ALASKA RAILROAD CORPORATION

DEPOT DRIVE IMPROVEMENTS
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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 west of the Historic Depot Building, north of 1st Avenue; see Drawings for detailed location. The Work included under this Contract consists of but is not limited to:

- Reconstructing the existing gravel roadway with a new, paved roadway including new structural section, curb and gutter, insulation, geogrid, approximately 4,480 tons of classified backfill and 290 tons of pavement
- Constructing a paved pedestrian pathway
- Installing new storm drain systems, including approximately 286 liner feet of pipe
- Installing new lighting infrastructure.
- Furnishing all labor, materials, equipment, supervision, and other facilities necessary to successfully complete the Work set forth in the Contract Drawings and Specifications.

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.	Roadway, Drainage and Storm Drain Improvements	Base Bid

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 2015, hereinafter referred to as M.A.S.S.; the Alaska Sign Design Specifications (ASDS) as adopted and amended by the Municipality; the Municipality of Anchorage Sign Manual; the Alaska Traffic Manual (ATM)-Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition, with the Alaska supplement, dated 1/13/12; the National Electrical Safety Code (NESC) as amended and adopted by the Municipality; the National Electrical Code as amended and adopted by the Municipality of Anchorage; and the Edition of the Standard Specifications for Structural Supports for Highway Sign, Luminaires and Traffic Signals provided in the appropriate divisions.

When conflicts exist between M.A.S.S. and MUTCD, the requirements of M.A.S.S. and these Special Provisions shall govern.

All applicable sections of MASS are incorporated, including but not limited to:

Division 10.00 – Standard General Provisions

Section 10.01 Definitions
Section 10.04 Scope of Work
- Article 4.1 Contract Documents
- Article 4.2 Interpretation of Contract, Specifications, and Drawings
- Article 4.3 Submittal List
- Article 4.7 Reference Stakes and Surveying
- Article 4.8 Work Incidental to the Contract
- Article 4.9 Disposal Sites
- Article 4.10 Protection of Persons, Property, and Environment
- Article 4.12 Public Convenience and Access
- Article 4.13 Traffic Control Plan
- Article 4.14 Maintenance and Drainage
- Article 4.15 Temporary Erosion Control and Storm Water Pollution Prevention Plans for Construction
- Article 4.17 Utilities
- Article 4.19 Record Drawings
- Article 4.20 Operating and Maintenance Manuals
- Article 4.21 Ownership of Contract Documents

Section 10.05 Control of Work
- Article 5.5 Shop Drawings
- Article 5.6 Product Data
- Article 5.7 Materials
- Article 5.12 Safeguarding of Excavations
- Article 5.16 Responsibility for Damages
- Article 5.17 Repair of Damages Caused by Contractor

Section 10.06 Legal Relations and Responsibilities
- Article 6.1 Laws to be Observed
- Article 6.6 Permits
- Article 6.8 Safety

Division 20.00 – Earthwork

Section 20.01 General
Section 20.02 Storm Water Pollution Prevention Plan
Section 20.04 Clearing and Grubbing
Section 20.07 Removal of Sidewalk and Concrete Apron
Section 20.08 Removal of Curb and Gutter
Section 20.09 Removal of Pavement

Section 20.10 Excavation for Traffic Ways
Section 20.11 Grading Existing Surfaces
Section 20.13 Trench Excavation and Backfill
Section 20.16 Furnish Bedding Material
Section 20.18 Drain/Filter Rock
Section 20.20 Unclassified Fill and Backfill
Section 20.21 Classified Fill and Backfill
Section 20.22 Leveling Course
Section 20.25 Geotextile Fabric
Section 20.26 Insulation
Section 20.27 Disposal of Unusable or Surplus Material

Division 30.00 – Portland Cement Concrete
Section 30.01 General
Section 30.02 Portland Cement Concrete, Curb and Gutter and Valley Gutter
Section 30.04 Portland Cement Concrete Curb Ramps

Division 40.00 – Asphalt Surfacing
Section 40.01 General
Section 40.04 Tack Coat
Section 40.06 Asphalt Concrete Pavement

Division 55.00 – Storm Drain Systems
Section 55.01 General
Section 55.02 Furnish and Install Pipe
Section 55.03 Subdrains
Section 55.04 Connections to Existing Manholes or Catch Basins
Section 55.05 Manholes and Catch Basin Manholes
Section 55.08 Adjust Storm Drain Manhole Ring

Division 65.00 – Construction Survey
Section 65.01 General
Section 65.02 Construction Surveying

Division 70.00 – Miscellaneous
Section 70.01 General
Section 70.07 Remove Pipe
Section 70.10 Traffic Markings
Section 70.12 Traffic Maintenance

Division 75.00 – Landscaping Improvements
Section 75.01 General
Section 75.02 Landscaping
Section 75.03 Topsoil

Section 75.04 Seeding

Standard Details including but not limited to:

20-12 Class 'D' Bedding Material
20-14 Type II Classified Fill and Backfill
20-15 Type II-A Classified Fill and Backfill
20-18 Leveling Course
30-1 Curb and Gutter Cross Sections
30-10 Accessible (Type 1A/2A) Curb and Gutter Sections
30-11 Curb Ramp Clearances
55-4 Storm Drain Manhole Type I
55-9 Storm Drain Beehive Intake Cover
55-10 Manhole Heights
55-18 Manhole Ring Adjustment
70-6 Standard Method for Shoring Phone/Conduit ACS Approved Method
70-7 Striping Notes
70-18 Typical Curb Return with Sidewalk
75-1 Shrub Planting Detail
75-3 Deciduous Tree Planting Detail

General

All Divisions, All Sections: Delete Articles Entitled "Measurement" and "Basis of Payment" unless otherwise indicated in these special provisions and the Schedule of Values. The prices bid in the Schedule of Values shall include all materials, equipment, labor, supervision, disposal, administration, and all other incidentals necessary to complete the project in accordance with the Plans, referenced Specifications, these Special Provisions, and supplemental conditions.

All Divisions, All Sections: All references to "Municipality of Anchorage" shall mean "Owner."

All Divisions, All Sections: References to construction within a Public Right-of-Way shall also include the construction areas as indicated on the drawings.

All Divisions, All Sections: All staking or surveys that are noted to be completed by the "Owner" or the "Engineer" shall be completed by the Contractor.

All Divisions, All Sections: All references to the "Engineer" shall mean "Owner's Representative".

SECTION 95.03 TIME OF COMPLETION

This Project shall be completed within sixty (60) calendar days after the Notice to Proceed is issued, but not later than October 1st, 2024. An NTP is anticipated mid to end of April, 2024.

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 10.01 DEFINITIONS

Add the following item to the list of definitions:

BMP – Best Management Practices

CEA – Chugach Electric Association

FHWA - Federal Highway Administration

NPDES – National Pollutant Discharge Elimination System

Record Drawings – Detailed drawings which accurately depict all changes in location (both horizontal and vertical), material, equipment, and other elements of Work accomplished by Contractor. The drawings shall also depict the horizontal and vertical locations of all other utilities and obstructions encountered during construction. Final elevations and locations shall be clearly marked with actual dimensions, or existing dimensions shall be noted with "ASB" if no changes occur.

UL – Underwriters Laboratories, Inc.

SECTION 10.04 SCOPE OF WORK

Article 4.8 Work Incidental to the Contract

Add the following items which shall be incidental to the cost of the Contract:

14. Asphalt for tack coat.
15. Sawcutting, unless otherwise noted to be paid for.
16. Repair of existing infrastructure or areas outside of demolition limits that are damaged by Contractor.
17. Furnishing and installing grounding conductors, ground rods, and ground rod clamps.
18. 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.
19. Removal and/or abandonment of soil boring caps, borings and piezometer tubes.
20. Remove and salvage existing signs.

21. Removal and disposal or replacement of private improvements within construction limits unless Pay Item is specifically identified on the Drawings
22. MOA Building Safety and Inspection permit fees
23. Removal and disposal of any encountered, abandoned underground utility.
24. All materials, equipment, labor, supervision, disposal, administration, and all other incidentals necessary to complete the project in accordance with the Plans, referenced Specifications, these Special Provisions, and supplemental conditions.

Article 4.17 Utilities

Add the following sentence to the end of the seventh paragraph:

Utilities are the responsibility of the Contractor to request locates, coordinate with the Work, maintain, and protect. Contractor is responsible to coordinate, submit all required items, perform all associated work, and pay any and all relocation or watch fees when utility companies perform relocation or watch services of their respective infrastructure, to include but not limited to: CEA owned lines and infrastructure, and ARRC owned lines and infrastructure.

Add the following paragraph:

Underground utilities shall be continuously supported during backfill placement and compaction. Geotextile shall be separated from nearby utilities with a minimum of 1 foot of backfill material to prevent undue stress during the compaction and settlement process.

C. Gas

Add the following paragraph:

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.

D. Electrical and Telecommunications

Add the following paragraph:

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) – Duilio Guerrero, 564-1522 or 230-8268

Anchorage Water & Wastewater Utility (AWWU) – Shawn Dooley, 564-2786

AT&T – Mike Barsalou, 264-7325

Chugach Electric Association (CEA) – Victor Willis, 230-7536

ENSTAR Natural Gas – Stan Staples, 334-7777

GCI – Steven Cranford, 868-6769

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

Municipal Street Light Maintenance – Steve Parkinson, 343-8290

Municipal Traffic Signals Section – Levi Piehl, 343-8363

Solid Waste Services (SWS) – Evalu Filitaula, 343-6258 or 317-6863

Alaska Waste – Josh James, 688-4446

Add the following Articles:

Article 4.22 Responsibility of Contractor to Act in Emergency

In case of an emergency that threatens loss and/or injury of property and/or safety of life, the Contractor shall act, without previous instructions from the Engineer, as the situation may warrant. The Contractor shall notify the Engineer thereof immediately thereafter. Any claim for compensation by the Contractor, together with substantiating documents in regard to expense, shall be submitted to the Owner through the Engineer. The amount of compensation shall be determined by agreement.

The Contractor shall supply the Engineer, prior to commencement of Work, with an emergency telephone number through which a responsible Contractor's representative can be contacted on a twenty-four (24) hour a day basis, seven (7) days a week.

Article 4.24 Coordination with Other Projects in the Area

It shall be the responsibility of the Contractor to coordinate with and minimize impact to other projects in the area including, but not limited to, the following:

- Utility Relocation/Protection Work by others.
- Downtown Edge Condominium Work by others
- 49th State Brewery Site Development work by others

The Contractor shall be responsible for affirmatively coordinating with other projects in the area to not unreasonably interfere with the performance of the other projects.

If the Work of the Contractor is delayed or disrupted because of the construction or transportation activities of other projects in the area, the Contractor shall not be entitled to additional compensation from the Owner, but may be entitled to an extension of time.

Except with regard to a possible entitlement to an extension of time, the Contractor shall hold harmless, defend, and indemnify the Owner from and against any and all claims by the Contractor arising directly or otherwise out of the other projects in the area.

Work required to coordinate with and minimize impact to other work in the Project area shall be considered incidental to the Project.

SECTION 10.05 CONTROL OF WORK

Add the following Article:

Article 5.34 Work Plan

Contractor shall prepare a Work Plan for approval by the Engineer prior to beginning construction. The goals of the Work Plan shall include the following:

- Maintain a safe transportation corridor through the project area for vehicles and pedestrians.
- Minimize impacts to existing utilities and protect existing utilities where required.
- Minimize impacts to vehicular and pedestrian traffic.
- Minimize dust and erosion generated by Construction activities.
- Minimize overall construction noise.
- Finish the project within the time of completion requirement.

Contractor shall submit a project Work Plan for approval by the Engineer within seven (7) days after signature of the Contract. Contractor shall coordinate the Work Plan with the Traffic Control Plan, Dewatering/Trench Dewatering Plan, SWPPP Plan and adhere to all permit requirements. 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 significant element of Work.

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

At a minimum, the Work Plan shall include the following requirements:

A. Disruption of driveways shall be kept to a minimum. Contractor shall provide and maintain access to all adjacent properties and side streets in accordance with M.A.S.S. 10.04.10 and 10.04.12.

B. Contractor shall provide for emergency vehicle access at all times in accordance with M.A.S.S 10.04.10.

C. The Contractor shall protect existing surfaces located beyond the limits of the proposed improvements identified in the demolition plan.

D. Contractor shall provide for uninterrupted utility service to nearby businesses and shall accommodate trash collection, paper delivery and mail delivery in a manner satisfactory to the utility provider.

E. Contractor shall provide proper notification to businesses of impending construction activities. Contractor shall provide businesses with contact name(s) and phone number(s) for Contractor personnel with responsibility to inform and coordinate with businesses. The Contractor shall give written notice to the business of any adjacent property having direct driveway or parking access to the project area, 48 hours in advance of installing curb and gutter, sidewalk, or approach aprons across the driveway, or driveways serving the adjacent property.

SECTION 10.06 LEGAL RELATIONS AND RESPONSIBILITIES

Article 6.6 Permits

Add the following paragraphs:

Contract shall obtain a Right-of-Way (ROW) permit from the Municipality of Anchorage for the purpose of constructing the proposed improvements within Municipal ROW.

The Contractor shall confine his operations to the existing right-of-way and Alaska Railroad Corporation (ARRC) property. The Contractor shall comply with all special conditions, stipulations and restrictions thereof. Prior to the start of construction, the Contractor shall verify that all permits necessary for construction of the project have been obtained. The Contractor shall have a copy of all permits on the job site at all times.

No private property within the permitting areas shall be damaged except as necessary to construct the proposed improvements and the Contractor shall repair or replace damaged property to pre-project conditions to the satisfaction of the Engineer.

The payment of basic and special fees, established under Anchorage Municipal Code (AMC) AMC 24.30.100 Fees for Use of Public Places (streets and rights-of-way), and which are applicable to the Project, shall be the responsibility of the Contractor.

Permit applications that have been submitted, which the Contractor is required to pick up from the MOA Permitting Department and pay for the associated inspection fees upon submittal of additional information, include:

Permit	Number	Permit Inspection Fees (Estimated)
MOA Building Permit	C24-xxxx (TBD)	$2,500.00

It will be necessary for the Contractor to prepare and obtain approval of the SWPPP in accordance with specification Section 20.02 as a condition of obtaining the building permit. Contractor may also be required to provide information specific to his operations, materials sources, haul routes, planned hours of operation, dust control measures, and other aspects of construction to the Permitting Department prior to picking up the Permit.

Contractor shall submit a copy of the approved, filed Alaska Pollutant Discharge Elimination System (APDES) Notice of Intent (NOI) to the Alaska Department of Environmental Conservation (ADEC) to the Engineer and the Owner. Upon completion of the project, Contractor shall submit a copy of the approved, filed APDES Notice of Termination (NOT) to ADEC to the Engineer and Owner.

The Contractor shall be responsible for complying with the conditions and regulations of the MOA Building Permit. This shall include arranging and paying for MOA building and electrical inspections in accordance with MOA Handouts AG.14, AG.09, and E.01. Inspections can be arranged by contacting the MOA Inspection Request Line at 343-8300.

The Contractor shall also apply for, purchase, and obtain a Noise Permit from the Municipality of Anchorage for all Work included in this Contract. The conditions of the Noise Permit shall be complied with at all times during construction. Apply for Noise Permits with the Anchorage Department of Health and Human Services at 343-4200. The application for the Noise Permit shall include 24-hour construction to cover Work performed in the evening, at night and in the early morning in case of emergency operations or modified work schedule.

The Contractor shall be solely responsible for applying for and obtaining all other necessary State, Municipality, and Utility permits and fulfilling all other requirements of MASS and the Municipal Code, pertinent to the approval and issuance of the permits. Contractor shall coordinate with utilities and pay all fees associated with all the permits, inspection, deposits, dumping, or other requirements of any agency having jurisdiction over elements of the Work. This shall be considered incidental to the project and no separate payment shall be made.

B. DIVISION 20 STANDARD CONSTRUCTION SPECIFICATIONS FOR EARTHWORK

SECTION 20.01 GENERAL

Article 1.6 Subsurface Investigation

Add the following paragraph:

The soils information for the project is in Section IV.

SECTION 20.02 STORM WATER POLLUTION PREVENTION PLAN

Article 2.10 Hazardous Material Control Plan (HMCP) Requirements

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

The contractor shall prepare and submit to the Owner for approval a HMCP for the prevention of pollution from handling, storage, use, containment, cleanup, and disposal of hazardous material, including petroleum products related to construction activities. Detail the plan for storing these materials as well as disposing of waste petroleum products and other hazardous materials generated by the project.

Add the following to the end of the seventh paragraph:

Any spill, regardless of the size, must be reported to the Owner's Representative.

Add the following after the last paragraph:

Specify the line of authority and designate the field representative for spill response and one representative for each subcontractor. Include a copy of the inspection form to be used for weekly compliance inspections in the HMCP with a certification of compliance or remedy. The Contractor shall sign and certify compliance with this plan. Implement all measures in the HMCP and ensure that it remains current.

Article 2.18 Measurement

Retain this article

Article 2.19 Payment

Retain this article

Delete Section 20.03 Exploratory Test Pits in its entirety and replace it with the following:

SECTION 20.03 EXPLORATORY TEST PITS

Article 3.1 General

Work under this Section consists of furnishing a vactor truck, excavator, operators, surveyors and all related supplies/materials in order to excavate and fill test pits for locating and surveying the location of buried utilities depth or other below ground infrastructure depths as directed by the Engineer prior to the commencement of below grade construction activities.

Article 3.2 Materials

Contractor shall furnish an excavator and vactor truck capable of excavating to a maximum depth of twelve feet (12'). Contractor shall provide shoring/sheeting materials as required when excavating exploratory test pits.

Article 3.3 Construction

Contractor shall excavate to locate utility or other below ground infrastructure as directed by the Engineer. Engineer shall be on site during duration of exploratory test pit work. Excavation shall be accomplished with vactor truck unless otherwise directed by the Engineer. Contractor shall be responsible for coordinating with and calling for utility companies to mark the location of the utility in question prior to excavation.

Once utility or other below grade item is located and exposed, Contractor shall survey the horizontal and vertical location of the utility or other below grade item and provide the data to the Engineer. Excavated material shall be disposed of by the Contractor.

After excavation and location of the utilities or other below grade item is complete, Contractor shall backfill test pits with Type IIA Classified Fill and compact them so that the ground is returned

to its original condition. Excavations in roadways shall be capped with AC pavement placed to match surrounding pavement.

Contractor shall locate utilities at locations as shown below if approved by Engineer and/or other locations as determined by the Engineer in the field.

- Electric Duct Bank at Station 18+51.98, 17.33 LT (at proposed storm drain crossing).

SECTION 20.04 CLEARING AND GRUBBING

Article 4.3 Measurement

Retain this article

Article 4.4 Payment

Retain this article

SECTION 20.09 REMOVAL OF PAVEMENT

Article 9.1 General

Add the following to the first paragraph after the word 'pavement':

…or RAP

SECTION 20.10 EXCAVATION FOR TRAFFIC WAYS

Article 10.1 General

Replace the first paragraph with the following paragraph:

The Work under this Section consists of furnishing all plant, labor, equipment, supplies, and material in performance of all operations pertaining to the excavation of unsuitable and/or surplus material for streets, alleys, access roads, parking lots, sidewalks, curbs, gutter, trails, bio-filtration swales, and detention/retention/infiltration basins.

Article 10.3 Miscellaneous

Add the following paragraph:

Any underground, abandoned utility encountered during the Work shall be removed and disposed of by the Contractor per Division 10, Section 10.04, Article 4.9 – Disposal Sites.

Article 10.5 Utilization or Disposal of Excavated Material

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

Excavated material conforming to the specifications for classified fill and backfill shall be used where practical for fill and backfill as directed by the Engineer. When this material is used, it shall be considered usable excavation. Usable excavation shall be compacted in accordance with Section 20.01, Article 1.5 - Compaction Standards. When not used on the Project site, the material shall be hauled away and treated as unusable excavation.

Article 10.7 Measurement

Retain this article

Article 10.8 Payment

Retain this article

SECTION 20.13 TRENCH EXCAVATION AND BACKFILL

Article 13.2 Trench Excavation and Backfill - Description

E. Locator Tape

Delete the fourth sentence and replace with the following:

The Contractor shall install the locator tape at least 18 inches but no more than 36 inches above the crown of the pipe.

SECTION 20.21 CLASSIFIED FILL AND BACKFILL

Article 21.4 Measurement

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

Classified fill or backfill material Type II and Type IIA, obtained from borrow pits, will be measured will be in tons (2000 lbs.) of material obtained, delivered, and placed in accordance with these Specifications. The measurement may include moisture up to a maximum of four percent (4.0%) of dry weight of the material. When tests by the Engineer indicate that moisture contents in excess of four percent (4.0%) may be occurring consistently, the frequency of testing will be increased as necessary and the results averaged over a period of one week. When this average is greater than four percent (4.0%), the tonnage as measured over the above period, shall be reduced by the difference. No credit will be due the Contractor when moisture content is less than four percent (4.0%). Testing shall be done in accordance with Section 20.01, Article 1.3 – Applicable Standards.

Measurement will be in tons (2000 lbs.) of material delivered and placed in accordance with these Specifications. The measurement may include moisture up to a maximum of four percent (4.0%) of dry weight of the material. When tests by the Engineer indicate that moisture contents in excess of four percent (4.0%) may be occurring consistently, the frequency of testing will be increased as necessary and the results averaged over a period of one week. When this average is greater than four percent (4.0%), the tonnage as measured over the above period, shall be reduced by the difference. No credit will be due the Contractor when moisture content is less than four percent (4.0%). Testing shall be done in accordance with Section 20.01, Article 1.3 – Applicable Standards.

Imported classified fill and backfill (all types) will be weighed on a scale certified by the State of Alaska. Weight tickets will be serialized and witnessed at the time of weighing by a Contractor-furnished weighman. The Engineer may at any time verify load weights and the weighing process.

Where excavation of unsuitable material beyond the lines and grades shown on the Drawings is ordered in writing, the measurement of classified backfill will include the material required for

replacement. No measurement will be made for quantities placed beyond the lines and grade authorized or for quantities placed outside the limits of required excavation.

The Contractor and the Engineer shall verify daily the quantity of material delivered to the Project site. Weight tickets not presented at time of delivery will require special verification by the Contractor before payment can be made.

Article 21.5 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 for the placement and compaction of usable excavation shall not be paid under this Section.

Payment shall be made under the following units:

ITEM	UNIT
Classified Fill and Backfill (Type)	Ton

SECTION 20.22 LEVELING COURSE

Article 22.4 Measurement

Remove the first sentence and replace with the following:

The leveling course shall be measured in tons of materials delivered and placed in accordance with these Specifications and adjusted for excess moisture as provided.

Article 22.4 Measurement

Retain this article

Article 22.5 Payment

Retain this article

SECTION 20.25 GEOTEXILE

Article 25.1 Description

Add the following to the end of the first paragraph:

Work under this Section shall also consist of furnishing and installing impermeable liners.

Article 25.2 Materials

Replace the second sentence in A. Type A Geotextile (Separation) with the following:

The Type A Geotextile (Separation) shall be a nonwoven pervious fabric constructed from long chain polymeric filaments such as polypropylene, polyethylene, polyester, polyvinylidene chloride or polyamide formed into a stable network such that the filaments or yarns retain their relative position to each other.

Add the following material type:

E. Impermeable Liner

Impermeable liners are used for prevention of drainage entering the subgrade. This material shall be constructed of polyethylene plastic with welded joints and have the following properties:

Property	Test Method	Frequency	Value
Thickness, mil, (lowest individual reading)	ASTM D 5199	Every roll	30 mils (27) mils
Density, g/cm3	ASTM D 1505	200,000 lb	0.940
Tensile Properties (each direction) Break strength Yield strength Break elongation Yield elongation	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lb	 114 lb/in-width 63 lb/in-width 700 % 12%
Tear Resistance	ASTM D 1004	45,000 lb	21 lb
Puncture Resistance	ASTM D 4833	45,000 lb	54 lb
Carbon Black Content (range)	ASTM D 4218	20,000 lb	2.0% - 3.0%
Notched Constant Tensile Load	ASTM D 5397	200,000 lb	500 hr
Oxidative Induction Time	ASTM D 3895, 200°C; O2, 1 atm	200,000 lb	>100 mins

SECTION 20.26 INSULATION

Article 26.2 Materials

Add the following sentence after the first sentence:

Insulation board shall be provided in one inch-thick increments as required to meet the specified R-Value. Insulation board provided with fractional inch thickness shall be rejected.

Add the following New Section:

SECTION 20.31 SOIL REMEDIATION

Article 31.1 General

The Work under this Section consists of coordination with ARRC for contaminated soil handling. Work will include transport of impacted soil off site and may also consists of stockpiling soil that would require additional evaluation by ARRCs environmental contractor.

Article 31.2 Construction

Based on the project area soil information, minor soil contamination is expected in the project site; see soils information included in Section IV. ARRC will coordinate with Alaska Department of Environmental Conservation (ADEC) and will obtain transport approval for removing soils off site for remediation. Unusable material, including soils that may contain minor contamination, shall be hauled off site by the contractor. Each Load of soil transported off the site will be covered and the bed of the truck will be dry swept after emptying the load.

If contractor observes visual or olfactory evidence of elevated concentrations including observation of free product in soils, contractor will notify ARRC immediately. The contractor may be directed to place soils in an adjacent long term stockpile. Contractor shall insure soils stockpiled on adjacent site will comply with ADEC long term stockpile regulations and will include berms, liners, and covers.

C. DIVISION 30 STANDARD CONSTRUCTION SPECIFICATIONS FOR PORTLAND CEMENT CONCRETE

SECTION 30.01 GENERAL

Article 1.3 Materials

B. Welded Steel Wire Fabric

Add the following paragraph:

Welded Steel Wire Fabric shall be used in all concrete driveways including colored concrete and in sidewalks at all driveway crossings and shall be 6x6-W4.0xW4.0.

SECTION 30.04 PORTLAND CEMENT CONCRETE CURB RAMPS

Article 4.1 General

Add the following Sentence:

The Work covered under this Section shall also include construction of backing curb, as required.

Article 4.2 Materials

Add the following Subsection:

C. Backing Curb

Backing curb materials and installation shall conform to the requirements of MASS Section 30.02 Portland Cement Concrete, Curb and Gutter and Valley Gutter, the Drawings, details and these specifications. Location and height of backing curb shall be as required to retain the neighboring ground, as approved by the Engineer.

D. DIVISION 40 STANDARD CONSTRUCTION SPECIFICATIONS FOR ASPHALT SURFACING

SECTION 40.01 GENERAL

Add the following Articles:

Article 1.7 Asphalt Price Adjustment

This provision provides a price adjustment for asphalt material by:

1. an increase to the contract amount, or
2. a deduction from the contract amount.

The provision shall apply to asphalt concrete pavement which:

- is a major bid item as defined in M.A.S.S. Division 10, Section 10.04, Article 4.5 – Increased Quantities;
- is placed in the second or later year of the contract;
- conforms to M.A.S.S. Division 40, Section 40.06 – Asphalt Concrete Pavement; and
- is paid pursuant to M.A.S.S. Division 40, Section 40.06 – Asphalt Concrete Pavement

This provision shall only apply to cost changes in the asphalt material that occurs between the date of bid opening and the date the asphalt material is incorporated into the project.

The asphalt price adjustment shall only apply when there is more than a seven and one-half percent (7.5%) increase or decrease in the Alaska Asphalt Material Price Index from the date of the bid opening to the date the asphalt material is incorporated into the project.

As used in this Article, the Alaska Asphalt Material Price Index is calculated bi-monthly on the first and third Friday of each month, and will remain in effect from the day of calculation until the next bi-monthly calculation. The Alaska Asphalt Material Price Index is posted on the ADOT&PF's Statewide Materials website and is calculated according to the formula posted therein.

The Asphalt Price Adjustment (APA) payment is cumulative and is calculated with each progress payment. Asphalt material price index in effect on the last day of the pay period is used to calculate the price adjustment for asphalt material incorporated into the project during that pay period. The Municipality will increase or decrease payment under this contract by the amount determined with the following asphalt material price adjustment formula:

$$\mathbf{APA\ \{price\ ^{increase}/_{decrease}\}^{*} = [(\pm\ IPP\ \mp\ IB) - (0.075 * IB)] * Q * \%\ AC}$$

Where,

Q = quantity of asphalt concrete pavement incorporated into the project during the pay period, in tons, and documented by weight tickets;

IB = Index at bid: the bi-monthly Alaska asphalt material price index in effect on date of bid, in dollars per ton;

IPP = Index at Pay Periods: the bi-monthly Alaska asphalt material price index in effect on the last day of the pay period, in dollars per ton; and

%AC = percentage asphalt cement content in the asphalt concrete pavement, as determined by the average asphalt cement content in project's asphalt concrete quality control testing.

***Note: a negative price adjustment (APA) results in a price reduction to the Contract.

Method of measurement for determining quantity, Q, is the weight of asphalt concrete pavement material that conforms to M.A.S.S. Division 40, Section 40.06 – Asphalt Concrete Pavement and is incorporated into the project.

No asphalt price adjustment will be paid based on estimated quantities.

Contingent Sum payment shall be made on the following basis:

The final asphalt price adjustment on a project is the aggregate of the price adjustments paid on a project's respective progress pay estimates, i.e.,

$$\mathbf{APA = APA_1 + APA_2 + \ldots. + APA_n}$$

Where,

n = partial payment estimate number.

SECTION 40.06 ASPHALT CONCRETE PAVEMENT

Article 4.3 Measurement

Retain this article

Article 4.4 Payment

Retain this article

E. DIVISION 55 STANDARD CONSTRUCTION SPECIFICATIONS FOR STORM DRAIN SYSTEMS

SECTION 55.02 FURNISH AND INSTALL PIPE

Article 2.2 Material

Replace the second sentence of E. High Density Polypropylene Pipe (HDPEP) with the following:

The pipe shall meet AASHTO M330.

SECTION 55.03 SUBDRAIN

Article 3.2 Material

Replace parargprah "D. Geotextile…" in its entirety and replace with the following:

D. Geotextile fabric shall conform to Division 20, Section 20.25 – Geotextile Fabric and shall be non-woven pervious drainage material or impermeable linear as indicated on the plans.

SECTION 55.04 CONNECTIONS TO EXISTING MANHOLES OR CATCH BASINS

Article 4.1 General

Add the following:

The Work under this Section shall also include the performance of all operations pertaining to the construction required for connections to existing storm drain pipes.

SECTION 55.05 MANHOLES AND CATCH BASIN MANHOLES

Article 5.3 Construction

B. Storm Drain Manholes and Catch Basin Manholes

Delete the second paragraph and replace it with the following:

After connecting the storm drain pipe to reinforced concrete manhole or catch basin, seal annular space around pipe penetrations with cement mortar or boot style connector, or approved equal. Cement mortar shall conform to the requirements of ASTM C-150, Type II. Boot style connector shall conform to the requirements of this Section. After the mortar has firmly set, Contractor shall cut the pipe evenly so that no more than two inches (2") of the pipe protrudes into the manhole. Boot style connectors shall be installed at all locations where watertight storm drain pipe connects to manholes.

G. DIVISION 70 STANDARD CONSTRUCTION SPECIFICATIONS MISCELLANEOUS

SECTION 70.12 TRAFFIC MAINTENANCE

Article 12.5 Materials

Delete items 8 and 9 and replace with the following items:

8. Portable Concrete Barriers. Provide portable concrete barriers that conform to ADOT&PF Standard Plan G-46.11 and are equipped with warning lights.
9. Work Zone Pavement Markings. Work zone pavement markings shall be either paint with glass beads or preformed marking tape.
10. Street Sweeping. Street sweeper shall be capable of collecting and storing materials for later disposal rather than ejecting them to the shoulder of the road.
11. Watering. Watering trucks shall be capable of providing both a high-pressure water stream to flush the pavement and a light-water spray to control dust.

12. Plastic Safety Fence. Use 4-foot high construction orange fence manufactured by one of the following companies or an approved equal:

    "Safety Fence" by Services and Materials Company, Inc., 2200 South "J" Street, Elwood, Indiana, 46036. Phone (800) 428-8185.

    "Flexible Safety Fencing" by Carsonite, 1301 Hot Springs Road, Carson City, Nevada, 89706. Phone (800) 648-7974.

    "Warning Barrier Fence" by Plastic Safety Systems, Inc. P.O. Box 20140, Cleveland, Ohio, 44120. Phone (800) 662-6338.

Article 12.6 Public Notice

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

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 Court System..... 264-8232
2. Alaska State Troopers 428-7200
3. Alaska Travel Industry Association 929-2842
4. Alaska Trucking Association..... 276-1149
5. Anchorage Chamber of Commerce 272-2401
6. Anchorage Fire Department 267-4950
7. Anchorage Police Department..... 786-8500
8. Anchorage Public Transportation 343-8253, 343-8386
9. ASD Pupil Transportation..... 742-1207
10. Commercial Vehicle Enforcement 365-1203
11. Local Emergency Medical Services 267-4950
12. Local Schools and Universities ..... Varies
13. Local Solid Waste Utilities..... 563-3717
14. MOA Parks and Recreation 343-4297
15. U.S. Postal Service..... 266-3261
16. University of Alaska Anchorage 786-1800, 786-6763, 786-6764

H. DIVISION 75 STANDARD CONSTRUCTION SPECIFICATIONS FOR LANDSCAPING IMPROVEMENTS

SECTION 75.01 GENERAL

Article 1.3 Payment – General

Add the following sentence:

For this project, Payment for all Work included in this Division shall be paid as Lump Sum and shall include full payment for all work described.

SECTION 75.02 LANDSCAPING

Article 2.1 General

A. Scope of Work

Add the following paragraph:

The Work shall also include an extended maintenance period and all equipment, labor, materials and transportation necessary to maintain the Landscape and Moose Protection Fence.

1. Installation of Tree Protection Zone Fences shall be per Section 75.12 Tree Protection Zone Fence.
2. Installation of Moose Protection Fence shall be per Section 75.14 Moose Protection Fence.

Article 2.3 Construction

Delete and replace the existing Paragraph with the following:

M. Pruning and Repair

For new plantings, the only pruning allowed at planting shall be removal of dead, damaged, or broken branches and roots. Pruning shall conform to the American National Standard for Tree Care Operation, ANSI A300. No pruning paint or other wound dressing shall be used.

Article 2.4 Maintenance

A. General

Add the following paragraphs:

1. Extended Maintenance: The plant establishment period shall be extended one year. The Contractor shall furnish all labor, materials, supplies and equipment required to maintain the Landscape and the Moose Protection Fence one year beyond the standard one-year plant establishment period from the date of acceptance of the initial planting operations. Contractor shall conduct periodic visual inspections and repair any damage due to moose, other wildlife or vandalism immediately. The Engineer may notify the Contractor about damages in which case the repairs shall be made within 24 hours. The Contractor shall repair and replace all materials damaged or destroyed within the scope of the Work, regardless of cause.
2. The Contractor shall also furnish all labor, materials, supplies and equipment required to remove the Moose Protection Fence two years from the date of acceptance of the initial planting operations.

Article 2.5 Landscaping Acceptance

Delete the second paragraph and replace with the following:

A Landscaping Acceptance Inspection of the project will occur after completion of the Plant Establishment Period. Engineer shall verify that Contractor performed maintenance functions as identified in Article 2.4 – Maintenance of this Section. Additional conditions governing Landscaping Acceptance of the planted and seeded areas are that, in the opinion of the Engineer, all plants are in a live, uniform, and sound and healthy and flourishing condition; free of disease, insect infestation and physical damage, and free of weeds, rubbish and construction debris. The Engineer shall verify that all Moose Protection Fencing has been removed as identified in Article 2.4 Maintenance of this Section. If the Engineer does not accept the plantings and removal of Moose Protection Fencing, the Contractor shall correct all deficiencies. All costs associated with correcting the deficiencies and extending the Plant Establishment Period shall be paid by the Contractor without additional cost to the Owner.

Should the required corrections not be made within thirty (30) days after the initial Landscaping Acceptance Inspection, the Contractor shall be assessed liquidated damages per Division 10, Section 10.05, Article 5.27 – Liquidated Damages, until all Work is complete and accepted by the Engineer.

SECTION 75.03 TOPSOIL

Article 3.1 General

Add the following paragraph:

The Work under this Section also consists of providing all operations pertaining to furnishing, transporting, installing, and spreading Engineered Soil

Article 3.2 Materials

Add the following material:

C. Engineered Soil

Engineered Soil shall conform to the following requirements:

Item	Amount/Value
Sand	50-60%
Compost	20-30%
Topsoil	20-30%
Organic Material	1.5-3%
Ph Range	5.5-6.5

Add the following Section:

SECTION 75.12 TREE PROTECTION ZONE FENCE

Article 12.1 General

The Work under this Section includes but is not limited to all equipment, labor, and transportation necessary to provide and remove Tree Protection Zone Fences as specified herein. Tree Protection Zone Fences are required where all work abuts mature tree plantings that are to remain in place. Tree Protection Zone Fences are to be removed when construction is complete.

Tree Protection Zone (TPZ): Tree Protection Zones shall be per Section 75.02.

The Contractor is responsible for the verification of all existing utilities or requesting locates of underground utility lines.

Article 12.2 Submittals

A. Certification: provide a certification from a certified arborist that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

B. Maintenance Recommendations: From certified arborist, for care and protection of trees affected by construction during and after completing the Work.

Article 12.3 Quality Assurance

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to project site during execution of tree protection and trimming.

B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where Project is located.

C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

D. Pre-installation Conference: Before tree protection operations begin, meet with the Engineer, Arborist to review tree protection procedures and responsibilities and determine tree protection fencing limits on site.

E. Prior to any excavation, tree protection limits will be staked by the Contractor and approved by the Engineer.

F. Provide written acceptance from a certified arborist that trees indicated to remain and protected by Tree Protection Zones have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

Article 12.4 Materials

A. Topsoil: Topsoil shall be per Section 75.03

B. Temporary Construction Fencing: 4’ High, high visible orange safety fence.

C. Steel T-Posts: with pointing and reflective safety caps, green color.

Article 12.5 Construction

A. Construction Fencing: Install fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations. Root pruning shall be per Section 75.13 ROOT PRUNING.

C. Do not store construction materials, debris, or excavated material inside Tree Protection Zones. Do not permit vehicles or foot traffic within Tree Protection Zones; prevent soil compaction over root systems.

D. Ensure that branches of trees within the Tree Protection Zone are not broken by equipment.

E. Maintain Tree Protection Zones free of trash.

F. Do not allow fires within Tree Protection Zones.

Article 12.6 Tree Repair

Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to Arborist's written instructions.

SECTION 75.14 MOOSE PROTECTION FENCE

Article 14.1 General

The work under this section includes but is not limited to all labor, materials, transportation, and maintenance necessary to furnish and install temporary fencing for moose protection as shown on the drawings and specified herein. Moose Protection Fence is required around all new individual deciduous trees and/or deciduous tree groupings.

The Contractor is responsible for the verification of all existing utilities or requesting locates of underground utility lines.

Article 14.2 Materials

Posts: Steel T- posts with pointing, green color, 9' height.

Fabric: Fabric shall be 1-3/4 inch opening black nylon netting with 5/16" black polyester rope border. Use metal ties to secure to posts.

Article 14.3 Construction

A. Workmanship and Procedure

Moose protection fencings shall be erected immediately following the tree installation. The moose protection fencing shall be place at the outside edges of individual deciduous trees and/or all deciduous tree groupings. All deciduous trees shall be enclosed within the fencing without damaging branches or allowing branches to protrude.

B. Detail Drawings:

All assemblies specified herein shall be installed in accordance with the drawings.

C. Maintenance:

Maintenance of the Moose Protection Fence shall be per Section 75.02.

END OF SPECIAL PROVISIONS

ALASKA RAILROAD CORPORATION

DEPOT DRIVE IMPROVEMENTS
PHASE 2

II

SUBMITTAL LIST

ALASKA RAILROAD CORPORATION

DEPOT DRIVE IMPROVEMENTS

PHASE 2

SUBMITTAL LIST

Job #: _____ Contractor: .

Submittal Number	Description
20.02	Storm Water Pollution Prevention Plan
20.02	Hazardous Material Control Plan
20.12	ADEC Dewatering Plan Permit Approval
20.13	Trench Excavation and Backfill
20.15	Tench Backfill (Engineered Soil)
20.16	Bedding Material
20.18	Drain Rock
20.20	Unclassified Fill and Backfill
20.21	Classified Fill and Backfill
20.22	Leveling Course
20.25	Geotextile (all types)
20.26	Insulation Board
30.01	All concrete mix designs
40.06.2	Certified Analysis of Asphalt for A.C. Pavement from Refinery Lab.
40.06.3	Asphalt Job Mix Formula for A.C. Pavement Laboratory
55.02	Storm Drain Televising Documentation
55.02	Storm Drain Pipe

Submittal Number	Description
55.05 & 55.09	Storm Drain Structure Shop Drawings
55.05	Bypass Gate Control Shop Drawings
70.12	Traffic Control Plan
75.02	Landscape Maintenance Schedule
75.02	Tree Service Firm & Arborist Certification
75.03.2	Topsoil Analysis Test Reports
75.03	Topsoil Mix
75.03	Engineered Soil
75.04	Seed Certification
75.12	Tree Protection Zone Fence
80.00	All Electrical/Signal Equipment and Materials Submittals

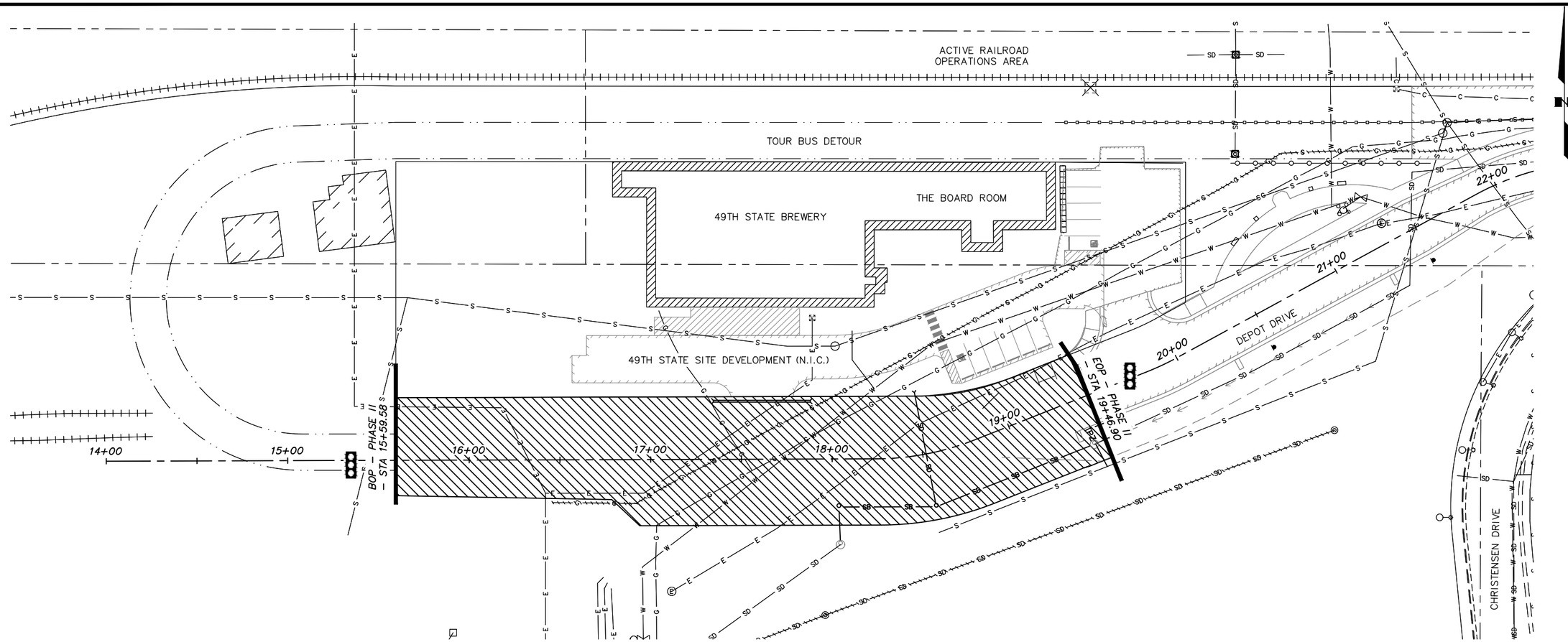
NOTE: The above list of submittals is not all inclusive. In addition to the above, the Contractor is required to comply with all submittal requirements as required or identified in the Drawings, specifications, M.A.S.S., or as directed by the Engineer.

ALASKA RAILROAD CORPORATION

DEPOT DRIVE IMPROVEMENTS
PHASE 2

III

TRAFFIC CONTROL PLAN



1
TC1

TRAFFIC CONTROL PLAN

GRAPHIC

30' 0 30' 60'

TRAFFIC CONTROL PLAN

- UTILIZE HALF–WIDTH CONSTRUCTION AND ONE LANE ROAD AS NEEDED WITH APPROPRIATE SIGNING, BARRICADES, TRAFFIC CONTROL DEVICES, CHANNELIZATION, AND ACTIVE WORK AREA BARRICADES IN ACCORDANCE WITH THE LATEST MUTCD & ALASKA TRAFFIC MANUAL
- UTILIZE TEMPORARY SIGNALIZATION FOR HALF–WIDTH/ONE LANE ROAD.
- PROVIDE CONTINUED ACCESS FOR VEHICLES TO THE BOARD ROOM AND 49TH STATE BREWERY.
- PROVIDE CONTINUED ACCESS FOR TOUR BUSSES TO THE ACTIVE RAILROAD OPERATIONS AREA. COORDINATE WITH ARRC FOR ANTICIPATED TIMES AND DATES FOR TOUR BUSSES.
- MAINTAIN 25.0' CLEAR SPACE BETWEEN RAILROAD TRACKS AND ACTIVE DETOUR ROUTE.

LEGEND

WORK AREA

TEMPORARY SIGNAL

CRW ENGINEERING GROUP

PROJECT NO. 31105.03
CITY GRID 1230
WATER GRID 1230
SEWER GRID 1230
DATE: DECEMBER 2023

PROJECT NO: ARRC DEPOT DRIVE IMPROVEMENTS – PHASE II

TRAFFIC CONTROL PLAN

STATUS: FINAL DESIGN

REVISION			
REV	DATE	DESCRIPTION	BY

SCALE HOR. 1"=30'
VER. N/A
DESIGNED BY MS
DRAWN BY MS
CHECKED BY MH
APPROVED BY MH

SHEET NO.
TC1

ALASKA RAILROAD CORPORATION

DEPOT DRIVE IMPROVEMENTS
PHASE 2

IV

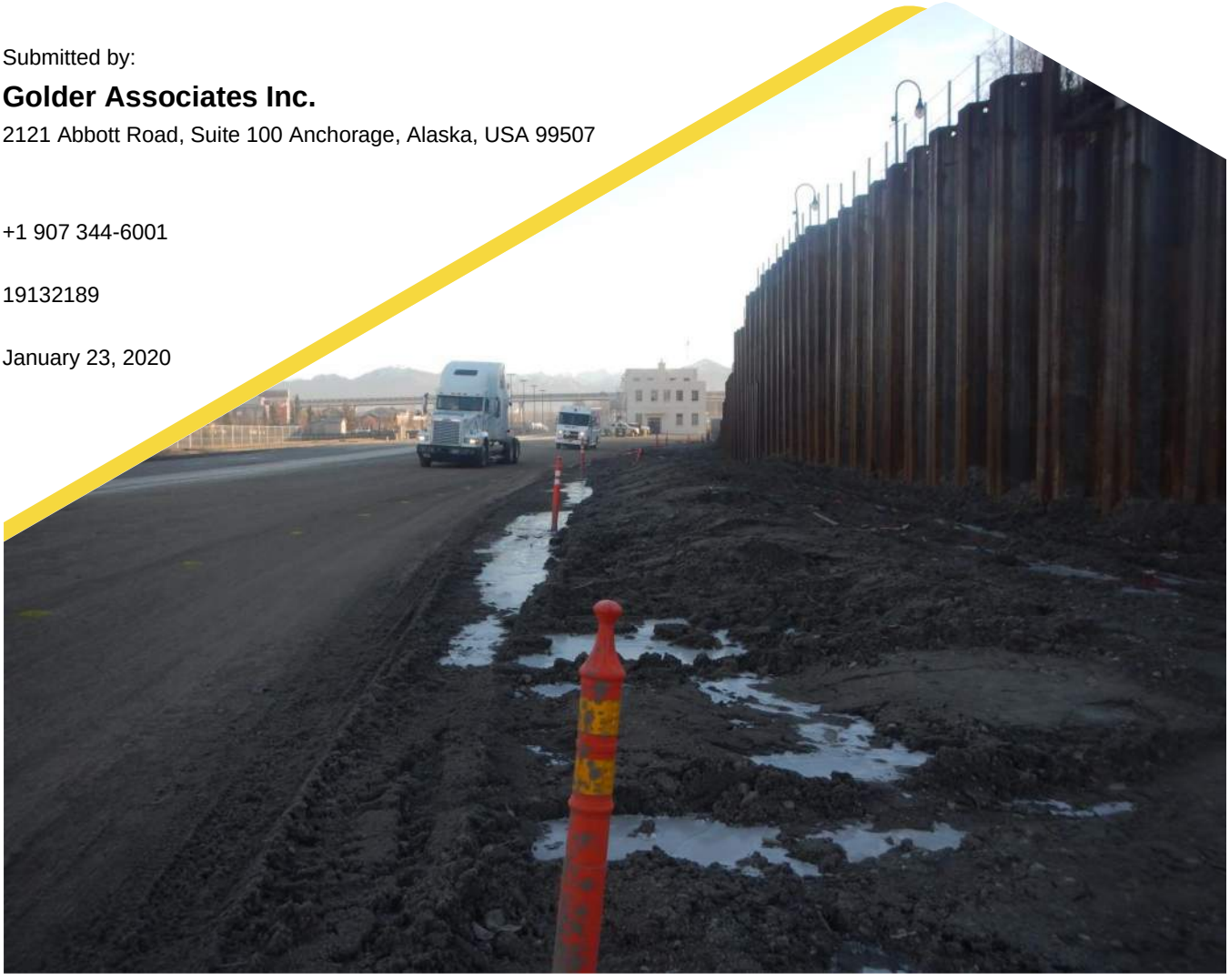
SOILS INFORMATION

FINAL REPORT

Data Report for Geotechnical Investigation and Environmental Sampling
ARRC Depot Drive Development - Phase I (East)
Alaska Railroad Corporation
Anchorage, Alaska

Submitted to:

Paul Farnsworth
Alaska Railroad Corporation



Submitted by:

Golder Associates Inc.
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19132189

January 23, 2020

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TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

Golder Associates Inc. (Golder) is pleased to present the results from our geotechnical investigation and environmental sampling to support the road design of Depot Drive for Alaska Railroad Corporation (ARRC). The project is located west of the Historical Railroad Depot in Anchorage Alaska. Depot Drive is near the northern bounds of Downtown Anchorage and is part of the greater Anchorage Rail Yard. The eastern portion of the gravel road, nearest the Historic Depot building, runs parallel to an active track that serves mostly passenger trains. A vicinity map of the project area is presented in Figure 1.

Much of the existing roadway has a gravel trafficked surface, excluding a middle segment that is located between the former sheet-pile wall and one recently added closer to Christensen Drive. The planned project includes upgrades to the existing Depot Drive, with plans for minor realignment to the south, betterment of the road including asphalt pavement and subgrade improvements, addition of accompanying pathway and bus-loading area, and stormwater management facilities. The attached Figure 2 shows the outline of the proposed realignment. We understand improvements may be phased over more than one construction season, with Phase I, encompassing the eastern half and closest to the Depot, happening first.

The geotechnical investigation was completed on behalf of ARRC and is in support of the civil design services being performed by CRW Engineering Group, LLC (CRW). The work described in this report was performed in general accordance with our proposal dated October 14, 2019 and your Task Order #20 issued October 28, 2019. Our scope of work included the following:

- Reviewing historic soil borings available through MOA GIS database
- Planning and executing a geotechnical field program, including drilling and sampling three boreholes at select locations along the alignment
- Percolation testing on one of the boreholes at two selected depths to determine infiltration rates for stormwater
- Installation of PVC standpipe piezometers in select boreholes for long-term groundwater monitoring
- Field screening soil samples for volatile organic compounds
- Collecting samples of soil for analytical chemical testing
- Geotechnical laboratory testing of select samples collected during the field program

Engineering recommendations for the road design are presented in a sperate document.

2.0 SURFICIAL GEOLOGY AND BACKGROUND REVIEW

The geologic setting and available historic borehole data are discussed in the following sections.

2.1 Surficial Geology

Anchorage and the surrounding region meet the edge of the Cook Inlet and are bound by Knik Arm to the north, the Chugach Mountains to the east, and Turnagain Arm to the south. Most of the surficial deposits in the region were deposited over the last several glaciations by way of glacial ice, water-deposited sediments from streams

and over deltas, and from sediments accumulated in quiet lakes or ponds within the ancestral Cook Inlet. The Anchorage lowlands extend from the Chugach Mountain front to the coastline. Within the lowlands an alluvial fan, identified as the Anchorage plain, consisting mainly of coarse-grained alluvial deposits, extends from the northeast to the southwest (Schmoll and Dobrovolny 1972).

Depot Drive surficial geology is predominately composed of alluvium sediments deposited by Ship Creek, which now occupies a channel north of the area of interest. These sediments are composed of primarily sand with some gravel. This thin veneer of alluvium is underlain by significant amounts of glacioesturine silt and clay as a part of the Bootlegger Cove Clay formation (Schmoll and Dobrovolny 1972, Combellick, 1999). The sand deposits indicated in surficial geologic mapping were historically overlain by peat deposits mapped as commonly being 5- to 10-feet thick. Various pockets of peat deposits are known to exist within project, particularly toward the western end. No fibrous peat was observed in historical borehole logs, however, organic rich silt was noted in two of the boreholes, as discussed in Section 2.2. Various fill materials are also present across the roadway and rail yard. The tidal silt flats are located nearby to the northwest.

The site is positioned at the toe of a slope that descends from Downtown Anchorage. The slope height is 20 feet along 1st Avenue / Christensen Drive and overall 55 feet high to the top of F Street. This bluff line experienced land-sliding during the 1964 Great Alaska Earthquake, and is near the culmination between the L Street and Fourth Avenue Slides. Considering the proximity of the historic slides, there is potential for debris at this site.

2.2 Review of Historical Soil Borehole Logs

Golder conducted a review of historical borehole logs that are available through the Municipality of Anchorage GIS database (MOA, 2019). Copies of historic borehole logs near and relevant to the project are provided in Appendix C. Two historical boreholes close to the project corridor are MOA GIS I.D. # SW1230A022 (Boring No. 2) and SW1229B001 (Boring No. A1007), from east to west, respectively. SW1230A022 reveals a subsurface composed of sand and gravel fill material from 0 feet to 9 feet below ground surface (bgs) underlain by clayey silt with trace organic material to a depth of 25 feet bgs. Further west along the project corridor, SW1229B001 observed a subsurface composed of a 2-foot thick layer of organic silt at the surface, underlain by a 3-foot section of sand with gravel that overlies a 4-foot section of clayey silt, before transitioning back to sand and gravel for the remainder of the borehole to a depth of 10 feet bgs.

3.0 FIELD INVESTIGATION METHODS

A description of each element of the field investigation are presented in the following sections. The subsurface investigation for this phase included drilling and sampling four boreholes, and collecting one bulk sample along Depot Drive, between November 14 and 15, 2019. The portion of Depot Drive under investigation begins near the Historical Railroad Depot building, extending west for a quarter-of-a-mile. Borehole locations are shown in Figure 2. Site photographs are included in Appendix D. Standpipe piezometers were installed in two of the four boreholes. In addition, a pair of boreholes received 4-inch diameter PVC pipe installation, which facilitated falling-head percolation tests within. Methods of geotechnical drilling, testing, and monitoring are presented in the following subsections.

In conjunction with the geotechnical investigation, samples were screened in the field for potential volatile organics and soil samples were collected for chemical analytical testing.

3.1 Utility Locates Prior to Drilling

Utility locates were conducted prior to drilling activities using Alaska Dig Line services. Overhead utilities include powerlines running across Depot Drive, located west of the 49th State Brewery building. Additional utilities encountered in the area include but are not limited to the following: gas, electric, telecommunications, stormwater, water, sewer, fiber optic, and communications. Utilities were also located crossing the roadway in multiple locations. Proposed borehole locations were adjusted in the field as needed to avoid utility conflicts. A previously planned borehole (then named BH-03, planned location near Sta 23+50) was not advanced due to proximity to a buried power line running parallel to Depot Drive, south of the existing road. Subsequent boreholes were re-named accordingly with the removal of proposed Borehole BH-03.

3.2 Subsurface Drilling

The four boreholes completed in this phase, titled BH-01, BH-02, BH-03A, and BH-03B, were advanced by Discovery Drilling, Inc. of Anchorage, Alaska using a truck-mounted CME-75 drill rig equipped with 3.25-inch and 4.25-inch inside diameter (ID) hollow-stem augers. Soil conditions in the boreholes were logged by a Golder geologist and engineer who collected representative samples for laboratory testing. Borehole logs are presented in Appendix A.

3.3 Geotechnical Sample Collection

Drive samples were collected using a 3-inch outside diameter (OD) split-barrel (split-spoon) sampler, noted as “LS” on the borehole logs (Appendix A). The samplers were driven using an automatic hammer with a 340-pound drop weight and a free fall distance of 30 inches. The samplers were advanced 24 inches into the soil ahead of the auger or to effective refusal as determined by our field geologist and engineer. The number of blows required to drive the sampler each 6-inch interval of the sampling attempt was recorded on the borehole logs. In addition, the total number of blows required to advance the sampler through the 6-inch to 18-inch sampling interval is plotted as “uncorrected blows per foot” on the borehole logs. The blows recorded on the borehole logs are field values that have not been corrected for overburden, sampler size, or other factors.

Samples were collected at the surface, at 2.5-foot intervals to 10 feet, and at 5-foot intervals thereafter to 15 feet. A single surface sample was collected at a depth of approximately 3 feet bgs in a small excavation, which was collected in lieu of the proposed borehole that was eliminated due to utility conflicts. All sampled soil was visually classified in the field and described in general accordance with the Unified Soil Classification System (USCS), which is summarized in Appendix A. Each soil sample collected was double-bagged and sealed in polyethylene bags to preserve natural moisture content and transported to our Anchorage laboratory for further examination and testing.

3.4 Standpipe Piezometer Installation

PVC standpipes were installed in Boreholes BH-01 and BH-02 at completion of their drilling to allow for future groundwater measurements. The 1.5-inch diameter, Schedule 80 PVC standpipes were hand-slotted in the field using a hacksaw for the bottom 10 feet of installation. The annular space around the standpipes was backfilled with drill cuttings to ground surface and completed with 6-inch steel flush mount monuments.

3.5 Groundwater Level Monitoring

The depth at which groundwater was observed during drilling was noted on the borehole logs. An attempt was made to measure stabilized groundwater levels within the standpipes; however, the flush-mount caps were

covered in ice and frozen soil and not readily accessible at the time. A future trip to the site is planned to clear ice from the caps and measure groundwater levels.

3.6 Falling Head Percolation Tests

Four-inch diameter, non-slotted and open-ended PVC pipe was installed in Boreholes BH-03A and BH-03B to depths of 7 feet and 15 feet bgs, respectively. Boreholes BH-03A and BH-03B are located approximately 4.4 feet apart from each other. The percolation test conducted at 7 feet bgs in Borehole BH-03A targeted the proposed depth of the stormwater infiltration facility. However, a layer of Silt was observed between the 8- and 13-foot interval, which may hinder permeation of water through that strata. For that reason, the adjoining Borehole BH-03B was advanced to 15 feet bgs to allow for percolation testing at that lower strata.

Two falling head percolation tests were conducted on December 16 and 17, 2019, in general accordance with EPA'S Design Manual – Onsite Wastewater Treatment and Disposal Systems (1980). The exception to this procedure being a 4-inch inside diameter pipe was used instead of a 6- to 9-inch, whereas the smaller pipe fits better inside the hollow-stem augers. Despite the variance in method, the test is considered suitable for the application. A summary of the two percolation tests conducted in Boreholes BH-03A and BH-03B is as follows:

- Percolation test at 7-foot depth: percolation rate of 2.2 minutes per inch
  - Test conducted within gravel with sand and little silt (GW-GMs)
  - However, underlying observed silt layer, from 8- to 13-foot depths, is much less permeable, and is therefore not a suitable stratum for long-term infiltration
- Percolation test at 15-foot depth: percolation rate of 0.2 minutes per inch
  - Test conducted within gravel with sand (GPs) unit
  - Groundwater noted at 11.2-foot depth

3.7 PID Field Screening

Each of the soil samples collected were screened with a Photo Ionization Detector (PID), in order to estimate the presence of volatile organic compounds (VOCs) such as petroleum hydrocarbons. Upon collection, soil samples were placed directly into a sealed polyethylene bag, heated, and then the airspace captured inside was screened with a PID. Prior to screening, each sample was agitated for 15 seconds to assist volatilization. The PID sampling probe was then inserted to about one-half the headspace depth and the highest measurement was recorded. The highest measurement was typically obtained around five seconds after probe insertion. The field PID measurements are presented on the borehole logs in Appendix A and results discussed in Sub-Section 5.2 of this report. The PID was calibrated at the beginning of each field day to 0.0 ppm with fresh air then to 100.0 ppm with isobutylene calibration gas. The PID used was equipped with a 10.2 eV lamp.

3.8 Sample Collection for Analytical Testing

Four soil samples were collected from each of the four boreholes, taken within the top 4 feet of materials, and submitted to a State of Alaska certified analytical laboratory, SGS North America Inc. (SGS), for analytical chemical testing. The soil samples were tested for the following:

- Gasoline range organics (GRO) by method AK101

- Diesel range organics (DRO) by method AK102
- Residual range organics (RRO) by method AK103
- Metals by method 6020A
- Polychlorinated biphenyls (PCBs) by method 8082A
- Semi-volatile organic compounds (SVOCs) by method 8270D
- Volatile organic compounds (VOCs) by method 8260C

Soil samples for analytical testing were collected directly from spilt spoon samplers during the geotechnical investigation, handled using stainless steel spoons and placed in laboratory-supplied jars. Soil samples were collected following Alaska Department of Environmental Conservation (ADEC) sampling methods (ADEC, 2017). Analytical sample results from the borings are discussed in Section 6.0 and are included in Appendix E.

4.0 GEOTECHNICAL LABORATORY TESTING

Laboratory tests were performed to measure index properties of the soil samples, which are used to develop correlations with the engineering properties of the soil. Moisture content tests were completed for all samples and were conducted according to procedures described in ASTM D2216. In addition, the grain size distribution with hydrometer analysis (ASTM D6913 and D422), organic content (ASTM D2974), and fines content (percent passing No. 200 US sieve, 0.75 mm, ASTM D1140) were determined for selected samples.

Laboratory test results are summarized in Appendix B, Table B-1. Selected laboratory test results are also presented on the borehole logs. Results of particle size analyses tests are presented graphically in Figures B-1 and B-2.

Hydrometer analyses were tested at abbreviated duration suitable to define the amount finer than 0.02 mm. Grain size distribution results from hydrometer analyses and percent passing U.S. No. 200 sieve were used to estimate the soil frost classifications shown on the borehole logs. Frost classifications of the soil were described according to procedures in the US Army Corps of Engineers (1965/1997) and MOA Design Criteria Manual (DCM, 2014), as illustrated on the Frozen Soil Classification / Legend found in Appendix A Figure A-2.

5.0 GEOTECHNICAL SUBSURFACE CONDITIONS

The subsurface conditions encountered during the exploration were predominantly comprised of gravel and sand fill material underlain by poorly graded sand to silty sand and silt to silt with sand. Clay was encountered in Boreholes BH-02 between 15.0 and 17.0 feet bgs. A generalized description of subsurface conditions is presented below:

- ***Granular Fill (GP, GM, GP-GM, GW-GM, SM):*** Granular fill, mostly poorly to well graded gravel with sand to silty sand with varying fines content (material passing the U.S. number 200 sieve) was observed from the surface to depths between approximately 5.0 and 8.5 feet bgs. The average thickness of the fill was approximately 6.7 feet. Gravel content of the fill ranged from 23 to 60 percent. Fines content of the fill ranged from 4 to 24 percent. Moisture content of granular fill ranged from 4 to 15 percent (dry weight basis) with an average moisture content of 6.5 percent. Frost classification of the fill was mostly NFS to F2, but toward the west, contained areas with F3 frost class.

- ***Unfilled Portions of the Existing Gravel Road:*** The middle segment of the proposed road, between about Stations 22+00 and 25+00, along its southern portion, is outside of the existing gravel roadway, and occupies ground that has not been previously filled. Here, a former sheet-pile wall was removed and replaced in 2019 with another sheet-pile wall, which pulled the toe of the slope further south and revealed native soil in between. Within areas south of the existing roadway, soils noted at the surface were primarily silt / clayey silt.
- ***Sand (SM, SP-SM):*** Silty sand to poorly graded sand with silt and gravel was observed in borehole BH-02 underlying fill material from approximately 5.0 to 7.5 feet bgs, and in Borehole BH-01 from approximately 21.2 to 22.0 feet bgs. Gravel content of the sand ranged from 44 to 21 percent. Fines content of the sand ranged from 9 to 34 percent. Moisture content of the sand ranged from 7 to 24 percent with an average moisture content of 14 percent. The frost classification of the sand ranged from F2 to F3.
- ***Organic Soil (PT):*** Pockets of peat soils are known to exist along the western portion of Depot Drive, however, peat was not encountered within the borings in the eastern portion of the project.
- ***Silt (ML):*** Silt with varying amounts of sand was observed in all four boreholes between 7.5 and 22.0 feet bgs. Moisture content of the silt ranged from 8 to 86 percent with an average moisture content of 35 percent.
- ***Gravel (GP, GM):*** Poorly graded gravel with sand to silty gravel with sand was observed in two boreholes (BH-02, and BH-03A/3B) from approximately 8.5 to 16.5 feet bgs. Moisture content of tested gravel samples was 9 percent. However, moisture content was not tested for gravels retained from Borehole BH-02 due PID readings above 40 ppm. Frost classification of the gravel was Potentially Frost-Susceptible (PFS).
- ***Clay (CL):*** Lean clay was observed in Borehole BH-02 from approximately 15.0 to 17.0 feet bgs. Moisture content of the clay ranged from 28 to 29 percent.
- ***Groundwater:*** Groundwater was observed in Borehole BH-03A/-03B at a depth of 11.2 feet bgs. Stabilized groundwater levels in the other two borings is unknown at this time, and future monitoring is planned.

Table 1 presents a summary of borehole depth, location, fill depth below ground surface, and PVC installation depth below ground surface. Subsurface conditions are detailed in the borehole logs provided in Appendix A. Select representative photographs taken during the field investigation are included in Appendix D.

Table 1: Borehole Summary

Borehole ID	Drill Date	Borehole Depth (feet bgs)	Location	Fill Depth (feet bgs)	PVC Depth (feet bgs)
BH-01	11/14/19	22.0	Depot Drive, west of the historic ARRC building	8.5	22.0
BH-02	11/14/19	17.0	Depot Drive, west of the historic ARRC building	6.0	17.0
[1]BH-03A/-03B	11/15/18	7.0 and 15.0	Depot Drive, east of The Boardroom building	8.0	7.0 and 15.0

Notes: 1) Boreholes BH-03A and -03B were completed within a 4.4-foot distance of each other.

5.1 Groundwater

Groundwater was observed in Boreholes BH-03A/-3B and BH-04 at depths of approximately 13 and 10 feet bgs while drilling, respectively. Upon two return visits to the site, groundwater was noted at 11.2 and 12.0 feet bgs in Borehole BH-03A/-03B. No groundwater was observed in the other two boreholes while drilling, but in a post-drilling/stabilized condition, is expected to be present at similar levels as the nearby boreholes. Groundwater within BH-02 may be partially influenced by the nearby sheet pile wall. Attempts were made to measure groundwater levels after drilling; however, the well caps were covered in frozen material and ice and not readily available. Additional measurements of groundwater levels are planned. Observed groundwater levels are listed in Table 2.

Table 2: Groundwater Measurement Summary

Borehole ID	During Drilling		Subsequent Measurements	
	Date	Depth (feet bgs)	Date	Depth (feet bgs)
BH-01	14 November 2019	None	[1]TBD	--
BH-02	14 November 2019	None	[1]TBD	--
BH-03A/-03B	15 November 2019	13.0	16 December 2019 13 January 2020	11.2 12.0

Notes: 1) Not measured yet due to access issues, including ice.

6.0 RESULTS OF PID FIELD SCREENING AND ANLYTICAL TESTING

6.1 PID Field Screening Results

PID field-screening was performed to identify potential areas which may contain petroleum or other volatile organic contaminated soils, and more specifically, such soils that may be within the limits of the planned excavations. A field-screening threshold level of 20-ppm was selected as an indicator of potential contamination, based on experience with Anchorage road projects. However, the actual presence of soil or groundwater contamination requires environmental sampling and testing in accordance with Alaska Department of Environmental Conservation (ADEC) guidelines, which was not part of our scope of work.

The measured headspace concentrations were less than the 20-ppm screening level in all, but three samples as indicated in Table 3. The headspace results (Appendix A) were relatively low within a few feet of the ground surface, where soil may be excavated prior to paving.

Table 3: PID Field-Screening Threshold Exceedance

Borehole ID	Depth (feet bgs)	PID Reading (ppm)
BH-02	8.5	43
BH-02	10.0	100
BH-03	2.0	32

Although elevated headspace readings can indicate possible petroleum hydrocarbon contamination in the soil, care must be applied to the interpretation of the results, since the response of the PID is sensitive to environmental variables (temperature and humidity) as well as the type of contaminants present and the nature of the soil (i.e., moisture content and natural organic content) (ADEC 2017). The headspace readings may also be elevated because the boreholes were executed using conventional geotechnical drilling methods in which we minimize the use of oil and grease that can influence the field screening results, rather than in accordance with strict environmental sampling and decontamination protocols. In addition, headspace readings may be elevated do to asphalt contamination from sluff or proximity to the asphalt layer. Because of these factors, the headspace results should only be used as a semi-quantitative indication of the potential presence of petroleum hydrocarbons (ADEC 2017).

6.2 Results of Analytical Chemical Testing

A total of four discrete analytical soil samples (includes one blind field duplicate sample) were collected from the four boreholes. The blind field duplicate sample was collected from Borehole BH-03A. At least one sample was collected from each boring advanced, and each within the upper 4 foot depth. Analytical results for compounds that were detected are summarized in Table E-1, and copies of the laboratory test reports are included in Appendix E.

Of the samples collected from Boreholes BH-01, BH-02, and BH-03A, Naphthalene was detected above the most stringent of the ADEC Method 2 Cleanup Levels for the “Under 40-inch Zone” annual precipitation (ADEC 2019). Napthalene was detected in Borehole BH-01 at a concentration of 93.3 µg/kg, which is above the ADEC Cleanup Level of 38 µg/kg. No other analytes were detected above ADEC Cleanup Levels.

7.0 LIMITATIONS AND USE OF REPORT

This report has been prepared exclusively for the use of ARRC and CRW in their design of the planned road development of Depot Drive west of the historic ARRC Depot. If there are significant changes in the nature, design, or location of the facilities, Golder should be notified in order to review conclusions and recommendations considering the proposed changes and provide a written modification or verification of the changes.

Variations are likely in subsurface conditions between explorations and also with time. Therefore, inspection and testing by a qualified geotechnical engineer should be included during construction to provide corrective recommendations adapted to the conditions revealed during the work. A contingency for unanticipated conditions should be included in the construction budget and schedule in the event corrective measures are necessary based on conditions revealed in the excavations.

This work program followed the standard of care expected of professionals undertaking similar work in the State of Alaska under similar conditions. No warranty expressed or implied is made.

8.0 CLOSING

Thank you for the opportunity to assist with this project. If you have any questions or additional information, please contact Travis at 907-865-2509.

Golder Associates Inc.

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RTS/TER/TGK/mlp

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FIGURES

Last Edited By: agarrigus Date: 2020-01-16 Time:3:09:18 PM | Printed By: AGarrigus Date: 2020-01-16 Time:3:14:05 PM
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SCALE FEET

REFERENCES

1. IMAGERY PROVIDED BY 2015 ANCHORAGE LIDAR AND AERIAL IMAGERY PROJECT.
2. ROAD DATA PROVIDED BY ALASKA DOT&PF.

CLIENT
ALASKA RAILROAD CORPORATION

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-16
DESIGNED	-
PREPARED	APG
REVIEWED	TER
APPROVED	TGK

PROJECT
DEPOT DRIVE DEVELOPMENT

ANCHORAGE, ALASKA

TITLE
VICINITY MAP

PROJECT NO.	CONTROL	REV.	FIGURE
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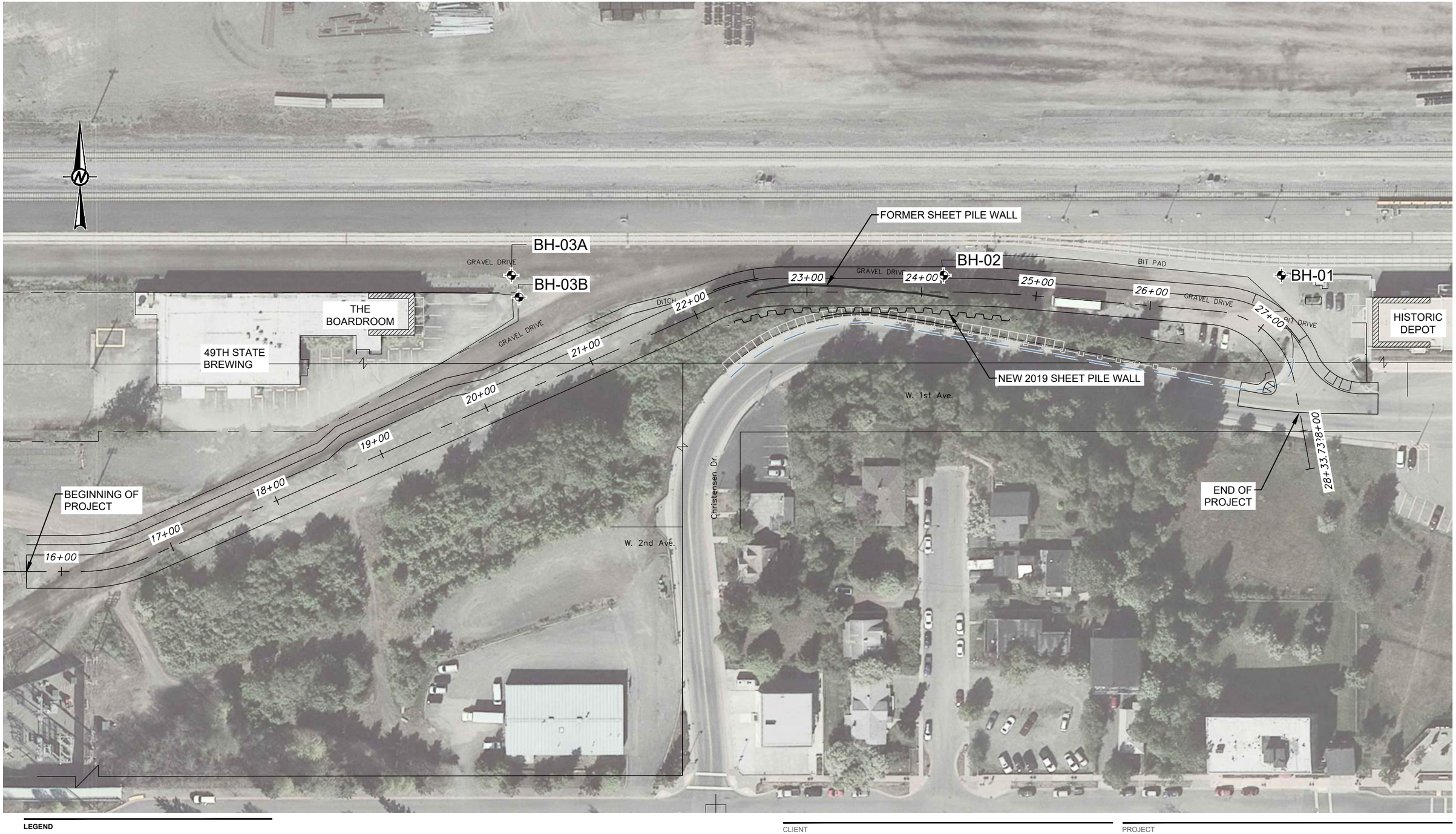
0



LEGEND

BH-0# — 2017 GEOTECHNICAL BOREHOLE LOCATION AND NAME

REFERENCE

1. BASEMAP PROVIDED BY CRW ENGINEERING GROUP LLC. ON NOVEMBER 11, 2019.
2. ORTHOIMAGERY ACQUIRED IN JULY 2015 BY THE ANCHORAGE LIDAR AND IMAGERY PROJECT AND WAS DISTRIBUTED BY ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS (DGGS) ONLINE MAP.

0 40 80 120
SCALE FEET

CLIENT
ALASKA RAILROAD CORPORATION

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-16
DESIGNED	-
PREPARED	APG
REVIEWED	TER
APPROVED	TGK

PROJECT
DEPOT DRIVE DEVELOPMENT

ANCHORAGE, ALASKA

TITLE
BOREHOLE LOCATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
19132189		0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

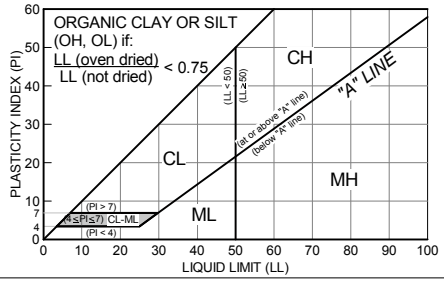
1 in 0

APPENDIX A

Record of Borehole Logs

UNIFIED SOIL CLASSIFICATION (adapted from ASTM D2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES AND GROUP SYMBOLS USING LABORATORY TESTS			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND	
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	$C_U \geq 4$ AND $1 \leq C_C \leq 3$	GW	WELL-GRADED GRAVEL	If soil contains ≥15% sand, add "with sand"
			$C_U < 4$ AND/OR [$C_C < 1$ OR $C_C > 3$]	GP	POORLY GRADED GRAVEL	
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR MH	GM	SILTY GRAVEL	
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL	
	SANDS ≥50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	$C_U \geq 6$ AND $1 \leq C_C \leq 3$	SW	WELL-GRADED SAND	If soil contains ≥15% gravel, add "with gravel"
			$C_U < 6$ AND/OR [$C_C < 1$ OR $C_C > 3$]	SP	POORLY GRADED SAND	
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR MH	SM	SILTY SAND	
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND	
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT <50	PLASTICITY CHART		CL	LEAN CLAY	If soil contains coarse-grained soil from 15% to 29%, add "with sand" or "with gravel" for whichever type is prominent, or for ≥30%, add "sandy" or "gravelly"
				ML	SILT	
				OL	ORGANIC CLAY OR SILT	
	SILTS AND CLAYS LIQUID LIMIT ≥50			CH	FAT CLAY	
				MH	ELASTIC SILT	
				OH	ORGANIC CLAY OR SILT	
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT	



NOTES:
$C_U = \frac{D_{60}}{D_{10}}$ $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

Gravels or sands with 5% to 12% fines require dual symbols (GW-GM, GW-GC, GP-GM, GP-GC, SW-SM, SW-SC, SP-SM, SP-SC) and add "with clay" or "with silt" to group name. If fines classify as CL-ML for GM or SM, use dual symbol GC-GM or SC-SM. The coefficient of uniformity, C_U, and coefficient of curvature, C_C, equations are given above where $D_{(X\%)}$ is soil particle diameter where X% is % finer. *Optional Abbeviations:* Lower case "s" after USCS group symbol denotes either "sandy" or "with sand" while "g" denotes either "gravelly" or "with gravel"

CRITERIA FOR DESCRIBING MOISTURE CONDITION (adapted from ASTM D2488)

DRY	ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

COMPONENT DEFINITIONS BY GRADATION

COMPONENT	SIZE RANGE
BOULDERS	GREATER THAN 12 in.
COBBLES	12 in. to 3 in.
GRAVEL	3 in. to #4 Sieve (4.76 mm)
COARSE GRAVEL	3 in. to 3/4 in.
FINE GRAVEL	3/4 in. to #4 (4.76 mm)
SAND	#4 (4.76 mm) to #200 (0.074 mm)
COARSE SAND	#4 (4.76 mm) to #10 (2.0 mm)
MEDIUM SAND	#10 (2.0 mm) to #40 (0.42 mm)
FINE SAND	#40 (0.42 mm) to #200 (0.074 mm)
SILT & CLAY (FINES)	SMALLER THAN #200 (0.074 mm)

RELATIVE DENSITY / CONSISTENCY ESTIMATE USING STANDARD PENETRATION TEST (SPT) VALUES (adapted from Terzaghi and Peck 1967 and NAVFAC DM 7.1)

COHESIONLESS SOILS [a]		COHESIVE SOILS[b]		
RELATIVE DENSITY	$(N_1)_{60}$ (blows/ft)[c]	CONSISTENCY	$(N_1)_{60}$ (blows/ft)[c]	UNCONFINED COMPRESSIVE STRENGTH (TSF)[d]
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.50
COMPACT (MEDIUM DENSE)	10 - 30	FIRM	4 - 8	0.50 - 1.0
		STIFF	8 - 15	1.0 - 2.0
DENSE	30 - 50	VERY STIFF	15 - 30	2.0 - 4.0
VERY DENSE	OVER 50	HARD	OVER 30	OVER 4.0

(a) Soils consisting of gravel, sand, and silt, either separately or in combination possessing no characteristics of plasticity, and exhibiting drained behavior.
(b) Soils possessing the characteristics of plasticity, and exhibiting undrained behavior.
(c) Refer to ASTM D1586 for a definition of N value. $(N_1)_{60}$ is the N value corrected for hammer energy and overburden pressure, and is detailed in ASTM D6066. N values may be affected by a number of factors including: material size, sampler size, hammer weight and type, depth, drilling method, and borehole disturbance. N values are only an approximate guide for cohesive soil and do not apply to frozen soil.
(d) Undrained shear strength, s_u= 1/2 unconfined compression strength, U_c. Note that Torvane (TV) measures s_u and pocket penetrometer (PP) measures U_c

SAMPLER ABBREVIATIONS

AR Air Rotary cuttings	**GB** Grab sample (disturbed from surface/test pit)	**SC** Soil core (continuous sampler)
AS Auger Sample, cuttings	**LS** LPT sampler (3-in. OD split spoon, 300 or 340-lb hammer)	**SS** SPT sampler (2-in. OD, 140-lb hammer)
CS Chunk/block sample (undisturbed from surface/test pit)	**MS** Modified Shelby tube	**TO** Thin-walled, open (Shelby tube)
DO Drive Open (split spoon other than SS or MC)	**R** Refusal when driving	**TP** Thin-walled, piston
DP Direct Push (Geoprobe)	**RC** Rock core	**WS** Wash sample

DESCRIPTIVE TERMINOLOGY FOR PERCENTAGES (ASTM D2488)

DESCRIPTIVE TERMS	RANGE OF PROPORTION
TRACE	0 - 5%
FEW	5 - 10%
LITTLE	10 - 25%
SOME	30 - 45%
MOSTLY	50 - 100%

LABORATORY TEST AND NOTES ABBREVIATIONS / SYMBOLS

Con	Consolidation	**PID**	Photoionization Detector	**TXCD**	Triaxial, Consolidated Drained
Dd	Dry Density	**PM**	Modified Proctor (D1557)	**TXCU**	Triaxial, Consolidated Undrained
K	Thermal Conductivity	**PP**	Pocket Penetrometer (Field)	**TXUU**	Triaxial, Unconsolidated Undrained
MA	Sieve and Hydrometer	**PTLD**	Point Load	**W_L**	Liquid Limit (LL)
NP	Non-plastic	**SA**	Sieve Analysis	**W_P**	Plastic Limit (PL)
OLI	Organic Loss	**SpG**	Specific Gravity	**Ω**	Soil Resistivity (Res.)
P200	Passing #200 Sieve (D1140)	**TC**	Thaw Consolidation/Strain	▼	Water Level
pH	Soil pH	**TV**	Torvane (Field)	▽	Water Level at time of drilling
PI	Plasticity Index (D4318)				

GOLDER

SOIL CLASSIFICATION / LEGEND

Figure A-1

FROZEN SOIL CLASSIFICATION (ASTM D4083)

1. DESCRIBE SOIL INDEPENDENT OF FROZEN STATE	CLASSIFY SOIL BY THE UNIFIED SOIL CLASSIFICATION SYSTEM				
2. MODIFY SOIL DESCRIPTION BY DESCRIPTION OF FROZEN SOIL	MAJOR GROUP		SUBGROUP		
	DESCRIPTION	DESIGNATION	DESCRIPTION		DESIGNATION
	Segregated ice not visible by eye	N	Poorly bonded of friable		Nf
			Well bonded	No excess ice	Nbn
				Excess ice	Nbe
	Segregated ice visible by eye (ice less than 25 mm thick)	V	Individual ice crystals or inclusions		Vx
			Ice coatings on particles		Vc
			Random or irregularly oriented ice formations		Vr
			Stratified or distinctly oriented ice formations		Vs
			Uniformly distributed ice		Vu
3. MODIFY SOIL DESCRIPTION BY DESCRIPTION OF SUBSTANTIAL ICE STRATA	Ice greater than 25 mm thick	ICE	Ice with soil inclusions		ICE+soil type
			Ice without soil inclusions		ICE

FROST DESIGN SOIL CLASSIFICATION [1]

FROST GROUP	GENERAL SOIL TYPE	% FINER THAN 0.02 mm BY WEIGHT	TYPICAL USCS SOIL CLASS
NFS (non-frost suceptable)	(a) Gravels Crushed stone Crushed rock	0 to 1.5	GW, GP
	(b) Sands	0 to 3	SW, SP
NFS [PFS[3]][2]	(a) Gravels Crushed stone Crushed rock	1.5 to 3	GW, GP
F1 [S1][2]	Gravelly soils	3 to 6	GW, GP, GW-GM, GP-GM, GW-GC, GP-GC
F1	Gravelly soils	6 to 10	GM, GC, GM-GC, GW-GM, GP-GM, GW-GC, GP-GC
F2 [PFS[3]/S2][2]	Sandy soils	3 to 6	SW, SP, SW-SM, SP-SM, SW-SC, SP-SC
F2	(a) Gravelly soils	10 to 20	GW, GP, GW-GM, GP-GM, GW-GC, GP-GC
	(b) Sands	6 to 15	SM, SW-SM, SP-SM, SC, SW-SC, SP-SC, SM-SC
F3	(a) Gravelly soils	Over 20	GM, GC, GM-GC
	(b) Sands, except very fine silty sands	Over 15	SM, SC, SM-SC
	(c) Clays, PI>12	--	CL, CH
F4	(a) Silts	--	ML, MH, ML-CL
	(b) Very fine silty sands	Over 15	SM, SC, SM-SC
	(c) Clays, PI<12	--	CL, ML-CL
	(d) Varved clays or other fine-grained banded sediments	--	CL or CH layered with ML, MH, ML-CL, SM, SC, or SM-SC

(1) From Municipality of Anchorage (MOA) Design Criteria Manual (DCM), 2007 and 2014; Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5320-6E; U.S. Army Corps of Engineers (USACE) "Arctic and Subarctic Construction, Runway and Road Design," Technical Manual TM 5-852-3, 1965; and USACE "Military Soils Engineering" Field Manual FM 5-410, 1997
(2) PFS, S1, and S2 frost groups from USACE, EM 1110-3-138, "Pavement Criteria for Seasonal Frost Conditions," April 1984
(3) Possibly frost susceptible, requires lab test for void ratio to determine frost design soil classification. Gravel with void ratio > 0.25 would be NFS; Gravel with void ratio < 0.25 would be S1; Sands with void ratio > 0.30 would be NFS; Sands with void ratio < 0.30 would be S2 or F2

ICE BONDING SYMBOLS

No ice-bonded soil observed

Poorly bonded or friable

Well bonded

DEFINITIONS

Candled Ice is ice which has rotted or otherwise formed into long columnar crystals, very loosely bonded together.

Clear Ice is transparent and contains only a moderate number of air bubbles.

Cloudy Ice is translucent, but essentially sound and non-pervious

Friable denotes a condition in which material is easily broken up under light to moderate pressure.

Granular Ice is composed of coarse, more or less equidimensional, ice crystals weakly bonded together.

Ice Coatings on particles are discernible layers of ice found on or below the larger soil particles in a frozen soil mass. They are sometimes associated with hoarfrost crystals, which have grown into voids produced by the freezing action.

Ice Crystal is a very small individual ice particle visible in the face of a soil mass. Crystals may be present alone or in a combination with other ice formations.

Ice Inclusions are individual ice masses visible in the face of a soil mass. Inclusions may be present alone or in a combination with other ice formations.

Ice Lenses are lenticular ice formations in soil occurring essentially parallel to each other, generally normal to the direction of heat loss and commonly in repeated layers.

Ice Segregation is the growth of ice as distinct lenses, layers, veins and masses in soils, commonly but not always oriented normal to direction of heat loss.

Massive Ice is a large mass of ice, typically nearly pure and relatively homogeneous.

Poorly-bonded signifies that the soil particles are weakly held together by the ice and that the frozen soil consequently has poor resistance to chipping or breaking.

Porous Ice contains numerous voids, usually interconnected and usually resulting from melting at air bubbles or along crystal interfaces from presence of salt or other materials in the water, or from the freezing of saturated snow. Though porous, the mass retains its structural unity.

Thaw-Stable frozen soils do not, on thawing, show loss of strength below normal, long-time thawed values nor produce detrimental settlement.

Thaw-Unstable frozen soils show on thawing, significant loss of strength below normal, long-time thawed values and/or significant settlement, as a direct result of the melting of the excess ice in the soil.

Well-Bonded signifies that the soil particles are strongly held together by the ice and that the frozen soil possesses relatively high resistance to chipping or breaking.

GOLDER

FROZEN SOIL CLASSIFICATION / LEGEND

Figure A-2

RECORD OF BOREHOLE BH-01

SHEET 1 of 1

PROJECT: ARRC Depot Drive Development
PROJECT NUMBER: 19132189
LOCATION: Anchorage, AK

CLIENT: Alaska Railroad Corporation
DRILLING DATE: 11/14/2019
EQUIPMENT: CME-75, Truck Mount

DATUM: NAD83, AK State Plane Zone 4
ELEVATION: n/a
COORDS: N: 2,638,442 E: 1,659,488

DEPTH (ft)	BORING METHOD	DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in (340 lb Hammer (Automatic) 30 in. Drop)	BLOWS PER FT	REC / ATT (inch)	NOTES TESTS WATER LEVELS
0	3.25-inch ID Hollow Stem Auger	VEGETATION: n/a, gravel road										
		0.0 - 2.0 Compact, moist, gray, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1 inch diameter, little silt, low plasticity (SMg, F2/F3) [FILL]		SMg			1	LS	26-13-6-5	19	24/24	PID = 1.0 ppm
		2.0 - 5.0 Compact, moist, gray, poorly graded GRAVEL with sand; subrounded to subangular gravel up to 1.5 inch diameter, some fine to coarse-grained sand, trace silt (GPs, NFS) [FILL]		GPs		2.0	2	LS	7-6-7-5	13	18/24	PID = 1.1 ppm, Gravel = 60%, Sand = 35%, Fines = 4.9%
5		5.0 - 7.5 Compact, moist, gray to brown, SILTY GRAVEL with sand; subrounded to subangular gravel up to 1.5 inch diameter, some fine and coarse-grained sand, little silt (GMs, F1/F2) [FILL]		GMs		5.0	3	LS	17-11-12-10	23	24/24	PID = 0.6 ppm, Gravel = 48%, Sand = 40%, Fines = 12.0%
		7.5 - 8.5 Loose, moist, gray, SILTY SAND with gravel; fine to coarse-grained sand, little subrounded to subangular gravel up to 1 inch diameter, little silt (SMg, F2/F3) [possible FILL]		SMg		7.5	4	LS	9-3-1-3	4	18/24	PID = 1.5 ppm, Gravel = 31%, Sand = 53%, Fines = 16.2% PID = 0.9 ppm
		8.5 - 21.2 Firm to stiff, moist, gray, SILT with sand; litte fine-grained sand (MLs, F4)		MLs		8.5	5	LS	2-2-3-4	5	24/24	PID = 0.2 ppm
15							6	LS	1-3-3-3	6	24/24	PID = 0.7 ppm
20							7	LS	2-4-6-6	10	24/24	PID = 1.1 ppm
		21.2 - 22.0 Compact, moist, gray, poorly graded SAND with silt; fine-grained sand, little silt (SP-SM)		SP-SM		21.2						PID = 0.8 ppm
		Borehole completed at 22.0 ft.										
25		1) No groundwater oberved while drilling. 2) 1.5-inch, Schedule 80 PVC installed to 22 feet below ground surface and hand-slotted from 12 to 22 feet below ground surface. 3) Annulus backfilled with gravel. 4) Borehole completed with 6-inch steel flush mount at the surface. 5) PID: Photoionization Detector.										
30												

UNCORRECTED BLOWS / FT ■ (10 20 30 40)
SALINITY (ppt) △
WATER CONTENT (PERCENT) W_P W W_L (10 20 30 40)

58 ○

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: D. Banzhof

LOGGED: R. Sanders
CHECKED: T. Ross
CHECK DATE: 12/4/2019

Figure A-3

19132189 ARRC DEPOT DRIVE.GPJ LIBRARY-ANC(11-22-19).GLB [ANC BOREHOLE] JKarp 1/23/20

RECORD OF BOREHOLE BH-02

SHEET 1 of 1

PROJECT: ARRC Depot Drive Development
PROJECT NUMBER: 19132189
LOCATION: Anchorage, AK

CLIENT: Alaska Railroad Corporation
DRILLING DATE: 11/14/2019
EQUIPMENT: CME-75, Truck Mount

DATUM: NAD83, AK State Plane Zone 4
ELEVATION: n/a
COORDS: N: 2,638,500 E: 1,659,193

DEPTH (ft)	BORING METHOD	SOIL PROFILE DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES NUMBER	TYPE	BLOWS per 6 in (340 lb Hammer (Automatic) 30 in. Drop)	BLOWS PER FT	REC / ATT (inch)	UNCORRECTED BLOWS / FT ■ 10 20 30 40; SALINITY (ppt) △; WATER CONTENT (PERCENT) W_P W W_L 10 20 30 40	NOTES TESTS WATER LEVELS
0	3.25-inch ID Hollow Stem Auger	VEGETATION: n/a, gravel road 0.0 - 6.0 Dense to very dense, moist, grayish brown, SILTY SAND with gravel; fine to coarse-grained sand, come subrounded to subangular-grained gravel up to 1.5 inch diameter, little silt, trace organic material observed at contact (SMg, F2) [FILL]		SMg			1	LS	12-16-30-28	46	24/24	○ ■	PID = 10.5 ppm
							2	LS	25-22-33-33	55	24/24	○ >>■	PID = 2.0 ppm, Gravel = 30%, Sand = 56%, Fines = 13.6%
5		- Trace organics at 6 ft.					3	LS	13-4-7-3	11	24/24	■○	PID = 2.1 ppm, OLI = 6%
		6.0 - 7.5 Compact, moist, reddish brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1 inch diameter, few silt (SP-SMg, F2)		SP-SMg		6.0						○	PID = 0.7 ppm, Gravel = 44%, Sand = 47%, Fines = 9.1%, MA
		7.5 - 8.5 Very stiff, moist, brown, SILT with sand; little fine to medium-grained sand, trace subrounded to subangular gravel up to 0.5 inch diameter (ML, F4)		ML		7.5	4	LS	13-10-13-13	23	24/24	○■	PID = 1.5 ppm
10		8.5 - 15.0 Compact to dense, moist, gray, poorly graded GRAVEL with sand; subrounded to subangular gravel up to 1.5 inch diameter, some fine to coarse-grained sand, trace silt (GPs, PFS)		GPs		8.5	5	LS	10-13-14-12	27	24/24	■	PID = 43.0 ppm PID = 100 ppm
15		15.0 - 17.0 Firm, moist, gray, lean CLAY with silt; low to medium plasticity, diesel odor (CL)		CL		15.0	6	LS	5-2-3-2	5	24/24	■ ○	PID = 0.8 ppm
		Borehole completed at 17.0 ft. 1) No groundwater observed while drilling. 2) 1.5-inch, Schedule 80 PVC installed to 17 feet below ground surface, handslotted from 7 feet to 17 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with 6-inch steel flush mount at surface. 5) PID: Photoionization Detector.											
20													
25													
30													

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: D. Banzhof

LOGGED: R. Sanders
CHECKED: T. Ross
CHECK DATE: 12/4/2019

Figure A-4

19132189 ARRC DEPOT DRIVE.GPJ LIBRARY-ANC(11-22-19).GLB [ANC BOREHOLE] JKarp 1/23/20

RECORD OF BOREHOLE BH-03A

SHEET 1 of 1

PROJECT: ARRC Depot Drive Development
PROJECT NUMBER: 19132189
LOCATION: Anchorage, AK

CLIENT: Alaska Railroad Corporation
DRILLING DATE: 11/15/2019
EQUIPMENT: CME-75, Truck Mount

DATUM: NAD83, AK State Plane Zone 4
ELEVATION: n/a
COORDS: N: 2,638,481 E: 1,658,822

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (340 lb Hammer (Automatic) 30 in. Drop)	BLOWS PER FT	REC / ATT (inch)	UNCORRECTED BLOWS / FT ■ 10 20 30 40; SALINITY (ppt) △; WATER CONTENT (PERCENT) W_P W W_L 10 20 30 40	NOTES TESTS WATER LEVELS
		VEGETATION: n/a, gravel road											
0	3.25-inch ID Hollow Stem Auger	0.0 - 5.0 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SMg, F2) [FILL]		SMg			1	LS	5-5-5-6	10	22/24	■ ○	PID = 13.2 ppm, Gravel = 40%, Sand = 48%, Fines = 12.1%
							2	LS	9-7-6-3	13	24/24	■ ○	PID = 32.3 ppm
5		5.0 - 7.0 Compact, moist, brown, well-graded GRAVEL with silt and sand; subrounded to subangular gravel up to 2 inch diameter, some fine to coarse-grained sand, few silt (GW-GMs, F1/F2) [FILL]		GW-GMs		5.0	3	LS	6-6-7-7	13	24/24	■ ○	PID = 6.6 ppm, Gravel = 54%, Sand = 38%, Fines = 8.4%, MA
		Borehole completed at 7.0 ft.											
10		1) No groundwater observed while drilling. 2) 4-inch, open-ended and non-slotted PVC installed to 7 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with 6-inch steel flush mount at surface. 5) Lithology based on nearby Borehole BH-03. 6) PID: Photoionization Detector.											
15													
20													
25													
30													

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: D. Banzhof

LOGGED: R. Sanders
CHECKED: T. Ross
CHECK DATE: 12/4/2019

GOLDER

Figure A-5

19132189 ARRC DEPOT DRIVE.GPJ LIBRARY-ANC(11-22-19).GLB [ANC BOREHOLE] JKarp 1/23/20

RECORD OF BOREHOLE BH-03B

SHEET 1 of 1

PROJECT: ARRC Depot Drive Development
PROJECT NUMBER: 19132189
LOCATION: Anchorage, AK

CLIENT: Alaska Railroad Corporation
DRILLING DATE: 11/15/2019
EQUIPMENT: CME-75, Truck Mount

DATUM: NAD83, AK State Plane Zone 4
ELEVATION: n/a
COORDS: N: 2,638,482 E: 1,658,818

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (340 lb Hammer (Automatic) 30 in. Drop)	BLOWS PER FT	REC / ATT (inch)	UNCORRECTED BLOWS / FT ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (PERCENT) W_P W W_L (10 20 30 40)	NOTES TESTS WATER LEVELS
0	3.25-inch ID Hollow Stem Auger	VEGETATION: n/a, gravel road											
		0.0 - 5.0 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SMg, F2) [FILL]		SMg			1	LS	5-5-5-6	10	22/24		PID = 13.2 ppm, Gravel = 40%, Sand = 48%, Fines = 12.1%
							2	LS	9-7-6-3	13	24/24		PID = 32.3 ppm
5		5.0 - 8.0 Compact, moist, brown, well-graded GRAVEL with silt and sand; subrounded to subangular gravel up to 2 inch diameter, some fine to coarse-grained sand, few silt (GW-GMs, F1/F2) [FILL]		GW-GMs		5.0	3	LS	6-6-7-7	13	24/24		PID = 6.6 ppm, Gravel = 54%, Sand = 38%, Fines = 8.4%, MA
		8.0 - 13.0 Stiff, moist, gray, SILT; little fine-grained sand, low plasticity (ML, F4)		ML		8.0	4	LS	2-4-4-5	8	6/24		PID = 9.3 ppm
10													11.2 ft 16 Dec 2019 12 ft 13 Jan 2020 13 ft ; WD
		13.0 - 15.0 Compact to dense, wet, gray, poorly graded GRAVEL with sand; subrounded to subangular gravel up to 1.5 inch diameter, little fine to coarse-grained sand, trace silt (GPs)		GPs		13.0	5	LS	6-10-11-7	21	24/24		PID = 8.6 ppm
15		Borehole completed at 15.0 ft.											
20		1) Groundwater observed at 13 feet below ground surface while drilling. 2) Borehole BH-03A drilled to 7 ft bgs, borehole BH-03B drilled to 15 ft bgs. Boreholes are approximately 4.4 ft apart. 3) Percolation wells installed to depth in both boreholes, 7 and 15 feet below ground surface, respectively, using 4-inch, open-ended and non-slotted PVC. 4) Backfilled with cuttings. 5) Borehole completed with a 6-inch steel flush mount at the surface. 6) PID: Photoionization Detector.											
25													
30													

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: D. Banzhof

LOGGED: R. Sanders
CHECKED: T. Ross
CHECK DATE: 12/4/2019

Figure A-6

19132189 ARRC DEPOT DRIVE.GPJ LIBRARY-ANC(11-22-19).GLB [ANC BOREHOLE] JKarp 1/23/20

APPENDIX B

Geotechnical Laboratory Testing

GOLDER

TABLE B-1: SAMPLE SUMMARY

Client:	Alaska Railroad Corporation	**Project No.:**	19132189
Project:	ARRC Depot Drive Development		
Location:	Anchorage, AK	**Reviewed By:**	J. Karp **Date:** 11/26/2019

SAMPLING DATA							CLASSIFICATION AND INDEX TEST RESULTS												
SAMPLE LOCATION	SAMPLE NUMBER	DEPTH (ft) TOP	DEPTH (ft) BOTTOM	RECOVERY (%)	SAMPLE TYPE	BLOWS PER FOOT	NATURAL MOISTURE CONTENT (%)	LIQUID LIMIT (LL) (%)	PLASTIC LIMIT (PL) (%)	PLASTICITY INDEX (PI) (%)	GRADATION (%) GRAVEL	GRADATION (%) SAND	GRADATION (%) FINES (SILT & CLAY)	ORGANIC CONTENT (%)	AMOUNT FINER THAN 0.02 mm (%)	FROST CLASSIFICATION	PID HEADSPACE (ppm)	DESCRIPTION (USCS)	TESTS / OTHER TESTS
BH-01	1	0.0	2.0	100	LS	19	10										1		
BH-01	2	2.0	4.0	75	LS	13	4				60	35	4.9			NFS	1.1	GPs	
BH-01	3	5.0	7.0	100	LS	23	6				48	40	12.0			F1/F2	0.6	GMs	
BH-01	4A	7.5	8.5	75	LS	4	8				31	53	16.2			F2/F3	1.5	SMg	
BH-01	4B	8.5	9.5				58										0.9		
BH-01	5	10.0	12.0	100	LS	5	20										0.2		
BH-01	6	15.0	17.0	100	LS	6	19										0.7		
BH-01	7A	20.0	21.2	100	LS	10	20										1.1		
BH-01	7B	21.2	22.0				24										0.8		
BH-02	1	0.0	2.0	100	LS	46	3										10.5		
BH-02	2	2.0	4.0	100	LS	55	5				30	56	13.6			F2	2	SMg	
BH-02	3A	5.0	6.0	100	LS	11	15							6			2.1		
BH-02	3B	6.0	7.0				7				44	47	9.1		6.8	F2	0.7	SP-SMg	MA
BH-02	4A	7.5	8.5	100	LS	23	21										1.5		
BH-02	4B	8.5	9.5														43		
BH-02	5	10.0	12.0	100	LS	27											100		
BH-02	6	15.0	17.0	100	LS	5	28										0.8		
BH-03A	1	0.0	2.0	92	LS	10	6				40	48	12.1			F2	13.2	SMg	
BH-03A	2	2.0	4.0	100	LS	13	4										32.3		
BH-03A	3	5.0	7.0	100	LS	13	6				54	38	8.4		7.6	F1/F2	6.6	GW-GMs	MA
BH-03B	1	0.0	2.0	92	LS	10	6				40	48	12.1			F2	13.2	SMg	
BH-03B	2	2.0	4.0	100	LS	13	4										32.3		
BH-03B	3	5.0	7.0	100	LS	13	6				54	38	8.4		7.6	F1/F2	6.6	GW-GMs	MA
BH-03B	4	8.0	10.0	25	LS	8	22										9.3		
BH-03B	5	13.0	15.0	100	LS	21	9										8.6		

19132189 ARRC DEPOT DRIVE.GPJ LIBRARY-ANC(11-22-19).GLB [ANC_SAMPLE_SUMMARY] RSanders 1/22/20

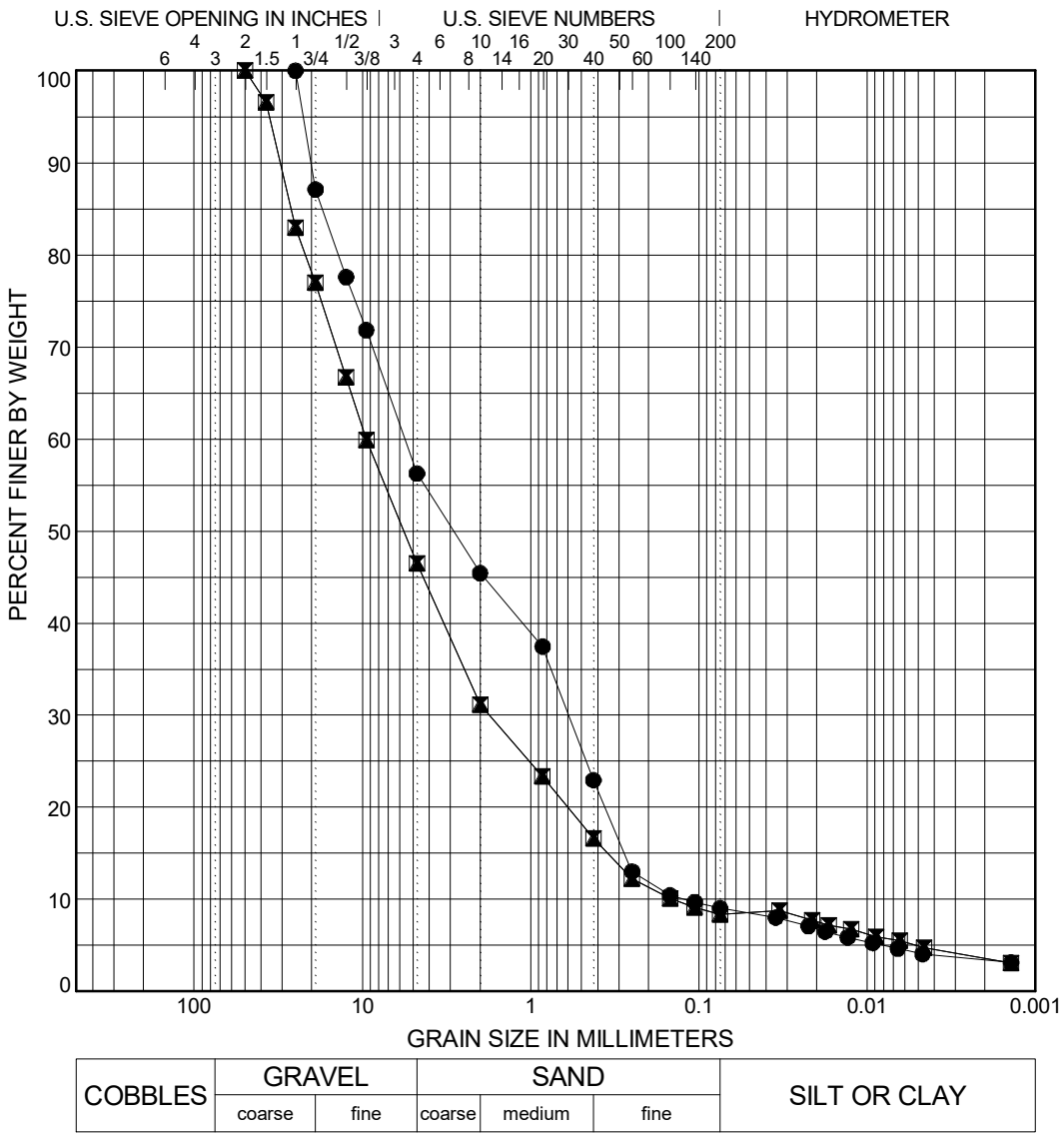
Golder Associates Inc.
2121 Abbott Road, Anchorage AK 99507
Tel: 19073446001 Fax: (907) 344-6011 www.golder.com

GOLDER

FIGURE B-1: SUMMARY OF PARTICLE SIZE DISTRIBUTION RESULTS

Reference(s)
ASTM C136, D422, D7928 and D6913

Client:	Alaska Railroad Corporation	**Location:**	Anchorage, AK		
Project:	ARRC Depot Drive Development	**Project No.:**	19132189	**Reviewed By:** J. Karp	**Date:** 11/26/2019



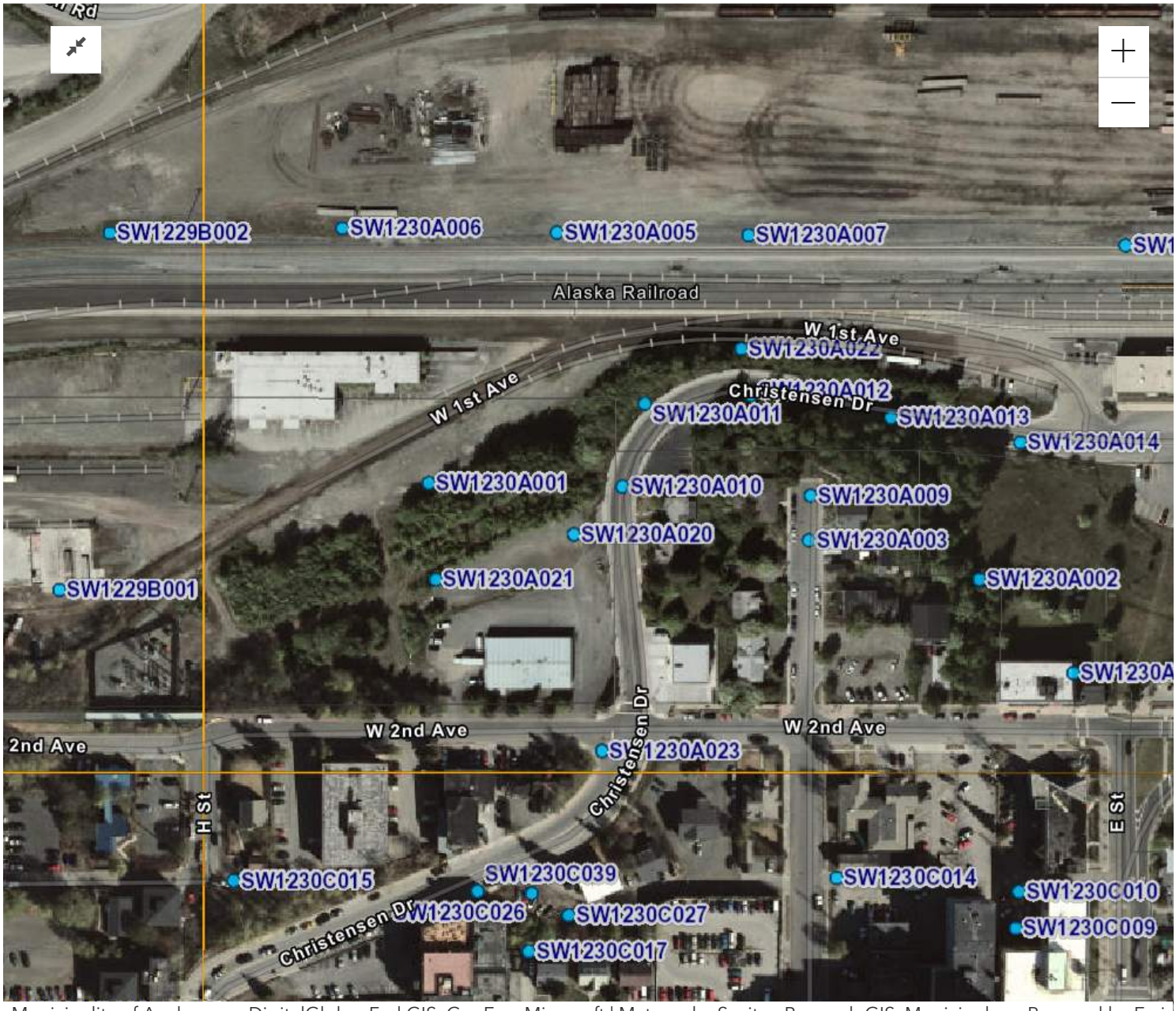
		●	⊠	▲
Sample Location		BH-02	BH-03A	BH-03B
Sample #		3B	3	3
Depth (ft)		6.0	5.0	5.0
Total Sample (g)		1163.7	2754.0	2754.0
MC (%)		6.8	5.5	5.5
LL				
PI				
% Passing Sieve (interpolated if not measured)	**3"**			
	2"		100	100
	1.5"		97	97
	1"	100	83	83
	3/4"	87	77	77
	1/2"	78	67	67
	3/8"	72	60	60
	#4	56	46	46
	#10	45	31	31
	#20	37	23	23
	#40	23	17	17
	#60	13	12	12
	#100	10	10	10
	#140	10	9	9
	#200	9	8	8
% <0.02 mm		7	8	8
% Gravel		44	54	54
% Sand		47	38	38
% Fines		9	8	8
D100		25	50	50
D60		5.61	9.55	9.55
D50		2.88	5.7	5.7
D30		0.6	1.76	1.76
D10		0.12	0.14	0.14
Cc		0.5	2.2	2.2
Cu		46.3	66.3	66.3
USCS Classification		poorly graded sand with silt and gravel (SP-SMg)	well-graded gravel with silt and sand (GW-GMs)	well-graded gravel with silt and sand (GW-GMs)

APPENDIX C

Historic Soil Borings from MOA GIS Database

Soil Boring Map

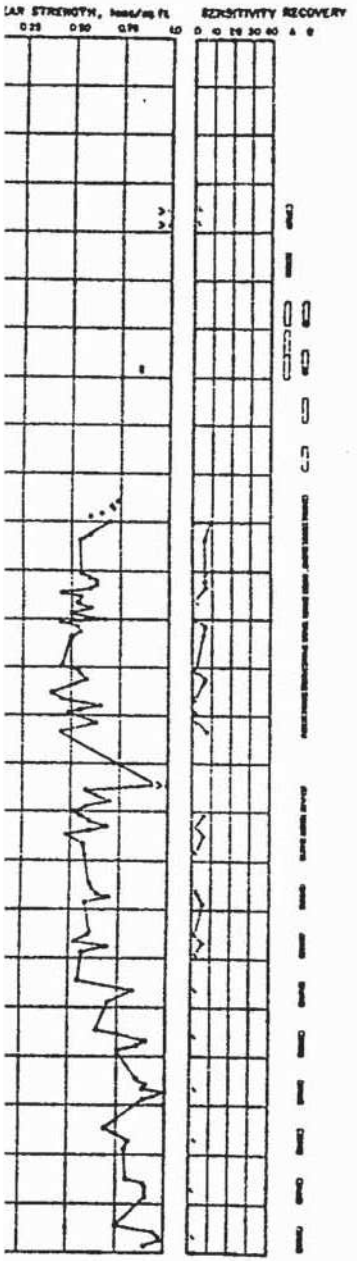
Last updated 2 months ago



Municipality of Anchorage, DigitalGlobe, Fed GIS, GeoEye, Microsoft | Matanuska-Susitna Borough GIS, Municipal… Powered by Esri

MOA GIS I.D.# SW1229B001

BORING NO. A133



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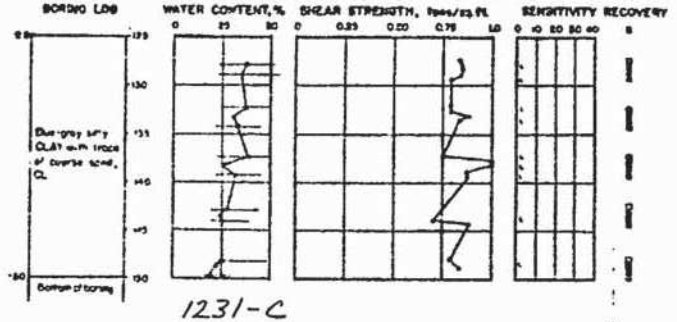
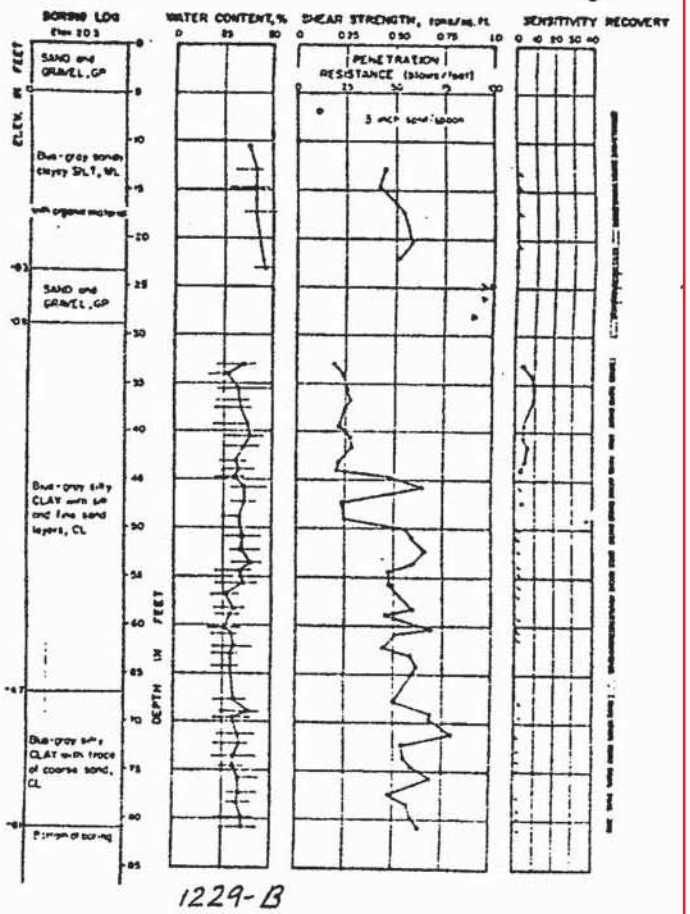


1231-C

BORING NO. A1007 (1)



1229-B

LEGEND

Shear strength:
Lab vane
A hole ●
B hole ○
Supplementary holes ⊙
Field vane □
Tube vane ▪
Pocket penetrometer ⅝ ▲

Standard penetration resistance ▲
Liquid limit
Natural water content
Plastic limit
Sensitivity less than 10 L
Piezometer tip ⊠
Water table ▽

For complete report see
Shannon & Wilson Report
Report Drawer A

SHANNON & WILSON, INC.
SOIL MECHANICS AND FOUNDATION ENGINEERS
SEATTLE, WASHINGTON

ANCHORAGE AREA SOILS STUDIES

LOGS FOR BORINGS A133 & A1007

MOA GIS I.D.# SW1230A022

PHUKAN CONSULTING ENGINEERS & ASSOCIATES, INC.

Civil • Geotechnical • Surveying • Environmental

2702 Gambell, Suite 201, Anchorage, AK, 99503

Tele: (907) 272-7111 Fax: (907) 277-3177

DATE: 11/12/97

BORING NO.: 2

PROJECT:- **Coastal Trail Northern Extension**

LOCATION:- West 1st Avenue and Christensen Drive

W.O.:- 97304.1

TOP ELEV.:- N/A

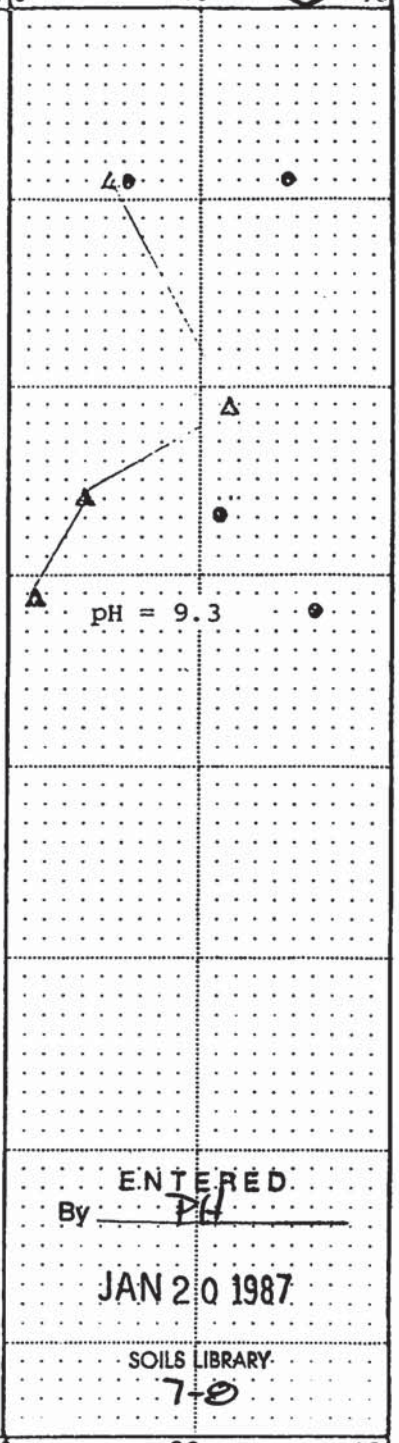
DEPTH (M)	GRAPHIC LOG	THERMAL STATE	SOIL DESCRIPTION	PENETRATION (SEC./15.3CM)	SAMPLES	MOISTURE CONTENT	DEPTH (M)
			ORGANIC SILT W/ SAND (OL) – dark brown, very moist – very soft – top 2.5cm vegetative mat/grass	2 2	1	5.8	
			POORLY GRADED SAND W/ GRAVEL (SP,NFS) – brown to dark brown – moist – very loose to compact – organics present down to 0.5m	2 2 4 5 7 12	2		
1				23 22	3A 3B		1
			SILTY CLAY (CL-ML,F4) – brownish grey – moist – firm to hard – occasional sand w/ gravel (SP) lenses	16 21 35 33 34	4	17.4	
2				21 10 17 14 13	5A 5B 5C		2
3			**POORLY GRADED SAND W/ GRAVEL (SP,F2)** – brown, moist, compact – Fe Oxide present @ 2.9m END OF TEST HOLE @3.05 METERS				3

COMMENTS:

SLMETRIC.DWG

SOIL DESCRIPTION Surface Elevation: 18.7'	GRAPHIC LOG	DEPTH, ft.	SAMPLE	GROUND WATER DEPTH, ft.
Medium dense to dense, dark brown slightly silty, gravelly SAND, interbedded (near bottom) with dark brown to black clayey SILT with organics			1 B 2 3	Observed during drilling
Medium stiff to stiff, light brown to gray, fine sandy, clayey SILT		12.0	4 5	
Bottom of Boring Completed 8/31/83		16.5		

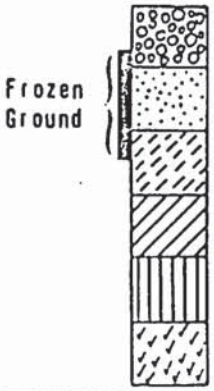
PENETRATION RESISTANCE
(340 lb. weight, 30" drop)
▲ Blows per foot
0 20 40

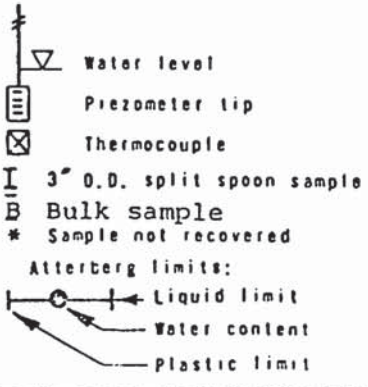


0 20 40
● % Water content

Note: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

LEGEND





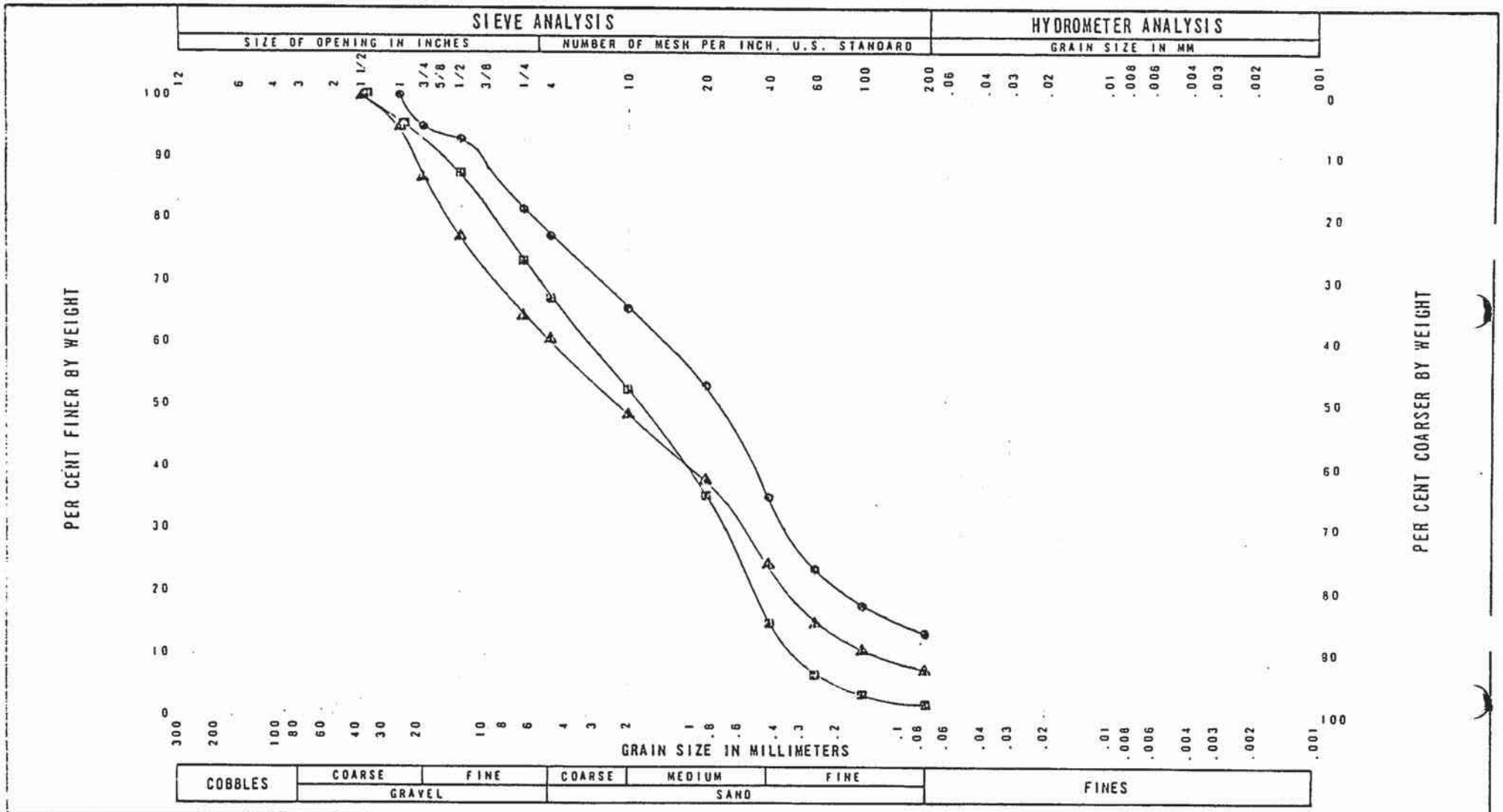
CBD-1 Sanitary Sewer Trunk
Phase III
Anchorage, Alaska

LOG OF BORING NO. B-1

SEPT 1983 A-126

SHANNON & WILSON, INC.
GEOTECHNICAL CONSULTANTS

FIG. 2



SAMPLE NO.	DEPTH-FT.	U.S.C.	CLASSIFICATION	NAT. W.C. %	LL	PL	PI
B1, S2	4.0-5.5	SM-SC	● Medium dense, dark brown, slightly silty, gravelly SAND	12.5			
B5, S1	5.0-6.5	SP-SM	▲ Medium dense, brown, slightly silty, gravelly SAND	4.3			
B5, S3	12.5-14.0	SP	■ Dense, brown-black, clean, gravelly SAND	10.6			

CBD-1 Sanitary Sewer Trunk
Phase III
Anchorage, Alaska

GRAIN SIZE CLASSIFICATION

SEPT 1983 A-126

FIG 8

PROJECT: MOA-Christensen Dr.
PROJECT LOCATION: Anchorage, AK
PROJECT NUMBER: 953-5254x020

RECORD OF BOREHOLE BH-4

BORING DATE: 12/22/95
BORING LOCATION: See Figure 2

SHEET: 1 OF 2
DATUM: Ground Surface

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT ■ (10 20 30 40) / WATER CONTENT, PERCENT Wp W Wl (10 20 30 40)	PIEZOMETER OR STANDPIPE INSTALLATION
0	4.25 in. ID HSA	Frozen and becoming thawed and compact to loose below 3 ft, brown, well-graded sand with silt and gravel. Gravel is subround to 1 in. diam. Trace organics includes brown leaves to 6.5 ft; organic odor to 11.5 ft. (SW-SM, Nbn, F2)			0.0	1	B	N/A	–	–	■ O	Slotted PVC Bentonite
5						2	HD	6,11,14	25	6/18	O ■	
						3	HD	3,6,8	14	6/18	O ■	
10						4	HD	4,4,3	7	6/18	O ■	Cuttings
15		Firm, gray, lean clay. (CL, F3) Some brown medium-fine sand intermixed with gray, lean clay at top of unit.			15.0	5	HD	4,4,4	8	12/18	■ O	
20		CONTINUED ON NEXT PAGE										

DRILL RIG: Mobile B-81
DRILLING CONTRACTOR: Denali Drilling
DRILLER: Ryan Ralston

Figure 8
Golder Associates

LOGGED: G. Eberle
CHECKED: M. Musick
DATE: 1-10-96

RECORD OF BOREHOLE BH-4

PROJECT: MOA-Christensen Dr.
PROJECT LOCATION: Anchorage, AK
PROJECT NUMBER: 953-5254x020

BORING DATE: 12/22/95
BORING LOCATION: See Figure 2

SHEET: 2 OF 2
DATUM: Ground Surface

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT ■ (10 20 30 40) / WATER CONTENT, PERCENT Wp W Wl (10 20 30 40)	PIEZOMETER OR STANDPIPE INSTALLATION
20	4.25 in. ID HSA	CONTINUED FROM PREVIOUS PAGE				6	HD	4,3,4	7	18/18	■ O	Cuttings; 1130 h 1/4/96
25						7	HD	2,5,3	8	18/18	■ O	Sandpack
30						8	HD	2,2,2	4	18/18	■ O	
35		BOH @ 31.5 ft at 1030 hours. No water encountered while drilling, but it sounded as if backfill was placed in water during standpipe installation.			31.5							
40												

DRILL RIG: Mobile B-61
DRILLING CONTRACTOR: Denali Drilling
DRILLER: Ryan Ralston

LOGGED: G. Eberle
CHECKED: M. McSiatt
DATE: 1-10-96

Figure 8 (Continued)

Golder Associates

MOA GIS I.D.# SW1230A013

PROJECT: MOA-Christensen Dr.
PROJECT LOCATION: Anchorage, AK
PROJECT NUMBER: 953-5254x020

RECORD OF BOREHOLE BH-6

BORING DATE: 12/22/95
BORING LOCATION: See Figure 2

SHEET: 1 OF 1
DATUM: Ground Surface

13

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	ICE BOND	GRAPHIC LOG	ELEV / DEPTH	NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT ■ 10 20 30 40 / WATER CONTENT, PERCENT Wp W Wl 10 20 30 40	PIEZOMETER OR STANDPIPE INSTALLATION
0	4.25 in. ID HSA	Black Asphalt Concrete			0.0							
		Frozen, brown, silty sand with gravel. Gravel is subround to 0.75 in. diam. (SM, Nbn, F2) (Fill)			0.3	1	B	N/A	–	–	■○	
						2	HD	14,24,25	–	18/18	■ ○	
		Compact, brown to reddish-brown, medium-fine, poorly graded sand. (SP, F2)			4.0	3	HD	2,9,5,6	14	12/18	○ ■	
5												
		Firm, mottled gray to light brown, lean clay. (CL, F3)			8.5	4	HD	2,2,4	6	18/18	■ ○	
10												
		Compact, gray, fine silty sand. (SM, F4)			13.0	5	HD	5,9,9	18	12/18	■ ○	
15												
		BOH @ 17.0 ft at 1255 hours. No water encountered while drilling.			16.5							
20												

DRILL RIG: Mobile B-61
DRILLING CONTRACTOR: Denali Drilling
DRILLER: Ryan Ralston

LOGGED: G. Eberle
CHECKED: [illegible]
DATE: 1-8-96

Figure 10
Golder Associates

MOA GIS I.D.# SW1230A001

RING NO. A124

ITENT, % SHEAR STRENGTH, tons/sq.ft. SENSITIVITY RECOVERY

BORING NO. A124 (CONTINUED)

BORING LOG WATER CONTENT, % SHEAR STRENGTH, tons/sq.ft. SENSITIVITY RECOVERY

Blue-gray silty CLAY with trace of coarse sand, CL

Bottom of boring

1230-C

BORING NO. A1005 (2)

BORING LOG WATER CONTENT, % SHEAR STRENGTH, tons/sq.ft. SENSITIVITY RECOVERY

ELEV. IN FEET

SAND and GRAVEL, GP

Blue-gray silty CLAY with silt and fine sand layers, CL

Blue-gray sandy clayey SILT, ML with organic material

SAND and GRAVEL, GP

Blue-gray silty CLAY with silt and fine sand layers, CL

Blue-gray sandy clayey SILT, ML

Blue-gray silty CLAY with silt and fine sand layers, CL

Blue-gray silty CLAY with trace of coarse sand, CL

Bottom of boring

3 inch split-spoon

PENETRATION RESISTANCE (blows/foot)

DEPTH IN FEET

1230-A

BORING NO. A1006 (1)

BORING LOG WATER CONTENT, % SHEAR STRENGTH, tons/sq.ft. SENSITIVITY RECOVERY

ELEV. IN FEET

SAND and GRAVEL, GP

Blue-gray silty CLAY with silt and fine sand layers, CL

SAND and GRAVEL, GP

Blue-gray silty CLAY with silt and fine sand layers, CL

Blue-gray silty CLAY with silt and fine sand layers, sensitive, CL

Blue-gray silty CLAY with trace of coarse sand, CL

Bottom of boring

3 inch split-spoon

PENETRATION RESISTANCE (blows/foot)

DEPTH IN FEET

1230-A

LEGEND

Shear strength:
Lab vane
A hole
B hole
Supplementary holes
Field vane
Tube vane
Pocket penetrometer

Standard penetration resistance
Liquid limit
Natural water content
Plastic limit
Sensitivity less than 10
Piezometer tip
Water table

For complete information see Shannon & Wilson Report Drawer A.

SHANNON & WILSON, INC.
SOIL MECHANICS AND FOUNDATION ENGINEERS
SEATTLE, WASHINGTON

ANCHORAGE AREA SOILS STUDIES

LOGS FOR BORINGS A124, A1005 & A1006

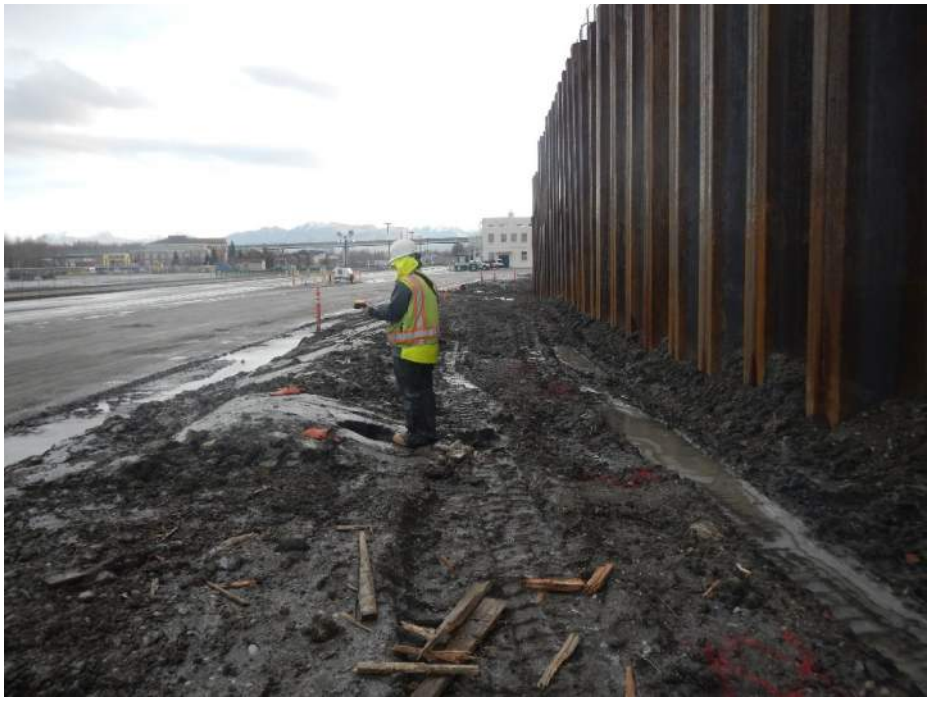
SCALE AS SHOWN DATE AUGUST 29, 1964

APPENDIX D

Site Photographs

Project Title: ARRC Depot Drive Development

PHOTO 1 Truck-mounted CME-75 in typical drilling set-up in Depot Drive at Borehole BH-03. Viewed northeast.	
PHOTO 2 Representative sample of fill material (silty sand with gravel) observed in Borehole BH-02 from 2 to 4 feet bgs (Sample 2).	

Project Title: ARRC Depot Drive Development	
PHOTO 3 Surface sample taken at approximate proposed Borehole BH-03 (not advanced).	
PHOTO 4 Location of surface sample at approximate proposed Borehole BH-03 (not advanced). Viewed east.	

Project Title: ARRC Depot Drive Development	
PHOTO 5 Typical borehole completion with 6-inch flush mount at ground surface.	

APPENDIX E

Analytical Testing Results

Table E-1: Analytical Laboratory Results Summary

Boreholes BH-01, BH-02, and BH-03A - ARRC Depot Drive Development

			Golder Sample Id:	BH-01	BH-02	BH-03A	BH-03A-1	PW7-25-11
			Lab Sample Id:	1196897001	1196897002	1196897003	1196897004	1196897009
			Borehole / Sample Location:	BH-01	BH-02	BH-03A	BH-03A	Trip Blank
			Depth Interval (ft bgs):	2 - 4	0 - 2	0 - 4	0 - 4	--
Analysis Method	Analyte	Unit	ADEC Cleanup Level [1]	Result	Result	Result	Result	Result
AK101	GRO	mg/kg	300	**2.67**	**0.987J**	ND	ND	ND
AK102	DRO	mg/kg	250	**64.3J**	**205**	**18.4J**	**23.1**	ND
AK103	RRO	mg/kg	11,000	**481**	**2020**	**27.4**	**39.6**	ND
SW6020A	Lead	mg/kg	400	--	--	--	--	--
SW6020A [2]	Lead	mg/L	--	--	--	--	--	--
SW8082A	Aroclor-1260	µg/kg	1,000	--	--	--	--	--
SW8260C	1,2,4-Trimethylbenzene	µg/kg	610	**79.3**	**19.6J**	ND	ND	ND
SW8260C	1,3,5-Trimethylbenzene	µg/kg	660	**12.2J**	ND	ND	ND	ND
SW8260C	4-Isopropyltoluene	µg/kg	--	**49.8J**	ND	ND	ND	ND
SW8260C	Acetone	µg/kg	38,000	ND	ND	ND	ND	ND
SW8260C	Benzene	µg/kg	22	**18.5**	**4.09J**	ND	ND	ND
SW8260C	Ethylbenzene	µg/kg	130	**37.9**	**8.19J**	ND	ND	ND
SW8260C	Isopropylbenzene	µg/kg	5,600	**12.4J**	ND	ND	ND	ND
SW8260C	Naphthalene	µg/kg	38	**93.3**	**29.3**	ND	ND	ND
SW8260C	n-Propylbenzene	µg/kg	9,100	**8.63J**	ND	ND	ND	ND
SW8260C	o-Xylene	µg/kg	1,500	**107**	**23.7**	ND	ND	ND
SW8260C	P & M -Xylene	µg/kg	1,500	**186**	**40.9J**	ND	ND	ND
SW8260C	sec-Butylbenzene	µg/kg	28,000	ND	ND	ND	ND	ND
SW8260C	Toluene	µg/kg	6,700	**139**	**26.3**	ND	ND	ND
SW8260C	Xylenes (total)	µg/kg	1,500	**293**	**64.6**	ND	ND	ND
SW8270D	Fluorene	µg/kg	36,000	ND	ND	ND	ND	ND
SW8270D	Phenanthrene	µg/kg	39,000	ND	ND	ND	ND	ND
SW8270D	Pyrene	µg/kg	87,000	ND	ND	ND	ND	ND

Notes:

-- = Not analyzed

Red Values exceed the cleanup level

U - Not detected at concentrations above the limit of detection (LOD)

J - Value is an estimation because detected below limit of quantitation (LOQ)

GRO, DRO, and RRO results in mg/kg (milligrams per kilogram) and VOC results in µg/kg (micrograms per kilogram).

[1] Tables B1 and B2. Method Two, Under 40-inch Zone, Migration to Groundwater Cleanup Level "18AAC75, Oil and Other Hazardous Substances Pollution Control," ADEC, as amended through January 2019.

[2] Maximum theoretical leachate concentration in accordance with USEPA Memotandum #36, "Total Analysis vs. TCLP," dated January 12, 199

Analyte compounds where results were not detected above the detection limit in any of the samples are not listed in the table for brevity.

Laboratory Report of Analysis

To: Golder Associates Inc.
2121 Abbott Road, #100
Anchorage, AK 99507
(907)344-6001

Report Number: **1196897**

Client Project: **ARRC DEPOT DR. Drilling Sample**

Dear Chris Valentine,

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

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Golder Associates Inc.**
SGS Project: **1196897**
Project Name/Site: **ARRC DEPOT DR. Drilling Sample**
Project Contact: **Chris Valentine**

Refer to sample receipt form for information on sample condition.

BH-01 (1196897001) PS

8270D - The LOQs are elevated due to sample dilution. The sample was analyzed at a dilution due to matrix interference with internal standards.

LCS for HBN 1802587 [XXX/42629 (1545011) LCS

8270D - LCS recovery for 2,4-dinitrophenol does not meet QC criteria. The associated sample concentrations for this analyte are less than the LOQ.
8270D - LCS recovery for aniline does not meet QC criteria.

1196897001MS (1544068) MS

8260C - MS recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MS (1545012) MS

8270D - MS recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1196897001MSD (1544069) MSD

8260C - MSD recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MSD (1545013) MSD

8270D - MSD recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
8270D - MSD RPD for 4-chloroaniline does not meet QC criteria. Results for this analyte are less than the LOQ in the parent sample.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8082A				
1545125	LCS for HBN 1802613 [XXX/42632	XGC10544	Aroclor-1016	BLC, SP
1545127	1196876010MSD	XGC10544	Aroclor-1016	SP
SW8260C				
1196897005	BH-04	VMS19671	4-Isopropyltoluene	SP
1196897005	BH-04	VMS19671	Naphthalene	SP
SW8270D				
1545011	LCS for HBN 1802587 [XXX/42629	XMS11885	1-Chloronaphthalene	SP
1545012	1196867001MS	XMS11889	1-Chloronaphthalene	SP
1545013	1196867001MSD	XMS11889	1,4-Dichlorobenzene	RP
1545013	1196867001MSD	XMS11889	1-Chloronaphthalene	SP

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.

Print Date: 12/13/2019 3:40:05PM

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, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 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
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.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
BH-01	1196897001	11/14/2019	11/15/2019	Soil/Solid (dry weight)

Method	Method Description
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SW6020A	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW8082A	SW8082 PCB's
SW8270D	SW846 8270 Semi-Volatiles by GC/MS (S)
SW8260C	VOC 8260 (S) Field Extracted

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	64.3	J	84.0	26.0	mg/Kg	4		11/21/19 18:58
Surrogates								
5a Androstane (surr)	100		50-150		%	4		11/21/19 18:58

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/21/19 18:58
Container ID: 1196897001-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.011 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	481		84.0	26.0	mg/Kg	4		11/21/19 18:58
Surrogates								
n-Triacontane-d62 (surr)	97.4		50-150		%	4		11/21/19 18:58

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Analyst: DSD
Analytical Date/Time: 11/21/19 18:58
Container ID: 1196897001-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.011 g
Prep Extract Vol: 5 mL

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
1,2-Dichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
1,3-Dichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
1,4-Dichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
1-Chloronaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
1-Methylnaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2,4,5-Trichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2,4,6-Trichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2,4-Dichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2,4-Dimethylphenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2,4-Dinitrophenol	1.56	U	3.12	0.979	mg/Kg	1		12/09/19 20:10
2,4-Dinitrotoluene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2,6-Dichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2,6-Dinitrotoluene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2-Chloronaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2-Chlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2-Methyl-4,6-dinitrophenol	5.20	U	10.4	3.23	mg/Kg	5		12/11/19 16:45
2-Methylnaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2-Methylphenol (o-Cresol)	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2-Nitroaniline	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
2-Nitrophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
3&4-Methylphenol (p&m-Cresol)	0.520	U	1.04	0.323	mg/Kg	1		12/09/19 20:10
3,3-Dichlorobenzidine	1.30	U	2.60	0.781	mg/Kg	5		12/11/19 16:45
3-Nitroaniline	0.261	U	0.521	0.156	mg/Kg	1		12/09/19 20:10
4-Bromophenyl-phenylether	0.650	U	1.30	0.406	mg/Kg	5		12/11/19 16:45
4-Chloro-3-methylphenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
4-Chloroaniline	0.520	U	1.04	0.323	mg/Kg	1		12/09/19 20:10
4-Chlorophenyl-phenylether	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
4-Nitroaniline	1.56	U	3.12	0.979	mg/Kg	1		12/09/19 20:10
4-Nitrophenol	1.04	U	2.08	0.646	mg/Kg	1		12/09/19 20:10
Acenaphthene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
Acenaphthylene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 20:10
Aniline	1.04	U	2.08	0.646	mg/Kg	1		12/09/19 20:10
Anthracene	0.650	U	1.30	0.406	mg/Kg	5		12/11/19 16:45
Azobenzene	0.650	U	1.30	0.406	mg/Kg	5		12/11/19 16:45
Benzo(a)Anthracene	0.650	U	1.30	0.406	mg/Kg	5		12/11/19 16:45
Benzo[a]pyrene	0.650	U	1.30	0.406	mg/Kg	5		12/11/19 16:45

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Benzo[g,h,i]perylene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Benzo[k]fluoranthene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Benzoic acid	0.780 U		1.56	0.489	mg/Kg	1		12/09/19 20:10
Benzyl alcohol	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Bis(2chloro1methylethyl)Ether	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Bis(2-Chloroethoxy)methane	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Bis(2-Chloroethyl)ether	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
bis(2-Ethylhexyl)phthalate	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Butylbenzylphthalate	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Carbazole	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Chrysene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Dibenzo[a,h]anthracene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Dibenzofuran	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Diethylphthalate	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Dimethylphthalate	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Di-n-butylphthalate	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
di-n-Octylphthalate	1.30 U		2.60	0.781	mg/Kg	5		12/11/19 16:45
Fluoranthene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Fluorene	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Hexachlorobenzene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Hexachlorobutadiene	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Hexachlorocyclopentadiene	0.364 U		0.729	0.208	mg/Kg	1		12/09/19 20:10
Hexachloroethane	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Indeno[1,2,3-c,d] pyrene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Isophorone	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Naphthalene	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Nitrobenzene	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
N-Nitrosodimethylamine	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
N-Nitroso-di-n-propylamine	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
N-Nitrosodiphenylamine	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Pentachlorophenol	5.20 U		10.4	3.23	mg/Kg	5		12/11/19 16:45
Phenanthrene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45
Phenol	0.130 U		0.260	0.0812	mg/Kg	1		12/09/19 20:10
Pyrene	0.650 U		1.30	0.406	mg/Kg	5		12/11/19 16:45

Surrogates

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol (surr)	85.8		35-125		%	5		12/11/19 16:45
2-Fluorobiphenyl (surr)	95.5		44-115		%	1		12/09/19 20:10
2-Fluorophenol (surr)	68.4		35-115		%	1		12/09/19 20:10
Nitrobenzene-d5 (surr)	74.9		37-122		%	1		12/09/19 20:10
Phenol-d6 (surr)	75.4		33-122		%	1		12/09/19 20:10
Terphenyl-d14 (surr)	89.1		54-127		%	5		12/11/19 16:45

Batch Information

Analytical Batch: XMS11889
Analytical Method: SW8270D
Analyst: JMG
Analytical Date/Time: 12/11/19 16:45
Container ID: 1196897001-A

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/19 14:52
Prep Initial Wt./Vol.: 22.705 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS11885
Analytical Method: SW8270D
Analyst: JMG
Analytical Date/Time: 12/09/19 20:10
Container ID: 1196897001-A

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/19 14:52
Prep Initial Wt./Vol.: 22.705 g
Prep Extract Vol: 1 mL

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.67		2.01	0.602	mg/Kg	1		11/18/19 19:47
Surrogates								
4-Bromofluorobenzene (surr)	93		50-150		%	1		11/18/19 19:47

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/18/19 19:47
Container ID: 1196897001-B

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/14/19 09:15
Prep Initial Wt./Vol.: 74.927 g
Prep Extract Vol: 28.6196 mL

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t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	8.05	U	16.1	4.98	ug/Kg	1		11/16/19 19:22
1,1,1-Trichloroethane	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,1,2,2-Tetrachloroethane	0.805	U	1.61	0.498	ug/Kg	1		11/16/19 19:22
1,1,2-Trichloroethane	0.321	U	0.642	0.201	ug/Kg	1		11/16/19 19:22
1,1-Dichloroethane	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,1-Dichloroethene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,1-Dichloropropene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,2,3-Trichlorobenzene	20.1	U	40.1	12.0	ug/Kg	1		11/16/19 19:22
1,2,3-Trichloropropane	0.805	U	1.61	0.498	ug/Kg	1		11/16/19 19:22
1,2,4-Trichlorobenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,2,4-Trimethylbenzene	79.3		40.1	12.0	ug/Kg	1		11/16/19 19:22
1,2-Dibromo-3-chloropropane	40.1	U	80.3	24.9	ug/Kg	1		11/16/19 19:22
1,2-Dibromoethane	0.402	U	0.803	0.249	ug/Kg	1		11/16/19 19:22
1,2-Dichlorobenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,2-Dichloroethane	0.805	U	1.61	0.498	ug/Kg	1		11/16/19 19:22
1,2-Dichloropropane	4.01	U	8.03	2.49	ug/Kg	1		11/16/19 19:22
1,3,5-Trimethylbenzene	12.2	J	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,3-Dichlorobenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
1,3-Dichloropropane	4.01	U	8.03	2.49	ug/Kg	1		11/16/19 19:22
1,4-Dichlorobenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
2,2-Dichloropropane	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
2-Butanone (MEK)	101	U	201	62.6	ug/Kg	1		11/16/19 19:22
2-Chlorotoluene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
2-Hexanone	40.1	U	80.3	24.9	ug/Kg	1		11/16/19 19:22
4-Chlorotoluene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
4-Isopropyltoluene	49.8	J	80.3	20.1	ug/Kg	1		11/16/19 19:22
4-Methyl-2-pentanone (MIBK)	101	U	201	62.6	ug/Kg	1		11/16/19 19:22
Acetone	101	U	201	62.6	ug/Kg	1		11/16/19 19:22
Benzene	18.5		10.0	3.13	ug/Kg	1		11/16/19 19:22
Bromobenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
Bromochloromethane	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
Bromodichloromethane	0.805	U	1.61	0.498	ug/Kg	1		11/16/19 19:22
Bromoform	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
Bromomethane	8.05	U	16.1	4.98	ug/Kg	1		11/16/19 19:22
Carbon disulfide	40.1	U	80.3	24.9	ug/Kg	1		11/16/19 19:22
Carbon tetrachloride	5.00	U	10.0	3.13	ug/Kg	1		11/16/19 19:22
Chlorobenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	80.5	U	161	49.8	ug/Kg	1		11/16/19 19:22
Chloroform	0.805	U	1.61	0.498	ug/Kg	1		11/16/19 19:22
Chloromethane	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
cis-1,2-Dichloroethene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
cis-1,3-Dichloropropene	5.00	U	10.0	3.13	ug/Kg	1		11/16/19 19:22
Dibromochloromethane	0.805	U	1.61	0.498	ug/Kg	1		11/16/19 19:22
Dibromomethane	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
Dichlorodifluoromethane	20.1	U	40.1	12.0	ug/Kg	1		11/16/19 19:22
Ethylbenzene	37.9		20.1	6.26	ug/Kg	1		11/16/19 19:22
Freon-113	40.1	U	80.3	24.9	ug/Kg	1		11/16/19 19:22
Hexachlorobutadiene	8.05	U	16.1	4.98	ug/Kg	1		11/16/19 19:22
Isopropylbenzene (Cumene)	12.4	J	20.1	6.26	ug/Kg	1		11/16/19 19:22
Methylene chloride	40.1	U	80.3	24.9	ug/Kg	1		11/16/19 19:22
Methyl-t-butyl ether	40.1	U	80.3	24.9	ug/Kg	1		11/16/19 19:22
Naphthalene	93.3		20.1	6.26	ug/Kg	1		11/16/19 19:22
n-Butylbenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
n-Propylbenzene	8.63	J	20.1	6.26	ug/Kg	1		11/16/19 19:22
o-Xylene	107		20.1	6.26	ug/Kg	1		11/16/19 19:22
P & M -Xylene	186		40.1	12.0	ug/Kg	1		11/16/19 19:22
sec-Butylbenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
Styrene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
tert-Butylbenzene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
Tetrachloroethene	5.00	U	10.0	3.13	ug/Kg	1		11/16/19 19:22
Toluene	139		20.1	6.26	ug/Kg	1		11/16/19 19:22
trans-1,2-Dichloroethene	10.1	U	20.1	6.26	ug/Kg	1		11/16/19 19:22
trans-1,3-Dichloropropene	5.00	U	10.0	3.13	ug/Kg	1		11/16/19 19:22
Trichloroethene	2.00	U	4.01	1.20	ug/Kg	1		11/16/19 19:22
Trichlorofluoromethane	20.1	U	40.1	12.0	ug/Kg	1		11/16/19 19:22
Vinyl acetate	40.1	U	80.3	24.9	ug/Kg	1		11/16/19 19:22
Vinyl chloride	0.321	U	0.642	0.201	ug/Kg	1		11/16/19 19:22
Xylenes (total)	293		60.2	18.3	ug/Kg	1		11/16/19 19:22
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		71-136		%	1		11/16/19 19:22
4-Bromofluorobenzene (surr)	84.6		55-151		%	1		11/16/19 19:22
Toluene-d8 (surr)	98.5		85-116		%	1		11/16/19 19:22

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-01**

Client Sample ID: **BH-01**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897001
Lab Project ID: 1196897

Collection Date: 11/14/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/16/19 19:22
Container ID: 1196897001-B

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/14/19 09:15
Prep Initial Wt./Vol.: 74.927 g
Prep Extract Vol: 28.6196 mL

Method Blank

Blank ID: MB for HBN 1802379 [MXX/33000]
Blank Lab ID: 1544246

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW6020A**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.100U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:44:07PM

Prep Batch: MXX33000
Prep Method: SW3050B
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

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t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [MXX33000]
Blank Spike Lab ID: 1544247
Date Analyzed: 11/21/2019 18:48

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW6020A**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Lead	50	51.8	104	(84-118)

Batch Information

Analytical Batch: **MMS10690**
Analytical Method: **SW6020A**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **DMM**

Prep Batch: **MXX33000**
Prep Method: **SW3050B**
Prep Date/Time: **11/20/2019 11:25**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

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200 West Potter Drive Anchorage, AK 95518
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Matrix Spike Summary

Original Sample ID: 1544248
MS Sample ID: 1544254 MS
MSD Sample ID: 1544255 MSD

QC for Samples: 1196897008

Analysis Date: 11/21/2019 18:53
Analysis Date: 11/21/2019 18:58
Analysis Date: 11/21/2019 19:02
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	3.76	46.9	50.6	100	46.5	45.9	91	84-118	9.92	(< 20)

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:58:12PM

Prep Batch: MXX33000
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1.07g
Prep Extract Vol: 50.00mL

Print Date: 12/13/2019 3:40:22PM

Method Blank

Blank ID: MB for HBN 1802346 [SPT/10940]
Blank Lab ID: 1544092

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A
Analytical Date/Time: 11/18/2019 5:09:00PM

Print Date: 12/13/2019 3:40:23PM

Duplicate Sample Summary

Original Sample ID: 1196869007
Duplicate Sample ID: 1544093
Analysis Date: 11/18/2019 17:09
Matrix: Soil/Solid (dry weight)

QC for Samples:

1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	94.3	94.5	%	0.23	(< 15)

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A

Print Date: 12/13/2019 3:40:25PM

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

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	0.400U	0.800	0.250	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	25.0U	50.0	15.0	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	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	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	50.0U	100	31.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	50.0U	100	25.0	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Acetone	125U	250	78.0	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	6.20	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

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloroform	1.00U	2.00	0.620	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	1.00U	2.00	0.620	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	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	2.50U	5.00	1.50	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)	102	71-136		%
4-Bromofluorobenzene (surr)	101	55-151		%
Toluene-d8 (surr)	97	85-116		%

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Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 3:23:00PM

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 12/13/2019 3:40:29PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	726	97	(78-125)
1,1,1-Trichloroethane	750	768	102	(73-130)
1,1,2,2-Tetrachloroethane	750	751	100	(70-124)
1,1,2-Trichloroethane	750	737	98	(78-121)
1,1-Dichloroethane	750	707	94	(76-125)
1,1-Dichloroethene	750	691	92	(70-131)
1,1-Dichloropropene	750	833	111	(76-125)
1,2,3-Trichlorobenzene	750	788	105	(66-130)
1,2,3-Trichloropropane	750	726	97	(73-125)
1,2,4-Trichlorobenzene	750	805	107	(67-129)
1,2,4-Trimethylbenzene	750	781	104	(75-123)
1,2-Dibromo-3-chloropropane	750	732	98	(61-132)
1,2-Dibromoethane	750	737	98	(78-122)
1,2-Dichlorobenzene	750	763	102	(78-121)
1,2-Dichloroethane	750	701	93	(73-128)
1,2-Dichloropropane	750	814	108	(76-123)
1,3,5-Trimethylbenzene	750	786	105	(73-124)
1,3-Dichlorobenzene	750	760	101	(77-121)
1,3-Dichloropropane	750	728	97	(77-121)
1,4-Dichlorobenzene	750	764	102	(75-120)
2,2-Dichloropropane	750	751	100	(67-133)
2-Butanone (MEK)	2250	2340	104	(51-148)
2-Chlorotoluene	750	761	101	(75-122)
2-Hexanone	2250	2360	105	(53-145)
4-Chlorotoluene	750	755	101	(72-124)
4-Isopropyltoluene	750	822	110	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2200	98	(65-135)
Acetone	2250	1920	85	(36-164)
Benzene	750	779	104	(77-121)
Bromobenzene	750	754	101	(78-121)
Bromochloromethane	750	690	92	(78-125)
Bromodichloromethane	750	812	108	(75-127)
Bromoform	750	733	98	(67-132)
Bromomethane	750	650	87	(53-143)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon disulfide	1130	1030	91	(63-132)
Carbon tetrachloride	750	787	105	(70-135)
Chlorobenzene	750	770	103	(79-120)
Chloroethane	750	734	98	(59-139)
Chloroform	750	707	94	(78-123)
Chloromethane	750	717	96	(50-136)
cis-1,2-Dichloroethene	750	734	98	(77-123)
cis-1,3-Dichloropropene	750	733	98	(74-126)
Dibromochloromethane	750	745	99	(74-126)
Dibromomethane	750	725	97	(78-125)
Dichlorodifluoromethane	750	707	94	(29-149)
Ethylbenzene	750	776	104	(76-122)
Freon-113	1130	1070	95	(66-136)
Hexachlorobutadiene	750	853	114	(61-135)
Isopropylbenzene (Cumene)	750	806	107	(68-134)
Methylene chloride	750	695	93	(70-128)
Methyl-t-butyl ether	1130	1180	105	(73-125)
Naphthalene	750	761	101	(62-129)
n-Butylbenzene	750	840	112	(70-128)
n-Propylbenzene	750	783	104	(73-125)
o-Xylene	750	785	105	(77-123)
P & M -Xylene	1500	1570	105	(77-124)
sec-Butylbenzene	750	810	108	(73-126)
Styrene	750	795	106	(76-124)
tert-Butylbenzene	750	790	105	(73-125)
Tetrachloroethene	750	804	107	(73-128)
Toluene	750	767	102	(77-121)
trans-1,2-Dichloroethene	750	716	96	(74-125)
trans-1,3-Dichloropropene	750	734	98	(71-130)
Trichloroethene	750	733	98	(77-123)
Trichlorofluoromethane	750	715	95	(62-140)
Vinyl acetate	750	756	101	(50-151)
Vinyl chloride	750	695	93	(56-135)
Xylenes (total)	2250	2350	105	(78-124)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	94.1	94	(71-136)
4-Bromofluorobenzene (surr)	750	91.2	91	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS19671**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **KAJ**

Prep Batch: **VXX35248**
Prep Method: **SW5035A**
Prep Date/Time: **11/16/2019 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
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Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		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	8.05U	525	480	91	525	528	101	78-125	9.60	(< 20)
1,1,1-Trichloroethane	10.1U	525	539	103	525	546	104	73-130	1.30	(< 20)
1,1,2,2-Tetrachloroethane	0.805U	525	508	97	525	554	105	70-124	8.40	(< 20)
1,1,2-Trichloroethane	0.321U	525	513	98	525	563	107	78-121	9.50	(< 20)
1,1-Dichloroethane	10.1U	525	487	93	525	498	95	76-125	2.10	(< 20)
1,1-Dichloroethene	10.1U	525	486	93	525	488	93	70-131	0.29	(< 20)
1,1-Dichloropropene	10.1U	525	572	109	525	591	113	76-125	3.40	(< 20)
1,2,3-Trichlorobenzene	20.1U	525	568	108	525	682	130	66-130	18.10	(< 20)
1,2,3-Trichloropropane	0.805U	525	502	96	525	550	105	73-125	9.10	(< 20)
1,2,4-Trichlorobenzene	10.1U	525	564	107	525	651	124	67-129	14.30	(< 20)
1,2,4-Trimethylbenzene	79.3	525	596	98	525	647	108	75-123	8.20	(< 20)
1,2-Dibromo-3-chloropropane	40.1U	525	504	96	525	555	105	61-132	9.50	(< 20)
1,2-Dibromoethane	0.402U	525	495	94	525	538	102	78-122	8.40	(< 20)
1,2-Dichlorobenzene	10.1U	525	513	98	525	553	105	78-121	7.50	(< 20)
1,2-Dichloroethane	0.805U	525	483	92	525	497	95	73-128	2.70	(< 20)
1,2-Dichloropropane	4.01U	525	555	106	525	586	111	76-123	5.50	(< 20)
1,3,5-Trimethylbenzene	12.2J	525	541	101	525	598	111	73-124	9.90	(< 20)
1,3-Dichlorobenzene	10.1U	525	514	98	525	547	104	77-121	6.20	(< 20)
1,3-Dichloropropane	4.01U	525	488	93	525	533	101	77-121	8.70	(< 20)
1,4-Dichlorobenzene	10.1U	525	512	97	525	557	106	75-120	8.30	(< 20)
2,2-Dichloropropane	10.1U	525	536	102	525	546	104	67-133	2.00	(< 20)
2-Butanone (MEK)	101U	1576	1681	106	1576	1859	118	51-148	10.30	(< 20)
2-Chlorotoluene	10.1U	525	515	98	525	553	105	75-122	7.00	(< 20)
2-Hexanone	40.1U	1576	1565	99	1576	1744	111	53-145	10.80	(< 20)
4-Chlorotoluene	10.1U	525	513	98	525	549	104	72-124	6.90	(< 20)
4-Isopropyltoluene	49.8J	525	592	103	525	636	111	73-127	7.10	(< 20)
4-Methyl-2-pentanone (MIBK)	101U	1576	1471	93	1576	1607	102	65-135	9.10	(< 20)
Acetone	101U	1576	1408	89	1576	1534	97	36-164	8.70	(< 20)
Benzene	18.5	525	527	97	525	567	104	77-121	7.40	(< 20)
Bromobenzene	10.1U	525	503	96	525	532	101	78-121	5.40	(< 20)
Bromochloromethane	10.1U	525	478	91	525	492	94	78-125	2.80	(< 20)
Bromodichloromethane	0.805U	525	562	107	525	581	110	75-127	3.30	(< 20)
Bromoform	10.1U	525	498	95	525	539	103	67-132	7.80	(< 20)
Bromomethane	8.05U	525	499	95	525	512	97	53-143	2.50	(< 20)
Carbon disulfide	40.1U	789	757	96	789	727	92	63-132	4.20	(< 20)
Carbon tetrachloride	5.00U	525	557	106	525	563	107	70-135	1.20	(< 20)
Chlorobenzene	10.1U	525	502	96	525	550	105	79-120	9.10	(< 20)

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroethane	80.5U	525	613	117	525	503	96	59-139	19.60	(< 20)
Chloroform	0.805U	525	486	93	525	498	95	78-123	2.20	(< 20)
Chloromethane	10.1U	525	516	98	525	516	98	50-136	0.10	(< 20)
cis-1,2-Dichloroethene	10.1U	525	495	94	525	502	96	77-123	1.50	(< 20)
cis-1,3-Dichloropropene	5.00U	525	503	96	525	530	101	74-126	5.20	(< 20)
Dibromochloromethane	0.805U	525	502	96	525	545	104	74-126	8.20	(< 20)
Dibromomethane	10.1U	525	504	96	525	517	98	78-125	2.40	(< 20)
Dichlorodifluoromethane	20.1U	525	527	100	525	506	96	29-149	4.10	(< 20)
Ethylbenzene	37.9	525	528	93	525	581	103	76-122	9.50	(< 20)
Freon-113	40.1U	789	753	96	789	752	95	66-136	0.12	(< 20)
Hexachlorobutadiene	8.05U	525	854	162 *	525	837	159 *	61-135	1.90	(< 20)
Isopropylbenzene (Cumene)	12.4J	525	524	97	525	580	108	68-134	10.10	(< 20)
Methylene chloride	40.1U	525	457	87	525	477	91	70-128	4.30	(< 20)
Methyl-t-butyl ether	40.1U	789	795	101	789	857	109	73-125	7.50	(< 20)
Naphthalene	93.3	525	583	93	525	696	115	62-129	17.90	(< 20)
n-Butylbenzene	10.1U	525	582	111	525	620	118	70-128	6.20	(< 20)
n-Propylbenzene	8.63J	525	521	98	525	564	106	73-125	8.00	(< 20)
o-Xylene	107	525	607	95	525	650	103	77-123	6.80	(< 20)
P & M -Xylene	186	1050	1176	94	1050	1261	102	77-124	7.40	(< 20)
sec-Butylbenzene	10.1U	525	543	103	525	584	111	73-126	7.30	(< 20)
Styrene	10.1U	525	529	101	525	561	107	76-124	5.90	(< 20)
tert-Butylbenzene	10.1U	525	520	99	525	570	109	73-125	9.30	(< 20)
Tetrachloroethene	5.00U	525	516	98	525	576	109	73-128	10.80	(< 20)
Toluene	139	525	608	89	525	666	100	77-121	9.20	(< 20)
trans-1,2-Dichloroethene	10.1U	525	514	98	525	502	96	74-125	2.30	(< 20)
trans-1,3-Dichloropropene	5.00U	525	499	95	525	540	103	71-130	7.90	(< 20)
Trichloroethene	2.00U	525	492	93	525	520	99	77-123	5.60	(< 20)
Trichlorofluoromethane	20.1U	525	523	100	525	507	97	62-140	3.00	(< 20)
Vinyl acetate	40.1U	525	523	99	525	564	107	50-151	7.50	(< 20)
Vinyl chloride	0.321U	525	512	97	525	501	95	56-135	2.00	(< 20)
Xylenes (total)	293	1576	1775	94	1576	1912	103	78-124	7.20	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		525	511	97	525	492	94	71-136	3.60	
4-Bromofluorobenzene (surr)		876	593	68	876	629	72	55-151	5.80	
Toluene-d8 (surr)		525	524	100	525	528	101	85-116	0.87	

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date:
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 5:43:00PM

Prep Batch: VXX35248
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 74.93g
Prep Extract Vol: 25.00mL

Print Date: 12/13/2019 3:40:34PM

Method Blank

Blank ID: MB for HBN 1802510 [VXX/35268]
Blank Lab ID: 1544772

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	75	50-150		%

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 11/18/2019 6:54:00PM

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/18/2019 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35268]
Blank Spike Lab ID: 1544773
Date Analyzed: 11/18/2019 18:18

Spike Duplicate ID: LCSD for HBN 1196897 [VXX35268]
Spike Duplicate Lab ID: 1544774
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

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	13.6	109	12.5	13.7	110	(60-120)	0.85	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	80.7	81	1.25	80.5	81	(50-150)	0.25	

Batch Information

Analytical Batch: **VFC15044**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX35268**
Prep Method: **SW5035A**
Prep Date/Time: **11/18/2019 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	8.65J	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	94	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	891	107	833	884	106	(75-125)	0.80	(< 20)
Surrogates									
5a Androstane (surr)	16.7	109	109	16.7	114	114	(60-120)	3.80	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	8.16J	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62 (surr)	87.2	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	845	101	833	831	100	(60-120)	1.70	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	96.8	97	16.7	92.5	93	(60-120)	4.60	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,2-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,3-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,4-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
1-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2,4,5-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4,6-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dimethylphenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dinitrophenol	1.50U	3.00	0.940	mg/Kg
2,4-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2,6-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,6-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Chlorophenol	0.125U	0.250	0.0780	mg/Kg
2-Methyl-4,6-dinitrophenol	1.00U	2.00	0.620	mg/Kg
2-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Methylphenol (o-Cresol)	0.125U	0.250	0.0780	mg/Kg
2-Nitroaniline	0.125U	0.250	0.0780	mg/Kg
2-Nitrophenol	0.125U	0.250	0.0780	mg/Kg
3&4-Methylphenol (p&m-Cresol)	0.500U	1.00	0.310	mg/Kg
3,3-Dichlorobenzidine	0.250U	0.500	0.150	mg/Kg
3-Nitroaniline	0.250U	0.500	0.150	mg/Kg
4-Bromophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Chloro-3-methylphenol	0.125U	0.250	0.0780	mg/Kg
4-Chloroaniline	0.500U	1.00	0.310	mg/Kg
4-Chlorophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Nitroaniline	1.50U	3.00	0.940	mg/Kg
4-Nitrophenol	1.00U	2.00	0.620	mg/Kg
Acenaphthene	0.125U	0.250	0.0780	mg/Kg
Acenaphthylene	0.125U	0.250	0.0780	mg/Kg
Aniline	1.00U	2.00	0.620	mg/Kg
Anthracene	0.125U	0.250	0.0780	mg/Kg
Azobenzene	0.125U	0.250	0.0780	mg/Kg
Benzo(a)Anthracene	0.125U	0.250	0.0780	mg/Kg
Benzo[a]pyrene	0.125U	0.250	0.0780	mg/Kg
Benzo[b]Fluoranthene	0.125U	0.250	0.0780	mg/Kg

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Benzo[g,h,i]perylene	0.125U	0.250	0.0780	mg/Kg
Benzo[k]fluoranthene	0.125U	0.250	0.0780	mg/Kg
Benzoic acid	0.750U	1.50	0.470	mg/Kg
Benzyl alcohol	0.125U	0.250	0.0780	mg/Kg
Bis(2chloro1methylethyl)Ether	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethoxy)methane	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethyl)ether	0.125U	0.250	0.0780	mg/Kg
bis(2-Ethylhexyl)phthalate	0.125U	0.250	0.0780	mg/Kg
Butylbenzylphthalate	0.125U	0.250	0.0780	mg/Kg
Carbazole	0.125U	0.250	0.0780	mg/Kg
Chrysene	0.125U	0.250	0.0780	mg/Kg
Dibenzo[a,h]anthracene	0.125U	0.250	0.0780	mg/Kg
Dibenzofuran	0.125U	0.250	0.0780	mg/Kg
Diethylphthalate	0.125U	0.250	0.0780	mg/Kg
Dimethylphthalate	0.125U	0.250	0.0780	mg/Kg
Di-n-butylphthalate	0.125U	0.250	0.0780	mg/Kg
di-n-Octylphthalate	0.250U	0.500	0.150	mg/Kg
Fluoranthene	0.125U	0.250	0.0780	mg/Kg
Fluorene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobenzene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobutadiene	0.125U	0.250	0.0780	mg/Kg
Hexachlorocyclopentadiene	0.350U	0.700	0.200	mg/Kg
Hexachloroethane	0.125U	0.250	0.0780	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.125U	0.250	0.0780	mg/Kg
Isophorone	0.125U	0.250	0.0780	mg/Kg
Naphthalene	0.125U	0.250	0.0780	mg/Kg
Nitrobenzene	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodimethylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitroso-di-n-propylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodiphenylamine	0.125U	0.250	0.0780	mg/Kg
Pentachlorophenol	1.00U	2.00	0.620	mg/Kg
Phenanthrene	0.125U	0.250	0.0780	mg/Kg
Phenol	0.125U	0.250	0.0780	mg/Kg
Pyrene	0.125U	0.250	0.0780	mg/Kg
Surrogates				
2,4,6-Tribromophenol (surr)	95.9	35-125		%
2-Fluorobiphenyl (surr)	79.9	44-115		%
2-Fluorophenol (surr)	68.5	35-115		%

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Nitrobenzene-d5 (surr)	71.6	37-122		%
Phenol-d6 (surr)	73.2	33-122		%
Terphenyl-d14 (surr)	92.8	54-127		%

Batch Information

Analytical Batch: XMS11885
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/9/2019 5:21:00PM

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)		CL
1,2,4-Trichlorobenzene	4.44	2.65	60		(34-118)
1,2-Dichlorobenzene	4.44	2.39	54		(33-117)
1,3-Dichlorobenzene	4.44	2.33	52		(30-115)
1,4-Dichlorobenzene	4.44	2.36	53		(31-115)
1-Chloronaphthalene	1.78	1.41	79		(48-115)
1-Methylnaphthalene	4.44	3.21	72		(40-119)
2,4,5-Trichlorophenol	4.44	3.84	86		(41-124)
2,4,6-Trichlorophenol	4.44	3.84	86		(39-126)
2,4-Dichlorophenol	4.44	3.43	77		(40-122)
2,4-Dimethylphenol	4.44	2.91	65		(30-127)
2,4-Dinitrophenol	8	10.2	127	*	(62-113)
2,4-Dinitrotoluene	4.44	3.65	82		(48-126)
2,6-Dichlorophenol	1.78	1.39	78		(41-117)
2,6-Dinitrotoluene	4.44	3.45	78		(46-124)
2-Chloronaphthalene	4.44	3.02	68		(41-114)
2-Chlorophenol	4.44	2.94	66		(34-121)
2-Methyl-4,6-dinitrophenol	8	8.58	107		(29-132)
2-Methylnaphthalene	4.44	2.77	62		(38-122)
2-Methylphenol (o-Cresol)	4.44	3.05	69		(32-122)
2-Nitroaniline	4.44	4.12	93		(44-127)
2-Nitrophenol	4.44	3.50	79		(36-123)
3&4-Methylphenol (p&m-Cresol)	6.22	4.97	80		(34-119)
3,3-Dichlorobenzidine	4.44	3.69	83		(22-121)
3-Nitroaniline	4.44	4.10	92		(33-119)
4-Bromophenyl-phenylether	4.44	4.07	92		(46-124)
4-Chloro-3-methylphenol	4.44	3.72	84		(45-122)
4-Chloroaniline	4.44	2.47	56		(17-106)
4-Chlorophenyl-phenylether	4.44	3.75	85		(45-121)
4-Nitroaniline	4.44	3.98	90		(77-120)
4-Nitrophenol	6.22	5.83	94		(30-132)
Acenaphthene	4.44	3.59	81		(40-123)
Acenaphthylene	4.44	3.55	80		(32-132)
Aniline	4.44	0.943J	21	*	(24-89)
Anthracene	4.44	3.72	84		(47-123)

Print Date: 12/13/2019 3:40:55PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Azobenzene	4.44	3.64	82	(39-125)
Benzo(a)Anthracene	4.44	4.18	94	(49-126)
Benzo[a]pyrene	4.44	4.03	91	(45-129)
Benzo[b]Fluoranthene	4.44	4.64	104	(45-132)
Benzo[g,h,i]perylene	4.44	3.93	88	(43-134)
Benzo[k]fluoranthene	4.44	4.54	102	(47-132)
Benzoic acid	6.22	5.38	86	(53-124)
Benzyl alcohol	4.44	2.82	63	(29-122)
Bis(2chloro1methylethyl)Ether	4.44	2.44	55	(33-131)
Bis(2-Chloroethoxy)methane	4.44	3.15	71	(36-121)
Bis(2-Chloroethyl)ether	4.44	2.41	54	(31-120)
bis(2-Ethylhexyl)phthalate	4.44	4.58	103	(51-133)
Butylbenzylphthalate	4.44	4.74	107	(48-132)
Carbazole	4.44	4.27	96	(50-123)
Chrysene	4.44	4.24	95	(50-124)
Dibenzo[a,h]anthracene	4.44	4.11	93	(45-134)
Dibenzofuran	4.44	3.24	73	(44-120)
Diethylphthalate	4.44	4.10	92	(50-124)
Dimethylphthalate	4.44	4.27	96	(48-124)
Di-n-butylphthalate	4.44	4.31	97	(51-128)
di-n-Octylphthalate	4.44	4.28	96	(45-140)
Fluoranthene	4.44	3.80	86	(50-127)
Fluorene	4.44	3.87	87	(43-125)
Hexachlorobenzene	4.44	3.61	81	(45-122)
Hexachlorobutadiene	4.44	2.86	64	(32-123)
Hexachlorocyclopentadiene	4.44	2.44	55	(34-74)
Hexachloroethane	4.44	2.31	52	(28-117)
Indeno[1,2,3-c,d] pyrene	4.44	4.03	91	(45-133)
Isophorone	4.44	3.04	68	(30-122)
Naphthalene	4.44	2.96	67	(35-123)
Nitrobenzene	4.44	2.56	58	(34-122)
N-Nitrosodimethylamine	4.44	2.56	58	(23-120)
N-Nitroso-di-n-propylamine	4.44	3.31	74	(36-120)
N-Nitrosodiphenylamine	4.44	3.15	71	(38-127)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Pentachlorophenol	6.22	6.10	98	(25-133)
Phenanthrene	4.44	3.92	88	(50-121)
Phenol	4.44	3.09	70	(34-121)
Pyrene	4.44	4.49	101	(47-127)
Surrogates				
2,4,6-Tribromophenol (surr)	8.89	103	103	(35-125)
2-Fluorobiphenyl (surr)	4.44	79	79	(44-115)
2-Fluorophenol (surr)	8.89	61	61	(35-115)
Nitrobenzene-d5 (surr)	4.44	68.2	68	(37-122)
Phenol-d6 (surr)	8.89	68.4	68	(33-122)
Terphenyl-d14 (surr)	4.44	104	104	(54-127)

Batch Information

Analytical Batch: **XMS11885**
Analytical Method: **SW8270D**
Instrument: **HP 6890/5973 SSA**
Analyst: **JMG**

Prep Batch: **XXX42629**
Prep Method: **SW3550C**
Prep Date/Time: **11/26/2019 14:52**
Spike Init Wt./Vol.: 4.44 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1,2,4-Trichlorobenzene	3.72U	5.26	4.32J	82		5.28	4.31J	82		34-118	0.28	(< 20)
1,2-Dichlorobenzene	3.72U	5.26	3.84J	73		5.28	3.89J	74		33-117	1.40	(< 20)
1,3-Dichlorobenzene	3.72U	5.26	3.90J	74		5.28	3.71J	70		30-115	5.20	(< 20)
1,4-Dichlorobenzene	3.72U	5.26	3.95J	75		5.28	3.74J	71		31-115	5.50	(< 20)
1-Chloronaphthalene	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	48-115	0.00	(< 20)
1-Methylnaphthalene	3.72U	5.26	4.89J	93		5.28	4.81J	91		40-119	1.80	(< 20)
2,4,5-Trichlorophenol	3.72U	5.26	4.81J	91		5.28	4.84J	92		41-124	0.88	(< 20)
2,4,6-Trichlorophenol	3.72U	5.26	4.98J	95		5.28	5.36J	102		39-126	7.50	(< 20)
2,4-Dichlorophenol	3.72U	5.26	5.19J	99		5.28	5.23J	99		40-122	0.84	(< 20)
2,4-Dimethylphenol	3.72U	5.26	4.89J	93		5.28	5.11J	97		30-127	4.30	(< 20)
2,4-Dinitrophenol	44.6U	9.46	44.6U	0	*	9.50	44.6U	0	*	62-113	0.00	(< 20)
2,4-Dinitrotoluene	3.72U	5.26	4.53J	86		5.28	4.17J	79		48-126	8.10	(< 20)
2,6-Dichlorophenol	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	41-117	0.00	(< 20)
2,6-Dinitrotoluene	3.72U	5.26	5.29J	101		5.28	5.20J	99		46-124	1.70	(< 20)
2-Chloronaphthalene	3.72U	5.26	4.55J	86		5.28	4.33J	82		41-114	4.70	(< 20)
2-Chlorophenol	3.72U	5.26	4.45J	85		5.28	4.44J	84		34-121	0.26	(< 20)
2-Methyl-4,6-dinitrophenol	29.8U	9.46	29.8U	0	*	9.50	29.8U	0	*	29-132	0.00	(< 20)
2-Methylnaphthalene	3.72U	5.26	4.29J	82		5.28	4.16J	79		38-122	3.10	(< 20)
2-Methylphenol (o-Cresol)	3.72U	5.26	4.41J	84		5.28	4.41J	84		32-122	0.03	(< 20)
2-Nitroaniline	3.72U	5.26	5.66J	108		5.28	5.33J	101		44-127	5.90	(< 20)
2-Nitrophenol	3.72U	5.26	5.25J	100		5.28	5.28J	100		36-123	0.33	(< 20)
3&4-Methylphenol (p&m-Cresol)	14.9U	7.36	14.9U	0	*	7.38	14.9U	0	*	34-119	0.00	(< 20)
3,3-Dichlorobenzidine	7.45U	5.26	5.28J	100		5.28	5.33J	101		22-121	1.10	(< 20)
3-Nitroaniline	7.45U	5.26	5.29J	101		5.28	5.36J	102		33-119	1.30	(< 20)
4-Bromophenyl-phenylether	3.72U	5.26	5.67J	108		5.28	5.25J	100		46-124	7.60	(< 20)
4-Chloro-3-methylphenol	3.72U	5.26	4.92J	93		5.28	5.08J	96		45-122	3.50	(< 20)
4-Chloroaniline	14.9U	5.26	14.9U	0	*	5.28	14.9U	0	*	17-106	0.00	(< 20)
4-Chlorophenyl-phenylether	3.72U	5.26	5.12J	97		5.28	4.90J	93		45-121	4.40	(< 20)
4-Nitroaniline	44.6U	5.26	44.6U	0	*	5.28	44.6U	0	*	77-120	0.00	(< 20)
4-Nitrophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	30-132	0.00	(< 20)
Acenaphthene	3.72U	5.26	5.31J	101		5.28	5.24J	99		40-123	1.20	(< 20)
Acenaphthylene	3.72U	5.26	5.37J	102		5.28	5.36J	102		32-132	0.16	(< 20)
Aniline	29.8U	5.26	29.8U	0	*	5.28	29.8U	0	*	24-89	0.00	(< 20)
Anthracene	3.72U	5.26	5.38J	102		5.28	5.22J	99		47-123	3.10	(< 20)
Azobenzene	3.72U	5.26	5.77J	110		5.28	5.85J	111		39-125	1.50	(< 20)
Benzo(a)Anthracene	3.72U	5.26	5.10J	97		5.28	5.28J	100		49-126	3.40	(< 20)
Benzo[a]pyrene	3.72U	5.26	4.80J	91		5.28	4.77J	90		45-129	0.50	(< 20)

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzo[b]Fluoranthene	3.72U	5.26	4.92J	93		5.28	4.76J	90		45-132	3.20	(< 20)
Benzo[g,h,i]perylene	3.72U	5.26	5.44J	103		5.28	5.25J	100		43-134	3.40	(< 20)
Benzo[k]fluoranthene	3.72U	5.26	5.06J	96		5.28	5.20J	99		47-132	2.90	(< 20)
Benzoic acid	22.3U	7.36	22.3U	0	*	7.38	22.3U	0	*	53-124	0.00	(< 20)
Benzyl alcohol	3.72U	5.26	3.88J	74		5.28	3.84J	73		29-122	1.00	(< 20)
Bis(2chloro1methylethyl)Ether	3.72U	5.26	3.95J	75		5.28	4.20J	80		33-131	6.10	(< 20)
Bis(2-Chloroethoxy)methane	3.72U	5.26	5.06J	96		5.28	4.90J	93		36-121	3.10	(< 20)
Bis(2-Chloroethyl)ether	3.72U	5.26	4.06J	77		5.28	4.13J	78		31-120	1.60	(< 20)
bis(2-Ethylhexyl)phthalate	3.72U	5.26	6.42J	122		5.28	6.59J	125		51-133	2.60	(< 20)
Butylbenzylphthalate	3.72U	5.26	6.32J	120		5.28	5.69J	108		48-132	10.40	(< 20)
Carbazole	3.72U	5.26	6.02J	114		5.28	5.83J	110		50-123	3.20	(< 20)
Chrysene	3.72U	5.26	5.49J	104		5.28	5.42J	103		50-124	1.40	(< 20)
Dibenzo[a,h]anthracene	3.72U	5.26	5.39J	103		5.28	5.71J	108		45-134	5.50	(< 20)
Dibenzofuran	3.72U	5.26	4.59J	87		5.28	4.44J	84		44-120	3.50	(< 20)
Diethylphthalate	3.72U	5.26	5.50J	105		5.28	5.44J	103		50-124	1.10	(< 20)
Dimethylphthalate	3.72U	5.26	5.94J	113		5.28	6.02J	114		48-124	1.20	(< 20)
Di-n-butylphthalate	3.72U	5.26	5.94J	113		5.28	5.75J	109		51-128	3.30	(< 20)
di-n-Octylphthalate	7.45U	5.26	8.15J	155	*	5.28	7.78J	147	*	45-140	4.60	(< 20)
Fluoranthene	3.72U	5.26	4.55J	86		5.28	4.43J	84		50-127	2.60	(< 20)
Fluorene	3.72U	5.26	5.28J	100		5.28	5.20J	99		43-125	1.40	(< 20)
Hexachlorobenzene	3.72U	5.26	4.59J	87		5.28	4.26J	81		45-122	7.70	(< 20)
Hexachlorobutadiene	3.72U	5.26	4.47J	85		5.28	4.53J	86		32-123	1.20	(< 20)
Hexachlorocyclopentadiene	10.4U	5.26	10.4U	0	*	5.28	10.4U	0	*	34-74	0.00	(< 20)
Hexachloroethane	3.72U	5.26	3.68J	70		5.28	3.88J	73		28-117	4.90	(< 20)
Indeno[1,2,3-c,d] pyrene	3.72U	5.26	5.31J	101		5.28	5.28J	100		45-133	0.66	(< 20)
Isophorone	3.72U	5.26	4.87J	93		5.28	4.58J	87		30-122	6.10	(< 20)
Naphthalene	3.72U	5.26	5.14J	98		5.28	5.05J	96		35-123	2.00	(< 20)
Nitrobenzene	3.72U	5.26	4.29J	82		5.28	4.14J	78		34-122	3.70	(< 20)
N-Nitrosodimethylamine	3.72U	5.26	3.79J	72		5.28	3.54J	67		23-120	6.80	(< 20)
N-Nitroso-di-n-propylamine	3.72U	5.26	4.94J	94		5.28	4.95J	94		36-120	0.33	(< 20)
N-Nitrosodiphenylamine	3.72U	5.26	5.01J	95		5.28	5.18J	98		38-127	3.20	(< 20)
Pentachlorophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	25-133	0.00	(< 20)
Phenanthrene	3.72U	5.26	5.37J	102		5.28	5.28J	100		50-121	1.90	(< 20)
Phenol	3.72U	5.26	4.38J	83		5.28	4.39J	83		34-121	0.33	(< 20)
Pyrene	3.72U	5.26	4.98J	95		5.28	5.08J	96		47-127	2.20	(< 20)
Surrogates												
2,4,6-Tribromophenol (surr)		10.5	10.2	97		10.6	10.9	104		35-125	6.40	

Print Date: 12/13/2019 3:40:57PM

Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date:
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
2-Fluorobiphenyl (surr)		5.26	5.56	106	5.28	5.45	103	44-115	2.10	
2-Fluorophenol (surr)		10.5	8.03	76	10.6	7.36	70	35-115	8.70	
Nitrobenzene-d5 (surr)		5.26	4.86	92	5.28	4.81	91	37-122	1.00	
Phenol-d6 (surr)		10.5	9.45	90	10.6	9.31	88	33-122	1.60	
Terphenyl-d14 (surr)		5.26	4.86	92	5.28	5.19	98	54-127	6.60	

Batch Information

Analytical Batch: XMS11889
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/11/2019 3:37:00PM

Prep Batch: XXX42629
Prep Method: Sonication Extraction Soil SW8270
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.75g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:40:57PM

Method Blank

Blank ID: MB for HBN 1802613 [XXX/42632]
Blank Lab ID: 1545124

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW8082A**

Parameter	Results	LOQ/CL	DL	Units
Aroclor-1016	25.0U	50.0	12.5	ug/Kg
Aroclor-1221	50.0U	100	25.0	ug/Kg
Aroclor-1232	25.0U	50.0	12.5	ug/Kg
Aroclor-1242	25.0U	50.0	12.5	ug/Kg
Aroclor-1248	25.0U	50.0	12.5	ug/Kg
Aroclor-1254	25.0U	50.0	12.5	ug/Kg
Aroclor-1260	25.0U	50.0	12.5	ug/Kg
Surrogates				
Decachlorobiphenyl (surr)	110	60-125		%

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 12:07:00PM

Prep Batch: XXX42632
Prep Method: SW3550C
Prep Date/Time: 11/27/2019 10:48:22AM
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 1196897 [XXX42632]
Blank Spike Lab ID: 1545125
Date Analyzed: 12/03/2019 12:17

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW8082A**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Aroclor-1016	222	198	89	(47-134)
Aroclor-1260	222	235	106	(53-140)
Surrogates				
Decachlorobiphenyl (surr)	222	112	112	(60-125)

Batch Information

Analytical Batch: **XGC10544**
Analytical Method: **SW8082A**
Instrument: **Agilent 7890B GC ECD SW F**
Analyst: **BMZ**

Prep Batch: **XXX42632**
Prep Method: **SW3550C**
Prep Date/Time: **11/27/2019 10:48**
Spike Init Wt./Vol.: 222 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196876010
MS Sample ID: 1545126 MS
MSD Sample ID: 1545127 MSD

QC for Samples: 1196897008

Analysis Date: 12/03/2019 13:09
Analysis Date: 12/03/2019 13:19
Analysis Date: 12/03/2019 13:29
Matrix: Soil/Solid (dry weight)

Results by **SW8082A**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Aroclor-1016	25.8U	229	251	110	228	253	111	47-134	0.56	(< 30)
Aroclor-1260	25.8U	229	227	99	228	226	99	53-140	0.65	(< 30)
Surrogates										
Decachlorobiphenyl (surr)		229	241	105	228	237	104	60-125	1.40	

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 1:19:00PM

Prep Batch: XXX42632
Prep Method: Sonication Extraction Soil SW8082 PCB
Prep Date/Time: 11/27/2019 10:48:22AM
Prep Initial Wt./Vol.: 22.63g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:41:02PM

SGS

1196897

North America Inc.
F CUSTODY RECORD

Profile: 334945

Locations Nationwide
Alaska Maryland
Revised Report - Revision 2
New Jersey New York
North Carolina Indiana
West Virgina Kentucky
www.us.sgs.com

Section 1

CLIENT: Golder Associates

CONTACT: Jessa Karp PHONE NO:

PROJECT NAME: ARRC Depot Dr. Drilling Samples PROJECT/ PWSID/ PERMIT#:

REPORTS TO: E-MAIL: jkarp@golder.com

INVOICE TO: Golder Associates QUOTE #:

P.O. #: 19132189

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 3

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: MeOH+BF / B	GRO (AK101) VOC (SW8260C)	DRO/RRO (AK102/103)	SVOC (SW8270D)	PCBs (SW8082A) Lead (SW6020)	REMARKS/ LOC ID
1AB	BH-01	11/14/19	9:15		2		X	X	X			
2AB	BH-02	11/14/19	12:30		2		X	X	X			
3AB	BH-03A	11/15/19	9:15		2		X	X	X			
4AB	BH-03A-1	11/15/19	9:15		2		X	X	X			
5AB	BH-04	11/14/19	15:00		2		X	X	X			
6AB	BH-05	11/14/19	13:45		2		X	X	X			
7AB	BH-05-1	11/14/19	13:45		2		X	X	X			
8AB	Composit	11/15/19	9:30		2	C	X	X	X	X		
9AB	PW7-25-11				2		X	X	X	X		Trip Blank

Section 5

	Date	Time	
Relinquished By: (1) Jessa Karp	11/15/19	16:00	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received For Laboratory By: 11/15/19 16:00

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 2.7° D63

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

SGS

Returned Bottles Inventory

Name of individual returning bottles: Jessa Karp

Date Received: 11/13/19

Client Name: Golder Associates

Received by:

Project Name: ARRC Depot Dr. Drilling Samples

SGS PM:

HDPE/Nalgene:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz					
	60-ml or 2-oz					
	other					
amber glass:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz with or without septa	10				
	40-ml VOA vial	12				
	other					
Subtotal:		22				

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted.***

Amount to Invoice Client $: 88

W

1196897

SGS

e-Sample Receipt Form

Revised Report - Revision 2

SGS Workorder #: **1196897**

1196897

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 2.2 °C Therm. ID: D63
		Cooler ID: @ °C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify 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.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	**Trip Blanks 9A-B were scheudled with PCB, DRO/RRO, and Lead 6020. Proceeding with GRO & VOC.**
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+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
1196897001-A	No Preservative Required	OK			
1196897001-B	Methanol field pres. 4 C	OK			
1196897002-A	No Preservative Required	OK			
1196897002-B	Methanol field pres. 4 C	OK			
1196897003-A	No Preservative Required	OK			
1196897003-B	Methanol field pres. 4 C	OK			
1196897004-A	No Preservative Required	OK			
1196897004-B	Methanol field pres. 4 C	OK			
1196897005-A	No Preservative Required	OK			
1196897005-B	Methanol field pres. 4 C	OK			
1196897006-A	No Preservative Required	OK			
1196897006-B	Methanol field pres. 4 C	OK			
1196897007-A	No Preservative Required	OK			
1196897007-B	Methanol field pres. 4 C	OK			
1196897008-A	No Preservative Required	OK			
1196897008-B	Methanol field pres. 4 C	OK			
1196897009-A	Methanol field pres. 4 C	OK			
1196897009-B	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.

Laboratory Report of Analysis

To: Golder Associates Inc.
2121 Abbott Road, #100
Anchorage, AK 99507
(907)344-6001

Report Number: **1196897**

Client Project: **ARRC DEPOT DR. Drilling Sample**

Dear Chris Valentine,

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

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Golder Associates Inc.**
SGS Project: **1196897**
Project Name/Site: **ARRC DEPOT DR. Drilling Sample**
Project Contact: **Chris Valentine**

Refer to sample receipt form for information on sample condition.

BH-02 (1196897002) PS

8270D - Surrogate recovery for 2-fluorobiphenyl does not meet QC criteria. The associated sample concentrations for all analytes are less than the LOQ.
8270D - The LOQs are elevated due to sample dilution. The sample was analyzed at a dilution due to matrix interference with internal standards.

LCS for HBN 1802587 [XXX/42629 (1545011) LCS

8270D - LCS recovery for 2,4-dinitrophenol does not meet QC criteria. The associated sample concentrations for this analyte are less than the LOQ.
8270D - LCS recovery for aniline does not meet QC criteria.

1196897001MS (1544068) MS

8260C - MS recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MS (1545012) MS

8270D - MS recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1196897001MSD (1544069) MSD

8260C - MSD recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MSD (1545013) MSD

8270D - MSD recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
8270D - MSD RPD for 4-chloroaniline does not meet QC criteria. Results for this analyte are less than the LOQ in the parent sample.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8082A				
1545125	LCS for HBN 1802613 [XXX/42632	XGC10544	Aroclor-1016	BLC, SP
1545127	1196876010MSD	XGC10544	Aroclor-1016	SP
SW8260C				
1196897005	BH-04	VMS19671	4-Isopropyltoluene	SP
1196897005	BH-04	VMS19671	Naphthalene	SP
SW8270D				
1545011	LCS for HBN 1802587 [XXX/42629	XMS11885	1-Chloronaphthalene	SP
1545012	1196867001MS	XMS11889	1-Chloronaphthalene	SP
1545013	1196867001MSD	XMS11889	1,4-Dichlorobenzene	RP
1545013	1196867001MSD	XMS11889	1-Chloronaphthalene	SP

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.

Print Date: 12/13/2019 3:40:05PM

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, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 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
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.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
BH-02	1196897002	11/14/2019	11/15/2019	Soil/Solid (dry weight)

Method	Method Description
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SW6020A	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW8082A	SW8082 PCB's
SW8270D	SW846 8270 Semi-Volatiles by GC/MS (S)
SW8260C	VOC 8260 (S) Field Extracted

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	205		83.0	25.7	mg/Kg	4		11/21/19 19:09
Surrogates								
5a Androstane (surr)	106		50-150		%	4		11/21/19 19:09

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/21/19 19:09
Container ID: 1196897002-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.043 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	2020		83.0	25.7	mg/Kg	4		11/21/19 19:09
Surrogates								
n-Triacontane-d62 (surr)	108		50-150		%	4		11/21/19 19:09

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Analyst: DSD
Analytical Date/Time: 11/21/19 19:09
Container ID: 1196897002-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.043 g
Prep Extract Vol: 5 mL

Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
1,2-Dichlorobenzene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
1,3-Dichlorobenzene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
1,4-Dichlorobenzene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
1-Chloronaphthalene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
1-Methylnaphthalene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2,4,5-Trichlorophenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2,4,6-Trichlorophenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2,4-Dichlorophenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2,4-Dimethylphenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2,4-Dinitrophenol	7.80	U	15.6	4.88	mg/Kg	1		12/09/19 20:44
2,4-Dinitrotoluene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2,6-Dichlorophenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2,6-Dinitrotoluene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2-Chloronaphthalene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2-Chlorophenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2-Methyl-4,6-dinitrophenol	25.9	U	51.9	16.1	mg/Kg	5		12/11/19 17:19
2-Methylnaphthalene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2-Methylphenol (o-Cresol)	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2-Nitroaniline	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
2-Nitrophenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
3&4-Methylphenol (p&m-Cresol)	2.60	U	5.19	1.61	mg/Kg	1		12/09/19 20:44
3,3-Dichlorobenzidine	6.50	U	13.0	3.89	mg/Kg	5		12/11/19 17:19
3-Nitroaniline	1.29	U	2.59	0.778	mg/Kg	1		12/09/19 20:44
4-Bromophenyl-phenylether	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
4-Chloro-3-methylphenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
4-Chloroaniline	2.60	U	5.19	1.61	mg/Kg	1		12/09/19 20:44
4-Chlorophenyl-phenylether	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
4-Nitroaniline	7.80	U	15.6	4.88	mg/Kg	1		12/09/19 20:44
4-Nitrophenol	5.20	U	10.4	3.22	mg/Kg	1		12/09/19 20:44
Acenaphthene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Acenaphthylene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Aniline	5.20	U	10.4	3.22	mg/Kg	1		12/09/19 20:44
Anthracene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Azobenzene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Benzo(a)Anthracene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Benzo[a]pyrene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Benzo[g,h,i]perylene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Benzo[k]fluoranthene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Benzoic acid	3.89	U	7.78	2.44	mg/Kg	1		12/09/19 20:44
Benzyl alcohol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Bis(2chloro1methylethyl)Ether	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Bis(2-Chloroethoxy)methane	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Bis(2-Chloroethyl)ether	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
bis(2-Ethylhexyl)phthalate	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Butylbenzylphthalate	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Carbazole	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Chrysene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Dibenzo[a,h]anthracene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Dibenzofuran	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Diethylphthalate	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Dimethylphthalate	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Di-n-butylphthalate	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
di-n-Octylphthalate	6.50	U	13.0	3.89	mg/Kg	5		12/11/19 17:19
Fluoranthene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Fluorene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Hexachlorobenzene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Hexachlorobutadiene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Hexachlorocyclopentadiene	1.81	U	3.63	1.04	mg/Kg	1		12/09/19 20:44
Hexachloroethane	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Indeno[1,2,3-c,d] pyrene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Isophorone	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Naphthalene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Nitrobenzene	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
N-Nitrosodimethylamine	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
N-Nitroso-di-n-propylamine	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
N-Nitrosodiphenylamine	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Pentachlorophenol	25.9	U	51.9	16.1	mg/Kg	5		12/11/19 17:19
Phenanthrene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19
Phenol	0.650	U	1.30	0.405	mg/Kg	1		12/09/19 20:44
Pyrene	3.24	U	6.48	2.02	mg/Kg	5		12/11/19 17:19

Surrogates

Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol (surr)	88.8		35-125		%	5		12/11/19 17:19
2-Fluorobiphenyl (surr)	117	*	44-115		%	1		12/09/19 20:44
2-Fluorophenol (surr)	81.2		35-115		%	1		12/09/19 20:44
Nitrobenzene-d5 (surr)	90.6		37-122		%	1		12/09/19 20:44
Phenol-d6 (surr)	84.6		33-122		%	1		12/09/19 20:44
Terphenyl-d14 (surr)	97.7		54-127		%	5		12/11/19 17:19

Batch Information

Analytical Batch: XMS11889
Analytical Method: SW8270D
Analyst: JMG
Analytical Date/Time: 12/11/19 17:19
Container ID: 1196897002-A

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/19 14:52
Prep Initial Wt./Vol.: 22.542 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS11885
Analytical Method: SW8270D
Analyst: JMG
Analytical Date/Time: 12/09/19 20:44
Container ID: 1196897002-A

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/19 14:52
Prep Initial Wt./Vol.: 22.542 g
Prep Extract Vol: 5 mL

Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.987	J	2.15	0.646	mg/Kg	1		11/18/19 20:05
Surrogates								
4-Bromofluorobenzene (surr)	90.9		50-150		%	1		11/18/19 20:05

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/18/19 20:05
Container ID: 1196897002-B

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/14/19 12:30
Prep Initial Wt./Vol.: 66.368 g
Prep Extract Vol: 27.5123 mL

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Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	8.60	U	17.2	5.34	ug/Kg	1		11/16/19 19:38
1,1,1-Trichloroethane	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,1,2,2-Tetrachloroethane	0.860	U	1.72	0.534	ug/Kg	1		11/16/19 19:38
1,1,2-Trichloroethane	0.344	U	0.689	0.215	ug/Kg	1		11/16/19 19:38
1,1-Dichloroethane	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,1-Dichloroethene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,1-Dichloropropene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,2,3-Trichlorobenzene	21.6	U	43.1	12.9	ug/Kg	1		11/16/19 19:38
1,2,3-Trichloropropane	0.860	U	1.72	0.534	ug/Kg	1		11/16/19 19:38
1,2,4-Trichlorobenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,2,4-Trimethylbenzene	19.6	J	43.1	12.9	ug/Kg	1		11/16/19 19:38
1,2-Dibromo-3-chloropropane	43.1	U	86.2	26.7	ug/Kg	1		11/16/19 19:38
1,2-Dibromoethane	0.431	U	0.862	0.267	ug/Kg	1		11/16/19 19:38
1,2-Dichlorobenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,2-Dichloroethane	0.860	U	1.72	0.534	ug/Kg	1		11/16/19 19:38
1,2-Dichloropropane	4.31	U	8.62	2.67	ug/Kg	1		11/16/19 19:38
1,3,5-Trimethylbenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,3-Dichlorobenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
1,3-Dichloropropane	4.31	U	8.62	2.67	ug/Kg	1		11/16/19 19:38
1,4-Dichlorobenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
2,2-Dichloropropane	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
2-Butanone (MEK)	108	U	215	67.2	ug/Kg	1		11/16/19 19:38
2-Chlorotoluene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
2-Hexanone	43.1	U	86.2	26.7	ug/Kg	1		11/16/19 19:38
4-Chlorotoluene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
4-Isopropyltoluene	43.1	U	86.2	21.5	ug/Kg	1		11/16/19 19:38
4-Methyl-2-pentanone (MIBK)	108	U	215	67.2	ug/Kg	1		11/16/19 19:38
Acetone	108	U	215	67.2	ug/Kg	1		11/16/19 19:38
Benzene	4.09	J	10.8	3.36	ug/Kg	1		11/16/19 19:38
Bromobenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
Bromochloromethane	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
Bromodichloromethane	0.860	U	1.72	0.534	ug/Kg	1		11/16/19 19:38
Bromoform	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
Bromomethane	8.60	U	17.2	5.34	ug/Kg	1		11/16/19 19:38
Carbon disulfide	43.1	U	86.2	26.7	ug/Kg	1		11/16/19 19:38
Carbon tetrachloride	5.40	U	10.8	3.36	ug/Kg	1		11/16/19 19:38
Chlorobenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	86.0	U	172	53.4	ug/Kg	1		11/16/19 19:38
Chloroform	0.860	U	1.72	0.534	ug/Kg	1		11/16/19 19:38
Chloromethane	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
cis-1,2-Dichloroethene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
cis-1,3-Dichloropropene	5.40	U	10.8	3.36	ug/Kg	1		11/16/19 19:38
Dibromochloromethane	0.860	U	1.72	0.534	ug/Kg	1		11/16/19 19:38
Dibromomethane	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
Dichlorodifluoromethane	21.6	U	43.1	12.9	ug/Kg	1		11/16/19 19:38
Ethylbenzene	8.19	J	21.5	6.72	ug/Kg	1		11/16/19 19:38
Freon-113	43.1	U	86.2	26.7	ug/Kg	1		11/16/19 19:38
Hexachlorobutadiene	8.60	U	17.2	5.34	ug/Kg	1		11/16/19 19:38
Isopropylbenzene (Cumene)	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
Methylene chloride	43.1	U	86.2	26.7	ug/Kg	1		11/16/19 19:38
Methyl-t-butyl ether	43.1	U	86.2	26.7	ug/Kg	1		11/16/19 19:38
Naphthalene	29.3		21.5	6.72	ug/Kg	1		11/16/19 19:38
n-Butylbenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
n-Propylbenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
o-Xylene	23.7		21.5	6.72	ug/Kg	1		11/16/19 19:38
P & M -Xylene	40.9	J	43.1	12.9	ug/Kg	1		11/16/19 19:38
sec-Butylbenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
Styrene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
tert-Butylbenzene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
Tetrachloroethene	5.40	U	10.8	3.36	ug/Kg	1		11/16/19 19:38
Toluene	26.3		21.5	6.72	ug/Kg	1		11/16/19 19:38
trans-1,2-Dichloroethene	10.8	U	21.5	6.72	ug/Kg	1		11/16/19 19:38
trans-1,3-Dichloropropene	5.40	U	10.8	3.36	ug/Kg	1		11/16/19 19:38
Trichloroethene	2.15	U	4.31	1.29	ug/Kg	1		11/16/19 19:38
Trichlorofluoromethane	21.6	U	43.1	12.9	ug/Kg	1		11/16/19 19:38
Vinyl acetate	43.1	U	86.2	26.7	ug/Kg	1		11/16/19 19:38
Vinyl chloride	0.344	U	0.689	0.215	ug/Kg	1		11/16/19 19:38
Xylenes (total)	64.6		64.6	19.6	ug/Kg	1		11/16/19 19:38
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		71-136		%	1		11/16/19 19:38
4-Bromofluorobenzene (surr)	93.4		55-151		%	1		11/16/19 19:38
Toluene-d8 (surr)	94.2		85-116		%	1		11/16/19 19:38

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-02**

Client Sample ID: **BH-02**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897002
Lab Project ID: 1196897

Collection Date: 11/14/19 12:30
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):96.2
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/16/19 19:38
Container ID: 1196897002-B

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/14/19 12:30
Prep Initial Wt./Vol.: 66.368 g
Prep Extract Vol: 27.5123 mL

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Method Blank

Blank ID: MB for HBN 1802379 [MXX/33000]
Blank Lab ID: 1544246

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW6020A**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.100U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:44:07PM

Prep Batch: MXX33000
Prep Method: SW3050B
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

Print Date: 12/13/2019 3:40:17PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [MXX33000]
Blank Spike Lab ID: 1544247
Date Analyzed: 11/21/2019 18:48

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW6020A**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Lead	50	51.8	104	(84-118)

Batch Information

Analytical Batch: **MMS10690**
Analytical Method: **SW6020A**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **DMM**

Prep Batch: **MXX33000**
Prep Method: **SW3050B**
Prep Date/Time: **11/20/2019 11:25**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1544248
MS Sample ID: 1544254 MS
MSD Sample ID: 1544255 MSD

QC for Samples: 1196897008

Analysis Date: 11/21/2019 18:53
Analysis Date: 11/21/2019 18:58
Analysis Date: 11/21/2019 19:02
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	3.76	46.9	50.6	100	46.5	45.9	91	84-118	9.92	(< 20)

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:58:12PM

Prep Batch: MXX33000
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1.07g
Prep Extract Vol: 50.00mL

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Method Blank

Blank ID: MB for HBN 1802346 [SPT/10940]
Blank Lab ID: 1544092

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A
Analytical Date/Time: 11/18/2019 5:09:00PM

Print Date: 12/13/2019 3:40:23PM

Duplicate Sample Summary

Original Sample ID: 1196869007
Duplicate Sample ID: 1544093
Analysis Date: 11/18/2019 17:09
Matrix: Soil/Solid (dry weight)

QC for Samples:

1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	94.3	94.5	%	0.23	(< 15)

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A

Print Date: 12/13/2019 3:40:25PM

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

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	0.400U	0.800	0.250	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	25.0U	50.0	15.0	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	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	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	50.0U	100	31.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	50.0U	100	25.0	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Acetone	125U	250	78.0	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	6.20	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

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloroform	1.00U	2.00	0.620	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	1.00U	2.00	0.620	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	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	2.50U	5.00	1.50	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)	102	71-136		%
4-Bromofluorobenzene (surr)	101	55-151		%
Toluene-d8 (surr)	97	85-116		%

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Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 3:23:00PM

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 12/13/2019 3:40:29PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	726	97	(78-125)
1,1,1-Trichloroethane	750	768	102	(73-130)
1,1,2,2-Tetrachloroethane	750	751	100	(70-124)
1,1,2-Trichloroethane	750	737	98	(78-121)
1,1-Dichloroethane	750	707	94	(76-125)
1,1-Dichloroethene	750	691	92	(70-131)
1,1-Dichloropropene	750	833	111	(76-125)
1,2,3-Trichlorobenzene	750	788	105	(66-130)
1,2,3-Trichloropropane	750	726	97	(73-125)
1,2,4-Trichlorobenzene	750	805	107	(67-129)
1,2,4-Trimethylbenzene	750	781	104	(75-123)
1,2-Dibromo-3-chloropropane	750	732	98	(61-132)
1,2-Dibromoethane	750	737	98	(78-122)
1,2-Dichlorobenzene	750	763	102	(78-121)
1,2-Dichloroethane	750	701	93	(73-128)
1,2-Dichloropropane	750	814	108	(76-123)
1,3,5-Trimethylbenzene	750	786	105	(73-124)
1,3-Dichlorobenzene	750	760	101	(77-121)
1,3-Dichloropropane	750	728	97	(77-121)
1,4-Dichlorobenzene	750	764	102	(75-120)
2,2-Dichloropropane	750	751	100	(67-133)
2-Butanone (MEK)	2250	2340	104	(51-148)
2-Chlorotoluene	750	761	101	(75-122)
2-Hexanone	2250	2360	105	(53-145)
4-Chlorotoluene	750	755	101	(72-124)
4-Isopropyltoluene	750	822	110	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2200	98	(65-135)
Acetone	2250	1920	85	(36-164)
Benzene	750	779	104	(77-121)
Bromobenzene	750	754	101	(78-121)
Bromochloromethane	750	690	92	(78-125)
Bromodichloromethane	750	812	108	(75-127)
Bromoform	750	733	98	(67-132)
Bromomethane	750	650	87	(53-143)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon disulfide	1130	1030	91	(63-132)
Carbon tetrachloride	750	787	105	(70-135)
Chlorobenzene	750	770	103	(79-120)
Chloroethane	750	734	98	(59-139)
Chloroform	750	707	94	(78-123)
Chloromethane	750	717	96	(50-136)
cis-1,2-Dichloroethene	750	734	98	(77-123)
cis-1,3-Dichloropropene	750	733	98	(74-126)
Dibromochloromethane	750	745	99	(74-126)
Dibromomethane	750	725	97	(78-125)
Dichlorodifluoromethane	750	707	94	(29-149)
Ethylbenzene	750	776	104	(76-122)
Freon-113	1130	1070	95	(66-136)
Hexachlorobutadiene	750	853	114	(61-135)
Isopropylbenzene (Cumene)	750	806	107	(68-134)
Methylene chloride	750	695	93	(70-128)
Methyl-t-butyl ether	1130	1180	105	(73-125)
Naphthalene	750	761	101	(62-129)
n-Butylbenzene	750	840	112	(70-128)
n-Propylbenzene	750	783	104	(73-125)
o-Xylene	750	785	105	(77-123)
P & M -Xylene	1500	1570	105	(77-124)
sec-Butylbenzene	750	810	108	(73-126)
Styrene	750	795	106	(76-124)
tert-Butylbenzene	750	790	105	(73-125)
Tetrachloroethene	750	804	107	(73-128)
Toluene	750	767	102	(77-121)
trans-1,2-Dichloroethene	750	716	96	(74-125)
trans-1,3-Dichloropropene	750	734	98	(71-130)
Trichloroethene	750	733	98	(77-123)
Trichlorofluoromethane	750	715	95	(62-140)
Vinyl acetate	750	756	101	(50-151)
Vinyl chloride	750	695	93	(56-135)
Xylenes (total)	2250	2350	105	(78-124)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	94.1	94	(71-136)
4-Bromofluorobenzene (surr)	750	91.2	91	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS19671**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **KAJ**

Prep Batch: **VXX35248**
Prep Method: **SW5035A**
Prep Date/Time: **11/16/2019 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		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	8.05U	525	480	91	525	528	101	78-125	9.60	(< 20)
1,1,1-Trichloroethane	10.1U	525	539	103	525	546	104	73-130	1.30	(< 20)
1,1,2,2-Tetrachloroethane	0.805U	525	508	97	525	554	105	70-124	8.40	(< 20)
1,1,2-Trichloroethane	0.321U	525	513	98	525	563	107	78-121	9.50	(< 20)
1,1-Dichloroethane	10.1U	525	487	93	525	498	95	76-125	2.10	(< 20)
1,1-Dichloroethene	10.1U	525	486	93	525	488	93	70-131	0.29	(< 20)
1,1-Dichloropropene	10.1U	525	572	109	525	591	113	76-125	3.40	(< 20)
1,2,3-Trichlorobenzene	20.1U	525	568	108	525	682	130	66-130	18.10	(< 20)
1,2,3-Trichloropropane	0.805U	525	502	96	525	550	105	73-125	9.10	(< 20)
1,2,4-Trichlorobenzene	10.1U	525	564	107	525	651	124	67-129	14.30	(< 20)
1,2,4-Trimethylbenzene	79.3	525	596	98	525	647	108	75-123	8.20	(< 20)
1,2-Dibromo-3-chloropropane	40.1U	525	504	96	525	555	105	61-132	9.50	(< 20)
1,2-Dibromoethane	0.402U	525	495	94	525	538	102	78-122	8.40	(< 20)
1,2-Dichlorobenzene	10.1U	525	513	98	525	553	105	78-121	7.50	(< 20)
1,2-Dichloroethane	0.805U	525	483	92	525	497	95	73-128	2.70	(< 20)
1,2-Dichloropropane	4.01U	525	555	106	525	586	111	76-123	5.50	(< 20)
1,3,5-Trimethylbenzene	12.2J	525	541	101	525	598	111	73-124	9.90	(< 20)
1,3-Dichlorobenzene	10.1U	525	514	98	525	547	104	77-121	6.20	(< 20)
1,3-Dichloropropane	4.01U	525	488	93	525	533	101	77-121	8.70	(< 20)
1,4-Dichlorobenzene	10.1U	525	512	97	525	557	106	75-120	8.30	(< 20)
2,2-Dichloropropane	10.1U	525	536	102	525	546	104	67-133	2.00	(< 20)
2-Butanone (MEK)	101U	1576	1681	106	1576	1859	118	51-148	10.30	(< 20)
2-Chlorotoluene	10.1U	525	515	98	525	553	105	75-122	7.00	(< 20)
2-Hexanone	40.1U	1576	1565	99	1576	1744	111	53-145	10.80	(< 20)
4-Chlorotoluene	10.1U	525	513	98	525	549	104	72-124	6.90	(< 20)
4-Isopropyltoluene	49.8J	525	592	103	525	636	111	73-127	7.10	(< 20)
4-Methyl-2-pentanone (MIBK)	101U	1576	1471	93	1576	1607	102	65-135	9.10	(< 20)
Acetone	101U	1576	1408	89	1576	1534	97	36-164	8.70	(< 20)
Benzene	18.5	525	527	97	525	567	104	77-121	7.40	(< 20)
Bromobenzene	10.1U	525	503	96	525	532	101	78-121	5.40	(< 20)
Bromochloromethane	10.1U	525	478	91	525	492	94	78-125	2.80	(< 20)
Bromodichloromethane	0.805U	525	562	107	525	581	110	75-127	3.30	(< 20)
Bromoform	10.1U	525	498	95	525	539	103	67-132	7.80	(< 20)
Bromomethane	8.05U	525	499	95	525	512	97	53-143	2.50	(< 20)
Carbon disulfide	40.1U	789	757	96	789	727	92	63-132	4.20	(< 20)
Carbon tetrachloride	5.00U	525	557	106	525	563	107	70-135	1.20	(< 20)
Chlorobenzene	10.1U	525	502	96	525	550	105	79-120	9.10	(< 20)

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroethane	80.5U	525	613	117	525	503	96	59-139	19.60	(< 20)
Chloroform	0.805U	525	486	93	525	498	95	78-123	2.20	(< 20)
Chloromethane	10.1U	525	516	98	525	516	98	50-136	0.10	(< 20)
cis-1,2-Dichloroethene	10.1U	525	495	94	525	502	96	77-123	1.50	(< 20)
cis-1,3-Dichloropropene	5.00U	525	503	96	525	530	101	74-126	5.20	(< 20)
Dibromochloromethane	0.805U	525	502	96	525	545	104	74-126	8.20	(< 20)
Dibromomethane	10.1U	525	504	96	525	517	98	78-125	2.40	(< 20)
Dichlorodifluoromethane	20.1U	525	527	100	525	506	96	29-149	4.10	(< 20)
Ethylbenzene	37.9	525	528	93	525	581	103	76-122	9.50	(< 20)
Freon-113	40.1U	789	753	96	789	752	95	66-136	0.12	(< 20)
Hexachlorobutadiene	8.05U	525	854	162 *	525	837	159 *	61-135	1.90	(< 20)
Isopropylbenzene (Cumene)	12.4J	525	524	97	525	580	108	68-134	10.10	(< 20)
Methylene chloride	40.1U	525	457	87	525	477	91	70-128	4.30	(< 20)
Methyl-t-butyl ether	40.1U	789	795	101	789	857	109	73-125	7.50	(< 20)
Naphthalene	93.3	525	583	93	525	696	115	62-129	17.90	(< 20)
n-Butylbenzene	10.1U	525	582	111	525	620	118	70-128	6.20	(< 20)
n-Propylbenzene	8.63J	525	521	98	525	564	106	73-125	8.00	(< 20)
o-Xylene	107	525	607	95	525	650	103	77-123	6.80	(< 20)
P & M -Xylene	186	1050	1176	94	1050	1261	102	77-124	7.40	(< 20)
sec-Butylbenzene	10.1U	525	543	103	525	584	111	73-126	7.30	(< 20)
Styrene	10.1U	525	529	101	525	561	107	76-124	5.90	(< 20)
tert-Butylbenzene	10.1U	525	520	99	525	570	109	73-125	9.30	(< 20)
Tetrachloroethene	5.00U	525	516	98	525	576	109	73-128	10.80	(< 20)
Toluene	139	525	608	89	525	666	100	77-121	9.20	(< 20)
trans-1,2-Dichloroethene	10.1U	525	514	98	525	502	96	74-125	2.30	(< 20)
trans-1,3-Dichloropropene	5.00U	525	499	95	525	540	103	71-130	7.90	(< 20)
Trichloroethene	2.00U	525	492	93	525	520	99	77-123	5.60	(< 20)
Trichlorofluoromethane	20.1U	525	523	100	525	507	97	62-140	3.00	(< 20)
Vinyl acetate	40.1U	525	523	99	525	564	107	50-151	7.50	(< 20)
Vinyl chloride	0.321U	525	512	97	525	501	95	56-135	2.00	(< 20)
Xylenes (total)	293	1576	1775	94	1576	1912	103	78-124	7.20	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		525	511	97	525	492	94	71-136	3.60	
4-Bromofluorobenzene (surr)		876	593	68	876	629	72	55-151	5.80	
Toluene-d8 (surr)		525	524	100	525	528	101	85-116	0.87	

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date:
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 5:43:00PM

Prep Batch: VXX35248
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 74.93g
Prep Extract Vol: 25.00mL

Print Date: 12/13/2019 3:40:34PM

Method Blank

Blank ID: MB for HBN 1802510 [VXX/35268]
Blank Lab ID: 1544772

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	75	50-150		%

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 11/18/2019 6:54:00PM

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/18/2019 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35268]
Blank Spike Lab ID: 1544773
Date Analyzed: 11/18/2019 18:18

Spike Duplicate ID: LCSD for HBN 1196897 [VXX35268]
Spike Duplicate Lab ID: 1544774
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

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	13.6	109	12.5	13.7	110	(60-120)	0.85	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	80.7	81	1.25	80.5	81	(50-150)	0.25	

Batch Information

Analytical Batch: **VFC15044**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX35268**
Prep Method: **SW5035A**
Prep Date/Time: **11/18/2019 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	8.65J	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	94	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	891	107	833	884	106	(75-125)	0.80	(< 20)
Surrogates									
5a Androstane (surr)	16.7	109	109	16.7	114	114	(60-120)	3.80	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	8.16J	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62 (surr)	87.2	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	845	101	833	831	100	(60-120)	1.70	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	96.8	97	16.7	92.5	93	(60-120)	4.60	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,2-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,3-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,4-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
1-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2,4,5-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4,6-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dimethylphenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dinitrophenol	1.50U	3.00	0.940	mg/Kg
2,4-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2,6-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,6-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Chlorophenol	0.125U	0.250	0.0780	mg/Kg
2-Methyl-4,6-dinitrophenol	1.00U	2.00	0.620	mg/Kg
2-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Methylphenol (o-Cresol)	0.125U	0.250	0.0780	mg/Kg
2-Nitroaniline	0.125U	0.250	0.0780	mg/Kg
2-Nitrophenol	0.125U	0.250	0.0780	mg/Kg
3&4-Methylphenol (p&m-Cresol)	0.500U	1.00	0.310	mg/Kg
3,3-Dichlorobenzidine	0.250U	0.500	0.150	mg/Kg
3-Nitroaniline	0.250U	0.500	0.150	mg/Kg
4-Bromophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Chloro-3-methylphenol	0.125U	0.250	0.0780	mg/Kg
4-Chloroaniline	0.500U	1.00	0.310	mg/Kg
4-Chlorophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Nitroaniline	1.50U	3.00	0.940	mg/Kg
4-Nitrophenol	1.00U	2.00	0.620	mg/Kg
Acenaphthene	0.125U	0.250	0.0780	mg/Kg
Acenaphthylene	0.125U	0.250	0.0780	mg/Kg
Aniline	1.00U	2.00	0.620	mg/Kg
Anthracene	0.125U	0.250	0.0780	mg/Kg
Azobenzene	0.125U	0.250	0.0780	mg/Kg
Benzo(a)Anthracene	0.125U	0.250	0.0780	mg/Kg
Benzo[a]pyrene	0.125U	0.250	0.0780	mg/Kg
Benzo[b]Fluoranthene	0.125U	0.250	0.0780	mg/Kg

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Benzo[g,h,i]perylene	0.125U	0.250	0.0780	mg/Kg
Benzo[k]fluoranthene	0.125U	0.250	0.0780	mg/Kg
Benzoic acid	0.750U	1.50	0.470	mg/Kg
Benzyl alcohol	0.125U	0.250	0.0780	mg/Kg
Bis(2chloro1methylethyl)Ether	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethoxy)methane	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethyl)ether	0.125U	0.250	0.0780	mg/Kg
bis(2-Ethylhexyl)phthalate	0.125U	0.250	0.0780	mg/Kg
Butylbenzylphthalate	0.125U	0.250	0.0780	mg/Kg
Carbazole	0.125U	0.250	0.0780	mg/Kg
Chrysene	0.125U	0.250	0.0780	mg/Kg
Dibenzo[a,h]anthracene	0.125U	0.250	0.0780	mg/Kg
Dibenzofuran	0.125U	0.250	0.0780	mg/Kg
Diethylphthalate	0.125U	0.250	0.0780	mg/Kg
Dimethylphthalate	0.125U	0.250	0.0780	mg/Kg
Di-n-butylphthalate	0.125U	0.250	0.0780	mg/Kg
di-n-Octylphthalate	0.250U	0.500	0.150	mg/Kg
Fluoranthene	0.125U	0.250	0.0780	mg/Kg
Fluorene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobenzene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobutadiene	0.125U	0.250	0.0780	mg/Kg
Hexachlorocyclopentadiene	0.350U	0.700	0.200	mg/Kg
Hexachloroethane	0.125U	0.250	0.0780	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.125U	0.250	0.0780	mg/Kg
Isophorone	0.125U	0.250	0.0780	mg/Kg
Naphthalene	0.125U	0.250	0.0780	mg/Kg
Nitrobenzene	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodimethylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitroso-di-n-propylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodiphenylamine	0.125U	0.250	0.0780	mg/Kg
Pentachlorophenol	1.00U	2.00	0.620	mg/Kg
Phenanthrene	0.125U	0.250	0.0780	mg/Kg
Phenol	0.125U	0.250	0.0780	mg/Kg
Pyrene	0.125U	0.250	0.0780	mg/Kg
Surrogates				
2,4,6-Tribromophenol (surr)	95.9	35-125		%
2-Fluorobiphenyl (surr)	79.9	44-115		%
2-Fluorophenol (surr)	68.5	35-115		%

Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Nitrobenzene-d5 (surr)	71.6	37-122		%
Phenol-d6 (surr)	73.2	33-122		%
Terphenyl-d14 (surr)	92.8	54-127		%

Batch Information

Analytical Batch: XMS11885
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/9/2019 5:21:00PM

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)		CL
1,2,4-Trichlorobenzene	4.44	2.65	60		(34-118)
1,2-Dichlorobenzene	4.44	2.39	54		(33-117)
1,3-Dichlorobenzene	4.44	2.33	52		(30-115)
1,4-Dichlorobenzene	4.44	2.36	53		(31-115)
1-Chloronaphthalene	1.78	1.41	79		(48-115)
1-Methylnaphthalene	4.44	3.21	72		(40-119)
2,4,5-Trichlorophenol	4.44	3.84	86		(41-124)
2,4,6-Trichlorophenol	4.44	3.84	86		(39-126)
2,4-Dichlorophenol	4.44	3.43	77		(40-122)
2,4-Dimethylphenol	4.44	2.91	65		(30-127)
2,4-Dinitrophenol	8	10.2	127	*	(62-113)
2,4-Dinitrotoluene	4.44	3.65	82		(48-126)
2,6-Dichlorophenol	1.78	1.39	78		(41-117)
2,6-Dinitrotoluene	4.44	3.45	78		(46-124)
2-Chloronaphthalene	4.44	3.02	68		(41-114)
2-Chlorophenol	4.44	2.94	66		(34-121)
2-Methyl-4,6-dinitrophenol	8	8.58	107		(29-132)
2-Methylnaphthalene	4.44	2.77	62		(38-122)
2-Methylphenol (o-Cresol)	4.44	3.05	69		(32-122)
2-Nitroaniline	4.44	4.12	93		(44-127)
2-Nitrophenol	4.44	3.50	79		(36-123)
3&4-Methylphenol (p&m-Cresol)	6.22	4.97	80		(34-119)
3,3-Dichlorobenzidine	4.44	3.69	83		(22-121)
3-Nitroaniline	4.44	4.10	92		(33-119)
4-Bromophenyl-phenylether	4.44	4.07	92		(46-124)
4-Chloro-3-methylphenol	4.44	3.72	84		(45-122)
4-Chloroaniline	4.44	2.47	56		(17-106)
4-Chlorophenyl-phenylether	4.44	3.75	85		(45-121)
4-Nitroaniline	4.44	3.98	90		(77-120)
4-Nitrophenol	6.22	5.83	94		(30-132)
Acenaphthene	4.44	3.59	81		(40-123)
Acenaphthylene	4.44	3.55	80		(32-132)
Aniline	4.44	0.943J	21	*	(24-89)
Anthracene	4.44	3.72	84		(47-123)

Print Date: 12/13/2019 3:40:55PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Azobenzene	4.44	3.64	82	(39-125)
Benzo(a)Anthracene	4.44	4.18	94	(49-126)
Benzo[a]pyrene	4.44	4.03	91	(45-129)
Benzo[b]Fluoranthene	4.44	4.64	104	(45-132)
Benzo[g,h,i]perylene	4.44	3.93	88	(43-134)
Benzo[k]fluoranthene	4.44	4.54	102	(47-132)
Benzoic acid	6.22	5.38	86	(53-124)
Benzyl alcohol	4.44	2.82	63	(29-122)
Bis(2chloro1methylethyl)Ether	4.44	2.44	55	(33-131)
Bis(2-Chloroethoxy)methane	4.44	3.15	71	(36-121)
Bis(2-Chloroethyl)ether	4.44	2.41	54	(31-120)
bis(2-Ethylhexyl)phthalate	4.44	4.58	103	(51-133)
Butylbenzylphthalate	4.44	4.74	107	(48-132)
Carbazole	4.44	4.27	96	(50-123)
Chrysene	4.44	4.24	95	(50-124)
Dibenzo[a,h]anthracene	4.44	4.11	93	(45-134)
Dibenzofuran	4.44	3.24	73	(44-120)
Diethylphthalate	4.44	4.10	92	(50-124)
Dimethylphthalate	4.44	4.27	96	(48-124)
Di-n-butylphthalate	4.44	4.31	97	(51-128)
di-n-Octylphthalate	4.44	4.28	96	(45-140)
Fluoranthene	4.44	3.80	86	(50-127)
Fluorene	4.44	3.87	87	(43-125)
Hexachlorobenzene	4.44	3.61	81	(45-122)
Hexachlorobutadiene	4.44	2.86	64	(32-123)
Hexachlorocyclopentadiene	4.44	2.44	55	(34-74)
Hexachloroethane	4.44	2.31	52	(28-117)
Indeno[1,2,3-c,d] pyrene	4.44	4.03	91	(45-133)
Isophorone	4.44	3.04	68	(30-122)
Naphthalene	4.44	2.96	67	(35-123)
Nitrobenzene	4.44	2.56	58	(34-122)
N-Nitrosodimethylamine	4.44	2.56	58	(23-120)
N-Nitroso-di-n-propylamine	4.44	3.31	74	(36-120)
N-Nitrosodiphenylamine	4.44	3.15	71	(38-127)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Pentachlorophenol	6.22	6.10	98	(25-133)
Phenanthrene	4.44	3.92	88	(50-121)
Phenol	4.44	3.09	70	(34-121)
Pyrene	4.44	4.49	101	(47-127)
Surrogates				
2,4,6-Tribromophenol (surr)	8.89	103	103	(35-125)
2-Fluorobiphenyl (surr)	4.44	79	79	(44-115)
2-Fluorophenol (surr)	8.89	61	61	(35-115)
Nitrobenzene-d5 (surr)	4.44	68.2	68	(37-122)
Phenol-d6 (surr)	8.89	68.4	68	(33-122)
Terphenyl-d14 (surr)	4.44	104	104	(54-127)

Batch Information

Analytical Batch: **XMS11885**
Analytical Method: **SW8270D**
Instrument: **HP 6890/5973 SSA**
Analyst: **JMG**

Prep Batch: **XXX42629**
Prep Method: **SW3550C**
Prep Date/Time: **11/26/2019 14:52**
Spike Init Wt./Vol.: 4.44 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1,2,4-Trichlorobenzene	3.72U	5.26	4.32J	82		5.28	4.31J	82		34-118	0.28	(< 20)
1,2-Dichlorobenzene	3.72U	5.26	3.84J	73		5.28	3.89J	74		33-117	1.40	(< 20)
1,3-Dichlorobenzene	3.72U	5.26	3.90J	74		5.28	3.71J	70		30-115	5.20	(< 20)
1,4-Dichlorobenzene	3.72U	5.26	3.95J	75		5.28	3.74J	71		31-115	5.50	(< 20)
1-Chloronaphthalene	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	48-115	0.00	(< 20)
1-Methylnaphthalene	3.72U	5.26	4.89J	93		5.28	4.81J	91		40-119	1.80	(< 20)
2,4,5-Trichlorophenol	3.72U	5.26	4.81J	91		5.28	4.84J	92		41-124	0.88	(< 20)
2,4,6-Trichlorophenol	3.72U	5.26	4.98J	95		5.28	5.36J	102		39-126	7.50	(< 20)
2,4-Dichlorophenol	3.72U	5.26	5.19J	99		5.28	5.23J	99		40-122	0.84	(< 20)
2,4-Dimethylphenol	3.72U	5.26	4.89J	93		5.28	5.11J	97		30-127	4.30	(< 20)
2,4-Dinitrophenol	44.6U	9.46	44.6U	0	*	9.50	44.6U	0	*	62-113	0.00	(< 20)
2,4-Dinitrotoluene	3.72U	5.26	4.53J	86		5.28	4.17J	79		48-126	8.10	(< 20)
2,6-Dichlorophenol	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	41-117	0.00	(< 20)
2,6-Dinitrotoluene	3.72U	5.26	5.29J	101		5.28	5.20J	99		46-124	1.70	(< 20)
2-Chloronaphthalene	3.72U	5.26	4.55J	86		5.28	4.33J	82		41-114	4.70	(< 20)
2-Chlorophenol	3.72U	5.26	4.45J	85		5.28	4.44J	84		34-121	0.26	(< 20)
2-Methyl-4,6-dinitrophenol	29.8U	9.46	29.8U	0	*	9.50	29.8U	0	*	29-132	0.00	(< 20)
2-Methylnaphthalene	3.72U	5.26	4.29J	82		5.28	4.16J	79		38-122	3.10	(< 20)
2-Methylphenol (o-Cresol)	3.72U	5.26	4.41J	84		5.28	4.41J	84		32-122	0.03	(< 20)
2-Nitroaniline	3.72U	5.26	5.66J	108		5.28	5.33J	101		44-127	5.90	(< 20)
2-Nitrophenol	3.72U	5.26	5.25J	100		5.28	5.28J	100		36-123	0.33	(< 20)
3&4-Methylphenol (p&m-Cresol)	14.9U	7.36	14.9U	0	*	7.38	14.9U	0	*	34-119	0.00	(< 20)
3,3-Dichlorobenzidine	7.45U	5.26	5.28J	100		5.28	5.33J	101		22-121	1.10	(< 20)
3-Nitroaniline	7.45U	5.26	5.29J	101		5.28	5.36J	102		33-119	1.30	(< 20)
4-Bromophenyl-phenylether	3.72U	5.26	5.67J	108		5.28	5.25J	100		46-124	7.60	(< 20)
4-Chloro-3-methylphenol	3.72U	5.26	4.92J	93		5.28	5.08J	96		45-122	3.50	(< 20)
4-Chloroaniline	14.9U	5.26	14.9U	0	*	5.28	14.9U	0	*	17-106	0.00	(< 20)
4-Chlorophenyl-phenylether	3.72U	5.26	5.12J	97		5.28	4.90J	93		45-121	4.40	(< 20)
4-Nitroaniline	44.6U	5.26	44.6U	0	*	5.28	44.6U	0	*	77-120	0.00	(< 20)
4-Nitrophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	30-132	0.00	(< 20)
Acenaphthene	3.72U	5.26	5.31J	101		5.28	5.24J	99		40-123	1.20	(< 20)
Acenaphthylene	3.72U	5.26	5.37J	102		5.28	5.36J	102		32-132	0.16	(< 20)
Aniline	29.8U	5.26	29.8U	0	*	5.28	29.8U	0	*	24-89	0.00	(< 20)
Anthracene	3.72U	5.26	5.38J	102		5.28	5.22J	99		47-123	3.10	(< 20)
Azobenzene	3.72U	5.26	5.77J	110		5.28	5.85J	111		39-125	1.50	(< 20)
Benzo(a)Anthracene	3.72U	5.26	5.10J	97		5.28	5.28J	100		49-126	3.40	(< 20)
Benzo[a]pyrene	3.72U	5.26	4.80J	91		5.28	4.77J	90		45-129	0.50	(< 20)

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzo[b]Fluoranthene	3.72U	5.26	4.92J	93		5.28	4.76J	90		45-132	3.20	(< 20)
Benzo[g,h,i]perylene	3.72U	5.26	5.44J	103		5.28	5.25J	100		43-134	3.40	(< 20)
Benzo[k]fluoranthene	3.72U	5.26	5.06J	96		5.28	5.20J	99		47-132	2.90	(< 20)
Benzoic acid	22.3U	7.36	22.3U	0	*	7.38	22.3U	0	*	53-124	0.00	(< 20)
Benzyl alcohol	3.72U	5.26	3.88J	74		5.28	3.84J	73		29-122	1.00	(< 20)
Bis(2chloro1methylethyl)Ether	3.72U	5.26	3.95J	75		5.28	4.20J	80		33-131	6.10	(< 20)
Bis(2-Chloroethoxy)methane	3.72U	5.26	5.06J	96		5.28	4.90J	93		36-121	3.10	(< 20)
Bis(2-Chloroethyl)ether	3.72U	5.26	4.06J	77		5.28	4.13J	78		31-120	1.60	(< 20)
bis(2-Ethylhexyl)phthalate	3.72U	5.26	6.42J	122		5.28	6.59J	125		51-133	2.60	(< 20)
Butylbenzylphthalate	3.72U	5.26	6.32J	120		5.28	5.69J	108		48-132	10.40	(< 20)
Carbazole	3.72U	5.26	6.02J	114		5.28	5.83J	110		50-123	3.20	(< 20)
Chrysene	3.72U	5.26	5.49J	104		5.28	5.42J	103		50-124	1.40	(< 20)
Dibenzo[a,h]anthracene	3.72U	5.26	5.39J	103		5.28	5.71J	108		45-134	5.50	(< 20)
Dibenzofuran	3.72U	5.26	4.59J	87		5.28	4.44J	84		44-120	3.50	(< 20)
Diethylphthalate	3.72U	5.26	5.50J	105		5.28	5.44J	103		50-124	1.10	(< 20)
Dimethylphthalate	3.72U	5.26	5.94J	113		5.28	6.02J	114		48-124	1.20	(< 20)
Di-n-butylphthalate	3.72U	5.26	5.94J	113		5.28	5.75J	109		51-128	3.30	(< 20)
di-n-Octylphthalate	7.45U	5.26	8.15J	155	*	5.28	7.78J	147	*	45-140	4.60	(< 20)
Fluoranthene	3.72U	5.26	4.55J	86		5.28	4.43J	84		50-127	2.60	(< 20)
Fluorene	3.72U	5.26	5.28J	100		5.28	5.20J	99		43-125	1.40	(< 20)
Hexachlorobenzene	3.72U	5.26	4.59J	87		5.28	4.26J	81		45-122	7.70	(< 20)
Hexachlorobutadiene	3.72U	5.26	4.47J	85		5.28	4.53J	86		32-123	1.20	(< 20)
Hexachlorocyclopentadiene	10.4U	5.26	10.4U	0	*	5.28	10.4U	0	*	34-74	0.00	(< 20)
Hexachloroethane	3.72U	5.26	3.68J	70		5.28	3.88J	73		28-117	4.90	(< 20)
Indeno[1,2,3-c,d] pyrene	3.72U	5.26	5.31J	101		5.28	5.28J	100		45-133	0.66	(< 20)
Isophorone	3.72U	5.26	4.87J	93		5.28	4.58J	87		30-122	6.10	(< 20)
Naphthalene	3.72U	5.26	5.14J	98		5.28	5.05J	96		35-123	2.00	(< 20)
Nitrobenzene	3.72U	5.26	4.29J	82		5.28	4.14J	78		34-122	3.70	(< 20)
N-Nitrosodimethylamine	3.72U	5.26	3.79J	72		5.28	3.54J	67		23-120	6.80	(< 20)
N-Nitroso-di-n-propylamine	3.72U	5.26	4.94J	94		5.28	4.95J	94		36-120	0.33	(< 20)
N-Nitrosodiphenylamine	3.72U	5.26	5.01J	95		5.28	5.18J	98		38-127	3.20	(< 20)
Pentachlorophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	25-133	0.00	(< 20)
Phenanthrene	3.72U	5.26	5.37J	102		5.28	5.28J	100		50-121	1.90	(< 20)
Phenol	3.72U	5.26	4.38J	83		5.28	4.39J	83		34-121	0.33	(< 20)
Pyrene	3.72U	5.26	4.98J	95		5.28	5.08J	96		47-127	2.20	(< 20)
Surrogates												
2,4,6-Tribromophenol (surr)		10.5	10.2	97		10.6	10.9	104		35-125	6.40	

Print Date: 12/13/2019 3:40:57PM

Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date:
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
2-Fluorobiphenyl (surr)		5.26	5.56	106	5.28	5.45	103	44-115	2.10	
2-Fluorophenol (surr)		10.5	8.03	76	10.6	7.36	70	35-115	8.70	
Nitrobenzene-d5 (surr)		5.26	4.86	92	5.28	4.81	91	37-122	1.00	
Phenol-d6 (surr)		10.5	9.45	90	10.6	9.31	88	33-122	1.60	
Terphenyl-d14 (surr)		5.26	4.86	92	5.28	5.19	98	54-127	6.60	

Batch Information

Analytical Batch: XMS11889
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/11/2019 3:37:00PM

Prep Batch: XXX42629
Prep Method: Sonication Extraction Soil SW8270
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.75g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:40:57PM

Method Blank

Blank ID: MB for HBN 1802613 [XXX/42632]
Blank Lab ID: 1545124

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW8082A**

Parameter	Results	LOQ/CL	DL	Units
Aroclor-1016	25.0U	50.0	12.5	ug/Kg
Aroclor-1221	50.0U	100	25.0	ug/Kg
Aroclor-1232	25.0U	50.0	12.5	ug/Kg
Aroclor-1242	25.0U	50.0	12.5	ug/Kg
Aroclor-1248	25.0U	50.0	12.5	ug/Kg
Aroclor-1254	25.0U	50.0	12.5	ug/Kg
Aroclor-1260	25.0U	50.0	12.5	ug/Kg
Surrogates				
Decachlorobiphenyl (surr)	110	60-125		%

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 12:07:00PM

Prep Batch: XXX42632
Prep Method: SW3550C
Prep Date/Time: 11/27/2019 10:48:22AM
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 1196897 [XXX42632]
Blank Spike Lab ID: 1545125
Date Analyzed: 12/03/2019 12:17

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW8082A**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Aroclor-1016	222	198	89	(47-134)
Aroclor-1260	222	235	106	(53-140)
Surrogates				
Decachlorobiphenyl (surr)	222	112	112	(60-125)

Batch Information

Analytical Batch: **XGC10544**
Analytical Method: **SW8082A**
Instrument: **Agilent 7890B GC ECD SW F**
Analyst: **BMZ**

Prep Batch: **XXX42632**
Prep Method: **SW3550C**
Prep Date/Time: **11/27/2019 10:48**
Spike Init Wt./Vol.: 222 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196876010
MS Sample ID: 1545126 MS
MSD Sample ID: 1545127 MSD

QC for Samples: 1196897008

Analysis Date: 12/03/2019 13:09
Analysis Date: 12/03/2019 13:19
Analysis Date: 12/03/2019 13:29
Matrix: Soil/Solid (dry weight)

Results by **SW8082A**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Aroclor-1016	25.8U	229	251	110	228	253	111	47-134	0.56	(< 30)
Aroclor-1260	25.8U	229	227	99	228	226	99	53-140	0.65	(< 30)
Surrogates										
Decachlorobiphenyl (surr)		229	241	105	228	237	104	60-125	1.40	

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 1:19:00PM

Prep Batch: XXX42632
Prep Method: Sonication Extraction Soil SW8082 PCB
Prep Date/Time: 11/27/2019 10:48:22AM
Prep Initial Wt./Vol.: 22.63g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:41:02PM

SGS

1196897

North America Inc.
F CUSTODY RECORD

Profile: 334945

Locations Nationwide
Alaska Maryland
Revised Report - Revision 2
New Jersey New York
North Carolina Indiana
West Virgina Kentucky
www.us.sgs.com

Section 1

CLIENT: Golder Associates

CONTACT: Jessa Karp PHONE NO:

PROJECT NAME: ARRC Depot Dr. Drilling Samples PROJECT/ PWSID/ PERMIT#:

REPORTS TO: E-MAIL: jkarp@golder.com

INVOICE TO: Golder Associates QUOTE #:

P.O. #: 19132189

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 3

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: MeOH+BF / B	GRO (AK101) VOC (SW8260C)	DRO/RRO (AK102/103)	SVOC (SW8270D)	PCBs (SW8082A) Lead (SW6020)	REMARKS/ LOC ID
1AB	BH-01	11/14/19	9:15		2		X	X	X			
2AB	BH-02	11/14/19	12:30		2		X	X	X			
3AB	BH-03A	11/15/19	9:15		2		X	X	X			
4AB	BH-03A-1	11/15/19	9:15		2		X	X	X			
5AB	BH-04	11/14/19	15:00		2		X	X	X			
6AB	BH-05	11/14/19	13:45		2		X	X	X			
7AB	BH-05-1	11/14/19	13:45		2		X	X	X			
8AB	Composit	11/15/19	9:30		2	C	X	X	X	X		
9AB	PW7-25-11				2		X	X	X	X		Trip Blank

Section 5

	Date	Time	
Relinquished By: (1) Jessa Karp	11/15/19	16:00	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received For Laboratory By: 11/15/19 16:00

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 2.7° D63

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

SGS

Returned Bottles Inventory

Name of individual returning bottles: Jessa Karp

Date Received: 11/13/19

Client Name: Golder Associates

Received by:

Project Name: ARRC Depot Dr. Drilling Samples

SGS PM:

HDPE/Nalgene:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz					
	60-ml or 2-oz					
	other					
amber glass:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz with or without septa	10				
	40-ml VOA vial	12				
	other					
Subtotal:		22				

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted.***

Amount to Invoice Client $: 88

W

1196897

SGS

e-Sample Receipt Form

Revised Report - Revision 2

SGS Workorder #: **1196897**

1196897

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 2.2 °C Therm. ID: D63
		Cooler ID: @ °C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify 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.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	**Trip Blanks 9A-B were scheudled with PCB, DRO/RRO, and Lead 6020. Proceeding with GRO & VOC.**
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+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
1196897001-A	No Preservative Required	OK			
1196897001-B	Methanol field pres. 4 C	OK			
1196897002-A	No Preservative Required	OK			
1196897002-B	Methanol field pres. 4 C	OK			
1196897003-A	No Preservative Required	OK			
1196897003-B	Methanol field pres. 4 C	OK			
1196897004-A	No Preservative Required	OK			
1196897004-B	Methanol field pres. 4 C	OK			
1196897005-A	No Preservative Required	OK			
1196897005-B	Methanol field pres. 4 C	OK			
1196897006-A	No Preservative Required	OK			
1196897006-B	Methanol field pres. 4 C	OK			
1196897007-A	No Preservative Required	OK			
1196897007-B	Methanol field pres. 4 C	OK			
1196897008-A	No Preservative Required	OK			
1196897008-B	Methanol field pres. 4 C	OK			
1196897009-A	Methanol field pres. 4 C	OK			
1196897009-B	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.

Laboratory Report of Analysis

To: Golder Associates Inc.
2121 Abbott Road, #100
Anchorage, AK 99507
(907)344-6001

Report Number: **1196897**

Client Project: **ARRC DEPOT DR. Drilling Sample**

Dear Chris Valentine,

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

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Golder Associates Inc.**
SGS Project: **1196897**
Project Name/Site: **ARRC DEPOT DR. Drilling Sample**
Project Contact: **Chris Valentine**

Refer to sample receipt form for information on sample condition.

LCS for HBN 1802587 [XXX/42629 (1545011) LCS

8270D - LCS recovery for 2,4-dinitrophenol does not meet QC criteria. The associated sample concentrations for this analyte are less than the LOQ.
8270D - LCS recovery for aniline does not meet QC criteria.

1196897001MS (1544068) MS

8260C - MS recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MS (1545012) MS

8270D - MS recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1196897001MSD (1544069) MSD

8260C - MSD recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MSD (1545013) MSD

8270D - MSD recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
8270D - MSD RPD for 4-chloroaniline does not meet QC criteria. Results for this analyte are less than the LOQ in the parent sample.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8082A				
1545125	LCS for HBN 1802613 [XXX/42632	XGC10544	Aroclor-1016	BLC, SP
1545127	1196876010MSD	XGC10544	Aroclor-1016	SP
SW8260C				
1196897005	BH-04	VMS19671	4-Isopropyltoluene	SP
1196897005	BH-04	VMS19671	Naphthalene	SP
SW8270D				
1545011	LCS for HBN 1802587 [XXX/42629	XMS11885	1-Chloronaphthalene	SP
1545012	1196867001MS	XMS11889	1-Chloronaphthalene	SP
1545013	1196867001MSD	XMS11889	1,4-Dichlorobenzene	RP
1545013	1196867001MSD	XMS11889	1-Chloronaphthalene	SP

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.

Print Date: 12/13/2019 3:40:05PM

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, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 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
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
BH-03A	1196897003	11/15/2019	11/15/2019	Soil/Solid (dry weight)

Method	Method Description
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SW6020A	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW8082A	SW8082 PCB's
SW8270D	SW846 8270 Semi-Volatiles by GC/MS (S)
SW8260C	VOC 8260 (S) Field Extracted

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Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	18.4	J	20.8	6.46	mg/Kg	1		11/21/19 19:19
Surrogates								
5a Androstane (surr)	100		50-150		%	1		11/21/19 19:19

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/21/19 19:19
Container ID: 1196897003-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.112 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	27.4		20.8	6.46	mg/Kg	1		11/21/19 19:19
Surrogates								
n-Triacontane-d62 (surr)	92.8		50-150		%	1		11/21/19 19:19

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Analyst: DSD
Analytical Date/Time: 11/21/19 19:19
Container ID: 1196897003-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.112 g
Prep Extract Vol: 5 mL

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
1,2-Dichlorobenzene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
1,3-Dichlorobenzene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
1,4-Dichlorobenzene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
1-Chloronaphthalene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
1-Methylnaphthalene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2,4,5-Trichlorophenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2,4,6-Trichlorophenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2,4-Dichlorophenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2,4-Dimethylphenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2,4-Dinitrophenol	1.55	U	3.11	0.976	mg/Kg	1		12/09/19 17:55
2,4-Dinitrotoluene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2,6-Dichlorophenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2,6-Dinitrotoluene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2-Chloronaphthalene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2-Chlorophenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2-Methyl-4,6-dinitrophenol	1.04	U	2.08	0.644	mg/Kg	1		12/09/19 17:55
2-Methylnaphthalene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2-Methylphenol (o-Cresol)	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2-Nitroaniline	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
2-Nitrophenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
3&4-Methylphenol (p&m-Cresol)	0.520	U	1.04	0.322	mg/Kg	1		12/09/19 17:55
3,3-Dichlorobenzidine	0.260	U	0.519	0.156	mg/Kg	1		12/09/19 17:55
3-Nitroaniline	0.260	U	0.519	0.156	mg/Kg	1		12/09/19 17:55
4-Bromophenyl-phenylether	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
4-Chloro-3-methylphenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
4-Chloroaniline	0.520	U	1.04	0.322	mg/Kg	1		12/09/19 17:55
4-Chlorophenyl-phenylether	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
4-Nitroaniline	1.55	U	3.11	0.976	mg/Kg	1		12/09/19 17:55
4-Nitrophenol	1.04	U	2.08	0.644	mg/Kg	1		12/09/19 17:55
Acenaphthene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Acenaphthylene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Aniline	1.04	U	2.08	0.644	mg/Kg	1		12/09/19 17:55
Anthracene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Azobenzene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Benzo(a)Anthracene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Benzo[a]pyrene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Benzo[g,h,i]perylene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Benzo[k]fluoranthene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Benzoic acid	0.780	U	1.56	0.488	mg/Kg	1		12/09/19 17:55
Benzyl alcohol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Bis(2chloro1methylethyl)Ether	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Bis(2-Chloroethoxy)methane	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Bis(2-Chloroethyl)ether	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
bis(2-Ethylhexyl)phthalate	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Butylbenzylphthalate	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Carbazole	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Chrysene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Dibenzo[a,h]anthracene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Dibenzofuran	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Diethylphthalate	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Dimethylphthalate	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Di-n-butylphthalate	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
di-n-Octylphthalate	0.260	U	0.519	0.156	mg/Kg	1		12/09/19 17:55
Fluoranthene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Fluorene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Hexachlorobenzene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Hexachlorobutadiene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Hexachlorocyclopentadiene	0.363	U	0.727	0.208	mg/Kg	1		12/09/19 17:55
Hexachloroethane	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Indeno[1,2,3-c,d] pyrene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Isophorone	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Naphthalene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Nitrobenzene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
N-Nitrosodimethylamine	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
N-Nitroso-di-n-propylamine	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
N-Nitrosodiphenylamine	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Pentachlorophenol	1.04	U	2.08	0.644	mg/Kg	1		12/09/19 17:55
Phenanthrene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Phenol	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55
Pyrene	0.130	U	0.260	0.0810	mg/Kg	1		12/09/19 17:55

Surrogates

Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol (surr)	95.2		35-125		%	1		12/09/19 17:55
2-Fluorobiphenyl (surr)	81		44-115		%	1		12/09/19 17:55
2-Fluorophenol (surr)	68.2		35-115		%	1		12/09/19 17:55
Nitrobenzene-d5 (surr)	69.8		37-122		%	1		12/09/19 17:55
Phenol-d6 (surr)	74.8		33-122		%	1		12/09/19 17:55
Terphenyl-d14 (surr)	96.4		54-127		%	1		12/09/19 17:55

Batch Information

Analytical Batch: XMS11885
Analytical Method: SW8270D
Analyst: JMG
Analytical Date/Time: 12/09/19 17:55
Container ID: 1196897003-A

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/19 14:52
Prep Initial Wt./Vol.: 22.674 g
Prep Extract Vol: 1 mL

Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.990	U	1.98	0.593	mg/Kg	1		11/18/19 20:23
Surrogates								
4-Bromofluorobenzene (surr)	96.9		50-150		%	1		11/18/19 20:23

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/18/19 20:23
Container ID: 1196897003-B

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/15/19 09:15
Prep Initial Wt./Vol.: 74.935 g
Prep Extract Vol: 28.3061 mL

Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	7.90	U	15.8	4.90	ug/Kg	1		11/16/19 19:54
1,1,1-Trichloroethane	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,1,2,2-Tetrachloroethane	0.790	U	1.58	0.490	ug/Kg	1		11/16/19 19:54
1,1,2-Trichloroethane	0.316	U	0.632	0.198	ug/Kg	1		11/16/19 19:54
1,1-Dichloroethane	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,1-Dichloroethene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,1-Dichloropropene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,2,3-Trichlorobenzene	19.8	U	39.5	11.9	ug/Kg	1		11/16/19 19:54
1,2,3-Trichloropropane	0.790	U	1.58	0.490	ug/Kg	1		11/16/19 19:54
1,2,4-Trichlorobenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,2,4-Trimethylbenzene	19.8	U	39.5	11.9	ug/Kg	1		11/16/19 19:54
1,2-Dibromo-3-chloropropane	39.5	U	79.0	24.5	ug/Kg	1		11/16/19 19:54
1,2-Dibromoethane	0.395	U	0.790	0.245	ug/Kg	1		11/16/19 19:54
1,2-Dichlorobenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,2-Dichloroethane	0.790	U	1.58	0.490	ug/Kg	1		11/16/19 19:54
1,2-Dichloropropane	3.95	U	7.90	2.45	ug/Kg	1		11/16/19 19:54
1,3,5-Trimethylbenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,3-Dichlorobenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
1,3-Dichloropropane	3.95	U	7.90	2.45	ug/Kg	1		11/16/19 19:54
1,4-Dichlorobenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
2,2-Dichloropropane	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
2-Butanone (MEK)	99.0	U	198	61.6	ug/Kg	1		11/16/19 19:54
2-Chlorotoluene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
2-Hexanone	39.5	U	79.0	24.5	ug/Kg	1		11/16/19 19:54
4-Chlorotoluene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
4-Isopropyltoluene	39.5	U	79.0	19.8	ug/Kg	1		11/16/19 19:54
4-Methyl-2-pentanone (MIBK)	99.0	U	198	61.6	ug/Kg	1		11/16/19 19:54
Acetone	99.0	U	198	61.6	ug/Kg	1		11/16/19 19:54
Benzene	4.94	U	9.88	3.08	ug/Kg	1		11/16/19 19:54
Bromobenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Bromochloromethane	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Bromodichloromethane	0.790	U	1.58	0.490	ug/Kg	1		11/16/19 19:54
Bromoform	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Bromomethane	7.90	U	15.8	4.90	ug/Kg	1		11/16/19 19:54
Carbon disulfide	39.5	U	79.0	24.5	ug/Kg	1		11/16/19 19:54
Carbon tetrachloride	4.94	U	9.88	3.08	ug/Kg	1		11/16/19 19:54
Chlorobenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	79.0	U	158	49.0	ug/Kg	1		11/16/19 19:54
Chloroform	0.790	U	1.58	0.490	ug/Kg	1		11/16/19 19:54
Chloromethane	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
cis-1,2-Dichloroethene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
cis-1,3-Dichloropropene	4.94	U	9.88	3.08	ug/Kg	1		11/16/19 19:54
Dibromochloromethane	0.790	U	1.58	0.490	ug/Kg	1		11/16/19 19:54
Dibromomethane	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Dichlorodifluoromethane	19.8	U	39.5	11.9	ug/Kg	1		11/16/19 19:54
Ethylbenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Freon-113	39.5	U	79.0	24.5	ug/Kg	1		11/16/19 19:54
Hexachlorobutadiene	7.90	U	15.8	4.90	ug/Kg	1		11/16/19 19:54
Isopropylbenzene (Cumene)	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Methylene chloride	39.5	U	79.0	24.5	ug/Kg	1		11/16/19 19:54
Methyl-t-butyl ether	39.5	U	79.0	24.5	ug/Kg	1		11/16/19 19:54
Naphthalene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
n-Butylbenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
n-Propylbenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
o-Xylene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
P & M -Xylene	19.8	U	39.5	11.9	ug/Kg	1		11/16/19 19:54
sec-Butylbenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Styrene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
tert-Butylbenzene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
Tetrachloroethene	4.94	U	9.88	3.08	ug/Kg	1		11/16/19 19:54
Toluene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
trans-1,2-Dichloroethene	9.90	U	19.8	6.16	ug/Kg	1		11/16/19 19:54
trans-1,3-Dichloropropene	4.94	U	9.88	3.08	ug/Kg	1		11/16/19 19:54
Trichloroethene	1.98	U	3.95	1.19	ug/Kg	1		11/16/19 19:54
Trichlorofluoromethane	19.8	U	39.5	11.9	ug/Kg	1		11/16/19 19:54
Vinyl acetate	39.5	U	79.0	24.5	ug/Kg	1		11/16/19 19:54
Vinyl chloride	0.316	U	0.632	0.198	ug/Kg	1		11/16/19 19:54
Xylenes (total)	29.6	U	59.3	18.0	ug/Kg	1		11/16/19 19:54
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		71-136		%	1		11/16/19 19:54
4-Bromofluorobenzene (surr)	94.4		55-151		%	1		11/16/19 19:54
Toluene-d8 (surr)	97.4		85-116		%	1		11/16/19 19:54

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-03A**

Client Sample ID: **BH-03A**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897003
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.6
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/16/19 19:54
Container ID: 1196897003-B

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/15/19 09:15
Prep Initial Wt./Vol.: 74.935 g
Prep Extract Vol: 28.3061 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1802379 [MXX/33000]
Blank Lab ID: 1544246

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW6020A**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.100U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:44:07PM

Prep Batch: MXX33000
Prep Method: SW3050B
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [MXX33000]
Blank Spike Lab ID: 1544247
Date Analyzed: 11/21/2019 18:48

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW6020A**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Lead	50	51.8	104	(84-118)

Batch Information

Analytical Batch: **MMS10690**
Analytical Method: **SW6020A**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **DMM**

Prep Batch: **MXX33000**
Prep Method: **SW3050B**
Prep Date/Time: **11/20/2019 11:25**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1544248
MS Sample ID: 1544254 MS
MSD Sample ID: 1544255 MSD

QC for Samples: 1196897008

Analysis Date: 11/21/2019 18:53
Analysis Date: 11/21/2019 18:58
Analysis Date: 11/21/2019 19:02
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	3.76	46.9	50.6	100	46.5	45.9	91	84-118	9.92	(< 20)

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:58:12PM

Prep Batch: MXX33000
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1.07g
Prep Extract Vol: 50.00mL

Print Date: 12/13/2019 3:40:22PM

Method Blank

Blank ID: MB for HBN 1802346 [SPT/10940]
Blank Lab ID: 1544092

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A
Analytical Date/Time: 11/18/2019 5:09:00PM

Print Date: 12/13/2019 3:40:23PM

Duplicate Sample Summary

Original Sample ID: 1196869007
Duplicate Sample ID: 1544093
Analysis Date: 11/18/2019 17:09
Matrix: Soil/Solid (dry weight)

QC for Samples:

1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	94.3	94.5	%	0.23	(< 15)

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A

Print Date: 12/13/2019 3:40:25PM

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

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	0.400U	0.800	0.250	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	25.0U	50.0	15.0	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	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	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	50.0U	100	31.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	50.0U	100	25.0	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Acetone	125U	250	78.0	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	6.20	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

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloroform	1.00U	2.00	0.620	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	1.00U	2.00	0.620	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	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	2.50U	5.00	1.50	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)	102	71-136		%
4-Bromofluorobenzene (surr)	101	55-151		%
Toluene-d8 (surr)	97	85-116		%

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Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 3:23:00PM

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 12/13/2019 3:40:29PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	726	97	(78-125)
1,1,1-Trichloroethane	750	768	102	(73-130)
1,1,2,2-Tetrachloroethane	750	751	100	(70-124)
1,1,2-Trichloroethane	750	737	98	(78-121)
1,1-Dichloroethane	750	707	94	(76-125)
1,1-Dichloroethene	750	691	92	(70-131)
1,1-Dichloropropene	750	833	111	(76-125)
1,2,3-Trichlorobenzene	750	788	105	(66-130)
1,2,3-Trichloropropane	750	726	97	(73-125)
1,2,4-Trichlorobenzene	750	805	107	(67-129)
1,2,4-Trimethylbenzene	750	781	104	(75-123)
1,2-Dibromo-3-chloropropane	750	732	98	(61-132)
1,2-Dibromoethane	750	737	98	(78-122)
1,2-Dichlorobenzene	750	763	102	(78-121)
1,2-Dichloroethane	750	701	93	(73-128)
1,2-Dichloropropane	750	814	108	(76-123)
1,3,5-Trimethylbenzene	750	786	105	(73-124)
1,3-Dichlorobenzene	750	760	101	(77-121)
1,3-Dichloropropane	750	728	97	(77-121)
1,4-Dichlorobenzene	750	764	102	(75-120)
2,2-Dichloropropane	750	751	100	(67-133)
2-Butanone (MEK)	2250	2340	104	(51-148)
2-Chlorotoluene	750	761	101	(75-122)
2-Hexanone	2250	2360	105	(53-145)
4-Chlorotoluene	750	755	101	(72-124)
4-Isopropyltoluene	750	822	110	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2200	98	(65-135)
Acetone	2250	1920	85	(36-164)
Benzene	750	779	104	(77-121)
Bromobenzene	750	754	101	(78-121)
Bromochloromethane	750	690	92	(78-125)
Bromodichloromethane	750	812	108	(75-127)
Bromoform	750	733	98	(67-132)
Bromomethane	750	650	87	(53-143)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon disulfide	1130	1030	91	(63-132)
Carbon tetrachloride	750	787	105	(70-135)
Chlorobenzene	750	770	103	(79-120)
Chloroethane	750	734	98	(59-139)
Chloroform	750	707	94	(78-123)
Chloromethane	750	717	96	(50-136)
cis-1,2-Dichloroethene	750	734	98	(77-123)
cis-1,3-Dichloropropene	750	733	98	(74-126)
Dibromochloromethane	750	745	99	(74-126)
Dibromomethane	750	725	97	(78-125)
Dichlorodifluoromethane	750	707	94	(29-149)
Ethylbenzene	750	776	104	(76-122)
Freon-113	1130	1070	95	(66-136)
Hexachlorobutadiene	750	853	114	(61-135)
Isopropylbenzene (Cumene)	750	806	107	(68-134)
Methylene chloride	750	695	93	(70-128)
Methyl-t-butyl ether	1130	1180	105	(73-125)
Naphthalene	750	761	101	(62-129)
n-Butylbenzene	750	840	112	(70-128)
n-Propylbenzene	750	783	104	(73-125)
o-Xylene	750	785	105	(77-123)
P & M -Xylene	1500	1570	105	(77-124)
sec-Butylbenzene	750	810	108	(73-126)
Styrene	750	795	106	(76-124)
tert-Butylbenzene	750	790	105	(73-125)
Tetrachloroethene	750	804	107	(73-128)
Toluene	750	767	102	(77-121)
trans-1,2-Dichloroethene	750	716	96	(74-125)
trans-1,3-Dichloropropene	750	734	98	(71-130)
Trichloroethene	750	733	98	(77-123)
Trichlorofluoromethane	750	715	95	(62-140)
Vinyl acetate	750	756	101	(50-151)
Vinyl chloride	750	695	93	(56-135)
Xylenes (total)	2250	2350	105	(78-124)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	94.1	94	(71-136)
4-Bromofluorobenzene (surr)	750	91.2	91	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS19671**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **KAJ**

Prep Batch: **VXX35248**
Prep Method: **SW5035A**
Prep Date/Time: **11/16/2019 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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200 West Potter Drive Anchorage, AK 95518
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Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		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	8.05U	525	480	91	525	528	101	78-125	9.60	(< 20)
1,1,1-Trichloroethane	10.1U	525	539	103	525	546	104	73-130	1.30	(< 20)
1,1,2,2-Tetrachloroethane	0.805U	525	508	97	525	554	105	70-124	8.40	(< 20)
1,1,2-Trichloroethane	0.321U	525	513	98	525	563	107	78-121	9.50	(< 20)
1,1-Dichloroethane	10.1U	525	487	93	525	498	95	76-125	2.10	(< 20)
1,1-Dichloroethene	10.1U	525	486	93	525	488	93	70-131	0.29	(< 20)
1,1-Dichloropropene	10.1U	525	572	109	525	591	113	76-125	3.40	(< 20)
1,2,3-Trichlorobenzene	20.1U	525	568	108	525	682	130	66-130	18.10	(< 20)
1,2,3-Trichloropropane	0.805U	525	502	96	525	550	105	73-125	9.10	(< 20)
1,2,4-Trichlorobenzene	10.1U	525	564	107	525	651	124	67-129	14.30	(< 20)
1,2,4-Trimethylbenzene	79.3	525	596	98	525	647	108	75-123	8.20	(< 20)
1,2-Dibromo-3-chloropropane	40.1U	525	504	96	525	555	105	61-132	9.50	(< 20)
1,2-Dibromoethane	0.402U	525	495	94	525	538	102	78-122	8.40	(< 20)
1,2-Dichlorobenzene	10.1U	525	513	98	525	553	105	78-121	7.50	(< 20)
1,2-Dichloroethane	0.805U	525	483	92	525	497	95	73-128	2.70	(< 20)
1,2-Dichloropropane	4.01U	525	555	106	525	586	111	76-123	5.50	(< 20)
1,3,5-Trimethylbenzene	12.2J	525	541	101	525	598	111	73-124	9.90	(< 20)
1,3-Dichlorobenzene	10.1U	525	514	98	525	547	104	77-121	6.20	(< 20)
1,3-Dichloropropane	4.01U	525	488	93	525	533	101	77-121	8.70	(< 20)
1,4-Dichlorobenzene	10.1U	525	512	97	525	557	106	75-120	8.30	(< 20)
2,2-Dichloropropane	10.1U	525	536	102	525	546	104	67-133	2.00	(< 20)
2-Butanone (MEK)	101U	1576	1681	106	1576	1859	118	51-148	10.30	(< 20)
2-Chlorotoluene	10.1U	525	515	98	525	553	105	75-122	7.00	(< 20)
2-Hexanone	40.1U	1576	1565	99	1576	1744	111	53-145	10.80	(< 20)
4-Chlorotoluene	10.1U	525	513	98	525	549	104	72-124	6.90	(< 20)
4-Isopropyltoluene	49.8J	525	592	103	525	636	111	73-127	7.10	(< 20)
4-Methyl-2-pentanone (MIBK)	101U	1576	1471	93	1576	1607	102	65-135	9.10	(< 20)
Acetone	101U	1576	1408	89	1576	1534	97	36-164	8.70	(< 20)
Benzene	18.5	525	527	97	525	567	104	77-121	7.40	(< 20)
Bromobenzene	10.1U	525	503	96	525	532	101	78-121	5.40	(< 20)
Bromochloromethane	10.1U	525	478	91	525	492	94	78-125	2.80	(< 20)
Bromodichloromethane	0.805U	525	562	107	525	581	110	75-127	3.30	(< 20)
Bromoform	10.1U	525	498	95	525	539	103	67-132	7.80	(< 20)
Bromomethane	8.05U	525	499	95	525	512	97	53-143	2.50	(< 20)
Carbon disulfide	40.1U	789	757	96	789	727	92	63-132	4.20	(< 20)
Carbon tetrachloride	5.00U	525	557	106	525	563	107	70-135	1.20	(< 20)
Chlorobenzene	10.1U	525	502	96	525	550	105	79-120	9.10	(< 20)

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroethane	80.5U	525	613	117	525	503	96	59-139	19.60	(< 20)
Chloroform	0.805U	525	486	93	525	498	95	78-123	2.20	(< 20)
Chloromethane	10.1U	525	516	98	525	516	98	50-136	0.10	(< 20)
cis-1,2-Dichloroethene	10.1U	525	495	94	525	502	96	77-123	1.50	(< 20)
cis-1,3-Dichloropropene	5.00U	525	503	96	525	530	101	74-126	5.20	(< 20)
Dibromochloromethane	0.805U	525	502	96	525	545	104	74-126	8.20	(< 20)
Dibromomethane	10.1U	525	504	96	525	517	98	78-125	2.40	(< 20)
Dichlorodifluoromethane	20.1U	525	527	100	525	506	96	29-149	4.10	(< 20)
Ethylbenzene	37.9	525	528	93	525	581	103	76-122	9.50	(< 20)
Freon-113	40.1U	789	753	96	789	752	95	66-136	0.12	(< 20)
Hexachlorobutadiene	8.05U	525	854	162 *	525	837	159 *	61-135	1.90	(< 20)
Isopropylbenzene (Cumene)	12.4J	525	524	97	525	580	108	68-134	10.10	(< 20)
Methylene chloride	40.1U	525	457	87	525	477	91	70-128	4.30	(< 20)
Methyl-t-butyl ether	40.1U	789	795	101	789	857	109	73-125	7.50	(< 20)
Naphthalene	93.3	525	583	93	525	696	115	62-129	17.90	(< 20)
n-Butylbenzene	10.1U	525	582	111	525	620	118	70-128	6.20	(< 20)
n-Propylbenzene	8.63J	525	521	98	525	564	106	73-125	8.00	(< 20)
o-Xylene	107	525	607	95	525	650	103	77-123	6.80	(< 20)
P & M -Xylene	186	1050	1176	94	1050	1261	102	77-124	7.40	(< 20)
sec-Butylbenzene	10.1U	525	543	103	525	584	111	73-126	7.30	(< 20)
Styrene	10.1U	525	529	101	525	561	107	76-124	5.90	(< 20)
tert-Butylbenzene	10.1U	525	520	99	525	570	109	73-125	9.30	(< 20)
Tetrachloroethene	5.00U	525	516	98	525	576	109	73-128	10.80	(< 20)
Toluene	139	525	608	89	525	666	100	77-121	9.20	(< 20)
trans-1,2-Dichloroethene	10.1U	525	514	98	525	502	96	74-125	2.30	(< 20)
trans-1,3-Dichloropropene	5.00U	525	499	95	525	540	103	71-130	7.90	(< 20)
Trichloroethene	2.00U	525	492	93	525	520	99	77-123	5.60	(< 20)
Trichlorofluoromethane	20.1U	525	523	100	525	507	97	62-140	3.00	(< 20)
Vinyl acetate	40.1U	525	523	99	525	564	107	50-151	7.50	(< 20)
Vinyl chloride	0.321U	525	512	97	525	501	95	56-135	2.00	(< 20)
Xylenes (total)	293	1576	1775	94	1576	1912	103	78-124	7.20	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		525	511	97	525	492	94	71-136	3.60	
4-Bromofluorobenzene (surr)		876	593	68	876	629	72	55-151	5.80	
Toluene-d8 (surr)		525	524	100	525	528	101	85-116	0.87	

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date:
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 5:43:00PM

Prep Batch: VXX35248
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 74.93g
Prep Extract Vol: 25.00mL

Print Date: 12/13/2019 3:40:34PM

Method Blank

Blank ID: MB for HBN 1802510 [VXX/35268]
Blank Lab ID: 1544772

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	75	50-150		%

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 11/18/2019 6:54:00PM

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/18/2019 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35268]
Blank Spike Lab ID: 1544773
Date Analyzed: 11/18/2019 18:18

Spike Duplicate ID: LCSD for HBN 1196897 [VXX35268]
Spike Duplicate Lab ID: 1544774
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

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	13.6	109	12.5	13.7	110	(60-120)	0.85	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	80.7	81	1.25	80.5	81	(50-150)	0.25	

Batch Information

Analytical Batch: **VFC15044**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX35268**
Prep Method: **SW5035A**
Prep Date/Time: **11/18/2019 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	8.65J	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	94	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	891	107	833	884	106	(75-125)	0.80	(< 20)
Surrogates									
5a Androstane (surr)	16.7	109	109	16.7	114	114	(60-120)	3.80	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	8.16J	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62 (surr)	87.2	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	845	101	833	831	100	(60-120)	1.70	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	96.8	97	16.7	92.5	93	(60-120)	4.60	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,2-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,3-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,4-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
1-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2,4,5-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4,6-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dimethylphenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dinitrophenol	1.50U	3.00	0.940	mg/Kg
2,4-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2,6-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,6-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Chlorophenol	0.125U	0.250	0.0780	mg/Kg
2-Methyl-4,6-dinitrophenol	1.00U	2.00	0.620	mg/Kg
2-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Methylphenol (o-Cresol)	0.125U	0.250	0.0780	mg/Kg
2-Nitroaniline	0.125U	0.250	0.0780	mg/Kg
2-Nitrophenol	0.125U	0.250	0.0780	mg/Kg
3&4-Methylphenol (p&m-Cresol)	0.500U	1.00	0.310	mg/Kg
3,3-Dichlorobenzidine	0.250U	0.500	0.150	mg/Kg
3-Nitroaniline	0.250U	0.500	0.150	mg/Kg
4-Bromophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Chloro-3-methylphenol	0.125U	0.250	0.0780	mg/Kg
4-Chloroaniline	0.500U	1.00	0.310	mg/Kg
4-Chlorophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Nitroaniline	1.50U	3.00	0.940	mg/Kg
4-Nitrophenol	1.00U	2.00	0.620	mg/Kg
Acenaphthene	0.125U	0.250	0.0780	mg/Kg
Acenaphthylene	0.125U	0.250	0.0780	mg/Kg
Aniline	1.00U	2.00	0.620	mg/Kg
Anthracene	0.125U	0.250	0.0780	mg/Kg
Azobenzene	0.125U	0.250	0.0780	mg/Kg
Benzo(a)Anthracene	0.125U	0.250	0.0780	mg/Kg
Benzo[a]pyrene	0.125U	0.250	0.0780	mg/Kg
Benzo[b]Fluoranthene	0.125U	0.250	0.0780	mg/Kg

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Benzo[g,h,i]perylene	0.125U	0.250	0.0780	mg/Kg
Benzo[k]fluoranthene	0.125U	0.250	0.0780	mg/Kg
Benzoic acid	0.750U	1.50	0.470	mg/Kg
Benzyl alcohol	0.125U	0.250	0.0780	mg/Kg
Bis(2chloro1methylethyl)Ether	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethoxy)methane	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethyl)ether	0.125U	0.250	0.0780	mg/Kg
bis(2-Ethylhexyl)phthalate	0.125U	0.250	0.0780	mg/Kg
Butylbenzylphthalate	0.125U	0.250	0.0780	mg/Kg
Carbazole	0.125U	0.250	0.0780	mg/Kg
Chrysene	0.125U	0.250	0.0780	mg/Kg
Dibenzo[a,h]anthracene	0.125U	0.250	0.0780	mg/Kg
Dibenzofuran	0.125U	0.250	0.0780	mg/Kg
Diethylphthalate	0.125U	0.250	0.0780	mg/Kg
Dimethylphthalate	0.125U	0.250	0.0780	mg/Kg
Di-n-butylphthalate	0.125U	0.250	0.0780	mg/Kg
di-n-Octylphthalate	0.250U	0.500	0.150	mg/Kg
Fluoranthene	0.125U	0.250	0.0780	mg/Kg
Fluorene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobenzene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobutadiene	0.125U	0.250	0.0780	mg/Kg
Hexachlorocyclopentadiene	0.350U	0.700	0.200	mg/Kg
Hexachloroethane	0.125U	0.250	0.0780	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.125U	0.250	0.0780	mg/Kg
Isophorone	0.125U	0.250	0.0780	mg/Kg
Naphthalene	0.125U	0.250	0.0780	mg/Kg
Nitrobenzene	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodimethylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitroso-di-n-propylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodiphenylamine	0.125U	0.250	0.0780	mg/Kg
Pentachlorophenol	1.00U	2.00	0.620	mg/Kg
Phenanthrene	0.125U	0.250	0.0780	mg/Kg
Phenol	0.125U	0.250	0.0780	mg/Kg
Pyrene	0.125U	0.250	0.0780	mg/Kg
Surrogates				
2,4,6-Tribromophenol (surr)	95.9	35-125		%
2-Fluorobiphenyl (surr)	79.9	44-115		%
2-Fluorophenol (surr)	68.5	35-115		%

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Nitrobenzene-d5 (surr)	71.6	37-122		%
Phenol-d6 (surr)	73.2	33-122		%
Terphenyl-d14 (surr)	92.8	54-127		%

Batch Information

Analytical Batch: XMS11885
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/9/2019 5:21:00PM

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)		CL
1,2,4-Trichlorobenzene	4.44	2.65	60		(34-118)
1,2-Dichlorobenzene	4.44	2.39	54		(33-117)
1,3-Dichlorobenzene	4.44	2.33	52		(30-115)
1,4-Dichlorobenzene	4.44	2.36	53		(31-115)
1-Chloronaphthalene	1.78	1.41	79		(48-115)
1-Methylnaphthalene	4.44	3.21	72		(40-119)
2,4,5-Trichlorophenol	4.44	3.84	86		(41-124)
2,4,6-Trichlorophenol	4.44	3.84	86		(39-126)
2,4-Dichlorophenol	4.44	3.43	77		(40-122)
2,4-Dimethylphenol	4.44	2.91	65		(30-127)
2,4-Dinitrophenol	8	10.2	127	*	(62-113)
2,4-Dinitrotoluene	4.44	3.65	82		(48-126)
2,6-Dichlorophenol	1.78	1.39	78		(41-117)
2,6-Dinitrotoluene	4.44	3.45	78		(46-124)
2-Chloronaphthalene	4.44	3.02	68		(41-114)
2-Chlorophenol	4.44	2.94	66		(34-121)
2-Methyl-4,6-dinitrophenol	8	8.58	107		(29-132)
2-Methylnaphthalene	4.44	2.77	62		(38-122)
2-Methylphenol (o-Cresol)	4.44	3.05	69		(32-122)
2-Nitroaniline	4.44	4.12	93		(44-127)
2-Nitrophenol	4.44	3.50	79		(36-123)
3&4-Methylphenol (p&m-Cresol)	6.22	4.97	80		(34-119)
3,3-Dichlorobenzidine	4.44	3.69	83		(22-121)
3-Nitroaniline	4.44	4.10	92		(33-119)
4-Bromophenyl-phenylether	4.44	4.07	92		(46-124)
4-Chloro-3-methylphenol	4.44	3.72	84		(45-122)
4-Chloroaniline	4.44	2.47	56		(17-106)
4-Chlorophenyl-phenylether	4.44	3.75	85		(45-121)
4-Nitroaniline	4.44	3.98	90		(77-120)
4-Nitrophenol	6.22	5.83	94		(30-132)
Acenaphthene	4.44	3.59	81		(40-123)
Acenaphthylene	4.44	3.55	80		(32-132)
Aniline	4.44	0.943J	21	*	(24-89)
Anthracene	4.44	3.72	84		(47-123)

Print Date: 12/13/2019 3:40:55PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Azobenzene	4.44	3.64	82	(39-125)
Benzo(a)Anthracene	4.44	4.18	94	(49-126)
Benzo[a]pyrene	4.44	4.03	91	(45-129)
Benzo[b]Fluoranthene	4.44	4.64	104	(45-132)
Benzo[g,h,i]perylene	4.44	3.93	88	(43-134)
Benzo[k]fluoranthene	4.44	4.54	102	(47-132)
Benzoic acid	6.22	5.38	86	(53-124)
Benzyl alcohol	4.44	2.82	63	(29-122)
Bis(2chloro1methylethyl)Ether	4.44	2.44	55	(33-131)
Bis(2-Chloroethoxy)methane	4.44	3.15	71	(36-121)
Bis(2-Chloroethyl)ether	4.44	2.41	54	(31-120)
bis(2-Ethylhexyl)phthalate	4.44	4.58	103	(51-133)
Butylbenzylphthalate	4.44	4.74	107	(48-132)
Carbazole	4.44	4.27	96	(50-123)
Chrysene	4.44	4.24	95	(50-124)
Dibenzo[a,h]anthracene	4.44	4.11	93	(45-134)
Dibenzofuran	4.44	3.24	73	(44-120)
Diethylphthalate	4.44	4.10	92	(50-124)
Dimethylphthalate	4.44	4.27	96	(48-124)
Di-n-butylphthalate	4.44	4.31	97	(51-128)
di-n-Octylphthalate	4.44	4.28	96	(45-140)
Fluoranthene	4.44	3.80	86	(50-127)
Fluorene	4.44	3.87	87	(43-125)
Hexachlorobenzene	4.44	3.61	81	(45-122)
Hexachlorobutadiene	4.44	2.86	64	(32-123)
Hexachlorocyclopentadiene	4.44	2.44	55	(34-74)
Hexachloroethane	4.44	2.31	52	(28-117)
Indeno[1,2,3-c,d] pyrene	4.44	4.03	91	(45-133)
Isophorone	4.44	3.04	68	(30-122)
Naphthalene	4.44	2.96	67	(35-123)
Nitrobenzene	4.44	2.56	58	(34-122)
N-Nitrosodimethylamine	4.44	2.56	58	(23-120)
N-Nitroso-di-n-propylamine	4.44	3.31	74	(36-120)
N-Nitrosodiphenylamine	4.44	3.15	71	(38-127)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Pentachlorophenol	6.22	6.10	98	(25-133)
Phenanthrene	4.44	3.92	88	(50-121)
Phenol	4.44	3.09	70	(34-121)
Pyrene	4.44	4.49	101	(47-127)
Surrogates				
2,4,6-Tribromophenol (surr)	8.89	103	103	(35-125)
2-Fluorobiphenyl (surr)	4.44	79	79	(44-115)
2-Fluorophenol (surr)	8.89	61	61	(35-115)
Nitrobenzene-d5 (surr)	4.44	68.2	68	(37-122)
Phenol-d6 (surr)	8.89	68.4	68	(33-122)
Terphenyl-d14 (surr)	4.44	104	104	(54-127)

Batch Information

Analytical Batch: **XMS11885**
Analytical Method: **SW8270D**
Instrument: **HP 6890/5973 SSA**
Analyst: **JMG**

Prep Batch: **XXX42629**
Prep Method: **SW3550C**
Prep Date/Time: **11/26/2019 14:52**
Spike Init Wt./Vol.: 4.44 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1,2,4-Trichlorobenzene	3.72U	5.26	4.32J	82		5.28	4.31J	82		34-118	0.28	(< 20)
1,2-Dichlorobenzene	3.72U	5.26	3.84J	73		5.28	3.89J	74		33-117	1.40	(< 20)
1,3-Dichlorobenzene	3.72U	5.26	3.90J	74		5.28	3.71J	70		30-115	5.20	(< 20)
1,4-Dichlorobenzene	3.72U	5.26	3.95J	75		5.28	3.74J	71		31-115	5.50	(< 20)
1-Chloronaphthalene	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	48-115	0.00	(< 20)
1-Methylnaphthalene	3.72U	5.26	4.89J	93		5.28	4.81J	91		40-119	1.80	(< 20)
2,4,5-Trichlorophenol	3.72U	5.26	4.81J	91		5.28	4.84J	92		41-124	0.88	(< 20)
2,4,6-Trichlorophenol	3.72U	5.26	4.98J	95		5.28	5.36J	102		39-126	7.50	(< 20)
2,4-Dichlorophenol	3.72U	5.26	5.19J	99		5.28	5.23J	99		40-122	0.84	(< 20)
2,4-Dimethylphenol	3.72U	5.26	4.89J	93		5.28	5.11J	97		30-127	4.30	(< 20)
2,4-Dinitrophenol	44.6U	9.46	44.6U	0	*	9.50	44.6U	0	*	62-113	0.00	(< 20)
2,4-Dinitrotoluene	3.72U	5.26	4.53J	86		5.28	4.17J	79		48-126	8.10	(< 20)
2,6-Dichlorophenol	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	41-117	0.00	(< 20)
2,6-Dinitrotoluene	3.72U	5.26	5.29J	101		5.28	5.20J	99		46-124	1.70	(< 20)
2-Chloronaphthalene	3.72U	5.26	4.55J	86		5.28	4.33J	82		41-114	4.70	(< 20)
2-Chlorophenol	3.72U	5.26	4.45J	85		5.28	4.44J	84		34-121	0.26	(< 20)
2-Methyl-4,6-dinitrophenol	29.8U	9.46	29.8U	0	*	9.50	29.8U	0	*	29-132	0.00	(< 20)
2-Methylnaphthalene	3.72U	5.26	4.29J	82		5.28	4.16J	79		38-122	3.10	(< 20)
2-Methylphenol (o-Cresol)	3.72U	5.26	4.41J	84		5.28	4.41J	84		32-122	0.03	(< 20)
2-Nitroaniline	3.72U	5.26	5.66J	108		5.28	5.33J	101		44-127	5.90	(< 20)
2-Nitrophenol	3.72U	5.26	5.25J	100		5.28	5.28J	100		36-123	0.33	(< 20)
3&4-Methylphenol (p&m-Cresol)	14.9U	7.36	14.9U	0	*	7.38	14.9U	0	*	34-119	0.00	(< 20)
3,3-Dichlorobenzidine	7.45U	5.26	5.28J	100		5.28	5.33J	101		22-121	1.10	(< 20)
3-Nitroaniline	7.45U	5.26	5.29J	101		5.28	5.36J	102		33-119	1.30	(< 20)
4-Bromophenyl-phenylether	3.72U	5.26	5.67J	108		5.28	5.25J	100		46-124	7.60	(< 20)
4-Chloro-3-methylphenol	3.72U	5.26	4.92J	93		5.28	5.08J	96		45-122	3.50	(< 20)
4-Chloroaniline	14.9U	5.26	14.9U	0	*	5.28	14.9U	0	*	17-106	0.00	(< 20)
4-Chlorophenyl-phenylether	3.72U	5.26	5.12J	97		5.28	4.90J	93		45-121	4.40	(< 20)
4-Nitroaniline	44.6U	5.26	44.6U	0	*	5.28	44.6U	0	*	77-120	0.00	(< 20)
4-Nitrophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	30-132	0.00	(< 20)
Acenaphthene	3.72U	5.26	5.31J	101		5.28	5.24J	99		40-123	1.20	(< 20)
Acenaphthylene	3.72U	5.26	5.37J	102		5.28	5.36J	102		32-132	0.16	(< 20)
Aniline	29.8U	5.26	29.8U	0	*	5.28	29.8U	0	*	24-89	0.00	(< 20)
Anthracene	3.72U	5.26	5.38J	102		5.28	5.22J	99		47-123	3.10	(< 20)
Azobenzene	3.72U	5.26	5.77J	110		5.28	5.85J	111		39-125	1.50	(< 20)
Benzo(a)Anthracene	3.72U	5.26	5.10J	97		5.28	5.28J	100		49-126	3.40	(< 20)
Benzo[a]pyrene	3.72U	5.26	4.80J	91		5.28	4.77J	90		45-129	0.50	(< 20)

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzo[b]Fluoranthene	3.72U	5.26	4.92J	93		5.28	4.76J	90		45-132	3.20	(< 20)
Benzo[g,h,i]perylene	3.72U	5.26	5.44J	103		5.28	5.25J	100		43-134	3.40	(< 20)
Benzo[k]fluoranthene	3.72U	5.26	5.06J	96		5.28	5.20J	99		47-132	2.90	(< 20)
Benzoic acid	22.3U	7.36	22.3U	0	*	7.38	22.3U	0	*	53-124	0.00	(< 20)
Benzyl alcohol	3.72U	5.26	3.88J	74		5.28	3.84J	73		29-122	1.00	(< 20)
Bis(2chloro1methylethyl)Ether	3.72U	5.26	3.95J	75		5.28	4.20J	80		33-131	6.10	(< 20)
Bis(2-Chloroethoxy)methane	3.72U	5.26	5.06J	96		5.28	4.90J	93		36-121	3.10	(< 20)
Bis(2-Chloroethyl)ether	3.72U	5.26	4.06J	77		5.28	4.13J	78		31-120	1.60	(< 20)
bis(2-Ethylhexyl)phthalate	3.72U	5.26	6.42J	122		5.28	6.59J	125		51-133	2.60	(< 20)
Butylbenzylphthalate	3.72U	5.26	6.32J	120		5.28	5.69J	108		48-132	10.40	(< 20)
Carbazole	3.72U	5.26	6.02J	114		5.28	5.83J	110		50-123	3.20	(< 20)
Chrysene	3.72U	5.26	5.49J	104		5.28	5.42J	103		50-124	1.40	(< 20)
Dibenzo[a,h]anthracene	3.72U	5.26	5.39J	103		5.28	5.71J	108		45-134	5.50	(< 20)
Dibenzofuran	3.72U	5.26	4.59J	87		5.28	4.44J	84		44-120	3.50	(< 20)
Diethylphthalate	3.72U	5.26	5.50J	105		5.28	5.44J	103		50-124	1.10	(< 20)
Dimethylphthalate	3.72U	5.26	5.94J	113		5.28	6.02J	114		48-124	1.20	(< 20)
Di-n-butylphthalate	3.72U	5.26	5.94J	113		5.28	5.75J	109		51-128	3.30	(< 20)
di-n-Octylphthalate	7.45U	5.26	8.15J	155	*	5.28	7.78J	147	*	45-140	4.60	(< 20)
Fluoranthene	3.72U	5.26	4.55J	86		5.28	4.43J	84		50-127	2.60	(< 20)
Fluorene	3.72U	5.26	5.28J	100		5.28	5.20J	99		43-125	1.40	(< 20)
Hexachlorobenzene	3.72U	5.26	4.59J	87		5.28	4.26J	81		45-122	7.70	(< 20)
Hexachlorobutadiene	3.72U	5.26	4.47J	85		5.28	4.53J	86		32-123	1.20	(< 20)
Hexachlorocyclopentadiene	10.4U	5.26	10.4U	0	*	5.28	10.4U	0	*	34-74	0.00	(< 20)
Hexachloroethane	3.72U	5.26	3.68J	70		5.28	3.88J	73		28-117	4.90	(< 20)
Indeno[1,2,3-c,d] pyrene	3.72U	5.26	5.31J	101		5.28	5.28J	100		45-133	0.66	(< 20)
Isophorone	3.72U	5.26	4.87J	93		5.28	4.58J	87		30-122	6.10	(< 20)
Naphthalene	3.72U	5.26	5.14J	98		5.28	5.05J	96		35-123	2.00	(< 20)
Nitrobenzene	3.72U	5.26	4.29J	82		5.28	4.14J	78		34-122	3.70	(< 20)
N-Nitrosodimethylamine	3.72U	5.26	3.79J	72		5.28	3.54J	67		23-120	6.80	(< 20)
N-Nitroso-di-n-propylamine	3.72U	5.26	4.94J	94		5.28	4.95J	94		36-120	0.33	(< 20)
N-Nitrosodiphenylamine	3.72U	5.26	5.01J	95		5.28	5.18J	98		38-127	3.20	(< 20)
Pentachlorophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	25-133	0.00	(< 20)
Phenanthrene	3.72U	5.26	5.37J	102		5.28	5.28J	100		50-121	1.90	(< 20)
Phenol	3.72U	5.26	4.38J	83		5.28	4.39J	83		34-121	0.33	(< 20)
Pyrene	3.72U	5.26	4.98J	95		5.28	5.08J	96		47-127	2.20	(< 20)
Surrogates												
2,4,6-Tribromophenol (surr)		10.5	10.2	97		10.6	10.9	104		35-125	6.40	

Print Date: 12/13/2019 3:40:57PM

Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date:
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
2-Fluorobiphenyl (surr)		5.26	5.56	106	5.28	5.45	103	44-115	2.10	
2-Fluorophenol (surr)		10.5	8.03	76	10.6	7.36	70	35-115	8.70	
Nitrobenzene-d5 (surr)		5.26	4.86	92	5.28	4.81	91	37-122	1.00	
Phenol-d6 (surr)		10.5	9.45	90	10.6	9.31	88	33-122	1.60	
Terphenyl-d14 (surr)		5.26	4.86	92	5.28	5.19	98	54-127	6.60	

Batch Information

Analytical Batch: XMS11889
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/11/2019 3:37:00PM

Prep Batch: XXX42629
Prep Method: Sonication Extraction Soil SW8270
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.75g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:40:57PM

Method Blank

Blank ID: MB for HBN 1802613 [XXX/42632]
Blank Lab ID: 1545124

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW8082A**

Parameter	Results	LOQ/CL	DL	Units
Aroclor-1016	25.0U	50.0	12.5	ug/Kg
Aroclor-1221	50.0U	100	25.0	ug/Kg
Aroclor-1232	25.0U	50.0	12.5	ug/Kg
Aroclor-1242	25.0U	50.0	12.5	ug/Kg
Aroclor-1248	25.0U	50.0	12.5	ug/Kg
Aroclor-1254	25.0U	50.0	12.5	ug/Kg
Aroclor-1260	25.0U	50.0	12.5	ug/Kg
Surrogates				
Decachlorobiphenyl (surr)	110	60-125		%

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 12:07:00PM

Prep Batch: XXX42632
Prep Method: SW3550C
Prep Date/Time: 11/27/2019 10:48:22AM
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 1196897 [XXX42632]
Blank Spike Lab ID: 1545125
Date Analyzed: 12/03/2019 12:17

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW8082A**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Aroclor-1016	222	198	89	(47-134)
Aroclor-1260	222	235	106	(53-140)
Surrogates				
Decachlorobiphenyl (surr)	222	112	112	(60-125)

Batch Information

Analytical Batch: **XGC10544**
Analytical Method: **SW8082A**
Instrument: **Agilent 7890B GC ECD SW F**
Analyst: **BMZ**

Prep Batch: **XXX42632**
Prep Method: **SW3550C**
Prep Date/Time: **11/27/2019 10:48**
Spike Init Wt./Vol.: 222 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196876010
MS Sample ID: 1545126 MS
MSD Sample ID: 1545127 MSD

QC for Samples: 1196897008

Analysis Date: 12/03/2019 13:09
Analysis Date: 12/03/2019 13:19
Analysis Date: 12/03/2019 13:29
Matrix: Soil/Solid (dry weight)

Results by **SW8082A**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Aroclor-1016	25.8U	229	251	110	228	253	111	47-134	0.56	(< 30)
Aroclor-1260	25.8U	229	227	99	228	226	99	53-140	0.65	(< 30)
Surrogates										
Decachlorobiphenyl (surr)		229	241	105	228	237	104	60-125	1.40	

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 1:19:00PM

Prep Batch: XXX42632
Prep Method: Sonication Extraction Soil SW8082 PCB
Prep Date/Time: 11/27/2019 10:48:22AM
Prep Initial Wt./Vol.: 22.63g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:41:02PM

SGS

1196897

North America Inc.
F CUSTODY RECORD

Profile: 334945

Locations Nationwide
Alaska Maryland
Revised Report - Revision 2
New Jersey New York
North Carolina Indiana
West Virgina Kentucky
www.us.sgs.com

Section 1

CLIENT: Golder Associates

CONTACT: Jessa Karp PHONE NO:

PROJECT NAME: ARRC Depot Dr. Drilling Samples PROJECT/ PWSID/ PERMIT#:

REPORTS TO: E-MAIL: jkarp@golder.com

INVOICE TO: Golder Associates QUOTE #:

P.O. #: 19132189

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 3

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: MeOH+BF / B	GRO (AK101) VOC (SW8260C)	DRO/RRO (AK102/103)	SVOC (SW8270D)	PCBs (SW8082A) Lead (SW6020)	REMARKS/ LOC ID
1AB	BH-01	11/14/19	9:15		2		X	X	X			
2AB	BH-02	11/14/19	12:30		2		X	X	X			
3AB	BH-03A	11/15/19	9:15		2		X	X	X			
4AB	BH-03A-1	11/15/19	9:15		2		X	X	X			
5AB	BH-04	11/14/19	15:00		2		X	X	X			
6AB	BH-05	11/14/19	13:45		2		X	X	X			
7AB	BH-05-1	11/14/19	13:45		2		X	X	X			
8AB	Composit	11/15/19	9:30		2	C	X	X	X	X		
9AB	PW7-25-11				2		X	X	X	X		Trip Blank

Section 5

	Date	Time	
Relinquished By: (1) Jessa Karp	11/15/19	16:00	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received For Laboratory By: 11/15/19 16:00

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 2.7° D63

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

SGS

Returned Bottles Inventory

Name of individual returning bottles: Jessa Karp

Date Received: 11/13/19

Client Name: Golder Associates

Received by:

Project Name: ARRC Depot Dr. Drilling Samples

SGS PM:

HDPE/Nalgene:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz					
	60-ml or 2-oz					
	other					
amber glass:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz with or without septa	10				
	40-ml VOA vial	12				
	other					
Subtotal:		22				

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted.***

Amount to Invoice Client $: 88

W

1196897

SGS

e-Sample Receipt Form

Revised Report - Revision 2

SGS Workorder #: **1196897**

1196897

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 2.2 °C Therm. ID: D63
		Cooler ID: @ °C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify 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.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	**Trip Blanks 9A-B were scheudled with PCB, DRO/RRO, and Lead 6020. Proceeding with GRO & VOC.**
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+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
1196897001-A	No Preservative Required	OK			
1196897001-B	Methanol field pres. 4 C	OK			
1196897002-A	No Preservative Required	OK			
1196897002-B	Methanol field pres. 4 C	OK			
1196897003-A	No Preservative Required	OK			
1196897003-B	Methanol field pres. 4 C	OK			
1196897004-A	No Preservative Required	OK			
1196897004-B	Methanol field pres. 4 C	OK			
1196897005-A	No Preservative Required	OK			
1196897005-B	Methanol field pres. 4 C	OK			
1196897006-A	No Preservative Required	OK			
1196897006-B	Methanol field pres. 4 C	OK			
1196897007-A	No Preservative Required	OK			
1196897007-B	Methanol field pres. 4 C	OK			
1196897008-A	No Preservative Required	OK			
1196897008-B	Methanol field pres. 4 C	OK			
1196897009-A	Methanol field pres. 4 C	OK			
1196897009-B	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.

Laboratory Report of Analysis

To: Golder Associates Inc.
2121 Abbott Road, #100
Anchorage, AK 99507
(907)344-6001

Report Number: **1196897**

Client Project: **ARRC DEPOT DR. Drilling Sample**

Dear Chris Valentine,

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

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Golder Associates Inc.**
SGS Project: **1196897**
Project Name/Site: **ARRC DEPOT DR. Drilling Sample**
Project Contact: **Chris Valentine**

Refer to sample receipt form for information on sample condition.

LCS for HBN 1802587 [XXX/42629 (1545011) LCS

8270D - LCS recovery for 2,4-dinitrophenol does not meet QC criteria. The associated sample concentrations for this analyte are less than the LOQ.
8270D - LCS recovery for aniline does not meet QC criteria.

1196897001MS (1544068) MS

8260C - MS recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MS (1545012) MS

8270D - MS recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1196897001MSD (1544069) MSD

8260C - MSD recovery for hexachlorobutadiene does not meet QC criteria. See LCS for accuracy requirements.

1196867001MSD (1545013) MSD

8270D - MSD recoveries for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
8270D - MSD RPD for 4-chloroaniline does not meet QC criteria. Results for this analyte are less than the LOQ in the parent sample.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8082A				
1545125	LCS for HBN 1802613 [XXX/42632	XGC10544	Aroclor-1016	BLC, SP
1545127	1196876010MSD	XGC10544	Aroclor-1016	SP
SW8260C				
1196897005	BH-04	VMS19671	4-Isopropyltoluene	SP
1196897005	BH-04	VMS19671	Naphthalene	SP
SW8270D				
1545011	LCS for HBN 1802587 [XXX/42629	XMS11885	1-Chloronaphthalene	SP
1545012	1196867001MS	XMS11889	1-Chloronaphthalene	SP
1545013	1196867001MSD	XMS11889	1,4-Dichlorobenzene	RP
1545013	1196867001MSD	XMS11889	1-Chloronaphthalene	SP

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.

Print Date: 12/13/2019 3:40:05PM

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, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 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
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
BH-03A-1	1196897004	11/15/2019	11/15/2019	Soil/Solid (dry weight)

Method	Method Description
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SW6020A	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW8082A	SW8082 PCB's
SW8270D	SW846 8270 Semi-Volatiles by GC/MS (S)
SW8260C	VOC 8260 (S) Field Extracted

SGS North America Inc.
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Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	23.1		20.9	6.49	mg/Kg	1		11/21/19 19:29
Surrogates								
5a Androstane (surr)	110		50-150		%	1		11/21/19 19:29

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/21/19 19:29
Container ID: 1196897004-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.072 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	39.6		20.9	6.49	mg/Kg	1		11/21/19 19:29
Surrogates								
n-Triacontane-d62 (surr)	103		50-150		%	1		11/21/19 19:29

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Analyst: DSD
Analytical Date/Time: 11/21/19 19:29
Container ID: 1196897004-A

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/19 09:06
Prep Initial Wt./Vol.: 30.072 g
Prep Extract Vol: 5 mL

Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
1,2-Dichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
1,3-Dichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
1,4-Dichlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
1-Chloronaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
1-Methylnaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2,4,5-Trichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2,4,6-Trichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2,4-Dichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2,4-Dimethylphenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2,4-Dinitrophenol	1.56	U	3.12	0.978	mg/Kg	1		12/09/19 18:29
2,4-Dinitrotoluene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2,6-Dichlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2,6-Dinitrotoluene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2-Chloronaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2-Chlorophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2-Methyl-4,6-dinitrophenol	1.04	U	2.08	0.645	mg/Kg	1		12/09/19 18:29
2-Methylnaphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2-Methylphenol (o-Cresol)	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2-Nitroaniline	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
2-Nitrophenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
3&4-Methylphenol (p&m-Cresol)	0.520	U	1.04	0.323	mg/Kg	1		12/09/19 18:29
3,3-Dichlorobenzidine	0.260	U	0.520	0.156	mg/Kg	1		12/09/19 18:29
3-Nitroaniline	0.260	U	0.520	0.156	mg/Kg	1		12/09/19 18:29
4-Bromophenyl-phenylether	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
4-Chloro-3-methylphenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
4-Chloroaniline	0.520	U	1.04	0.323	mg/Kg	1		12/09/19 18:29
4-Chlorophenyl-phenylether	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
4-Nitroaniline	1.56	U	3.12	0.978	mg/Kg	1		12/09/19 18:29
4-Nitrophenol	1.04	U	2.08	0.645	mg/Kg	1		12/09/19 18:29
Acenaphthene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Acenaphthylene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Aniline	1.04	U	2.08	0.645	mg/Kg	1		12/09/19 18:29
Anthracene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Azobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Benzo(a)Anthracene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Benzo[a]pyrene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Benzo[g,h,i]perylene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Benzo[k]fluoranthene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Benzoic acid	0.780	U	1.56	0.489	mg/Kg	1		12/09/19 18:29
Benzyl alcohol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Bis(2chloro1methylethyl)Ether	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Bis(2-Chloroethoxy)methane	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Bis(2-Chloroethyl)ether	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
bis(2-Ethylhexyl)phthalate	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Butylbenzylphthalate	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Carbazole	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Chrysene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Dibenzo[a,h]anthracene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Dibenzofuran	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Diethylphthalate	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Dimethylphthalate	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Di-n-butylphthalate	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
di-n-Octylphthalate	0.260	U	0.520	0.156	mg/Kg	1		12/09/19 18:29
Fluoranthene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Fluorene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Hexachlorobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Hexachlorobutadiene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Hexachlorocyclopentadiene	0.364	U	0.729	0.208	mg/Kg	1		12/09/19 18:29
Hexachloroethane	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Indeno[1,2,3-c,d] pyrene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Isophorone	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Naphthalene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Nitrobenzene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
N-Nitrosodimethylamine	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
N-Nitroso-di-n-propylamine	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
N-Nitrosodiphenylamine	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Pentachlorophenol	1.04	U	2.08	0.645	mg/Kg	1		12/09/19 18:29
Phenanthrene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Phenol	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29
Pyrene	0.130	U	0.260	0.0812	mg/Kg	1		12/09/19 18:29

Surrogates

Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Semivolatile Organics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol (surr)	92.8		35-125		%	1		12/09/19 18:29
2-Fluorobiphenyl (surr)	71.8		44-115		%	1		12/09/19 18:29
2-Fluorophenol (surr)	57.5		35-115		%	1		12/09/19 18:29
Nitrobenzene-d5 (surr)	59.9		37-122		%	1		12/09/19 18:29
Phenol-d6 (surr)	66.7		33-122		%	1		12/09/19 18:29
Terphenyl-d14 (surr)	94.9		54-127		%	1		12/09/19 18:29

Batch Information

Analytical Batch: XMS11885
Analytical Method: SW8270D
Analyst: JMG
Analytical Date/Time: 12/09/19 18:29
Container ID: 1196897004-A

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/19 14:52
Prep Initial Wt./Vol.: 22.683 g
Prep Extract Vol: 1 mL

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Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.975	U	1.95	0.585	mg/Kg	1		11/18/19 20:40
Surrogates								
4-Bromofluorobenzene (surr)	102		50-150		%	1		11/18/19 20:40

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/18/19 20:40
Container ID: 1196897004-B

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/15/19 09:15
Prep Initial Wt./Vol.: 76.933 g
Prep Extract Vol: 28.6119 mL

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Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	7.80 U		15.6	4.84	ug/Kg	1		11/16/19 20:10
1,1,1-Trichloroethane	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,1,2,2-Tetrachloroethane	0.780 U		1.56	0.484	ug/Kg	1		11/16/19 20:10
1,1,2-Trichloroethane	0.312 U		0.624	0.195	ug/Kg	1		11/16/19 20:10
1,1-Dichloroethane	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,1-Dichloroethene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,1-Dichloropropene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,2,3-Trichlorobenzene	19.5 U		39.0	11.7	ug/Kg	1		11/16/19 20:10
1,2,3-Trichloropropane	0.780 U		1.56	0.484	ug/Kg	1		11/16/19 20:10
1,2,4-Trichlorobenzene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,2,4-Trimethylbenzene	19.5 U		39.0	11.7	ug/Kg	1		11/16/19 20:10
1,2-Dibromo-3-chloropropane	39.0 U		78.0	24.2	ug/Kg	1		11/16/19 20:10
1,2-Dibromoethane	0.390 U		0.780	0.242	ug/Kg	1		11/16/19 20:10
1,2-Dichlorobenzene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,2-Dichloroethane	0.780 U		1.56	0.484	ug/Kg	1		11/16/19 20:10
1,2-Dichloropropane	3.90 U		7.80	2.42	ug/Kg	1		11/16/19 20:10
1,3,5-Trimethylbenzene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,3-Dichlorobenzene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
1,3-Dichloropropane	3.90 U		7.80	2.42	ug/Kg	1		11/16/19 20:10
1,4-Dichlorobenzene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
2,2-Dichloropropane	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
2-Butanone (MEK)	97.5 U		195	60.9	ug/Kg	1		11/16/19 20:10
2-Chlorotoluene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
2-Hexanone	39.0 U		78.0	24.2	ug/Kg	1		11/16/19 20:10
4-Chlorotoluene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
4-Isopropyltoluene	39.0 U		78.0	19.5	ug/Kg	1		11/16/19 20:10
4-Methyl-2-pentanone (MIBK)	97.5 U		195	60.9	ug/Kg	1		11/16/19 20:10
Acetone	97.5 U		195	60.9	ug/Kg	1		11/16/19 20:10
Benzene	4.88 U		9.76	3.04	ug/Kg	1		11/16/19 20:10
Bromobenzene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
Bromochloromethane	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
Bromodichloromethane	0.780 U		1.56	0.484	ug/Kg	1		11/16/19 20:10
Bromoform	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10
Bromomethane	7.80 U		15.6	4.84	ug/Kg	1		11/16/19 20:10
Carbon disulfide	39.0 U		78.0	24.2	ug/Kg	1		11/16/19 20:10
Carbon tetrachloride	4.88 U		9.76	3.04	ug/Kg	1		11/16/19 20:10
Chlorobenzene	9.75 U		19.5	6.09	ug/Kg	1		11/16/19 20:10

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	78.0	U	156	48.4	ug/Kg	1		11/16/19 20:10
Chloroform	0.780	U	1.56	0.484	ug/Kg	1		11/16/19 20:10
Chloromethane	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
cis-1,2-Dichloroethene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
cis-1,3-Dichloropropene	4.88	U	9.76	3.04	ug/Kg	1		11/16/19 20:10
Dibromochloromethane	0.780	U	1.56	0.484	ug/Kg	1		11/16/19 20:10
Dibromomethane	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
Dichlorodifluoromethane	19.5	U	39.0	11.7	ug/Kg	1		11/16/19 20:10
Ethylbenzene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
Freon-113	39.0	U	78.0	24.2	ug/Kg	1		11/16/19 20:10
Hexachlorobutadiene	7.80	U	15.6	4.84	ug/Kg	1		11/16/19 20:10
Isopropylbenzene (Cumene)	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
Methylene chloride	39.0	U	78.0	24.2	ug/Kg	1		11/16/19 20:10
Methyl-t-butyl ether	39.0	U	78.0	24.2	ug/Kg	1		11/16/19 20:10
Naphthalene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
n-Butylbenzene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
n-Propylbenzene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
o-Xylene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
P & M -Xylene	19.5	U	39.0	11.7	ug/Kg	1		11/16/19 20:10
sec-Butylbenzene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
Styrene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
tert-Butylbenzene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
Tetrachloroethene	4.88	U	9.76	3.04	ug/Kg	1		11/16/19 20:10
Toluene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
trans-1,2-Dichloroethene	9.75	U	19.5	6.09	ug/Kg	1		11/16/19 20:10
trans-1,3-Dichloropropene	4.88	U	9.76	3.04	ug/Kg	1		11/16/19 20:10
Trichloroethene	1.95	U	3.90	1.17	ug/Kg	1		11/16/19 20:10
Trichlorofluoromethane	19.5	U	39.0	11.7	ug/Kg	1		11/16/19 20:10
Vinyl acetate	39.0	U	78.0	24.2	ug/Kg	1		11/16/19 20:10
Vinyl chloride	0.312	U	0.624	0.195	ug/Kg	1		11/16/19 20:10
Xylenes (total)	29.3	U	58.5	17.8	ug/Kg	1		11/16/19 20:10
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		71-136		%	1		11/16/19 20:10
4-Bromofluorobenzene (surr)	105		55-151		%	1		11/16/19 20:10
Toluene-d8 (surr)	97		85-116		%	1		11/16/19 20:10

Print Date: 12/13/2019 3:40:12PM

J flagging is activated

Results of **BH-03A-1**

Client Sample ID: **BH-03A-1**
Client Project ID: **ARRC DEPOT DR. Drilling Sample**
Lab Sample ID: 1196897004
Lab Project ID: 1196897

Collection Date: 11/15/19 09:15
Received Date: 11/15/19 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):95.3
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/16/19 20:10
Container ID: 1196897004-B

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/15/19 09:15
Prep Initial Wt./Vol.: 76.933 g
Prep Extract Vol: 28.6119 mL

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Method Blank

Blank ID: MB for HBN 1802379 [MXX/33000]
Blank Lab ID: 1544246

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW6020A**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.100U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:44:07PM

Prep Batch: MXX33000
Prep Method: SW3050B
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [MXX33000]
Blank Spike Lab ID: 1544247
Date Analyzed: 11/21/2019 18:48

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW6020A**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Lead	50	51.8	104	(84-118)

Batch Information

Analytical Batch: **MMS10690**
Analytical Method: **SW6020A**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **DMM**

Prep Batch: **MXX33000**
Prep Method: **SW3050B**
Prep Date/Time: **11/20/2019 11:25**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1544248
MS Sample ID: 1544254 MS
MSD Sample ID: 1544255 MSD

QC for Samples: 1196897008

Analysis Date: 11/21/2019 18:53
Analysis Date: 11/21/2019 18:58
Analysis Date: 11/21/2019 19:02
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	3.76	46.9	50.6	100	46.5	45.9	91	84-118	9.92	(< 20)

Batch Information

Analytical Batch: MMS10690
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/21/2019 6:58:12PM

Prep Batch: MXX33000
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 11/20/2019 11:25:30AM
Prep Initial Wt./Vol.: 1.07g
Prep Extract Vol: 50.00mL

Print Date: 12/13/2019 3:40:22PM

Method Blank

Blank ID: MB for HBN 1802346 [SPT/10940]
Blank Lab ID: 1544092

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A
Analytical Date/Time: 11/18/2019 5:09:00PM

Print Date: 12/13/2019 3:40:23PM

Duplicate Sample Summary

Original Sample ID: 1196869007
Duplicate Sample ID: 1544093
Analysis Date: 11/18/2019 17:09
Matrix: Soil/Solid (dry weight)

QC for Samples:

1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	94.3	94.5	%	0.23	(< 15)

Batch Information

Analytical Batch: SPT10940
Analytical Method: SM21 2540G
Instrument:
Analyst: A.A

Print Date: 12/13/2019 3:40:25PM

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

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	0.400U	0.800	0.250	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	25.0U	50.0	15.0	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	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	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	50.0U	100	31.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	50.0U	100	25.0	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Acetone	125U	250	78.0	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	6.20	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

Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloroform	1.00U	2.00	0.620	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	1.00U	2.00	0.620	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	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	2.50U	5.00	1.50	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)	102	71-136		%
4-Bromofluorobenzene (surr)	101	55-151		%
Toluene-d8 (surr)	97	85-116		%

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Method Blank

Blank ID: MB for HBN 1802332 [VXX/35248]
Blank Lab ID: 1544066

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 3:23:00PM

Prep Batch: VXX35248
Prep Method: SW5035A
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 12/13/2019 3:40:29PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	726	97	(78-125)
1,1,1-Trichloroethane	750	768	102	(73-130)
1,1,2,2-Tetrachloroethane	750	751	100	(70-124)
1,1,2-Trichloroethane	750	737	98	(78-121)
1,1-Dichloroethane	750	707	94	(76-125)
1,1-Dichloroethene	750	691	92	(70-131)
1,1-Dichloropropene	750	833	111	(76-125)
1,2,3-Trichlorobenzene	750	788	105	(66-130)
1,2,3-Trichloropropane	750	726	97	(73-125)
1,2,4-Trichlorobenzene	750	805	107	(67-129)
1,2,4-Trimethylbenzene	750	781	104	(75-123)
1,2-Dibromo-3-chloropropane	750	732	98	(61-132)
1,2-Dibromoethane	750	737	98	(78-122)
1,2-Dichlorobenzene	750	763	102	(78-121)
1,2-Dichloroethane	750	701	93	(73-128)
1,2-Dichloropropane	750	814	108	(76-123)
1,3,5-Trimethylbenzene	750	786	105	(73-124)
1,3-Dichlorobenzene	750	760	101	(77-121)
1,3-Dichloropropane	750	728	97	(77-121)
1,4-Dichlorobenzene	750	764	102	(75-120)
2,2-Dichloropropane	750	751	100	(67-133)
2-Butanone (MEK)	2250	2340	104	(51-148)
2-Chlorotoluene	750	761	101	(75-122)
2-Hexanone	2250	2360	105	(53-145)
4-Chlorotoluene	750	755	101	(72-124)
4-Isopropyltoluene	750	822	110	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2200	98	(65-135)
Acetone	2250	1920	85	(36-164)
Benzene	750	779	104	(77-121)
Bromobenzene	750	754	101	(78-121)
Bromochloromethane	750	690	92	(78-125)
Bromodichloromethane	750	812	108	(75-127)
Bromoform	750	733	98	(67-132)
Bromomethane	750	650	87	(53-143)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon disulfide	1130	1030	91	(63-132)
Carbon tetrachloride	750	787	105	(70-135)
Chlorobenzene	750	770	103	(79-120)
Chloroethane	750	734	98	(59-139)
Chloroform	750	707	94	(78-123)
Chloromethane	750	717	96	(50-136)
cis-1,2-Dichloroethene	750	734	98	(77-123)
cis-1,3-Dichloropropene	750	733	98	(74-126)
Dibromochloromethane	750	745	99	(74-126)
Dibromomethane	750	725	97	(78-125)
Dichlorodifluoromethane	750	707	94	(29-149)
Ethylbenzene	750	776	104	(76-122)
Freon-113	1130	1070	95	(66-136)
Hexachlorobutadiene	750	853	114	(61-135)
Isopropylbenzene (Cumene)	750	806	107	(68-134)
Methylene chloride	750	695	93	(70-128)
Methyl-t-butyl ether	1130	1180	105	(73-125)
Naphthalene	750	761	101	(62-129)
n-Butylbenzene	750	840	112	(70-128)
n-Propylbenzene	750	783	104	(73-125)
o-Xylene	750	785	105	(77-123)
P & M -Xylene	1500	1570	105	(77-124)
sec-Butylbenzene	750	810	108	(73-126)
Styrene	750	795	106	(76-124)
tert-Butylbenzene	750	790	105	(73-125)
Tetrachloroethene	750	804	107	(73-128)
Toluene	750	767	102	(77-121)
trans-1,2-Dichloroethene	750	716	96	(74-125)
trans-1,3-Dichloropropene	750	734	98	(71-130)
Trichloroethene	750	733	98	(77-123)
Trichlorofluoromethane	750	715	95	(62-140)
Vinyl acetate	750	756	101	(50-151)
Vinyl chloride	750	695	93	(56-135)
Xylenes (total)	2250	2350	105	(78-124)

Print Date: 12/13/2019 3:40:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35248]
Blank Spike Lab ID: 1544067
Date Analyzed: 11/16/2019 15:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	94.1	94	(71-136)
4-Bromofluorobenzene (surr)	750	91.2	91	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS19671**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **KAJ**

Prep Batch: **VXX35248**
Prep Method: **SW5035A**
Prep Date/Time: **11/16/2019 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		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	8.05U	525	480	91	525	528	101	78-125	9.60	(< 20)
1,1,1-Trichloroethane	10.1U	525	539	103	525	546	104	73-130	1.30	(< 20)
1,1,2,2-Tetrachloroethane	0.805U	525	508	97	525	554	105	70-124	8.40	(< 20)
1,1,2-Trichloroethane	0.321U	525	513	98	525	563	107	78-121	9.50	(< 20)
1,1-Dichloroethane	10.1U	525	487	93	525	498	95	76-125	2.10	(< 20)
1,1-Dichloroethene	10.1U	525	486	93	525	488	93	70-131	0.29	(< 20)
1,1-Dichloropropene	10.1U	525	572	109	525	591	113	76-125	3.40	(< 20)
1,2,3-Trichlorobenzene	20.1U	525	568	108	525	682	130	66-130	18.10	(< 20)
1,2,3-Trichloropropane	0.805U	525	502	96	525	550	105	73-125	9.10	(< 20)
1,2,4-Trichlorobenzene	10.1U	525	564	107	525	651	124	67-129	14.30	(< 20)
1,2,4-Trimethylbenzene	79.3	525	596	98	525	647	108	75-123	8.20	(< 20)
1,2-Dibromo-3-chloropropane	40.1U	525	504	96	525	555	105	61-132	9.50	(< 20)
1,2-Dibromoethane	0.402U	525	495	94	525	538	102	78-122	8.40	(< 20)
1,2-Dichlorobenzene	10.1U	525	513	98	525	553	105	78-121	7.50	(< 20)
1,2-Dichloroethane	0.805U	525	483	92	525	497	95	73-128	2.70	(< 20)
1,2-Dichloropropane	4.01U	525	555	106	525	586	111	76-123	5.50	(< 20)
1,3,5-Trimethylbenzene	12.2J	525	541	101	525	598	111	73-124	9.90	(< 20)
1,3-Dichlorobenzene	10.1U	525	514	98	525	547	104	77-121	6.20	(< 20)
1,3-Dichloropropane	4.01U	525	488	93	525	533	101	77-121	8.70	(< 20)
1,4-Dichlorobenzene	10.1U	525	512	97	525	557	106	75-120	8.30	(< 20)
2,2-Dichloropropane	10.1U	525	536	102	525	546	104	67-133	2.00	(< 20)
2-Butanone (MEK)	101U	1576	1681	106	1576	1859	118	51-148	10.30	(< 20)
2-Chlorotoluene	10.1U	525	515	98	525	553	105	75-122	7.00	(< 20)
2-Hexanone	40.1U	1576	1565	99	1576	1744	111	53-145	10.80	(< 20)
4-Chlorotoluene	10.1U	525	513	98	525	549	104	72-124	6.90	(< 20)
4-Isopropyltoluene	49.8J	525	592	103	525	636	111	73-127	7.10	(< 20)
4-Methyl-2-pentanone (MIBK)	101U	1576	1471	93	1576	1607	102	65-135	9.10	(< 20)
Acetone	101U	1576	1408	89	1576	1534	97	36-164	8.70	(< 20)
Benzene	18.5	525	527	97	525	567	104	77-121	7.40	(< 20)
Bromobenzene	10.1U	525	503	96	525	532	101	78-121	5.40	(< 20)
Bromochloromethane	10.1U	525	478	91	525	492	94	78-125	2.80	(< 20)
Bromodichloromethane	0.805U	525	562	107	525	581	110	75-127	3.30	(< 20)
Bromoform	10.1U	525	498	95	525	539	103	67-132	7.80	(< 20)
Bromomethane	8.05U	525	499	95	525	512	97	53-143	2.50	(< 20)
Carbon disulfide	40.1U	789	757	96	789	727	92	63-132	4.20	(< 20)
Carbon tetrachloride	5.00U	525	557	106	525	563	107	70-135	1.20	(< 20)
Chlorobenzene	10.1U	525	502	96	525	550	105	79-120	9.10	(< 20)

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date: 11/16/2019 19:22
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroethane	80.5U	525	613	117	525	503	96	59-139	19.60	(< 20)
Chloroform	0.805U	525	486	93	525	498	95	78-123	2.20	(< 20)
Chloromethane	10.1U	525	516	98	525	516	98	50-136	0.10	(< 20)
cis-1,2-Dichloroethene	10.1U	525	495	94	525	502	96	77-123	1.50	(< 20)
cis-1,3-Dichloropropene	5.00U	525	503	96	525	530	101	74-126	5.20	(< 20)
Dibromochloromethane	0.805U	525	502	96	525	545	104	74-126	8.20	(< 20)
Dibromomethane	10.1U	525	504	96	525	517	98	78-125	2.40	(< 20)
Dichlorodifluoromethane	20.1U	525	527	100	525	506	96	29-149	4.10	(< 20)
Ethylbenzene	37.9	525	528	93	525	581	103	76-122	9.50	(< 20)
Freon-113	40.1U	789	753	96	789	752	95	66-136	0.12	(< 20)
Hexachlorobutadiene	8.05U	525	854	162 *	525	837	159 *	61-135	1.90	(< 20)
Isopropylbenzene (Cumene)	12.4J	525	524	97	525	580	108	68-134	10.10	(< 20)
Methylene chloride	40.1U	525	457	87	525	477	91	70-128	4.30	(< 20)
Methyl-t-butyl ether	40.1U	789	795	101	789	857	109	73-125	7.50	(< 20)
Naphthalene	93.3	525	583	93	525	696	115	62-129	17.90	(< 20)
n-Butylbenzene	10.1U	525	582	111	525	620	118	70-128	6.20	(< 20)
n-Propylbenzene	8.63J	525	521	98	525	564	106	73-125	8.00	(< 20)
o-Xylene	107	525	607	95	525	650	103	77-123	6.80	(< 20)
P & M -Xylene	186	1050	1176	94	1050	1261	102	77-124	7.40	(< 20)
sec-Butylbenzene	10.1U	525	543	103	525	584	111	73-126	7.30	(< 20)
Styrene	10.1U	525	529	101	525	561	107	76-124	5.90	(< 20)
tert-Butylbenzene	10.1U	525	520	99	525	570	109	73-125	9.30	(< 20)
Tetrachloroethene	5.00U	525	516	98	525	576	109	73-128	10.80	(< 20)
Toluene	139	525	608	89	525	666	100	77-121	9.20	(< 20)
trans-1,2-Dichloroethene	10.1U	525	514	98	525	502	96	74-125	2.30	(< 20)
trans-1,3-Dichloropropene	5.00U	525	499	95	525	540	103	71-130	7.90	(< 20)
Trichloroethene	2.00U	525	492	93	525	520	99	77-123	5.60	(< 20)
Trichlorofluoromethane	20.1U	525	523	100	525	507	97	62-140	3.00	(< 20)
Vinyl acetate	40.1U	525	523	99	525	564	107	50-151	7.50	(< 20)
Vinyl chloride	0.321U	525	512	97	525	501	95	56-135	2.00	(< 20)
Xylenes (total)	293	1576	1775	94	1576	1912	103	78-124	7.20	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		525	511	97	525	492	94	71-136	3.60	
4-Bromofluorobenzene (surr)		876	593	68	876	629	72	55-151	5.80	
Toluene-d8 (surr)		525	524	100	525	528	101	85-116	0.87	

Print Date: 12/13/2019 3:40:34PM

Matrix Spike Summary

Original Sample ID: 1196897001
MS Sample ID: 1544068 MS
MSD Sample ID: 1544069 MSD

Analysis Date:
Analysis Date: 11/16/2019 17:43
Analysis Date: 11/16/2019 18:00
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS19671
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/16/2019 5:43:00PM

Prep Batch: VXX35248
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 11/16/2019 6:00:00AM
Prep Initial Wt./Vol.: 74.93g
Prep Extract Vol: 25.00mL

Print Date: 12/13/2019 3:40:34PM

Method Blank

Blank ID: MB for HBN 1802510 [VXX/35268]
Blank Lab ID: 1544772

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	75	50-150		%

Batch Information

Analytical Batch: VFC15044
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 11/18/2019 6:54:00PM

Prep Batch: VXX35268
Prep Method: SW5035A
Prep Date/Time: 11/18/2019 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [VXX35268]
Blank Spike Lab ID: 1544773
Date Analyzed: 11/18/2019 18:18

Spike Duplicate ID: LCSD for HBN 1196897 [VXX35268]
Spike Duplicate Lab ID: 1544774
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008, 1196897009

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	13.6	109	12.5	13.7	110	(60-120)	0.85	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	80.7	81	1.25	80.5	81	(50-150)	0.25	

Batch Information

Analytical Batch: **VFC15044**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX35268**
Prep Method: **SW5035A**
Prep Date/Time: **11/18/2019 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	8.65J	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	94	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	891	107	833	884	106	(75-125)	0.80	(< 20)
Surrogates									
5a Androstane (surr)	16.7	109	109	16.7	114	114	(60-120)	3.80	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802372 [XXX/42611]
Blank Lab ID: 1544214

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	8.16J	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62 (surr)	87.2	60-120		%

Batch Information

Analytical Batch: XFC15480
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/21/2019 3:28:00PM

Prep Batch: XXX42611
Prep Method: SW3550C
Prep Date/Time: 11/20/2019 9:06:20AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42611]
Blank Spike Lab ID: 1544215
Date Analyzed: 11/21/2019 16:08

Spike Duplicate ID: LCSD for HBN 1196897 [XXX42611]
Spike Duplicate Lab ID: 1544216
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

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	833	845	101	833	831	100	(60-120)	1.70	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	96.8	97	16.7	92.5	93	(60-120)	4.60	

Batch Information

Analytical Batch: **XFC15480**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42611**
Prep Method: **SW3550C**
Prep Date/Time: **11/20/2019 09:06**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,2-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,3-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1,4-Dichlorobenzene	0.125U	0.250	0.0780	mg/Kg
1-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
1-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2,4,5-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4,6-Trichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dimethylphenol	0.125U	0.250	0.0780	mg/Kg
2,4-Dinitrophenol	1.50U	3.00	0.940	mg/Kg
2,4-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2,6-Dichlorophenol	0.125U	0.250	0.0780	mg/Kg
2,6-Dinitrotoluene	0.125U	0.250	0.0780	mg/Kg
2-Chloronaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Chlorophenol	0.125U	0.250	0.0780	mg/Kg
2-Methyl-4,6-dinitrophenol	1.00U	2.00	0.620	mg/Kg
2-Methylnaphthalene	0.125U	0.250	0.0780	mg/Kg
2-Methylphenol (o-Cresol)	0.125U	0.250	0.0780	mg/Kg
2-Nitroaniline	0.125U	0.250	0.0780	mg/Kg
2-Nitrophenol	0.125U	0.250	0.0780	mg/Kg
3&4-Methylphenol (p&m-Cresol)	0.500U	1.00	0.310	mg/Kg
3,3-Dichlorobenzidine	0.250U	0.500	0.150	mg/Kg
3-Nitroaniline	0.250U	0.500	0.150	mg/Kg
4-Bromophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Chloro-3-methylphenol	0.125U	0.250	0.0780	mg/Kg
4-Chloroaniline	0.500U	1.00	0.310	mg/Kg
4-Chlorophenyl-phenylether	0.125U	0.250	0.0780	mg/Kg
4-Nitroaniline	1.50U	3.00	0.940	mg/Kg
4-Nitrophenol	1.00U	2.00	0.620	mg/Kg
Acenaphthene	0.125U	0.250	0.0780	mg/Kg
Acenaphthylene	0.125U	0.250	0.0780	mg/Kg
Aniline	1.00U	2.00	0.620	mg/Kg
Anthracene	0.125U	0.250	0.0780	mg/Kg
Azobenzene	0.125U	0.250	0.0780	mg/Kg
Benzo(a)Anthracene	0.125U	0.250	0.0780	mg/Kg
Benzo[a]pyrene	0.125U	0.250	0.0780	mg/Kg
Benzo[b]Fluoranthene	0.125U	0.250	0.0780	mg/Kg

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Benzo[g,h,i]perylene	0.125U	0.250	0.0780	mg/Kg
Benzo[k]fluoranthene	0.125U	0.250	0.0780	mg/Kg
Benzoic acid	0.750U	1.50	0.470	mg/Kg
Benzyl alcohol	0.125U	0.250	0.0780	mg/Kg
Bis(2chloro1methylethyl)Ether	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethoxy)methane	0.125U	0.250	0.0780	mg/Kg
Bis(2-Chloroethyl)ether	0.125U	0.250	0.0780	mg/Kg
bis(2-Ethylhexyl)phthalate	0.125U	0.250	0.0780	mg/Kg
Butylbenzylphthalate	0.125U	0.250	0.0780	mg/Kg
Carbazole	0.125U	0.250	0.0780	mg/Kg
Chrysene	0.125U	0.250	0.0780	mg/Kg
Dibenzo[a,h]anthracene	0.125U	0.250	0.0780	mg/Kg
Dibenzofuran	0.125U	0.250	0.0780	mg/Kg
Diethylphthalate	0.125U	0.250	0.0780	mg/Kg
Dimethylphthalate	0.125U	0.250	0.0780	mg/Kg
Di-n-butylphthalate	0.125U	0.250	0.0780	mg/Kg
di-n-Octylphthalate	0.250U	0.500	0.150	mg/Kg
Fluoranthene	0.125U	0.250	0.0780	mg/Kg
Fluorene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobenzene	0.125U	0.250	0.0780	mg/Kg
Hexachlorobutadiene	0.125U	0.250	0.0780	mg/Kg
Hexachlorocyclopentadiene	0.350U	0.700	0.200	mg/Kg
Hexachloroethane	0.125U	0.250	0.0780	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.125U	0.250	0.0780	mg/Kg
Isophorone	0.125U	0.250	0.0780	mg/Kg
Naphthalene	0.125U	0.250	0.0780	mg/Kg
Nitrobenzene	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodimethylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitroso-di-n-propylamine	0.125U	0.250	0.0780	mg/Kg
N-Nitrosodiphenylamine	0.125U	0.250	0.0780	mg/Kg
Pentachlorophenol	1.00U	2.00	0.620	mg/Kg
Phenanthrene	0.125U	0.250	0.0780	mg/Kg
Phenol	0.125U	0.250	0.0780	mg/Kg
Pyrene	0.125U	0.250	0.0780	mg/Kg
Surrogates				
2,4,6-Tribromophenol (surr)	95.9	35-125		%
2-Fluorobiphenyl (surr)	79.9	44-115		%
2-Fluorophenol (surr)	68.5	35-115		%

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Method Blank

Blank ID: MB for HBN 1802587 [XXX/42629]
Blank Lab ID: 1545010

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Nitrobenzene-d5 (surr)	71.6	37-122		%
Phenol-d6 (surr)	73.2	33-122		%
Terphenyl-d14 (surr)	92.8	54-127		%

Batch Information

Analytical Batch: XMS11885
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/9/2019 5:21:00PM

Prep Batch: XXX42629
Prep Method: SW3550C
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)		CL
1,2,4-Trichlorobenzene	4.44	2.65	60		(34-118)
1,2-Dichlorobenzene	4.44	2.39	54		(33-117)
1,3-Dichlorobenzene	4.44	2.33	52		(30-115)
1,4-Dichlorobenzene	4.44	2.36	53		(31-115)
1-Chloronaphthalene	1.78	1.41	79		(48-115)
1-Methylnaphthalene	4.44	3.21	72		(40-119)
2,4,5-Trichlorophenol	4.44	3.84	86		(41-124)
2,4,6-Trichlorophenol	4.44	3.84	86		(39-126)
2,4-Dichlorophenol	4.44	3.43	77		(40-122)
2,4-Dimethylphenol	4.44	2.91	65		(30-127)
2,4-Dinitrophenol	8	10.2	127	*	(62-113)
2,4-Dinitrotoluene	4.44	3.65	82		(48-126)
2,6-Dichlorophenol	1.78	1.39	78		(41-117)
2,6-Dinitrotoluene	4.44	3.45	78		(46-124)
2-Chloronaphthalene	4.44	3.02	68		(41-114)
2-Chlorophenol	4.44	2.94	66		(34-121)
2-Methyl-4,6-dinitrophenol	8	8.58	107		(29-132)
2-Methylnaphthalene	4.44	2.77	62		(38-122)
2-Methylphenol (o-Cresol)	4.44	3.05	69		(32-122)
2-Nitroaniline	4.44	4.12	93		(44-127)
2-Nitrophenol	4.44	3.50	79		(36-123)
3&4-Methylphenol (p&m-Cresol)	6.22	4.97	80		(34-119)
3,3-Dichlorobenzidine	4.44	3.69	83		(22-121)
3-Nitroaniline	4.44	4.10	92		(33-119)
4-Bromophenyl-phenylether	4.44	4.07	92		(46-124)
4-Chloro-3-methylphenol	4.44	3.72	84		(45-122)
4-Chloroaniline	4.44	2.47	56		(17-106)
4-Chlorophenyl-phenylether	4.44	3.75	85		(45-121)
4-Nitroaniline	4.44	3.98	90		(77-120)
4-Nitrophenol	6.22	5.83	94		(30-132)
Acenaphthene	4.44	3.59	81		(40-123)
Acenaphthylene	4.44	3.55	80		(32-132)
Aniline	4.44	0.943J	21	*	(24-89)
Anthracene	4.44	3.72	84		(47-123)

Print Date: 12/13/2019 3:40:55PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Azobenzene	4.44	3.64	82	(39-125)
Benzo(a)Anthracene	4.44	4.18	94	(49-126)
Benzo[a]pyrene	4.44	4.03	91	(45-129)
Benzo[b]Fluoranthene	4.44	4.64	104	(45-132)
Benzo[g,h,i]perylene	4.44	3.93	88	(43-134)
Benzo[k]fluoranthene	4.44	4.54	102	(47-132)
Benzoic acid	6.22	5.38	86	(53-124)
Benzyl alcohol	4.44	2.82	63	(29-122)
Bis(2chloro1methylethyl)Ether	4.44	2.44	55	(33-131)
Bis(2-Chloroethoxy)methane	4.44	3.15	71	(36-121)
Bis(2-Chloroethyl)ether	4.44	2.41	54	(31-120)
bis(2-Ethylhexyl)phthalate	4.44	4.58	103	(51-133)
Butylbenzylphthalate	4.44	4.74	107	(48-132)
Carbazole	4.44	4.27	96	(50-123)
Chrysene	4.44	4.24	95	(50-124)
Dibenzo[a,h]anthracene	4.44	4.11	93	(45-134)
Dibenzofuran	4.44	3.24	73	(44-120)
Diethylphthalate	4.44	4.10	92	(50-124)
Dimethylphthalate	4.44	4.27	96	(48-124)
Di-n-butylphthalate	4.44	4.31	97	(51-128)
di-n-Octylphthalate	4.44	4.28	96	(45-140)
Fluoranthene	4.44	3.80	86	(50-127)
Fluorene	4.44	3.87	87	(43-125)
Hexachlorobenzene	4.44	3.61	81	(45-122)
Hexachlorobutadiene	4.44	2.86	64	(32-123)
Hexachlorocyclopentadiene	4.44	2.44	55	(34-74)
Hexachloroethane	4.44	2.31	52	(28-117)
Indeno[1,2,3-c,d] pyrene	4.44	4.03	91	(45-133)
Isophorone	4.44	3.04	68	(30-122)
Naphthalene	4.44	2.96	67	(35-123)
Nitrobenzene	4.44	2.56	58	(34-122)
N-Nitrosodimethylamine	4.44	2.56	58	(23-120)
N-Nitroso-di-n-propylamine	4.44	3.31	74	(36-120)
N-Nitrosodiphenylamine	4.44	3.15	71	(38-127)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42629]
Blank Spike Lab ID: 1545011
Date Analyzed: 12/09/2019 17:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Pentachlorophenol	6.22	6.10	98	(25-133)
Phenanthrene	4.44	3.92	88	(50-121)
Phenol	4.44	3.09	70	(34-121)
Pyrene	4.44	4.49	101	(47-127)
Surrogates				
2,4,6-Tribromophenol (surr)	8.89	103	103	(35-125)
2-Fluorobiphenyl (surr)	4.44	79	79	(44-115)
2-Fluorophenol (surr)	8.89	61	61	(35-115)
Nitrobenzene-d5 (surr)	4.44	68.2	68	(37-122)
Phenol-d6 (surr)	8.89	68.4	68	(33-122)
Terphenyl-d14 (surr)	4.44	104	104	(54-127)

Batch Information

Analytical Batch: **XMS11885**
Analytical Method: **SW8270D**
Instrument: **HP 6890/5973 SSA**
Analyst: **JMG**

Prep Batch: **XXX42629**
Prep Method: **SW3550C**
Prep Date/Time: **11/26/2019 14:52**
Spike Init Wt./Vol.: 4.44 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1,2,4-Trichlorobenzene	3.72U	5.26	4.32J	82		5.28	4.31J	82		34-118	0.28	(< 20)
1,2-Dichlorobenzene	3.72U	5.26	3.84J	73		5.28	3.89J	74		33-117	1.40	(< 20)
1,3-Dichlorobenzene	3.72U	5.26	3.90J	74		5.28	3.71J	70		30-115	5.20	(< 20)
1,4-Dichlorobenzene	3.72U	5.26	3.95J	75		5.28	3.74J	71		31-115	5.50	(< 20)
1-Chloronaphthalene	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	48-115	0.00	(< 20)
1-Methylnaphthalene	3.72U	5.26	4.89J	93		5.28	4.81J	91		40-119	1.80	(< 20)
2,4,5-Trichlorophenol	3.72U	5.26	4.81J	91		5.28	4.84J	92		41-124	0.88	(< 20)
2,4,6-Trichlorophenol	3.72U	5.26	4.98J	95		5.28	5.36J	102		39-126	7.50	(< 20)
2,4-Dichlorophenol	3.72U	5.26	5.19J	99		5.28	5.23J	99		40-122	0.84	(< 20)
2,4-Dimethylphenol	3.72U	5.26	4.89J	93		5.28	5.11J	97		30-127	4.30	(< 20)
2,4-Dinitrophenol	44.6U	9.46	44.6U	0	*	9.50	44.6U	0	*	62-113	0.00	(< 20)
2,4-Dinitrotoluene	3.72U	5.26	4.53J	86		5.28	4.17J	79		48-126	8.10	(< 20)
2,6-Dichlorophenol	3.72U	2.11	3.72U	0	*	2.11	3.72U	0	*	41-117	0.00	(< 20)
2,6-Dinitrotoluene	3.72U	5.26	5.29J	101		5.28	5.20J	99		46-124	1.70	(< 20)
2-Chloronaphthalene	3.72U	5.26	4.55J	86		5.28	4.33J	82		41-114	4.70	(< 20)
2-Chlorophenol	3.72U	5.26	4.45J	85		5.28	4.44J	84		34-121	0.26	(< 20)
2-Methyl-4,6-dinitrophenol	29.8U	9.46	29.8U	0	*	9.50	29.8U	0	*	29-132	0.00	(< 20)
2-Methylnaphthalene	3.72U	5.26	4.29J	82		5.28	4.16J	79		38-122	3.10	(< 20)
2-Methylphenol (o-Cresol)	3.72U	5.26	4.41J	84		5.28	4.41J	84		32-122	0.03	(< 20)
2-Nitroaniline	3.72U	5.26	5.66J	108		5.28	5.33J	101		44-127	5.90	(< 20)
2-Nitrophenol	3.72U	5.26	5.25J	100		5.28	5.28J	100		36-123	0.33	(< 20)
3&4-Methylphenol (p&m-Cresol)	14.9U	7.36	14.9U	0	*	7.38	14.9U	0	*	34-119	0.00	(< 20)
3,3-Dichlorobenzidine	7.45U	5.26	5.28J	100		5.28	5.33J	101		22-121	1.10	(< 20)
3-Nitroaniline	7.45U	5.26	5.29J	101		5.28	5.36J	102		33-119	1.30	(< 20)
4-Bromophenyl-phenylether	3.72U	5.26	5.67J	108		5.28	5.25J	100		46-124	7.60	(< 20)
4-Chloro-3-methylphenol	3.72U	5.26	4.92J	93		5.28	5.08J	96		45-122	3.50	(< 20)
4-Chloroaniline	14.9U	5.26	14.9U	0	*	5.28	14.9U	0	*	17-106	0.00	(< 20)
4-Chlorophenyl-phenylether	3.72U	5.26	5.12J	97		5.28	4.90J	93		45-121	4.40	(< 20)
4-Nitroaniline	44.6U	5.26	44.6U	0	*	5.28	44.6U	0	*	77-120	0.00	(< 20)
4-Nitrophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	30-132	0.00	(< 20)
Acenaphthene	3.72U	5.26	5.31J	101		5.28	5.24J	99		40-123	1.20	(< 20)
Acenaphthylene	3.72U	5.26	5.37J	102		5.28	5.36J	102		32-132	0.16	(< 20)
Aniline	29.8U	5.26	29.8U	0	*	5.28	29.8U	0	*	24-89	0.00	(< 20)
Anthracene	3.72U	5.26	5.38J	102		5.28	5.22J	99		47-123	3.10	(< 20)
Azobenzene	3.72U	5.26	5.77J	110		5.28	5.85J	111		39-125	1.50	(< 20)
Benzo(a)Anthracene	3.72U	5.26	5.10J	97		5.28	5.28J	100		49-126	3.40	(< 20)
Benzo[a]pyrene	3.72U	5.26	4.80J	91		5.28	4.77J	90		45-129	0.50	(< 20)

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Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date: 12/11/2019 15:04
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzo[b]Fluoranthene	3.72U	5.26	4.92J	93		5.28	4.76J	90		45-132	3.20	(< 20)
Benzo[g,h,i]perylene	3.72U	5.26	5.44J	103		5.28	5.25J	100		43-134	3.40	(< 20)
Benzo[k]fluoranthene	3.72U	5.26	5.06J	96		5.28	5.20J	99		47-132	2.90	(< 20)
Benzoic acid	22.3U	7.36	22.3U	0	*	7.38	22.3U	0	*	53-124	0.00	(< 20)
Benzyl alcohol	3.72U	5.26	3.88J	74		5.28	3.84J	73		29-122	1.00	(< 20)
Bis(2chloro1methylethyl)Ether	3.72U	5.26	3.95J	75		5.28	4.20J	80		33-131	6.10	(< 20)
Bis(2-Chloroethoxy)methane	3.72U	5.26	5.06J	96		5.28	4.90J	93		36-121	3.10	(< 20)
Bis(2-Chloroethyl)ether	3.72U	5.26	4.06J	77		5.28	4.13J	78		31-120	1.60	(< 20)
bis(2-Ethylhexyl)phthalate	3.72U	5.26	6.42J	122		5.28	6.59J	125		51-133	2.60	(< 20)
Butylbenzylphthalate	3.72U	5.26	6.32J	120		5.28	5.69J	108		48-132	10.40	(< 20)
Carbazole	3.72U	5.26	6.02J	114		5.28	5.83J	110		50-123	3.20	(< 20)
Chrysene	3.72U	5.26	5.49J	104		5.28	5.42J	103		50-124	1.40	(< 20)
Dibenzo[a,h]anthracene	3.72U	5.26	5.39J	103		5.28	5.71J	108		45-134	5.50	(< 20)
Dibenzofuran	3.72U	5.26	4.59J	87		5.28	4.44J	84		44-120	3.50	(< 20)
Diethylphthalate	3.72U	5.26	5.50J	105		5.28	5.44J	103		50-124	1.10	(< 20)
Dimethylphthalate	3.72U	5.26	5.94J	113		5.28	6.02J	114		48-124	1.20	(< 20)
Di-n-butylphthalate	3.72U	5.26	5.94J	113		5.28	5.75J	109		51-128	3.30	(< 20)
di-n-Octylphthalate	7.45U	5.26	8.15J	155	*	5.28	7.78J	147	*	45-140	4.60	(< 20)
Fluoranthene	3.72U	5.26	4.55J	86		5.28	4.43J	84		50-127	2.60	(< 20)
Fluorene	3.72U	5.26	5.28J	100		5.28	5.20J	99		43-125	1.40	(< 20)
Hexachlorobenzene	3.72U	5.26	4.59J	87		5.28	4.26J	81		45-122	7.70	(< 20)
Hexachlorobutadiene	3.72U	5.26	4.47J	85		5.28	4.53J	86		32-123	1.20	(< 20)
Hexachlorocyclopentadiene	10.4U	5.26	10.4U	0	*	5.28	10.4U	0	*	34-74	0.00	(< 20)
Hexachloroethane	3.72U	5.26	3.68J	70		5.28	3.88J	73		28-117	4.90	(< 20)
Indeno[1,2,3-c,d] pyrene	3.72U	5.26	5.31J	101		5.28	5.28J	100		45-133	0.66	(< 20)
Isophorone	3.72U	5.26	4.87J	93		5.28	4.58J	87		30-122	6.10	(< 20)
Naphthalene	3.72U	5.26	5.14J	98		5.28	5.05J	96		35-123	2.00	(< 20)
Nitrobenzene	3.72U	5.26	4.29J	82		5.28	4.14J	78		34-122	3.70	(< 20)
N-Nitrosodimethylamine	3.72U	5.26	3.79J	72		5.28	3.54J	67		23-120	6.80	(< 20)
N-Nitroso-di-n-propylamine	3.72U	5.26	4.94J	94		5.28	4.95J	94		36-120	0.33	(< 20)
N-Nitrosodiphenylamine	3.72U	5.26	5.01J	95		5.28	5.18J	98		38-127	3.20	(< 20)
Pentachlorophenol	29.8U	7.36	29.8U	0	*	7.38	29.8U	0	*	25-133	0.00	(< 20)
Phenanthrene	3.72U	5.26	5.37J	102		5.28	5.28J	100		50-121	1.90	(< 20)
Phenol	3.72U	5.26	4.38J	83		5.28	4.39J	83		34-121	0.33	(< 20)
Pyrene	3.72U	5.26	4.98J	95		5.28	5.08J	96		47-127	2.20	(< 20)
Surrogates												
2,4,6-Tribromophenol (surr)		10.5	10.2	97		10.6	10.9	104		35-125	6.40	

Print Date: 12/13/2019 3:40:57PM

Matrix Spike Summary

Original Sample ID: 1196867001
MS Sample ID: 1545012 MS
MSD Sample ID: 1545013 MSD

Analysis Date:
Analysis Date: 12/11/2019 15:37
Analysis Date: 12/11/2019 16:11
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897001, 1196897002, 1196897003, 1196897004, 1196897005, 1196897006, 1196897007, 1196897008

Results by **SW8270D**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
2-Fluorobiphenyl (surr)		5.26	5.56	106	5.28	5.45	103	44-115	2.10	
2-Fluorophenol (surr)		10.5	8.03	76	10.6	7.36	70	35-115	8.70	
Nitrobenzene-d5 (surr)		5.26	4.86	92	5.28	4.81	91	37-122	1.00	
Phenol-d6 (surr)		10.5	9.45	90	10.6	9.31	88	33-122	1.60	
Terphenyl-d14 (surr)		5.26	4.86	92	5.28	5.19	98	54-127	6.60	

Batch Information

Analytical Batch: XMS11889
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: JMG
Analytical Date/Time: 12/11/2019 3:37:00PM

Prep Batch: XXX42629
Prep Method: Sonication Extraction Soil SW8270
Prep Date/Time: 11/26/2019 2:52:08PM
Prep Initial Wt./Vol.: 22.75g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:40:57PM

Method Blank

Blank ID: MB for HBN 1802613 [XXX/42632]
Blank Lab ID: 1545124

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196897008

Results by **SW8082A**

Parameter	Results	LOQ/CL	DL	Units
Aroclor-1016	25.0U	50.0	12.5	ug/Kg
Aroclor-1221	50.0U	100	25.0	ug/Kg
Aroclor-1232	25.0U	50.0	12.5	ug/Kg
Aroclor-1242	25.0U	50.0	12.5	ug/Kg
Aroclor-1248	25.0U	50.0	12.5	ug/Kg
Aroclor-1254	25.0U	50.0	12.5	ug/Kg
Aroclor-1260	25.0U	50.0	12.5	ug/Kg
Surrogates				
Decachlorobiphenyl (surr)	110	60-125		%

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 12:07:00PM

Prep Batch: XXX42632
Prep Method: SW3550C
Prep Date/Time: 11/27/2019 10:48:22AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196897 [XXX42632]
Blank Spike Lab ID: 1545125
Date Analyzed: 12/03/2019 12:17

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196897008

Results by **SW8082A**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Aroclor-1016	222	198	89	(47-134)
Aroclor-1260	222	235	106	(53-140)
Surrogates				
Decachlorobiphenyl (surr)	222	112	112	(60-125)

Batch Information

Analytical Batch: **XGC10544**
Analytical Method: **SW8082A**
Instrument: **Agilent 7890B GC ECD SW F**
Analyst: **BMZ**

Prep Batch: **XXX42632**
Prep Method: **SW3550C**
Prep Date/Time: **11/27/2019 10:48**
Spike Init Wt./Vol.: 222 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1196876010
MS Sample ID: 1545126 MS
MSD Sample ID: 1545127 MSD

QC for Samples: 1196897008

Analysis Date: 12/03/2019 13:09
Analysis Date: 12/03/2019 13:19
Analysis Date: 12/03/2019 13:29
Matrix: Soil/Solid (dry weight)

Results by **SW8082A**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Aroclor-1016	25.8U	229	251	110	228	253	111	47-134	0.56	(< 30)
Aroclor-1260	25.8U	229	227	99	228	226	99	53-140	0.65	(< 30)
Surrogates										
Decachlorobiphenyl (surr)		229	241	105	228	237	104	60-125	1.40	

Batch Information

Analytical Batch: XGC10544
Analytical Method: SW8082A
Instrument: Agilent 7890B GC ECD SW F
Analyst: BMZ
Analytical Date/Time: 12/3/2019 1:19:00PM

Prep Batch: XXX42632
Prep Method: Sonication Extraction Soil SW8082 PCB
Prep Date/Time: 11/27/2019 10:48:22AM
Prep Initial Wt./Vol.: 22.63g
Prep Extract Vol: 5.00mL

Print Date: 12/13/2019 3:41:02PM

SGS

1196897

North America Inc.
F CUSTODY RECORD

Profile: 334945

Locations Nationwide
Alaska Maryland
Revised Report - Revision 2
New Jersey New York
North Carolina Indiana
West Virgina Kentucky
www.us.sgs.com

Section 1

CLIENT: Golder Associates

CONTACT: Jessa Karp PHONE NO:

PROJECT NAME: ARRC Depot Dr. Drilling Samples PROJECT/ PWSID/ PERMIT#:

REPORTS TO: E-MAIL: jkarp@golder.com

INVOICE TO: Golder Associates QUOTE #:

P.O. #: 19132189

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 3

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: MeOH+BF / B	GRO (AK101) VOC (SW8260C)	DRO/RRO (AK102/103)	SVOC (SW8270D)	PCBs (SW8082A) Lead (SW6020)	REMARKS/ LOC ID
1AB	BH-01	11/14/19	9:15		2		X	X	X			
2AB	BH-02	11/14/19	12:30		2		X	X	X			
3AB	BH-03A	11/15/19	9:15		2		X	X	X			
4AB	BH-03A-1	11/15/19	9:15		2		X	X	X			
5AB	BH-04	11/14/19	15:00		2		X	X	X			
6AB	BH-05	11/14/19	13:45		2		X	X	X			
7AB	BH-05-1	11/14/19	13:45		2		X	X	X			
8AB	Composit	11/15/19	9:30		2	C	X	X	X	X		
9AB	PW7-25-11				2		X	X	X	X		Trip Blank

Section 5

	Date	Time	
Relinquished By: (1) Jessa Karp	11/15/19	16:00	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received For Laboratory By: 11/15/19 16:00

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 2.7° D63

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

SGS

Returned Bottles Inventory

Name of individual returning bottles: Jessa Karp

Date Received: 11/13/19

Client Name: Golder Associates

Received by:

Project Name: ARRC Depot Dr. Drilling Samples

SGS PM:

HDPE/Nalgene:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz					
	60-ml or 2-oz					
	other					
amber glass:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz with or without septa	10				
	40-ml VOA vial	12				
	other					
Subtotal:		22				

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted.***

Amount to Invoice Client $: 88

W

1196897

SGS

e-Sample Receipt Form

Revised Report - Revision 2

SGS Workorder #: **1196897**

1196897

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 2.2 °C Therm. ID: D63
		Cooler ID: @ °C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify 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.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	**Trip Blanks 9A-B were scheudled with PCB, DRO/RRO, and Lead 6020. Proceeding with GRO & VOC.**
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+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
1196897001-A	No Preservative Required	OK			
1196897001-B	Methanol field pres. 4 C	OK			
1196897002-A	No Preservative Required	OK			
1196897002-B	Methanol field pres. 4 C	OK			
1196897003-A	No Preservative Required	OK			
1196897003-B	Methanol field pres. 4 C	OK			
1196897004-A	No Preservative Required	OK			
1196897004-B	Methanol field pres. 4 C	OK			
1196897005-A	No Preservative Required	OK			
1196897005-B	Methanol field pres. 4 C	OK			
1196897006-A	No Preservative Required	OK			
1196897006-B	Methanol field pres. 4 C	OK			
1196897007-A	No Preservative Required	OK			
1196897007-B	Methanol field pres. 4 C	OK			
1196897008-A	No Preservative Required	OK			
1196897008-B	Methanol field pres. 4 C	OK			
1196897009-A	Methanol field pres. 4 C	OK			
1196897009-B	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.

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ALASKA RAILROAD CORPORATION

DEPOT DRIVE IMPROVEMENTS
PHASE 2

V

PLANS
Under Separate Cover