlorobenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,2-Dichloroethane	1.26 U	2.53	0.887	ug/kg	1		08/31/22 16:25
1,2-Dichloropropane	6.35 U	12.7	6.34	ug/kg	1		08/31/22 16:25
1,3,5-Trimethylbenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,3-Dichlorobenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
1,3-Dichloropropane	6.35 U	12.7	3.93	ug/kg	1		08/31/22 16:25
1,4-Dichlorobenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
2,2-Dichloropropane	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
2-Butanone (MEK)	159 U	317	98.8	ug/kg	1		08/31/22 16:25
2-Chlorotoluene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
2-Hexanone	76.0 U	152	76.0	ug/kg	1		08/31/22 16:25
4-Chlorotoluene	12.7 U	25.3	12.7	ug/kg	1		08/31/22 16:25
4-Isopropyltoluene	50.5 U	101	50.7	ug/kg	1		08/31/22 16:25
4-Methyl-2-pentanone (MIBK)	159 U	317	98.8	ug/kg	1		08/31/22 16:25
Acetone	159 U	317	139	ug/kg	1		08/31/22 16:25
Benzene	7.90 U	15.8	4.94	ug/kg	1		08/31/22 16:25
Bromobenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Bromochloromethane	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Bromodichloromethane	1.26 U	2.53	0.786	ug/kg	1		08/31/22 16:25
Bromoform	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Bromomethane	12.7 U	25.3	10.1	ug/kg	1		08/31/22 16:25
Carbon disulfide	63.5 U	127	39.3	ug/kg	1		08/31/22 16:25
Carbon tetrachloride	7.90 U	15.8	4.94	ug/kg	1		08/31/22 16:25
Chlorobenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25

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Results of **106424-TP16S1**

Client Sample ID: **106424-TP16S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228006
Lab Project ID: 1225228

Collection Date: 08/18/22 13:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):79.8
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	127 U	253	78.6	ug/kg	1		08/31/22 16:25
Chloroform	3.80 U	7.60	3.80	ug/kg	1		08/31/22 16:25
Chloromethane	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
cis-1,2-Dichloroethene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
cis-1,3-Dichloropropene	7.90 U	15.8	4.94	ug/kg	1		08/31/22 16:25
Dibromochloromethane	3.17 U	6.34	1.90	ug/kg	1		08/31/22 16:25
Dibromomethane	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Dichlorodifluoromethane	63.5 U	127	38.0	ug/kg	1		08/31/22 16:25
Ethylbenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Freon-113	63.5 U	127	39.3	ug/kg	1		08/31/22 16:25
Hexachlorobutadiene	12.7 U	25.3	7.86	ug/kg	1		08/31/22 16:25
Isopropylbenzene (Cumene)	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Methylene chloride	63.5 U	127	39.3	ug/kg	1		08/31/22 16:25
Methyl-t-butyl ether	63.5 U	127	39.3	ug/kg	1		08/31/22 16:25
Naphthalene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
n-Butylbenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
n-Propylbenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
o-Xylene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
P & M -Xylene	31.7 U	63.4	19.0	ug/kg	1		08/31/22 16:25
sec-Butylbenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Styrene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
tert-Butylbenzene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
Tetrachloroethene	7.90 U	15.8	4.94	ug/kg	1		08/31/22 16:25
Toluene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
trans-1,2-Dichloroethene	15.9 U	31.7	9.88	ug/kg	1		08/31/22 16:25
trans-1,3-Dichloropropene	7.90 U	15.8	4.94	ug/kg	1		08/31/22 16:25
Trichloroethene	6.35 U	12.7	4.05	ug/kg	1		08/31/22 16:25
Trichlorofluoromethane	31.7 U	63.4	19.0	ug/kg	1		08/31/22 16:25
Vinyl acetate	63.5 U	127	39.3	ug/kg	1		08/31/22 16:25
Vinyl chloride	0.505 U	1.01	0.317	ug/kg	1		08/31/22 16:25
Xylenes (total)	47.5 U	95.0	28.9	ug/kg	1		08/31/22 16:25
Surrogates							
1,2-Dichloroethane-D4 (surr)	117	71-136		%	1		08/31/22 16:25
4-Bromofluorobenzene (surr)	99.4	55-151		%	1		08/31/22 16:25
Toluene-d8 (surr)	96.7	85-116		%	1		08/31/22 16:25

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Results of **106424-TP16S1**

Client Sample ID: **106424-TP16S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228006
Lab Project ID: 1225228

Collection Date: 08/18/22 13:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):79.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 16:25
Container ID: 1225228006-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 13:00
Prep Initial Wt./Vol.: 82.571 g
Prep Extract Vol: 41.7196 mL

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Results of **106424-TP21S2**

Client Sample ID: **106424-TP21S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228007
Lab Project ID: 1225228

Collection Date: 08/18/22 14:35
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	3.63	1.00	0.311	mg/kg	10		09/01/22 17:57
Barium	61.4	0.301	0.0943	mg/kg	10		09/01/22 17:57
Cadmium	0.178 J	0.201	0.0622	mg/kg	10		09/01/22 17:57
Chromium	21.2	1.00	0.311	mg/kg	10		09/01/22 17:57
Lead	6.91	0.201	0.0622	mg/kg	10		09/01/22 17:57
Mercury	0.150 U	0.301	0.100	mg/kg	10		09/01/22 17:57
Selenium	1.00 U	2.01	0.622	mg/kg	10		09/01/22 17:57
Silver	0.251 U	0.502	0.150	mg/kg	10		09/01/22 17:57

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 17:57
Container ID: 1225228007-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.056 g
Prep Extract Vol: 50 mL

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Results of **106424-TP21S2**

Client Sample ID: **106424-TP21S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228007
Lab Project ID: 1225228

Collection Date: 08/18/22 14:35
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
2-Methylnaphthalene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Acenaphthene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Acenaphthylene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Anthracene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Benzo(a)Anthracene	62.1 J	131	32.7	ug/kg	5		09/08/22 21:33
Benzo[a]pyrene	112 J	131	32.7	ug/kg	5		09/08/22 21:33
Benzo[b]Fluoranthene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Benzo[g,h,i]perylene	177	131	32.7	ug/kg	5		09/08/22 21:33
Benzo[k]fluoranthene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Chrysene	61.9 J	131	32.7	ug/kg	5		09/08/22 21:33
Dibenzo[a,h]anthracene	45.2 J	131	32.7	ug/kg	5		09/08/22 21:33
Fluoranthene	146	131	32.7	ug/kg	5		09/08/22 21:33
Fluorene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Indeno[1,2,3-c,d] pyrene	65.5 U	131	32.7	ug/kg	5		09/08/22 21:33
Naphthalene	52.5 U	105	26.2	ug/kg	5		09/08/22 21:33
Phenanthrene	61.5 J	131	32.7	ug/kg	5		09/08/22 21:33
Pyrene	121 J	131	32.7	ug/kg	5		09/08/22 21:33
Surrogates							
2-Methylnaphthalene-d10 (surr)	91.4	58-103		%	5		09/08/22 21:33
Fluoranthene-d10 (surr)	96.9	54-113		%	5		09/08/22 21:33

Batch Information

Analytical Batch: XMS13331
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/08/22 21:33
Container ID: 1225228007-A

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 08/31/22 08:31
Prep Initial Wt./Vol.: 22.771 g
Prep Extract Vol: 5 mL

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Results of **106424-TP21S2**

Client Sample ID: **106424-TP21S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228007
Lab Project ID: 1225228

Collection Date: 08/18/22 14:35
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	295	83.9	37.8	mg/kg	4		09/01/22 09:47
Surrogates							
5a Androstane (surr)	107	50-150		%	4		09/01/22 09:47

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/01/22 09:47
Container ID: 1225228007-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.291 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	6730	420	180	mg/kg	4		09/01/22 09:47
Surrogates							
n-Triacontane-d62 (surr)	88	50-150		%	4		09/01/22 09:47

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/01/22 09:47
Container ID: 1225228007-A

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 08/31/22 14:41
Prep Initial Wt./Vol.: 30.291 g
Prep Extract Vol: 5 mL

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Results of **106424-TP21S2**

Client Sample ID: **106424-TP21S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228007
Lab Project ID: 1225228

Collection Date: 08/18/22 14:35
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.798 J	1.90	0.569	mg/kg	1		09/08/22 07:18
Surrogates							
4-Bromofluorobenzene (surr)	88.6	50-150		%	1		09/08/22 07:18

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 07:18
Container ID: 1225228007-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/18/22 14:35
Prep Initial Wt./Vol.: 82.693 g
Prep Extract Vol: 29.6293 mL

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Results of **106424-TP21S2**

Client Sample ID: **106424-TP21S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228007
Lab Project ID: 1225228

Collection Date: 08/18/22 14:35
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	7.60 U	15.2	4.71	ug/kg	1		08/31/22 16:42
1,1,1-Trichloroethane	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,1,2,2-Tetrachloroethane	0.760 U	1.52	0.471	ug/kg	1		08/31/22 16:42
1,1,2-Trichloroethane	0.380 U	0.759	0.380	ug/kg	1		08/31/22 16:42
1,1-Dichloroethane	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,1-Dichloroethene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,1-Dichloropropene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,2,3-Trichlorobenzene	38.0 U	75.9	22.8	ug/kg	1		08/31/22 16:42
1,2,3-Trichloropropane	0.760 U	1.52	0.471	ug/kg	1		08/31/22 16:42
1,2,4-Trichlorobenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,2,4-Trimethylbenzene	38.0 U	75.9	22.8	ug/kg	1		08/31/22 16:42
1,2-Dibromo-3-chloropropane	38.0 U	75.9	23.5	ug/kg	1		08/31/22 16:42
1,2-Dibromoethane	0.570 U	1.14	0.569	ug/kg	1		08/31/22 16:42
1,2-Dichlorobenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,2-Dichloroethane	0.760 U	1.52	0.531	ug/kg	1		08/31/22 16:42
1,2-Dichloropropane	3.79 U	7.59	3.80	ug/kg	1		08/31/22 16:42
1,3,5-Trimethylbenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,3-Dichlorobenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
1,3-Dichloropropane	3.79 U	7.59	2.35	ug/kg	1		08/31/22 16:42
1,4-Dichlorobenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
2,2-Dichloropropane	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
2-Butanone (MEK)	95.0 U	190	59.2	ug/kg	1		08/31/22 16:42
2-Chlorotoluene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
2-Hexanone	45.5 U	91.1	45.5	ug/kg	1		08/31/22 16:42
4-Chlorotoluene	7.60 U	15.2	7.59	ug/kg	1		08/31/22 16:42
4-Isopropyltoluene	30.4 U	60.7	30.4	ug/kg	1		08/31/22 16:42
4-Methyl-2-pentanone (MIBK)	95.0 U	190	59.2	ug/kg	1		08/31/22 16:42
Acetone	95.0 U	190	83.5	ug/kg	1		08/31/22 16:42
Benzene	4.75 U	9.49	2.96	ug/kg	1		08/31/22 16:42
Bromobenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Bromochloromethane	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Bromodichloromethane	0.760 U	1.52	0.471	ug/kg	1		08/31/22 16:42
Bromoform	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Bromomethane	7.60 U	15.2	6.07	ug/kg	1		08/31/22 16:42
Carbon disulfide	38.0 U	75.9	23.5	ug/kg	1		08/31/22 16:42
Carbon tetrachloride	4.75 U	9.49	2.96	ug/kg	1		08/31/22 16:42
Chlorobenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42

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Results of **106424-TP21S2**

Client Sample ID: **106424-TP21S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228007
Lab Project ID: 1225228

Collection Date: 08/18/22 14:35
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	76.0 U	152	47.1	ug/kg	1		08/31/22 16:42
Chloroform	2.27 U	4.55	2.28	ug/kg	1		08/31/22 16:42
Chloromethane	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
cis-1,2-Dichloroethene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
cis-1,3-Dichloropropene	4.75 U	9.49	2.96	ug/kg	1		08/31/22 16:42
Dibromochloromethane	1.90 U	3.80	1.14	ug/kg	1		08/31/22 16:42
Dibromomethane	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Dichlorodifluoromethane	38.0 U	75.9	22.8	ug/kg	1		08/31/22 16:42
Ethylbenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Freon-113	38.0 U	75.9	23.5	ug/kg	1		08/31/22 16:42
Hexachlorobutadiene	7.60 U	15.2	4.71	ug/kg	1		08/31/22 16:42
Isopropylbenzene (Cumene)	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Methylene chloride	38.0 U	75.9	23.5	ug/kg	1		08/31/22 16:42
Methyl-t-butyl ether	38.0 U	75.9	23.5	ug/kg	1		08/31/22 16:42
Naphthalene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
n-Butylbenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
n-Propylbenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
o-Xylene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
P & M -Xylene	19.0 U	38.0	11.4	ug/kg	1		08/31/22 16:42
sec-Butylbenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Styrene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
tert-Butylbenzene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
Tetrachloroethene	4.75 U	9.49	2.96	ug/kg	1		08/31/22 16:42
Toluene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
trans-1,2-Dichloroethene	9.50 U	19.0	5.92	ug/kg	1		08/31/22 16:42
trans-1,3-Dichloropropene	4.75 U	9.49	2.96	ug/kg	1		08/31/22 16:42
Trichloroethene	3.79 U	7.59	2.43	ug/kg	1		08/31/22 16:42
Trichlorofluoromethane	19.0 U	38.0	11.4	ug/kg	1		08/31/22 16:42
Vinyl acetate	38.0 U	75.9	23.5	ug/kg	1		08/31/22 16:42
Vinyl chloride	0.303 U	0.607	0.190	ug/kg	1		08/31/22 16:42
Xylenes (total)	28.4 U	56.9	17.3	ug/kg	1		08/31/22 16:42
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	71-136		%	1		08/31/22 16:42
4-Bromofluorobenzene (surr)	94.2	55-151		%	1		08/31/22 16:42
Toluene-d8 (surr)	99.4	85-116		%	1		08/31/22 16:42

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Results of **106424-TP21S2**

Client Sample ID: **106424-TP21S2**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228007
Lab Project ID: 1225228

Collection Date: 08/18/22 14:35
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 16:42
Container ID: 1225228007-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 14:35
Prep Initial Wt./Vol.: 82.693 g
Prep Extract Vol: 29.6293 mL

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Results of **106424-TP23S1**

Client Sample ID: **106424-TP23S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228008
Lab Project ID: 1225228

Collection Date: 08/22/22 07:15
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.0
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	5.53		1.09	0.338	mg/kg	10		09/01/22 18:06
Barium	42.6		0.327	0.103	mg/kg	10		09/01/22 18:06
Cadmium	0.370		0.218	0.0677	mg/kg	10		09/01/22 18:06
Chromium	22.7		1.09	0.338	mg/kg	10		09/01/22 18:06
Lead	7.44		0.218	0.0677	mg/kg	10		09/01/22 18:06
Mercury	0.164	U	0.327	0.109	mg/kg	10		09/01/22 18:06
Selenium	1.09	U	2.18	0.677	mg/kg	10		09/01/22 18:06
Silver	0.273	U	0.546	0.164	mg/kg	10		09/01/22 18:06

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Analyst: DSD
Analytical Date/Time: 09/01/22 18:06
Container ID: 1225228008-A

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 09/01/22 08:08
Prep Initial Wt./Vol.: 1.053 g
Prep Extract Vol: 50 mL

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Results of **106424-TP23S1**

Client Sample ID: **106424-TP23S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228008
Lab Project ID: 1225228

Collection Date: 08/22/22 07:15
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
2-Methylnaphthalene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
Acenaphthene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
Acenaphthylene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
Anthracene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
Benzo(a)Anthracene	50.2	J	142	35.5	ug/kg	5		09/07/22 19:23
Benzo[a]pyrene	92.5	J	142	35.5	ug/kg	5		09/07/22 19:23
Benzo[b]Fluoranthene	99.3	J	142	35.5	ug/kg	5		09/07/22 19:23
Benzo[g,h,i]perylene	103	J	142	35.5	ug/kg	5		09/07/22 19:23
Benzo[k]fluoranthene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
Chrysene	47.2	J	142	35.5	ug/kg	5		09/07/22 19:23
Dibenzo[a,h]anthracene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
Fluoranthene	126	J	142	35.5	ug/kg	5		09/07/22 19:23
Fluorene	71.0	U	142	35.5	ug/kg	5		09/07/22 19:23
Indeno[1,2,3-c,d] pyrene	63.7	J	142	35.5	ug/kg	5		09/07/22 19:23
Naphthalene	56.5	U	113	28.4	ug/kg	5		09/07/22 19:23
Phenanthrene	75.8	J	142	35.5	ug/kg	5		09/07/22 19:23
Pyrene	106	J	142	35.5	ug/kg	5		09/07/22 19:23
Surrogates								
2-Methylnaphthalene-d10 (surr)	137	*	58-103		%	5		09/07/22 19:23
Fluoranthene-d10 (surr)	81.3		54-113		%	5		09/07/22 19:23

Batch Information

Analytical Batch: XMS13330
Analytical Method: 8270D SIM (PAH)
Analyst: NGG
Analytical Date/Time: 09/07/22 19:23
Container ID: 1225228008-A

Prep Batch: XXX46920
Prep Method: SW3550C
Prep Date/Time: 09/02/22 09:05
Prep Initial Wt./Vol.: 22.789 g
Prep Extract Vol: 5 mL

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Results of 106424-TP23S1

Client Sample ID: **106424-TP23S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228008
Lab Project ID: 1225228

Collection Date: 08/22/22 07:15
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	115 U	229	103	mg/kg	10		09/09/22 09:25
Surrogates							
5a Androstane (surr)	95.4	50-150		%	10		09/09/22 09:25

Batch Information

Analytical Batch: XFC16335
Analytical Method: AK102
Analyst: MAP
Analytical Date/Time: 09/09/22 09:25
Container ID: 1225228008-A

Prep Batch: XXX46921
Prep Method: SW3550C
Prep Date/Time: 09/02/22 09:56
Prep Initial Wt./Vol.: 30.11 g
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1990	1150	492	mg/kg	10		09/09/22 09:25
Surrogates							
n-Triacontane-d62 (surr)	93.2	50-150		%	10		09/09/22 09:25

Batch Information

Analytical Batch: XFC16335
Analytical Method: AK103
Analyst: MAP
Analytical Date/Time: 09/09/22 09:25
Container ID: 1225228008-A

Prep Batch: XXX46921
Prep Method: SW3550C
Prep Date/Time: 09/02/22 09:56
Prep Initial Wt./Vol.: 30.11 g
Prep Extract Vol: 5 mL

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Results of **106424-TP23S1**

Client Sample ID: **106424-TP23S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228008
Lab Project ID: 1225228

Collection Date: 08/22/22 07:15
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.0
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.26 J	2.77	0.830	mg/kg	1		09/08/22 07:37
Surrogates							
4-Bromofluorobenzene (surr)	100	50-150		%	1		09/08/22 07:37

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/08/22 07:37
Container ID: 1225228008-B

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 08/22/22 07:15
Prep Initial Wt./Vol.: 71.137 g
Prep Extract Vol: 34.2509 mL

Print Date: 09/15/2022 7:58:40AM

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Results of 106424-TP23S1

Client Sample ID: **106424-TP23S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228008
Lab Project ID: 1225228

Collection Date: 08/22/22 07:15
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.0
Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	11.1 U	22.1	6.86	ug/kg	1		08/31/22 17:00
1,1,1-Trichloroethane	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,1,2,2-Tetrachloroethane	1.11 U	2.21	0.686	ug/kg	1		08/31/22 17:00
1,1,2-Trichloroethane	0.555 U	1.11	0.553	ug/kg	1		08/31/22 17:00
1,1-Dichloroethane	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,1-Dichloroethene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,1-Dichloropropene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,2,3-Trichlorobenzene	55.5 U	111	33.2	ug/kg	1		08/31/22 17:00
1,2,3-Trichloropropane	1.11 U	2.21	0.686	ug/kg	1		08/31/22 17:00
1,2,4-Trichlorobenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,2,4-Trimethylbenzene	55.5 U	111	33.2	ug/kg	1		08/31/22 17:00
1,2-Dibromo-3-chloropropane	55.5 U	111	34.3	ug/kg	1		08/31/22 17:00
1,2-Dibromoethane	0.830 U	1.66	0.830	ug/kg	1		08/31/22 17:00
1,2-Dichlorobenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,2-Dichloroethane	1.11 U	2.21	0.775	ug/kg	1		08/31/22 17:00
1,2-Dichloropropane	5.55 U	11.1	5.53	ug/kg	1		08/31/22 17:00
1,3,5-Trimethylbenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,3-Dichlorobenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
1,3-Dichloropropane	5.55 U	11.1	3.43	ug/kg	1		08/31/22 17:00
1,4-Dichlorobenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
2,2-Dichloropropane	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
2-Butanone (MEK)	139 U	277	86.3	ug/kg	1		08/31/22 17:00
2-Chlorotoluene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
2-Hexanone	66.5 U	133	66.4	ug/kg	1		08/31/22 17:00
4-Chlorotoluene	11.1 U	22.1	11.1	ug/kg	1		08/31/22 17:00
4-Isopropyltoluene	44.3 U	88.6	44.3	ug/kg	1		08/31/22 17:00
4-Methyl-2-pentanone (MIBK)	139 U	277	86.3	ug/kg	1		08/31/22 17:00
Acetone	133 J	277	122	ug/kg	1		08/31/22 17:00
Benzene	6.90 U	13.8	4.32	ug/kg	1		08/31/22 17:00
Bromobenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Bromochloromethane	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Bromodichloromethane	1.11 U	2.21	0.686	ug/kg	1		08/31/22 17:00
Bromoform	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Bromomethane	11.1 U	22.1	8.86	ug/kg	1		08/31/22 17:00
Carbon disulfide	55.5 U	111	34.3	ug/kg	1		08/31/22 17:00
Carbon tetrachloride	6.90 U	13.8	4.32	ug/kg	1		08/31/22 17:00
Chlorobenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00

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Results of **106424-TP23S1**

Client Sample ID: **106424-TP23S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228008
Lab Project ID: 1225228

Collection Date: 08/22/22 07:15
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.0
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	111 U	221	68.6	ug/kg	1		08/31/22 17:00
Chloroform	3.32 U	6.64	3.32	ug/kg	1		08/31/22 17:00
Chloromethane	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
cis-1,2-Dichloroethene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
cis-1,3-Dichloropropene	6.90 U	13.8	4.32	ug/kg	1		08/31/22 17:00
Dibromochloromethane	2.77 U	5.53	1.66	ug/kg	1		08/31/22 17:00
Dibromomethane	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Dichlorodifluoromethane	55.5 U	111	33.2	ug/kg	1		08/31/22 17:00
Ethylbenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Freon-113	55.5 U	111	34.3	ug/kg	1		08/31/22 17:00
Hexachlorobutadiene	11.1 U	22.1	6.86	ug/kg	1		08/31/22 17:00
Isopropylbenzene (Cumene)	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Methylene chloride	55.5 U	111	34.3	ug/kg	1		08/31/22 17:00
Methyl-t-butyl ether	55.5 U	111	34.3	ug/kg	1		08/31/22 17:00
Naphthalene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
n-Butylbenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
n-Propylbenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
o-Xylene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
P & M -Xylene	27.6 U	55.3	16.6	ug/kg	1		08/31/22 17:00
sec-Butylbenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Styrene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
tert-Butylbenzene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
Tetrachloroethene	6.90 U	13.8	4.32	ug/kg	1		08/31/22 17:00
Toluene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
trans-1,2-Dichloroethene	13.9 U	27.7	8.63	ug/kg	1		08/31/22 17:00
trans-1,3-Dichloropropene	6.90 U	13.8	4.32	ug/kg	1		08/31/22 17:00
Trichloroethene	5.55 U	11.1	3.54	ug/kg	1		08/31/22 17:00
Trichlorofluoromethane	27.6 U	55.3	16.6	ug/kg	1		08/31/22 17:00
Vinyl acetate	55.5 U	111	34.3	ug/kg	1		08/31/22 17:00
Vinyl chloride	0.443 U	0.886	0.277	ug/kg	1		08/31/22 17:00
Xylenes (total)	41.5 U	83.0	25.2	ug/kg	1		08/31/22 17:00
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		08/31/22 17:00
4-Bromofluorobenzene (surr)	96.8	55-151		%	1		08/31/22 17:00
Toluene-d8 (surr)	97.8	85-116		%	1		08/31/22 17:00

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Results of **106424-TP23S1**

Client Sample ID: **106424-TP23S1**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228008
Lab Project ID: 1225228

Collection Date: 08/22/22 07:15
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):87.0
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 17:00
Container ID: 1225228008-B

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/22/22 07:15
Prep Initial Wt./Vol.: 71.137 g
Prep Extract Vol: 34.2509 mL

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Results of **106424-STB**

Client Sample ID: **106424-STB**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228009
Lab Project ID: 1225228

Collection Date: 08/18/22 08:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.24 J	2.51	0.753	mg/kg	1		09/07/22 19:09
Surrogates							
4-Bromofluorobenzene (surr)	107	50-150		%	1		09/07/22 19:09

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/07/22 19:09
Container ID: 1225228009-A

Prep Batch: VXX39136
Prep Method: SW5035A
Prep Date/Time: 08/18/22 08:00
Prep Initial Wt./Vol.: 49.805 g
Prep Extract Vol: 25 mL

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Results of **106424-STB**

Client Sample ID: **106424-STB**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228009
Lab Project ID: 1225228

Collection Date: 08/18/22 08:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	10.1 U	20.1	6.22	ug/kg	1		08/31/22 14:26
1,1,1-Trichloroethane	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,1,2,2-Tetrachloroethane	1.00 U	2.01	0.622	ug/kg	1		08/31/22 14:26
1,1,2-Trichloroethane	0.500 U	1.00	0.502	ug/kg	1		08/31/22 14:26
1,1-Dichloroethane	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,1-Dichloroethene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,1-Dichloropropene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,2,3-Trichlorobenzene	50.0 U	100	30.1	ug/kg	1		08/31/22 14:26
1,2,3-Trichloropropane	1.00 U	2.01	0.622	ug/kg	1		08/31/22 14:26
1,2,4-Trichlorobenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,2,4-Trimethylbenzene	50.0 U	100	30.1	ug/kg	1		08/31/22 14:26
1,2-Dibromo-3-chloropropane	50.0 U	100	31.1	ug/kg	1		08/31/22 14:26
1,2-Dibromoethane	0.755 U	1.51	0.753	ug/kg	1		08/31/22 14:26
1,2-Dichlorobenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,2-Dichloroethane	1.00 U	2.01	0.703	ug/kg	1		08/31/22 14:26
1,2-Dichloropropane	5.00 U	10.0	5.02	ug/kg	1		08/31/22 14:26
1,3,5-Trimethylbenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,3-Dichlorobenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
1,3-Dichloropropane	5.00 U	10.0	3.11	ug/kg	1		08/31/22 14:26
1,4-Dichlorobenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
2,2-Dichloropropane	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
2-Butanone (MEK)	126 U	251	78.3	ug/kg	1		08/31/22 14:26
2-Chlorotoluene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
2-Hexanone	60.0 U	120	60.2	ug/kg	1		08/31/22 14:26
4-Chlorotoluene	10.1 U	20.1	10.0	ug/kg	1		08/31/22 14:26
4-Isopropyltoluene	40.1 U	80.3	40.2	ug/kg	1		08/31/22 14:26
4-Methyl-2-pentanone (MIBK)	126 U	251	78.3	ug/kg	1		08/31/22 14:26
Acetone	126 U	251	110	ug/kg	1		08/31/22 14:26
Benzene	6.25 U	12.5	3.92	ug/kg	1		08/31/22 14:26
Bromobenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Bromochloromethane	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Bromodichloromethane	1.00 U	2.01	0.622	ug/kg	1		08/31/22 14:26
Bromoform	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Bromomethane	10.1 U	20.1	8.03	ug/kg	1		08/31/22 14:26
Carbon disulfide	50.0 U	100	31.1	ug/kg	1		08/31/22 14:26
Carbon tetrachloride	6.25 U	12.5	3.92	ug/kg	1		08/31/22 14:26
Chlorobenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26

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Results of **106424-STB**

Client Sample ID: **106424-STB**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228009
Lab Project ID: 1225228

Collection Date: 08/18/22 08:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	101 U	201	62.2	ug/kg	1		08/31/22 14:26
Chloroform	3.01 U	6.02	3.01	ug/kg	1		08/31/22 14:26
Chloromethane	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
cis-1,2-Dichloroethene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
cis-1,3-Dichloropropene	6.25 U	12.5	3.92	ug/kg	1		08/31/22 14:26
Dibromochloromethane	2.51 U	5.02	1.51	ug/kg	1		08/31/22 14:26
Dibromomethane	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Dichlorodifluoromethane	50.0 U	100	30.1	ug/kg	1		08/31/22 14:26
Ethylbenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Freon-113	50.0 U	100	31.1	ug/kg	1		08/31/22 14:26
Hexachlorobutadiene	10.1 U	20.1	6.22	ug/kg	1		08/31/22 14:26
Isopropylbenzene (Cumene)	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Methylene chloride	50.0 U	100	31.1	ug/kg	1		08/31/22 14:26
Methyl-t-butyl ether	50.0 U	100	31.1	ug/kg	1		08/31/22 14:26
Naphthalene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
n-Butylbenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
n-Propylbenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
o-Xylene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
P & M -Xylene	25.1 U	50.2	15.1	ug/kg	1		08/31/22 14:26
sec-Butylbenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Styrene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
tert-Butylbenzene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
Tetrachloroethene	6.25 U	12.5	3.92	ug/kg	1		08/31/22 14:26
Toluene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
trans-1,2-Dichloroethene	12.6 U	25.1	7.83	ug/kg	1		08/31/22 14:26
trans-1,3-Dichloropropene	6.25 U	12.5	3.92	ug/kg	1		08/31/22 14:26
Trichloroethene	5.00 U	10.0	3.21	ug/kg	1		08/31/22 14:26
Trichlorofluoromethane	25.1 U	50.2	15.1	ug/kg	1		08/31/22 14:26
Vinyl acetate	50.0 U	100	31.1	ug/kg	1		08/31/22 14:26
Vinyl chloride	0.402 U	0.803	0.251	ug/kg	1		08/31/22 14:26
Xylenes (total)	37.6 U	75.3	22.9	ug/kg	1		08/31/22 14:26
Surrogates							
1,2-Dichloroethane-D4 (surr)	107	71-136		%	1		08/31/22 14:26
4-Bromofluorobenzene (surr)	113	55-151		%	1		08/31/22 14:26
Toluene-d8 (surr)	98.2	85-116		%	1		08/31/22 14:26

J flagging is activated

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Results of **106424-STB**

Client Sample ID: **106424-STB**
Client Project ID: **106424-002 Kleop Station Impro**
Lab Sample ID: 1225228009
Lab Project ID: 1225228

Collection Date: 08/18/22 08:00
Received Date: 08/30/22 15:23
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/31/22 14:26
Container ID: 1225228009-A

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 08/18/22 08:00
Prep Initial Wt./Vol.: 49.805 g
Prep Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1842540 [MXX/35415]
Blank Lab ID: 1682785

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **SW6020B**

Parameter	Results	LOQ/CL	DL	Units
Arsenic	0.500U	1.00	0.310	mg/kg
Barium	0.150U	0.300	0.0940	mg/kg
Cadmium	0.100U	0.200	0.0620	mg/kg
Chromium	0.500U	1.00	0.310	mg/kg
Lead	0.100U	0.200	0.0620	mg/kg
Mercury	0.150U	0.300	0.100	mg/kg
Selenium	1.00U	2.00	0.620	mg/kg
Silver	0.250U	0.500	0.150	mg/kg

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Instrument: P7 Agilent 7800
Analyst: DSD
Analytical Date/Time: 9/1/2022 4:19:00PM

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 9/1/2022 8:08:58AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

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Duplicate Sample Summary

Original Sample ID: 1682784
Duplicate Sample ID: 1682790

Analysis Date: 09/01/2022 17:03
Matrix: Solid/Soil (Wet Weight)

QC for Samples:

1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **SW6020B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Lead	247	103	mg/kg	82.50*	(< 20)

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Instrument: P7 Agilent 7800
Analyst: DSD

Prep Batch: MXX35415
Prep Method: SW3050B
Prep Date/Time: 9/1/2022 8:08:58AM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [MXX35415]
Blank Spike Lab ID: 1682786
Date Analyzed: 09/01/2022 16:22

Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **SW6020B**

	Blank Spike (mg/kg)			
Parameter	Spike	Result	Rec (%)	CL
Arsenic	50	47.2	94	(82-118)
Barium	50	49.4	99	(86-116)
Cadmium	5	4.86	97	(84-116)
Chromium	20	19.4	97	(83-119)
Lead	50	49.1	98	(84-118)
Mercury	0.5	0.469	94	(74-126)
Selenium	50	48.5	97	(80-119)
Silver	5	4.88	98	(83-118)

Batch Information

Analytical Batch: **MMS11661**
Analytical Method: **SW6020B**
Instrument: **P7 Agilent 7800**
Analyst: **DSD**

Prep Batch: **MXX35415**
Prep Method: **SW3050B**
Prep Date/Time: **09/01/2022 08:08**
Spike Init Wt./Vol.: 50 mg/kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 09/15/2022 7:58:47AM

Matrix Spike Summary

Original Sample ID: 1682784
MS Sample ID: 1682788 MS
MSD Sample ID: 1682789 MSD

Analysis Date: 09/01/2022 16:25
Analysis Date: 09/01/2022 16:27
Analysis Date: 09/01/2022 16:57
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **SW6020B**

		Matrix Spike (mg/kg)				Spike Duplicate (mg/kg)							
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)		RPD CL
Arsenic	2.82	45.7	44.4	91		47.7	46.0	91		82-118	3.58		(< 20)
Barium	179	45.7	157	-49	*	47.7	146	-70	*	86-116	7.21		(< 20)
Cadmium	0.416	4.57	4.81	96		4.77	5.05	97		84-116	4.93		(< 20)
Chromium	6.21	18.3	23.8	97		19.1	24.7	97		83-119	3.38		(< 20)
Lead	247	45.7	302	119	*	47.7	176	-149	*	84-118	52.60	*	(< 20)
Mercury	0.150U	0.457	.463	101		0.477	0.486	102		74-126	4.82		(< 20)
Selenium	1.00U	45.7	44.4	97		47.7	44.5	93		80-119	0.31		(< 20)
Silver	0.455J	4.57	4.74	94		4.77	4.79	91		83-118	0.95		(< 20)

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Instrument: P7 Agilent 7800
Analyst: DSD
Analytical Date/Time: 9/1/2022 4:27:00PM

Prep Batch: MXX35415
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 9/1/2022 8:08:58AM
Prep Initial Wt./Vol.: 1.09g
Prep Extract Vol: 50.00mL

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Bench Spike Summary

Original Sample ID: 1682784
MS Sample ID: 1682787 BND
MSD Sample ID:

Analysis Date: 09/01/2022 16:25
Analysis Date: 09/01/2022 17:00
Analysis Date:
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **SW6020B**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Barium	179	250	425	98				75-125		
Lead	247	125	369	97				75-125		

Batch Information

Analytical Batch: MMS11661
Analytical Method: SW6020B
Instrument: P7 Agilent 7800
Analyst: DSD
Analytical Date/Time: 9/1/2022 5:00:00PM

Prep Batch: MXX35415
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 9/1/2022 8:08:58AM
Prep Initial Wt./Vol.: 1.00g
Prep Extract Vol: 50.00mL

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Method Blank

Blank ID: MB for HBN 1842405 [SPT/11615]
Blank Lab ID: 1682586

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT11615
Analytical Method: SM21 2540G
Instrument:
Analyst: ICC
Analytical Date/Time: 8/30/2022 5:40:00PM

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Duplicate Sample Summary

Original Sample ID: 1225209002
Duplicate Sample ID: 1682587
QC for Samples:

Analysis Date: 08/30/2022 17:40
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	96.6	96.6	%	0.04	(< 15)

Batch Information

Analytical Batch: SPT11615
Analytical Method: SM21 2540G
Instrument:
Analyst: ICC

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Duplicate Sample Summary

Original Sample ID: 1225209008
Duplicate Sample ID: 1682588

Analysis Date: 08/30/2022 17:40
Matrix: Soil/Solid (dry weight)

QC for Samples:

1225228001, 1225228002

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	97.7	97.6	%	0.10	(< 15)

Batch Information

Analytical Batch: SPT11615
Analytical Method: SM21 2540G
Instrument:
Analyst: ICC

Duplicate Sample Summary

Original Sample ID: 1225228002
Duplicate Sample ID: 1682589

Analysis Date: 08/30/2022 17:40
Matrix: Soil/Solid (dry weight)

QC for Samples:

1225228001, 1225228002, 1225228003

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	92.3	93.2	%	1.00	(< 15)

Batch Information

Analytical Batch: SPT11615
Analytical Method: SM21 2540G
Instrument:
Analyst: ICC

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Duplicate Sample Summary

Original Sample ID: 1225228003
Duplicate Sample ID: 1682590

Analysis Date: 08/30/2022 17:40
Matrix: Soil/Solid (dry weight)

QC for Samples:

1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.2	93.5	%	0.33	(< 15)

Batch Information

Analytical Batch: SPT11615
Analytical Method: SM21 2540G
Instrument:
Analyst: ICC

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Method Blank

Blank ID: MB for HBN 1842571 [VXX/39095]
Blank Lab ID: 1682968

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	10.0U	20.0	6.20	ug/kg
1,1,1-Trichloroethane	12.5U	25.0	7.80	ug/kg
1,1,2,2-Tetrachloroethane	1.00U	2.00	0.620	ug/kg
1,1,2-Trichloroethane	0.500U	1.00	0.500	ug/kg
1,1-Dichloroethane	12.5U	25.0	7.80	ug/kg
1,1-Dichloroethene	12.5U	25.0	7.80	ug/kg
1,1-Dichloropropene	12.5U	25.0	7.80	ug/kg
1,2,3-Trichlorobenzene	50.0U	100	30.0	ug/kg
1,2,3-Trichloropropane	1.00U	2.00	0.620	ug/kg
1,2,4-Trichlorobenzene	12.5U	25.0	7.80	ug/kg
1,2,4-Trimethylbenzene	50.0U	100	30.0	ug/kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/kg
1,2-Dibromoethane	0.750U	1.50	0.750	ug/kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/kg
1,2-Dichloroethane	1.00U	2.00	0.700	ug/kg
1,2-Dichloropropane	5.00U	10.0	5.00	ug/kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/kg
1,3-Dichlorobenzene	12.5U	25.0	7.80	ug/kg
1,3-Dichloropropane	5.00U	10.0	3.10	ug/kg
1,4-Dichlorobenzene	12.5U	25.0	7.80	ug/kg
2,2-Dichloropropane	12.5U	25.0	7.80	ug/kg
2-Butanone (MEK)	125U	250	78.0	ug/kg
2-Chlorotoluene	12.5U	25.0	7.80	ug/kg
2-Hexanone	60.0U	120	60.0	ug/kg
4-Chlorotoluene	10.0U	20.0	10.0	ug/kg
4-Isopropyltoluene	40.0U	80.0	40.0	ug/kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/kg
Acetone	125U	250	110	ug/kg
Benzene	6.25U	12.5	3.90	ug/kg
Bromobenzene	12.5U	25.0	7.80	ug/kg
Bromochloromethane	12.5U	25.0	7.80	ug/kg
Bromodichloromethane	1.00U	2.00	0.620	ug/kg
Bromoform	12.5U	25.0	7.80	ug/kg
Bromomethane	10.0U	20.0	8.00	ug/kg
Carbon disulfide	50.0U	100	31.0	ug/kg
Carbon tetrachloride	6.25U	12.5	3.90	ug/kg
Chlorobenzene	12.5U	25.0	7.80	ug/kg
Chloroethane	100U	200	62.0	ug/kg

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Method Blank

Blank ID: MB for HBN 1842571 [VXX/39095]
Blank Lab ID: 1682968

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Chloroform	3.00U	6.00	3.00	ug/kg
Chloromethane	12.5U	25.0	7.80	ug/kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/kg
cis-1,3-Dichloropropene	6.25U	12.5	3.90	ug/kg
Dibromochloromethane	2.50U	5.00	1.50	ug/kg
Dibromomethane	12.5U	25.0	7.80	ug/kg
Dichlorodifluoromethane	50.0U	100	30.0	ug/kg
Ethylbenzene	12.5U	25.0	7.80	ug/kg
Freon-113	50.0U	100	31.0	ug/kg
Hexachlorobutadiene	10.0U	20.0	6.20	ug/kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/kg
Methylene chloride	50.0U	100	31.0	ug/kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/kg
Naphthalene	12.5U	25.0	7.80	ug/kg
n-Butylbenzene	12.5U	25.0	7.80	ug/kg
n-Propylbenzene	12.5U	25.0	7.80	ug/kg
o-Xylene	12.5U	25.0	7.80	ug/kg
P & M -Xylene	25.0U	50.0	15.0	ug/kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/kg
Styrene	12.5U	25.0	7.80	ug/kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/kg
Tetrachloroethene	6.25U	12.5	3.90	ug/kg
Toluene	12.5U	25.0	7.80	ug/kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/kg
trans-1,3-Dichloropropene	6.25U	12.5	3.90	ug/kg
Trichloroethene	5.00U	10.0	3.20	ug/kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/kg
Vinyl acetate	50.0U	100	31.0	ug/kg
Vinyl chloride	0.400U	0.800	0.250	ug/kg
Xylenes (total)	37.5U	75.0	22.8	ug/kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	107	71-136		%
4-Bromofluorobenzene (surr)	112	55-151		%
Toluene-d8 (surr)	99.7	85-116		%

Print Date: 09/15/2022 7:58:54AM

Method Blank

Blank ID: MB for HBN 1842571 [VXX/39095]
Blank Lab ID: 1682968

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/31/2022 10:41:00AM

Prep Batch: VXX39095
Prep Method: SW5035A
Prep Date/Time: 8/31/2022 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [VXX39095]
Blank Spike Lab ID: 1682969
Date Analyzed: 08/31/2022 10:58

Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

Parameter	Blank Spike (ug/kg) Spike	Result	Rec (%)		CL
1,1,1,2-Tetrachloroethane	750	757	101		(78-125)
1,1,1-Trichloroethane	750	910	121		(73-130)
1,1,2,2-Tetrachloroethane	750	783	104		(70-124)
1,1,2-Trichloroethane	750	818	109		(78-121)
1,1-Dichloroethane	750	917	122		(76-125)
1,1-Dichloroethene	750	905	121		(70-131)
1,1-Dichloropropene	750	933	124		(76-125)
1,2,3-Trichlorobenzene	750	728	97		(66-130)
1,2,3-Trichloropropane	750	737	98		(73-125)
1,2,4-Trichlorobenzene	750	740	99		(67-129)
1,2,4-Trimethylbenzene	750	761	102		(75-123)
1,2-Dibromo-3-chloropropane	750	820	109		(61-132)
1,2-Dibromoethane	750	864	115		(78-122)
1,2-Dichlorobenzene	750	765	102		(78-121)
1,2-Dichloroethane	750	742	99		(73-128)
1,2-Dichloropropane	750	785	105		(76-123)
1,3,5-Trimethylbenzene	750	758	101		(73-124)
1,3-Dichlorobenzene	750	777	104		(77-121)
1,3-Dichloropropane	750	794	106		(77-121)
1,4-Dichlorobenzene	750	777	104		(75-120)
2,2-Dichloropropane	750	903	120		(67-133)
2-Butanone (MEK)	2250	2830	126		(51-148)
2-Chlorotoluene	750	752	100		(75-122)
2-Hexanone	2250	2330	103		(53-145)
4-Chlorotoluene	750	760	101		(72-124)
4-Isopropyltoluene	750	801	107		(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2270	101		(65-135)
Acetone	2250	2800	125		(36-164)
Benzene	750	926	123	*	(77-121)
Bromobenzene	750	761	101		(78-121)
Bromochloromethane	750	882	118		(78-125)
Bromodichloromethane	750	832	111		(75-127)
Bromoform	750	775	103		(67-132)
Bromomethane	750	913	122		(53-143)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [VXX39095]
Blank Spike Lab ID: 1682969
Date Analyzed: 08/31/2022 10:58

Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

	Blank Spike (ug/kg)				
Parameter	Spike	Result	Rec (%)		CL
Carbon disulfide	1130	1530	136	*	(63-132)
Carbon tetrachloride	750	948	126		(70-135)
Chlorobenzene	750	773	103		(79-120)
Chloroethane	750	860	115		(59-139)
Chloroform	750	919	123		(78-123)
Chloromethane	750	824	110		(50-136)
cis-1,2-Dichloroethene	750	847	113		(77-123)
cis-1,3-Dichloropropene	750	843	112		(74-126)
Dibromochloromethane	750	784	105		(74-126)
Dibromomethane	750	790	105		(78-125)
Dichlorodifluoromethane	750	808	108		(29-149)
Ethylbenzene	750	756	101		(76-122)
Freon-113	1130	1370	122		(66-136)
Hexachlorobutadiene	750	791	106		(61-135)
Isopropylbenzene (Cumene)	750	754	101		(68-134)
Methylene chloride	750	939	125		(70-128)
Methyl-t-butyl ether	1130	1380	123		(73-125)
Naphthalene	750	746	100		(62-129)
n-Butylbenzene	750	808	108		(70-128)
n-Propylbenzene	750	774	103		(73-125)
o-Xylene	750	757	101		(77-123)
P & M -Xylene	1500	1500	100		(77-124)
sec-Butylbenzene	750	801	107		(73-126)
Styrene	750	775	103		(76-124)
tert-Butylbenzene	750	799	106		(73-125)
Tetrachloroethene	750	777	104		(73-128)
Toluene	750	709	95		(77-121)
trans-1,2-Dichloroethene	750	931	124		(74-125)
trans-1,3-Dichloropropene	750	737	98		(71-130)
Trichloroethene	750	793	106		(77-123)
Trichlorofluoromethane	750	1050	140		(62-140)
Vinyl acetate	750	1000	134		(50-151)
Vinyl chloride	750	835	111		(56-135)
Xylenes (total)	2250	2260	100		(78-124)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [VXX39095]
Blank Spike Lab ID: 1682969
Date Analyzed: 08/31/2022 10:58

Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by SW8260D

Parameter	Blank Spike (ug/kg) Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750		107	(71-136)
4-Bromofluorobenzene (surr)	750		110	(55-151)
Toluene-d8 (surr)	750		97	(85-116)

Batch Information

Analytical Batch: **VMS21924**
Analytical Method: **SW8260D**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **S.S**

Prep Batch: **VXX39095**
Prep Method: **SW5035A**
Prep Date/Time: **08/31/2022 06:00**
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 09/15/2022 7:58:56AM

Matrix Spike Summary

Original Sample ID: 1682970
MS Sample ID: 1682971 MS
MSD Sample ID: 1682972 MSD

Analysis Date: 08/31/2022 15:00
Analysis Date: 08/31/2022 12:26
Analysis Date: 08/31/2022 12:43
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	7.55U	565	565	100	565	562	99	78-125	0.64	(< 20)
1,1,1-Trichloroethane	9.40U	565	562	100	565	567	100	73-130	0.87	(< 20)
1,1,2,2-Tetrachloroethane	0.755U	565	664	118	565	671	119	70-124	1.00	(< 20)
1,1,2-Trichloroethane	0.377U	565	654	116	565	660	117	78-121	0.90	(< 20)
1,1-Dichloroethane	9.40U	565	558	99	565	559	99	76-125	0.29	(< 20)
1,1-Dichloroethene	9.40U	565	559	99	565	570	101	70-131	2.00	(< 20)
1,1-Dichloropropene	9.40U	565	580	103	565	580	103	76-125	0.00	(< 20)
1,2,3-Trichlorobenzene	37.6U	565	573	101	565	628	111	66-130	9.20	(< 20)
1,2,3-Trichloropropane	0.755U	565	569	101	565	571	101	73-125	0.42	(< 20)
1,2,4-Trichlorobenzene	9.40U	565	575	102	565	598	106	67-129	4.00	(< 20)
1,2,4-Trimethylbenzene	37.6U	565	595	105	565	592	105	75-123	0.54	(< 20)
1,2-Dibromo-3-chloropropane	37.6U	565	616	109	565	630	111	61-132	2.20	(< 20)
1,2-Dibromoethane	0.565U	565	656	116	565	660	117	78-122	0.58	(< 20)
1,2-Dichlorobenzene	9.40U	565	577	102	565	576	102	78-121	0.31	(< 20)
1,2-Dichloroethane	0.755U	565	527	93	565	530	94	73-128	0.44	(< 20)
1,2-Dichloropropane	3.77U	565	589	104	565	589	104	76-123	0.01	(< 20)
1,3,5-Trimethylbenzene	9.40U	565	589	104	565	583	103	73-124	1.10	(< 20)
1,3-Dichlorobenzene	9.40U	565	584	103	565	580	103	77-121	0.65	(< 20)
1,3-Dichloropropane	3.77U	565	626	111	565	629	111	77-121	0.51	(< 20)
1,4-Dichlorobenzene	9.40U	565	581	103	565	576	102	75-120	0.91	(< 20)
2,2-Dichloropropane	9.40U	565	564	100	565	565	100	67-133	0.18	(< 20)
2-Butanone (MEK)	94.0U	1690	1650	97	1690	1690	100	51-148	2.40	(< 20)
2-Chlorotoluene	9.40U	565	605	107	565	593	105	75-122	2.00	(< 20)
2-Hexanone	45.2U	1690	1910	112	1690	1940	115	53-145	1.80	(< 20)
4-Chlorotoluene	7.55U	565	607	108	565	595	105	72-124	2.00	(< 20)
4-Isopropyltoluene	30.1U	565	617	109	565	612	108	73-127	0.81	(< 20)
4-Methyl-2-pentanone (MIBK)	94.0U	1690	1740	102	1690	1740	103	65-135	0.56	(< 20)
Acetone	94.0U	1690	1650	98	1690	1760	104	36-164	6.00	(< 20)
Benzene	4.71U	565	577	102	565	574	102	77-121	0.52	(< 20)
Bromobenzene	9.40U	565	566	100	565	564	100	78-121	0.40	(< 20)
Bromochloromethane	9.40U	565	534	95	565	537	95	78-125	0.63	(< 20)
Bromodichloromethane	0.755U	565	597	106	565	596	105	75-127	0.16	(< 20)
Bromoform	9.40U	565	569	101	565	569	101	67-132	0.02	(< 20)
Bromomethane	7.55U	565	513	91	565	513	91	53-143	0.05	(< 20)
Carbon disulfide	37.6U	847	920	109	847	933	110	63-132	1.40	(< 20)
Carbon tetrachloride	4.71U	565	591	105	565	591	105	70-135	0.04	(< 20)
Chlorobenzene	9.40U	565	574	102	565	572	101	79-120	0.36	(< 20)

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Matrix Spike Summary

Original Sample ID: 1682970
MS Sample ID: 1682971 MS
MSD Sample ID: 1682972 MSD

Analysis Date: 08/31/2022 15:00
Analysis Date: 08/31/2022 12:26
Analysis Date: 08/31/2022 12:43
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)						
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Chloroethane	75.5U	565	553	98	565	524	93		59-139	5.30	(< 20)
Chloroform	2.26U	565	559	99	565	560	99		78-123	0.27	(< 20)
Chloromethane	9.40U	565	405	72	565	414	73		50-136	2.30	(< 20)
cis-1,2-Dichloroethene	9.40U	565	534	95	565	540	96		77-123	1.30	(< 20)
cis-1,3-Dichloropropene	4.71U	565	623	110	565	622	110		74-126	0.19	(< 20)
Dibromochloromethane	1.89U	565	584	103	565	585	104		74-126	0.08	(< 20)
Dibromomethane	9.40U	565	560	99	565	563	100		78-125	0.61	(< 20)
Dichlorodifluoromethane	37.6U	565	326	58	565	326	58		29-149	0.05	(< 20)
Ethylbenzene	9.40U	565	574	102	565	574	102		76-122	0.02	(< 20)
Freon-113	37.6U	847	840	99	847	855	101		66-136	1.70	(< 20)
Hexachlorobutadiene	7.55U	565	736	130	565	788	140	*	61-135	6.90	(< 20)
Isopropylbenzene (Cumene)	9.40U	565	580	103	565	578	102		68-134	0.47	(< 20)
Methylene chloride	37.6U	565	547	97	565	562	100		70-128	2.80	(< 20)
Methyl-t-butyl ether	37.6U	847	812	96	847	836	99		73-125	2.90	(< 20)
Naphthalene	9.40U	565	575	102	565	613	109		62-129	6.50	(< 20)
n-Butylbenzene	9.40U	565	661	117	565	658	116		70-128	0.43	(< 20)
n-Propylbenzene	9.40U	565	616	109	565	607	107		73-125	1.50	(< 20)
o-Xylene	9.40U	565	584	103	565	585	104		77-123	0.23	(< 20)
P & M -Xylene	18.9U	1130	1160	102	1130	1160	103		77-124	0.17	(< 20)
sec-Butylbenzene	9.40U	565	634	112	565	622	110		73-126	1.90	(< 20)
Styrene	9.40U	565	595	105	565	599	106		76-124	0.66	(< 20)
tert-Butylbenzene	9.40U	565	617	109	565	602	107		73-125	2.50	(< 20)
Tetrachloroethene	4.71U	565	573	101	565	575	102		73-128	0.34	(< 20)
Toluene	9.40U	565	565	100	565	561	99		77-121	0.66	(< 20)
trans-1,2-Dichloroethene	9.40U	565	559	99	565	583	103		74-125	4.20	(< 20)
trans-1,3-Dichloropropene	4.71U	565	577	102	565	582	103		71-130	0.77	(< 20)
Trichloroethene	3.77U	565	572	101	565	572	101		77-123	0.00	(< 20)
Trichlorofluoromethane	18.9U	565	653	116	565	622	110		62-140	4.80	(< 20)
Vinyl acetate	37.6U	565	592	105	565	599	106		50-151	1.30	(< 20)
Vinyl chloride	0.301U	565	455	81	565	460	81		56-135	1.10	(< 20)
Xylenes (total)	28.3U	1690	1740	103	1690	1740	103		78-124	0.19	(< 20)
Surrogates											
1,2-Dichloroethane-D4 (surr)		565	524	93	565	529	94		71-136	0.88	
4-Bromofluorobenzene (surr)		942	672	71	942	659	70		55-151	2.00	
Toluene-d8 (surr)		565	572	101	565	570	101		85-116	0.36	

Print Date: 09/15/2022 7:58:57AM

Matrix Spike Summary

Original Sample ID: 1682970
MS Sample ID: 1682971 MS
MSD Sample ID: 1682972 MSD

Analysis Date:
Analysis Date: 08/31/2022 12:26
Analysis Date: 08/31/2022 12:43
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008, 1225228009

Results by **SW8260D**

Parameter	Sample	Matrix Spike (%) Spike	Matrix Spike (%) Result	Matrix Spike (%) Rec (%)	Spike Duplicate (%) Spike	Spike Duplicate (%) Result	Spike Duplicate (%) Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS21924
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/31/2022 12:26:00PM

Prep Batch: VXX39095
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 8/31/2022 6:00:00AM
Prep Initial Wt./Vol.: 66.38g
Prep Extract Vol: 25.00mL

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Method Blank

Blank ID: MB for HBN 1842870 [VXX/39136]
Blank Lab ID: 1684256

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.15J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	97.1	50-150		%

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: PHK
Analytical Date/Time: 9/7/2022 2:56:00PM

Prep Batch: VXX39136
Prep Method: SW5035A
Prep Date/Time: 9/7/2022 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [VXX39136]
Blank Spike Lab ID: 1684257
Date Analyzed: 09/07/2022 14:19

Spike Duplicate ID: LCSD for HBN 1225228 [VXX39136]
Spike Duplicate Lab ID: 1684258
Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228009

Results by AK101

Parameter	Blank Spike (mg/kg) Spike	Result	Rec (%)	Spike Duplicate (mg/kg) Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	14.2	113	12.5	14.1	113	(60-120)	0.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25		98	1.25		98	(50-150)	0.20	

Batch Information

Analytical Batch: **VFC16246**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39136**
Prep Method: **SW5035A**
Prep Date/Time: **09/07/2022 06:00**
Spike Init Wt./Vol.: 1.25 mg/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1842871 [VXX/39137]
Blank Lab ID: 1684259

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.12J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	91.1	50-150		%

Batch Information

Analytical Batch: VFC16246
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: PHK
Analytical Date/Time: 9/8/2022 4:34:00AM

Prep Batch: VXX39137
Prep Method: SW5035A
Prep Date/Time: 9/7/2022 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [VXX39137]
Blank Spike Lab ID: 1684260
Date Analyzed: 09/08/2022 03:58

Spike Duplicate ID: LCSD for HBN 1225228 [VXX39137]
Spike Duplicate Lab ID: 1684261
Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007, 1225228008

Results by AK101

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	14.4	115	12.5	14.0	112	(60-120)	3.30	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25		97	1.25		96	(50-150)	1.50	

Batch Information

Analytical Batch: **VFC16246**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39137**
Prep Method: **SW5035A**
Prep Date/Time: **09/07/2022 06:00**
Spike Init Wt./Vol.: 1.25 mg/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1842400 [XXX/46897]
Blank Lab ID: 1682566

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
Acenaphthene	12.5U	25.0	6.25	ug/kg
Acenaphthylene	12.5U	25.0	6.25	ug/kg
Anthracene	12.5U	25.0	6.25	ug/kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/kg
Chrysene	12.5U	25.0	6.25	ug/kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/kg
Fluoranthene	12.5U	25.0	6.25	ug/kg
Fluorene	12.5U	25.0	6.25	ug/kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/kg
Naphthalene	10.0U	20.0	5.00	ug/kg
Phenanthrene	12.5U	25.0	6.25	ug/kg
Pyrene	12.5U	25.0	6.25	ug/kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	93.3	58-103		%
Fluoranthene-d10 (surr)	101	54-113		%

Batch Information

Analytical Batch: XMS13323
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent 8890 GC/MS US2210A024
Analyst: NGG
Analytical Date/Time: 9/1/2022 8:51:00PM

Prep Batch: XXX46897
Prep Method: SW3550C
Prep Date/Time: 8/31/2022 8:31:05AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [XXX46897]
Blank Spike Lab ID: 1682567
Date Analyzed: 09/01/2022 21:07

Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007

Results by **8270D SIM (PAH)**

Parameter	Blank Spike (ug/kg) Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	102	92	(43-111)
2-Methylnaphthalene	111	104	94	(39-114)
Acenaphthene	111	112	101	(44-111)
Acenaphthylene	111	104	93	(39-116)
Anthracene	111	111	100	(50-114)
Benzo(a)Anthracene	111	108	97	(54-122)
Benzo[a]pyrene	111	112	101	(50-125)
Benzo[b]Fluoranthene	111	113	101	(53-128)
Benzo[g,h,i]perylene	111	108	98	(49-127)
Benzo[k]fluoranthene	111	111	100	(56-123)
Chrysene	111	112	101	(57-118)
Dibenzo[a,h]anthracene	111	109	99	(50-129)
Fluoranthene	111	110	99	(55-119)
Fluorene	111	108	97	(47-114)
Indeno[1,2,3-c,d] pyrene	111	110	99	(49-130)
Naphthalene	111	96.1	87	(38-111)
Phenanthrene	111	104	94	(49-113)
Pyrene	111	110	99	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111		87	(58-103)
Fluoranthene-d10 (surr)	111		93	(54-113)

Batch Information

Analytical Batch: **XMS13323**
Analytical Method: **8270D SIM (PAH)**
Instrument: **Agilent 8890 GC/MS US2210A024**
Analyst: **NGG**

Prep Batch: **XXX46897**
Prep Method: **SW3550C**
Prep Date/Time: **08/31/2022 08:31**
Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1225021001
MS Sample ID: 1682568 MS
MSD Sample ID: 1682569 MSD

Analysis Date: 09/01/2022 21:23
Analysis Date: 09/01/2022 21:39
Analysis Date: 09/01/2022 21:55
Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007

Results by **8270D SIM (PAH)**

		Matrix Spike (ug/kg)				Spike Duplicate (ug/kg)						
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1-Methylnaphthalene	25.9U	116	135	116	*	116	127	110		43-111	5.90	(< 20)
2-Methylnaphthalene	25.9U	116	142	116	*	116	138	113		39-114	3.00	(< 20)
Acenaphthene	25.9U	116	139	119	*	116	135	117	*	44-111	2.60	(< 20)
Acenaphthylene	25.9U	116	130	112		116	126	108		39-116	4.00	(< 20)
Anthracene	25.9U	116	132	113		116	131	113		50-114	1.00	(< 20)
Benzo(a)Anthracene	25.9U	116	122	104		116	123	106		54-122	0.37	(< 20)
Benzo[a]pyrene	25.9U	116	123	105		116	123	106		50-125	0.30	(< 20)
Benzo[b]Fluoranthene	25.9U	116	123	105		116	125	107		53-128	1.40	(< 20)
Benzo[g,h,i]perylene	25.9U	116	115	99		116	115	100		49-127	0.03	(< 20)
Benzo[k]fluoranthene	25.9U	116	123	105		116	121	104		56-123	2.20	(< 20)
Chrysene	25.9U	116	124	106		116	122	105		57-118	1.00	(< 20)
Dibenzo[a,h]anthracene	25.9U	116	115	99		116	116	100		50-129	0.63	(< 20)
Fluoranthene	25.9U	116	127	109		116	127	110		55-119	0.09	(< 20)
Fluorene	25.9U	116	131	112		116	129	112		47-114	0.90	(< 20)
Indeno[1,2,3-c,d] pyrene	25.9U	116	115	99		116	115	100		49-130	0.08	(< 20)
Naphthalene	20.7U	116	126	108		116	121	104		38-111	4.60	(< 20)
Phenanthrene	25.9U	116	127	108		116	125	107		49-113	1.60	(< 20)
Pyrene	25.9U	116	128	109		116	127	110		55-117	0.34	(< 20)
Surrogates												
2-Methylnaphthalene-d10 (surr)		116	124	106	*	116	122	105	*	58-103	2.40	
Fluoranthene-d10 (surr)		116	119	101		116	119	103		54-113	0.24	

Batch Information

Analytical Batch: XMS13323
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent 8890 GC/MS US2210A024
Analyst: NGG
Analytical Date/Time: 9/1/2022 9:39:00PM

Prep Batch: XXX46897
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 8/31/2022 8:31:05AM
Prep Initial Wt./Vol.: 22.64g
Prep Extract Vol: 5.00mL

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Method Blank

Blank ID: MB for HBN 1842535 [XXX/46905]
Blank Lab ID: 1682768

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	9.00	mg/kg
Surrogates				
5a Androstane (surr)	97.2	60-120		%

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: MAP
Analytical Date/Time: 9/1/2022 5:26:00AM

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 8/31/2022 2:41:37PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [XXX46905]
Blank Spike Lab ID: 1682769
Date Analyzed: 09/01/2022 05:57

Spike Duplicate ID: LCSD for HBN 1225228 [XXX46905]
Spike Duplicate Lab ID: 1682770
Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007

Results by **AK102**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	667	703	105	667	706	106	(75-125)	0.43	(< 20)
Surrogates									
5a Androstane (surr)	16.7		99	16.7		101	(60-120)	1.10	

Batch Information

Analytical Batch: **XFC16329**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **MAP**

Prep Batch: **XXX46905**
Prep Method: **SW3550C**
Prep Date/Time: **08/31/2022 14:41**
Spike Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL

Print Date: 09/15/2022 7:59:13AM

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Method Blank

Blank ID: MB for HBN 1842535 [XXX/46905]
Blank Lab ID: 1682768

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	50.0U	100	43.0	mg/kg
Surrogates				
n-Triacontane-d62 (surr)	99.4	60-120		%

Batch Information

Analytical Batch: XFC16329
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: MAP
Analytical Date/Time: 9/1/2022 5:26:00AM

Prep Batch: XXX46905
Prep Method: SW3550C
Prep Date/Time: 8/31/2022 2:41:37PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [XXX46905]
Blank Spike Lab ID: 1682769
Date Analyzed: 09/01/2022 05:57

Spike Duplicate ID: LCSD for HBN 1225228 [XXX46905]
Spike Duplicate Lab ID: 1682770
Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228001, 1225228002, 1225228003, 1225228004, 1225228005, 1225228006, 1225228007

Results by AK103

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	667	742	111	667	748	112	(60-120)	0.83	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7		111	16.7		111	(60-120)	0.42	

Batch Information

Analytical Batch: **XFC16329**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **MAP**

Prep Batch: **XXX46905**
Prep Method: **SW3550C**
Prep Date/Time: **08/31/2022 14:41**
Spike Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1842628 [XXX/46920]
Blank Lab ID: 1683175

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228008

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
Acenaphthene	12.5U	25.0	6.25	ug/kg
Acenaphthylene	12.5U	25.0	6.25	ug/kg
Anthracene	12.5U	25.0	6.25	ug/kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/kg
Chrysene	12.5U	25.0	6.25	ug/kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/kg
Fluoranthene	12.5U	25.0	6.25	ug/kg
Fluorene	12.5U	25.0	6.25	ug/kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/kg
Naphthalene	10.0U	20.0	5.00	ug/kg
Phenanthrene	12.5U	25.0	6.25	ug/kg
Pyrene	12.5U	25.0	6.25	ug/kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	93.2	58-103		%
Fluoranthene-d10 (surr)	98.1	54-113		%

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent 8890 GC/MS US2210A024
Analyst: NGG
Analytical Date/Time: 9/2/2022 1:10:00PM

Prep Batch: XXX46920
Prep Method: SW3550C
Prep Date/Time: 9/2/2022 9:05:00AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [XXX46920]
Blank Spike Lab ID: 1683176
Date Analyzed: 09/02/2022 13:26

Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228008

Results by 8270D SIM (PAH)

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	114	103	(43-111)
2-Methylnaphthalene	111	113	102	(39-114)
Acenaphthene	111	118	106	(44-111)
Acenaphthylene	111	114	103	(39-116)
Anthracene	111	118	106	(50-114)
Benzo(a)Anthracene	111	112	101	(54-122)
Benzo[a]pyrene	111	115	104	(50-125)
Benzo[b]Fluoranthene	111	114	103	(53-128)
Benzo[g,h,i]perylene	111	116	104	(49-127)
Benzo[k]fluoranthene	111	120	108	(56-123)
Chrysene	111	116	105	(57-118)
Dibenzo[a,h]anthracene	111	117	106	(50-129)
Fluoranthene	111	116	104	(55-119)
Fluorene	111	121	109	(47-114)
Indeno[1,2,3-c,d] pyrene	111	117	106	(49-130)
Naphthalene	111	89.4	81	(38-111)
Phenanthrene	111	116	104	(49-113)
Pyrene	111	115	104	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111		100	(58-103)
Fluoranthene-d10 (surr)	111		101	(54-113)

Batch Information

Analytical Batch: **XMS13325**
Analytical Method: **8270D SIM (PAH)**
Instrument: **Agilent 8890 GC/MS US2210A024**
Analyst: **NGG**

Prep Batch: **XXX46920**
Prep Method: **SW3550C**
Prep Date/Time: **09/02/2022 09:05**
Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1225209004
MS Sample ID: 1683177 MS
MSD Sample ID: 1683178 MSD

QC for Samples: 1225228008

Analysis Date: 09/02/2022 14:15
Analysis Date: 09/02/2022 14:31
Analysis Date: 09/02/2022 14:47
Matrix: Soil/Solid (dry weight)

Results by **8270D SIM (PAH)**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	13.1U	117	114	97	115	116	101	43-111	2.30	(< 20)
2-Methylnaphthalene	13.1U	117	114	97	115	115	100	39-114	1.30	(< 20)
Naphthalene	10.5U	117	110	93	115	108	94	38-111	1.30	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		117	111	95	115	112	97	58-103	0.79	
Fluoranthene-d10 (surr)		117	114	97	115	103	89	54-113	10.40	

Batch Information

Analytical Batch: XMS13325
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent 8890 GC/MS US2210A024
Analyst: NGG
Analytical Date/Time: 9/2/2022 2:31:00PM

Prep Batch: XXX46920
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 9/2/2022 9:05:00AM
Prep Initial Wt./Vol.: 22.50g
Prep Extract Vol: 5.00mL

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Method Blank

Blank ID: MB for HBN 1842632 [XXX/46921]
Blank Lab ID: 1683192

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228008

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	9.00	mg/kg
Surrogates				
5a Androstane (surr)	98.2	60-120		%

Batch Information

Analytical Batch: XFC16335
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: MAP
Analytical Date/Time: 9/9/2022 3:32:00AM

Prep Batch: XXX46921
Prep Method: SW3550C
Prep Date/Time: 9/2/2022 9:56:31AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [XXX46921]
Blank Spike Lab ID: 1683193
Date Analyzed: 09/09/2022 03:42

Spike Duplicate ID: LCSD for HBN 1225228 [XXX46921]
Spike Duplicate Lab ID: 1683194
Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228008

Results by **AK102**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	667	695	104	667	675	101	(75-125)	2.90	(< 20)
Surrogates									
5a Androstane (surr)	16.7		99	16.7		97	(60-120)	2.10	

Batch Information

Analytical Batch: **XFC16335**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **MAP**

Prep Batch: **XXX46921**
Prep Method: **SW3550C**
Prep Date/Time: **09/02/2022 09:56**
Spike Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1842632 [XXX/46921]
Blank Lab ID: 1683192

Matrix: Soil/Solid (dry weight)

QC for Samples:
1225228008

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	50.0U	100	43.0	mg/kg
Surrogates				
n-Triacontane-d62 (surr)	100	60-120		%

Batch Information

Analytical Batch: XFC16335
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: MAP
Analytical Date/Time: 9/9/2022 3:32:00AM

Prep Batch: XXX46921
Prep Method: SW3550C
Prep Date/Time: 9/2/2022 9:56:31AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225228 [XXX46921]
Blank Spike Lab ID: 1683193
Date Analyzed: 09/09/2022 03:42

Spike Duplicate ID: LCSD for HBN 1225228 [XXX46921]
Spike Duplicate Lab ID: 1683194
Matrix: Soil/Solid (dry weight)

QC for Samples: 1225228008

Results by **AK103**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	667	675	101	667	658	99	(60-120)	2.50	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7		105	16.7		104	(60-120)	1.80	

Batch Information

Analytical Batch: **XFC16335**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **MAP**

Prep Batch: **XXX46921**
Prep Method: **SW3550C**
Prep Date/Time: **09/02/2022 09:56**
Spike Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL

Print Date: 09/15/2022 7:59:31AM

profile#361385DBR

Revised Report - Revision 1 1225228

SGS North America I

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
(907) 561-2120
Fax (206) 695-6777

Date	Time	Sample ID	Total Containers	GRO-AK101 Amber HCl	VOCs- EPA Method 8260D Amber HCl	DRO/RRO- AK102/103 Amber 4C	PAHs- EPA Method 8270D SIM Amber 4C	RCRA Metals Amber 4C			
8/18/2022	7:50	106424-TP1S2	2	X	X	X	X	X			1AB
8/18/2022	8:20	106424-TP2S2	2	X	X	X	X	X			2AB
8/18/2022	9:18	106424-TP6S2	2	X	X	X	X	X			3AB
8/18/2022	10:05	106424-TP9S2	2	X	X	X	X	X			4AB
8/18/2022	12:05	106424-TP13S1	2	X	X	X	X	X			5AB
8/18/2022	13:00	106424-TP16S1	2	X	X	X	X	X			6AB
8/18/2022	14:35	106424-TP21S2	2	X	X	X	X	X			7AB
8/22/2022	7:15	106424-TP23S1	2	X	X	X	X	X			8AB
8-18-22	8:00	106424-STB	1	X	X						9A

Relinquished By:	Relinquished By:	Project Information
Signature:	Signature:	Project Number: 106424-002
Print Name: Chris Pepe	Print Name:	Project Name: Kleop Station Improvements
Company: Shannon & Wilson, Inc.	Company:	Contact: Russell Hepner
Date: 8-30-22	Date:	Sampler: ZJT
Time: 15:27	Time:	Special Instructions:

Received By:	Received By:	Sample Receipt
Signature:	Signature: DLF	Shipped Via: Hand Delivered
Print Name:	Print Name: Daniel Fennessy	
Company:	Company: SGS	Cooler Temperature Upon Arrival: 3.8°C D29
Date:	Date: 8/30/22	Sample Matrix: Water
Time:	Time: 15:23	10 Working DAY TAT

3.8°C

If present

SGS Workorder #: **1225228** 1225228

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		*Note:* Temperature and COC seal information is found on the chain of custody form
DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any containers received at non-compliant temperature: *(Use form FS-0029 if more space is needed)*		
Holding Time / Documentation / Sample Condition Requirements		*Note:* Refer to form F-083 "Sample Guide" for specific holding times and sample containers.
Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies. ***Note:*** *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*	Yes	
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	
Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
Were all soil VOAs received with a corresponding % solids container?	Yes	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with Methanol+BFB?	Yes	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1225228001-A	No Preservative Required	OK			
1225228001-B	Methanol field pres. 4 C	OK			
1225228002-A	No Preservative Required	OK			
1225228002-B	Methanol field pres. 4 C	OK			
1225228003-A	No Preservative Required	OK			
1225228003-B	Methanol field pres. 4 C	OK			
1225228004-A	No Preservative Required	OK			
1225228004-B	Methanol field pres. 4 C	OK			
1225228005-A	No Preservative Required	OK			
1225228005-B	Methanol field pres. 4 C	OK			
1225228006-A	No Preservative Required	OK			
1225228006-B	Methanol field pres. 4 C	OK			
1225228007-A	No Preservative Required	OK			
1225228007-B	Methanol field pres. 4 C	OK			
1225228008-A	No Preservative Required	OK			
1225228008-B	Methanol field pres. 4 C	OK			
1225228009-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

ATTACHMENT 4

IMPORTANT INFORMATION ABOUT YOUR

GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 106424-002

Date: February 2023
To: MOA
Attn: Timothy Huntting

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE PHASE II

19-01b

V

TEMPORARY CONSTRUCTION PERMITS AND EASEMENTS

Intergovernmental Use Permit
Chugach Electric Association (CEA) Agreement
Easement Acquisition Map – included as a placeholder for easements

A
L
A
S
K
A

2025-009704-0
Recording Dist: 301 - Anchorage
4/16/2025 02:40 PM Pages: 1 of 4

Please return to:
Municipality of Anchorage
Project Management & Engineering
P.O. Box 196650
Anchorage, Alaska 99519-6650
Attn: Martha Robinson

MOA/PM&E/ROW
West Anchorage Snow Disposal Site
PM&E# 19-01
Tax # 012-581-13
MOA Parcel 3

INTRAGOVERNMENTAL USE PERMIT

The Municipality of Anchorage, acting by and through the **Heritage Land Bank**, whose mailing address is P.O. Box 196650, Anchorage, AK 99519-6650, hereinafter called the PERMITTER, hereby grants authority to the **Project Management and Engineering Department**, a municipal agency, whose mailing address is P.O. Box 196650, Anchorage, AK 99519-6650 hereinafter called the PERMITTEE, and to its successors, assigns, licenses and permittees, a sole and exclusive permit to construct, reconstruct, maintain, repair, operate and improve a public street, highway, walkway, trail, drainage facility, transit facility and/or electrical, telephone or telecommunications, gas, water, sewer, or other utility transmission or distribution facilities together with the right to license, permit, or otherwise agree to the exercise of these rights by any other person, or entity through, across, over and under lands of the PERMITTER, more particularly described as follows, to wit:

> An Intragovernmental Use Permit located within Lot 1, Raspberry Road Municipal Land Selection Site, ASLS 97-10, filed as Plat No. 99-102 in the Anchorage Recording District, Third Judicial District, State of Alaska, containing 78,678 square feet, more or less. See Exhibits A and B.

It is agreed that this Intragovernmental Use Permit shall be converted to a Public Use Easement in perpetuity conveying the aforementioned rights to the Municipality of Anchorage, if said property is conveyed to an owner other than the Municipality of Anchorage.

PERMITTER: Heritage Land Bank

Tiffany E Briggs ______________________ 04/16/2025

By: Tiffany E. Briggs Date:
Its: Director, Real Estate Dept. & Heritage Land Bank

STATE OF ALASKA)
)ss.
THIRD JUDICIAL DISTRICT)

The foregoing instrument was acknowledged before me this 16th day of April, 2025 by Tiffany E. Briggs, Director of the Real Estate Department and Heritage Land Bank.

Martha Robinson
Notary Public for the State of Alaska
My Commission Expires: 03-08-2029

MARTHA ROBINSON
NOTARY PUBLIC
STATE OF ALASKA

eRecorded Document

EXHIBIT A
LEGAL DESCRIPTION

Intragovernmental Use Permit
Parcel No. 3
Lot 1, Raspberry Road Municipal Land Selection Site, ASLS 97-10, Plat No. 99-102
West Anchorage Snow Disposal Site, Project No. 19-01

Bearings for this description are based on the Anchorage Bowl 2000 coordinate system.

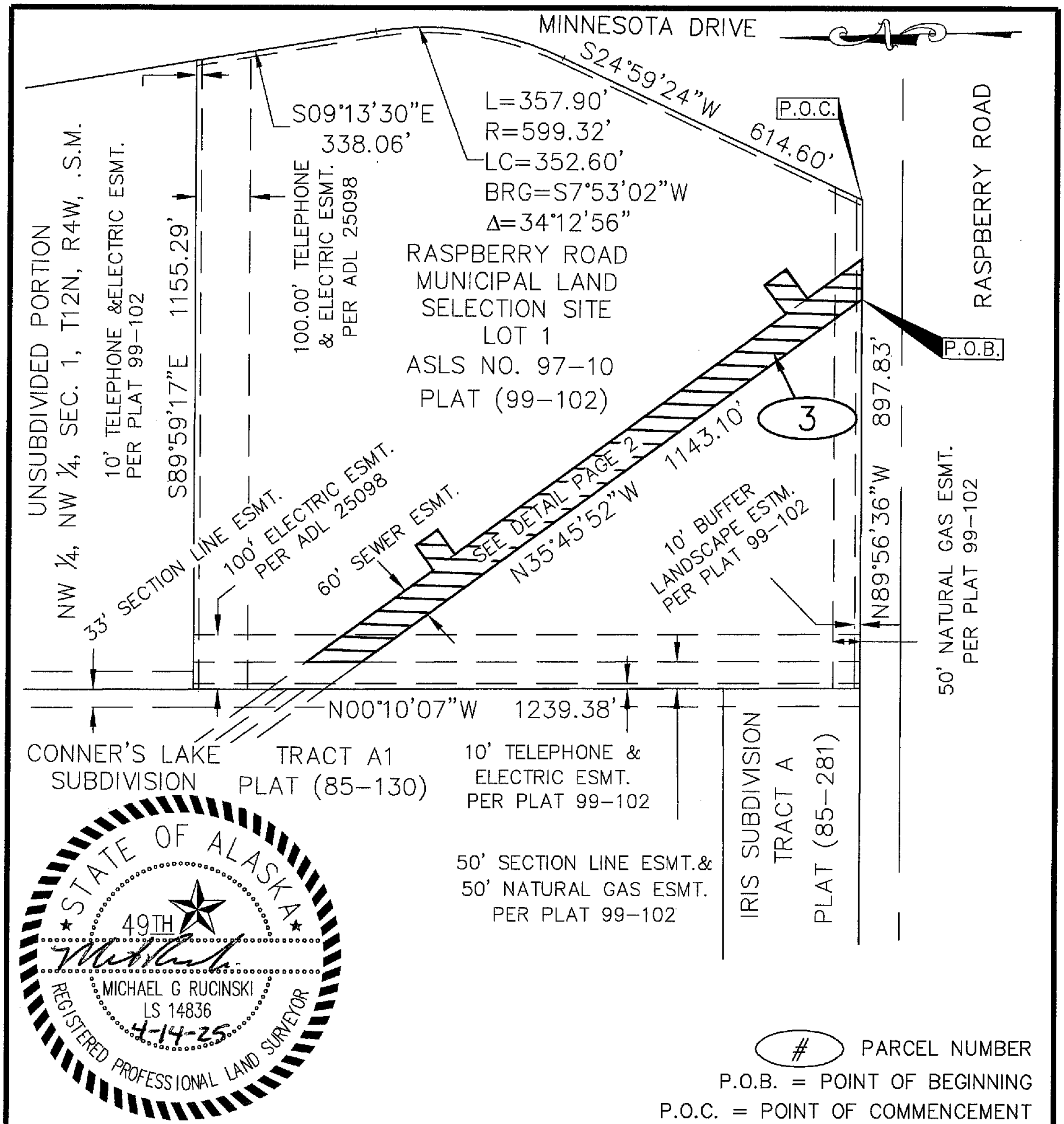
A portion of Lot 1, Raspberry Road Municipal Land Selection Site, ASLS 97-10, filed as Plat No. 99-102 in the Anchorage Recording District, Third Judicial District, State of Alaska, being more fully described as follows:

Commencing at the southeast property corner thence, N89°56'36"W a distance of 108.47 feet on the south property line to the TRUE POINT OF BEGINNING; thence N89°56'36"W a distance of 74.00 feet, thence N35°45'52"W a distance of 1,143.10 feet, thence N00°10'07"W distance of 103.08 feet, thence S35°45'52"E distance of 289.27 feet, thence N54°18'18"E a distance of 55.79 feet, thence S35°44'38"E a distance of 50.00 feet, thence S54°18'18"W a distance of 55.77 feet, thence S35°45'52"E a distance of 756.83 feet, thence N53°19'37"E a distance of 66.06 feet, thence S36°43'25"E a distance of 48.43 feet, thence S51°59'10"W a distance of 66.92 feet, thence S35°45'52"E a distance of 124.12 feet to TRUE POINT OF BEGINNING..

Said easement embraces an area of 78,678 square feet, more or less.

This easement is subject to an existing sanitary sewer easement, a natural gas easement, and a buffer landscape easement.

STATE OF ALASKA
49TH
MICHAEL G RUCINSKI
LS 14836
4-14-25
REGISTERED PROFESSIONAL LAND SURVEYOR



(#) PARCEL NUMBER

P.O.B. = POINT OF BEGINNING

P.O.C. = POINT OF COMMENCEMENT

INTRAGOVERNMENTAL USE PERMIT (IGP)

Basis of Bearing = Anchorage Bowl 2000

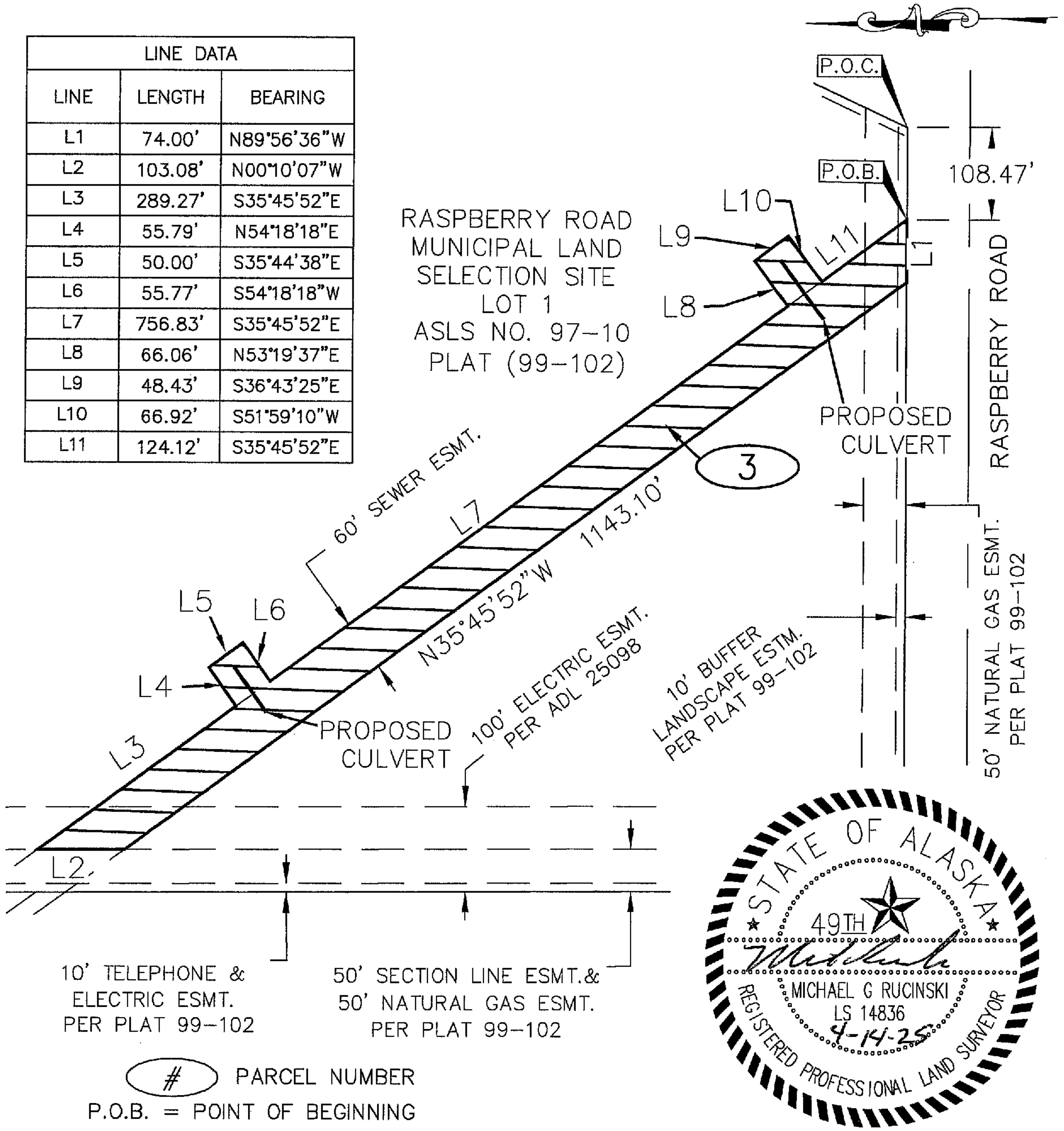
EXHIBIT B

Page 1 of 2

PTS INC., 912 E 15TH AVE SUITE 200, ANCHORAGE 99501, INFO@PTSINCALASKA.COM, 907-561-6237, AECC924

PUBLIC WORKS DEPARTMENT PROJECT MANAGEMENT & ENGINEERING DEVISION	**WEST ANCHORAGE SNOW DISPOSAL SITE PM&E # 19-01**
MUNICIPALITY OF ANCHORAGE OWNER'S INITIALS: TCB PAGE 3 OF 4 DATED 4-16-25	PARCEL TAXABLE AREA: ± **1,386,950 S.F.** ROW ACQUISITION TYPE: ± **IGP** ROW ACQUISITION AREA: ± **78,678 S.F.** SCALE: 1"=300' DATE: 3/5/25 GRID: SW2027 PARCEL No. 3

LINE DATA		
LINE	LENGTH	BEARING
L1	74.00'	N89°56'36"W
L2	103.08'	N00°10'07"W
L3	289.27'	S35°45'52"E
L4	55.79'	N54°18'18"E
L5	50.00'	S35°44'38"E
L6	55.77'	S54°18'18"W
L7	756.83'	S35°45'52"E
L8	66.06'	N53°19'37"E
L9	48.43'	S36°43'25"E
L10	66.92'	S51°59'10"W
L11	124.12'	S35°45'52"E



(#) PARCEL NUMBER

P.O.B. = POINT OF BEGINNING

P.O.C. = POINT OF COMMENCEMENT

INTRAGOVERNMENTAL USE PERMIT (IGP)

Basis of Bearing = Anchorage Bowl 2000

EXHIBIT B

Page 2 of 2

PTS INC., 912 E 15TH AVE SUITE 200, ANCHORAGE 99501, INFO@PTSINCALASKA.COM, 907-561-6237, AECC924

PUBLIC WORKS DEPARTMENT
PROJECT MANAGEMENT & ENGINEERING DEVISION

WEST ANCHORAGE SNOW DISPOSAL SITE PM&E # 19-01

MUNICIPALITY OF ANCHORAGE

OWNER'S INITIALS: TEB

PAGE 4 OF 4 DATED 4-16-25

PARCEL TAXABLE AREA: ± **1,386,950 S.F.**
ROW ACQUISITION TYPE: ± **IGP**
ROW ACQUISITION AREA: ± **78,678 S.F.**

SCALE: 1"=200'
GRID: SW2027
DATE: 3/5/25
PARCEL No. 3

CHUGACH ELECTRIC ASSOCIATION, INC.
Anchorage, Alaska

AGREEMENT REGARDING CONSENT TO USE EASEMENT AREA

This AGREEMENT REGARDING CONSENT TO USE EASEMENT AREA ("Agreement") is made this ____ day of ______, 2024 by and between: **Municipality of Anchorage** acting through its Project Management and Engineering Department (hereinafter collectively referred to as ("**MOA**"), whose address is 4700 Elmore Rd. Anchorage, AK 99507, and **Chugach Electric Association, Inc.**, an Alaska nonprofit electric cooperative membership corporation, whose address is 5601 Electron Dr. Anchorage, Alaska 99519 (**"Chugach")**.

RECITALS

WHEREAS, Chugach is the holder of rights of way and easements as described in Attachments A, B, and C to this Agreement and as further described below:

> Easement located within Tract 3B, International East Subdivistion, recorded as Plat 99-10, and Tract 3B, Connor's Lake Subdivision, recorded as Plat 85-130. ("Easement Area");

WHEREAS, MOA is the present property owner of the lands in the Easement Area;

WHEREAS, MOA desires to access and transport snow across ("Activities") the Easement Area as needed for municipal snow management, disposal, and storage purposes ("Purpose"), the location of such desired Activities being more specifically described in Attachment D;

WHEREAS, Chugach is willing to consent to the above described use of the Easement Area, subject to the following terms and conditions:

AGREEMENT

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. Chugach hereby offers no objection to MOA, insofar as MOA has the right to do so, accessing the Easement Area to perform the Activities as needed to accomplish the Purpose.

2. MOA accepts this consent with full knowledge of Chugach's prior rights and existing facilities and agrees that it will (a) strictly follow the *Electrical Facility Clearance Requirements* ("Clearance Requirements") described in **Exhibit A** attached hereto, at all times while conducting the Activities under this Agreement, (b) coordinate with Chugach staff to monitor activities near

Chugach facilities as described in the Clearance Requirements, and (c) design, construction and operation of the snow dump access shall be in compliance with clearance requirements established in the National Electric Safety Code ("NESC").

3. MOA agrees that no grading cuts will be allowed over the Easement Area absent Chugach's prior written approval and consent.

4. MOA agrees that except for the improvements identified in Attachment D, no roads, driveways, streets, walkways, permanent structures, additional facilities, vegetation, or other improvements will be installed or located on, in, over, or under the Easement Area without Chugach's prior written consent.

5. Chugach retains all existing rights related to the Easement Area including the right to cut or dig up any roads, driveways, streets, walkways, or other improvements of any kind ("Improvements") that MOA may construct or locate within any portion of the Easement Area, provided, however, Chugach agrees not to alter any roads, driveways, streets, walkways or other improvements without MOA's prior written consent.

6. MOA agrees to access the Easement Area to perform the Activities for the Purpose in a manner which shall minimize interference with Chugach's use of the Easement Area, and otherwise in accordance with this Agreement.

7. The snow disposal facility is intended to be permanent, but if MOA chooses to permanently close the facility, MOA shall supply Chugach with written notice of its intent to do so. ("Termination Notice"). This Agreement shall terminate upon the date identified in the Termination Notice ("Termination Date").

8. Notices under this permit shall be given to:

<u>If to Permittee:</u>

Municipality of Anchorage
Project Management and Engineering Department
Attn: Melinda Kohlaas
P.O. Box 196650
Anchorage, AK 99519-6650
Email: melinda.kohlhaas@anchorageak.gov

<u>If to Chugach:</u>
Chugach Electric Association, Inc
Attn: Cynthia Coughlin
5601 Electron Drive
Anchorage, Alaska 99519
Email: cynthia_coughlin@chugachelectric.com

9. On or before the Termination Date, or within 60 days following any termination of this Agreement for any other reason, MOA shall:

a. abandon the access road, including culverts, in place;

b. remove any and all of its property from the Easement Area, including, without limitation, MOA's equipment, signage, lighting, fencing, traffic control devices, etc.;

c. restore the Easement Area outside of the road prism to its condition immediately prior to MOA's initial entry to the Easement Area;

d. repair any damages to the Easement Area caused in whole or in part by MOA's use of or access to the Easement Area (or use of or access to the Easement Area by any of its agents, employees, or contractors); and

e. otherwise comply with its obligations under this Agreement, including, without limitation, Section 10 hereof.

10. MOA shall:

a. comply with any federal, state, or local laws, regulations, or ordinances applicable to MOA's performance of the Activities;

b. prior to entering onto the Easement Area and commencing the Activities, deliver to Chugach all required licenses and permits and proof of insurance required by this Agreement;

c. maintain the Easement Area at all times in a clean, orderly, and safe condition; and

d. not cause any third-party lien or claim to encumber the Easement Area. MOA shall immediately discharge of record any such lien or claim at MOA's sole cost and expense (which obligation shall survive any cancellation, expiration, or termination, for any reason, of this Agreement).

11. In the event of MOA's failure to timely and properly vacate the Easement Area, then Chugach shall have the right to enforce any rights and remedies Chugach may have under this Agreement at law or in equity. This Section 11 shall survive any cancellation, expiration, or termination, for any reason, of this Agreement.

12. Until the Termination Date, MOA shall maintain, or cause to be maintained, a policy of commercial general liability insurance, issued by an insurance company reasonably acceptable to Chugach, with a combined single limit of not less than Two Million Dollars ($2,000,000.00) naming Chugach and its agents, contractors, and any other third parties required by Chugach as additional insureds, insuring against any injury or damage to persons or Easement Area that may result from MOA's use of or access to the Easement Area in accordance with this Agreement. All insurance shall be effective through the Termination Date. A copy of the insurance policy, or other evidence satisfactory to Chugach, shall be submitted to Chugach prior to MOA's initial entry onto the Easement Area. MOA

13. Chugach and its officers, employees, directors, trustees, agents, invitees, successors, and assigns shall have no responsibility, obligation, or liability whatsoever to MOA or its agents, employees, or contractors, for any occurrence on or about the Easement Area or with respect to any property of MOA or its agents, employees, or contractors, including, without limitation, any loss, injury, or damage, all of such obligations or liabilities being hereby waived and released to the extent permitted by law other than as caused by the gross negligence or willful misconduct of Chugach.

14. MOA shall indemnify, defend, and hold harmless Chugach and its officers, directors, members, partners, employees, agents, affiliates, successors, assigns, and contractors, (collectively, "**Indemnified Parties**") from and against any and all claims made or judicial or administrative actions filed (including, without limitation, reasonable attorneys' fees) suffered or incurred by Chugach or any other Indemnified Parties arising out of or in connection with: (a) any violation of, or failure to comply with, the provisions of this Agreement by MOA; (b) the Activities; or (c) any other activity conducted by MOA, its agents, employees, or contractors in connection with: (i) its access to the Easement Area; or (ii) the exercise of MOA's rights under this Agreement. The indemnity obligations outlined herein shall survive any cancellation, expiration, or termination, for any reason, of this Agreement.

15. MOA acknowledges and understands that Chugach makes no representation or warranty whatsoever, express or implied, with respect to the Easement Area, including, without limitation, any hazards or dangers found at the Easement Area. Grantee understands and acknowledges that it enters the Easement Area and performs the Activities at its own risk.

16. In the event of any uncured breach or default by MOA hereunder, after written notice to MOA and a reasonable opportunity to cure, Chugach may, effective immediately upon notice to MOA, terminate this Agreement.

17. MOA shall be solely responsible for the costs and expenses of any and all Activities performed by or on behalf of MOA, and MOA shall not seek or be entitled to any reimbursement or contribution from Chugach for any portion of such costs or expenses.

18. Each and all of the rights of MOA under this Agreement, shall terminate effective immediately upon any termination of this Agreement for any reason. Notwithstanding the foregoing or any other provision of this Agreement, the obligations of MOA hereunder shall survive termination this Agreement.

19. If any term in this Agreement is deemed unenforceable, such term shall be deemed independent from the remainder of this Agreement, the enforceability of which shall in no way be affected thereby, and the term in question shall be deemed to be rewritten so as to be enforceable to the fullest extent possible consistent with parties' intent.

20. No purported alteration, amendment, change, waiver, termination or other modification of this Agreement (including any exhibit) shall be binding upon either party or have any other force or effect unless the same shall be in writing and signed by or on behalf of the party to be charged therewith.

21. All prior understandings and agreements among the parties concerning the matters covered by this Agreement are merged in this Agreement, which alone fully and completely express the understandings among the parties thereto and which are entered into after full investigation. This Agreement shall be given a fair and reasonable construction in accordance with the parties' intent and without regard to or aid of canons requiring construction against the party responsible for the drafting of the same.

22. No failure or delay of any party in the exercise of any right given to such party hereunder, or the waiver by any party of any condition hereunder for its benefit, shall constitute a waiver of any other or further right, nor shall any single or partial exercise of any right preclude other or further exercise thereof or any other right. The waiver of any breach shall not be deemed to be a waiver of any other or subsequent breach hereof.

23. This Agreement and the rights of MOA hereunder may not be assigned by MOA without Chugach's prior written consent.

24. This Agreement shall be governed by the laws and jurisdiction of the State of Alaska without reference to conflicts of laws principles that would result in the application of the laws of any other jurisdiction.

Permitee
MUNICIPALITY OF ANCHORAGE, ALASKA

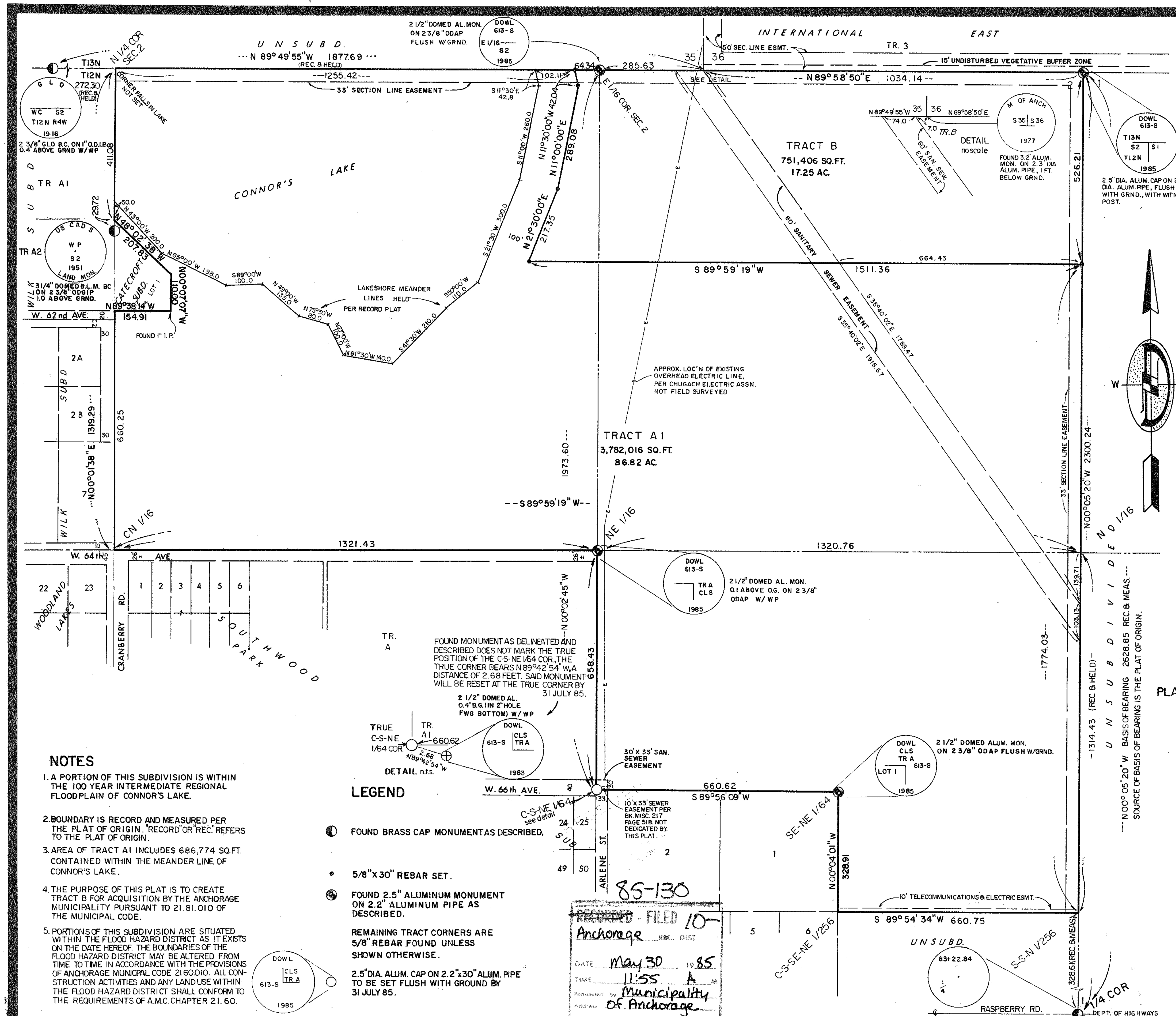
By ________________________________
Name:
Title:

CHUGACH ELECTRIC ASSOCIATION, INC.

By ________________________________
Name:
Title:

Attachment A

80745



NOTES

1. A PORTION OF THIS SUBDIVISION IS WITHIN THE 100 YEAR INTERMEDIATE REGIONAL FLOODPLAIN OF CONNOR'S LAKE.
2. BOUNDARY IS RECORD AND MEASURED PER THE PLAT OF ORIGIN. "RECORD" OR "REC." REFERS TO THE PLAT OF ORIGIN.
3. AREA OF TRACT A1 INCLUDES 686,774 SQ.FT. CONTAINED WITHIN THE MEANDER LINE OF CONNOR'S LAKE.
4. THE PURPOSE OF THIS PLAT IS TO CREATE TRACT B FOR ACQUISITION BY THE ANCHORAGE MUNICIPALITY PURSUANT TO 21.81.010 OF THE MUNICIPAL CODE.
5. PORTIONS OF THIS SUBDIVISION ARE SITUATED WITHIN THE FLOOD HAZARD DISTRICT AS IT EXISTS ON THE DATE HEREOF. THE BOUNDARIES OF THE FLOOD HAZARD DISTRICT MAY BE ALTERED FROM TIME TO TIME IN ACCORDANCE WITH THE PROVISIONS OF ANCHORAGE MUNICIPAL CODE 21.60.010. ALL CONSTRUCTION ACTIVITIES AND ANY LAND USE WITHIN THE FLOOD HAZARD DISTRICT SHALL CONFORM TO THE REQUIREMENTS OF A.M.C. CHAPTER 21.60.

LEGEND

- FOUND BRASS CAP MONUMENTAS DESCRIBED.
- 5/8"X30" REBAR SET.
- FOUND 2.5" ALUMINUM MONUMENT ON 2.2" ALUMINUM PIPE AS DESCRIBED.

REMAINING TRACT CORNERS ARE 5/8" REBAR FOUND UNLESS SHOWN OTHERWISE.

2.5" DIA. ALUM. CAP ON 2.2"x30" ALUM. PIPE TO BE SET FLUSH WITH GROUND BY 31 JULY 85.

85-130

~~RECORDED~~ - FILED 10 - Anchorage REC. DIST
DATE May 30 1985
TIME 11:55 A
Requested by Municipality Of Anchorage

CERTIFICATE OF OWNERSHIP and DEDICATION

I (we), hereby certify that I (we) hold the herein specified property interest in the property described hereon. I (we) hereby dedicate to the Municipality of Anchorage all areas depicted for use as public utility easements, streets, alleys, thoroughfares, parks, and other public areas shown hereon. There shall be reserved adjacent to the dedicated streets shown hereon, a slope reservation easement sufficient to contain cut and fill slopes of 1.5 feet horizontal for each 1 foot vertical (1.5 to 1) of cut or fill for the purpose of providing and maintaining the lateral support of the constructed streets. There is reserved to the grantors, their heirs, successors and assigns, the right to use such areas at any time upon providing and maintaining other adequate lateral support, as approved by the Municipality.

I (we) hereby agree to this plat, and to any restriction or covenent appearing hereon and any such restriction or covenant shall be binding and enforceable against present and successive owners of this subdivided property.

Owner:

Duane Heyman PRESIDENT
Swamp Rats
by Jack White Co., General Partner
by Duane Heyman, Pres.
3201 C Street
Anchorage, Ak. 99503

Subscribed and sworn to before me this 14th day of March, 1985
Personally appeared Duane Heyman
My commission expires 10/16/85
Notary Public

Beneficiaries:

Henry P. Cate, Sr.
Henry P. Cate, Sr.
and for
Julia H. Cate, bk. P/A 16 p. 417
Henry Pratt Cate, Jr., bk. P/A 16 p. 413
Esko George Cate, Sr., bk. P/A 16 p. 415
Carole Cummings Cate, bk. P/A 16 p. 415
Emma Louise Cate, bk. P/A 16 p. 413
} by Henry P. Cate, Sr., per power of attorneys recorded in Anchorage, Ak.

Subscribed and sworn to before me this 7th day of March 1985

Personally Appeared Henry P. Cate, Sr.
Jan 2, 1988
My Commission Expires
Rose Teresa Vermiglio
Notary Public

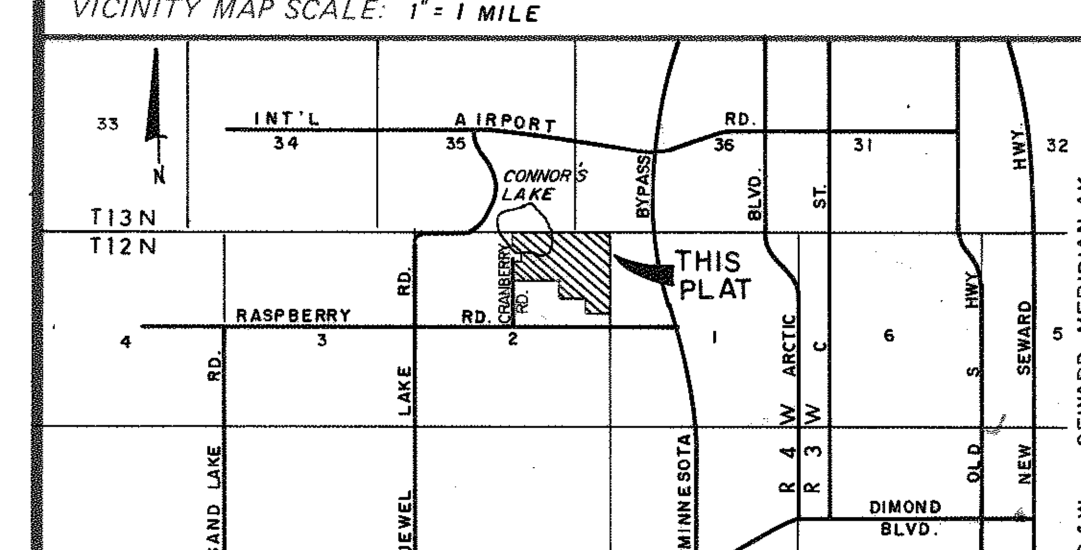
OFFICIAL SEAL
ROSE TERESA VERMIGLIO
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires JAN 2, 1988

OFFICIAL SEAL
ROSE TERESA VERMIGLIO
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires JAN 2, 1988

PLAT OF ORIGIN IS 85-127

CORRECTED DATA PER RELOCATED N.E. COR. OA 22 MAR 85

VICINITY MAP SCALE: 1" = 1 MILE



SURVEYOR'S CERTIFICATE

I, Lewis E. Dickinson, professional land surveyor do hereby certify that the plat hereon is a true and correct representation of lands actually surveyed and that the distances and bearings are shown correctly and that all permanent exterior control monuments, all other monuments, and lot corners have been set and staked, or if final completion is assured by subdivision agreement, they will be set as specified in said subdivision agreement.

STATE OF ALASKA
Lewis E. Dickinson
502-S
REGISTERED PROFESSIONAL LAND SURVEYOR

PLAT APPROVAL

Plat approved by the Municipal Platting Authority this 30th day of May, 1985.

JoAnn B. Contreras
Authorized Official

ACCEPTANCE OF DEDICATION

The Municipality of Anchorage hereby accepts for public uses and for public purposes the real property dedicated on this plat including, but not limited to the easements, rights-of-way, alleys, roadways, thoroughfares and parks shown hereon.

Dated at Anchorage, Alaska this 29th day of May 1985

Attest:
Ruby E. Smith
Municipal Clerk

for *Mayor of Anchorage*

TAX CERTIFICATION

All real property taxes levied by the Municipality of Anchorage on the area shown on this plat have been paid.

4/10/85
Date
Authorized Official

APPROVALS | Signature | Date
Platting Officer JoAnn B. Contreras 5-30-85
Municipal Engineer 5-28-85
W.B.C. 5-24-85 ~~Environmental Protection~~

CONNOR'S LAKE SUBDIVISION
TRACTS A1 AND B

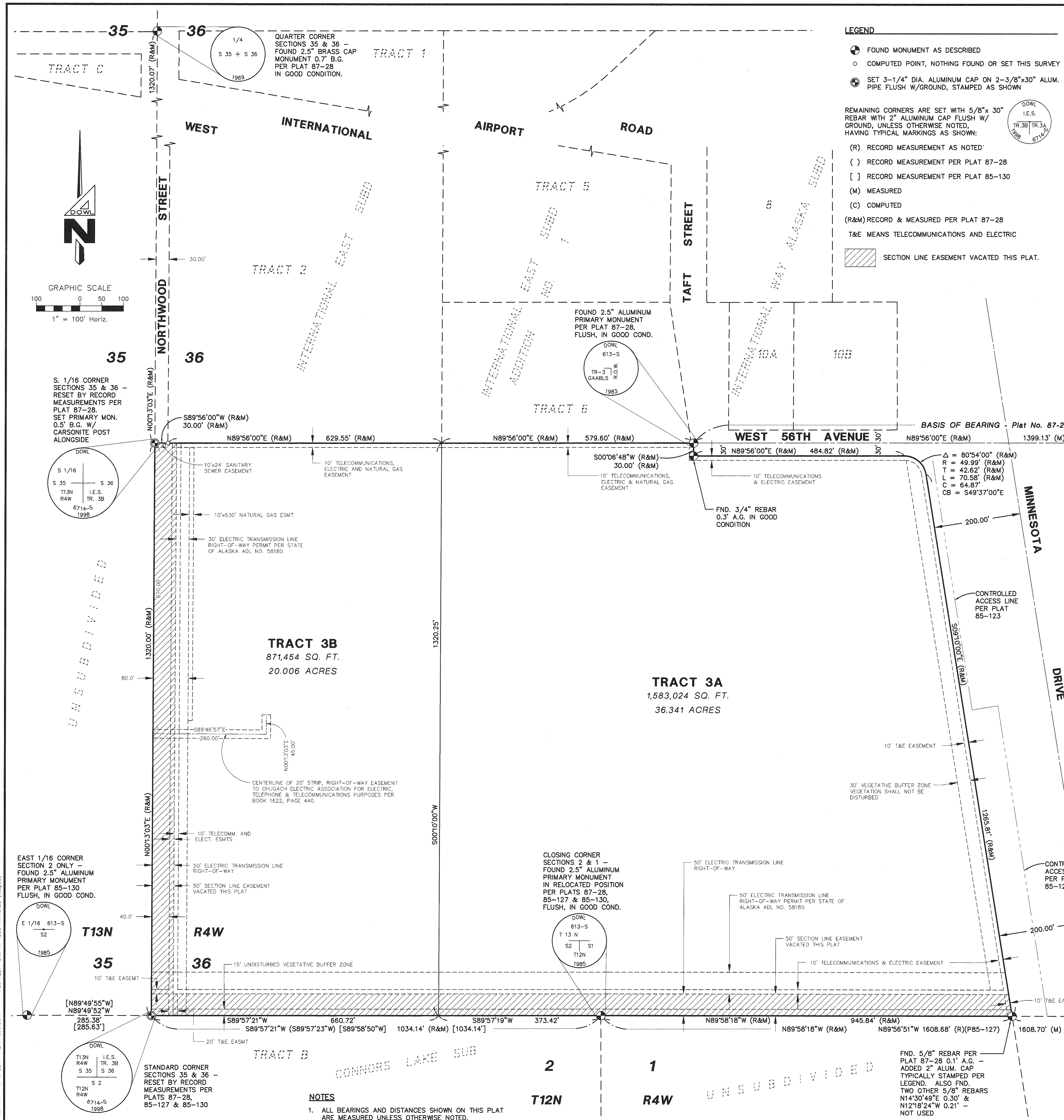
A 104.07 ACRE SUBDIVISION OF TRACT A, CONNOR'S LAKE SUBD.
LOCATED WITHIN THE NE 1/4
SECTION 2, T 12 N, R 4 W, S.M., AK.

DOWL ENGINEERS
4040 B STREET, ANCHORAGE, ALASKA 99503
(907) 562-2000

Grid	2027	Scale	1" = 200'	Date	17 JAN 85	Case No. S-7990	
Drawn	SLH	Ref.	121-97	W O No.	51623	DOWL File No.	
F.B. 830-33 & 60						111-38	

(85-130) FO

1985-1046



CERTIFICATE OF OWNERSHIP AND DEDICATION

WE HEREBY CERTIFY THAT WE HOLD THE HEREIN SPECIFIED PROPERTY INTEREST IN THE PROPERTY DESCRIBED HEREON. WE HEREBY DEDICATE TO THE MUNICIPALITY OF ANCHORAGE ALL AREAS DEPICTED FOR USE AS PUBLIC UTILITY EASEMENTS, STREETS, ALLEYS, THOROUGHFARES, PARKS, AND OTHER PUBLIC AREAS SHOWN HEREON. THERE SHALL BE RESERVED ADJACENT TO THE DEDICATED STREETS SHOWN HEREON, A SLOPE RESERVATION EASEMENT SUFFICIENT TO CONTAIN CUT AND FILL SLOPES OF 1.5 FEET HORIZONTAL FOR EACH 1 FOOT VERTICAL (1.5 TO 1) OF CUT OR FILL FOR THE PURPOSE OF PROVIDING AND MAINTAINING THE LATERAL SUPPORT OF THE CONSTRUCTED STREETS. THERE IS RESERVED TO THE GRANTORS, THEIR HEIRS, SUCCESSORS AND ASSIGNS, THE RIGHT TO USE SUCH AREAS AT ANY TIME UPON PROVIDING AND MAINTAINING OTHER ADEQUATE LATERAL SUPPORT AS APPROVED BY THE MUNICIPALITY.

WE HEREBY AGREE TO THIS PLAT, AND TO ANY RESTRICTION OR COVENANT APPEARING HEREON AND ANY SUCH RESTRICTION OR COVENANT SHALL BE BINDING AND ENFORCEABLE AGAINST PRESENT AND SUCCESSIVE OWNERS OF THIS SUBDIVIDED PROPERTY.

MUNICIPALITY OF ANCHORAGE
P.O. BOX 196650
ANCHORAGE, AK. 99519-6650

BY:

GEORGE J. VAKALIS
MUNICIPAL MANAGER

NOTARY ACKNOWLEDGEMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS 10th DAY OF February 1999.

George J. Vakalis
PERSONALLY APPEARED

NOTARY PUBLIC

5/02/01
MY COMMISSION EXPIRES

SECTION LINE EASEMENT VACATION CERTIFICATE

APPROVAL RECOMMENDATION

STATE OF ALASKA, DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

THE VACATION STATEMENT, AS SHOWN HEREON, HAS BEEN REVIEWED BY THE CENTRAL REGION OFFICE, AND IS HEREBY RECOMMENDED FOR APPROVAL BY THE COMMISSIONER.

RECOMMENDED BY:

REGIONAL CHIEF RIGHT-OF-WAY AGENT — 1.21.99 DATE

STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES, DIVISION OF LAND

THE VACATION STATEMENT, AS SHOWN HEREON, HAS BEEN REVIEWED BY THE DIVISION OF LAND AND IS HEREBY RECOMMENDED FOR APPROVAL BY THE COMMISSIONER.

RECOMMENDED BY:

DIRECTOR, DIVISION OF LAND — JAN. 19, 1999 DATE

THE STATE OF ALASKA, ACTING BY AND THROUGH THE COMMISSIONER OF THE DEPARTMENT OF NATURAL RESOURCES AND THE COMMISSIONER OF THE DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES, DOES HEREBY STATE AND DECLARE THAT THE STATE OF ALASKA VACATES AND RELEASES ALL RIGHTS AND TITLE TO ANY AND ALL PORTIONS OF SECTION LINE EASEMENTS FOR PUBLIC HIGHWAYS RESERVED TO IT UNDER AS 19.10.010 WITHIN THE SPECIFIC AREA DELINEATED BY DIAGONAL HATCHING ON THIS PLAT.

APPROVED BY:

COMMISSIONER
DEPARTMENT OF NATURAL RESOURCES — JAN. 19, 1999 DATE

APPROVED BY:

COMMISSIONER
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES — Jan 26, 1999 DATE

NOTES

1. ALL BEARINGS AND DISTANCES SHOWN ON THIS PLAT ARE MEASURED UNLESS OTHERWISE NOTED.
2. ALL EASEMENTS REFERENCED BY A BOOK AND PAGE NUMBER ARE DOCUMENT EASEMENTS AND ARE NOT DEDICATED BY THIS PLAT.
3. NO DIRECT VEHICULAR ACCESS WILL BE PERMITTED ON MINNESOTA DRIVE FOR TRACT 3A, EXCEPT VIA FRONTAGE ROADS.
4. DISTANCES SHOWN TO THE NEAREST FOOT (I.E. 50') ARE ACTUALLY MEASURED TO THE NEAREST HUNDREDTH OF A FOOT (I.E. 50.00').
5. THIS PROPERTY IS IN CLOSE PROXIMITY TO ANCHORAGE INTERNATIONAL AIRPORT AND IS SUBJECT TO CONSIDERABLE NOISE FROM ITS OPERATION. STRUCTURES SHALL BE CONSTRUCTED TO MITIGATE THE NOISE IMPACT.
6. DIAGONALLY HATCHED AREA INDICATES THE PORTION OF THE SECTION LINE EASEMENTS BEING VACATED WITHIN SECTION 36, T.13N., R.4W., S.M. IT IS NOT THE INTENT OF THIS PLAT TO VACATE ANY OTHER DEDICATED PUBLIC RIGHTS-OF-WAY OR EASEMENTS.
7. TRACT 3A HAS BEEN DEDICATED FOR PERMANENT OR LONG-TERM PARK OR RECREATIONAL PURPOSES PURSUANT TO THE PROVISIONS OF AMC 25.10.080 THROUGH THE ADOPTION OF AO NO. 90-71(S).

SURVEYOR'S CERTIFICATE

I, STANLEY E. PONSNESS, PROFESSIONAL LAND SURVEYOR, HEREBY CERTIFY THAT THE PLAT SHOWN HEREON IS A TRUE AND CORRECT REPRESENTATION OF LANDS ACTUALLY SURVEYED AND THAT THE DISTANCES AND BEARINGS ARE SHOWN CORRECTLY AND LOT CORNERS HAVE BEEN SET OR STAKED, OR, IF FINAL COMPLETION IS ASSURED BY SUBDIVISION AGREEMENT, THEY WILL BE SET AS SPECIFIED IN SAID SUBDIVISION AGREEMENT. NO SUBDIVISION AGREEMENT.

STATE OF ALASKA — 49TH — STANLEY E. PONSNESS — 6714-S — REGISTERED PROFESSIONAL LAND SURVEYOR — 1-11-99

TAX CERTIFICATION

ALL REAL PROPERTY TAXES LEVIED BY THE MUNICIPALITY OF ANCHORAGE ON THE AREA SHOWN ON THIS PLAT HAVE BEEN PAID IN FULL. IF APPROVAL IS SOUGHT BETWEEN JANUARY 1 AND THE TAX DUE DATE, THERE IS ON DEPOSIT WITH THE CHIEF FISCAL OFFICER AN AMOUNT SUFFICIENT TO PAY ESTIMATED REAL PROPERTY TAX FOR THE CURRENT YEAR.

2-2-99 — Judith A. McCleary
DATE — AUTHORIZED OFFICIAL

PLAT APPROVAL

PLAT APPROVED BY THE MUNICIPAL PLATTING AUTHORITY THIS 4th DAY OF February 1999.

AUTHORIZED OFFICIAL

ACCEPTANCE OF DEDICATION

THE MUNICIPALITY OF ANCHORAGE HEREBY ACCEPTS FOR PUBLIC USES AND FOR PUBLIC PURPOSES THE REAL PROPERTY DEDICATED ON THIS PLAT, INCLUDING BUT NOT LIMITED TO THE EASEMENTS, RIGHTS OF WAY, ALLEYS, ROADWAYS, THOROUGHFARES AND PARKS SHOWN HEREON.
DATED AT ANCHORAGE, ALASKA, THIS 3rd DAY OF February 1999.

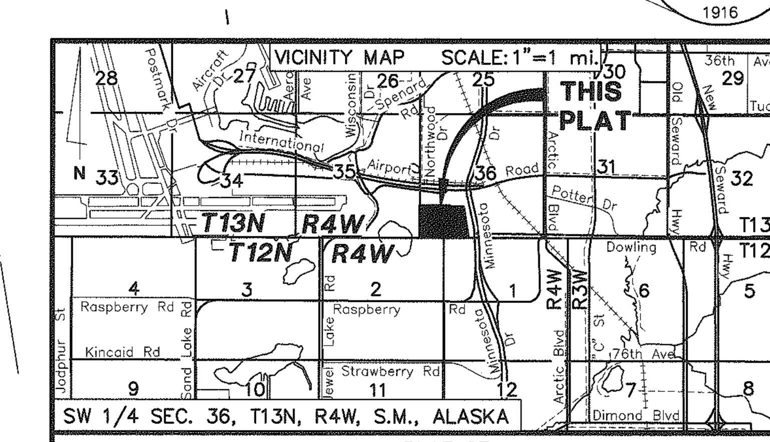
Vicki Cantrell
MUNICIPAL CLERK Deputy — MAYOR OF ANCHORAGE

APPROVALS

APPROVALS		DATE
PLATTING OFFICER		2-9-99
MUNICIPAL SURVEYOR		1/29/99

99-10

RECORDED-FILED 20 — ANCHORAGE REC. DIST.
DATE 2-12 99
TIME 3:03 P.M.
Requested by AH
Address



PLAT OF
INTERNATIONAL EAST SUBDIVISION
TRACT 3A AND TRACT 3B

A 56.347 ACRE SUBDIVISION OF TRACT 3, INTERNATIONAL EAST SUBD. ACCORDING TO PLAT 87-28, WITH VACATION OF SECTION LINE EASEMENTS PER VACATION RESOLUTION NO. 98-06, LOCATED WITHIN THE SW 1/4 OF SECTION 36, T 13 N, R 4 W, S.M., AK. ANCHORAGE RECORDING DISTRICT

DOWL ENGINEERS
4040 B STREET, ANCHORAGE, ALASKA 99503 PH. (907) 562-2000 FAX (907) 563-3953

DWN. TDM	C-P: STC/A 35666	SCALE 1"=100'	CASE S-10195
F.B. 2931/2983	REF. P87-28, 85-130, 85-127		DOWL FILE NO.
GRID 1928	DATE: 01/11/99	W.O. D56006	126-13

99-10

DNR FILE NO. EV-2-706

PROJECT: D56006 DRAWING NAME: PLAT006.DWG SCRIPT FILE FOR THIS SHEET: PLAT006.SCR PLOTTED: JAN 11 1999 11:40:25 (WGH5)

Attachment B

sl

CHUGACH ELECTRIC ASSOCIATION, INC.

CEA Form 21 (Revised 9-10-84)

Anchorage, Alaska

RIGHT-OF-WAY EASEMENT

1304-26C
Grid 1928
W.O. 10127
(17)

KNOW ALL MEN BY THESE PRESENTS, that Municipality of Anchorage

party, or parties, of the first part, which expression shall include his, her, its, or their heirs, executors, administrators, agents, successors, or assigns when the context so requires or admits, hereinafter called, without consideration of gender or number, "Grantor", for a good and valuable consideration, the receipt of which is hereby acknowledged, does hereby grant, bargain, sell, convey, set-over, and deliver unto CHUGACH ELECTRIC ASSOCIATION, INC., an Alaska non-profit electric cooperative membership corporation of Anchorage, Alaska, party of the second part, hereinafter called "Grantee", and to its successors, assigns, licensees, and permittees, a sole and exclusive easement for the erection, construction, reconstruction, and installation, and continued operation, maintenance, repair, alteration, inspection, replacement, improvement, and relocation, and removal, of electric transmission and distribution lines, and telephone lines, and telecommunication lines, including foundations, footings, and pilings, as may be required, and guys, crossarms, and other attachments and equipment incidental thereto, through, over, in, under, and across the lands of Grantor, situate in the Anchorage Recording District, State of Alaska, and more particularly described as follows, to wit:

A strip of land Twenty Feet (20') in width, located within Tract Three (3), International East Subdivision, according to Plat 83-492 on file in the office of the District Recorder, Anchorage Recording District, Seward Meridian, Alaska, the centerline of said strip being more particularly described as follows: Commencing at the South One Sixteenth (S 1/16) corner common to Sections Thirty-five (35) and Thirty-six (36), Township Thirteen North (T13N), Range Four West (R4W), Seward Meridian, Alaska; thence along the section line S 00° 13' 03" W 670 Feet to the point of beginning; thence S 89° 46' 57" E 260 Feet; thence N 00° 13' 03" E Forty-five Feet (45') to the end of said strip.

AND specifically, there is hereby granted to Grantee, and its successors, assigns, licensees, and permittees, the sole and exclusive right to erect, construct, reconstruct, and install, and to continue to operate, maintain, repair, alter, inspect, replace, improve, and relocate, and to remove, such electric transmission and distribution lines, and their related facilities, and telephone lines, and telecommunication lines, and their related facilities, through, over, in, under, and across the aforesaid premises as may from time to time be necessary or desirable for the exclusive use, occupation, and enjoyment of such right-of-way, including the right of ingress & egress to said premises, and the right to cut and keep clear of all trees, shrubbery, undergrowth, and other obstructions on said premises as may be reasonably required for the construction, reconstruction, relocation, installation, operation, and maintenance of such facilities.

TO HAVE AND TO HOLD the same to Grantee, its successors, assigns, licensees, and permittees, FOREVER.

Grantor agrees that all poles, wire, conductor, and other facilities, including any main service entrance equipment, which may be installed on the above-described premises by or for Grantee or its successors, assigns, licensees, and permittees, shall remain the property of Grantee, or the property of such successors, assigns, licensees, or permittees, as the case may be, and removable at its or their option.

Grantor covenants that he is the owner of the above-described premises, and that the said premises are free and clear of encumbrances and liens of whatsoever character, except those held by the following persons:

IN WITNESS WHEREOF, Grantor has set his hand and seal, or has caused these presents to be executed by his duly authorized representative or agent, all as of the 29th day of June, 1987.

Bob Smith (Seal) ("Grantor")
Municipal Manager, Municipality of Anchorage

_______________ (Seal) ("Grantor")

_______________ (Seal) ("Grantor")

_______________ (Seal) ("Grantor")

STATE OF ALASKA) ss.
THIRD JUDICIAL DISTRICT)

After Recording, Return To:
Chugach Electric Association, Inc.
P.O. Box 196300
Anchorage, AK 99519-6300

THIS IS TO CERTIFY that on this 29th day of June, 1987, before me, the undersigned, a Notary Public in and for the State of Alaska, duly commissioned and sworn as such, personally appeared Bob Smith, Municipal Manager, Municipality of Anchorage known to me and to me known to be the individual named in and who executed the foregoing instrument and acknowledged to me that he signed and sealed the same as his voluntary act and deed for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal the day and year first above written.

Carol Shutt

FOR DISTRICT RECORDERS USE

87 045808

10

RECORDED-FILED
ANCHORAGE REC.
DISTRICT

JUL 1 11 35 AM '87

REQUESTED BY CEA

ADDRESS

Attachment C

1304-34C
(8)

218433

Form No. DL 72
(Rev. June 1969)

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF LANDS

ADL No. 58180

RIGHT-OF-WAY PERMIT

THIS AGREEMENT made and entered into this 11th day of December, 19 72, by and between the STATE OF ALASKA, acting by and through the Department of Natural Resources, Division of Lands, hereinafter referred to as the grantor and CHUGACH ELECTRIC ASSOCIATION, INC. hereinafter referred to as the permittee.

WITNESSETH, that in accordance with the provisions of Sec. 38.05.330, A.S. and the rules and regulations promulgated thereunder, the permittee having filed an application for a right-of-way for: Electric Transmission Line

with the Division of Lands together with a map showing the definite location thereon of the line of right-of-way which the permittee has adopted and agrees to be the specific and definite location of the aforesaid right-of-way, and

WHEREAS, it is understood and agreed by the permittee herein that, as a condition to the granting of the right-of-way applied for, the land covered by said right-of-way shall be used for no purpose other than the location, construction, operation and maintenance of the said right-of-way over and across the following described State lands, to wit:

Township 13 North, Range 4 West, Seward Meridian:
Section 36: The East 30 feet of the West 80 feet of the North 2,590 feet of the South 2,640 feet. Subject to the rights-of-way of International Airport Road and the Alaska Railroad.
The North 50 feet of the South 100 feet of the East 2,590 feet of the West 2,640 feet, subject to the right-of-way of Minnesota Drive

running 5,180 feet in length and/or containing 4.75 acres, more or less and shall extend a width of 30 and 50 feet, as indicated above.

TO HAVE AND TO HOLD the same until the above described land shall no longer be used for the above-mentioned purpose and subject to conditions and reservations elsewhere set forth herein.

The sketch map revealing the right-of-way granted herein shall be attached hereto and made a part hereof.

In the event that the right-of-way herein granted shall in any manner conflict with or overlap a previously granted right-of-way the permittee herein shall use this right-of-way in such a manner as not to interfere with the peaceful use and enjoyment of the previously issued right-of-way and no improvements shall be constructed by the permittee herein upon the overlapping area unless the consent therefor has first been obtained from the permittee under the pre-existing right-of-way.

The permittee in the exercise of the rights and privileges granted by this

Addendum "A": **The Grantor reserves the right to charge a fee for the use of the right-of-way granted herein, in the event that a standard right-of-way fee schedule becomes established during the life of this permit.**

73 em 1/24/73
ds

indenture shall comply with all regulations now in effect or as hereafter established by the Division of Lands and all other Federal, State or municipal laws, regulations or ordinances applicable to the area herein granted.

Upon abandonment, termination, revocation or cancellation of this indenture, the permittee shall within 90 days remove all structures and improvements from the area herein granted, except those owned by the grantor, and shall restore the area to the same or similar condition as the same was upon the issuance of this permit. Should the permittee fail or refuse to remove said structures or improvements, within the time allotted, they shall revert to and become the property of the grantor. However, the permittee shall not be relieved of the cost of the removal of the structures, improvements and/or the cost of restoring the area. Provided further, however, that the grantor, in his discretion, may alter or modify the requirements contained in this provision if it is to the best interest of Alaska to do so.

The permittee shall utilize the lands herein granted consistent with the purposes of the proposed use, as revealed by the application therefor, and shall maintain the premises in a neat and orderly manner and shall adopt and apply such safety measures as shall be necessary, proper and prudent with respect to the use to which the land is subjected.

The permittee shall take all reasonable precaution to prevent and suppress brush and forest fires. No material shall be disposed of by burning in open fire during the closed season unless a permit therefor has first been obtained from the agency empowered by law to issue such permits.

Prior to any construction or development that will use, divert, obstruct, pollute or utilize any of the waters of the State, the permittee shall first obtain approval therefor from the Commissioner of the Department of Fish and Game and file an image copy thereof with the grantor.

Any lands included in this permit which are sold under a contract to purchase shall be subject to this permit. Upon issuance of title to the purchaser, this permit shall remain in effect until its date of expiration.

In case the necessity for the right-of-way shall no longer exist, or the permittee should abandon or fail to use the same, then this permit shall terminate.

The State of Alaska shall be forever wholly absolved from any liability for damages which might result to the permittee herein on account of this permit having been cancelled, forfeited, or terminated prior to the expiration of the full time for which it was issued.

NOW THEREFOR, in accordance with the provisions of Sec. 38.05.330, A.S. and the rules and regulations promulgated thereunder and in accordance with the conditions heretofore set forth or attached hereto and made a part hereof, the permittee herein is hereby authorized to locate, construct, operate and maintain said right-of-way over and across the lands herein described.

IN WITNESS WHEREOF, the said grantor has caused these presents to be signed in duplicate and the permittee herein has hereunto affixed his signature on the

218441

day and year first above written.

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

By: Kenneth H. Hallback
Chief, Lands Section
Division of Lands

CHUGACH ELECTRIC ASSOCIATION, INC.

Gunnar Flygenring
Permittee
Gunnar Flygenring, Acting General Manager

UNITED STATES OF AMERICA)
State of Alaska) ss.

This is to certify that on the 11th day of Jan 1973, before me, the undersigned Notary Public, personally appeared KENNETH H. HALLBACK known to me and known by me to be the CHIEF, LANDS SECTION of the Division of Lands of the Department of Natural Resources, and acknowledged to me that he executed the foregoing instrument for and on behalf of said State, freely and voluntarily for the use and purposes therein set forth.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

Jewell Ols
Notary Public in and for the State of Alaska
My commission expires 9/1/74

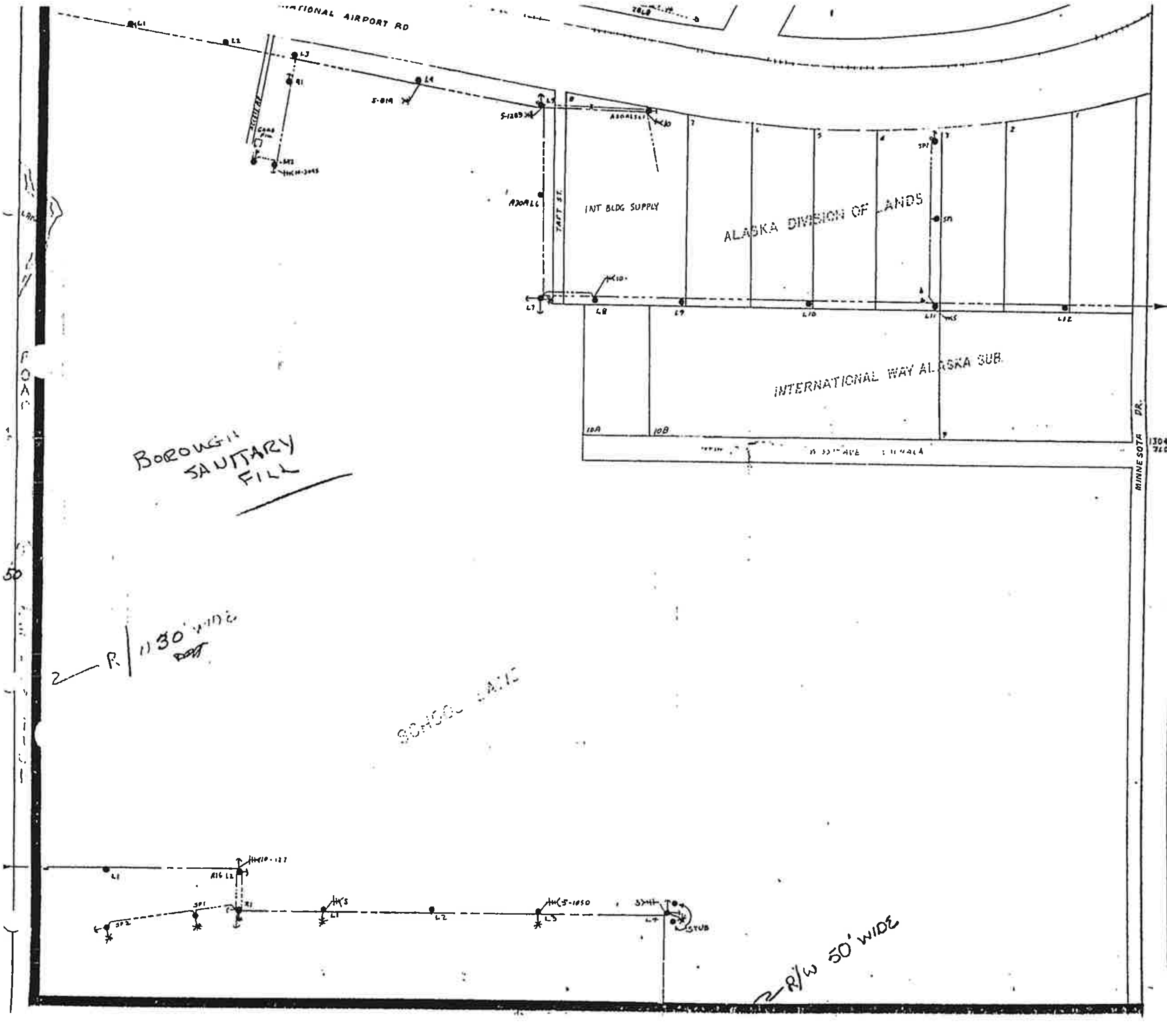
UNITED STATES OF AMERICA)
State of Alaska) ss.

This is to certify that on this 3RD day of JANUARY, 1973, before me, the undersigned Notary Public, personally appeared Gunnar Flygenring to me personally known to be one of the persons described in and who executed the within instrument and the said Acting General Manager acknowledged to me that he signed and executed the same freely and voluntarily for the uses and purposes therein mentioned.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

Harold J. Casey
Notary Public in and for the State of Alaska
My commission expires January 17 1974

218442



3-11-69	REDRAWN FROM EXISTING CLOTH
DATE	REVISIONS

CHUGACH ELECTRIC ASSOCIATI

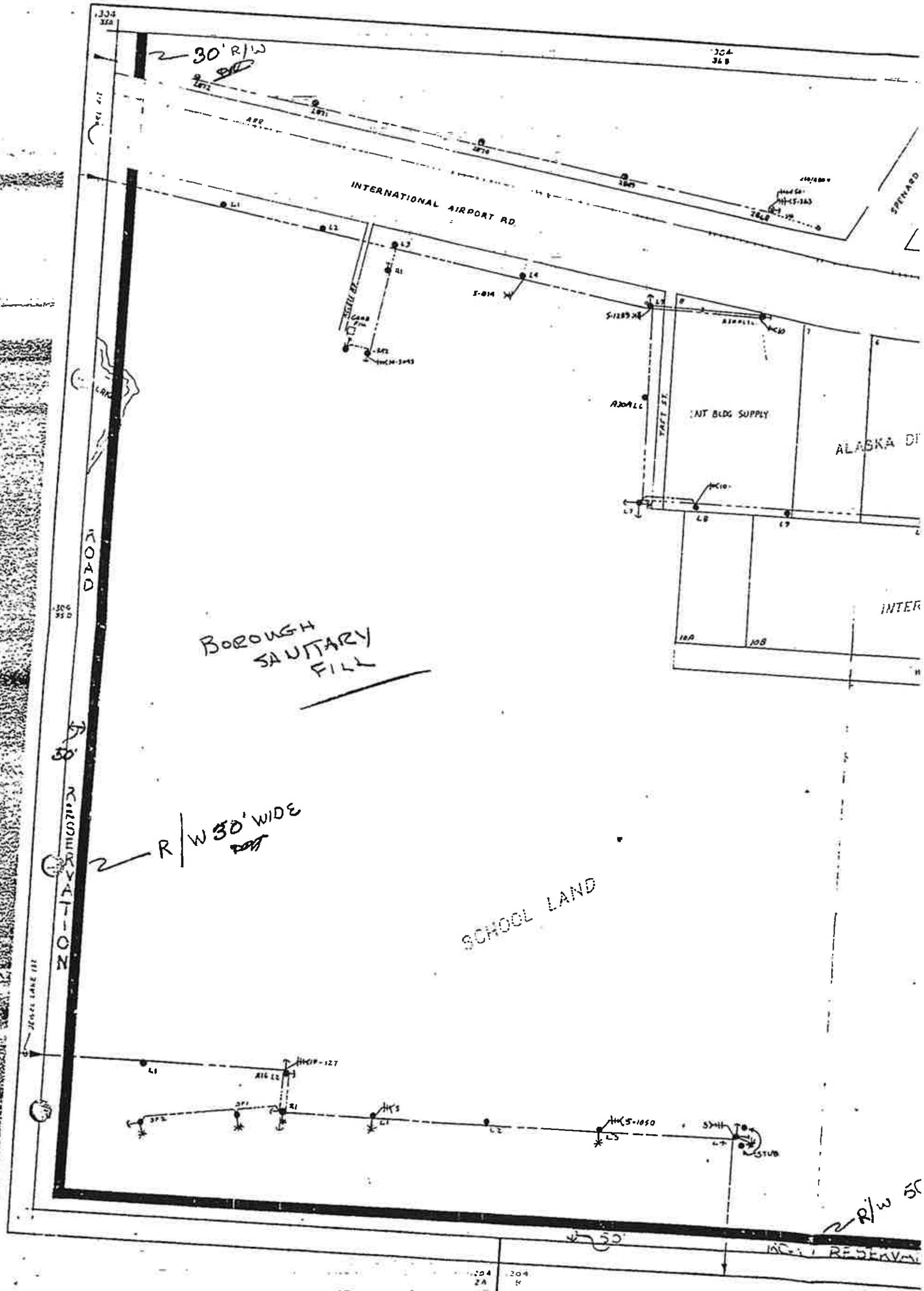
ALASKA & CHUGACH

RURAL ELECTRIFICATION ADMINIS

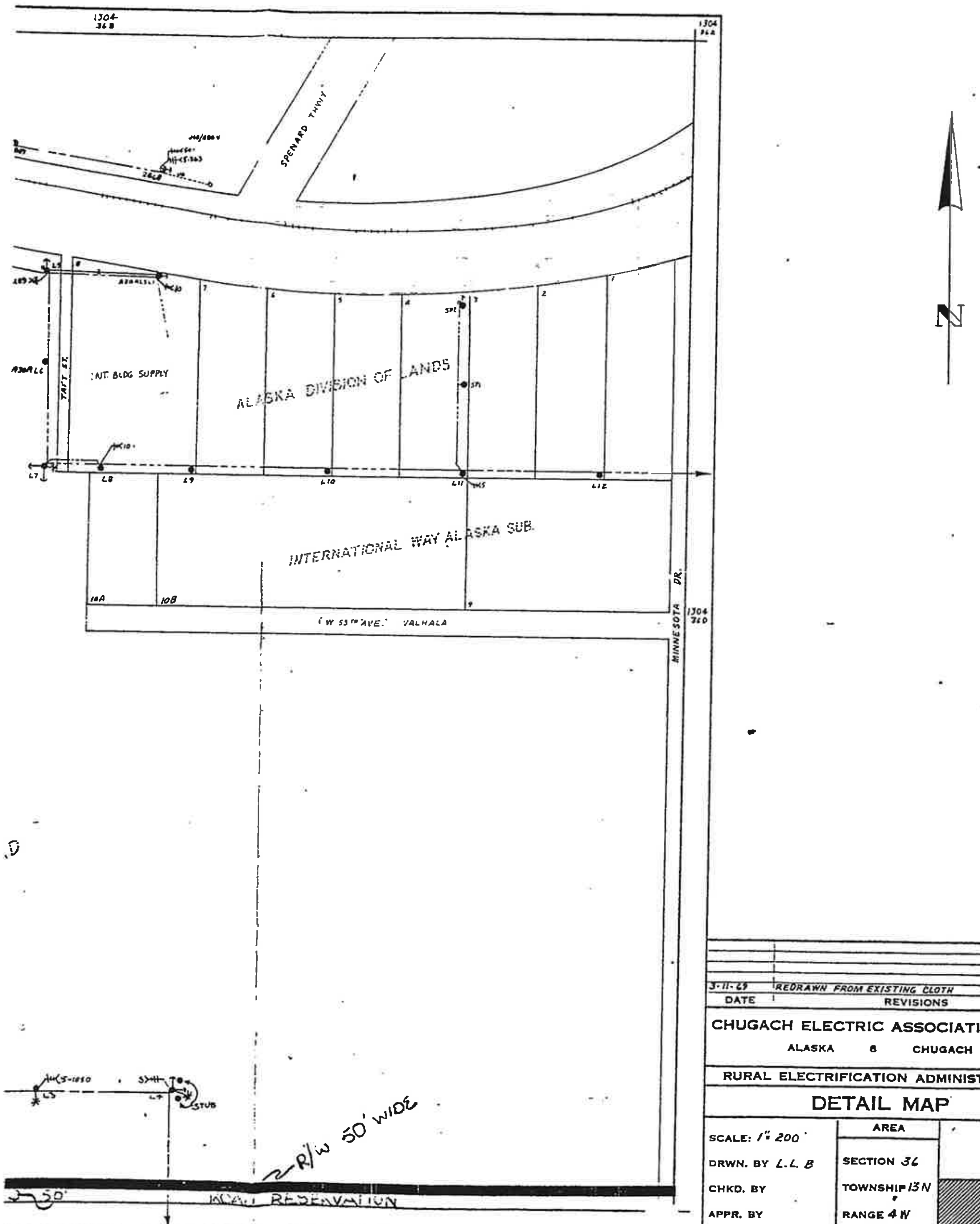
DETAIL MAP

SCALE: 1" 200'	AREA
DRWN. BY L.L.B	SECTION 36
CHKD. BY	TOWNSHIP 13N

218443


30' R/W
INTERNATIONAL AIRPORT RD.
SPENARD
TAFT ST.
INT BLDG SUPPLY
ALASKA
INTER
BOROUGH SANITARY FILL
ROAD RESERVATION
30'
R/W 30' WIDE
SCHOOL LAND
JEWEL LAKE
R/W 50
ROAD RESERVA
STUB

218444



DATE	REVISIONS
3-11-69	REDRAWN FROM EXISTING CLOTH

CHUGACH ELECTRIC ASSOCIATION, INC.

ALASKA 8 CHUGACH

RURAL ELECTRIFICATION ADMINISTRATION

DETAIL MAP

SCALE: 1" = 200'
DRWN. BY L. L. B
CHKD. BY
APPR. BY

AREA
SECTION 36
TOWNSHIP 13N
RANGE 4W

36

1304-36C

303992

STATE OF ALASKA

JAY S. HAMMOND, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FOREST, LAND AND WATER MANAGEMENT
SOUTHCENTRAL DISTRICT OFFICE

3327 FAIRBANKS STREET
ANCHORAGE, ALASKA 99503

March 30, 1979

CEA REC'D APR 3 '79

Route to	Info	Action	Initials	Date
General Manager				
General Counsel				
Exec. Asst.–Finance				
Exec. Asst.–Planning & Projects				
Div. Mgr. of Central Services				
Div. Mgr. of Wellman	✓		TW	4/4/79
Div. Mgr. of Production				
Div. Mgr. of Operations				
Gen. Mgr's Sec'y		F		
TOPOLSKI		✓	(3)	4-3-79

Ted Wellman
Manager of Engineering
Chugach Electric Association, Inc.
P.O. Box 3518
Anchorage, Alaska 99501

RE: Right-of-Way Application
ADL 79856

Dear Mr. Wellman:

On November 12, 1976, Chugach Electric Association applied for a right-of-way permit to authorize the construction of an electric distribution line along the south side of International Airport Road between Northwood and Taft Streets located in the SW¼ of Section 36, T13N, R4W, S.M. The purpose of this application was to comply with a request from the Department of Transportation (DOT) to relocate facilities that would otherwise conflict with the extension and upgrading of International Airport Road.

Our records indicate that the land in question falls within an Interagency Land Management Transfer issued to the DOT and on February 14, 1979, a utility permit was issued by DOT to Chugach Electric authorizing this line. Therefore, since the management of this parcel is no longer within our jurisdiction and since an appropriate permit has already been issued for this project, we conclude that no further action on this application is in order. Consequently, we are notifying you that this file is being closed.

Thank you for your patience and cooperation in handling this matter.

Sincerely,

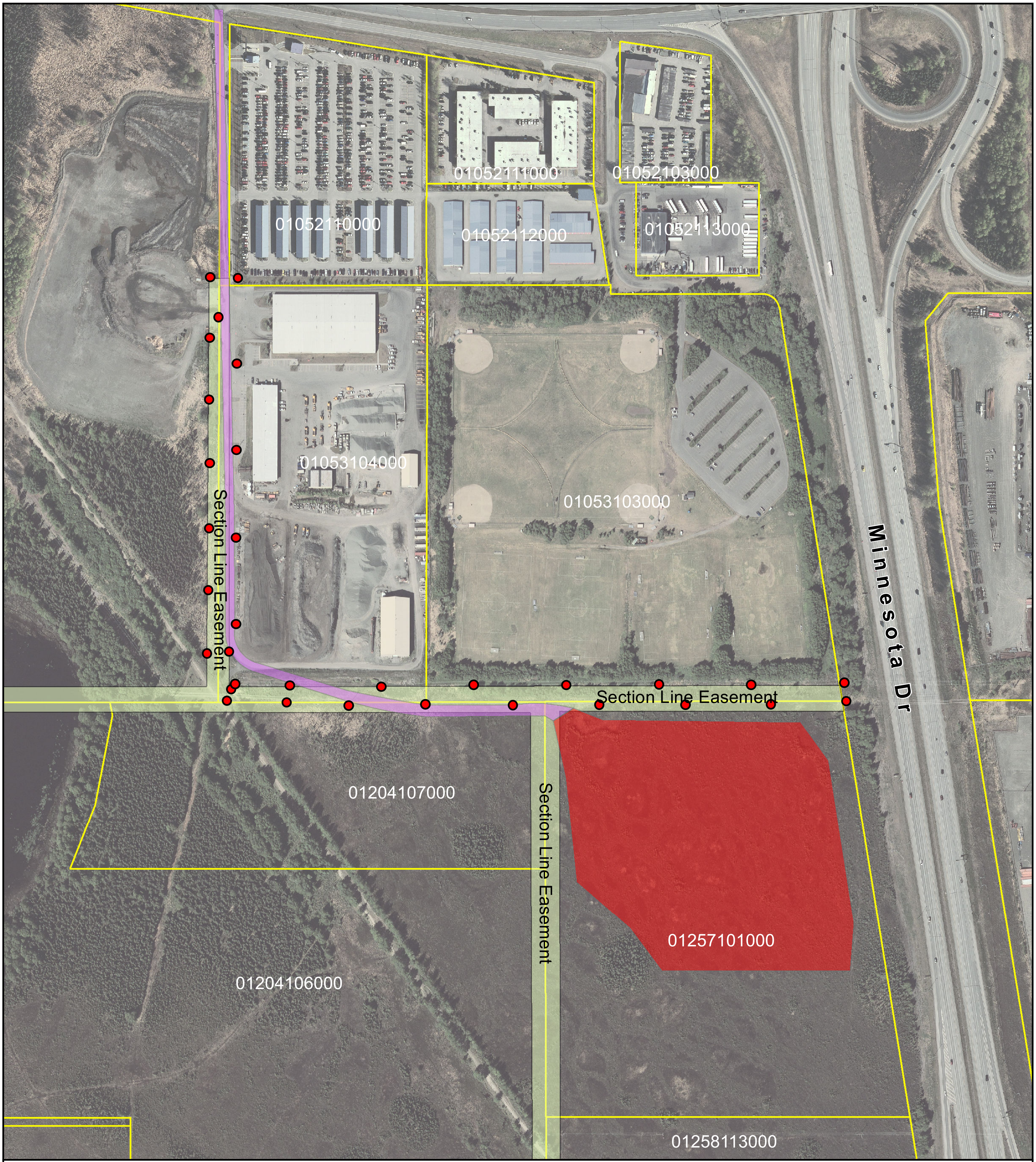
L.A. DUTTON
District Manager

John M. Morris

BY: John Morris
Land Management Technician

10-J7

Attachment D



Power Poles
Concept Snow Site Pad
Proposed Access Road
Section Line Easement
Parcel

West Anchorage Snow Disposal Site
Attachment D

0 250 500 Feet

HDR

MUNICIPALITY OF ANCHORAGE

Exhibit A

December 7, 2020

ELECTRICAL FACILITY CLEARANCE REQUIREMENTS

Enclosed please find a copy of Chugach Electric Association, Inc.'s (Chugach) Electrical Facility Clearance Requirements policy. Periodically, copies of this policy are mailed out to various companies and agencies whose activities may bring their personnel in close proximity to Chugach's electrical facilities. Chugach distributes copies of this policy in an effort to help minimize and identify potential hazards for construction personnel and the general public. In addition, Chugach is concerned with preventing damage to its electrical facilities and any disruption of electrical service to its customers. Please note that the Electrical Facility Clearance Requirements publication may be found on Chugach's website at: www.chugachelectric.com. Click on the "Member Services" tab and go to "Regulations & Requirements", click on "Electrical Facility Clearance Requirements" (December 7, 2020).

For your additional information, Alaska State Statute ("AS 42.30.400 " Excavator's Notice of Proposed Excavation") has been included as an attachment.

Please thoroughly read and understand the entire document. It could save your life or the life of your employees and the public. We request that particular attention be paid to the following provisions:

(Paragraph B. 2.) "Under no circumstances will Chugach allow any of its underground cable(s) to remain energized after it has been exposed, unless it is protected by supplementary mechanical protection approved by Chugach or unless a *qualified person* is on site at all times".

(Paragraph H. 7.) "Chugach defines a *qualified person* as a journeyman lineman who holds a current Certificate of Fitness in the Journeyman Lineman category issued by the State of Alaska". These two provisions clearly emphasize Chugach's position relating to the exposure and approach to energized facilities.

Chugach strongly recommends that prior coordination takes place between Chugach and the construction entity or contractor , either during the design phase of a project or prior to the start of construction, to help eliminate or minimize conflicts. If you have questions, please contact the Line Operations Division at (907) 762-7679 and your call will be directed to the appropriate department for assistance.

Sincerely,

James Mullican

James Mullican
Senior Manager Line Operations

Enclosures

cc: MOA Development Services; State of Alaska OSHA Inspector; SOA Electrical Inspector; AGC, Cook Inlet Housing, GCI, ACS, Enstar, AWWU, Anchorage Home Builders Association

CHUGACH ELECTRIC ASSOCIATION, INC.

CLEARANCE REQUIREMENTS
FOR CONSTRUCTION OR MAINTENANCE NEAR ELECTRICAL FACILITIES

Chugach's concern for the safety of non-qualified personnel working adjacent to its electrical facilities, its concern for the public in general, and its requirement that only *qualified personnel* under the employ of *qualified electrical contractors* handle electrical facilities such as conductors, cables, poles, transformers, padmounted equipment, etc., is based upon the following considerations:

- The potential for serious injury and resulting liability is extremely high when dealing with all electric utility voltage levels up to 230,000 volts on overhead and underground lines.

- Certain types of equipment, particularly cable, can easily be damaged by improper handling. For example, when cable is hit or improperly suspended (common during excavation adjacent to cables), the scraped, cut, or stressed insulation will almost always result in premature cable failure. The highest risk to unqualified personnel is a cable failure while the cable is being handled during excavation or construction. Undetected cable damage may result in a subsequent cable failure with consumer outages for periods of up to a week's duration during winter conditions.

- The inherent stability of overhead pole lines or padmounted equipment is jeopardized with improper excavation and backfill, often resulting in hazardous voltage exposure to the public and contractors and leads to consumer power outages.

The above concerns can be minimized by the use of properly trained, licensed, and certified electrical outside linework personnel. The National Electrical Safety Code (NESC), the United States Occupational Safety and Health Administration (OSHA) and the Alaska State OSHA support this position as well as the clearances addressed herein.

The NESC, defines *"qualified"* as *"Having been trained in and having demonstrated adequate knowledge of the installation, construction, or operation of lines and equipment and the hazards involved, including identification of and exposure to electric supply and communication lines and equipment in or near the workplace*." Only qualified persons are permitted to handle or work on or adjacent to energized electrical facilities. This includes not only overhead pole lines but also padmounted and underground facilities. Within the NESC, two rules specifically address the need for qualified persons to perform work on or near energized facilities:

> Rule 420B1 states, *"Employees whose duties require working on or in the vicinity of energized equipment or lines shall perform only those tasks for which they are trained, equipped, authorized, and so directed. Inexperienced employees shall: (a) work under the direction of an experienced and qualified person at the site; and (b) perform only directed tasks."*
>
> Rule 420B4 states, *"Employees who do not normally work on or in the vicinity of electric supply lines and equipment but whose work brings them into these areas for certain tasks shall proceed with this work only when authorized by a qualified person."*

OSHA 29CFR 1910.269 contains the training and documentation requirements for a qualified person.

OSHA 29CFR 1926.1408 addresses equipment operations near electrical lines. If any part of the equipment, when operated up to the equipment's maximum working radius, could get closer than twenty (20) feet to a power line, then the operator must notify the utility, verify line voltage, and implement one of the safety options in OSHA 29CFR 1926.1408.

At no time may equipment violate minimum required clearance to an energized power line: ten (10) feet for lines up to 50 kilovolts (kV), or ten (10) feet plus 0.4 inches per one (1) kV over 50 kV. Minimum clearances are provided below for common Chugach system voltages.

CHUGACH SYSTEM VOLTAGES	
Normal Voltage (Phase-to-Phase)	**Minimum Clearance Required At All Times**
Operations Near High-Voltage Overhead Power Lines to 50 kV	10 Feet
Over 50 kV to 200 kV	15 Feet
Over 200 kV to 350 kV	20 Feet

Specifically, 29CFR1926.1408 (b)(4)(ii) requires a "Safety Observer" during equipment operations if the equipment is operating where it is difficult for the operator to maintain twenty (20) feet of clearance to the overhead power line(s) by visual means. Alaska Statutes (AS) Sections 18.60.670 through Section 18.60.695 govern placement and operation of equipment near electrical lines or conductors. 29CFR1926, Subpart P addresses the specific requirements involved with trenching operations. These include prior notice to utility companies, prior location of utility facilities, and proper supports once the facilities are exposed. Furthermore, 29CFR Sections 1910.180; 1910.333; 1926.416; and 1926.651 regulate activities relative to job site electrical facilities.

In summary, Chugach's concern for the safety of all personnel affected by work adjacent to its energized facilities has led to the development of the attached policy.

ELECTRICAL FACILITY CLEARANCE REQUIREMENTS

The following requirements have been developed to help provide a safer work site to those personnel working adjacent to Chugach's electrical facilities and to protect Chugach facilities that are in proximity to the area of work being done by State or Municipal entities and private construction and maintenance projects.

A. NOTIFICATION

It is recommended that Chugach be informed of construction/maintenance activities as early as possible in the design process and be included in timely plan reviews. Any work that needs to be performed on Chugach facilities must have prior Chugach approval.

1. Overhead Facilities

Any work in the proximity of overhead power lines shall be preceded by a call to Chugach at (907) 762-7679 , at least 48 hours in advance, as notification of the planned work and compliance with OSHA 29CFR1926 (1408), and AS 18.60.670. If equipment, tools, machinery, or material must work in proximity closer than the minimum clearances outlined in OSHA 29CFR1926 (1408), and AS 18.60.670, the requirements of AS 18.60.680 shall be implemented before work can proceed. All necessary arrangements with Chugach by the requesting party for compliance with AS 18.60.680 shall be arranged in advance of the project start date.

2. Underground Facilities

Alaska Statutes 42.30.400 through 42.30.490, Anchorage Municipal Code, 24.40 and 26.90, and 29CFR1926, Subpart P place requirements on contractors who will be excavating around or adjacent to underground utilities. Advance notification requirements, underground facility locates, and the responsibilities for protection of utility facilities by contractors are specified in these regulations. All requests for locates of Chugach's underground facilities are to be made through the Alaska Digline at 811. Prior to excavation, Chugach's Line Operations Department shall be contacted at (907) 762-7679 a minimum of two (2) business days in advance of construction.

Locate surface markings are only reasonably accurate to +/- two (2) feet. Chugach and State law require hand-digging within two (2) feet of locate marks. In some cases, hand-digging may be required within three (3) or four (4) feet of the markings, depending on the facility involved and field conditions at the project site. Maintaining locate marks is the responsibility of the party requesting the locate. Chugach may charge for re-locating and re-marking facilities that were previously marked.

B. UNDERGROUND CABLE EXCAVATION

1. Any excavation which is within a three (3) foot radius of a cable and parallels a cable for a distance greater than twenty (20) feet in length (see Section H.1 below) may require relocation of that cable. Excavations shorter in length and/or closer may also require relocation. At a minimum, cables that will require exposure must be exposed by *hand-digging* only, by a *qualified person* under the employ of a *qualified electrical contractor* (see Section H). See Drawing No. F-062388 attached.

2. Any excavation, such as a trench which crosses cable and/or conduit, shall be limited to twenty (20) feet in width and have provisions for the exposed cable/conduit to be supported every two (2) feet on a Chugach approved support system, to prevent cable damage. The cable support work and excavation within the three (3) foot radius (see Section H-1) shall be performed by a *qualified* person under the employ of a *qualified electrical contractor*.

   NOTE: When excavation must occur within the limits specified in B.1, and B.2, above, reasonable efforts will be made by Chugach to de-energize the cable if system conditions and personnel requirements allow. Even if the cable has been de-energized, a "Cable Watch" by a qualified person under the employ of a qualified contractor is still required. To request the de-energization of the cable, contact the Chugach Line Operations Department at (907) 762-7679 and your call will be directed to the appropriate department for assistance. Requests must be made three (3) business days in advance of the outage date requested. For emergencies, contact Chugach's Dispatch Center at (907) 762-4660.

   Under no circumstances will Chugach allow any of its underground cable(s) to remain energized after it has been exposed, unless it is protected by supplementary mechanical protection approved by Chugach or unless a qualified person is on site at all times.

3. Should any cable be exposed by non-qualified personnel, Chugach must be immediately contacted for field investigation before work may resume in the immediate area of such exposed cable.

Chugach recognizes that reasonable continuation of work may be required around energized underground cables after Chugach inspects the site. When this occurs, it is the responsibility of the construction contractor working at the site to arrange for qualified personnel as well as payment of the costs of said personnel and/or equipment. Chugach will neither arrange for, nor provide qualified personnel to satisfy this requirement unless Chugach determines this course of action is in its best interest, on a case-by-case basis. Where Chugach is otherwise forced to subsequently take steps to ensure the safety of the site, Chugach will advise the construction contractor that Chugach will pass these costs to the construction contractor.

4. In all cases, a final minimum burial depth of forty (40) to sixty (60) inches for primary-voltage (above 1000 volts) circuits and thirty (30) inches for secondary voltage (480V or below) circuits shall be maintained. If, however, existing Federal, State, or Municipal permit conditions require depths in excess of forty (40) inches, then the cable/conduit shall be buried at the depth required in the permit. The depth is measured from the top of the cable/conduit to final grade at the shallowest depth. Burial shall be in compliance with Chugach Construction Standard SUR 2-3, 5 or 6 (supplied upon request).

5. Projects that will increase final grade to sixty (60) inches or greater above Chugach direct buried cable shall require relocation at the customer's expense. Where cables are in conduit, review and written approval by Chugach is required for proposed grade changes resulting in a burial depth of sixty (60) inches or greater.

6. Projects which propose to modify the grade over Chugach's underground cables/circuits at voltages above 25kV require review and written approval by Chugach in all cases.

7. Excavations near underground cable/circuits energized above 25kV will require the following:

   a) Excavation Adjacent to Cables/Circuits Energized Above 24kV
   Chugach will require its Locate Contractor to notify excavators when a locate request includes the locating of cables are energized above 25kV.

   When excavation is planned that will come within ten (10) feet, expose, parallel, or undermine sections of Chugach's underground cables energized above 25kV, special precaution and safety consideration must be taken. These distribution and sub-transmission cables operate at voltages of 34.5kV (34,000 volts) and transmission cables operate above 34.5kV up to 230kV (230,000 volts), provide power to tens of thousands of Chugach customers and require extraordinary protection. The following guidelines shall apply:

Chugach Line Operations Department shall be contacted at (907) 762-7679 in advance of the planned excavation a minimum of five (5) business days prior to beginning excavation. Chugach requires that a *qualified person* be on site at all times during excavation activity that comes within ten (10) feet of any circuit cable energized above 24kV. The contractor shall arrange and pay for a *qualified person* from Chugach or, with approval, from one of Chugach's approved and *qualified contractors*. Excavations closer than ten (10) feet shall require exposure of the cables (vac-truck, pot-holing or other approved means) at the intersecting point or at intervals of not less than every twenty-five (25) feet for parallel excavations by *qualified personnel* to determine the exact location of the cable prior to machine excavation.

Excavations within ten (10) feet of cables energized above 25kV can expose unqualified workers to potentially high fault currents and extremely unsafe conditions. Prior planning by the construction contractor with coordination and approval from Chugach for any excavation projects within ten (10) feet of circuits or cables energized above 25kV is mandatory.

Chugach may require a special locate utilizing Ground Penetrating Radar to locate critical facilities. "Pothole" locates utilizing vacuum excavation in conjunction with an air-knife tool may be used, with Chugach approval.

C. STRUCTURE EXCAVATION

1. <u>Equipment Pads or Vaults</u>

Temporary excavation is allowed with a maximum slope of 1:1 beginning three (3) feet from the exterior edge of a concrete pad or vault. The final grade shall consist of a level area radiating out a minimum of four (4) feet, measured from the exterior edge of the pad or vault, and a maximum slope of 2:1 beginning from that four (4) foot distance from the exterior edge of the pad or vault. For both temporary and final grade situations, a level area extending ten (10) feet out from the edge of the concrete pad in front of equipment doors or access panels is necessary. Refer to Drawing No. F-062388 attached.

If the slope cannot be maintained at the grades specified above, additional protection such as barriers or piling is required. All shoring and excavation (closer than the above limits) shall be done by a qualified person(s) under the employ of a qualified electrical contractor.

2. Concrete-Encased Duct

Excavation wider than five (5) feet under a concrete-encased duct requires a method designed and certified by an Alaska-registered civil engineer and approved by Chugach. Installation of the temporary shoring or bracing shall be done under the supervision of a qualified person under the employ of a qualified electrical contractor.

D. POLE/GUY ANCHOR EXCAVATION

Excavation beginning no closer than a three (3) foot radius from a pole or guy anchor in stable soil conditions or a ten (10) foot radius from a pole or guy anchor in organic/unstable soil conditions is allowed, provided the slope from that point does not exceed 1:1. Refer to Drawing No. F-062388 attached.

Excavation closer than the limits defined above or within a ten (10) foot radius of more than one consecutive pole where excavation will be open while more than one pole is affected, may require shoring of each pole. Chugach review and approval of a shoring plan is required for all excavations where more than one pole is subject to an open excavation. Pole shoring shall be approved by Chugach for the specific excavation. All work for installing poles must be performed within OSHA guidelines. Shoring by other methods requires prior approval by Chugach on a case-by-case basis. Streetlight poles may be temporarily removed, subject to a written agreement with Chugach, prior to excavation.

Any excavation that may expose the pole butt requires a structural analysis of the pole shoring method. The analysis shall be performed by an Alaska-licensed professional engineer familiar with electrical transmission and distribution design standards in use by Chugach. Chugach also reserves the right, at contractor expense, to have a structural engineer examine any excavation deeper than the pole butt within a fifteen (15) foot radius of the pole.

All shoring and excavation (closer than the above limits) shall be done by a qualified person under the employ of a qualified electrical contractor.

E. RELOCATION REQUIRED

Where protection of the cable and structures cannot be maintained, as required in Sections A, B, and C, relocation of those facilities will be required prior to the intended work and at the contracting agency's expense.

F. BACKFILL

Replacement backfill for electrical facilities must be in accordance with Chugach specifications and performed by a qualified person under the employ of a qualified electrical contractor.

A damaged underground facility may not be reburied until it is repaired or relocated to the satisfaction of Chugach.

G. INSPECTION AND APPROVAL

All work on or in the immediate vicinity of Chugach facilities, such as backfilling, temporary support, shoring, and relocations are subject to prior approval and inspection by Chugach. On large projects where inspection time is substantial, all costs for inspection shall be the responsibility of the agency or entity contracting for the work. Reimbursement to Chugach shall be in accordance with Chugach's tariff, Section 8.

For any questions or approvals involving these requirements contact Chugach Line Operations at (907) 762-7679 and your call will be directed to the appropriate department for assistance.

H. MISCELLANEOUS

1. Depending on the soil type, depth and length of the excavation, type of Chugach facility involved, and the certainty of the cable locate markings, excavations can be approved within a two (2) foot radius of cable on a case-by-case basis.

2. Stable soil conditions are defined as all dry and non-organic. Soil conditions shall be evaluated and approved on a case-by-case basis by Chugach. The evaluation will be done using 29CFR1926, Subpart P, "*Excavations*" as a guide.

3. Excavation, except as noted, shall be defined as mechanically performed by a backhoe, trencher, scraper, grader, auger, or other equipment.

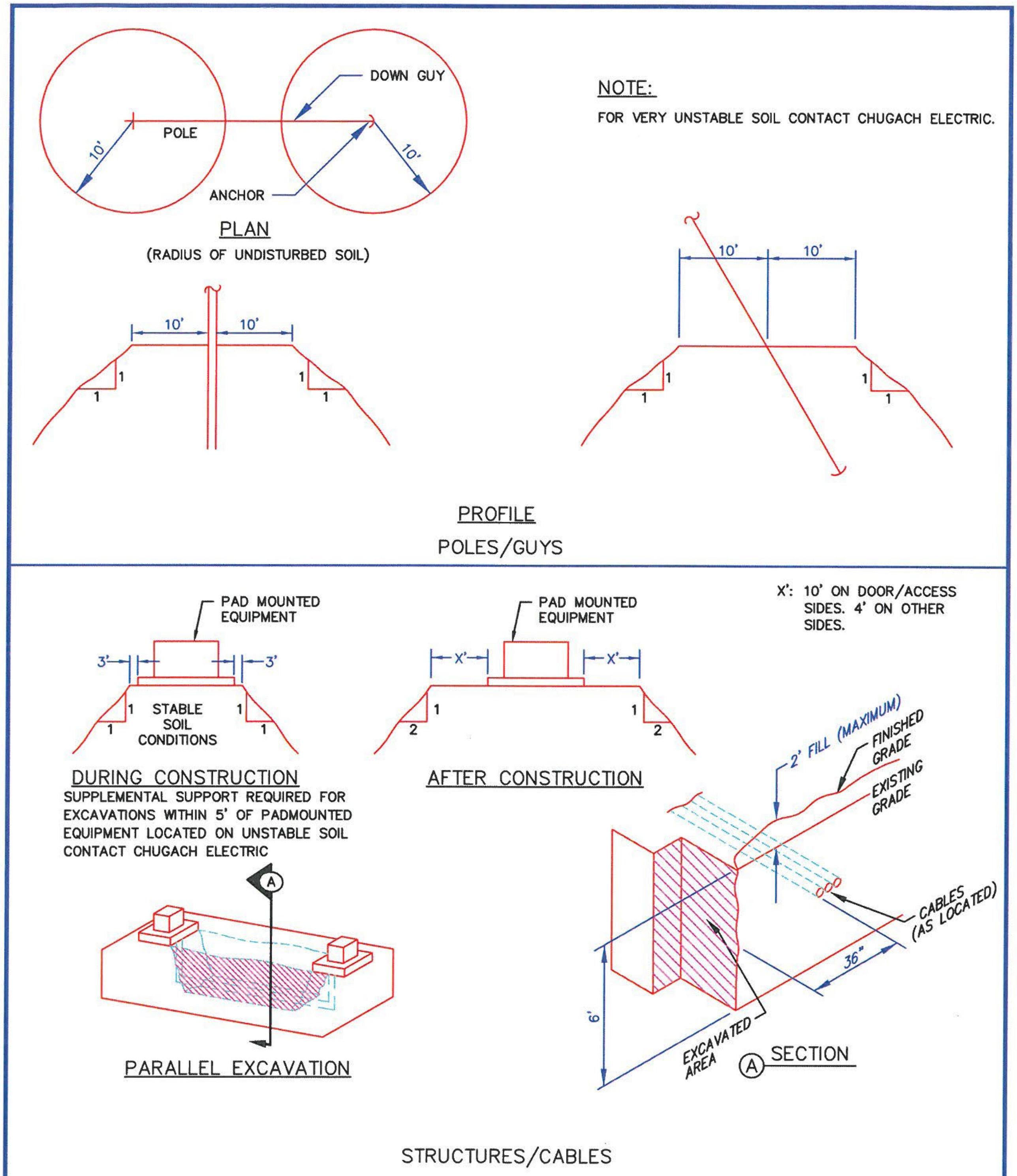
4. Cables are defined as insulated conductors whether buried directly or in conduit. The guidelines for cables also include 600-Volt pedestals and other small electrical apparatus associated with cables but not included under pads or vaults.

5. Spare conduit is not included in these provisions except to the extent of providing temporary support when exposed and inspected by Chugach prior to the placement of proper backfill.

6. Chugach defines a *qualified electrical contractor* as a contractor registered in the State of Alaska who has an Electrical Administrator's License in the Outside Linework category; or who has an employee with an Electrical Administrator's License in the same category registered with the contractor.

7. Chugach defines a *qualified person* as a journeyman lineman who holds a current Certificate of Fitness in the Journeyman Lineman category issued by the State of Alaska.

8. Chugach defines *hand-digging* as the removal of soil with hand tools, an air-knife tool (compressed air jet), or a vacuum truck.



REV. NO.: 3 DATE: 1/28/98

Standards Engineer:

Mgr., Dist. Engineering:

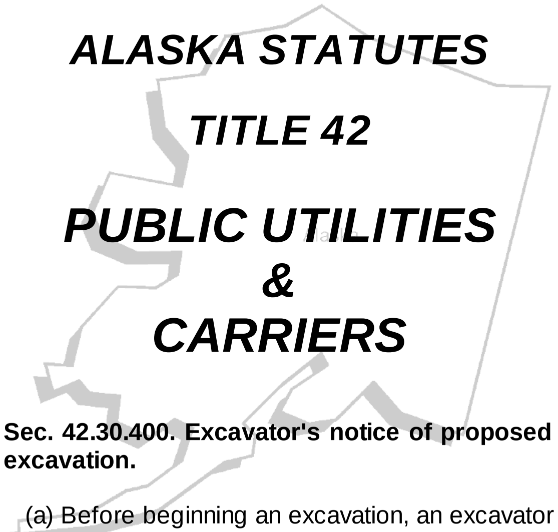
Mgr., Const. & Maint.:

Dir., T&D Services Div.:

Chugach Electric Association, Inc.

EXCAVATION LIMITS
DEFINITION OF LIMITS REQUIRING
NO ADDITIONAL STRUCTURAL SUPPORT

DRAWING NUMBER F-062388 SHEET 1 OF 1



ALASKA STATUTES

TITLE 42

PUBLIC UTILITIES & CARRIERS

Sec. 42.30.400. Excavator's notice of proposed excavation.

(a) Before beginning an excavation, an excavator shall give notice of the proposed excavation to each underground facility operator who has an underground facility in the area of the proposed excavation and request the operator to field mark the location of its underground facility. The excavator shall notify an underground facility operator who subscribes to a notification center by giving notice to the center. The excavator shall notify an underground facility operator listed in the applicable telephone directory who is not a subscriber to a notification center by giving notice directly to the operator.

(b) Except in the case of an emergency locate request or a request to locate in a remote, unstaffed, or inaccessible location, the excavator shall notify an underground facility operator who may have a facility in the area of a proposed excavation at least two but not more than 15 working days before the date scheduled for beginning the excavation. In the case of a request to locate in a remote or unstaffed location, the excavator shall notify the operator at least 10 but not more than 20 working days before the scheduled date for beginning excavation.

(c) In an emergency, the excavator shall immediately notify each underground facility operator in the area of the emergency and of the need for the excavation and request prompt location of underground facilities.

Sec. 42.30.450. Waiver of requirements by written agreement.

An operator and an excavator may, by written agreement, waive the requirements of AS 42.30.400 - 42.30.490 that the excavator notify the operator of planned excavations and that the operator locate underground facilities. The agreement must identify the geographic areas to which the waiver applies and the time period for which the waiver is valid.

Sec. 42.30.460. Underground facility owner.

If the operator of an underground facility is not the owner of the facility and if the operator cannot be identified or has been identified but cannot be reached in a reasonable amount of time, the excavator may give the notice required by AS 42.30.400 - 42.30.490 to the owner of the underground facility and the owner shall assume the duties and responsibilities of the operator under AS 42.30.400 - 42.30.490.

Sec. 42.30.490. Definitions.

(1) "damage" means

(A) the substantial weakening of structural or lateral support of an underground facility;

(B) penetration, impairment, or destruction of any underground protective coating, housing, or other protective device; and

(C) the partial or complete severance of an underground facility to the extent that the project owner or facility operator determines that repairs are required;

(2) "emergency" means

(A) a condition that constitutes a clear and present danger to life, health, or property; or

(B) an unplanned service interruption;

(3) "excavation" means

(A) an activity in which earth, rock, or other material on or below the ground is moved or otherwise displaced by any means;

(B) road maintenance that changes the original road grade;

(C) demolition or movement of earth by equipment, tools, or explosive device except tilling of the soil less than 12 inches in depth for agricultural purposes;

(4) "excavator" means a person who conducts excavation in the state;

(5) "inaccessible" means impossible or unreasonably difficult to reach due to conditions beyond the control of the underground facility operator;

(6) "notification center" or "center" means a service through which a person is able to call one number to notify member operators of underground facilities that an excavation is proposed and to request the operators to mark facilities located inside of the proposed excavation area;

(7) "operator" means a person who supplies a service for commercial or public use by means of an underground facility;

(8) "person" means any individual, public or private corporation, political subdivision, government agency, municipality, industry, partnership, copartnership, association, firm, trust, estate, or any other entity whatsoever;

(9) "remote" means not accessible by road;

(10) "underground facility" means a pipe, sewer, conduit, cable, valve, line, or wire, including attachments and those parts of poles or anchors that are below ground, for use in connection with the storage or conveyance of water, sewage, telecommunications, cable television, electricity, petroleum, petroleum products, hazardous liquids, or flammable, toxic, or corrosive gas;

(11) "unstaffed" means not normally staffed with employees;

(12) "working day" means a day on which an underground facility operator is open for regular business.

Sec. 42.30.410. Operator's response to request to locate; immunity related to unmarked or inaccurately marked facilities.

(a) An underground facility operator shall accept requests to locate underground facilities during the operator's regular business hours. An operator who receives a request to locate shall maintain for at least one year an accurate record of the request and responses to the request.

(b) When an underground facility operator receives a request to locate, it shall notify the excavator of the location of the underground facilities that the operator is able to field mark with reasonable accuracy and field mark those facilities. If the operator owns, uses, or operates an underground facility that is identified as being in the area of the proposed excavation but that the operator cannot field mark with reasonable accuracy, the operator shall provide the excavator with the best information available to the operator about its location and shall provide on-site assistance until the facility is located or until the excavator no longer needs assistance in locating that facility.

(c) The field marks for an underground facility buried 10 feet deep or less must be located within 24 horizontal inches of the outside dimensions of the facility. For a facility buried deeper than 10 feet, the operator shall locate the field marks within 30 horizontal inches of the outside dimensions of the facility. The operator shall use stakes, paint, or other clearly identifiable material to show the field location of the underground facility. The marker used to designate the approximate location of an underground facility must follow the current color code standard used by the American Public Works Association.

(d) Except for an underground facility in a remote, unstaffed, or inaccessible location, an underground facility operator shall respond to a request to locate promptly. A response is considered to be prompt if it is made within two working days after the operator receives the request or at a later time so long as the response occurs before the beginning of the excavation. For an underground facility in an accessible remote or unstaffed location, the operator shall respond within 10 working days after the operator receives the request or at a later time so long as the response occurs before the beginning of excavation.

(e) After an operator has field marked an underground facility, the excavator is responsible for maintaining the markings.

(f) An excavator may not begin to excavate until each underground facility has been field marked.

(g) When an operator has field marked an underground facility once at the request of an excavator, the operator has the right to receive compensation from the excavator for costs incurred in responding to subsequent requests to locate the same underground facility during the same excavation project if the excavator failed to maintain the original marking.

(h) If an excavator discovers an underground facility that was not field marked or was inaccurately field marked, the excavator shall immediately stop excavating in the vicinity of the facility and shall notify the operator of the discovery. The excavator may notify the operator by means of a notification center. The operator shall treat the notification as a request to locate in an emergency and shall respond accordingly. An excavator may not be held liable for inadvertent damage caused to an unmarked or an inaccurately marked underground facility.

(i) Unless the request to locate is made in response to an emergency, an underground facility operator has the right to receive compensation for costs incurred in responding to a request to locate that gives the operator less notice than the minimum notice required by this section. This subsection may not be interpreted to require the operator to respond to the request to locate within the time requested in the notice.

Sec. 42.30.420. Responsibility of construction project owners.

The owner of a construction project that will require excavation shall indicate in bid documents or contracts for construction the existence of underground facilities that the project owner knows are located inside of the proposed area of excavation. This requirement does not release the excavator from the excavator's responsibility under AS 42.30.400 - 42.30.490.

Sec. 42.30.430. Obligations concerning the conduct of excavations.

(a) An excavator shall use reasonable care to avoid damaging an underground facility. The excavator shall

(1) determine, without damage to the facility, the precise location of an underground facility whose location has been marked;

(2) plan the excavation to avoid damage to and minimize interference with an underground facility in or near the excavation area; and

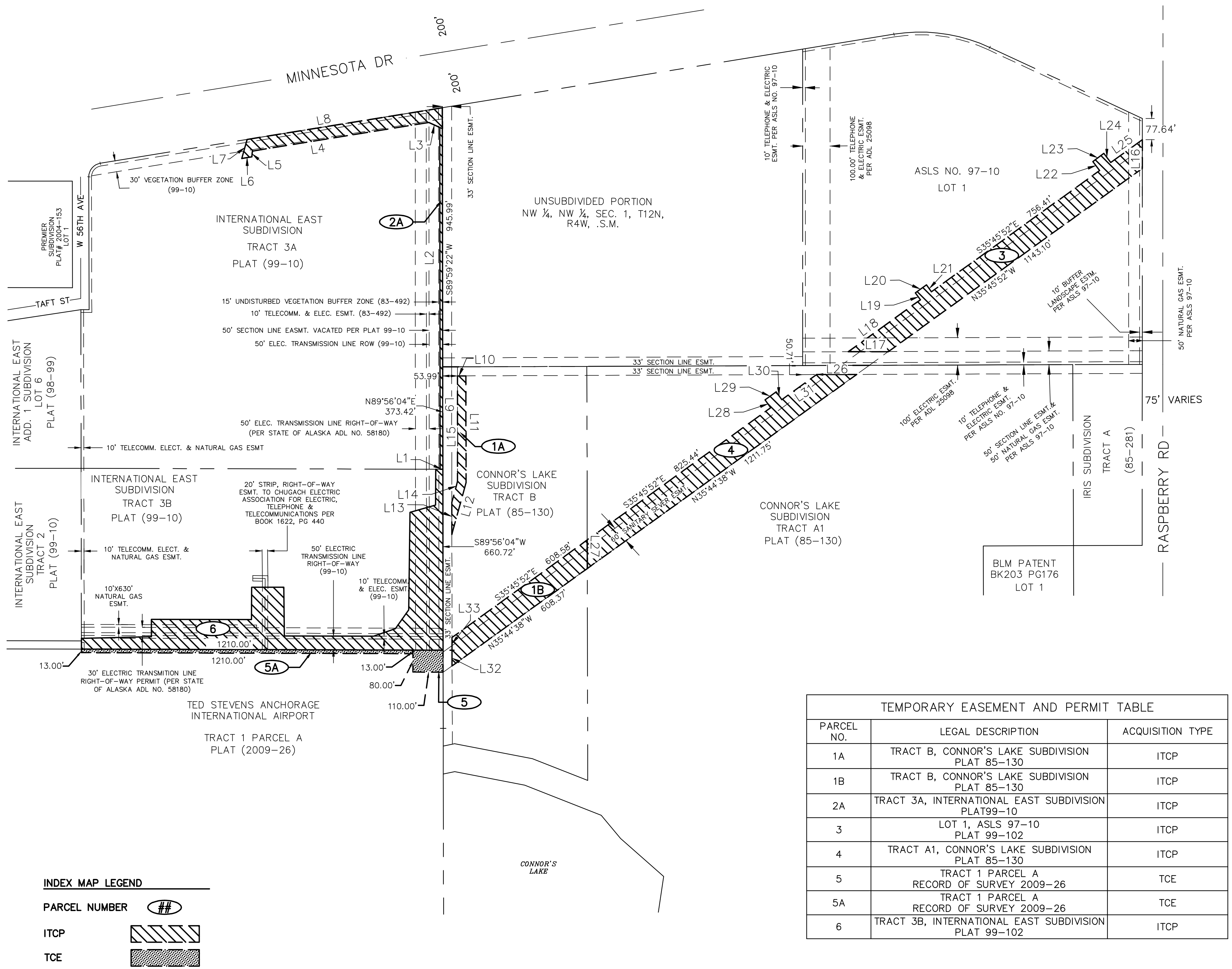
(3) to the extent necessary to protect a facility from damage, provide support for an underground facility in and near the construction area during the excavation.

(b) An excavator who, in the course of excavation, contacts or damages an underground facility shall notify the operator. If the damage causes an emergency, the excavator shall also alert appropriate local public safety agencies and take reasonable steps to ensure public safety. A damaged underground facility may not be reburied until it is repaired or relocated to the satisfaction of the operator. The operator of an underground facility that was damaged during excavation shall arrange for repair or relocation of the facility as soon as practical.

Sec. 42.30.440. Penalties; injunctive relief.

(a) In addition to all other remedies provided by law, a person who violates a provision of AS 42.30.400 - 42.30.490 is subject to a civil penalty of not less than $50 nor more than $1,000 for each offense if the violation results in or significantly contributes to damage to an underground facility.

(b) If the court finds that an excavator is violating or threatening to violate a provision of AS 42.30.400 - 42.30.490 and the violation may result in damage to an underground facility, the court may grant injunctive relief to the underground facility operator.



LINE DATA		
LINE	LENGTH	BEARING
L1	10.00'	N00°09'25"E
L2	1,247.39'	N89°58'26"E
L3	43.33'	N24°48'55"E
L4	652.58'	N09°11'18"W
L5	20.71'	N84°07'45"W
L6	37.32'	N09°11'18"W
L7	72.04'	S73°51'54"E
L8	721.92'	S09°11'18"E
L9	373.42'	S89°56'04"W
L10	31.00'	S00°10'31"E
L11	389.35'	S89°57'30"W
L12	196.80'	N74°43'13"W
L13	117.32'	N89°57'31"E
L14	79.47'	S74°43'13"E
L15	385.15'	N89°57'30"E
L16	104.83'	N89°56'36"W

LINE DATA		
LINE	LENGTH	BEARING
L17	146.03'	N00°10'07"W
L18	324.21'	S35°45'52"E
L19	30.97'	N54°15'22"E
L20	50.00'	S35°44'38"E
L21	30.95'	S54°15'22"W
L22	41.24'	N53°17'18"E
L23	50.00'	S36°42'42"E
L24	42.07'	S53°17'18"W
L25	142.58'	S35°42'52"E
L26	146.00'	S00°10'07"E
L27	104.64	S89°54'44"W
L28	35.18'	N54°15'22"E
L29	50.00'	S35°44'38"E
L30	35.16'	S54°15'22"W
L31	156.89	S35°45'52"E
L32	57.60'	N89°50'02"E
L33	46.25'	N89°57'31"E

TEMPORARY EASEMENT AND PERMIT TABLE

PARCEL NO.	LEGAL DESCRIPTION	ACQUISITION TYPE
1A	TRACT B, CONNOR'S LAKE SUBDIVISION PLAT 85-130	ITCP
1B	TRACT B, CONNOR'S LAKE SUBDIVISION PLAT 85-130	ITCP
2A	TRACT 3A, INTERNATIONAL EAST SUBDIVISION PLAT99-10	ITCP
3	LOT 1, ASLS 97-10 PLAT 99-102	ITCP
4	TRACT A1, CONNOR'S LAKE SUBDIVISION PLAT 85-130	ITCP
5	TRACT 1 PARCEL A RECORD OF SURVEY 2009-26	TCE
5A	TRACT 1 PARCEL A RECORD OF SURVEY 2009-26	TCE
6	TRACT 3B, INTERNATIONAL EAST SUBDIVISION PLAT 99-102	ITCP

N

0 200 400 600

1" = 200'

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

FIELD BOOKS		BM NO.	LOCATION	ELEV.
DESIGN:	MOA 3782	E-75	OLD INTERNATIONAL	72.93'
		GAAB-216	5011 SPENARD RD.	78.80'
STAKING:				
ASBUILT:				
CONTRACTOR:		BASIS OF DATUM:		
INSPECTOR:		HORIZONTAL: ANCHORAGE BOWL 2000		
		VERTICAL: 1972 N.G.S. DATUM		
CONSTRUCTION RECORD		HORIZONTAL & VERTICAL DATUMS		

DATA	DRAWN BY	CHECKED BY	DATA	DRAWN BY	CHECKED BY
BASE	MCR	PTS	TELEPHONE	--	--
TOPOGRAPHY	MCR	PTS	ELECTRIC	--	--
PROFILE	TJH	DWS	CABLE TV	--	--
SANITARY SEWER	--	--	DESIGN	TJH	BMS
STORM SEWER	--	--	QUANTITIES	--	BMS
WATER	--	--	MUN. FINAL CHECK		
GAS	--	--			
PLAN CHECK					

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY

PTS
PROFESSIONAL & TECHNICAL SERVICES, INC.
CONSULTING • ENGINEERING • SURVEYING
912 EAST 15TH AVE, SUITE 200
ANCHORAGE, ALASKA 99501
PHONE:(907) 561-6237
FAX:(907) 563-3813
LICENSE# AECC924

CONSULTANT

SEAL

PROJECT MANAGEMENT & ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE - PHASE I
PROJECT No. 19-01

TEMPORARY EASEMENT AND PERMIT MAP

SCALE:	1"=200' NTS	DATE: NOVEMBER 2024	GRIDS: SW1928	SHEET 10 of 37
		ACCT. NO. 0000001901 (PME)		

FILE NO.–

User: MIKERUCINSKI Oct 31, 2024 – 2:53pm
Drawing: S:\SD-05\DWG ACTIVE\SD-05 BS AQUISITION IGP V2.DWG – Layout: TEMPORARY EASEMENT AQUISITION MAP (2)

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

19-01b VII

EQUAL EMPLOYMENT OPPORTUNITY SPECIAL PROVISIONS

CONTRACT COMPLIANCE SPECIFICATIONS

EQUAL EMPLOYMENT OPPORTUNITY

SPECIAL PROVISIONS

Every municipal contract shall include language substantially the same as the following: The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, age, sex, sexual orientation, gender identity, marital status, or physical or mental disability. The contract will comply with all laws concerning the prohibition of discrimination including, but not limited to, Title 5 and Title 7 of the Anchorage Municipal Code.

Every municipal contract shall state, in all solicitations or advertisements for employees to work under the contract, that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, age, sex, sexual orientation, gender identity, marital status, or physical or mental disability.

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

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VIII

MINIMUM RATES OF PAY

Laborers' & Mechanics' Minimum Rates of Pay

Title 36. Public Contracts AS 36.05 & AS 36.10 Wage & Hour Administration Pamphlet No. 600 (Pamphlet 600) is hereby incorporated in its entirety. Pamphlet 600 is available for free download at http://labor.state.ak.us/lss/pamp600.htm.

The Municipality of Anchorage will include a paper copy of the wage rates in the signed Contract.

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

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IX

CONTRACT

C O N T R A C T

Invitation to Bid No. **20XXC_______**

Contract No. **C-20XX_______**

NAME AND ADDRESS OF CONTRACTOR:

____

____

____

Check appropriate box:

☒ **Incorporated in the State of**

MUNICIPALITY OF ANCHORAGE, acting through _______________________ (hereinafter the Owner).

Contract for __________________________

BID SCHEDULES	**ITEMS**	**PLAN SHEET FILE NUMBERS**	**AMOUNT**
			$ ________________
		Total Amount:	$ ________________

THIS CONTRACT, entered into by the MUNICIPALITY OF ANCHORAGE, ALASKA, acting through the Owner named above, and the individual, partnership, or corporation named above, hereinafter called the Contractor, WITNESSETH that the parties hereto do mutually agree as follows:

Statement of Work: The Contractor shall furnish all labor, equipment and materials and perform the Work above described, for the amount stated, in strict accordance with the Contract Documents.

CONTRACT DOCUMENTS

I. This CONTRACT consisting of 4 pages.

II. The Bid Proposal Section____consisting of_____pages numbered as_____, **as contained in ITB 20XXC_______.**

III. The Contract Performance and Payment Bond _________________________.

IV. The Contractor's Certificate of Insurance Dated _________________________.

V. Municipality of Anchorage Standard Specifications dated 2024 (MASS) Incorporated by Reference, **as contained in ITB 20XXC_______.**

VI. Specifications consisting of the following:

Supplemental Provisions Section______consisting of ______ pages, with attachments Exhibit A through F, **as contained in ITB 20XXC_______.**

VII. Equal Opportunity Special Provisions and Forms Section _____ consisting of______pages, **as contained in ITB 20XXC_______.**

VIII. Disadvantaged/Women-Owned Business Enterprise (DBE/WBE) Specification Section ________ consisting of______pages, **as contained in ITB 20XXC_______.**

IX. The Laborers' and Mechanics' Minimum Rates of Pay dated _________________ Section ____ consisting of _____ pages, **as contained in ITB 20XXC_______.**

X. Submittal List Section _____ consisting of______page, **as contained in ITB 20XXC_______.**

XI. The Drawings consisting of ________ sheets numbered____________, as contained in ITB **20XXC_______.**

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the Contract Date entered below.

MUNICIPALITY OF ANCHORAGE, ALASKA

BY ______________________________
Signature

Purchasing Officer or designee
Title

Date of Signature and Contract Date:

____

VENDOR ______________________________

BY ______________________________
Signature

____
Printed Name

____
Title

____
Date of Signature

CONTRACT AND PERFORMANCE AND PAYMENT BOND SIGNATURE INSTRUCTIONS

1. The full name and business of the Contractor shall be inserted on Page 1 of the Contract and on the Performance and Payment Bond, hereinafter the Bond.
2. Two copies of the Contract and the Bond shall be manually signed by the Contractor. If the Contractor is a partnership or joint venture, all partners or joint ventures shall sign the Contract and the Bond except that one partner or one joint venturer may sign for the partnership or joint venture when all other partners or joint venturers have executed a Power-of-Attorney authorizing one partner or joint venturer to sign. The Power-of-Attorney shall accompany the executed contract and the Bond.
3. If the Contractor is a corporation, the President of the corporation shall execute the Contract and the Bond unless a Power-of-Attorney or corporate resolution shall accompany the executed Contract and Bond.
4. The Bond shall be returned to the Purchasing Division undated. The Contract Date shall be inserted on the Contract when the Municipality signs the Contract and the Bond shall be dated the same as the Contract Date.

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

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X

CONTRACT PERFORMANCE AND PAYMENT BOND

CONTRACT PERFORMANCE AND PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we ______________________________
______________________________ of ____
as Principal, and ____
a corporation organized under the laws of the ______________________________________
______________________________________ and authorized to transact surety business in the State of Alaska, of ____
as Surety, are held and firmly bound unto the MUNICIPALITY OF ANCHORAGE, as Obligee, in the full and just sum of ____
($_________________________________) Dollars, lawful money of the UNITED STATES, for the payment which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION IS SUCH, that whereas the principal has entered into a certain contract dated the _____________________ day of ___________ 20___________, with the Obligee for the construction of ____
____
which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract, and shall promptly make payments to all persons supplying labor and material in the prosecution of the work provided for in said contract, during the original term of said contract and any extensions or modifications thereof that may be granted by the Municipality, with or without notice to the Surety, then this obligation to be void; otherwise to remain in full force and effect.

This obligation is made for the use of said Obligee and also for use and benefit of all persons who may perform any work or labor or furnish any material in the execution of said Contract and may be sued on thereby in the name of said Obligee.

The said Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same, shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

Whenever Principal shall be, and declared by Obligee to be in default under the Contract the Obligee having performed Obligee's obligations thereunder, the Surety may promptly remedy the default or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or
2. Obtain a bid or bids for submission to Obligee for completing the Contract in accordance with its terms and conditions and upon determination by Surety of the lowest responsible bidder, or, if the Obligee elects, upon determination by Obligee and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Obligee and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price but not exceeding, including other costs and damages for which the Surety may be liable hereunder the amount set forth in the first paragraph hereof. The term "balance of the contract price" as used in this paragraph, shall mean the total amount payable by Obligee to Principal under the Contract and any amendments thereto, less the amount properly paid by Obligee to Principal.

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution hereof in ________ ________________ original counterparts as of the __________________ day of ____________, 20_________.

WITNESS AS TO PRINCIPAL:

___________________________________ ___________________________________
Principal Name

____
Principal Signature

____
Corporate Surety

(AFFIX CORPORATE SEAL)

____

____
Surety Business Address

BY: _____________________________
(Attorney-In-Fact)

(AFFIX SURETY SEAL)

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

19-01b

XI

CERTIFICATE OF INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

ACORD®

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A :	
INSURED	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY CLAIMS-MADE / OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY / PRO-JECT / LOC						EACH OCCURRENCE	$
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
							GENERAL AGGREGATE	$
							PRODUCTS - COMP/OP AGG	$
								$
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS / SCHEDULED AUTOS HIRED AUTOS / NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident)	$
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB / OCCUR EXCESS LIAB / CLAIMS-MADE DED / RETENTION $						EACH OCCURRENCE	$
							AGGREGATE	$
								$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A					WC STATU-TORY LIMITS / OTH-ER	
							E.L. EACH ACCIDENT	$
							E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

ADDITIONAL INSURED:

1. ADDITIONAL INSURANCE: The Municipality of Anchorage is an additional insured on all policies, and shall contain a WAIVER OF SUBROGATION against the Municipality except Professional Liability and Worker's Compensation.
2. CANCELLATION: "Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the Policy Provisions."

CERTIFICATE HOLDER	CANCELLATION
	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

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XII

BID BOND

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we, ______________________________________
as Principal, and ____ a corporation organized under the laws of the ____ and authorized to transact surety business in the State of Alaska, of ______________________________
___________________________ as Surety, are held and firmly bound unto the MUNICIPALITY OF ANCHORAGE, as Obligee, in the full and just sum of ____
____ ($__________________________) Dollars, lawful money of the UNITED STATES, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by the presents.

WHEREAS, the said Principle is herewith submitting its proposal for ____________________________
____.

The condition of this obligation is such that if the aforesaid Principal will, within the time required enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this Obligation to be void; otherwise the Principal and Surety will pay unto to the Obligee the amount stated above.

Signed, sealed, and delivered ____, 20__________.

WITNESS AS TO PRINCIPAL:

____

____
Contractor Name

____
Contractor Signature

(AFFIX CORPORATE SEAL)

____
Corporate Surety

____

____
Surety Business Address

BY: _______________________________________
(Attorney-In-Fact)

(AFFIX SURETY SEAL)

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

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XIII

BIDDER'S CHECKLIST & RESPONSIBLE BIDDER QUESTIONNAIRE

BIDDER'S CHECKLIST

INSTRUCTIONS TO BIDDER

I. GENERAL

Bidders are advised that, notwithstanding any instructions or implications elsewhere in this Invitation to Bid, only the documents shown and detailed on this sheet need be submitted with and made part of their bid. Other documents may be required to be submitted after bid time, but prior to award. Bidders are hereby advised that failure to submit the documents shown and detailed on this sheet shall be justification for rendering the bid nonresponsive. Evaluation of bids for responsiveness shall be accomplished in accordance with Anchorage Municipal Code, Title 7.

II. REQUIRED DOCUMENTS FOR BID:

NOTE: Only the following listed items as marked with an "X" are required to be completely filled out and submitted with the bid.

__X__ Bid proposal consisting of five (5) pages BP-1 through BP-5. BP-3, BP-4, and BP-5 must be signed.

__X__ Erasures or other changes made to the Bid Proposal Sheet must be initialed by the person signing the bid.

______ Two identical sets of descriptive literature, brochures, and/or data must accompany the bid where specifically requested or when in support of an "or equal" offer.

__X__ Bid bond, certified check, cashiers check, money order or cash shall be submitted with the bid in the amount indicated.

__X__ All Addenda issued shall be acknowledged in the space provided on the Bid Proposal sheet or by signing the Addenda sheet and submitting it prior to the bid opening in accordance with Anchorage Municipal Code 7.20.020C.

______ Disadvantaged and Women-Owned Business Enterprises, Form 10-029

______ Others

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

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XIV

BID PROPOSAL

BID PROPOSAL
(CERTIFICATION)

TO: MUNICIPALITY OF ANCHORAGE ________________, 2025
PURCHASING DEPARTMENT
632 W. 6TH AVENUE, SUITE 520
ANCHORAGE, ALASKA 99501

SUBJECT: Invitation to Bid No. _________

PROJECT TITLE: West Anchorage Snow Disposal Site, Phase II

Pursuant to and in compliance with subject Invitation to Bid, and other bid documents relating thereto, the bidder hereby proposes to furnish all labor and materials and to perform all work for the construction of the above referenced project in strict accordance with the bid documents at the prices established in the Bid Proposal, pages **BP-03 through BP-05** submitted herewith.

The bidder agrees, if awarded the contract, to commence and complete the work within the time specified in the bid documents.

The bidder acknowledges receipt of the following addenda:

Addenda No.__________________ Date of Addenda__________________
Addenda No.__________________ Date of Addenda__________________
Addenda No.__________________ Date of Addenda__________________

Enclosed is a Bid Bond in the amount of _________________________________.
(Dollar Amount or Percentage of Bid)

Type of Business Organization
The bidder, by checking the applicable box, represents that it operates as ( ) a corporation incorporated under the laws of the State of ____, ( ) an individual, ( ) an LLC, ( ) a partnership, ( ) a nonprofit organization, or ( ) a joint venture. If a partnership or joint venture, identify all parties on a separate page.

____
Company Name

BID PROPOSAL
(CERTIFICATION)
Continued

SUBJECT: Invitation to Bid No. __________

PROJECT TITLE: West Anchorage Snow Disposal Site : Phase II

Date	Alaska Contractor's License Number
Company Name (Printed)	Employer's Tax Identification Number
Authorized Representative Signature	Printed Name & Title
Company **Mailing** Address	Company Phone Number
City, State, Zip Code	Company Fax Number
	Company Email Address
Company **Physical** Address (if different from mailing address)	
City, State, Zip Code	

SCHEDULE A: SITE WORK

ITEM NO.	SPEC. NO.	WORK DESCRIPTION	UNITS	EST QTY	UNIT BID PRICE	TOTAL BID PRICE
A-1	20.02	Storm Water Pollution Prevention Plan (Type 3)	per LS	1		
A-2	20.10 95.04	Usable Excavation Placed as Classified Fill and Backfill (Cross Section)	per CY	75,000		
A-3	20.10 95.04	Unusable Excavation and Disposal at Anchorage Regional Landfill	per Ton	3,500		
A-4	20.11	Grading Existing Surfaces	per LF	425		
A-5	20.13	Trench Excavation and Backfill	per CY	345		
A-6	20.16	Bedding Material (Class D)	per Ton	375		
A-7	20.21	Classified Fill and Backfill (Type II-A)	per Ton	120,000		
A-8	20.24	Riprap (Class I)	per CY	145		
A-9	20.25	Geotextile Fabric (Type A, Separation)	per SY	2,350		
A-10	20.26	Insulation *(R= 18)*	per SF	1,050		
A-11	30.09 95.04	Concrete Traffic Barrier (32 inch)	per LF	230		
A-12	40.08 95.04	Recycled Asphalt Pavement (RAP)	per CY	580		
A-13	55.07	Adjust Storm Drain Manhole Ring	per EACH	1		
A-14	55.20	Culvert (18", CPEP, Type S)	per LF	238.5		
A-15	65.02	Construction Survey Measurement	per LS	1		
A-16	65.02	Two-Person Survey Crew	per Hour	20		
A-17	70.07 95.04	Maintain and Remove Existing Pipe	per LF	115		
A-18	70.08 95.04	Furnish, Install, Maintain, and Remove New Silt Fence with Compost Sock	per LF	750		
A-19	70.08 95.04	Maintain and Remove Existing Silt Fence with Compost Sock	per LF	5,500		

CONTRACTOR NAME______________________

A-20	70.09 95.04	Bonded Fiber Matrix with Tackifier	per 1000 sq ft	60		
A-21	70.10 95.04	Settlement Plates	per Each	27		
A-22	70.11 95.04	Maintain and Remove Temporary Truck Over-Height Warning System	per LS	1		
A-23	70.12 95.04	Wide Pad Dozer, 65 hp min.	per Hour	40		
A-24	70.24 95.04	Screw Pile Supported Weir	per EA	3		
A-25	70.25 95.04	Snow Marker Poles	per EA	70		
A-26	75.03	Topsoil (4")	per 1000 sq ft	835		
A-27	75.04	Seeding (Schedule C, Wetlands)	per 1000 sq ft	190		
A-28	75.04	Seeding (Schedule D, Revegetation)	per 1000 sq ft	20		
A-29	75.04 95.04	Seeding (Schedule F, Snow Disposal)	per 1000 sq ft	625		
A-30	75.10 95.04	Bollard (Steel)	per EA	4		
A-31	75.17 95.04	Removal of Chain Link Fence (Chain Link, 4')	per LF	450		
A-32	75.17 95.04	Removal of Gate	per EA	1		
A-33	75.17	Chain Link Fence (Barbed Wire, 8' Fabric Height, 9 Gauge)	per LF	830		
A-34	75.17 95.04	Gate (Chain Link, Double Swing, Barbed Wire, 8' Fabric Height, 24' Opening, 9 Gauge)	per EA	2		
A-35	75.18 95.04	Woven Wire Fence (6' Fabric Height, 11 Gage)	per LF	5,025		
A-36	75.18 95.04	Gate (Woven Wire, Single Swing, 6' Fabric Height, 6' Opening, 11 Gauge)	per EA	5		
A-37	80.02	Trench & Backfill (2' Width) (3' Depth)	per LF	2,200		
A-38	80.04	Driven Pile Luminaire Pole Foundations	per EACH	12		
A-39	80.04	Load Center Foundation (Type 1A)	Per EA	1		
A-40	80.05	Breakaway Base Luminaire Pole (30 ft)	per EACH	11		

A-41	80.05	Fixed Base Luminaire Pole (30 ft)	per EACH	1		
A-42	80.05	Luminaire Arm (6 ft Length)	per EACH	11		
A-43	80.07	GRC Steel Conduit (2")	per LF	2,200		
A-44	80.08	Junction Box (Type 1A)	per EACH	15		
A-45	80.08	Junction Box (Type 2)	per EACH	1		
A-46	80.10	Conductor (3C, #8 AWG, XHHW)	per LF	3,100		
A-47	80.10	Conductor (3C, #14 AWG, XHHW)	per LF	250		
A-48	80.14	Single Meter Load Center Enclosure, Type IA	per EACH	1		
A-49	80.22 95.04	Hazard Beacon	per EACH	1		
A-50	80.22 95.04	Flashing Beacon Control Unit	per EACH	1		
A-51	80.23	Luminaire (LED, 2,520 Lumens, Type 2)	per EACH	10		
A-52	80.23	Luminaire (LED, 5,336 Lumens, Type 4)	per EACH	1		
A-53	80.28	Remove Load Center	per EAC	1		
A-54	80.28	Remove Luminaire Pole	per EACH	1		
A-55	80.31 95.04	Furnish, Install, Maintain, and Remove Temporary Illumination	per LS	1		
A-56	85.04	Standard Sign	per SF	19		
A-57	85.05	Traffic Maintenance	per LS	1		

Schedule A Total:

______________________________ Contractor

______________ Date

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

WEST ANCHORAGE SNOW DISPOSAL SITE

PHASE II

19-01b

XV

PLANS (50 SHEETS)

Sheet 1	PROJECT COVER SHEET
Sheet 2	SHEET INDEX & KEY MAP
Sheet 3	GENERAL NOTES – LEGEND & SYMBOLS
Sheet 4	ABBREVIATIONS
Sheet 5	SURVEY CONTROL SHEET
Sheet 6	SURVEY CONTROL SHEET
Sheet 7	SURVEY CONTROL SHEET
Sheet 8	SURVEY CONTROL SHEET
Sheet 9	RIGHT OF WAY MAP
Sheet 10	TEMPORARY EASEMENT AND PERMIT MAP
Sheet 11	DEMOLITION PLAN
Sheet 12	CONSTRUCTION ACCESS & ESCP MEASURES
Sheet 13	AWWU TRAIL CULVERTS
Sheet 14	ACCESS ROAD PLAN & PROFILE STA 8+50 - STA 13+50

Sheet 15 ACCESS ROAD PLAN & PROFILE STA 13+50 - STA 18+50

Sheet 16 ACCESS ROAD PLAN & PROFILE STA 18+50 - STA 23+50

Sheet 17 ACCESS ROAD PLAN & PROFILE STA 23+50 - STA 28+00

Sheet 18 ACCESS ROAD PLAN & PROFILE STA 28+00 - STA 30+75

Sheet 19 BERM-A PLAN & PROFILE STA 300+00 - STA 304+00

Sheet 20 BERM-A PLAN & PROFILE STA 304+00 - STA 308+00

Sheet 21 BERM-A PLAN & PROFILE STA 308+00 - STA 312+00

Sheet 22 BERM-A PLAN & PROFILE STA 312+00 - STA 316+00

Sheet 23 BERM-A PLAN & PROFILE STA 316+00 - STA 319+97

Sheet 24 BERM-B PLAN & PROFILE STA 500+00 - STA 504+00

Sheet 25 BERM-B PLAN & PROFILE STA 504+00 - STA 508+00

Sheet 26 BERM-B PLAN & PROFILE STA 508+00 - STA 512+00

Sheet 27 BERM-B PLAN & PROFILE STA 512+00 - STA 514+75

Sheet 28 BERM-C PLAN & PROFILE STA 100+70 - STA 104+00

Sheet 29 BERM-C PLAN & PROFILE STA 104+00 - STA 107+65

Sheet 30 TRAIL-D PLAN & PROFILE STA 200+00 - STA 201+25

Sheet 31 TRAIL-E PLAN & PROFILE STA 400+00 - STA 405+20

Sheet 32 TYPICAL SECTIONS - ACCESS ROAD

Sheet 33 TYPICAL SECTIONS - BERMS & TRAILS

Sheet 34 SNOW DISPOSAL PAD TYPICAL SECTION

Sheet 35 WEIR-A PLAN & SECTION

Sheet 36 WEIR-B1 & WEIR-B2 PLAN & SECTION

Sheet 37 WEIR ASSEMBLY DETAILS

Sheet 38	DRIVEWAY & DRIVE GATE DETAILS
Sheet 39	WOVEN WIRE & MISC DETAILS & SIGN SCHEDULE
Sheet 40	MISC DETAILS
Sheet 41	TEMPORARY OVER HEIGHT WARNING SYSTEM DETAILS
Sheet 42	SETTLEMENT PLATE LAYOUT & DETAIL
Sheet 43	ILLUMINATION LEGEND, ABBREVIATIONS, NOTES AND SITE PLAN
Sheet 44	ILLUMINATION LAYOUT STA 10+00 TO STA 20+40
Sheet 45	ILLUMINATION LAYOUT STA 20+40 TO STA 31+00
Sheet 46	ILLUMINATION SCHEDULES
Sheet 47	FLASHING BEACON DETAILS
Sheet 48	OVER HEIGHT VEHICLE DETECTOR SCHEMATIC & ELEVATION
Sheet 49	SIGN MOUNTING DETAILS
Sheet 50	EQUIPMENT MOUNTING DETAILS