

**TO:** All Tenderers

**FROM:** McElhanney Ltd.

**DATE:** June 28, 2023

**PROJECT:** Church Road – Throup Road Roundabout - Tender

**FILE NO:** 2241-20128-01

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## **1. PRECEDENCE**

1. This Addendum shall form an integral part of the Work. This Addendum shall take precedence over all requirements of the Tender Documents with which it may prove to be at variance unless otherwise qualified by McElhanney.

## **2. PURPOSE**

1. This addendum provides additional information and instructions to the bidders.

## **3. INSTRUCTIONS**

1. **Revisions to Form of Tender – Appendix 1 - Schedule of Quantities and Prices (all revisions in red text)**
  - a. 31.04 – Quantity reduced for reallocation to line item 31.05
  - b. 31.05 – Line item added for contaminated soils excavation and disposal
  - c. 33.29 – Line item added for contaminated soils disposal associated with storm sewer construction
  - d. OPT 3.3 – Quantity increased as per revised drawings, per 4
  - e. OPT 3.13 – description revised for clarification
2. **Revisions to Form of Agreement**
  - a. Schedule 2 – List of Contract Drawings revised per 4
3. **Revisions to Supplementary Specifications**
  - a. Section 31 23 01 added

#### **4. Revisions to Contract Drawings**

- a. Drawing C209 to be replaced with “Issued for Addendum #3” dated June 22, 2023
- b. Drawing C210 added

#### **5. Additional Information**

- a. “Technical Memo: Soil Assessment for the Church Road Roundabout Project, Sooke, BC” prepared by McElhanney Ltd.

#### **4. ATTACHMENTS**

**Form of Tender – Appendix 1 – Schedule of Quantities and Prices – Issued for Addendum #3**

**Form of Agreement – Issued for Addendum #3**

**Supplementary Specifications – Issued for Addendum #3**

**Revised Contract Drawings – C209 & C210**

**Technical Memo: Soil Assessment for the Church Road Roundabout Project, Sooke, BC**



## **FORM OF TENDER**

### **APPENDIX 1 – SCHEDULE OF QUANTITIES AND PRICES**

Form of Tender - Appendix 1

**SCHEDULE OF QUANTITIES AND PRICES**  
(See paragraph 5.3.1 of the Instructions to Tenderers - Part II)

(All prices and *Quotations* including the *Contract Price* shall include all *Taxes*, but shall not include *GST*.)

Any work called for in these Contract Documents, shown on the plans, or which is necessary for the completion of the Work called for in these Contract Documents and which is not specifically listed as a separate payment item in this Appendix shall be deemed incidental to the performance of the Work and to the general purpose of the Contract; no separate payment will be made on account of any such Work, but the costs of any such incidental Work shall be included in the Unit and Lump Sum Prices.

Summary Sheet

Division 01:	General Requirements	\$ _____
Division 03:	Concrete	\$ _____
Division 26:	Electrical	\$ _____
Division 31:	Earthworks	\$ _____
Division 32:	Roads and Site Improvements	\$ _____
Division 33:	Utilities	\$ _____
Optional Items		\$ _____

<b>TOTAL TENDER PRICE</b>	<b>\$ _____</b>
<b>GST (5%)</b>	<b>\$ _____</b>
<b>TENDER PRICE plus GST</b>	<b>\$ _____</b>

Tenderer's Initials \_\_\_\_\_

DIV 01		GENERAL REQUIREMENTS				
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
	01 10 01SS	<b>Quality Control Testing</b>				
1.01	1.1	Quality Control Testing	Lump Sum	1		
	01 10 01SS	<b>Survey</b>				
1.02	1.2	Layout Survey, Quantity Survey, Volume Calculations, and Record Survey	Lump Sum	1		
	01 52 01	<b>Temporary Structures</b>				
1.03	1.6.2ss	Mobilization & De-mobilization	Lump Sum	1		
	01 55 00	<b>Traffic Control, Vehicle Access and Parking</b>				
1.04	1.4.15ss	Traffic Management Plan	Lump Sum	1		
	01 57 01	<b>Environmental Protection</b>				
1.05	1.6.2ss	Environmental Protection	Lump Sum	1		
	01 58 01	<b>Project Identification</b>				
1.06	1.2.1.1ss	Project Identification	Lump Sum	1		
<b>Sub-Total</b>					<b>\$</b>	

DIV 03		CONCRETE				
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
	03 30 20	<b>Concrete Walks, Curbs and Gutters</b>				
3.01	1.4.3	<b>Concrete Curb &amp; Gutter</b> Non-mountable (incl. let-downs, Regular and Reverse Gutter)	Lineal Metre	885		
3.02	1.4.3	<b>Concrete Curb &amp; Gutter</b> Mountable (Regular and Reverse Gutter)	Lineal Metre	110		
3.03	1.4.3	<b>Concrete Curb &amp; Gutter</b> Median Curb	Lineal Metre	45		
3.04	1.4.5	<b>Concrete Sidewalk and Walkways</b> 100mm thickness, non-reinforced	Square Metre	190		
	03 40 01	<b>Pre-cast Concrete</b>				
3.05	1.4.2ss	<b>Concrete Lock Block Retaining Wall</b> Including Shop Drawings	Square Metre	75		
3.06	N/A	Restoration of Existing Allan Block Retaining Wall Following Construction (2207 Church Road)	Lump Sum	1		
<b>Sub-Total</b>					<b>\$</b>	

Tenderer's Initials \_\_\_\_\_

DIV 26		ELECTRICAL				
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
	<b>26 56 01</b>	<b>Roadway Lighting</b>				
26.01	1.9.4ss	Streetlight Pole incl. Base	Each	14		
26.02	1.9.4ss	Relocate Existing Streetlight Pole incl. Base	Each	1		
26.03	1.9.4ss	Streetlight Wiring & Conduit incl. Junction Boxes	Lineal Metre	445		
26.04	1.9.4ss	Pedestrian Flashers	Each	6		
		<b>Electrical Works</b>				
26.05	N/A	Underground Electrical Works – Complete, as per BC Hydro Drawing 500-U07-08875	Lump Sum	1		
26.06	N/A	Facilitate Overhead Pole Relocation works to be completed by BC Hydro and Telus – per BC Hydro Drawing 500-D07-03041	Lump Sum	1		
<b>Sub-Total</b>					<b>\$</b>	

DIV 31		EARTHWORKS				
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
	<b>31 11 01</b>	<b>Clearing and Grubbing</b>				
31.01	1.4.1, 1.4.2	Clearing & Grubbing	Lump Sum	1		
	<b>31 23 01</b>	<b>Excavation, Trenching and Backfilling</b>				
31.02	1.10.6	Roadside Channel Excavation & Berming (North of Roundabout)	Lineal Metre	45		
31.03	1.10.6	Trailside Ditch (South of Roundabout)	Lineal Metre	45		
	<b>31 24 13</b>	<b>Roadway Excavation, Embankment and Compaction</b>				
31.04	1.8.14ss, 1.8.12	<b>Common Excavation</b> Including Removals, Stripping, Excavation to Subgrade - Off-Site Disposal	Cubic Metre	2765		
31.05	1.8.14ss	<b>Common Excavation</b> Contaminated Soils, Excavation to Subgrade - Off-Site Disposal	Cubic Metre	385		
31.06	1.8.7	<b>Embankment Fill</b>	Cubic Metre	1000		
31.07	1.8.9	<b>Subgrade Preparation</b>	Square Metre	7250		
	<b>31 32 19</b>	<b>Geosynthetics</b>				
31.08	1.6.1	Non woven geotextile (Channel)	Square Metre	90		
	<b>31 37 10</b>	<b>RipRap</b>				
31.09	1.4.1	Class 25kg Riprap (Channel)	Cubic Metre	15		
31.10	1.4.1	River Rock (Cobbles, Channel bed)	Cubic Metre	5		

Tenderer's Initials \_\_\_\_\_

Sub-Total	\$
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DIV 32		ROADS AND SITE IMPROVEMENTS				
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
	32 01 16.7	<b>Cold Milling</b>				
32.01	1.5.1	<b>Cold Milling</b> Including disposal offsite	Square Metres	305		
	32 11 23	<b>Granular Sub-Base</b>				
32.02	1.4.3	<b>Granular Sub-Base</b> 300mm Thickness - Roads	Square Metres	5350		
32.03	1.4.3	<b>Granular Sub-Base</b> 150mm Thickness - Sidewalks, MUP & Driveways	Square Metres	1900		
	32 11 23	<b>Granular Base</b>				
32.04	1.4.2	<b>Granular Base</b> 150mm Thickness - Roads, MUP & Driveways	Square Metres	7060		
	32 12 16	<b>Hot-Mix Asphalt Concrete Paving</b>				
32.05	1.5.1ss, 1.5.2	<b>Asphalt Pavement</b> 80mm thickness – Roads	Square Metres	4150		
32.06	1.5.3ss, 1.5.2	<b>Asphalt Pavement</b> 50mm thickness – Trails & Driveways, including stamped tactile warning strips	Square Metres	1538		
32.07	1.5.1ss, 1.5.2	<b>Asphalt Pavement</b> 40mm thickness – Milled Areas	Square Metres	305		
32.08	1.5.1ss, 1.5.2	<b>Stamped Coloured Asphalt Pavement</b> 80mm thickness – Mountable Islands, Red, Herringbone Pattern	Square Metres	285		
32.09	1.5.1ss, 1.5.2	<b>Stamped Coloured Asphalt Pavement</b> 50mm thickness – Non-mountable Islands, Buffer Strips, Red, Herringbone Pattern	Square Metres	135		
32.10	1.5.4	Asphalt Curb	Lineal Metres	55		
	32 17 23	<b>Painted Pavement Markings</b>				
32.11	1.5.2	Painted pavement markings, permanent	Lump Sum	1		
32.12	1.5.3	Thermoplastic Pavement Markings, permanent	Lump Sum	1		
32.13	1.5.5ss	Traffic Control Signs, including poles and concrete base	Each	15		
32.14	1.5.6ss	Relocated Existing Traffic Control Signs, including poles and concrete base	Each	1		
32.15	1.5.5ss	Flexible Delineators	Each	21		
	32 31 13	<b>Chain Link Fences &amp; Gates</b>				
32.16	1.5.4ss	Handrail (On Retaining Wall)	Lineal Metre	37		
	32 91 21	<b>Topsoil and Finish Grading</b>				
32.17	1.4.1	<b>Imported Topsoil</b> 150mm thickness	Square Metres	2210		
32.18	1.4.1	<b>Growing Medium (Roundabout Button)</b> 450mm thickness	Square Metres	150		

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	<b>32 92 19</b>	<b>Hydraulic Seeding</b>				
32.19	1.8.1, 1.8.2	Hydraulic Seeding	Square Metres	725		
	<b>32 92 23</b>	<b>Sodding</b>				
32.20	1.8.1	Sod	Square metre	685		
	<b>32 93 01</b>	<b>Planting of Trees, Shrubs &amp; Ground Cover</b>				
32.21	1.9.1	Shrubs & Ground Cover (Roundabout Button)	Lump Sum	1		
32.22	1.9.3ss	Irrigation System (Design-Build)	Lump Sum	1		
32.23	1.9.1, 1.9.4ss	Re-plant Native Riparian Plantings (Channel Banks) – Salvage, if possible	Square Metres	200		
<b>Sub-Total</b>					\$	

<b>DIV 33</b>		<b>UTILITIES</b>				
<b>Item No.</b>	<b>Section</b>	<b>Specification Title</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Amount</b>
	<b>33 11 01</b>	<b>Waterworks</b>				
33.01	1.8.12ss	Facilitate CRD Water Works – Meter Box Relocations/Upgrades, Main Lowering	Lump Sum	1		
	<b>33 34 01</b>	<b>Sewage Force mains</b>				
33.02	1.8.1, 1.8.2, 1.8.3	Existing Sanitary Force main Lowering	Lineal Metres	10		
33.03	1.8.1, 1.8.2	Sanitary Force main Service – 75mm, complete (6588 Throup Rd)	Each	1		
	<b>33 40 01</b>	<b>Storm Sewers</b>				
33.04	1.6.1, 1.6.2	Irrigation Sleeve - 100mm diameter PVC SCHD 40 (Driveways, MUP)	Lineal Metres	120		
33.05	1.6.1, 1.6.2	Irrigation Sleeve - 150mm diameter PVC SCHD 40 (Roads)	Lineal Metres	50		
33.06	1.6.1, 1.6.2	<b>Drainage Pipe PVC SDR 35</b> 250mm diameter, imported backfill (1-4m depth)	Lineal Metres	172		
33.07	1.6.1, 1.6.2	<b>Drainage Pipe PVC SDR 35</b> 300mm diameter, imported backfill (1-4m depth)	Lineal Metres	18		
33.08	1.6.1, 1.6.2	<b>Drainage Pipe HDPE N12</b> 450mm diameter, imported backfill (1-4m depth)	Lineal Metres	28		
33.09	1.6.1, 1.6.2	<b>Drainage Pipe HDPE N12</b> 600mm diameter, imported backfill (1-4m depth)	Lineal Metres	237		
33.10	1.6.1, 1.6.2	<b>Drainage Pipe HDPE N12</b> 900mm diameter, imported backfill (1-4m depth)	Lineal Metres	25		
33.11	1.6.1, 1.6.2	<b>Drainage Pipe HDPE N12</b> 1050mm diameter, imported backfill (1-4m depth)	Lineal Metres	46		
33.12	1.6.3	<b>Drainage Service Connection</b> 100mm c/w Inspection Chamber	Each	9		
33.13	1.6.3	<b>Drainage Service Connection</b> 200mm c/w Inspection Chamber	Each	1		
33.14	1.6.5	<b>Catchbasin Lead</b> 150mm diameter	Lineal Metres	145		

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33.15	1.6.9	<b>Drainage Tie -In</b> Tie Into Existing Storm System	Each	5		
	<b>33 42 13</b>	<b>Pipe Culvert</b>				
33.16	1.5.3	<b>Precast Headwall</b> 300mm Storm Pipe	Each	1		
33.17	1.5.3	<b>Precast Headwall</b> 450mm Storm Pipe c/w grillage	Each	1		
33.18	1.5.3	<b>Precast Headwall</b> 600mm Storm Pipe c/w grillage	Each	1		
33.19	1.5.3	<b>Precast Headwall</b> 1050mm Storm Pipe c/w grillage and handrail	Each	2		
	<b>33 44 01</b>	<b>Manholes and Catchbasins</b>				
33.20	1.5.1.1ss	<b>Manhole</b> base, lid, slab,cover and frame - 1050mm diameter	Each	4		
33.21	1.5.1.1ss	<b>Manhole</b> base, lid, slab,cover and frame - 1200mm diameter	Each	6		
33.22	1.5.1.1ss	<b>Manhole</b> base, lid, slab,cover and frame - 1500mm diameter	Each	1		
33.23	1.5.1.1ss	<b>Manhole</b> base, lid, slab,cover and frame - 1800mm diameter	Each	1		
33.24	1.5.1.1ss	<b>Manhole</b> base, lid, slab,cover and frame - 2100mm diameter	Each	1		
33.25	1.5.1.1ss	<b>Manhole</b> base, lid, slab,cover and frame - 2400mm diameter	Each	2		
33.26	1.5.2	<b>Catchbasin Top Inlet</b> Standard Drawing S11	Each	20		
33.27	1.5.2	<b>Offset Catchbasin Top Inlet</b>	Each	1		
33.28	1.5.3	Adjustment of Existing Lids - Outside of Roadway	Each	14		
		<b>Miscellaneous</b>				
33.29		Disposal of Contaminated Materials required for Storm Sewer Trenching Work	Cubic Metre	185		
			<b>Sub-Total</b>		\$	

Tenderer's Initials \_\_\_\_\_

**OPTIONAL ITEMS**  
(Included in Tender Price)

This section forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

Optional items quoted on will be reviewed and accepted or rejected at the Owner's option. Accepted optional items prices will be identified in the construction agreement.

Coordinate related work and modify surrounding work to integrate the Work of each optional item.

Prices quoted should not include GST.

Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
<b>1.0</b>	<b>OPT</b>	<b>Over-Excavation</b>				
	<b>31 24 13</b>	<b>Roadway Excavation, Embankment and Compaction</b>				
1.1	1.8.14ss, 1.8.12	<b>Common Excavation</b> Excavation from Subgrade to Suitable Soils – Off-Site Disposal	Cubic Metre	2300		
1.2	1.8.7	<b>Embankment Fill (Over-excavated Areas)</b>	Cubic Metre	2300		
<b>2.0</b>	<b>OPT</b>	<b>2182 Church Road – Frontage Works</b>				
	<b>03 30 20</b>	<b>Concrete Walks, Curbs and Gutters</b>				
2.1	1.4.3	<b>Concrete Curb &amp; Gutter</b> Non-mountable (incl. let-downs, Regular and Reverse Gutter)	Lineal Metre	32		
	<b>26 56 01</b>	<b>Roadway Lighting</b>				
2.2	1.9.4ss	Streetlight Pole incl. Base	Each	3		
2.3	1.9.4ss	Streetlight Wiring & Conduit incl. Junction Boxes	Lineal Metre	95		
	<b>31 24 13</b>	<b>Roadway Excavation, Embankment and Compaction</b>				
2.4	1.8.14ss, 1.8.12	<b>Common Excavation</b> Including Removals, Stripping, Excavation to Subgrade - Off-Site Disposal	Cubic Metre	350		
2.5	1.8.7	<b>Embankment Fill</b>	Cubic Metre	150		
2.6	1.8.9	<b>Subgrade Preparation</b>	Square Metre	362		
	<b>32 11 23</b>	<b>Granular Sub-Base</b>				
2.7	1.4.3	<b>Granular Sub-Base</b> 300mm Thickness - Roads	Square Metres	147		
2.8	1.4.3	<b>Granular Sub-Base</b> 150mm Thickness - MUP	Square Metres	215		
	<b>32 11 23</b>	<b>Granular Base</b>				
2.9	1.4.2	<b>Granular Base</b> 150mm Thickness - Roads, MUP & Driveways	Square Metres	362		

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	<b>32 12 16</b>	<b>Hot-Mix Asphalt Concrete Paving</b>				
2.10	1.5.1ss, 1.5.2	<b>Asphalt Pavement</b> 80mm thickness - Roads	Square Metres	115		
2.11	1.5.3ss, 1.5.2	<b>Asphalt Pavement</b> 50mm thickness - MUP	Square Metres	220		
	<b>32 17 23</b>	<b>Painted Pavement Markings</b>				
2.12	1.5.2	Painted pavement markings, permanent	Lump Sum	1		
2.13	1.5.3	Thermoplastic Pavement Markings, permanent	Lump Sum	1		
2.14	1.5.5ss	Traffic Control Signs, including poles and concrete base	Each	3		
	<b>32 91 21</b>	<b>Topsoil and Finish Grading</b>				
2.15	1.4.1	<b>Imported Topsoil</b> 150mm thickness	Square Metres	800		
	<b>32 92 23</b>	<b>Sodding</b>				
2.16	1.8.1	Sod	Square metre	800		
	<b>32 93 01</b>	<b>Planting of Trees, Shrubs &amp; Ground Cover</b>				
2.17	1.9.1	Trees – Garry Oak, 4.0cm cal, b&b (MDI Drawings)	Each	14		
2.18	1.9.3ss	Irrigation System (Design-Build)	Lump Sum	1		
	<b>33 11 01</b>	<b>Waterworks</b>				
2.19	1.8.12ss	Facilitate CRD Water Works – Church Rd Services, Main	Lump Sum	1		
	<b>33 40 01</b>	<b>Storm Sewers</b>				
2.20	1.6.1, 1.6.2	Irrigation Sleeve - 100mm diameter PVC SCHD 40 (Driveways, MUP)	Lineal Metres	10		
2.21	1.6.1, 1.6.2	Irrigation Sleeve - 150mm diameter PVC SCHD 40 (Roads)	Lineal Metres	28		
2.22	1.6.1, 1.6.2	<b>Drainage Pipe PVC SDR 35</b> 300mm diameter, imported backfill (1-4m depth)	Lineal Metres	10		
2.23	1.6.4	<b>Drainage Clean Out</b>	Each	1		
2.24	1.6.5	<b>Catchbasin Lead</b> 150mm diameter	Lineal Metres	7		
2.25	1.6.9	<b>Drainage Tie -In</b> Tie Into Existing Storm System	Each	1		
	<b>33 44 01</b>	<b>Manholes and Catchbasins</b>				
2.26	1.5.1.1ss	<b>Manhole</b> base, lid, slab, cover and frame - 1200mm diameter	Each	1		
2.27	1.5.2	<b>Catchbasin Top Inlet</b> Standard Drawing S11	Each	1		

Tenderer's Initials \_\_\_\_\_

3.0	OPT	Frances Gardens Storm System Replacement				
	31 32 19	Geosynthetics				
3.1	1.6.1	Non woven geotextile (Riprap Areas)	Square Metre	50		
	31 37 10	RipRap				
3.2	1.4.1	Class 50kg Riprap	Cubic Metre	26		
3.3	1.4.1	River Rock (Cobbles, Stream bed atop Riprap)	Cubic Metre	10		
	32 12 16	Hot-Mix Asphalt Concrete Paving				
3.4	1.5.3ss, 1.5.2	Asphalt Pavement 50mm thickness – Road Restoration	Square Metres	410		
3.5	1.5.4	Asphalt Curb	Lineal Metres	105		
	32 31 13	Chain Link Fences & Gates				
3.6	1.5.4ss	Chain Link Fence Restoration (on Retaining Wall)	Lump Sum	1		
	32 91 21	Topsoil and Finish Grading				
3.7	1.4.1	Imported Topsoil 150mm thickness	Square Metres	150		
	32 92 19	Hydraulic Seeding				
3.8	1.8.1, 1.8.2	Hydraulic Seeding	Square Metres	150		
	33 05 24	CIP Pipe Lining				
3.9	1.9.3, 1.9.8	900mm CSP Storm Sewer Lining, incl. Cleaning	Lineal Metres	50		
	33 40 01	Storm Sewers				
3.10	1.6.1, 1.6.2	Drainage Pipe HDPE N12 1200mm diameter, imported backfill (1-4m depth)	Lineal Metres	224		
3.11	1.6.5	Catchbasin Lead 150mm diameter	Lineal Metres	25		
3.12	1.6.9	Drainage Tie -In Tie Into Existing Storm System	Each	1		
	33 42 13	Pipe Culvert				
3.13	1.5.1	Concrete Box Culvert 1500mmx1800mm c/w fish baffles, imported backfill, granular base	Lineal Metres	18		
3.14	1.5.3	Precast Headwall 1200mm Storm Pipe	Each	1		
3.15	1.5.3	Precast Headwall 1500mmx1800mm Box Culvert	Each	2		

Tenderer's Initials \_\_\_\_\_

	33 44 01	<b>Manholes and Catchbasins</b>				
3.16	1.5.1.1ss	<b>Manhole</b> base, lid, slab,cover and frame - 2400mm diameter	Each	1		
		<b>Miscellaneous</b>				
3.17	N/A	Restoration of Existing Retaining Wall following Construction	Lump Sum	1		

( FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND  
OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

**BETWEEN OWNER AND CONTRACTOR**

This agreement made in duplicate this

\_\_\_\_\_ day of \_\_\_\_\_, 20\_23\_.

**CONTRACT:** Church Road – Throup Road Roundabout

**REFERENCE No.** 20128-01

**BETWEEN:**

The District Of Sooke  
(the “Owner”)

**AND:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
( NAME AND OFFICE ADDRESS OF CONTRACTOR )

(the “Contractor”)

**THE OWNER AND THE CONTRACTOR AGREE AS FOLLOWS:**

<b>Article 1 THE WORK START / COMPLETION DATES</b>	1.1	The <i>Contractor</i> will perform all <i>Work</i> and provide all labour, equipment and material and do all things strictly as required by the <i>Contract Documents</i> .
	1.2	The <i>Contractor</i> will commence the <i>Work</i> in accordance with the <i>Notice to Proceed</i> . The <i>Contractor</i> will proceed with the <i>Work</i> diligently, will perform the <i>Work</i> generally in accordance with the construction schedules as required by the <i>Contract Documents</i> and will achieve <i>Substantial Performance</i> of the <i>Work</i> on or before <u>April 30, 2024</u> subject to the provisions of the <i>Contract Documents</i> for adjustments to the <i>Contract Time</i> .
	1.3	Time shall be of the essence of the <i>Contract</i> .

**Article 2** **CONTRACT**  
**DOCUMENTS**

- 2.1 The “*Contract Documents*” consist of the documents listed or referred to in Schedule 1, entitled “Schedule of Contract Documents”, which is attached and forms a part of this Agreement, and includes any and all additional and amending documents issued in accordance with the provisions of the *Contract Documents*. All of the *Contract Documents* shall constitute the entire *Contract* between the *Owner* and the *Contractor*.
- 2.2 The *Contract* supersedes all prior negotiations, representations, or agreements, whether written or oral, and the *Contract* may be amended only in strict accordance with the provisions of the *Contract Documents*.

**Article 3** **CONTRACT**  
**PRICE**

- 3.1 The price for the *Work* (“*Contract Price*”) shall be the sum in Canadian dollars of the following
- 3.1.1 the product of the actual quantities of the items of *Work* listed in the *Schedule of Quantities and Prices* which are incorporated into or made necessary by the *Work* and the unit prices listed in the *Schedule of Quantities and Prices*; plus
- 3.1.2 all lump sums, if any, as listed in the *Schedule of Quantities and Prices*, for items relating to or incorporated into the *Work*; plus
- 3.1.3 any adjustments, including any payments owing on account of *Changes* and agreed to *Extra Work*, approved in accordance with the provisions of the *Contract Documents*.
- 3.2 The *Contract Price* shall be the entire compensation owing to the *Contractor* for the *Work* and this compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing, and all other costs and expenses whatsoever incurred in performing the *Work*.

**Article 4** **PAYMENT**

- 4.1 Subject to applicable legislation and the provisions of the *Contract Documents*, the *Owner* shall make payments to the *Contractor*.
- 4.2 If the *Owner* fails to make payments to the *Contractor* as they become due in accordance with the terms of the *Contract Documents* then interest calculated at 2% per annum over the prime commercial lending rate of the Royal Bank of Canada on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

**Article 5** **RIGHTS AND**  
**REMEDIES**

- 5.1 The duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.
- 5.2 Except as specifically set out in the *Contract Documents*, no action or failure to act by the *Owner*, *Contract Administrator* or *Contractor* shall

constitute a waiver of any of the parties' rights or duties afforded under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach under the *Contract*.

## Article 6 NOTICES

- 6.1 Communications among the *Owner*, the *Contract Administrator* and the *Contractor*, including all written notices required by the *Contract Documents*, may be delivered by hand, or by fax, or by email, or by pre-paid registered mail to the addresses as set out below:

### The *OWNER*:

District of Sooke  
2205 Otter Point Road, Sooke, BC, V9Z 1J2

Email: [jcarter@sooke.ca](mailto:jcarter@sooke.ca)  
Attention: Jeff Carter, Director of Operations

### The *CONTRACTOR*:

Fax:

Email

Attention:

### The *CONTRACT ADMINISTRATOR*:

McElhanney Ltd.  
#500-3960 Quadra Street, Victoria, BC, V8X 4A3

Email: [jirving@mcelhanney.com](mailto:jirving@mcelhanney.com)  
Attention: Jon Irving, P.Eng.

- 6.2 A communication or notice that is addressed as above shall be considered to have been received
- 3.1.4 immediately upon delivery, if delivered by hand; or
  - 3.1.5 after 5 *Days* from date of posting if sent by registered mail
  - 3.1.6 n/a

- 6.3 The *Owner* or the *Contractor* may, at any time, change its address for notice by giving written notice to the other at the address then applicable. Similarly if the *Contract Administrator* changes its address for notice then the *Owner* will give or cause to be given written notice to the *Contractor*.
- 6.4 The sender of a notice by fax assumes all risk that the fax is received in hard copy.

**Article 7 GENERAL**

- 7.1 This *Contract* shall be construed according to the laws of British Columbia.
- 7.2 The *Contractor* shall not, without the express written consent of the *Owner*, assign this *Contract*, or any portion of this *Contract*.
- 7.3 The headings included in the *Contract Documents* are for convenience only and do not form part of this *Contract* and will not be used to interpret, define or limit the scope or intent of this *Contract* or any of the provisions of the *Contract Documents*.
- 7.4 A word in the *Contract Documents* in the singular includes the plural and, in each case, vice versa.
- 7.5 This agreement shall ensure to the benefit of and be binding upon the parties and their successors, executors, administrators and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement the day and year first written above.

**CONTRACTOR:**

\_\_\_\_\_  
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

\_\_\_\_\_  
(AUTHORIZED SIGNATORY)

\_\_\_\_\_  
(AUTHORIZED SIGNATORY)

**OWNER:**

District Of Sooke

\_\_\_\_\_  
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

\_\_\_\_\_  
(AUTHORIZED SIGNATORY)

\_\_\_\_\_  
(AUTHORIZED SIGNATORY)

(INCLUDE IN LIST ALL DOCUMENTS INCLUDING, IF ANY, SUPPLEMENTARY GENERAL CONDITIONS, SUPPLEMENTARY SPECIFICATIONS, SUPPLEMENTARY STANDARD DETAIL DRAWINGS.)

**Schedule 1 SCHEDULE OF  
CONTRACT  
DOCUMENTS**

The following is an exact and complete list of the *Contract Documents*, as referred to in Article 2.1 of the Agreement.

**NOTE:** The documents noted with “\*” are contained in the “Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings”, edition dated 2019. All sections of this publication are included in the *Contract Documents*.

- 8.1 Agreement, including all Schedules;
- 8.2 Supplementary General Conditions;
- 8.3 General Conditions\*;
- 8.4 Supplementary Specifications;
- 8.5 District of Sooke Bylaw 404, Subdivision and Development Standards Bylaw;
- 8.6 Specifications\*;
- 8.7 Supplementary Standard Detail Drawings;
- 8.8 Supplementary Standard Detail Drawings as per Bylaw 404;
- 8.9 Standard Detail Drawings\*;
- 8.10 Executed Form of Tender, including all Appendices;
- 8.11 *Contract Drawings* listed in Schedule 2 to the Agreement – “List of *Contract Drawings*”;
- 8.12 Optional Works Explanatory Plan;
- 8.13 Geotechnical Investigation – “Proposed Church Road Phase 2, Church Road – Sooke, BC” prepared by Ryzuk Geotechnical, February 16, 2022;
- 8.14 “Environmental Management Plan for Throup Road and Church Road Roundabout Construction, adjacent to Throup Stream” prepared by Swell Environmental Consulting, May 18, 2023
- 8.15 “Charters Road and Church Road Constructions Traffic Management Strategy, District of Sooke” prepared by ISL Engineering Ltd, May 2023
- 8.16 Parts of 2182 Church Road Landscape Drawings prepared by Murdoch de Greeff Inc. – “Issued For Approval”, February 4, 2022
- 8.17 “Chance Find Protocol for Archaeological Sites” prepared by Stantec Consulting Ltd., 2023



- 8.18 BC Hydro Drawing 500-D07-03041 “Issued For Review”, April 17, 2023
- 8.19 Instructions to Tenderers - Part I;
- 8.20 Instructions to Tenderers - Part II\*
- 8.22 The following Addenda:

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( ADDENDA, IF ANY )

(COMPLETE LISTING OF ALL DRAWINGS, PLANS AND SKETCHES WHICH ARE TO FORM A PART OF THE CONTRACT,  
OTHER THAN STANDARD DETAIL DRAWINGS AND SUPPLEMENTARY STANDARD DETAIL DRAWINGS.)

**Schedule 2 LIST OF CONTRACT DRAWINGS**

TITLE	DRAWING NO.	DATE	REVISION NO.	REVISION DATE
Cover		May 5, 2023	0	
General Notes & Legend	C001	May 5, 2023	0	
Church Road Roadworks – Sta. 9+500 to 9+665	C201	May 5, 2023	0	
Church Road Roadworks – Sta. 9+665 to 9+830	C202	May 5, 2023	0	
Throup Road Roadworks – Sta. 12+000 to 12+030 & 13+000 to 13+025	C203	May 5, 2023	0	
Church Street & Francis Gardens Roadworks – Sta. 12+000 to 12+030 & 13+000 to 13+025	C204	May 5, 2023	0	
Church & Throup Road – Storm Plan and Profiles	C205	May 5, 2023	0	
Church Road – Water & Storm Plan and Profiles	C206	May 5, 2023	0	
Ditch & Storm Connection – Plan, Profile and Details	C207	May 5, 2023	0	
Frances Gardens Storm Main Replacement	C208	May 5, 2023	0	
Frances Gardens Storm Main Replacement – 1+170 to 1+242	C209	June 22, 2023	1	
Banford Place Culvert Replacement – 1+265 – 1+310	C210	June 22, 2023	1	
Curb Plan and Profiles – Throup Road Northbound	C211	May 5, 2023	0	
Curb Plan and Profiles – Church Road Southbound	C212	May 5, 2023	0	
Curb Plan and Profiles – Throup Road Eastbound	C213	May 5, 2023	0	

Curb Plan and Profiles – Roundabout Button and Apron	C214	May 5, 2023	0	
Curb Plan and Profiles – Wadams Way and 2182 Access	C215	May 5, 2023	0	
Driveway Profiles	C221	May 5, 2023	0	
Details and Typical Sections	C301	May 5, 2023	0	
Road Cross Sections – Church Road Sta. 9+500.5 to 9+570	C401	May 5, 2023	0	
Road Cross Sections – Church Road Sta. 9+580 to 9+690	C402	May 5, 2023	0	
Road Cross Sections – Church Road Sta. 9+700 to 9+770	C403	May 5, 2023	0	
Road Cross Sections – Church Road Sta. 9+780 to 9+850	C404	May 5, 2023	0	
Road Cross Sections – Throup Road Sta. 11+020 to 11+100	C407	May 5, 2023	0	
Grading Plan	C501	May 5, 2023	0	
Geometrics and Signage	C601	May 5, 2023	0	
Landscape Plan	L101	May 19, 2023	0	
Landscape Plan	L102	May 19, 2023	0	
Landscape Details	L103	May 19, 2023	0	
Church Road – Lighting Layout	E1.00	May 12, 2023	6	
Church Road – Lighting Layout	E1.01	May 12, 2023	6	
Pole Details	E2.00	May 12, 2023	6	
Details & Specifications	E2.01	May 12, 2023	6	
Underground Duct and Structures For U/G Servicing Provisions (Civil Works Only) – 6588 Throup Road – Sooke	500-U07-08875	June 2, 2023	2	

SUPPLEMENTARY SPECIFICATIONS		
Add the following Supplementary Specifications (attached at end):		
SECTION	SUB SECTION	SUPPLEMENTARY SPECIFICATION
01 10 00SS Measurement and Payment	All	
Revise the following Master Municipal Specifications Platinum Edition:		
SECTION	SUB SECTION	SUPPLEMENTARY SPECIFICATION
01 52 01 Temporary Structures	1.6 Payment	<p><b>Add Clause 1.6.2:</b> "Payment for mobilization and demobilization shall include all the Contractor costs of mobilization at the beginning of the project and the cost of demobilization at the end of the project.</p> <p>.1 Included in the mobilization are such items as bonding, insurance, permits, moving personnel, equipment and materials to the site, setting up temporary facilities and all preparation for performing the <i>Work</i>.</p> <p>.2 Included in demobilization are preparation and submission of record drawings, operation and maintenance manuals, removal of all personnel, equipment and materials and cleanup of the <i>Site</i> and the <i>Work</i>.</p> <p>.3 The lump sum price bid for this work shall be relative to the costs involved but shall not exceed ten percent of the <i>Tender Price</i>.</p> <p>.4 Payment shall be made as follows, as approved by the Contract Administrator:</p> <p>.1 60% of the lump sum bid will be included in the first progress payment certificate</p> <p>.2 40% of the lump sum bid will be included in the final progress payment certificate</p> <p>.5 The Contract Administrator may at his discretion authorize partial payment if mobilization or demobilization is not complete</p> <p>.6 The cost of other items specified under General Requirements shall be considered incidental to the work and separate payment will not be made for any other items in the General Requirements unless specifically noted in the <i>Schedule of Quantities and Prices</i>."</p>
01 55 00 Traffic Control, Vehicle Access and Parking	1.4 Traffic Control	<p><b>Add Clause 1.4.15:</b></p> <p>"Provide a detailed Traffic Management Plan (TMP) and drawings with dedicated traffic control and pedestrian delineation for safety of motorists, pedestrians and bicycle traffic for all locations where roadways are affected by construction activities. The TMP shall be sealed by a qualified professional engineer and will be approved by the Contract Administrator in advance of implementation. This plan is to be submitted to the Contract Administrator a minimum of 14 calendar days prior to the</p>

		<p>contractor's desired date of construction commencement. The plan shall be updated and modified as requested by the Contract Administrator, as the construction project proceeds and traffic management needs warrant. The TMP is to contain sufficient details to allow the Contract Administrator and Owner a clear understanding of how the Contractor will ensure the following performance specification will be achieved, at a minimum.</p> <ol style="list-style-type: none"><li>1. TMP shall be prepared in accordance with the "Charters Road and Church Roads Constructions Traffic Management Strategy" prepared by ISL Engineering Ltd. to accommodate the adjacent road corridor construction project on Charters Road, planned for 2023 / 2024 construction.</li><li>2. TMP shall be in prepared in accordance with the 2020 BC Ministry of Transportation and Infrastructure guidelines specified in the Traffic Management Guidelines for Work on Roadways Manual, and the 2016 Standard Specifications for Highway Construction. Table of Contents to include the following:<ol style="list-style-type: none"><li>2.1. General Information</li><li>2.2. Operations and Signage</li><li>2.3. Users and Access</li><li>2.4. Traffic Control Drawings</li><li>2.5. Public Information Plan</li><li>2.6. Incident Management Plan</li><li>2.7. Implementation Plan</li></ol></li><li>3. Partial closure of existing travel lanes to a minimum of single lane alternating traffic to facilitate construction of the Works may be requested</li><li>4. Diverted travel lanes must be on paved or granular base surfaces. Travel surface will allow for vehicles to move through the construction zone at an intended speed of 20 km/h.</li><li>5. Minimize stopping traffic in the travel lane. No dumping or off loading of materials shall be permitted in the travel lane. Stoppages are permitted for vehicle access to and egress from the construction zone or for construction vehicles crossing the travel lane. No delays for full lane closure of more than 5 minutes. Traffic cannot queue into the Sooke Road R/W at any time.</li><li>6. Provide a plan of all off site and on site signage and traffic control devices for review and acceptance by the Contract Administrator and the Owner. Update the plan as requested whenever signage or traffic control device locations are changed.</li><li>7. Provide access for garbage collection and recycling pick-up programs and mail delivery to all residents and businesses. Provide communication to and coordination with all service providers as necessary to ensure access as required.</li><li>8. Provide for the BC Transit bus routes. Communicate to and coordinate with BC Transit as necessary regarding temporary bus stop locations, transit through the work zone and any other issues that may arise that require discussion and coordination.</li></ol>
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		<p>9. Work shall be in accordance with District Of Sooke Noise Bylaws.</p> <p>10. At the discretion of the Contract Administrator, the Contractor may be requested to modify the TMP to accommodate any irregularities or excessive congestion of traffic flow. Maximum total delays of up to 5 minutes are permitted</p> <p>11. Maintain at least one access to all properties, at all times unless otherwise authorized by the Contract Administrator or unless the work is directly in front of a residential driveway. Where closures of residential driveways are required, provide a hand delivered letter a minimum of 72 hours prior to construction to impacted property owner(s). Driveways shall be closed for 72 hours for concrete curing. Daily access shall be provided for trenching where possible using steel plates.</p> <p>12. Facilitate priority access through the work zone for fire trucks and all other emergency vehicles when they are operating with emergency lights and sirens active and where possible otherwise.</p> <p>13. Where sidewalks are closed, provide adequate signage regarding pedestrian detour including signage at closest pedestrian crossing at each side of the closed section. Where work directly impacts sidewalk accessibility, “fixed in place” ramps with a tactile surface are to be provided at either end of the work area allowing pedestrians to safely negotiate the grade change between the roadway surface and drop ramps, curbs, and boulevards. Ramps must be of solid / sound construction, a minimum of 1.5m wide, less than 8% grade, and fixed in place with a traction surface and have a raised barrier edge a minimum of 35mm high.</p> <p>14. Provide plan for on site or off site storage of materials and equipment, location of site trailers and all other storage facilities (e.g. shipping containers). Use of the road right-of way or other public lands will require a Permit to Occupy a Road Allowance.</p>
<b>01 57 01 Environmental Protection</b>	1.1 Section 10 57 01 Includes	<b>Add Clause 1.1.5:</b> “Qualified Environmental Professional”
	1.2 Temporary Erosion and Sediment Controls	<b>Add Clause 1.2.1.4:</b> “All catch basin, silt trap, and lawn basin inlet castings that may receive runoff from the work area to be covered with filter cloth. Ensure no silt or sediment enters the storm drainage system while removing the silt cloth once construction is complete”
	1.4 Environmental Protection	<b>Add Clause 1.4.4:</b> “Disposal of Waste: <ol style="list-style-type: none"> <li>1. Do not bury rubbish and waste materials on site.</li> <li>2. Do not dispose of waste or volatile materials such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.</li> <li>3. Dispose of waste materials off property, in accordance with applicable provincial and/or federal regulations.</li> <li>4. Removal and disposal of Asbestos Cement pipe shall follow current WCB requirements.”</li> </ol>

		<p><b>Add Clause 1.4.5:</b> “Concrete and Asphalt Cutting and Placing:</p> <ol style="list-style-type: none"> <li>1. Control and pick up all wet or dry residue from saw cutting, coring, grinding and milling operations by means of a vacuum device or street sweeper. Under no circumstances is any dust, debris or run-off to migrate into waterways, storm or sanitary sewers.</li> <li>2. Minimize the volume of wastewater produced by cutting tools by recycling and reusing wastewater whenever possible.</li> <li>3. Do not allow cement washout into the streets, driveways, gutters, storm drains, ditches or water courses.</li> <li>4. Set up and operate portable mixers on tarps or heavy drop cloths to contain spillage.</li> <li>5. When breaking up and milling pavement, remove broken pavement and sweep area clean.”</li> </ol>
<b>01 57 01 Environmental Protection</b>	1.4 Environmental Protection	<p><b>Add Clause 1.4.4:</b> “Archaeological Sites: Contractor to comply with “Chance Find Protocol for Archaeological Sites” report prepared by Stantec Consulting Ltd., 2023, amended to the Contract documents, for all ground disturbance activities.”</p>
	1.6 Measurement and Payment	<p><b>Add Clause 1.6.2:</b> “Environmental Protection Plan to be prepared in accordance with “Environmental Management Plan for Throup Road and Church Road Roundabout Construction, Adjacent to Throup Stream” prepared by Swell Environmental Consulting. Payment for Environmental Protection Plan shall be lump sum and includes all work to prepare, deliver and enact an Environmental Management Plan prepared by a registered qualified environmental professional (QEP) that contains the following components: tree protection plan; sensitive ecosystem management plan; sediment and erosion control plan; invasive species management plan; waste disposal; storage areas and laydown area management plan; equipment idling control plan; hazardous material control and spill response plan.”</p>
<b>01 58 01 Project Identification</b>	1.2 Temporary Project Sign	<p><b>Clause 1.2.1.1 delete:</b> “Provide and erect, within 3 weeks of signing Contract, a project sign in a location designated by the Contract Administrator.” <b>Replace with:</b> “Erect, within 2 weeks of being provided signs, two project signs in locations designated by the Contract Administrator.” <b>Delete Clauses 1.2.1.2 and 1.2.1.3</b></p>
<b>03 40 01 Pre-cast Concrete</b>	1.4 Measurement and Payment	<p><b>Clause 1.4.2 delete:</b> “concrete footing” <b>Replace with:</b> “finished ground”. <b>Add</b> “Shop drawings to be provided for approval.”</p>
<b>26 56 01 Roadway Lighting</b>	1.9 Measurement and Payment	<p><b>Add Clause 1.9.4:</b> “All Streetlights, poles, bases, conduit, wiring, junction boxes and pedestrian flashers to be installed as a complete, functioning system as per AES Drawings, paid at the unit rates shown in the Schedule of Quantities and Prices. Payment to include all labour, equipment and materials required to undertake the installation.”</p>

<b>31 23 01 Excavation, Trenching and Backfilling</b>	<b>3.3 Excavation</b>	<b>Clause 3.3.9 delete:</b> "Provisions of Provincial Contaminated Sites Legislation" <b>Replace with</b> "Provisions of Provincial Contaminated Sites Legislation and Technical Memo: Soil Assessment for The Church Road Roundabout Project, Sooke BC prepared by McElhanney Ltd."
<b>31 24 13 Roadway Excavation, Embankment and Compaction</b>	<b>1.8 Measurement and Payment</b>	<b>Add Clause 1.8.14:</b> "Payment for common excavation (neat line area to design subgrade) includes excavation and offsite disposal to design subgrade, including asphalt and concrete removal. Payment includes removal of all existing site fixtures, retaining walls, signs, fencing, stumps, pipes, culverts, conduits and underground infrastructure as shown on the Drawings. Measurement shall be based on the surface area neat lines required and shown on the Drawings and surveyed volume calculations as specified in Supplemental Specifications 01 10 00SS."
<b>32 12 16 Hot Mix Asphalt Concrete Paving</b>	<b>1.5 Measurement and Payment</b>	<b>Clause 1.5.1 change:</b> "based on weigh tickets provided to Contract Administrator as loads are delivered" <b>to</b> "based on area for each thickness specified in the Schedule of Quantities and Prices". <b>Clause 1.5.3 change:</b> "based on weigh tickets provided to Contract Administrator as loads are delivered" <b>to</b> "based on area for each thickness specified in the Schedule of Quantities and Prices".
<b>32 17 23 Painted Pavement Markings</b>	<b>1.5 Measurement and Payment</b>	<b>Add Clause 1.5.5:</b> "Supply and installation of traffic control signs and delineators shall be paid at the unit price shown on the Schedule of Quantities and Prices and shall include all labour, equipment and materials required to complete the installation as shown on the Contract Drawings."
		<b>Add Clause 1.5.6:</b> "Relocation of existing traffic control signs shall be paid at the unit price shown on the Schedule of Quantities and Prices and shall include all labour, equipment and materials required to complete the removal and re-installation as shown on the Contract Drawings. The post and signs shall be salvaged for re-installation and new concrete bases installed. Sign relocations required for construction that are not shown in the Contract Drawings will be considered incidental to the work."
<b>32 31 13 Chain Link Fences and Gates</b>	<b>1.5 Measurement and Payment</b>	<b>Clause 1.5.4 delete:</b> "Payment for handrails and bicycle baffles includes all materials, work and incidentals shown on Standard Detail Drawings C11 and C14 as separate items for each type of installation. Measurement will be made horizontally along surface of the ground for length of handrail or bicycle baffle installed." <b>Replace with:</b> "Payment for handrails includes all materials, work and incidentals shown on Contract drawings. Measurement will be made horizontally along surface of the ground for length of handrail installed."
<b>32 91 21 Topsoil and Finish Grading</b>	<b>1.4 Measurement and Payment</b>	<b>Clause 1.4.1 delete:</b> "Payment for growing medium will be by actual area provided and payment for imported topsoil will be based on loose truck box volume." <b>Replace with:</b> "Payment for growing medium and imported topsoil will be by actual area



		provided at depth specified in contract drawings and Schedule of Quantities and Prices."
<b>33 44 01 Manholes and Catch basins</b>	1.5 Measurement and Payment	<b>Clause 1.5.1.1 delete:</b> "except riser". <b>Replace with:</b> "including riser". <b>Delete Clause 1.5.1.2:</b> <b>Clause 1.5.3 delete:</b> "existing catchbasins,". <b>Replace with:</b> "existing manholes, catchbasins,".
<b>32 93 01 Planting of Trees, Shrubs &amp; Ground Cover</b>	1.9 Measurement and Payment	<b>Add clause 1.9.3:</b> "Payment for Irrigation System shall be paid at the unit price shown on the Schedule of Quantities and Prices and shall include all labour, equipment, and materials required to design, supply and install a complete functioning irrigation system to support sod, trees and shrubs in specified areas, as shown on the Contract Drawings. Contractor is to provide Shop Drawings for approval prior to construction." <b>Add Clause 1.9.4:</b> "Native riparian plantings to be salvaged or supplied in 1-gallon pots, planted in a grid at 1m intervals, centre-to-centre, in an arrangement directed by the Owner's QEP. Plantings to include mix of willow, red osier dogwood, slough sedge and soft-stemmed bullrush complete with mulch."
<b>33 11 01 Waterworks</b>	1.8 Measurement and Payment	<b>Clause 1.8.12 delete:</b> "tie-ins to existing mains" <b>Replace with</b> "tie-ins to existing mains, service box adjustments/relocations, and watermain lowering" <b>delete:</b> "tie-in work" <b>Replace with</b> "work, including traffic control,"





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ORIGINAL DWG SIZE: A1 (594 x 841mm)

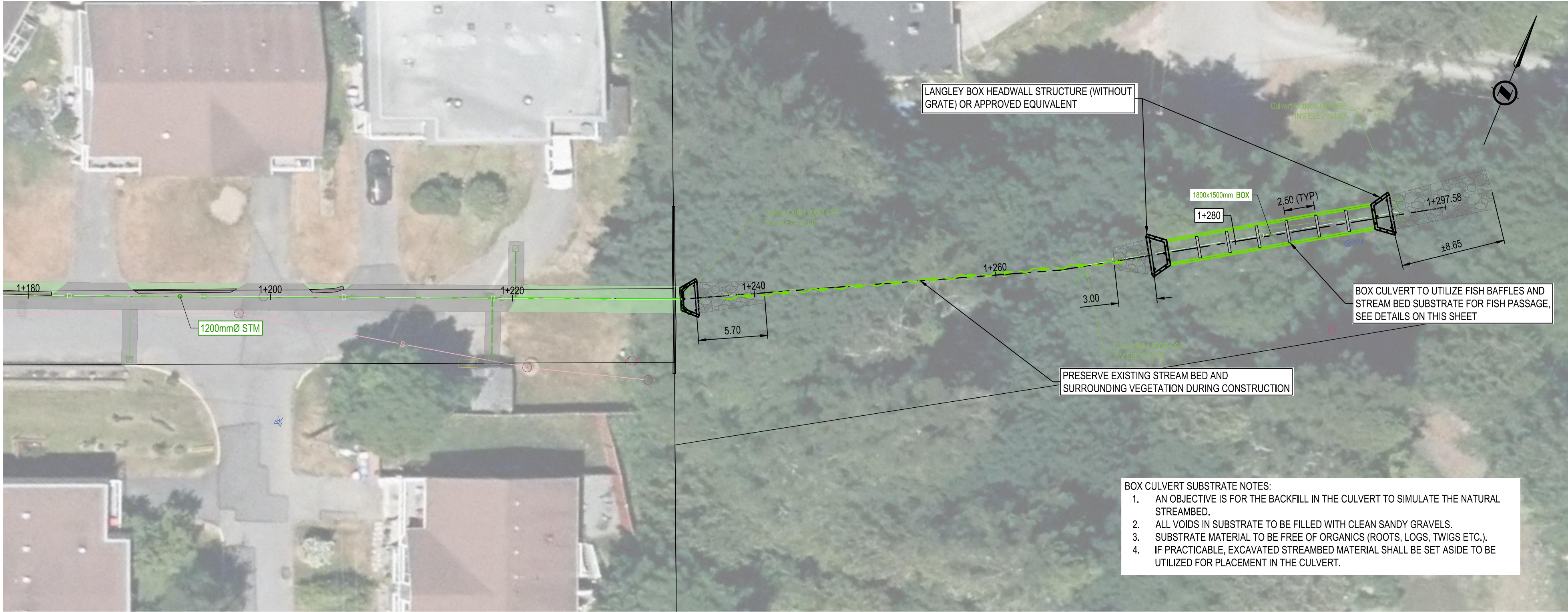


**PERMIT TO PRACTICE**  
McElhanney Ltd.  
**PERMIT NUMBER: 1003299**  
Engineers and Geoscientists of BC

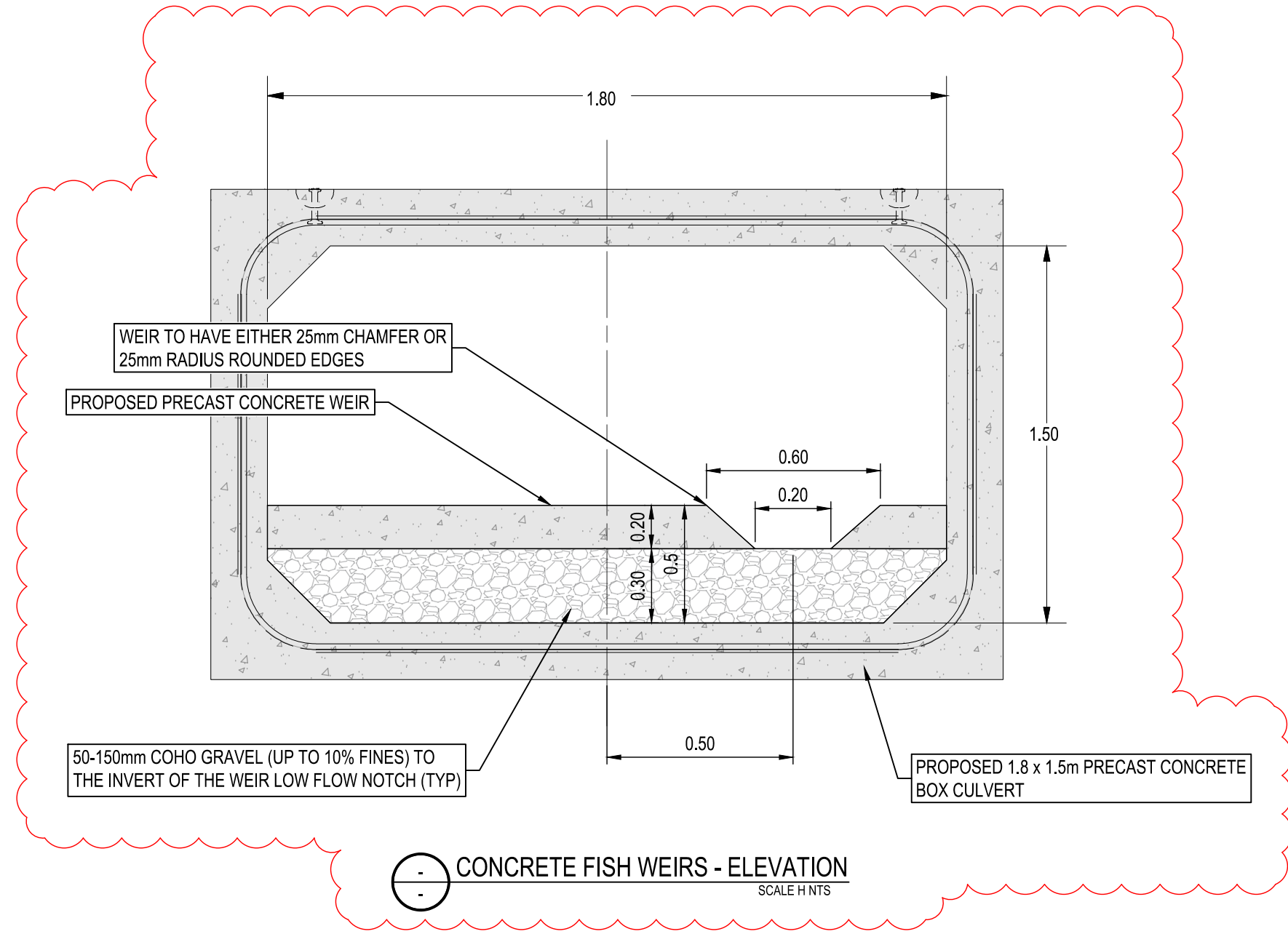
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AND MAY CONTAIN ERRORS AND OMISSIONS

Drawing No.	
C209	
Project Number	Rev.
241-20-128	1

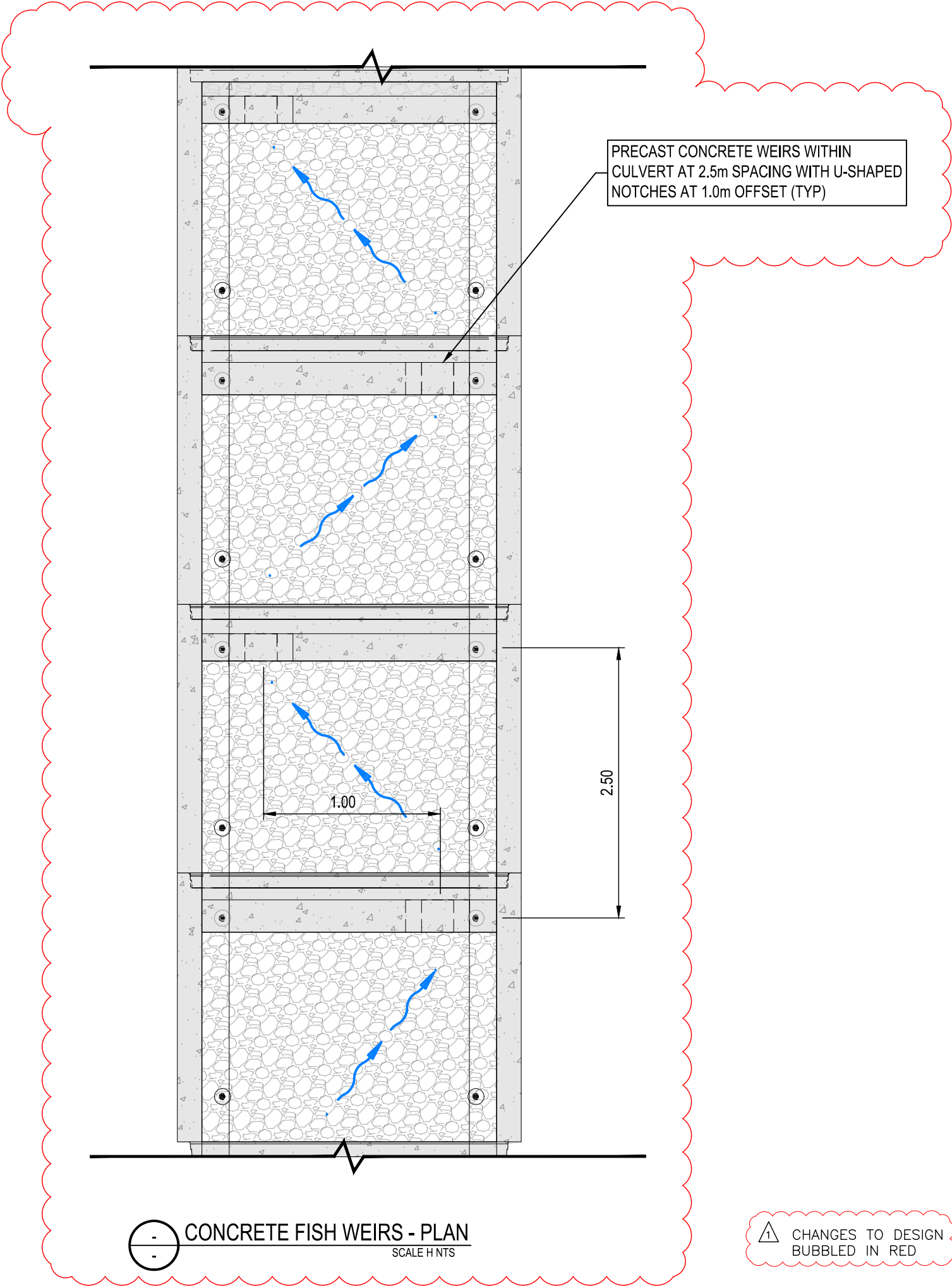
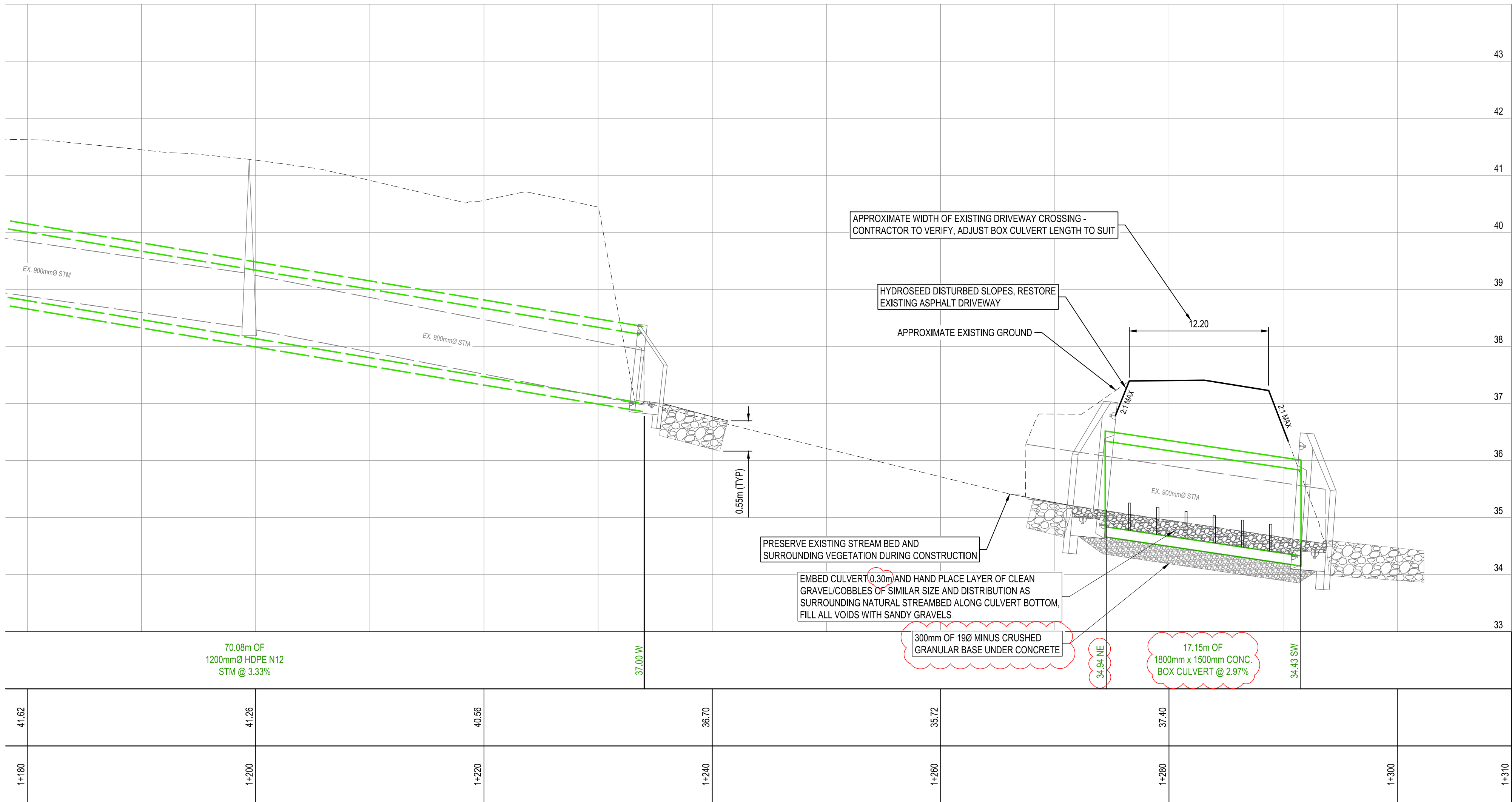




- BOX CULVERT SUBSTRATE NOTES:
1. AN OBJECTIVE IS FOR THE BACKFILL IN THE CULVERT TO SIMULATE THE NATURAL STREAMBED.
  2. ALL VOIDS IN SUBSTRATE TO BE FILLED WITH CLEAN SANDY GRAVELS.
  3. SUBSTRATE MATERIAL TO BE FREE OF ORGANICS (ROOTS, LOGS, TWIGS ETC.).
  4. IF PRACTICABLE, EXCAVATED STREAMBED MATERIAL SHALL BE SET ASIDE TO BE UTILIZED FOR PLACEMENT IN THE CULVERT.



- BOX CULVERT & FISH BAFFLE NOTES:
1. PRECAST CONCRETE BOX CULVERT AND FISH WEIR SUPPLIER TO PROVIDE SHOP DRAWINGS PRIOR TO FABRICATION c/w BC REGISTERED PROFESSIONAL ENGINEER'S SEAL.



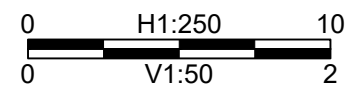
Rev	Date	Description	Drawn	Design	App'd
1	2023-06-22	ISSUED FOR ADDENDUM #3	MR	MR	JL
0	2023-05-05	ISSUED FOR TENDER	DN	DN	JL

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ORIGINAL DWG SIZE: A1 (894 x 841mm)



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McElhanney Ltd.  
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Engineers and Geoscientists of BC

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**DISTRICT OF SOOKE**  
2205 OTTER POINT ROAD, SOOKE, B.C.  
**BANFORD PLACE CULVERT REPLACEMENT**  
STA 1+265 TO 1+310

Drawing No.  
**C210**  
Project Number  
2241-20-128  
Rev.  
1

CHANGES TO DESIGN  
BUBBLED IN RED



# TECHNICAL MEMO

**To**  
Jeff Carter, Director of Operations  
District of Sooke

**From**  
Brian White, P.Eng, Task Lead  
McElhanney, Environmental Services

**Re**  
Soil Assessment for the Church Road Roundabout  
Project, Sooke, BC

**Date**  
June 28, 2023

## 1. Introduction

McElhanney Ltd. (McElhanney) was retained by the District of Sooke (the District; the Client) to complete a Soil Assessment program for the Church Road Roundabout Project in Sooke, BC (the Project). Refer to *Figure 1* for the approximate Project boundary. The purpose of the Soil Assessment was to characterize the quality of soils within the Project construction footprint (the Site) that are anticipated to be excavated as a result of planned construction activities.



*Figure 1: Approximate Project Boundary (red outline), imagery courtesy of Google Earth)*

## 2. Background

McElhanney understands that the District is planning to complete storm system upgrades and road improvements including a new roundabout structure at the intersection of Church Road and Throup Road. The Project alignment includes the following approximate linear meters: 320m along Church Road, 100m along Throup Road, and 310m along Francis Gardens.

### 2.1. PROJECT OBJECTIVES

The Soil Assessment aims to meet the following objectives:

- To investigate soils in areas of planned soil cuts for potential contamination from the roadway, unknown fill, or other historical activities;
- Characterize soils within the areas of planned soil cuts to determine future soil management and disposal options during construction; and,
- Provide recommendations and associated measures to manage the presence of contamination, if identified, in soil during construction phases of the work.

## 3. Scope of Work

McElhanney's Soil Assessment for the Site was developed using the McElhanney Issued for Tender drawings dated May 5, 2023. The sampling locations were chosen to target areas of greatest potential for soil disturbance and cuts during construction. The scope of work included:

- Project management, subcontractor coordination and Client communication.
- A desktop search of regulatory and historical databases to assess likelihood and potential sources of contamination including: aerial photographs, BC Contaminated Sites Registry, and Federal Contaminated Sites Inventory.
- A subsurface investigation work plan targeting soils within the Project footprint.
- A site-specific Health & Safety Plan completed by McElhanney field personnel and reviewed by its subcontractors.
- Application for District permits and retention of traffic control.
- Preliminary layout of all planned test hole locations using a handheld GPS
- Completion of a BC One Call and private utility locate of the proposed ground disturbance locations by a third-party subcontractor.
- Advancement of 8 test holes, to a maximum exploratory depth of 2.0 meters below ground surface (mbgs) using hydro vacuum truck (hydrovac).



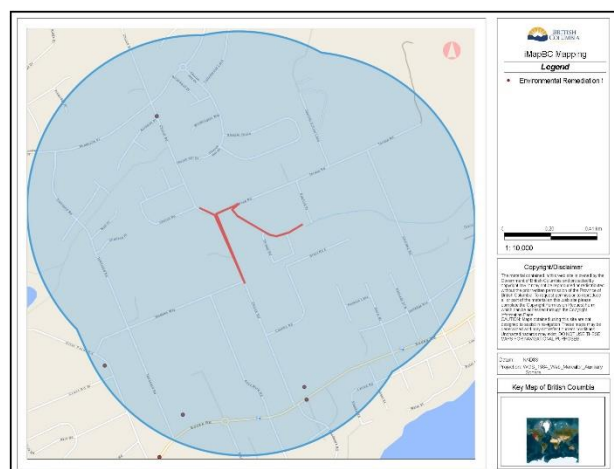
- Log each borehole advanced for soil type, colour, density, moisture content, staining, odour and other relevant observations in general accordance with McElhanney's Soil Classification Manual for Geotechnical Assessments (based on the modified Unified Soil Classification System).
- Collection of soil samples at regular depth intervals or where geological units changed, for analyses of Potential Contaminants of Concern (PCOCs). Headspace vapour analysis was completed through field screening on each sample collected for the presence or absence of volatiles organic compounds at the time of sample collection using a photoionization detector (PID).
- Collection of one blind field duplicate (BFD) sample at a rate of approximately 1 in 10 for quality assurance/quality control purposes.
- Submission of soil samples to a CALA certified laboratory, ALS Environmental, for analysis on a regular turnaround time.
- Evaluated the soil analytical results to the current applicable BC Contaminated Sites Regulation (CSR) standards for Residential Low Density and Industrial Land Use (RLLD/IL).
- Confirm or refute the presence or absence of contamination and provide an estimate of the possible extent, magnitude, and variability of the contamination.
- Preparation of this Soil Assessment report outlining the results of historical searches, field activities, methodology, analytical results, discussion, an estimate of soil volumes by class and proposed receiving facilities, and conclusions.

## 4. Desktop Review

### 4.1. REGULATORY DATABASE REVIEW

#### 4.1.1. BC Ministry of Environment & Climate Change Strategy (ENV) Site Registry Search

The iMapBC Environmental Remediation Sites layer, which is maintained by ENV, was used to perform a 500 m radius search from the edge of the Site for BC Site Registry listings. The Site Registry is a data repository maintained under the provisions of the Environmental Management Act (EMA) and CSR regarding information on activities with contamination causing potential. There were five listings identified within the 500m search radius as shown on *Figure 2*. None of the Registered Sites are considered of environmental concern due to their distance from Site.



*Figure 2: iMapBC BC Site Registry Search Results within 500m of the Project footprint.*

## 4.2. FEDERAL CONTAMINATED SITES INVENTORY

The Federal Contaminated Sites Inventory (FCSI), which is maintained by the Government of Canada, was used to perform a 500 m search from the edge of Site for all known federal contaminated sites. The FCSI includes information on all known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility (Government of Canada, 1903; 1911).

There was one Federal Contaminated Site (Site 00020882 – Sooke Moorage) within the 500 m search area. The site status is closed and is not of concern at this time. Search results are presented on [Figure 3](#).

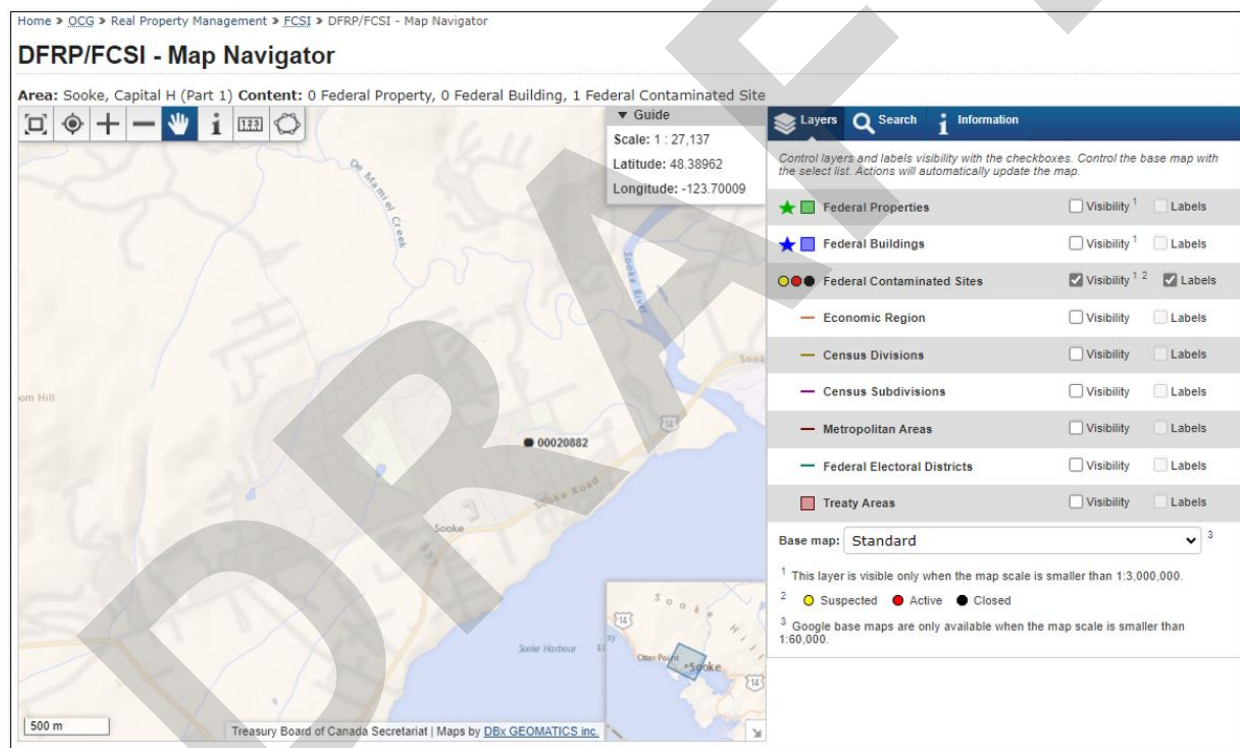


Figure 3: Federal Contaminated Sites Inventory Search results within 500 m of the Site.

## 4.3. HISTORICAL RECORDS REVIEW

### 4.3.1. Aerial Photograph Interpretation

Historical aerial photographs were obtained from UBC's Geographic Information Center and images from Google Earth. A selection of photographs were available for review from the following years; 1946, 1951, 1962, 1972, 1980, 1990, 2004, 2013, 2017, 2021, and 2023. A summary of our review has been presented in [Table 1](#) and copies of select aerial photographs with a detailed review are provided in [Appendix C](#).





Table 1: Aerial Photograph Interpretation.

Year	Photograph Reference	Site Area	Adjacent Properties
1946	BC.249;10	Church Road and Throup Road are present on Site.	The areas to the west and east of the Site are cleared and largely undeveloped. Residential homes were present on the west side of Church Road and north of the Site along Throup Road.
1951	BC1238;41	No significant changes	Additional residential homes had been constructed in the area south of the Site along Church Road.
1962	BC5055;115	No significant changes.	No significant changes.
1972	BC7410NO271	No significant changes.	Additional residential development to the north and south of the Site.
1980	30BC80082NO.171	No significant changes.	Additional residential development to the east of the Site.
1990	15BCB90144NO.62	No significant changes.	Additional residential development southeast of the Site.
2004	Google Earth	No significant changes.	A church was constructed north of the Site and a municipal building southwest of the Site.
2013	Google Earth	No significant changes.	Additional residential development west/northwest of the Site
2017	Google Earth	Wadams Way had been constructed connecting to the southwest corner of the Site. A walking/bike path had been constructed adjacent to the west side of the Site.	No significant changes outside of Wadams Way.
2021	Google Earth	No significant changes.	No significant changes.
2023	Google Earth	No significant changes.	The property to the west of the Site was under active construction.

Based on the review of available aerial photographs, no on Site or off-Site APECs were identified.





### 4.3.2. Potential Contamination Sources Summary

Based on the findings of the desktop review, the main sources of potential contamination within the Project footprint are fill of unknown origins and road salting. The PCOCs are outlined in [Table 2](#).

*Table 2: Summary of Potential Contamination Sources and PCOCs.*

Location	Description	PCOCs
<b>Project Footprint</b>	Potential for fill of unknown origin and road salting on all road Right of Way (ROWs).	Chloride and sodium ions, LEPHs, HEPHs, PAHs, metals

PAHs - Polycyclic aromatic hydrocarbons in soil

LEPHs – Light extractable petroleum hydrocarbons in soil

HEPHs – Heavy extractable petroleum hydrocarbons in soil

Note that although not a Schedule 2 activity, road salting has been identified as a potential contamination causing activity as we understand that soils originating from trench excavation may be unsuitable for re-use during construction and off-site disposal will be necessary. To accommodate acceptance by local soil disposal dump sites, chloride and sodium ions have been added as PCOCs for screening purposes.

## 5. Regulatory Framework

The investigations described within this report were completed in accordance with the BC EMA, and its associated regulation the BC CSR, the governing provincial legislation on the management and remediation of contaminated sites. Under the EMA, the BC CSR contains the relevant standards to characterize soil, vapour and groundwater quality.

### 5.1. APPLICABLE SOIL STANDARDS

Soil results were evaluated to the current BC CSR Schedule 3.1 standards. Road ROWs fall under the BC CSR Industrial Land Use (IL) definition and therefore these standards were applied for the Site. The majority of potential soil receiving facilities within greater Victoria require soils to meet BC CSR Residential Low Density (RLLD) Land Use standards. Considering current Site use and the goal of characterizing soils for relocation, standards for IL and RLLD Land uses were applied for the Site in this assessment.

The BC CSR Schedule 3.1 standards consist of the following three parts:

- Part 1 – Matrix numerical soil standards;
- Part 2 – Generic numerical soil standards to protect human health; and,
- Part 3 – Generic numerical soil standards to protect environmental health.

For the matrix standards included in Part 1, the following Site-specific factors were considered applicable:

- Intake of contaminated soil (mandatory);
- Drinking water use (as per ENV Protocol 21);
- Toxicity to soil invertebrates and plants (mandatory); and,



- Groundwater flow to surface water used by freshwater and marine aquatic life;

Groundwater used for irrigation was not considered applicable as the potential receiving sites are not within 500m of agricultural land. Based on this assessment, when soils are relocated, any potential receiving soil sites **must be more than 500m from lands using groundwater for irrigation**. Regional background soil quality estimates for **Region 1** – Vancouver Island, as outlined in *ENV Protocol 4 – Establishing Background Concentrations in Soil*, were also considered, where applicable (BC ENV, 2021).

## 6. Methodologies

Field activities were completed June 6, 8, and 9, 2023. Investigation methods were conducted by qualified, trained staff and in general accordance to prescribed guidance documents such as the BC Field Sampling Manual parts A, D, and E (BC ENV, 2013 and 2020). When working on roadways, traffic control was used to ensure safe isolation of the work zone. A summary of the methods used during the completion of the field program are provided in the following subsections. Select Site photographs are included in [Appendix E](#).

### 6.1. UTILITY LOCATING

Kelly's First Call Locating (First Call) met with McElhanney field staff on-Site June 6, 2023, to perform the utility clearances prior to ground disturbance activities. A BC One Call was completed by McElhanney prior to arriving on the Site. Available One Call information was reviewed during the utility clearance activities, and utility clearances were completed by use of Electromagnetic (EM) and Ground Penetrating Radar (GPR) scanning to identify any unmarked subsurface utilities or anomalous materials.

### 6.2. HYDROVAC INVESTIGATION

Hydroforce Excavating Ltd was retained to complete hydrovac activities at eight locations on June 8 and 9, 2023. A volume of approximately 12,000 L of material was removed during the hydrovac activities and was transported to Environmental 360 Solutions Ltd.'s facility in Nanaimo for disposal.

During test hole advancement, soils were logged for soil type, colour, density, moisture content, observed staining, odour, and other relevant observations in general accordance with McElhanney's *Soil Classification Manual for Geotechnical Assessments* (based on the modified Unified Soil Classification System). Select soil samples were collected directly from the soil sample bags, minimizing potential cross-contamination. Sample frequency depended on field observations, including changes in stratigraphy, and results of soil headspace readings. Soil samples were obtained from select depths for field screening and eight soil samples and one duplicate soil sample were submitted for laboratory analysis of PCOCs to ALS Environmental in Burnaby, BC under Chain of Custody. [Table 3](#) in [Section 7.2](#) provides a summary of analytical exceedances in soil and the PCOCs analyzed. All other analytical samples were placed on hold for further analysis if required.

Approximate locations of each test hole are presented on [Figure 4](#).







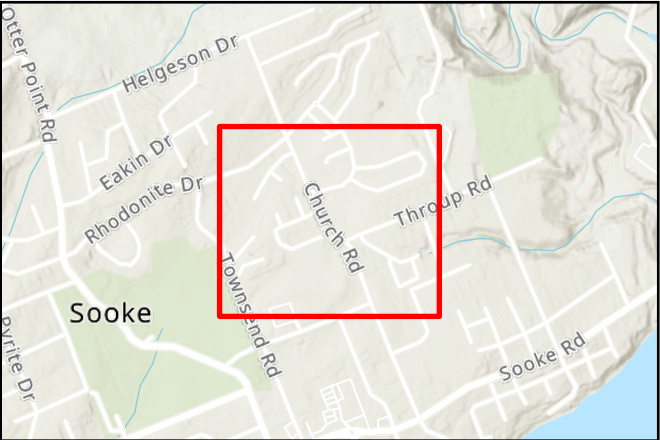


Figure 4: CHURCH AND THROUP ROAD  
SOIL ASSESSMENT  
TEST HOLE LOCATIONS

LEGEND

-  Hydrovac Test Hole Sample
-  Site Boundary

SITE LOCATION



DATE: 2023-06-22  
REV: 0  
SCALE: 1 : 1,500  
COORD: NAD 1983 UTM Zone 10  
PROJECT: 2241-20128-00  
DRAWN BY: JD  
REVIEWED BY: VA



### 6.3. SOIL SAMPLING

During test hole advancement, select soil samples were collected. At each depth interval, the collected soil sample was divided into two portions: one for potential laboratory analysis and the other for field headspace analysis. Samples collected for laboratory analysis were placed in laboratory supplied 120mL sterilized glass jars and 40 mL pre-weighed methanol vials (using single use Terra-Cores™). Field headspace screening samples were placed into plastic sealable bags (approximately 40% full) and set aside for approximately seven to 10 minutes to allow semi-volatile and volatile organic compounds to partition to the vapour phase within the airspace contained within the bag. The headspace concentration was then measured using a PID in units of parts per million (ppm). All soil samples collected for laboratory analysis were placed into coolers with ice packs and shipped to ALS Laboratory in Burnaby, BC under Chain of Custody.

### 6.4. QUALITY ASSURANCE / QUALITY CONTROL

Several Quality Assurance/Quality Control (QA/QC) measures were employed during program sampling. Specifically, the following items identify both in-house and external QA/QC protocols applied:

- Duplicate samples were collected on an approximate 10% frequency and analyzed to evaluate laboratory accuracy.
- The field PID meter was calibrated with isobutylene of a known concentration and zero-calibrated with fresh air prior to use before each day.
- ALS is certified with the Canadian Association for Laboratory Accreditation (CALA) and performs its analytical services under auditable QA/QC standards.
- All activities were conducted by qualified and trained staff.
- The project was managed in accordance with McElhanney's certified ISO 9001 program.
- Soil samples were collected in accordance with the BC Field Sampling Manual.
  - Nitrile gloves were worn during sampling and replaced for each subsequent sample to minimize the potential for cross-contamination between samples.
  - Dedicated disposable Terra-cores were used to sample soils for VOC analysis.
  - All soil samples were collected in laboratory-supplied sterile sampling jars, bottles.
- To preserve sample integrity, samples were shipped in coolers containing ice packs to ALS Laboratory in Burnaby, BC.
- All PCOCs were extracted within their laboratory-prescribed holding time; and
- Summary analytical tables prepared for this report were verified to be true with original analytical records.



## 7. Results

### 7.1. GEOLOGY

A general description of the Site's geology observed at the investigation locations is provided below:

- **Asphalt** at surface in thicknesses around 0.09m, underlain by
- **Sand and gravel, trace cobbles** with varying amounts of silt (approximately 20-50% based on visual estimate) to maximum advanced depths of 1.8m.

The soil samples collected during this investigation were collected from the sidewalls of each test hole. No visible or olfactory indications of petroleum hydrocarbons were noted. No groundwater was encountered during this Soil Assessment.

### 7.2. ANALYTICAL RESULTS

A summary of soil analytical exceedances from the test holes submitted for laboratory analyses are included in [Table 3](#) and on [Figure 5](#). The detailed analytical results table is included in [Appendix C](#). Laboratory Certificates of Analysis are included in [Appendix D](#).

*Table 3: Summary of Soil Exceedances.*

Sample ID	Sample Depth (mbgs)	Soil Sample PID Headspace Reading	PCOCs	Results
TH23-04A	0.3 – 0.6	0.4	Chloride ion, sodium ion, PAHs, LEPHs, HEPHs, BTEXSM, VPH, and metals	<b>Chloride ion &gt; BC CSR IL Standards</b>
TH23-04B	1.0 – 1.2	0.4	Chloride ion and sodium ion	<b>Chloride ion &gt; BC CSR IL Standards</b>

Notes:

**Formatted Bold** – Parameter exceeds applicable standard

PAHs – Polycyclic Aromatic Hydrocarbons

LEPHs/HEPHs – Light/Heavy Extractable Petroleum Hydrocarbons

VPH – Volatile Petroleum Hydrocarbons

BTEXSM – Benzene, Toluene, Ethylbenzene, Xylenes, Styrene, and MTBE

PPM – Parts per million

IL – Industrial Land Use

RLLD – Residential Low Density Land Use







Figure 5: CHURCH AND THROUP ROAD SOIL ASSESSMENT RESULTS IN SOIL

LEGEND

- ⊕ Hydrovac Test Hole Sample
- Concentrations below BC CSR Standards for RLLD
- Concentrations exceed BC CSR Standards for IL
- Site Boundary

SITE LOCATION



DATE: 2023-06-22  
REV: 0  
SCALE: 1 : 1,500  
COORD: NAD 1983 UTM Zone 10  
PROJECT: 2241-20128-00  
DRAWN BY: JD  
REVIEWED BY: VA



## 8. Analytical QA/QC

### 8.1. RELATIVE PERCENT DIFFERENCE (RPD)

Blind field duplicate (BFD) samples were collected during the investigation to assess laboratory precision. One duplicate soil sample was analyzed during the investigation.

Relative Percent Difference (RPD) calculations were conducted on select sample sets where duplicate samples were collected. Relative percent difference was calculated using laboratory result values of a select sample, its duplicate result, and the equation  $\% \text{ Difference} = \frac{|E_1 - E_2|}{\frac{1}{2}(E_1 + E_2)} \cdot 100$ . Descriptive statistics were applied to each duplicate sample.

The RPD results are considered less precise when the concentration of a given parameter is less than five times the analytical laboratory Reportable Detection Limit (RDL). Consequently, RPD values were not calculated in instances when the concentration of either the sample or duplicate sample are less than five times the RDL and/or either sample is reported at concentrations less than the RDL. Generally, the range of acceptable values for RPD is 20% to 50% with values under 20% considered with a higher degree of assurance. The sample duplicate RPD Data Quality Objectives (DQO) provided in the BC Environmental Laboratory Manual are summarized in [Table 4](#) for each of the PCOCs analyzed.

*Table 4: Sample Duplicate Data Quality Objectives (BC Environmental Laboratory Manual).*

Parameter Category	Recommended Laboratory DQOs (RPD %)
<b>Organics in Soil</b>	
<i>Polycyclic Aromatic Hydrocarbons</i>	50
<i>Volatile Organics (including BTEX and VH)</i>	40
<i>Extractable Petroleum Hydrocarbons (EPH, LEPH, HEPH)</i>	40
<i>Most Other Typical Organic Parameters</i>	40
<b>Metals in Soil</b>	
<i>High Variability Metals (Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, Ti)</i>	40
<i>Other Metals</i>	30
<b>Inorganics</b>	
<i>General Inorganics in Soil</i>	30

RPD values were calculated in soil for parameters with concentrations greater than five times the RDL. Only inorganics (metals and salinity) parameters for the duplicate-sample pair met these criteria and results are summarized in [Table 5](#). In instances where the calculated RPD values were greater than the DQO threshold, a review of those samples was conducted to confirm if additional analysis was warranted:

- Zirconium concentrations were calculated above the 30% threshold at 37.5%.



The RPD value above 30% was likely due to heterogeneity within the soil unit. The measured zirconium concentrations are not of concern as there as it is not a regulated parameter under the BC CSR. Outside zirconium, the remainder of the RPD values in soil are well below the DQOs. In addition, ALS Laboratories implements internal QA/QC procedures and checks using certified reference materials, duplicates, method blanks and method spikes. McElhanney reviewed the laboratory QA/QC, and no issues were identified.

*Table 5: Summary of RPD Calculations.*

Sample ID / Duplicate ID	Parameter	Sample Size	Standard Deviation (%)	Upper 95% Confidence Limit	Average RPD (%)	RPD Range (%)
TH23-03A / DUP-A	Inorganics: metals, chloride ion, sodium ion	29	8.33	14.33	11.78	0.90 – 37.5

Based on the result of RPD calculations and our review of the ALS QA/QC report, McElhanney considers the results accurate and reliable for the purposes of this investigation.



## 9. Conclusions

Based on the findings of this Soil Assessment and the information available at the time of this investigation, McElhanney makes the following conclusions:

- The soil stratigraphy within the Project area is generally comprised of 0.05m – 0.08m of asphalt, followed by sand and gravel with various amounts of silt to maximum explored depths of 1.8m. Groundwater was not encountered during the investigation.
- Chloride ion contaminated soils (concentrations greater than BC CSR IL standards) were identified at one location along Church Road. The source of chlorides may be historical road salting activities. These soils within the Project footprint are of concern and will need to be managed appropriately during construction.
- Total chromium concentrations exceeded BC CSR IL standards for hexavalent chromium at multiple locations. Therefore speciation for hexavalent chromium was performed on two samples from opposite ends of the Project alignment and different depths in order to assess potential hexavalent chromium concentrations in all types and depths of soils in the Project footprint. Results indicate that hexavalent chromium concentrations are well below applicable standards and were applied to all soil within the Project footprint.
- Lateral extents of contaminants were estimated as halfway between a contaminated sample location and a clean sample location.

A summary of soil quality along the project alignment referring to construction stations in the McElhanney Issued for Tender drawings dated May 5, 2023 and depths below existing ground surface is provided in [Table 6](#) and on [Figure 6](#).



Table 6: Summary of IL+ Soil Quality Along the Project Alignment.

General Location	Construction Element	Soil Quality	Parameters Exceeding Applicable Standard	Construction Stations		Depth Below Existing Ground Surface		Average Trench Depth for Calculation	Approximate Plane View Area (m <sup>2</sup> )	Preliminary Soil Volume Estimate (m <sup>3</sup> )
				From (m)	To (m)	From (m)	To (m)			
Church Road	Storm main	IL+	Chloride ions	9+665	9+725	below asphalt	trench depth	2.6	72	185
Church Road	Road	IL+	Chloride ions	9+665	9+725	below asphalt	0.425	0.425	905	385

## Notes:

**IL+:** Concentrations of parameters in soil are greater than BC CSR Industrial land use standards.

All other soils are less than BC CSR Residential Low Density standards and are not included in the summary.

Construction stations are as per McElhanney IFT drawings dated May 5, 2023.

**Concentrations of chloride ions were between 40-100 ug/g in certain areas. All residential quality soils must be taken to a facility that accepts chloride ions up to 100ug/g. Residential quality soils cannot be relocated to an area within 500m of a groundwater well used for irrigation.**





Figure 6: CHURCH AND THROUP ROAD  
SOIL ASSESSMENT  
SOIL QUALITY SUMMARY

LEGEND

- ⊕ Hydrovac Test Hole Sample
- Concentrations below BC CSR Standards for RLLD
- Concentrations exceed BC CSR Standards for IL
- Site Boundary

SITE LOCATION



DATE: 2023-06-22  
REV: 0  
SCALE: 1 : 1,500  
COORD: NAD 1983 UTM Zone 10  
PROJECT: 2241-20128-00  
DRAWN BY: JD  
REVIEWED BY: VA





A preliminary estimate of neat soil volumes for IL+ soils identified is provided in *Table 7*.

*Table 7: Preliminary Estimate of Neat Soil Volumes for IL+ Soil Quality Class.*

Soil Quality	Preliminary Soil Volume Estimate (m <sup>3</sup> )	Relocation / Disposal	Potential Disposal Facilities
<b>IL+ Chloride Ions</b>	570	Soils are considered a waste and must be disposed of at a permitted facility.	<b>GRT Facility</b> Duke Point Nanaimo, BC 250-883-1124 <a href="https://www.grtenv.com/contact-us">https://www.grtenv.com/contact-us</a>

Notes:

**IL+:** Concentrations of parameters in soil are greater than BC CSR Industrial land use standards.

All other soils are less than BC CSR Residential Low Density standards and soil volume estimates are not included in the summary.

Construction stations are as per McElhanney IFT drawings dated May 5, 2023.

**Concentrations of chloride ions are between 40-100 ug/g in certain areas. All residential quality soils must be taken to a facility that accepts chloride ions up to 100ug/g. Residential quality soils cannot be relocated to an area within 500m of a groundwater well used for irrigation.**

Volumes were estimated using the IFT drawings submitted May 5, 2023 and the following assumptions:

- Assumptions in soil volume estimate calculations include:
  - Average trench width of 1.2m;
  - Neat soil volumes provided are in-situ and do not account for any soil bulking factors;
  - Calculations are based on McElhanney IFT drawings dated May 5, 2023, and include main lines only;
  - Calculations are based on an average pipe depth computed using depths measured at 15m spacing along the alignment;
  - Depth of soils that will be disturbed in roadway improvement areas of 425mm; and,
  - Bedding under the pipe invert of 150mm.

## 10. Recommendations

Given the findings of the Soil Assessment completed at the Site, McElhanney recommends the following:

- Complete step-out sampling at approximate 10m spacing from identified contaminated locations to further delineate and potentially reduce IL+ soil volumes. This sampling can be deferred following tender closing when the contract has been awarded during utility locating or potholing activities by the successful proponent.
- A Soil Management Plan (SMP) is recommended for the proposed construction of the Project. The SMP will define roles and responsibilities for the work, identify soil handling, transport, and disposal procedures, outline reporting requirements, and inform crews of visual cues that will assist with the identification of potential chance finds for contaminants during the execution of the project. The SMP would reference the findings of this report and speak to the contractor's requirements for off-site disposal.
- Review of the analytical results by a Qualified Professional upon selection of a receiving Site for disposal to confirm assumptions made within are applicable to the disposal location.
- Remediation of soil beyond the areas that will be disturbed as a result of construction is not required. The District is not required at this time to chase or remediate the impacts of the historical contamination within the roadway as there is an exemption from doing so by BC ENV. However, it is conceivable that future work and maintenance in this area will be required. The District should make third parties and staff aware of the environmental concerns during future permitting requests. Any and all future work should include consideration of the contaminants of concern as identified herein.

## 11. Professional Statement and Closure

In conformance with applicable regulations, we confirm that:

- This Soil Assessment has been prepared in accordance with the applicable standards; and
- The undersigned have demonstrable experience in investigation of the type of contamination at the Site for which this statement applies and are familiar with the investigation carried out at the Site.

McElhanney appreciates the opportunity to provide environmental services to the District of Sooke and we look forward to working with you for the duration of this assignment. If you have any questions regarding the information within, please do not hesitate to contact the undersigned.

Yours Truly,

**McELHANNEY LTD.**

Prepared by:

Reviewed by:

DRAFT

DRAFT

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## 12. Limitations of Report

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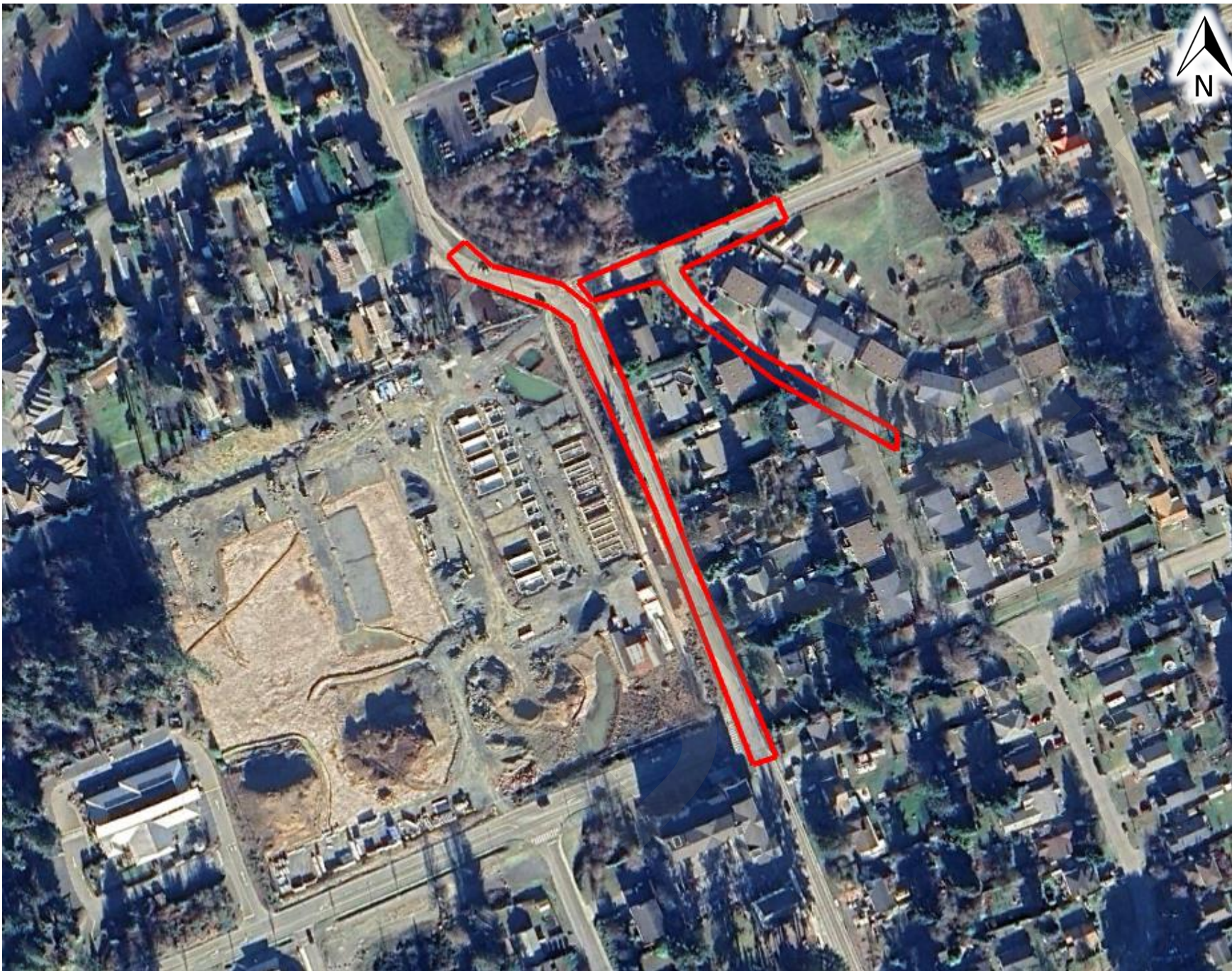


## 13. References

- BC Ministry of the Environment and Climate Change Strategy. (BC ENV). 2013 and 2020. *British Columbia Field Sampling Manual – For Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples*.
- BC Ministry of the Environment and Climate Change Strategy. (BC ENV). 2021. *Contaminated Sites Regulation*, BC Reg. 375/96, includes Stage 10/11 Housekeeping Amendments, March 2021.
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- Government of Canada. (2022). *Federal Contaminated Sites Inventory - Map Navigator*. Retrieved from Treasury Board of Canada Secretariat: <https://map-carte.tbs-sct.gc.ca/map-carte/fcsi-rscf/map-carte.aspx?Language=EN&backto=www.tbs-sct.gc.ca/fcsi-rscf/home-accueil-eng.aspx>

# **APPENDIX A – AERIAL PHOTOGRAPHS**





Photograph Reference: Google Earth  
Photograph Year: 2023  
Interpreted by: MM/SM  
Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: The property to the west of the Site was under active construction.





Photograph Reference: Google Earth  
Photograph Year: 2021  
Interpreted by: MM/SM  
Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: No significant changes.





Photograph Reference: Google Earth  
Photograph Year: 2017  
Interpreted by: MM/SM  
Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: Wadams Way had been constructed connecting to the southwest corner of the Site. A walking/bike path had been constructed adjacent to the west side of the Site.

The Surrounding Area: No significant changes outside of Wadams Way.





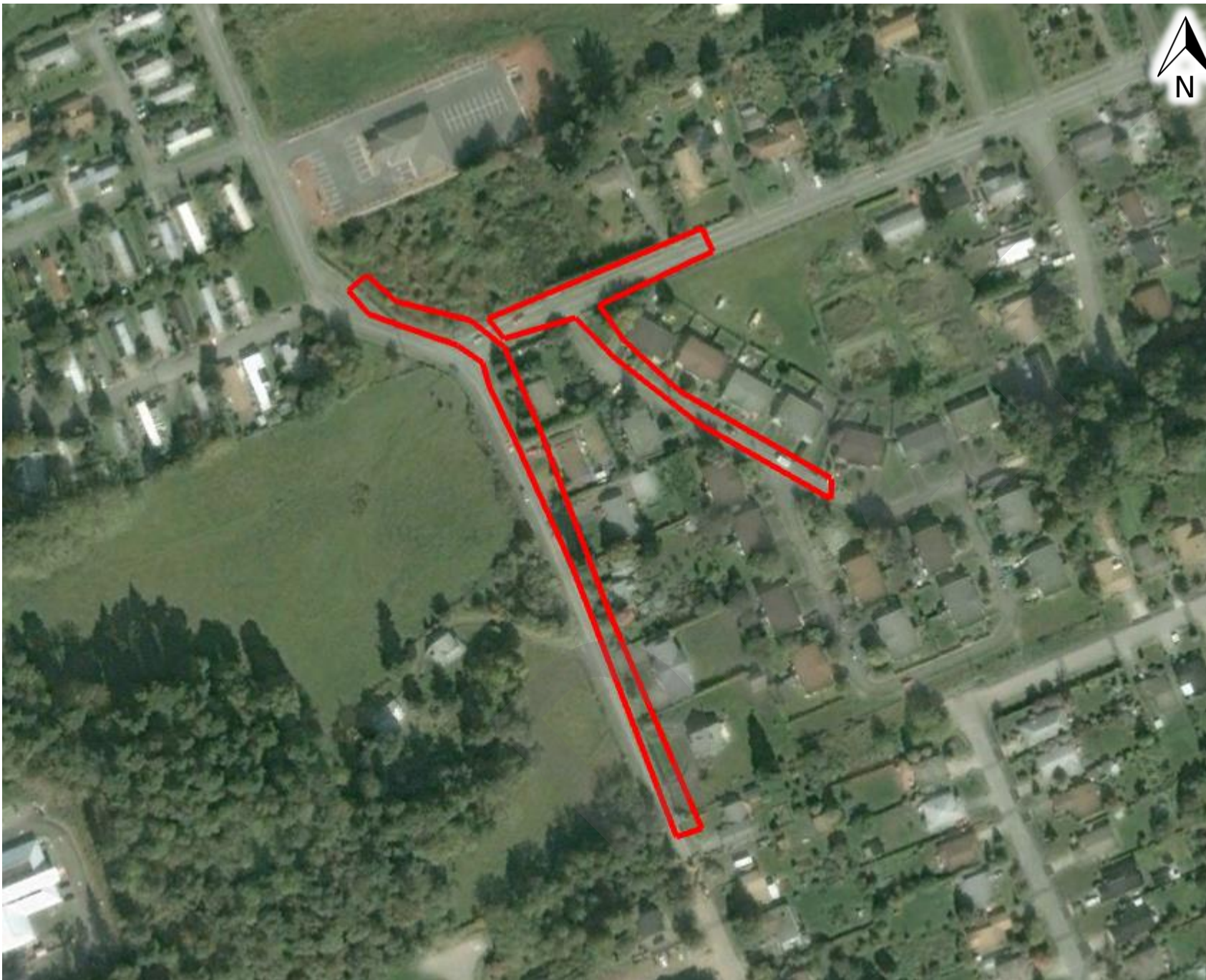
Photograph Reference: Google Earth  
Photograph Year: 2013  
Interpreted by: MM/SM  
Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: Additional residential development west/northwest of the Site





Photograph Reference: Google Earth  
Photograph Year: September 2004  
Interpreted by: MM/SM  
Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: A church was constructed north of the Site and a municipal building southwest of the Site.





Photograph Reference: 15BCB90144NO.62

Photograph Year: 1990

Interpreted by: MM

Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: Additional residential development southeast of the Site.





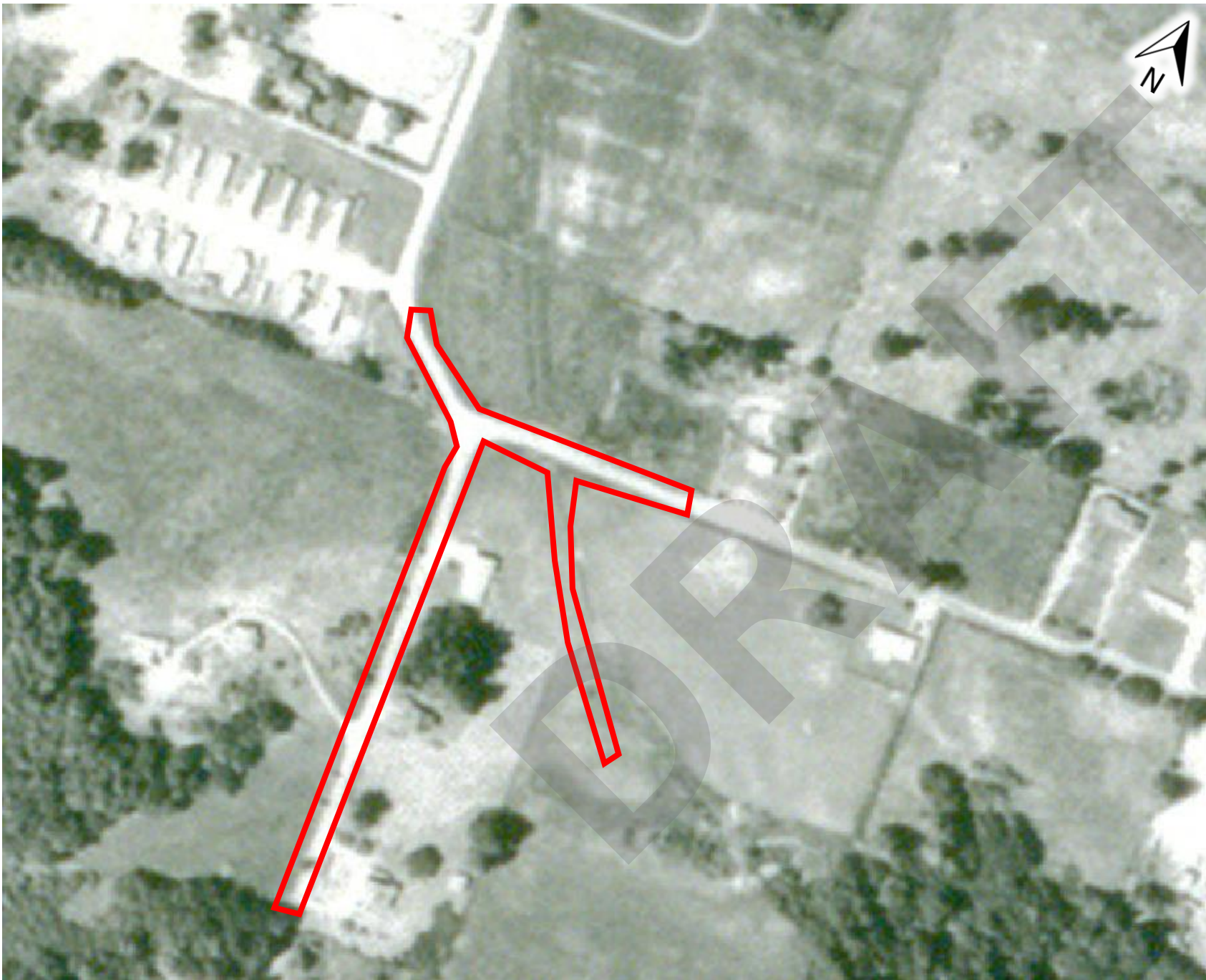
Photograph Reference: 30BC80082NO.171  
Photograph Year: 1980  
Interpreted by: MM/SM  
Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: Additional residential development to the east of the Site.





Photograph Reference: BC7410NO271

Photograph Year: 1972

Interpreted by: MM/SM

Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: Additional residential development to the north and south of the Site.





Photograph Reference: BC5055;115

Photograph Year: 1962

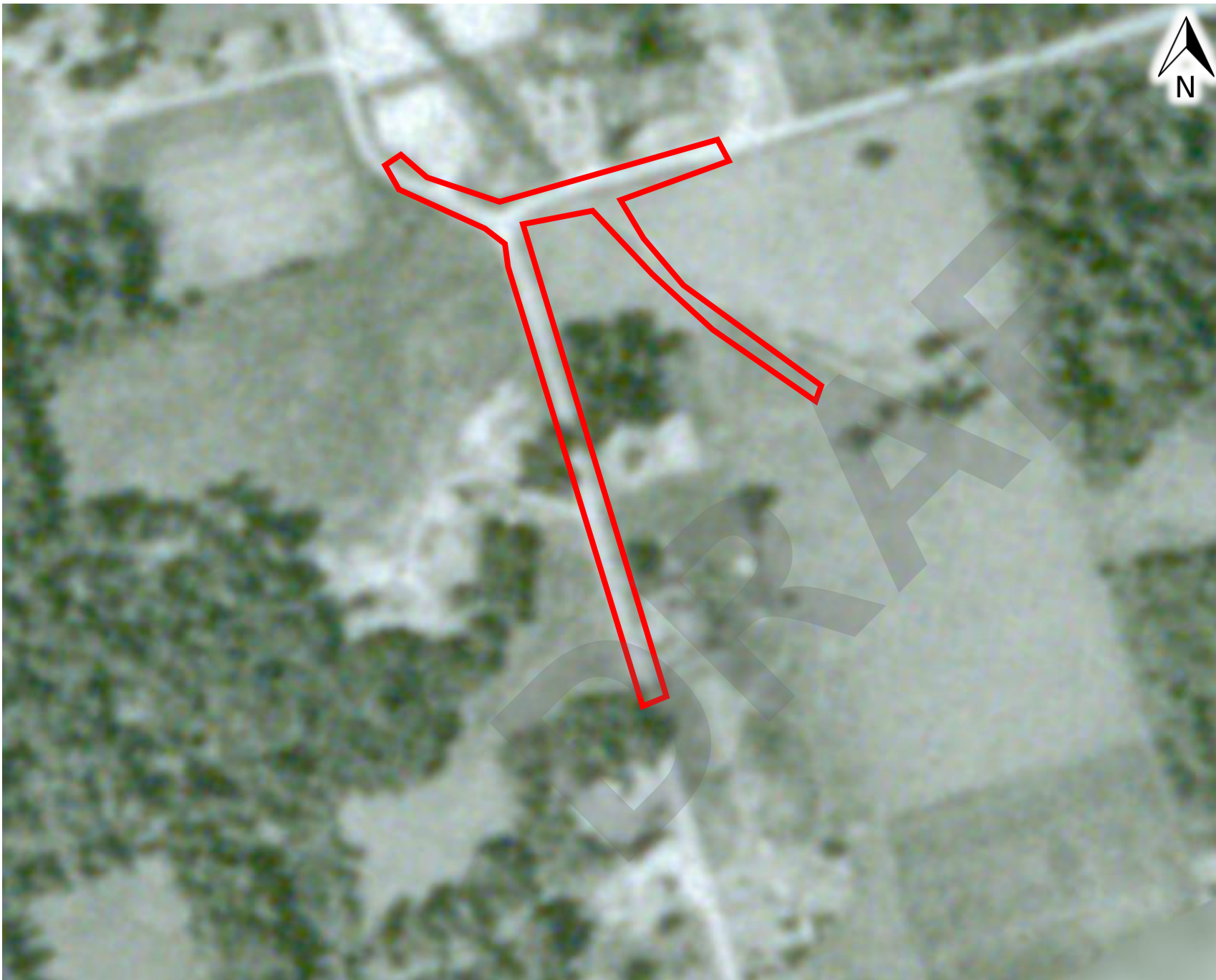
Interpreted by: MM/SM

Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes.

The Surrounding Area: No significant changes.



Photograph Reference: BC1238;41

Photograph Year: 1951

Interpreted by: MM/SM

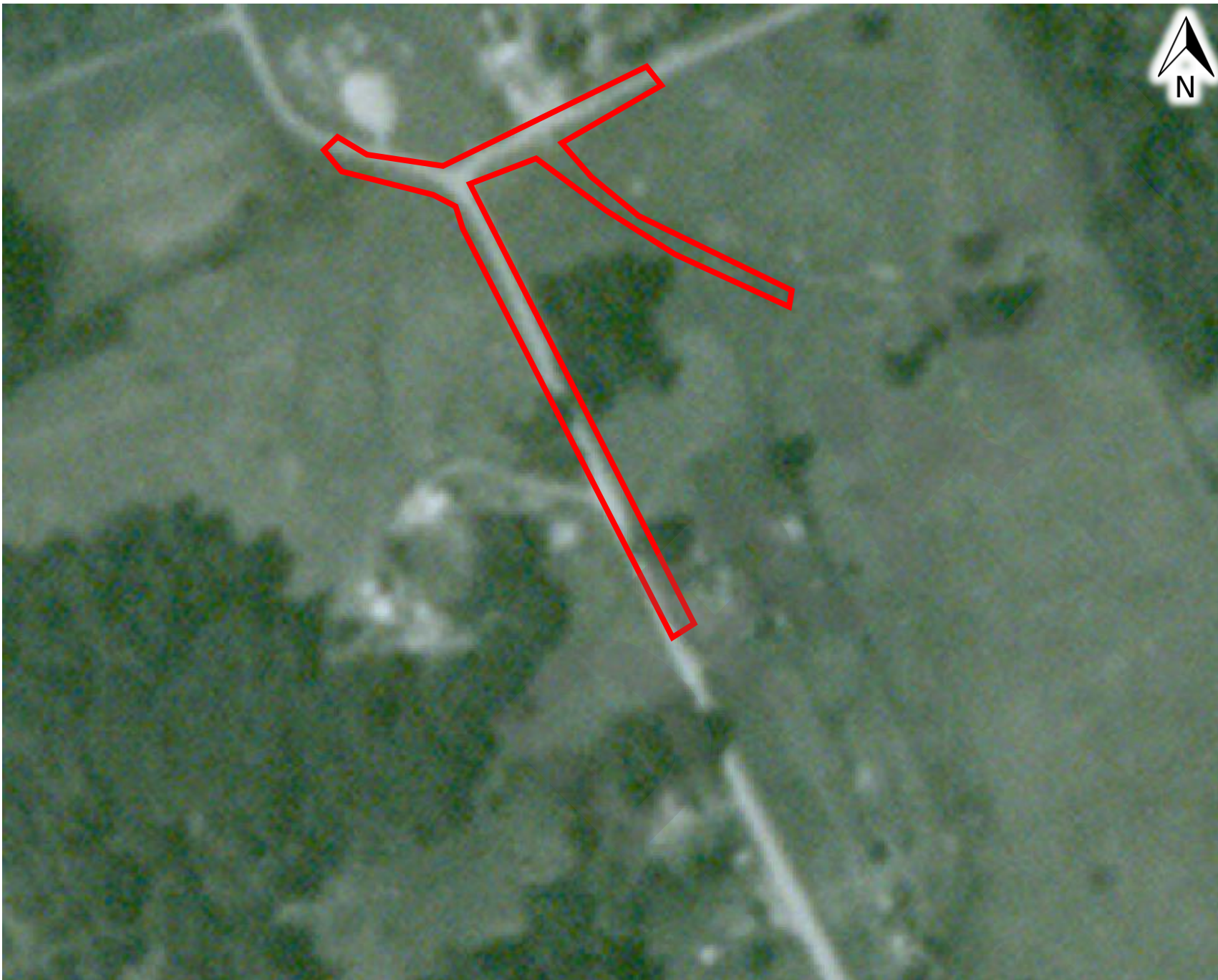
Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

The Site: No significant changes

The Surrounding Area: Additional residential homes had been constructed in the area south of the Site along Church road.





Photograph Reference: BC.249;10

Photograph Year: 1946

Interpreted by: MM/SM

Reviewed by: RJW

*For ease of reference the Site has been outlined in red.*

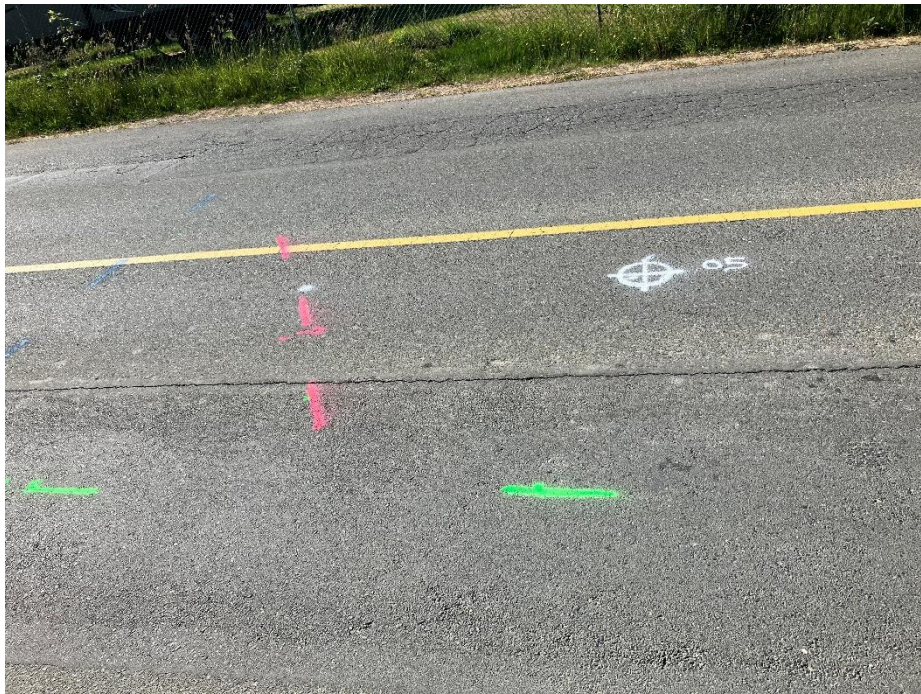
The Site: Church Road and Throup Road are present on Site.

The Surrounding Area: The areas to the west and east of the Site are cleared and largely undeveloped. Residential homes were present on the west side of Church Road and north of the Site along Throup Road.

## **APPENDIX B – SELECT SITE PHOTOGRAPHS**

DRAFT





Photograph 1: View of utility locating activities at location TH23-05



Photograph 2: View of hydrovac activities at test hole location TH23-03. Note asphalt thickness ~0.09m.



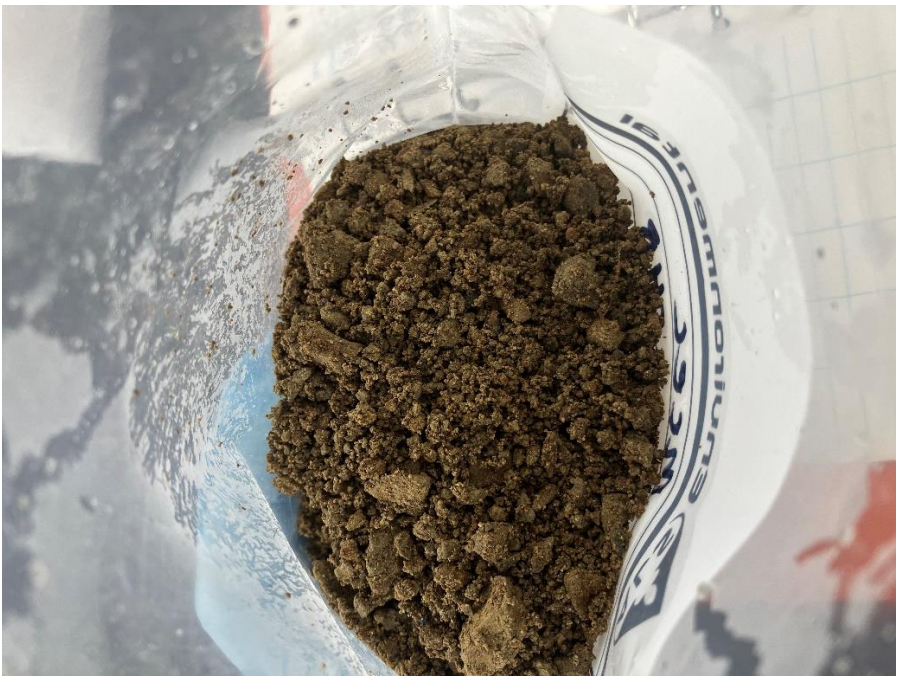
Photograph 3: View of soils at location TH23-05



Photograph 4: View of hydrovac activities at TH23-08 on Frances Gardens.



Photograph 5: View of soils at test hole TH23-08.



Photograph 6: View of soil sample TH23-04B.



## **APPENDIX C – ANALYTICAL TABLES**

DRAFT

Laboratory: ALS	Units	DL	BC CSR Schedule 3.1 Parts 1, 2 and 3 Industrial Land Use (IL) <sup>1</sup>							TH23-01A	TH23-02A	TH23-03A	DUP-A	TH23-04A	TH23-04B	TH23-05A	TH23-06B	TH23-07A	TH23-08A
Sample Collection Date			Intake of Contaminated Soil <sup>2</sup>	Drinking Water <sup>3</sup>	Toxicity to soil invertebrates and plants <sup>4</sup>	GW Flow to SW Freshwater Aquatic Life <sup>5</sup>	GW Flow to SW Marine Aquatic Life <sup>6</sup>	Human Health Soil <sup>7</sup>	Ecological Health Soil <sup>8</sup>	08-Jun-23	08-Jun-23	08-Jun-23	06-Jun-23	08-Jun-23	08-Jun-23	08-Jun-23	08-Jun-23	09-Jun-23	09-Jun-23
Lab Work Order										VA23B3105-001	VA23B3105-003	VA23B3105-005	VA23B3105-016	VA23B3105-007	VA23B3105-008	VA23B3105-009	VA23B3105-012	VA23B3174-001	VA23B3174-003
Analyte										Soil	Soil	Soil	BFD of TH23-03A	Soil	Soil	Soil	Soil	Soil	Soil
Sample Collection Depth	m	-	-	-	-	-	-	-	-	0.3-0.6	0.3-0.6	0.3-0.6	0.3-0.6	0.3-0.6	1 - 1.2	0.3-0.6	1 - 1.2	0.3-0.6	0.3-0.6
PID (field)	ppm	-	-	-	-	-	-	-	-	0.4	0.2	0.6	0.6	0.4	0.4	0.5	0.5	0.3	0.1
Moisture	%	0.25	-	-	-	-	-	-	-	21.9	4.64	26	27	17.6	-	22	21.1	32.8	7.27
Saturation	%	1	-	-	-	-	-	-	-	67.3	21.7	114	97.9	36.3	70.1	91.3	75.3	80.6	222
pH (Lab)	pH	0.1	-	-	-	-	-	-	-	5.92	6.7	6.52	6.44	5.2	-	5.53	5.82	5.55	6.29
Metals:															-				
Aluminum	ug/g	50	-	-	-	-	-	250,000	-	44,600	19,300	49,600	42,000	28,400	-	38,700	33,200	30,400	21,300
Antimony	ug/g	0.1	-	-	-	-	-	40,000	40	0.26	0.1	0.2	0.24	<0.1	-	0.27	0.22	<0.1	0.12
Arsenic	ug/g	0.1	400	10	40	10	10	-	-	7.14	2.59	4.06	4.68	2.25	-	3.58	4.93	2.06	5.37
Barium	ug/g	0.5	>1,000,000	350	1,500	3,500	1,500	-	-	91.1	29	231	195	43.6	-	81.2	71.7	133	31.3
Beryllium	ug/g	0.1	15,000	1 <sup>a</sup>	350	1 <sup>a</sup>	85 <sup>a</sup>	-	-	0.46	0.2	0.9	0.76	0.32	-	0.52	0.39	0.55	0.24
Bismuth	ug/g	0.2	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	0.38	<0.2
Boron	ug/g	5	-	-	-	-	-	>1,000,000	-	<5	<5	<5	<5	<5	-	<5	<5	<5	<5
Cadmium	ug/g	0.02	3,500	1 <sup>a</sup>	75	1 <sup>a</sup>	1 <sup>a</sup>	-	-	0.045	0.046	0.041	0.05	0.045	-	0.026	0.02	0.104	0.065
Calcium	ug/g	50	-	-	-	-	-	-	-	5,640	6,970	5,560	5,940	6,980	-	4,040	4,230	5,410	8,580
Chromium, Total	ug/g	0.5	20,000	60 <sup>b</sup> , >1,000,000 <sup>c</sup>	250	60 <sup>b</sup> , 300,000 <sup>c</sup>	60 <sup>b</sup> , >1,000,000 <sup>c</sup>	-	-	80.2	29.4	67.7 <sup>d</sup>	68.4 <sup>d</sup>	37.9	-	65.1 <sup>d</sup>	65.3	46.2	40.4
Chromium, hexavalent	ug/g	0.1	-	60	-	60	60	-	-	1.27	-	-	-	-	-	-	1.68	-	-
Cobalt	ug/g	0.1	2,000	25	200	25	25	-	-	18.2	11.4	17.4	16.6	10.1	-	10.8	12.9	9.75	12.3
Copper	ug/g	0.5	700,000	250 <sup>a</sup>	300	75 <sup>a</sup>	75 <sup>a</sup>	-	-	59.5	36.3	59.2	53.3	37.9	-	48.5	40.6	24.7	44.7
Iron	ug/g	50	-	-	-	-	-	150,000	-	45,000	25,200	33,200	36,000	26,200	-	41,300	38,600	27,000	30,200
Lead	ug/g	0.5	4,000	120 <sup>a</sup>	1,000	200 <sup>a</sup>	120 <sup>a</sup>	-	-	5.27	2.18	8.48	6.47	1.52	-	4.62	4.72	8.86	2.36
Lithium	ug/g	2	-	-	-	-	-	450	-	20.5	10.6	20.3	20.5	5.8	-	16.5	18.6	17.3	12.5
Magnesium	ug/g	20	-	-	-	-	-	-	-	14,100	10,400	8,570	9,380	7,180	-	8,530	9,970	5350	10,100
Manganese	ug/g	1	>1,000,000	2,000	2,000	-	-	-	-	642	477	432	492	294	-	348	458	267	565
Mercury	ug/g	0.05	2,000	-	75	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	0.062	<0.05	<0.05	<0.05
Molybdenum	ug/g	0.1	35,000	15	150	650	650	-	-	0.29	0.17	0.59	0.64	0.32	-	0.3	0.32	0.41	0.26
Nickel	ug/g	0.5	80,000	70 <sup>a</sup>	250	90 <sup>a</sup>	70 <sup>a</sup>	-	-	51.6	27.8	51.9	47.8	20	-	32.6	38.3	31.9	27.4
Phosphorus	ug/g	50	-	-	-	-	-	-	-	243	428	397	337	432	-	176	148	272	519
Potassium	ug/g	100	-	-	-	-	-	-	-	940	410	540	530	320	-	660	480	530	550
Selenium	ug/g	0.2	35,000	1	2	1	1	-	-	0.4	<0.2	0.35	0.32	0.5	-	0.33	0.29	<0.2	<0.2
Silver	ug/g	0.1	-	-	-	-	-	35,000	40	<0.1	<0.1	<0.1	<0.1	0.13	-	<0.1	<0.1	0.2	<0.1
Sodium	ug/g	50	-	-	-	-	-	-	-	329	199	329	295	436	-	184	194	280	170
Strontium	ug/g	0.5	-	-	-	-	-	150,000	-	41.9	25.6	40.4	43.4	30	-	35.4	28.1	35.6	29.8
Sulphur as S	ug/g	1000	-	-	-	-	-	-	-	<1000	<1000	<1000	<1000	<1000	-	<1000	<1000	<1000	<1000
Thallium	ug/g	0.05	-	-	-	-	-	-	25	0.087	<0.05	0.139	0.112	<0.05	-	0.078	0.067	0.074	<0.05
Tin	ug/g	2	-	-	-	-	-	>1,000,000	300	<2	<2	<2	<2	<2	-	<2	<2	<2	<2
Titanium	ug/g	1	-	-	-	-	-	-	-	2,140	1,260	1,100	1,110	2,170	-	1,290	1,120	1,030	1,320
Tungsten	ug/g	0.5	-	-	-	-	-	200	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
Uranium	ug/g	0.05	20,000	30	2,000	150	150	-	-	0.542	0.182	1.11	1.06	0.366	-	0.653	0.433	0.536	0.25
Vanadium	ug/g	0.2	35,000	100	300	-	-	-	-	125	62.4	97.6	103	105	-	130	100	82.4	80
Zinc	ug/g	2	>1,000,000	200 <sup>a</sup>	450	150 <sup>a</sup>	150 <sup>a</sup>	-	-	62.1	39.4	57.1	52.4	27.3	-	40.8	46.3	33.9	47
Zirconium	ug/g	1	-	-	-	-	-	-	-	4.7	2.2	1.9	1.3	5.1	-	4.6	3.4	<1	2.3
Salinity:															-				
Chloride	ug/g	4.3	>1,000,000	100	2,500	600	600	-	-	31.6	4.3	38.8	32.3	156	207	<18.3	19.6	35.5	<44.4
Sodium Ion	ug/g	4.34	>1,000,000	15,000	1,000	-	-	-	-	19.4	4.86	<22.9	<19.6	80.6	116	<18.3	<15.1	18.9	<44.4
Petroleum Hydrocarbons:															-				
EPH C10-C19	ug/g	200	-	-	-	-	-	-	-	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
EPH C19-C32	ug/g	200	-	-	-	-	-	-	-	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
HEPH	ug/g	200	-	-	-	-	-	5,000	5,000	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
LEPH	ug/g	200	-	-	-	-	-	2,000	2,000	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
Volatile Hydrocarbons (V6-10)	ug/g	10	-	-	-	-	-	-	-	<10	<10	<10	<10	<10	-	<10	<10	-	-
VPHs	ug/g	10	-	-	-	-	-	200	200	<10	<10	<10	<10	<10	-	<10	<10	-	-

Laboratory: ALS		Units	DL	BC CSR Schedule 3.1 Parts 1, 2 and 3 Industrial Land Use (IL) <sup>1</sup>						TH23-01A	TH23-02A	TH23-03A	DUP-A	TH23-04A	TH23-04B	TH23-05A	TH23-06B	TH23-07A	TH23-08A		
Sample Collection Date				Intake of Contaminated Soil <sup>2</sup>	Drinking Water <sup>3</sup>	Toxicity to soil invertebrates and plants <sup>4</sup>	GW Flow to SW Freshwater Aquatic Life <sup>5</sup>	GW Flow to SW Marine Aquatic Life <sup>6</sup>	Human Health Soil <sup>7</sup>	Ecological Health Soil <sup>8</sup>	08-Jun-23	08-Jun-23	08-Jun-23	06-Jun-23	08-Jun-23	08-Jun-23	08-Jun-23	08-Jun-23	08-Jun-23	09-Jun-23	09-Jun-23
Lab Work Order											VA23B3105-001	VA23B3105-003	VA23B3105-005	VA23B3105-016	VA23B3105-007	VA23B3105-008	VA23B3105-009	VA23B3105-012	VA23B3174-001	VA23B3174-003	
Analyte											Soil	Soil	Soil	BFD of TH23-03A	Soil	Soil	Soil	Soil	Soil	Soil	
Polycyclic Aromatic Hydrocarbons:															-						
Acenaphthene	ug/g	0.005	-	-	-	-	15,000	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005		
Acenaphthylene	ug/g	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005		
Anthracene	ug/g	0.004	1,000,000	-	30	-	-	-	<0.0041	<0.004	<0.0043	<0.004	<0.004	<0.004	-	<0.0041	<0.0042	<0.0048	<0.004		
Benz(a)anthracene	ug/g	0.01	-	-	-	-	500	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Benzo(a) pyrene	ug/g	0.01	50	-	70	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Benzo[b+j]fluoranthene	ug/g	0.01	-	-	-	-	500	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Benzo(b+j+k)fluoranthene	ug/g	0.015	-	-	-	-	-	-	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	-	<0.015	<0.015	<0.015	<0.015		
Benzo(g,h,i)perylene	ug/g	0.01	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Benzo(k)fluoranthene	ug/g	0.01	-	-	-	-	500	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Chrysene	ug/g	0.01	-	-	-	-	4,500	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Dibenz(a,h)anthracene	ug/g	0.005	-	-	-	-	50	10	0.0084	<0.005	0.0066	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005		
Fluoranthene	ug/g	0.01	300,000	-	200	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Fluorene	ug/g	0.01	-	-	-	-	9,500	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
1-Methylnaphthalene	ug/g	0.01	-	-	-	-	1,000	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
2-methylnaphthalene	ug/g	0.01	-	-	-	-	950	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Indeno(1,2,3-c,d)pyrene	ug/g	0.01	-	-	-	-	500	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Naphthalene	ug/g	0.01	150,000	100	20	75	75	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Phenanthrene	ug/g	0.01	-	-	-	-	300,000	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Pyrene	ug/g	0.01	-	-	-	-	200,000	100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Quinoline	ug/g	0.01	-	-	-	-	10	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Acridine	ug/g	0.01	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		
Volatile Organic Compounds:															-						
Benzene	ug/g	0.005	6,500	0.035	250	2.5	6.5	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	-	-		
Ethylbenzene	ug/g	0.015	700,000	15	650	200	200	-	-	<0.015	<0.015	<0.015	<0.015	<0.015	-	<0.015	<0.015	-	-		
MTBE	ug/g	0.2	-	-	-	-	20,000	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	-		
Styrene	ug/g	0.05	-	-	-	-	>1,000,000	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-		
Toluene	ug/g	0.05	550,000	6	450	0.5	200	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-		
Xylene (o)	ug/g	0.05	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-		
Xylene (m & p)	ug/g	0.05	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-		
Xylenes	ug/g	0.075	>1,000,000	6.5	600	20	20	-	-	<0.075	<0.075	<0.075	<0.075	<0.075	-	<0.075	<0.075	-	-		



**Colour Key:**

Exceeds Standard	Exceeds Standard but meets Protocol 4	DL Exceeds Standard
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**Notes:**

*All values reported as ug/g unless otherwise indicated*

1 - Stage 12 Amendments to the BC CSR B.C Reg 179/2021375/96, effective July 7, 2021 Schedule 3.1 Parts 1, 2 and 3 for Industrial Land Use

2 - Schedule 3.1 Part 1 - Human health protection, intake of contaminated soil

3 - Schedule 3.1 Part 1 - Human health protection, groundwater used for drinking water applies as per Protocol 21

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5 - Schedule 3.1 Part 1 - Environmental protection, groundwater flow to surface water, used by aquatic life (freshwater) applies as per Protocol 21

6 - Schedule 3.1 Part 1 - Environmental protection, groundwater flow to surface water, used by aquatic life (marine) applies as per Protocol 21

7 - Schedule 3.1 Part 2 - Generic numerical soil standards to protect human health

8 - Schedule 3.1 Part 3 - Generic numerical soil standards to protect ecological health

a - Standard is pH dependent, and only the most stringent standard is shown

b - Standard is for chromium, hexavalent

c - Standard is for chromium, trivalent

d - Speciation analysis completed for 2 samples at different depths and opposite ends of the linear alignment. Results are considered representative of the entire alignment and apply to these results.

e - Concentration exceeds applicable standards, but is less than BC CSR Protocol 4: Establishing Background Concentrations in Soil for Region 1 - Vancouver Island (200 ug/g for Vanadium). Protocol 4 values only apply if soil is to stay in this region.

BFD - Blind field duplicate

"-" Not analyzed or no standards apply

"<" Less than the laboratory reportable detection limit (DL) indicated.

DL - Laboratory detection limit

Laboratory: ALS	Units	DL	BC CSR Schedule 3.1 Parts 1, 2 and 3 Residential Low Density Land Use (RLLD) <sup>1</sup>							TH23-01A	TH23-02A	TH23-03A	DUP-A	TH23-04A	TH23-04B	TH23-05A	TH23-06B	TH23-07A	TH23-08A
Sample Collection Date			Intake of Contaminated Soil <sup>2</sup>	Drinking Water <sup>3</sup>	Toxicity to soil invertebrates and plants <sup>4</sup>	GW Flow to SW Freshwater Aquatic Life <sup>5</sup>	GW Flow to SW Marine Aquatic Life <sup>6</sup>	Human Health Soil <sup>7</sup>	Ecological Health Soil <sup>8</sup>	08-Jun-23	08-Jun-23	08-Jun-23	06-Jun-23	08-Jun-23	08-Jun-23	08-Jun-23	08-Jun-23	09-Jun-23	09-Jun-23
Lab Work Order										VA23B3105-001	VA23B3105-003	VA23B3105-005	VA23B3105-016	VA23B3105-007	VA23B3105-008	VA23B3105-009	VA23B3105-012	VA23B3174-001	VA23B3174-003
Analyte										Soil	Soil	Soil	BFD of TH23-03A	Soil	Soil	Soil	Soil	Soil	Soil
Sample Collection Depth	m	-	-	-	-	-	-	-	-	0.3-0.6	0.3-0.6	0.3-0.6	0.3-0.6	0.3-0.6	1 - 1.2	0.3-0.6	1 - 1.2	0.3-0.6	0.3-0.6
PID (field)	ppm	-	-	-	-	-	-	-	-	0.4	0.2	0.6	0.6	0.4	0.4	0.5	0.5	0.3	0.1
Moisture	%	0.25	-	-	-	-	-	-	-	21.9	4.64	26	27	17.6	-	22	21.1	32.8	7.27
Saturation	%	1	-	-	-	-	-	-	-	67.3	21.7	114	97.9	36.3	70.1	91.3	75.3	80.6	222
pH (Lab)	pH	0.1	-	-	-	-	-	-	-	5.92	6.7	6.52	6.44	5.2	-	5.53	5.82	5.55	6.29
<b>Metals:</b>															-				
Aluminum	ug/g	50	-	-	-	-	-	40,000	-	44,600	19,300	49,600	42,000	28,400	-	38,700	33,200	30,400	21,300
Antimony	ug/g	0.1	-	-	-	-	-	250	20	0.26	0.1	0.2	0.24	<0.1	-	0.27	0.22	<0.1	0.12
Arsenic	ug/g	0.1	15	10	25	10	10	-	-	7.14	2.59	4.06	4.68	2.25	-	3.58	4.93	2.06	5.37
Barium	ug/g	0.5	8,500	350	700	3,500	1,500	-	-	91.1	29	231	195	43.6	-	81.2	71.7	133	31.3
Beryllium	ug/g	0.1	85	1 <sup>a</sup>	150	1 <sup>a</sup>	85 <sup>a</sup>	-	-	0.46	0.2	0.9	0.76	0.32	-	0.52	0.39	0.55	0.24
Bismuth	ug/g	0.2	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	0.38	<0.2
Boron	ug/g	5	-	-	-	-	-	8,500	-	<5	<5	<5	<5	<5	-	<5	<5	<5	<5
Cadmium	ug/g	0.02	20	1 <sup>a</sup>	30	1 <sup>a</sup>	1 <sup>a</sup>	-	-	0.045	0.046	0.041	0.05	0.045	-	0.026	0.02	0.104	0.065
Calcium	ug/g	50	-	-	-	-	-	-	-	5,640	6,970	5,560	5,940	6,980	-	4,040	4,230	5,410	8,580
Chromium (Total)	ug/g	0.5	100	60 <sup>b</sup> , >1,000,000 <sup>c</sup>	200	60 <sup>b</sup> , 300,000 <sup>c</sup>	60 <sup>b</sup> , >1,000,000 <sup>c</sup>	-	-	80.2	29.4	67.7 <sup>d</sup>	68.4 <sup>d</sup>	37.9	-	65.1 <sup>d</sup>	65.3	46.2	40.4
Chromium, hexavalent	ug/g	0.1	-	60	-	60	60	-	-	1.27	-	-	-	-	-	-	1.68	-	-
Cobalt	ug/g	0.1	25	25	45	25	25	-	-	18.2	11.4	17.4	16.6	10.1	-	10.8	12.9	9.75	12.3
Copper	ug/g	0.5	3,500	250 <sup>a</sup>	150	75 <sup>a</sup>	75 <sup>a</sup>	-	-	59.5	36.3	59.2	53.3	37.9	-	48.5	40.6	24.7	44.7
Iron	ug/g	50	-	-	-	-	-	35,000	-	45,000	25,200	33,200	36,000	26,200	-	41,300	38,600	27,000	30,200
Lead	ug/g	0.5	120	120 <sup>a</sup>	550	200 <sup>a</sup>	120 <sup>a</sup>	-	-	5.27	2.18	8.48	6.47	1.52	-	4.62	4.72	8.86	2.36
Lithium	ug/g	2	-	-	-	-	-	30	-	20.5	10.6	20.3	20.5	5.8	-	16.5	18.6	17.3	12.5
Magnesium	ug/g	20	-	-	-	-	-	-	-	14,100	10,400	8,570	9,380	7,180	-	8,530	9,970	5350	10,100
Manganese	ug/g	1	6,000	2,000	2,000	-	-	-	-	642	477	432	492	294	-	348	458	267	565
Mercury	ug/g	0.05	10	-	40	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	0.062	<0.05	<0.05	<0.05
Molybdenum	ug/g	0.1	200	15	80	650	650	-	-	0.29	0.17	0.59	0.64	0.32	-	0.3	0.32	0.41	0.26
Nickel	ug/g	0.5	450	70 <sup>a</sup>	150	90 <sup>a</sup>	70 <sup>a</sup>	-	-	51.6	27.8	51.9	47.8	20	-	32.6	38.3	31.9	27.4
Phosphorus	ug/g	50	-	-	-	-	-	-	-	243	428	397	337	432	-	176	148	272	519
Potassium	ug/g	100	-	-	-	-	-	-	-	940	410	540	530	320	-	660	480	530	550
Selenium	ug/g	0.2	200	1	1.5	1	1	-	-	0.4	<0.2	0.35	0.32	0.5	-	0.33	0.29	<0.2	<0.2
Silver	ug/g	0.1	-	-	-	-	-	200	20	<0.1	<0.1	<0.1	<0.1	0.13	-	<0.1	<0.1	0.2	<0.1
Sodium	ug/g	50	-	-	-	-	-	-	-	329	199	329	295	436	-	184	194	280	170
Strontium	ug/g	0.5	-	-	-	-	-	9,500	-	41.9	25.6	40.4	43.4	30	-	35.4	28.1	35.6	29.8
Sulphur as S	ug/g	1000	-	-	-	-	-	-	-	<1000	<1000	<1000	<1000	<1000	-	<1000	<1000	<1000	<1000
Thallium	ug/g	0.05	-	-	-	-	-	-	9	0.087	<0.05	0.139	0.112	<0.05	-	0.078	0.067	0.074	<0.05
Tin	ug/g	2	-	-	-	-	-	25,000	50	<2	<2	<2	<2	<2	-	<2	<2	<2	<2
Titanium	ug/g	1	-	-	-	-	-	-	-	2,140	1,260	1,100	1,110	2,170	-	1,290	1,120	1,030	1,320
Tungsten	ug/g	0.5	-	-	-	-	-	15	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
Uranium	ug/g	0.05	100	30	500	150	150	-	-	0.542	0.182	1.11	1.06	0.366	-	0.653	0.433	0.536	0.25
Vanadium	ug/g	0.2	200	100	150	-	-	-	-	125	62.4	97.6	103	105	-	130	100	82.4	80
Zinc	ug/g	2	10,000	200 <sup>a</sup>	450	150 <sup>a</sup>	150 <sup>a</sup>	-	-	62.1	39.4	57.1	52.4	27.3	-	40.8	46.3	33.9	47
Zirconium	ug/g	1	-	-	-	-	-	-	-	4.7	2.2	1.9	1.3	5.1	-	4.6	3.4	<1	2.3
<b>Salinity:</b>															-				
Chloride	ug/g	4.3	>1,000,000	100	350	600	-	-	-	31.6	4.3	38.8	32.3	156	207	<18.3	19.6	35.5	<44.4
Sodium Ion	ug/g	4.34	>1,000,000	15,000	200	-	-	-	-	19.4	4.86	<22.9	<19.6	80.6	116	<18.3	<15.1	18.9	<44.4
<b>Petroleum Hydrocarbons:</b>															-				
EPH C10-C19	ug/g	200	-	-	-	-	-	-	-	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
EPH C19-C32	ug/g	200	-	-	-	-	-	-	-	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
HEPH	ug/g	200	-	-	-	-	-	1,000	1,000	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
LEPH	ug/g	200	-	-	-	-	-	1,000	1,000	<200	<200	<200	<200	<200	-	<200	<200	<200	<200
Volatile Hydrocarbons (V6-10)	ug/g	10	-	-	-	-	-	-	-	<10	<10	<10	<10	<10	-	<10	<10	-	-
VPHs	ug/g	10	-	-	-	-	-	200	200	<10	<10	<10	<10	<10	-	<10	<10	-	-

Polycyclic Aromatic Hydrocarbons:															-				
Acenaphthene	ug/g	0.005	-	-	-	-	-	950	-	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	ug/g	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005
Anthracene	ug/g	0.004	10,000	-	2.5	-	-	-	-	<0.0041	<0.004	<0.0043	<0.004	<0.004	-	<0.0041	<0.0042	<0.0048	<0.004
Benz(a)anthracene	ug/g	0.01	-	-	-	-	-	50	1	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Benzo(a) pyrene	ug/g	0.01	5	-	20	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Benzo[b+j]fluoranthene	ug/g	0.01	-	-	-	-	-	50	1	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Benzo(b+j+k)fluoranthene	ug/g	0.015	-	-	-	-	-	-	-	<0.015	<0.015	<0.015	<0.015	<0.015	-	<0.015	<0.015	<0.015	<0.015
Benzo(g,h,i)perylene	ug/g	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/g	0.01	-	-	-	-	-	50	1	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/g	0.01	-	-	-	-	-	200	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	ug/g	0.005	-	-	-	-	-	5	1	0.0084	<0.005	0.0066	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005
Fluoranthene	ug/g	0.01	1,500	-	50	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/g	0.01	-	-	-	-	-	600	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	ug/g	0.01	-	-	-	-	-	250	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
2-methylnaphthalene	ug/g	0.01	-	-	-	-	-	60	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	ug/g	0.01	-	-	-	-	-	50	1	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/g	0.01	850	100	0.6	75	75	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/g	0.01	-	-	-	-	-	1,500	5	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/g	0.01	-	-	-	-	-	1,000	10	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Quinoline	ug/g	0.01	-	-	-	-	-	2.5	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Acridine	ug/g	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Volatile Organic Compounds:															-				
Benzene	ug/g	0.005	150	0.035	100	2.5	6.5	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	-	-
Ethylbenzene	ug/g	0.015	4,000	15	200	200	200	-	-	<0.015	<0.015	<0.015	<0.015	<0.015	-	<0.015	<0.015	-	-
MTBE	ug/g	0.2	-	-	-	-	-	4,000	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	-
Styrene	ug/g	0.05	-	-	-	-	-	8,500	5	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-
Toluene	ug/g	0.05	3,500	6	150	0.5	200	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-
Xylene (o)	ug/g	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-
Xylene (m & p)	ug/g	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-
Xylenes	ug/g	0.075	8,500	6.5	150	20	20	-	-	<0.075	<0.075	<0.075	<0.075	<0.075	-	<0.075	<0.075	-	-



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Exceeds Standard	Exceeds Standard but meets Protocol 4	DL Exceeds Standard
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- a - Standard is pH dependent, and only the most stringent standard is shown
- b - Standard is for chromium, hexavalent
- c - Standard is for chromium, trivalent
- d - Speciation analysis completed for 2 samples at different depths and opposite ends of the linear alignment. Results are considered representative of the entire alignment and apply to these results.
- e - Concentration exceeds applicable standards, but is less than BC CSR Protocol 4: Establishing Background Concentrations in Soil for Region 1 - Vancouver Island (55,000 ug/g for Aluminium, 70,000 ug/g for iron, and 200 ug/g for Vanadium). Protocol 4 values only apply if soil is to stay in this region.

BFD - Blind field duplicate

"-" Not analyzed or no standards apply

"<" Less than the laboratory reportable detection limit (DL) indicated.

# **APPENDIX D – LABORATORY CERTIFICATES OF ANALYSIS**

DRAFT

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA23B3105**  
**Amendment** : **1**  
**Client** : **McElhanney Ltd.**  
**Contact** : Victoria Amson  
**Address** : # 500 - 3960 Quadra Street  
Victoria BC Canada V8X 4A3  
**Telephone** : 250 370 9221  
**Project** : 2241-20182-00  
**PO** : ----  
**C-O-C number** : 20-909141  
**Sampler** : MM  
**Site** : ----  
**Quote number** : BC/Yukon Standing Offer - 2022 update  
**No. of samples received** : 16  
**No. of samples analysed** : 11

**Page** : 1 of 14  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Dean Watt  
**Address** : 8081 Lougheed Highway  
Burnaby BC Canada V5A 1W9  
**Telephone** : +1 604 253 4188  
**Date Samples Received** : 09-Jun-2023 11:00  
**Date Analysis Commenced** : 12-Jun-2023  
**Issue Date** : 26-Jun-2023 13:38

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

**Signatories**

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Jon Fisher	Production Manager, Environmental	Metals, Waterloo, Ontario
Kate Dimitrova	Analyst	Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Metals, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia





## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
%	percent
µg/g	micrograms per gram
µg/L	micrograms per litre
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Workorder Comments

Additional data has been added.

## Qualifiers

Qualifier	Description
DLCI	Detection Limit Raised: Chromatographic interference due to co-elution.
DLHM	Detection Limit Adjusted: Sample has high moisture content.
DLQ	Detection Limit raised due to co-eluting interference. Mass Spectrometry qualifier ion ratio did not meet acceptance criteria.



## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-01A	TH23-02A	TH23-03A	TH23-04A	TH23-04B
Client sampling date / time					08-Jun-2023 07:30	08-Jun-2023 08:20	08-Jun-2023 09:00	08-Jun-2023 09:45	08-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-001	VA23B3105-003	VA23B3105-005	VA23B3105-007	VA23B3105-008
					Result	Result	Result	Result	Result
<b>Physical Tests</b>									
% Saturation	----	E141/VA	1.0	%	67.3	21.7	114	36.3	70.1
Moisture	----	E144/VA	0.25	%	21.9	4.64	26.0	17.6	----
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	5.92	6.70	6.52	5.20	----
<b>Saturated Paste Extractables</b>									
Chloride, soluble ion content	16887-00-6	EC239A.CI/V A	1.0	µg/g	31.6	4.3	38.8	156	207
Chloride, soluble ion content	16887-00-6	E239.CI/VA	20000	µg/L	47000	20000	34000	429000	295000
Sodium, soluble ion content	17341-25-2	EC442/VA	1.00	µg/g	19.4	4.86	<22.9	80.6	116
Sodium, soluble ion content	17341-25-2	E442/VA	20000	µg/L	28800	22400	<20000	222000	165000
<b>Metals</b>									
Aluminum	7429-90-5	E440/VA	50	µg/g	44600	19300	49600	28400	----
Antimony	7440-36-0	E440/VA	0.10	µg/g	0.26	0.10	0.20	<0.10	----
Arsenic	7440-38-2	E440/VA	0.10	µg/g	7.14	2.59	4.06	2.25	----
Barium	7440-39-3	E440/VA	0.50	µg/g	91.1	29.0	231	43.6	----
Beryllium	7440-41-7	E440/VA	0.10	µg/g	0.46	0.20	0.90	0.32	----
Bismuth	7440-69-9	E440/VA	0.20	µg/g	<0.20	<0.20	<0.20	<0.20	----
Boron	7440-42-8	E440/VA	5.0	µg/g	<5.0	<5.0	<5.0	<5.0	----
Cadmium	7440-43-9	E440/VA	0.020	µg/g	0.045	0.046	0.041	0.045	----
Calcium	7440-70-2	E440/VA	50	µg/g	5640	6970	5560	6980	----
Chromium	7440-47-3	E440/VA	0.50	µg/g	80.2	29.4	67.7	37.9	----
Cobalt	7440-48-4	E440/VA	0.10	µg/g	18.2	11.4	17.4	10.1	----
Copper	7440-50-8	E440/VA	0.50	µg/g	59.5	36.3	59.2	37.9	----
Iron	7439-89-6	E440/VA	50	µg/g	45000	25200	33200	26200	----
Lead	7439-92-1	E440/VA	0.50	µg/g	5.27	2.18	8.48	1.52	----
Lithium	7439-93-2	E440/VA	2.0	µg/g	20.5	10.6	20.3	5.8	----
Magnesium	7439-95-4	E440/VA	20	µg/g	14100	10400	8570	7180	----
Manganese	7439-96-5	E440/VA	1.0	µg/g	642	477	432	294	----
Mercury	7439-97-6	E510/VA	0.0500	µg/g	<0.0500	<0.0500	<0.0500	<0.0500	----
Molybdenum	7439-98-7	E440/VA	0.10	µg/g	0.29	0.17	0.59	0.32	----



## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-01A	TH23-02A	TH23-03A	TH23-04A	TH23-04B
Client sampling date / time					08-Jun-2023 07:30	08-Jun-2023 08:20	08-Jun-2023 09:00	08-Jun-2023 09:45	08-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-001	VA23B3105-003	VA23B3105-005	VA23B3105-007	VA23B3105-008
					Result	Result	Result	Result	Result
<b>Metals</b>									
Nickel	7440-02-0	E440/VA	0.50	µg/g	51.6	27.8	51.9	20.0	----
Phosphorus	7723-14-0	E440/VA	50	µg/g	243	428	397	432	----
Potassium	7440-09-7	E440/VA	100	µg/g	940	410	540	320	----
Selenium	7782-49-2	E440/VA	0.20	µg/g	0.40	<0.20	0.35	0.50	----
Silver	7440-22-4	E440/VA	0.10	µg/g	<0.10	<0.10	<0.10	0.13	----
Sodium	7440-23-5	E440/VA	50	µg/g	329	199	329	436	----
Strontium	7440-24-6	E440/VA	0.50	µg/g	41.9	25.6	40.4	30.0	----
Sulfur	7704-34-9	E440/VA	1000	µg/g	<1000	<1000	<1000	<1000	----
Thallium	7440-28-0	E440/VA	0.050	µg/g	0.087	<0.050	0.139	<0.050	----
Tin	7440-31-5	E440/VA	2.0	µg/g	<2.0	<2.0	<2.0	<2.0	----
Titanium	7440-32-6	E440/VA	1.0	µg/g	2140	1260	1100	2170	----
Tungsten	7440-33-7	E440/VA	0.50	µg/g	<0.50	<0.50	<0.50	<0.50	----
Uranium	7440-61-1	E440/VA	0.050	µg/g	0.542	0.182	1.11	0.366	----
Vanadium	7440-62-2	E440/VA	0.20	µg/g	125	62.4	97.6	105	----
Zinc	7440-66-6	E440/VA	2.0	µg/g	62.1	39.4	57.1	27.3	----
Zirconium	7440-67-7	E440/VA	1.0	µg/g	4.7	2.2	1.9	5.1	----
<b>Speciated Metals</b>									
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	0.10	µg/g	1.27	----	----	----	----
<b>Volatile Organic Compounds [Fuels]</b>									
Benzene	71-43-2	E611A/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0050	<0.0050	----
Ethylbenzene	100-41-4	E611A/VA	0.015	µg/g	<0.015	<0.015	<0.015	<0.015	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A/VA	0.200	µg/g	<0.200	<0.200	<0.200	<0.200	----
Styrene	100-42-5	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	----
Toluene	108-88-3	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	----
Xylene, m+p-	179601-23-1	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	----
Xylene, o-	95-47-6	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	----
Xylenes, total	1330-20-7	E611A/VA	0.075	µg/g	<0.075	<0.075	<0.075	<0.075	----
<b>Hydrocarbons</b>									
EPH (C10-C19)	----	E601A/VA	200	µg/g	<200	<200	<200	<200	----
EPH (C19-C32)	----	E601A/VA	200	µg/g	<200	<200	<200	<200	----





## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-01A	TH23-02A	TH23-03A	TH23-04A	TH23-04B
Client sampling date / time					08-Jun-2023 07:30	08-Jun-2023 08:20	08-Jun-2023 09:00	08-Jun-2023 09:45	08-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-001	VA23B3105-003	VA23B3105-005	VA23B3105-007	VA23B3105-008
					Result	Result	Result	Result	Result
<b>Hydrocarbons</b>									
VHs (C6-C10)	---	E581.VH+F1/ VA	10	µg/g	<10	<10	<10	<10	---
HEPHs	---	EC600A/VA	200	µg/g	<200	<200	<200	<200	---
LEPHs	---	EC600A/VA	200	µg/g	<200	<200	<200	<200	---
VPHs	---	EC580A/VA	10	µg/g	<10	<10	<10	<10	---
<b>Hydrocarbons Surrogates</b>									
Bromobenzotrifluoride, 2- (EPH surrogate)	392-83-6	E601A/VA	1.0	%	89.7	97.2	96.2	96.3	---
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/ VA	1.0	%	112	106	97.6	108	---
<b>Volatile Organic Compounds Surrogates</b>									
Bromofluorobenzene, 4-	460-00-4	E611A/VA	0.10	%	83.9	91.6	77.8	91.5	---
Difluorobenzene, 1,4-	540-36-3	E611A/VA	0.10	%	91.9	104	88.4	103	---
<b>Polycyclic Aromatic Hydrocarbons</b>									
Acenaphthene	83-32-9	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0050	<0.0050	---
Acenaphthylene	208-96-8	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0050	<0.0050	---
Acridine	260-94-6	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Anthracene	120-12-7	E641A-L/VA	0.0040	µg/g	<0.0041 <sup>DLHM</sup>	<0.0040	<0.0043 <sup>DLHM</sup>	<0.0040	---
Benz(a)anthracene	56-55-3	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Benzo(a)pyrene	50-32-8	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Benzo(b+j)fluoranthene	n/a	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Benzo(b+j+k)fluoranthene	n/a	E641A-L/VA	0.015	µg/g	<0.015	<0.015	<0.015	<0.015	---
Benzo(g,h,i)perylene	191-24-2	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Benzo(k)fluoranthene	207-08-9	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Chrysene	218-01-9	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Dibenz(a,h)anthracene	53-70-3	E641A-L/VA	0.0050	µg/g	0.0084	<0.0050	0.0066	<0.0050	---
Fluoranthene	206-44-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Fluorene	86-73-7	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Methylnaphthalene, 1-	90-12-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---
Methylnaphthalene, 2-	91-57-6	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	---



## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-01A	TH23-02A	TH23-03A	TH23-04A	TH23-04B
Client sampling date / time					08-Jun-2023 07:30	08-Jun-2023 08:20	08-Jun-2023 09:00	08-Jun-2023 09:45	08-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-001	VA23B3105-003	VA23B3105-005	VA23B3105-007	VA23B3105-008
					Result	Result	Result	Result	Result
<b>Polycyclic Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	----
Phenanthrene	85-01-8	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	----
Pyrene	129-00-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	----
Quinoline	91-22-5	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/VA	0.020	µg/g	<0.020	<0.020	<0.020	<0.020	----
IACR (CCME)	----	E641A-L/VA	0.150	-	<0.150	<0.150	<0.150	<0.150	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>									
Acridine-d9	34749-75-2	E641A-L/VA	0.1	%	74.6	87.7	92.2	89.0	----
Chrysene-d12	1719-03-5	E641A-L/VA	0.1	%	86.1	92.8	97.6	93.3	----
Naphthalene-d8	1146-65-2	E641A-L/VA	0.1	%	102	110	108	104	----
Phenanthrene-d10	1517-22-2	E641A-L/VA	0.1	%	97.0	105	103	99.8	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.



## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-05A	TH23-06B	HA23-01	HA23-04	HA23-05
Client sampling date / time					08-Jun-2023 10:45	08-Jun-2023 11:30	06-Jun-2023 12:30	06-Jun-2023 12:45	06-Jun-2023 13:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-009	VA23B3105-012	VA23B3105-013	VA23B3105-014	VA23B3105-015
					Result	Result	Result	Result	Result
<b>Physical Tests</b>									
% Saturation	---	E141/VA	1.0	%	91.3	75.3	38.7	80.5	79.2
Moisture	---	E144/VA	0.25	%	22.0	21.1	12.1	7.52	13.8
pH (1:2 soil:water)	---	E108/VA	0.10	pH units	5.53	5.82	5.25	5.97	5.54
<b>Saturated Paste Extractables</b>									
Chloride, soluble ion content	16887-00-6	EC239A.CI/V A	1.0	µg/g	<18.3	19.6	<7.7	<16.1	<15.8
Chloride, soluble ion content	16887-00-6	E239.CI/VA	20000	µg/L	<20000	26000	<20000	<20000	<20000
Sodium, soluble ion content	17341-25-2	EC442/VA	1.00	µg/g	<18.3	<15.1	<7.75	<16.1	<15.8
Sodium, soluble ion content	17341-25-2	E442/VA	20000	µg/L	<20000	<20000	<20000	<20000	<20000
<b>Metals</b>									
Aluminum	7429-90-5	E440/VA	50	µg/g	38700	33200	19700	25600	26200
Antimony	7440-36-0	E440/VA	0.10	µg/g	0.27	0.22	0.20	1.05	0.87
Arsenic	7440-38-2	E440/VA	0.10	µg/g	3.58	4.93	3.06	4.32	5.48
Barium	7440-39-3	E440/VA	0.50	µg/g	81.2	71.7	59.4	142	149
Beryllium	7440-41-7	E440/VA	0.10	µg/g	0.52	0.39	0.33	0.31	0.37
Bismuth	7440-69-9	E440/VA	0.20	µg/g	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	7440-42-8	E440/VA	5.0	µg/g	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/VA	0.020	µg/g	0.026	0.020	0.084	0.235	0.918
Calcium	7440-70-2	E440/VA	50	µg/g	4040	4230	7060	8780	7840
Chromium	7440-47-3	E440/VA	0.50	µg/g	65.1	65.3	31.7	48.9	46.2
Cobalt	7440-48-4	E440/VA	0.10	µg/g	10.8	12.9	12.7	15.2	13.4
Copper	7440-50-8	E440/VA	0.50	µg/g	48.5	40.6	45.2	64.9	54.8
Iron	7439-89-6	E440/VA	50	µg/g	41300	38600	27800	33700	33200
Lead	7439-92-1	E440/VA	0.50	µg/g	4.62	4.72	5.08	143	115
Lithium	7439-93-2	E440/VA	2.0	µg/g	16.5	18.6	10.5	12.3	14.8
Magnesium	7439-95-4	E440/VA	20	µg/g	8530	9970	8300	11200	9350
Manganese	7439-96-5	E440/VA	1.0	µg/g	348	458	658	688	860
Mercury	7439-97-6	E510/VA	0.0500	µg/g	0.0620	<0.0500	<0.0500	<0.0500	0.0900
Molybdenum	7439-98-7	E440/VA	0.10	µg/g	0.30	0.32	0.42	0.84	0.76
Nickel	7440-02-0	E440/VA	0.50	µg/g	32.6	38.3	24.4	33.9	31.8





## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-05A	TH23-06B	HA23-01	HA23-04	HA23-05
Client sampling date / time					08-Jun-2023 10:45	08-Jun-2023 11:30	06-Jun-2023 12:30	06-Jun-2023 12:45	06-Jun-2023 13:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-009	VA23B3105-012	VA23B3105-013	VA23B3105-014	VA23B3105-015
					Result	Result	Result	Result	Result
<b>Metals</b>									
Phosphorus	7723-14-0	E440/VA	50	µg/g	176	148	769	769	1880
Potassium	7440-09-7	E440/VA	100	µg/g	660	480	520	1010	690
Selenium	7782-49-2	E440/VA	0.20	µg/g	0.33	0.29	0.21	0.21	0.23
Silver	7440-22-4	E440/VA	0.10	µg/g	<0.10	<0.10	<0.10	<0.10	0.14
Sodium	7440-23-5	E440/VA	50	µg/g	184	194	316	292	250
Strontium	7440-24-6	E440/VA	0.50	µg/g	35.4	28.1	29.7	36.1	37.5
Sulfur	7704-34-9	E440/VA	1000	µg/g	<1000	<1000	<1000	<1000	<1000
Thallium	7440-28-0	E440/VA	0.050	µg/g	0.078	0.067	<0.050	<0.050	0.058
Tin	7440-31-5	E440/VA	2.0	µg/g	<2.0	<2.0	<2.0	<2.0	3.4
Titanium	7440-32-6	E440/VA	1.0	µg/g	1290	1120	1240	1540	1160
Tungsten	7440-33-7	E440/VA	0.50	µg/g	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	7440-61-1	E440/VA	0.050	µg/g	0.653	0.433	0.291	0.261	0.400
Vanadium	7440-62-2	E440/VA	0.20	µg/g	130	100	72.6	86.9	81.0
Zinc	7440-66-6	E440/VA	2.0	µg/g	40.8	46.3	57.8	191	242
Zirconium	7440-67-7	E440/VA	1.0	µg/g	4.6	3.4	2.0	2.3	<1.0
<b>Speciated Metals</b>									
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	0.10	µg/g	----	1.68	----	----	----
<b>Volatile Organic Compounds [Fuels]</b>									
Benzene	71-43-2	E611A/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ethylbenzene	100-41-4	E611A/VA	0.015	µg/g	<0.015	<0.015	<0.015	<0.015	<0.015
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A/VA	0.200	µg/g	<0.200	<0.200	<0.200	<0.200	<0.200
Styrene	100-42-5	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	<0.050
Toluene	108-88-3	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	<0.050
Xylene, m+p-	179601-23-1	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	<0.050
Xylene, o-	95-47-6	E611A/VA	0.050	µg/g	<0.050	<0.050	<0.050	<0.050	<0.050
Xylenes, total	1330-20-7	E611A/VA	0.075	µg/g	<0.075	<0.075	<0.075	<0.075	<0.075
<b>Hydrocarbons</b>									
EPH (C10-C19)	----	E601A/VA	200	µg/g	<200	<200	<200	<200	<200
EPH (C19-C32)	----	E601A/VA	200	µg/g	<200	<200	<200	<200	<200



## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-05A	TH23-06B	HA23-01	HA23-04	HA23-05
Client sampling date / time					08-Jun-2023 10:45	08-Jun-2023 11:30	06-Jun-2023 12:30	06-Jun-2023 12:45	06-Jun-2023 13:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-009	VA23B3105-012	VA23B3105-013	VA23B3105-014	VA23B3105-015
					Result	Result	Result	Result	Result
<b>Hydrocarbons</b>									
VHs (C6-C10)	----	E581.VH+F1/ VA	10	µg/g	<10	<10	<10	<10	<10
HEPHs	----	EC600A/VA	200	µg/g	<200	<200	<200	<200	<200
LEPHs	----	EC600A/VA	200	µg/g	<200	<200	<200	<200	<200
VPHs	----	EC580A/VA	10	µg/g	<10	<10	<10	<10	<10
<b>Hydrocarbons Surrogates</b>									
Bromobenzotrifluoride, 2- (EPH surrogate)	392-83-6	E601A/VA	1.0	%	97.9	101	89.0	93.1	94.0
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/ VA	1.0	%	114	111	105	113	104
<b>Volatile Organic Compounds Surrogates</b>									
Bromofluorobenzene, 4-	460-00-4	E611A/VA	0.10	%	81.3	84.1	84.3	87.2	81.2
Difluorobenzene, 1,4-	540-36-3	E611A/VA	0.10	%	91.5	94.5	96.1	98.8	92.4
<b>Polycyclic Aromatic Hydrocarbons</b>									
Acenaphthene	83-32-9	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	208-96-8	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0050	0.0080	0.0138
Acridine	260-94-6	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	120-12-7	E641A-L/VA	0.0040	µg/g	<0.0041 <sup>DLHM</sup>	<0.0042 <sup>DLHM</sup>	<0.0040	<0.0080 <sup>DLO</sup>	<0.0120 <sup>DLO</sup>
Benz(a)anthracene	56-55-3	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.028	0.038
Benzo(a)pyrene	50-32-8	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.050 <sup>DLO</sup>	0.044
Benzo(b+j)fluoranthene	n/a	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.077	0.066
Benzo(b+j+k)fluoranthene	n/a	E641A-L/VA	0.015	µg/g	<0.015	<0.015	<0.015	0.100	0.085
Benzo(g,h,i)perylene	191-24-2	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.080	0.048
Benzo(k)fluoranthene	207-08-9	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.023	0.019
Chrysene	218-01-9	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.070 <sup>DLO</sup>	<0.060 <sup>DLO</sup>
Dibenz(a,h)anthracene	53-70-3	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0050	0.0094	0.0087
Fluoranthene	206-44-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.092	0.073
Fluorene	86-73-7	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.052	0.042
Methylnaphthalene, 1-	90-12-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	<0.010
Methylnaphthalene, 2-	91-57-6	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	<0.010



## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					TH23-05A	TH23-06B	HA23-01	HA23-04	HA23-05
Client sampling date / time					08-Jun-2023 10:45	08-Jun-2023 11:30	06-Jun-2023 12:30	06-Jun-2023 12:45	06-Jun-2023 13:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-009	VA23B3105-012	VA23B3105-013	VA23B3105-014	VA23B3105-015
					Result	Result	Result	Result	Result
<b>Polycyclic Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	85-01-8	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.039	0.032
Pyrene	129-00-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	0.080	0.073
Quinoline	91-22-5	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	<0.010	<0.010
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/VA	0.020	µg/g	<0.020	<0.020	<0.020	0.054	0.070
IACR (CCME)	----	E641A-L/VA	0.150	-	<0.150	<0.150	<0.150	0.866	0.840
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>									
Acridine-d9	34749-75-2	E641A-L/VA	0.1	%	93.7	94.6	83.9	73.7	62.2
Chrysene-d12	1719-03-5	E641A-L/VA	0.1	%	98.6	102	95.6	93.6	94.4
Naphthalene-d8	1146-65-2	E641A-L/VA	0.1	%	110	114	119	106	101
Phenanthrene-d10	1517-22-2	E641A-L/VA	0.1	%	106	107	111	98.2	95.1

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.





## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

Client sampling date / time					DUP-A	----	----	----	----
06-Jun-2023 09:00						----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-016	-----	-----	-----	-----
Result						----	----	----	----
<b>Physical Tests</b>									
% Saturation	---	E141/VA	1.0	%	97.9	----	----	----	----
Moisture	---	E144/VA	0.25	%	27.0	----	----	----	----
pH (1:2 soil:water)	---	E108/VA	0.10	pH units	6.44	----	----	----	----
<b>Saturated Paste Extractables</b>									
Chloride, soluble ion content	16887-00-6	EC239A.CI/V A	1.0	µg/g	32.3	----	----	----	----
Chloride, soluble ion content	16887-00-6	E239.CI/VA	20000	µg/L	33000	----	----	----	----
Sodium, soluble ion content	17341-25-2	EC442/VA	1.00	µg/g	<19.6	----	----	----	----
Sodium, soluble ion content	17341-25-2	E442/VA	20000	µg/L	<20000	----	----	----	----
<b>Metals</b>									
Aluminum	7429-90-5	E440/VA	50	µg/g	42000	----	----	----	----
Antimony	7440-36-0	E440/VA	0.10	µg/g	0.24	----	----	----	----
Arsenic	7440-38-2	E440/VA	0.10	µg/g	4.68	----	----	----	----
Barium	7440-39-3	E440/VA	0.50	µg/g	195	----	----	----	----
Beryllium	7440-41-7	E440/VA	0.10	µg/g	0.76	----	----	----	----
Bismuth	7440-69-9	E440/VA	0.20	µg/g	<0.20	----	----	----	----
Boron	7440-42-8	E440/VA	5.0	µg/g	<5.0	----	----	----	----
Cadmium	7440-43-9	E440/VA	0.020	µg/g	0.050	----	----	----	----
Calcium	7440-70-2	E440/VA	50	µg/g	5940	----	----	----	----
Chromium	7440-47-3	E440/VA	0.50	µg/g	68.4	----	----	----	----
Cobalt	7440-48-4	E440/VA	0.10	µg/g	16.6	----	----	----	----
Copper	7440-50-8	E440/VA	0.50	µg/g	53.3	----	----	----	----
Iron	7439-89-6	E440/VA	50	µg/g	36000	----	----	----	----
Lead	7439-92-1	E440/VA	0.50	µg/g	6.47	----	----	----	----
Lithium	7439-93-2	E440/VA	2.0	µg/g	20.5	----	----	----	----
Magnesium	7439-95-4	E440/VA	20	µg/g	9380	----	----	----	----
Manganese	7439-96-5	E440/VA	1.0	µg/g	492	----	----	----	----
Mercury	7439-97-6	E510/VA	0.0500	µg/g	<0.0500	----	----	----	----
Molybdenum	7439-98-7	E440/VA	0.10	µg/g	0.64	----	----	----	----
Nickel	7440-02-0	E440/VA	0.50	µg/g	47.8	----	----	----	----



## Analytical Results

Sub-Matrix: Soil/Solid

Client sample ID

(Matrix: Soil/Solid)

					DUP-A	----	----	----	----
Client sampling date / time					06-Jun-2023 09:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-016	-----	-----	-----	-----
					Result	---	---	---	---
<b>Metals</b>									
Phosphorus	7723-14-0	E440/VA	50	µg/g	337	---	---	---	---
Potassium	7440-09-7	E440/VA	100	µg/g	530	---	---	---	---
Selenium	7782-49-2	E440/VA	0.20	µg/g	0.32	---	---	---	---
Silver	7440-22-4	E440/VA	0.10	µg/g	<0.10	---	---	---	---
Sodium	7440-23-5	E440/VA	50	µg/g	295	---	---	---	---
Strontium	7440-24-6	E440/VA	0.50	µg/g	43.4	---	---	---	---
Sulfur	7704-34-9	E440/VA	1000	µg/g	<1000	---	---	---	---
Thallium	7440-28-0	E440/VA	0.050	µg/g	0.112	---	---	---	---
Tin	7440-31-5	E440/VA	2.0	µg/g	<2.0	---	---	---	---
Titanium	7440-32-6	E440/VA	1.0	µg/g	1110	---	---	---	---
Tungsten	7440-33-7	E440/VA	0.50	µg/g	<0.50	---	---	---	---
Uranium	7440-61-1	E440/VA	0.050	µg/g	1.06	---	---	---	---
Vanadium	7440-62-2	E440/VA	0.20	µg/g	103	---	---	---	---
Zinc	7440-66-6	E440/VA	2.0	µg/g	52.4	---	---	---	---
Zirconium	7440-67-7	E440/VA	1.0	µg/g	1.3	---	---	---	---
<b>Volatile Organic Compounds [Fuels]</b>									
Benzene	71-43-2	E611A/VA	0.0050	µg/g	<0.0050	---	---	---	---
Ethylbenzene	100-41-4	E611A/VA	0.015	µg/g	<0.015	---	---	---	---
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A/VA	0.200	µg/g	<0.200	---	---	---	---
Styrene	100-42-5	E611A/VA	0.050	µg/g	<0.050	---	---	---	---
Toluene	108-88-3	E611A/VA	0.050	µg/g	<0.050	---	---	---	---
Xylene, m+p-	179601-23-1	E611A/VA	0.050	µg/g	<0.050	---	---	---	---
Xylene, o-	95-47-6	E611A/VA	0.050	µg/g	<0.050	---	---	---	---
Xylenes, total	1330-20-7	E611A/VA	0.075	µg/g	<0.075	---	---	---	---
<b>Hydrocarbons</b>									
EPH (C10-C19)	---	E601A/VA	200	µg/g	<200	---	---	---	---
EPH (C19-C32)	---	E601A/VA	200	µg/g	<200	---	---	---	---
VHs (C6-C10)	---	E581.VH+F1/ VA	10	µg/g	<10	---	---	---	---
HEPHs	---	EC600A/VA	200	µg/g	<200	---	---	---	---



## Analytical Results

Sub-Matrix: Soil/Solid					Client sample ID	DUP-A	----	----	----	----
(Matrix: Soil/Solid)					Client sampling date / time	06-Jun-2023 09:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-016	Result	----	----	----	----
<b>Hydrocarbons</b>										
LEPHs	---	EC600A/VA	200	µg/g	<200	----	----	----	----	----
VPHs	---	EC580A/VA	10	µg/g	<10	----	----	----	----	----
<b>Hydrocarbons Surrogates</b>										
Bromobenzotrifluoride, 2- (EPH surrogate)	392-83-6	E601A/VA	1.0	%	102	----	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/ VA	1.0	%	86.4	----	----	----	----	----
<b>Volatile Organic Compounds Surrogates</b>										
Bromofluorobenzene, 4-	460-00-4	E611A/VA	0.10	%	83.4	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/VA	0.10	%	91.2	----	----	----	----	----
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene	83-32-9	E641A-L/VA	0.0050	µg/g	<0.0050	----	----	----	----	----
Acenaphthylene	208-96-8	E641A-L/VA	0.0050	µg/g	<0.0050	----	----	----	----	----
Acridine	260-94-6	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Anthracene	120-12-7	E641A-L/VA	0.0040	µg/g	<0.0040	----	----	----	----	----
Benz(a)anthracene	56-55-3	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Benzo(b+j+k)fluoranthene	n/a	E641A-L/VA	0.015	µg/g	<0.015	----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Chrysene	218-01-9	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A-L/VA	0.0050	µg/g	<0.0050	----	----	----	----	----
Fluoranthene	206-44-0	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Fluorene	86-73-7	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Naphthalene	91-20-3	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Phenanthrene	85-01-8	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
Pyrene	129-00-0	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----





## Analytical Results

Sub-Matrix: Soil/Solid (Matrix: Soil/Solid)					Client sample ID	DUP-A	----	----	----	----
					Client sampling date / time	06-Jun-2023 09:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3105-016	Result	----	----	----	----
<b>Polycyclic Aromatic Hydrocarbons</b>										
Quinoline	91-22-5	E641A-L/VA	0.010	µg/g	<0.010	----	----	----	----	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/VA	0.020	µg/g	<0.020	----	----	----	----	----
IACR (CCME)	----	E641A-L/VA	0.150	-	<0.150	----	----	----	----	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>										
Acridine-d9	34749-75-2	E641A-L/VA	0.1	%	98.7	----	----	----	----	----
Chrysene-d12	1719-03-5	E641A-L/VA	0.1	%	109	----	----	----	----	----
Naphthalene-d8	1146-65-2	E641A-L/VA	0.1	%	114	----	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A-L/VA	0.1	%	108	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA23B3105	Page	: 1 of 22
Amendment	: 1		
Client	: McElhanney Ltd.	Laboratory	: Vancouver - Environmental
Contact	: Victoria Amson	Account Manager	: Dean Watt
Address	: # 500 - 3960 Quadra Street Victoria BC Canada V8X 4A3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 250 370 9221	Telephone	: +1 604 253 4188
Project	: 2241-20182-00	Date Samples Received	: 09-Jun-2023 11:00
PO	: ----	Issue Date	: 26-Jun-2023 13:39
C-O-C number	: 20-909141		
Sampler	: MM		
Site	: ----		
Quote number	: BC/Yukon Standing Offer - 2022 update		
No. of samples received	: 16		
No. of samples analysed	: 11		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

### Key

**Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.  
**CAS Number:** Chemical Abstracts Service number is a unique identifier assigned to discrete substances.  
**DQO:** Data Quality Objective.  
**LOR:** Limit of Reporting (detection limit).  
**RPD:** Relative Percent Difference.

### Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### Summary of Outliers

#### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Duplicate outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.

DRAFT





## Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: Soil/Solid

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
<b>Duplicate (DUP) RPDs</b>								
Metals	Anonymous	Anonymous	Uranium	7440-61-1	E440	74.5 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.

## Result Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-01A	E601A	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-02A	E601A	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-03A	E601A	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-04A	E601A	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-05A	E601A	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-06B	E601A	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap DUP-A	E601A	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	16-Jun-2023	40 days	2 days	✓



Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap HA23-01	E601A	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap HA23-04	E601A	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap HA23-05	E601A	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	16-Jun-2023	40 days	2 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial TH23-01A	E581.VH+F1	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial TH23-02A	E581.VH+F1	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial TH23-03A	E581.VH+F1	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial TH23-04A	E581.VH+F1	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial TH23-05A	E581.VH+F1	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial TH23-06B	E581.VH+F1	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓





Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial DUP-A	E581.VH+F1	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial HA23-01	E581.VH+F1	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial HA23-04	E581.VH+F1	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial HA23-05	E581.VH+F1	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap DUP-A	E510	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap HA23-01	E510	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap HA23-04	E510	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap HA23-05	E510	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-01A	E510	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	8 days	✓



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-02A	E510	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-03A	E510	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-04A	E510	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-05A	E510	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-06B	E510	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	28 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap DUP-A	E440	06-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap HA23-01	E440	06-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap HA23-04	E440	06-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap HA23-05	E440	06-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	10 days	✓



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-01A	E440	08-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-02A	E440	08-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-03A	E440	08-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-04A	E440	08-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-05A	E440	08-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-06B	E440	08-Jun-2023	15-Jun-2023	----	----		16-Jun-2023	180 days	8 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap DUP-A	E144	06-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap HA23-01	E144	06-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap HA23-04	E144	06-Jun-2023	----	----	----		14-Jun-2023	----	----	





Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap HA23-05	E144	06-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-01A	E144	08-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-02A	E144	08-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-03A	E144	08-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-04A	E144	08-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-05A	E144	08-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-06B	E144	08-Jun-2023	----	----	----		14-Jun-2023	----	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-01A	E108	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-02A	E108	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	7 days	✓



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-03A	E108	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-04A	E108	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-05A	E108	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-06B	E108	08-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap DUP-A	E108	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap HA23-01	E108	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap HA23-04	E108	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap HA23-05	E108	06-Jun-2023	15-Jun-2023	----	----		15-Jun-2023	30 days	9 days	✓
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap DUP-A	E141	06-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap HA23-01	E141	06-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap HA23-04	E141	06-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap HA23-05	E141	06-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-01A	E141	08-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-02A	E141	08-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-03A	E141	08-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-04A	E141	08-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-04B	E141	08-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-05A	E141	08-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	





Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-06B	E141	08-Jun-2023	14-Jun-2023	----	----		14-Jun-2023	----	0 days	
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-01A	E641A-L	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-02A	E641A-L	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-03A	E641A-L	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-04A	E641A-L	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-05A	E641A-L	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-06B	E641A-L	08-Jun-2023	14-Jun-2023	14 days	6 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap DUP-A	E641A-L	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap HA23-01	E641A-L	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	15-Jun-2023	40 days	1 days	✓



Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap HA23-04	E641A-L	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	15-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap HA23-05	E641A-L	06-Jun-2023	14-Jun-2023	14 days	8 days	✓	15-Jun-2023	40 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-04B	E442	08-Jun-2023	22-Jun-2023	365 days	14 days	✓	22-Jun-2023	180 days	0 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-06B	E442	08-Jun-2023	14-Jun-2023	365 days	6 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-01A	E442	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-02A	E442	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-03A	E442	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-04A	E442	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-05A	E442	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	180 days	1 days	✓



Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap HA23-01	E442	06-Jun-2023	14-Jun-2023	365 days	8 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap HA23-04	E442	06-Jun-2023	14-Jun-2023	365 days	8 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap HA23-05	E442	06-Jun-2023	14-Jun-2023	365 days	8 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap DUP-A	E442	06-Jun-2023	14-Jun-2023	365 days	9 days	✓	15-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-04B	E239.Cl	08-Jun-2023	22-Jun-2023	365 days	14 days	✓	22-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-06B	E239.Cl	08-Jun-2023	14-Jun-2023	365 days	6 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-01A	E239.Cl	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-02A	E239.Cl	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-03A	E239.Cl	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	28 days	0 days	✓





Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-04A	E239.Cl	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-05A	E239.Cl	08-Jun-2023	14-Jun-2023	365 days	7 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap HA23-01	E239.Cl	06-Jun-2023	14-Jun-2023	365 days	8 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap HA23-04	E239.Cl	06-Jun-2023	14-Jun-2023	365 days	8 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap HA23-05	E239.Cl	06-Jun-2023	14-Jun-2023	365 days	8 days	✓	15-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap DUP-A	E239.Cl	06-Jun-2023	14-Jun-2023	365 days	9 days	✓	15-Jun-2023	28 days	0 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap TH23-01A	E532	08-Jun-2023	23-Jun-2023	30 days	15 days	✓	26-Jun-2023	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap TH23-06B	E532	08-Jun-2023	23-Jun-2023	30 days	15 days	✓	26-Jun-2023	7 days	3 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial TH23-01A	E611A	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial TH23-02A	E611A	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial TH23-03A	E611A	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial TH23-04A	E611A	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial TH23-05A	E611A	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial TH23-06B	E611A	08-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	4 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial DUP-A	E611A	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial HA23-01	E611A	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial HA23-04	E611A	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial HA23-05	E611A	06-Jun-2023	12-Jun-2023	----	----		12-Jun-2023	40 days	6 days	✓

[Legend & Qualifier Definitions](#)



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Rec. HT: ALS recommended hold time (see units).

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## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
BC PHCs - EPH by GC-FID	E601A	989133	1	10	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	984135	1	20	5.0	5.0	✓
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	989130	2	22	9.0	5.0	✓
Chloride by IC (Saturated Paste)	E239.Cl	989128	2	28	7.1	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1005485	1	2	50.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	989125	1	16	6.2	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	989124	1	16	6.2	5.0	✓
Moisture Content by Gravimetry	E144	989135	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	989134	1	10	10.0	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	989127	1	16	6.2	5.0	✓
Saturation Percentage	E141	989129	2	28	7.1	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	984134	1	16	6.2	5.0	✓
Laboratory Control Samples (LCS)							
BC PHCs - EPH by GC-FID	E601A	989133	1	10	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	984135	1	20	5.0	5.0	✓
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	989130	4	22	18.1	10.0	✓
Chloride by IC (Saturated Paste)	E239.Cl	989128	4	28	14.2	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1005485	2	2	100.0	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	989125	2	16	12.5	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	989124	2	16	12.5	10.0	✓
Moisture Content by Gravimetry	E144	989135	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	989134	1	10	10.0	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	989127	1	16	6.2	5.0	✓
Saturation Percentage	E141	989129	4	28	14.2	10.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	984134	1	16	6.2	5.0	✓
Method Blanks (MB)							
BC PHCs - EPH by GC-FID	E601A	989133	1	10	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	984135	1	20	5.0	5.0	✓
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	989130	2	22	9.0	5.0	✓
Chloride by IC (Saturated Paste)	E239.Cl	989128	2	28	7.1	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1005485	1	2	50.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	989125	1	16	6.2	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	989124	1	16	6.2	5.0	✓
Moisture Content by Gravimetry	E144	989135	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	989134	1	10	10.0	5.0	✓



Matrix: **Soil/Solid**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Method Blanks (MB) - Continued							
Saturation Percentage	E141	989129	2	28	7.1	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	984134	1	16	6.2	5.0	✔
Matrix Spikes (MS)							
BC PHCs - EPH by GC-FID	E601A	989133	1	10	10.0	5.0	✔
BTEX by Headspace GC-MS	E611A	984135	1	20	5.0	5.0	✔
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	989134	1	10	10.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	984134	1	16	6.2	5.0	✔

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## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108  Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally $20 \pm 5^{\circ}\text{C}$ ), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at $<60^{\circ}\text{C}$ ) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Saturation Percentage	E141  Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/AER D50	Saturation Percentage (SP) is determined as the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage.
Moisture Content by Gravimetry	E144  Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at $105^{\circ}\text{C}$ . Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Chloride by IC (Saturated Paste)	E239.Cl  Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by obtaining a soil extract produced by the saturated paste extraction procedure which is then analyzed by Ion Chromatography with conductivity and/or UV detection.
Metals in Soil/Solid by CRC ICPMS	E440  Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with $\text{HNO}_3$ and $\text{HCl}$ .  Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines.  Analysis is by Collision/Reaction Cell ICPMS.
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442  Vancouver - Environmental	Soil/Solid	CSSS CH15/EPA 6020B (mod)	A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium and Sodium by Collision/Reaction Cell ICPMS as per "Soil Sampling Methods of Analysis" By M Carter.
Mercury in Soil/Solid by CVAAS	E510  Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with $\text{HNO}_3$ and $\text{HCl}$ , followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532  Waterloo - Environmental	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VH and F1 by Headspace GC-FID	E581.VH+F1  Vancouver - Environmental	Soil/Solid	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A  Vancouver - Environmental	Soil/Solid	BC MOE Lab Manual (EPH in Solids by GC/FID) (mod)	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A  Vancouver - Environmental	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L  Vancouver - Environmental	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
Chloride by IC (Saturated Paste) (mg/kg)	EC239A.Cl  Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by obtaining a soil extract produced by the saturated paste extraction procedure which is then analyzed by Ion Chromatography with conductivity and/or UV detection.
Ca, K, Mg, Na by ICPMS (Saturated Paste, mg/kg)	EC442  Vancouver - Environmental	Soil/Solid	CSSS CH15/EPA 6020B (mod)	A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium, Sodium by ICPMS.
VPH: VH-BTEX-Styrene	EC580A  Vancouver - Environmental	Soil/Solid	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VH-BTEX = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
LEPH and HEPH: EPH-PAH	EC600A  Vancouver - Environmental	Soil/Solid	BC MOE Lab Manual (LEPH and HEPH)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(b+j+k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Pyrene.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108  Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Digestion for Metals and Mercury	EP440  Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.





Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532  Waterloo - Environmental	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581  Vancouver - Environmental	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601  Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

## QUALITY CONTROL REPORT

Work Order : **VA23B3105**

Page : 1 of 15

Amendment : **1**

Client : McElhanney Ltd.

Laboratory : Vancouver - Environmental

Contact : Victoria Amson

Account Manager : Dean Watt

Address : # 500 - 3960 Quadra Street  
Victoria BC Canada V8X 4A3Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

Telephone :

Telephone : +1 604 253 4188

Project : 2241-20182-00

Date Samples Received : 09-Jun-2023 11:00

PO : ----

Date Analysis Commenced : 12-Jun-2023

C-O-C number : 20-909141

Issue Date : 26-Jun-2023 13:39

Sampler : MM 250 370 9221

Site : ----

Quote number : BC/Yukon Standing Offer - 2022 update

No. of samples received : 16

No. of samples analysed : 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

## Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
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Kate Dimitrova	Analyst	Vancouver Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 989127)											
VA23A0774-003	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	8.47	8.43	0.5%	5%	----
Physical Tests (QC Lot: 989135)											
VA23A0774-003	Anonymous	Moisture	----	E144	0.25	%	15.6	14.8	5.93%	20%	----
Saturated Paste Extractables (QC Lot: 1001664)											
VA23B3105-008	TH23-04B	Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	295000 µg/L	257	13.7%	30%	----
Saturated Paste Extractables (QC Lot: 1001665)											
VA23B3105-008	TH23-04B	% Saturation	----	E141	1.0	%	70.1	74.1	5.46%	20%	----
Saturated Paste Extractables (QC Lot: 1001666)											
VA23B3105-008	TH23-04B	Sodium, soluble ion content	17341-25-2	E442	20.0	mg/L	165000 µg/L	143	14.3%	30%	----
Saturated Paste Extractables (QC Lot: 989128)											
VA23A0774-003	Anonymous	Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	4930	4690	5.01%	30%	----
Saturated Paste Extractables (QC Lot: 989129)											
VA23A0774-003	Anonymous	% Saturation	----	E141	1.0	%	39.9	39.7	0.524%	20%	----
Saturated Paste Extractables (QC Lot: 989130)											
VA23A0774-003	Anonymous	Sodium, soluble ion content	17341-25-2	E442	2.0	mg/L	2800	2700	3.81%	30%	----
Metals (QC Lot: 989124)											
VA23A0774-003	Anonymous	Aluminum	7429-90-5	E440	50	mg/kg	9410	9160	2.78%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	0.24	0.24	0.004	Diff <2x LOR	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	3.05	3.09	1.19%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	48.6	44.7	8.38%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.20	0.19	0.01	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.100	0.107	0.008	Diff <2x LOR	----
		Calcium	7440-70-2	E440	50	mg/kg	4630	4390	5.27%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	29.1	27.3	6.18%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	7.88	7.55	4.25%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	13.6	13.5	1.10%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	17600	17800	0.843%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	2.27	2.23	0.04	Diff <2x LOR	----





Sub-Matrix: Soil/Solid

Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 989124) - continued											
VA23A0774-003	Anonymous	Lithium	7439-93-2	E440	2.0	mg/kg	7.4	7.8	0.4	Diff <2x LOR	----
		Magnesium	7439-95-4	E440	20	mg/kg	8000	7760	3.02%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	316	319	1.02%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.39	0.36	0.02	Diff <2x LOR	----
		Nickel	7440-02-0	E440	0.50	mg/kg	33.6	33.8	0.540%	30%	----
		Phosphorus	7723-14-0	E440	50	mg/kg	418	410	1.99%	30%	----
		Potassium	7440-09-7	E440	100	mg/kg	620	620	0.505%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Sodium	7440-23-5	E440	50	mg/kg	1450	1850	24.5%	40%	----
		Strontium	7440-24-6	E440	0.50	mg/kg	26.1	26.5	1.52%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		Titanium	7440-32-6	E440	1.0	mg/kg	824	800	3.02%	40%	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.254	0.556	74.5%	30%	DUP-H
		Vanadium	7440-62-2	E440	0.20	mg/kg	40.7	38.6	5.24%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	36.0	38.1	5.79%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	3.8	4.3	0.5	Diff <2x LOR	----
Metals (QC Lot: 989125)											
VA23A0774-003	Anonymous	Mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 1005485)											
VA23B3105-001	TH23-01A	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	1.27 µg/g	1.10	14.4%	35%	----
Volatile Organic Compounds (QC Lot: 984135)											
VA23B2778-010	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	0.0441	0.0466	5.54%	40%	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	0.042	0.044	0.002	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.200	mg/kg	<0.200	<0.200	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	0.190	0.200	0.010	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	0.148	0.160	7.74%	40%	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	0.031	0.001	Diff <2x LOR	----
Hydrocarbons (QC Lot: 984134)											
VA23B2778-010	Anonymous	VHs (C6-C10)	----	E581.VH+F1	10	mg/kg	33	36	3	Diff <2x LOR	----



Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Hydrocarbons (QC Lot: 989133)											
VA23B3105-001	TH23-01A	EPH (C10-C19)	----	E601A	200	mg/kg	<200 µg/g	<200	0	Diff <2x LOR	----
		EPH (C19-C32)	----	E601A	200	mg/kg	<200 µg/g	<200	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 989134)											
VA23B3105-001	TH23-01A	Acenaphthene	83-32-9	E641A-L	0.0050	mg/kg	<0.0050 µg/g	<0.0050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A-L	0.0050	mg/kg	<0.0050 µg/g	<0.0050	0	Diff <2x LOR	----
		Acridine	260-94-6	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A-L	0.0040	mg/kg	<0.0041 µg/g	<0.0040	0.0040	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.0050	mg/kg	0.0084 µg/g	<0.0050	0.0034	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Fluorene	86-73-7	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Pyrene	129-00-0	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Quinoline	91-22-5	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 989135)</b>						
Moisture	---	E144	0.25	%	<0.25	---
<b>Saturated Paste Extractables (QCLot: 1001664)</b>						
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	<20	---
<b>Saturated Paste Extractables (QCLot: 1001665)</b>						
% Saturation	---	E141	1	%	50.0	---
<b>Saturated Paste Extractables (QCLot: 1001666)</b>						
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	<2.0	---
<b>Saturated Paste Extractables (QCLot: 989128)</b>						
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	<20	---
<b>Saturated Paste Extractables (QCLot: 989129)</b>						
% Saturation	---	E141	1	%	50.0	---
<b>Saturated Paste Extractables (QCLot: 989130)</b>						
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	<2.0	---
<b>Metals (QCLot: 989124)</b>						
Aluminum	7429-90-5	E440	50	mg/kg	<50	---
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	---
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	---
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	---
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	---
Bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	---
Boron	7440-42-8	E440	5	mg/kg	<5.0	---
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	---
Calcium	7440-70-2	E440	50	mg/kg	<50	---
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	---
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	---
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	---
Iron	7439-89-6	E440	50	mg/kg	<50	---
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	---
Lithium	7439-93-2	E440	2	mg/kg	<2.0	---
Magnesium	7439-95-4	E440	20	mg/kg	<20	---
Manganese	7439-96-5	E440	1	mg/kg	<1.0	---
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	---



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Metals (QCLot: 989124) - continued</b>						
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Phosphorus	7723-14-0	E440	50	mg/kg	<50	----
Potassium	7440-09-7	E440	100	mg/kg	<100	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Sodium	7440-23-5	E440	50	mg/kg	<50	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Titanium	7440-32-6	E440	1	mg/kg	<1.0	----
Tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
<b>Metals (QCLot: 989125)</b>						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
<b>Speciated Metals (QCLot: 1005485)</b>						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
<b>Volatile Organic Compounds (QCLot: 984135)</b>						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.04	mg/kg	<0.040	----
Styrene	100-42-5	E611A	0.05	mg/kg	<0.050	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
<b>Hydrocarbons (QCLot: 984134)</b>						
VHs (C6-C10)	----	E581.VH+F1	10	mg/kg	<10	----
<b>Hydrocarbons (QCLot: 989133)</b>						
EPH (C10-C19)	----	E601A	200	mg/kg	<200	----
EPH (C19-C32)	----	E601A	200	mg/kg	<200	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 989134)</b>						
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----





Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 989134) - continued</b>						
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 989127)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	100	95.0	105	----
Physical Tests (QCLot: 989135)									
Moisture	----	E144	0.25	%	50 %	99.4	90.0	110	----
Saturated Paste Extractables (QCLot: 1001664)									
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	100 mg/L	103	80.0	120	----
Saturated Paste Extractables (QCLot: 1001665)									
% Saturation	----	E141	1	%	100 %	100	80.0	120	----
Saturated Paste Extractables (QCLot: 1001666)									
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	50 mg/L	108	80.0	120	----
Saturated Paste Extractables (QCLot: 989128)									
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	100 mg/L	99.9	80.0	120	----
Saturated Paste Extractables (QCLot: 989129)									
% Saturation	----	E141	1	%	100 %	100	80.0	120	----
Saturated Paste Extractables (QCLot: 989130)									
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	50 mg/L	107	80.0	120	----
Metals (QCLot: 989124)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	100	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	106	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	105	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	97.3	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	99.8	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	99.0	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	90.8	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	100	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	98.0	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	99.5	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	99.2	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	95.7	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	97.0	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	101	80.0	120	----



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Metals (QCLot: 989124) - continued</b>									
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	97.9	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	108	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	102	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	96.2	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	96.1	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	103	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	101	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	102	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	85.4	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	101	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	98.1	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	99.4	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	100	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	96.2	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	95.9	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	97.0	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	98.0	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	99.1	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	97.5	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	90.8	80.0	120	----
<b>Metals (QCLot: 989125)</b>									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	104	80.0	120	----
<b>Speciated Metals (QCLot: 1005485)</b>									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	95.1	80.0	120	----
<b>Volatile Organic Compounds (QCLot: 984135)</b>									
Benzene	71-43-2	E611A	0.005	mg/kg	2.5 mg/kg	104	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	2.5 mg/kg	104	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.04	mg/kg	2.5 mg/kg	109	70.0	130	----
Styrene	100-42-5	E611A	0.05	mg/kg	2.5 mg/kg	103	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	2.5 mg/kg	110	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	5 mg/kg	109	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	2.5 mg/kg	104	70.0	130	----
<b>Hydrocarbons (QCLot: 984134)</b>									



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Hydrocarbons (QCLot: 984134) - continued</b>									
VHs (C6-C10)	----	E581.VH+F1	10	mg/kg	85.8 mg/kg	104	70.0	130	----
<b>Hydrocarbons (QCLot: 989133)</b>									
EPH (C10-C19)	----	E601A	200	mg/kg	1134.37 mg/kg	98.7	70.0	130	----
EPH (C19-C32)	----	E601A	200	mg/kg	575.98 mg/kg	91.8	70.0	130	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 989134)</b>									
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	104	60.0	130	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	102	60.0	130	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	94.7	60.0	130	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	109	60.0	130	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	89.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	90.5	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	99.1	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	128	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	94.3	60.0	130	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	93.5	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	96.7	60.0	130	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	104	60.0	130	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	105	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	130	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	102	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	104	60.0	130	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	105	50.0	130	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	105	60.0	130	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	105	60.0	130	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	92.2	60.0	130	----





Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: Soil/Solid

Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 984135)										
VA23B2778-011	Anonymous	Benzene	71-43-2	E611A	2.74 mg/kg	3.125 mg/kg	102	60.0	140	----
		Ethylbenzene	100-41-4	E611A	2.89 mg/kg	3.125 mg/kg	108	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	2.92 mg/kg	3.125 mg/kg	109	60.0	140	----
		Styrene	100-42-5	E611A	2.88 mg/kg	3.125 mg/kg	107	60.0	140	----
		Toluene	108-88-3	E611A	2.94 mg/kg	3.125 mg/kg	109	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	5.69 mg/kg	6.25 mg/kg	106	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.82 mg/kg	3.125 mg/kg	105	60.0	140	----
Hydrocarbons (QCLot: 984134)										
VA23B2778-012	Anonymous	VHs (C6-C10)	----	E581.VH+F1	147 mg/kg	171.9 mg/kg	81.4	60.0	140	----
Hydrocarbons (QCLot: 989133)										
VA23B3105-003	TH23-02A	EPH (C10-C19)	----	E601A	880 mg/kg	1134.37 mg/kg	96.8	60.0	140	----
		EPH (C19-C32)	----	E601A	420 mg/kg	575.98 mg/kg	92.0	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 989134)										
VA23B3105-003	TH23-02A	Acenaphthene	83-32-9	E641A-L	0.424 mg/kg	0.5 mg/kg	105	50.0	140	----
		Acenaphthylene	208-96-8	E641A-L	0.419 mg/kg	0.5 mg/kg	104	50.0	140	----
		Acridine	260-94-6	E641A-L	0.387 mg/kg	0.5 mg/kg	95.8	50.0	140	----
		Anthracene	120-12-7	E641A-L	0.438 mg/kg	0.5 mg/kg	108	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A-L	0.376 mg/kg	0.5 mg/kg	93.1	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.377 mg/kg	0.5 mg/kg	93.4	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.397 mg/kg	0.5 mg/kg	98.4	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.558 mg/kg	0.5 mg/kg	138	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.381 mg/kg	0.5 mg/kg	94.4	50.0	140	----
		Chrysene	218-01-9	E641A-L	0.388 mg/kg	0.5 mg/kg	96.0	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.394 mg/kg	0.5 mg/kg	97.6	50.0	140	----
		Fluoranthene	206-44-0	E641A-L	0.421 mg/kg	0.5 mg/kg	104	50.0	140	----
		Fluorene	86-73-7	E641A-L	0.422 mg/kg	0.5 mg/kg	104	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.486 mg/kg	0.5 mg/kg	120	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.420 mg/kg	0.5 mg/kg	104	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.431 mg/kg	0.5 mg/kg	107	50.0	140	----
		Naphthalene	91-20-3	E641A-L	0.434 mg/kg	0.5 mg/kg	107	50.0	140	----



Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 989134) - continued										
VA23B3105-003	TH23-02A	Phenanthrene	85-01-8	E641A-L	0.426 mg/kg	0.5 mg/kg	106	50.0	140	----
		Pyrene	129-00-0	E641A-L	0.423 mg/kg	0.5 mg/kg	105	50.0	140	----
		Quinoline	91-22-5	E641A-L	0.388 mg/kg	0.5 mg/kg	96.3	50.0	140	----

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Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method					
Saturated Paste Extractables (QCLot: 1001664)									
	RM	Chloride, soluble ion content	16887-00-6	E239.Cl	1237 mg/L	90.4	70.0	130	----
Saturated Paste Extractables (QCLot: 1001665)									
	RM	% Saturation	----	E141	48.3 %	97.6	70.0	130	----
Saturated Paste Extractables (QCLot: 1001666)									
	RM	Sodium, soluble ion content	17341-25-2	E442	330 mg/L	97.9	70.0	130	----
Saturated Paste Extractables (QCLot: 989128)									
	RM	Chloride, soluble ion content	16887-00-6	E239.Cl	1237 mg/L	87.3	70.0	130	----
Saturated Paste Extractables (QCLot: 989129)									
	RM	% Saturation	----	E141	48.3 %	107	70.0	130	----
Saturated Paste Extractables (QCLot: 989130)									
	RM	Sodium, soluble ion content	17341-25-2	E442	330 mg/L	92.2	70.0	130	----
Metals (QCLot: 989124)									
	SCP SS-2	Aluminum	7429-90-5	E440	9817 mg/kg	111	70.0	130	----
	SCP SS-2	Antimony	7440-36-0	E440	3.99 mg/kg	97.1	70.0	130	----
	SCP SS-2	Arsenic	7440-38-2	E440	3.73 mg/kg	100	70.0	130	----
	SCP SS-2	Barium	7440-39-3	E440	105 mg/kg	108	70.0	130	----
	SCP SS-2	Beryllium	7440-41-7	E440	0.349 mg/kg	114	70.0	130	----
	SCP SS-2	Boron	7440-42-8	E440	8.5 mg/kg	114	40.0	160	----
	SCP SS-2	Cadmium	7440-43-9	E440	0.91 mg/kg	100	70.0	130	----
	SCP SS-2	Calcium	7440-70-2	E440	31082 mg/kg	110	70.0	130	----
	SCP SS-2	Chromium	7440-47-3	E440	101 mg/kg	112	70.0	130	----
	SCP SS-2	Cobalt	7440-48-4	E440	6.9 mg/kg	103	70.0	130	----
	SCP SS-2	Copper	7440-50-8	E440	123 mg/kg	106	70.0	130	----
	SCP SS-2	Iron	7439-89-6	E440	23558 mg/kg	106	70.0	130	----
	SCP SS-2	Lead	7439-92-1	E440	267 mg/kg	110	70.0	130	----
	SCP SS-2	Lithium	7439-93-2	E440	9.5 mg/kg	107	70.0	130	----
	SCP SS-2	Magnesium	7439-95-4	E440	5509 mg/kg	112	70.0	130	----
	SCP SS-2	Manganese	7439-96-5	E440	269 mg/kg	110	70.0	130	----



Sub-Matrix:

Sub-Matrix:

					Reference Material (RM) Report				
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 989124) - continued									
	SCP SS-2	Molybdenum	7439-98-7	E440	1.03 mg/kg	99.8	70.0	130	----
	SCP SS-2	Nickel	7440-02-0	E440	26.7 mg/kg	102	70.0	130	----
	SCP SS-2	Phosphorus	7723-14-0	E440	752 mg/kg	100	70.0	130	----
	SCP SS-2	Potassium	7440-09-7	E440	1587 mg/kg	102	70.0	130	----
	SCP SS-2	Sodium	7440-23-5	E440	797 mg/kg	96.2	70.0	130	----
	SCP SS-2	Strontium	7440-24-6	E440	86.1 mg/kg	102	70.0	130	----
	SCP SS-2	Thallium	7440-28-0	E440	0.0786 mg/kg	102	40.0	160	----
	SCP SS-2	Tin	7440-31-5	E440	10.6 mg/kg	94.5	70.0	130	----
	SCP SS-2	Titanium	7440-32-6	E440	839 mg/kg	110	70.0	130	----
	SCP SS-2	Uranium	7440-61-1	E440	0.52 mg/kg	106	70.0	130	----
	SCP SS-2	Vanadium	7440-62-2	E440	32.7 mg/kg	105	70.0	130	----
	SCP SS-2	Zinc	7440-66-6	E440	297 mg/kg	98.6	70.0	130	----
	SCP SS-2	Zirconium	7440-67-7	E440	5.73 mg/kg	90.5	70.0	130	----
Metals (QCLot: 989125)									
	SCP SS-2	Mercury	7439-97-6	E510	0.059 mg/kg	105	70.0	130	----
Speciated Metals (QCLot: 1005485)									
	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	172 mg/kg	98.0	70.0	130	----





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# Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 909141

Page 1 of 2

Environmental Division  
Vancouver

Work Order Reference  
VA23B3105



Telephone : +1 604 263 4188

<b>Report To</b> Contact and company name below will appear on the final report		<b>Reports / Recipients</b>		<b>Turnaround Time (TAT) Requested</b>	
Company: <u>Mcelhanney</u>		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)		<input checked="" type="checkbox"/> Routine [R] If received by 3pm M-F - no surcharges apply	
Contact: <u>Victoria Anison</u>		Merge QC/QCI Reports with COA <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A		<input type="checkbox"/> 4 day [P4] If received by 3pm M-F - 20% rush surcharge minimum	
Phone: <u>778 584 1382</u>		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		<input type="checkbox"/> 3 day [P3] If received by 3pm M-F - 25% rush surcharge minimum	
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<input type="checkbox"/> 2 day [P2] If received by 3pm M-F - 50% rush surcharge minimum	
Street: <u>Suite 500 3960 Quadra St</u>		Email 1 or Fax: <u>vanson@mcelhanney.com</u>		<input type="checkbox"/> 1 day [E] If received by 3pm M-F - 100% rush surcharge minimum	
City/Province: <u>Victoria BC</u>		Email 2: <u>mmanzi@mcelhanney.com</u>		<input type="checkbox"/> Same day [E2] If received by 10am M-S - 200% rush surcharge. Addtl may apply to rush requests on weekends, statutory holidays and non-rout	
Postal Code: <u>V8X 4A3</u>		Email 3: <u>bwhite@mcelhanney.com</u>		Date and Time Required for all E&P TATs:	
Invoice To: Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Recipients		For all tests with rush TATs requested, please con	
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<b>Analysis Req</b>	
Company:		Email 1 or Fax: <u>See above</u>		Indicate Filtered (F), Preserved (P) or Filtered and	
Contact:		Email 2:		NUMBER OF CONTAINERS	
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>		BTEx, VPH, MTBE	
ALS Account # / Quote #:		AFE/Cost Center:		LEPH/HEH/PAHS	
Job #: <u>2241-20182-00</u>		Major/Minor Code:		CSR Metals	
PO / AFE:		Requisitioner:		Salinity (sat paste)	
LSD:		Location:			
ALS Lab Work Order # (ALS use only):		ALS Contact: <u>Dean Watt</u>		Sampler: <u>M. Manzi</u>	
ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	
	TH23-01A	08-06-23	0730	Soil	5
	TH23-01B		0730	Soil	5
	TH23-02A		0820		5
	TH23-02B		0820		5
	TH23-03A		0900		5
	TH23-03B		0900		5
	TH23-04A		0945		5
	TH23-04R		0945		5
	TH23-05A		1045		5
	TH23-05B		1045		5
	TH23-06A		1130		5
	TH23-06B		1130		5
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>		<b>Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)</b>		<b>SAMPLE RECEIPT DETAILS (ALS use only)</b>	
Are samples taken from a Regulated DW System?				Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input checked="" type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED	
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
Are samples for human consumption/ use?				Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A	
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				INITIAL COOLER TEMPERATURES °C	
				FINAL COOLER TEMPERATURES °C	
				10.14°C	
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>		<b>FINAL SHIPMENT RECEPTION (ALS use only)</b>	
Released by: <u>M. Manzi</u>	Date: <u>June 8 2023</u>	Time: <u>4pm</u>	Received by: <u>SP</u>	Date: <u>9/6/23</u>	Time: <u>11:00 AM</u>

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

AUG 2020 FORM



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# Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 995105

Page 2 of 2

<b>Report To</b> Contact and company name below will appear on the final report		<b>Reports / Recipients</b>		<b>Turnaround Time (TAT) Requested</b>		<b>AFFIX ALS BARCODE LABEL HERE</b> (ALS use only)																																													
Company: <u>Mcel Hanney</u> Contact: <u>Victoria Amson</u> Phone: <u>778 584 1382</u> Company address below will appear on the final report		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Merge QC/QCI Reports with COA <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests																																															
Street: <u>#500, 3960 Quadra St</u> City/Province: <u>Victoria BC</u> Postal Code: <u>V8X 4A3</u>		Email 1 or Fax: <u>amson@mcelhanney.com</u> Email 2: <u>mmanzi@mcelhanney.com</u> Email 3: <u>hwhite@mcelhanney.com</u>		Date and Time Required for all E&P TATs: _____ dd-mm-yy hh:mm am/pm For all tests with rush TATs requested, please contact your AM to confirm availability.																																															
<b>Invoice To</b>		<b>Invoice Recipients</b>		<b>Analysis Request</b>																																															
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <u>See above</u> Email 2: _____		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																															
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>		<table border="1"> <tr> <th rowspan="4">NUMBER OF CONTAINERS</th> <th colspan="10">Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below</th> <th rowspan="4">SAMPLES ON HOLD</th> <th rowspan="4">EXTENDED STORAGE REQUIRED</th> <th rowspan="4">SUSPECTED HAZARD (see notes)</th> </tr> <tr> <th>BTEX/VPH/MTBE</th> <th>LEPH/HEPH/PAHS</th> <th>CSR metals</th> <th>Salinity (state)</th> <th></th><th></th><th></th><th></th><th></th><th></th> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>				NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)	BTEX/VPH/MTBE	LEPH/HEPH/PAHS	CSR metals	Salinity (state)																										
NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)																																						
	BTEX/VPH/MTBE	LEPH/HEPH/PAHS	CSR metals						Salinity (state)																																										
ALS Account # / Quote #: _____ Job #: <u>2241-20128-00</u> PO / AFE: _____ LSD: _____		AFE/Cost Center: _____ PO#: _____ Major/Minor Code: _____ Routing Code: _____ Requisitioner: _____ Location: _____																																																	
ALS Lab Work Order # (ALS use only): _____		ALS Contact: <u>Dean Watt</u> Sampler: <u>Mr. Manzi</u>																																																	
ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type																																															
	<u>HA23-01</u>	<u>June 6</u>	<u>1230</u>	<u>Soil</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>																																										
	<u>HA23-04</u>	<u>June 6</u>	<u>1245</u>	<u>Soil</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>																																										
	<u>HA23-05</u>	<u>June 6</u>	<u>1300</u>	<u>Soil</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>																																										
	<u>DUP-A</u>	<u>June 8</u>	<u>0900</u>	<u>Soil</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>																																										
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>		<b>Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)</b>		<b>SAMPLE RECEIPT DETAILS (ALS use only)</b>																																															
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input type="checkbox"/> NO				Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input checked="" type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED																																															
Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO				Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO																																															
				Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A																																															
				INITIAL COOLER TEMPERATURES °C _____ FINAL COOLER TEMPERATURES °C _____																																															
				_____ 10°C _____ 14°C																																															
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>		<b>FINAL SHIPMENT RECEPTION (ALS use only)</b>																																															
Released by: <u>M. Manzi</u>	Date: <u>June 8 2023</u>	Time: <u>4pm</u>	Received by: _____	Date: _____	Time: _____	Received by: <u>SP</u>	Date: <u>9/6/23</u>	Time: <u>11:00AM</u>																																											

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

AUG 2020 FRONT

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA23B3174**  
**Amendment** : **1**  
**Client** : **McElhanney Ltd.**  
**Contact** : Victoria Amson  
**Address** : # 500 - 3960 Quadra Street  
Victoria BC Canada V8X 4A3  
**Telephone** : 250 370 9221  
**Project** : 2241-20128-00  
**PO** : ----  
**C-O-C number** : ----  
**Sampler** : LD, MM  
**Site** : ----  
**Quote number** : BC/Yukon Standing Offer - 2022 update  
**No. of samples received** : 8  
**No. of samples analysed** : 5

**Page** : 1 of 5

**Laboratory** : Vancouver - Environmental  
**Account Manager** : Dean Watt  
**Address** : 8081 Lougheed Highway  
Burnaby BC Canada V5A 1W9  
**Telephone** : +1 604 253 4188  
**Date Samples Received** : 12-Jun-2023 11:50  
**Date Analysis Commenced** : 16-Jun-2023  
**Issue Date** : 22-Jun-2023 16:52

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

**Signatories**

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

**Signatories**

Alex Thornton  
Dan Gebert  
Janice Leung  
Kevin Duarte  
Kim Jensen  
Miles Gropen

**Position**

Analyst  
Laboratory Analyst  
Supervisor - Organics Instrumentation  
Supervisor - Metals ICP Instrumentation  
Department Manager - Metals  
Department Manager - Inorganics

**Laboratory Department**

Metals, Burnaby, British Columbia  
Metals, Burnaby, British Columbia  
Organics, Burnaby, British Columbia  
Metals, Burnaby, British Columbia  
Metals, Burnaby, British Columbia  
Inorganics, Burnaby, British Columbia



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
%	percent
µg/g	micrograms per gram
µg/L	micrograms per litre
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Workorder Comments

Additional data has been added.

## Qualifiers

Qualifier	Description
DLHM	Detection Limit Adjusted: Sample has high moisture content.





## Analytical Results

Sub-Matrix: Soil					Client sample ID				
(Matrix: Soil/Solid)					TH23-07A	TH23-08A	TH23-09A	TH23-09B	TH23-10A
Client sampling date / time					09-Jun-2023	09-Jun-2023	09-Jun-2023	09-Jun-2023	09-Jun-2023
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3174-001	VA23B3174-003	VA23B3174-005	VA23B3174-006	VA23B3174-007
					Result	Result	Result	Result	Result
<b>Physical Tests</b>									
% Saturation	---	E141/VA	1.0	%	80.6	222	99.8	62.4	78.4
Moisture	---	E144/VA	0.25	%	32.8	7.27	38.0	---	31.9
pH (1:2 soil:water)	---	E108/VA	0.10	pH units	5.55	6.29	6.27	---	4.89
<b>Saturated Paste Extractables</b>									
Chloride, soluble ion content	16887-00-6	EC239A.CI/V A	1.0	µg/g	35.5	<44.4	240	106	32.1
Chloride, soluble ion content	16887-00-6	E239.CI/VA	20000	µg/L	44000	<20000	240000	170000	41000
Sodium, soluble ion content	17341-25-2	EC442/VA	1.00	µg/g	18.9	<44.4	113	56.9	18.0
Sodium, soluble ion content	17341-25-2	E442/VA	20000	µg/L	23400	<20000	113000	91200	23000
<b>Metals</b>									
Aluminum	7429-90-5	E440/VA	50	µg/g	30400	21300	36900	---	29100
Antimony	7440-36-0	E440/VA	0.10	µg/g	<0.10	0.12	0.15	---	0.14
Arsenic	7440-38-2	E440/VA	0.10	µg/g	2.06	5.37	5.27	---	5.73
Barium	7440-39-3	E440/VA	0.50	µg/g	133	31.3	61.2	---	57.4
Beryllium	7440-41-7	E440/VA	0.10	µg/g	0.55	0.24	0.50	---	0.36
Bismuth	7440-69-9	E440/VA	0.20	µg/g	0.38	<0.20	<0.20	---	<0.20
Boron	7440-42-8	E440/VA	5.0	µg/g	<5.0	<5.0	<5.0	---	<5.0
Cadmium	7440-43-9	E440/VA	0.020	µg/g	0.104	0.065	0.052	---	0.034
Calcium	7440-70-2	E440/VA	50	µg/g	5410	8580	4820	---	4400
Chromium	7440-47-3	E440/VA	0.50	µg/g	46.2	40.4	56.9	---	46.2
Cobalt	7440-48-4	E440/VA	0.10	µg/g	9.75	12.3	15.9	---	11.4
Copper	7440-50-8	E440/VA	0.50	µg/g	24.7	44.7	26.8	---	24.4
Iron	7439-89-6	E440/VA	50	µg/g	27000	30200	35200	---	28500
Lead	7439-92-1	E440/VA	0.50	µg/g	8.86	2.36	4.48	---	3.89
Lithium	7439-93-2	E440/VA	2.0	µg/g	17.3	12.5	17.4	---	16.3
Magnesium	7439-95-4	E440/VA	20	µg/g	5350	10100	9230	---	9060
Manganese	7439-96-5	E440/VA	1.0	µg/g	267	565	452	---	363
Mercury	7439-97-6	E510/VA	0.0500	µg/g	<0.0500	<0.0500	0.0505	---	<0.0500
Molybdenum	7439-98-7	E440/VA	0.10	µg/g	0.41	0.26	0.61	---	0.51
Nickel	7440-02-0	E440/VA	0.50	µg/g	31.9	27.4	37.0	---	34.4



## Analytical Results

Sub-Matrix: Soil

Client sample ID

(Matrix: Soil/Solid)

					TH23-07A	TH23-08A	TH23-09A	TH23-09B	TH23-10A
Client sampling date / time					09-Jun-2023	09-Jun-2023	09-Jun-2023	09-Jun-2023	09-Jun-2023
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3174-001	VA23B3174-003	VA23B3174-005	VA23B3174-006	VA23B3174-007
					Result	Result	Result	Result	Result
<b>Metals</b>									
Phosphorus	7723-14-0	E440/VA	50	µg/g	272	519	604	----	347
Potassium	7440-09-7	E440/VA	100	µg/g	530	550	840	----	560
Selenium	7782-49-2	E440/VA	0.20	µg/g	<0.20	<0.20	0.64	----	0.52
Silver	7440-22-4	E440/VA	0.10	µg/g	0.20	<0.10	0.11	----	0.12
Sodium	7440-23-5	E440/VA	50	µg/g	280	170	338	----	239
Strontium	7440-24-6	E440/VA	0.50	µg/g	35.6	29.8	27.0	----	23.1
Sulfur	7704-34-9	E440/VA	1000	µg/g	<1000	<1000	<1000	----	<1000
Thallium	7440-28-0	E440/VA	0.050	µg/g	0.074	<0.050	0.084	----	0.073
Tin	7440-31-5	E440/VA	2.0	µg/g	<2.0	<2.0	<2.0	----	<2.0
Titanium	7440-32-6	E440/VA	1.0	µg/g	1030	1320	1100	----	1070
Tungsten	7440-33-7	E440/VA	0.50	µg/g	<0.50	<0.50	<0.50	----	<0.50
Uranium	7440-61-1	E440/VA	0.050	µg/g	0.536	0.250	0.593	----	0.434
Vanadium	7440-62-2	E440/VA	0.20	µg/g	82.4	80.0	84.2	----	79.9
Zinc	7440-66-6	E440/VA	2.0	µg/g	33.9	47.0	69.4	----	46.6
Zirconium	7440-67-7	E440/VA	1.0	µg/g	<1.0	2.3	1.7	----	1.4
<b>Hydrocarbons</b>									
EPH (C10-C19)	----	E601A/VA	200	µg/g	<200	<200	<200	----	<200
EPH (C19-C32)	----	E601A/VA	200	µg/g	<200	<200	<200	----	<200
HEPHs	----	EC600A/VA	200	µg/g	<200	<200	<200	----	<200
LEPHs	----	EC600A/VA	200	µg/g	<200	<200	<200	----	<200
<b>Hydrocarbons Surrogates</b>									
Bromobenzotrifluoride, 2- (EPH surrogate)	392-83-6	E601A/VA	1.0	%	96.1	94.4	93.9	----	97.9
<b>Polycyclic Aromatic Hydrocarbons</b>									
Acenaphthene	83-32-9	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0053 <sup>DLHM</sup>	----	<0.0050
Acenaphthylene	208-96-8	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0053 <sup>DLHM</sup>	----	<0.0050
Acridine	260-94-6	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010
Anthracene	120-12-7	E641A-L/VA	0.0040	µg/g	<0.0048 <sup>DLHM</sup>	<0.0040	<0.0053 <sup>DLHM</sup>	----	<0.0048 <sup>DLHM</sup>
Benz(a)anthracene	56-55-3	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010
Benzo(a)pyrene	50-32-8	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010
Benzo(b+j)fluoranthene	n/a	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010
Benzo(b+j+k)fluoranthene	n/a	E641A-L/VA	0.015	µg/g	<0.015	<0.015	<0.015	----	<0.015



## Analytical Results

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	TH23-07A	TH23-08A	TH23-09A	TH23-09B	TH23-10A
Client sampling date / time					09-Jun-2023	09-Jun-2023	09-Jun-2023	09-Jun-2023	09-Jun-2023	
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23B3174-001	VA23B3174-003	VA23B3174-005	VA23B3174-006	VA23B3174-007	
					Result	Result	Result	Result	Result	
Polycyclic Aromatic Hydrocarbons										
Benzo(g,h,i)perylene	191-24-2	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Benzo(k)fluoranthene	207-08-9	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Chrysene	218-01-9	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Dibenz(a,h)anthracene	53-70-3	E641A-L/VA	0.0050	µg/g	<0.0050	<0.0050	<0.0053 <sup>DLHM</sup>	----	<0.0050	
Fluoranthene	206-44-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Fluorene	86-73-7	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Methylnaphthalene, 1-	90-12-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Methylnaphthalene, 2-	91-57-6	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Naphthalene	91-20-3	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Phenanthrene	85-01-8	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Pyrene	129-00-0	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
Quinoline	91-22-5	E641A-L/VA	0.010	µg/g	<0.010	<0.010	<0.010	----	<0.010	
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/VA	0.020	µg/g	<0.020	<0.020	<0.020	----	<0.020	
IACR (CCME)	----	E641A-L/VA	0.150	-	<0.150	<0.150	<0.150	----	<0.150	
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/VA	0.1	%	76.6	102	105	----	95.5	
Chrysene-d12	1719-03-5	E641A-L/VA	0.1	%	104	93.2	110	----	94.8	
Naphthalene-d8	1146-65-2	E641A-L/VA	0.1	%	113	110	122	----	112	
Phenanthrene-d10	1517-22-2	E641A-L/VA	0.1	%	109	107	116	----	109	

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA23B3174	Page	: 1 of 10
Amendment	: 1		
Client	: McElhanney Ltd.	Laboratory	: Vancouver - Environmental
Contact	: Victoria Amson	Account Manager	: Dean Watt
Address	: # 500 - 3960 Quadra Street Victoria BC Canada V8X 4A3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 250 370 9221	Telephone	: +1 604 253 4188
Project	: 2241-20128-00	Date Samples Received	: 12-Jun-2023 11:50
PO	: ----	Issue Date	: 22-Jun-2023 16:52
C-O-C number	: ----		
Sampler	: LD, MM		
Site	: ----		
Quote number	: BC/Yukon Standing Offer - 2022 update		
No. of samples received	: 8		
No. of samples analysed	: 5		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

### Key

**Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.

**CAS Number:** Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

**LOR:** Limit of Reporting (detection limit).

**RPD:** Relative Percent Difference.

### Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### Summary of Outliers

#### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.



### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

DRAFT



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-07A	E601A	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-08A	E601A	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-09A	E601A	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Glass soil jar/Teflon lined cap TH23-10A	E601A	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-07A	E510	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	28 days	9 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-08A	E510	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	28 days	9 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-09A	E510	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	28 days	9 days	✓



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TH23-10A	E510	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	28 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-07A	E440	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	180 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-08A	E440	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	180 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-09A	E440	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	180 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TH23-10A	E440	09-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	180 days	9 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-07A	E144	09-Jun-2023	----	----	----		16-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-08A	E144	09-Jun-2023	----	----	----		16-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-09A	E144	09-Jun-2023	----	----	----		16-Jun-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TH23-10A	E144	09-Jun-2023	----	----	----		16-Jun-2023	----	----	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-07A	E108	09-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-08A	E108	09-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-09A	E108	09-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TH23-10A	E108	09-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	30 days	8 days	✓
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-07A	E141	09-Jun-2023	16-Jun-2023	----	----		16-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-08A	E141	09-Jun-2023	16-Jun-2023	----	----		16-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-09A	E141	09-Jun-2023	16-Jun-2023	----	----		16-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-09B	E141	09-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	----	0 days	
Physical Tests : Saturation Percentage										
Glass soil jar/Teflon lined cap TH23-10A	E141	09-Jun-2023	16-Jun-2023	----	----		16-Jun-2023	----	0 days	





Matrix: Soil/Solid

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-07A	E641A-L	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-08A	E641A-L	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-09A	E641A-L	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TH23-10A	E641A-L	09-Jun-2023	16-Jun-2023	14 days	8 days	✓	17-Jun-2023	40 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-09B	E442	09-Jun-2023	22-Jun-2023	365 days	13 days	✓	22-Jun-2023	180 days	0 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-07A	E442	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	17-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-08A	E442	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	17-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-09A	E442	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	17-Jun-2023	180 days	1 days	✓
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)										
Glass soil jar/Teflon lined cap TH23-10A	E442	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	17-Jun-2023	180 days	1 days	✓



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-09B	E239.Cl	09-Jun-2023	22-Jun-2023	365 days	13 days	✓	22-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-07A	E239.Cl	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	16-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-08A	E239.Cl	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	16-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-09A	E239.Cl	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	16-Jun-2023	28 days	0 days	✓
Saturated Paste Extractables : Chloride by IC (Saturated Paste)										
Glass soil jar/Teflon lined cap TH23-10A	E239.Cl	09-Jun-2023	16-Jun-2023	365 days	8 days	✓	16-Jun-2023	28 days	0 days	✓

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
BC PHCs - EPH by GC-FID	E601A	992976	1	16	6.2	5.0	✓
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	1001666	2	16	12.5	5.0	✓
Chloride by IC (Saturated Paste)	E239.Cl	1001664	2	25	8.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	992978	1	13	7.6	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	992979	2	15	13.3	5.0	✓
Moisture Content by Gravimetry	E144	992984	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	992975	1	16	6.2	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	992980	1	13	7.6	5.0	✓
Saturation Percentage	E141	1001665	1	24	4.1	5.0	✗
Laboratory Control Samples (LCS)							
BC PHCs - EPH by GC-FID	E601A	992976	1	16	6.2	5.0	✓
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	1001666	4	16	25.0	10.0	✓
Chloride by IC (Saturated Paste)	E239.Cl	1001664	4	25	16.0	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	992978	2	13	15.3	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	992979	2	15	13.3	10.0	✓
Moisture Content by Gravimetry	E144	992984	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	992975	1	16	6.2	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	992980	1	13	7.6	5.0	✓
Saturation Percentage	E141	1001665	4	24	16.6	10.0	✓
Method Blanks (MB)							
BC PHCs - EPH by GC-FID	E601A	992976	1	16	6.2	5.0	✓
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	1001666	2	16	12.5	5.0	✓
Chloride by IC (Saturated Paste)	E239.Cl	1001664	2	25	8.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	992978	1	13	7.6	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	992979	1	15	6.6	5.0	✓
Moisture Content by Gravimetry	E144	992984	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	992975	1	16	6.2	5.0	✓
Saturation Percentage	E141	1001665	2	24	8.3	5.0	✓
Matrix Spikes (MS)							
BC PHCs - EPH by GC-FID	E601A	992976	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	992975	1	16	6.2	5.0	✓



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108  Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally $20 \pm 5^{\circ}\text{C}$ ), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at $<60^{\circ}\text{C}$ ) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Saturation Percentage	E141  Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/AER D50	Saturation Percentage (SP) is determined as the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage.
Moisture Content by Gravimetry	E144  Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at $105^{\circ}\text{C}$ . Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Chloride by IC (Saturated Paste)	E239.Cl  Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by obtaining a soil extract produced by the saturated paste extraction procedure which is then analyzed by Ion Chromatography with conductivity and/or UV detection.
Metals in Soil/Solid by CRC ICPMS	E440  Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with $\text{HNO}_3$ and $\text{HCl}$ .  Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines.  Analysis is by Collision/Reaction Cell ICPMS.
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442  Vancouver - Environmental	Soil/Solid	CSSS CH15/EPA 6020B (mod)	A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium and Sodium by Collision/Reaction Cell ICPMS as per "Soil Sampling Methods of Analysis" By M Carter.
Mercury in Soil/Solid by CVAAS	E510  Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with $\text{HNO}_3$ and $\text{HCl}$ , followed by CVAAS analysis.
BC PHCs - EPH by GC-FID	E601A  Vancouver - Environmental	Soil/Solid	BC MOE Lab Manual (EPH in Solids by GC/FID) (mod)	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.





Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L  Vancouver - Environmental	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
Chloride by IC (Saturated Paste) (mg/kg)	EC239A.Cl  Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by obtaining a soil extract produced by the saturated paste extraction procedure which is then analyzed by Ion Chromatography with conductivity and/or UV detection.
Ca, K, Mg, Na by ICPMS (Saturated Paste, mg/kg)	EC442  Vancouver - Environmental	Soil/Solid	CSSS CH15/EPA 6020B (mod)	A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium, Sodium by ICPMS.
LEPH and HEPH: EPH-PAH	EC600A  Vancouver - Environmental	Soil/Solid	BC MOE Lab Manual (LEPH and HEPH)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(b+j+k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Pyrene.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108  Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Digestion for Metals and Mercury	EP440  Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601  Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

## QUALITY CONTROL REPORT

Work Order : VA23B3174

Page : 1 of 14

Amendment : 1

Client : McElhanney Ltd.

Laboratory : Vancouver - Environmental

Contact : Victoria Amson

Account Manager : Dean Watt

Address : # 500 - 3960 Quadra Street  
Victoria BC Canada V8X 4A3Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

Telephone :

Telephone : +1 604 253 4188

Project : 2241-20128-00

Date Samples Received : 12-Jun-2023 11:50

PO : ----

Date Analysis Commenced : 16-Jun-2023

C-O-C number : ----

Issue Date : 22-Jun-2023 16:52

Sampler : LD, MM 250 370 9221

Site : ----

Quote number : BC/Yukon Standing Offer - 2022 update

No. of samples received : 8

No. of samples analysed : 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia



## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 992980)											
VA23B3174-001	TH23-07A	pH (1:2 soil:water)	----	E108	0.10	pH units	5.55	5.42	2.4%	5%	----
Physical Tests (QC Lot: 992984)											
VA23B3174-001	TH23-07A	Moisture	----	E144	0.25	%	32.8	33.1	0.816%	20%	----
Saturated Paste Extractables (QC Lot: 1001664)											
VA23B3105-008	Anonymous	Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	295000 µg/L	257	13.7%	30%	----
Saturated Paste Extractables (QC Lot: 1001666)											
VA23B3105-008	Anonymous	Sodium, soluble ion content	17341-25-2	E442	20.0	mg/L	165000 µg/L	143	14.3%	30%	----
Saturated Paste Extractables (QC Lot: 992981)											
VA23B1990-005	Anonymous	% Saturation	----	E141	1.0	%	197	220	10.7%	20%	----
Saturated Paste Extractables (QC Lot: 992982)											
VA23B1990-005	Anonymous	Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	190	161	16.7%	30%	----
Saturated Paste Extractables (QC Lot: 992983)											
VA23B3174-001	TH23-07A	Sodium, soluble ion content	17341-25-2	E442	20.0	mg/L	23400 µg/L	25.7	2.4	Diff <2x LOR	----
Metals (QC Lot: 992978)											
VA23B3174-001	TH23-07A	Mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500 µg/g	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 992979)											
VA23B3174-001	TH23-07A	Arsenic	7440-38-2	E440	0.10	mg/kg	2.06 µg/g	1.99	3.79%	30%	----
VA23B3174-001	TH23-07A	Aluminum	7429-90-5	E440	50	mg/kg	30400 µg/g	28500	6.40%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	<0.10 µg/g	<0.10	0	Diff <2x LOR	----
		Barium	7440-39-3	E440	0.50	mg/kg	133 µg/g	130	2.35%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.55 µg/g	0.53	0.02	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	0.38 µg/g	0.28	0.10	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0 µg/g	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.104 µg/g	0.090	0.014	Diff <2x LOR	----
		Calcium	7440-70-2	E440	50	mg/kg	5410 µg/g	4970	8.56%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	46.2 µg/g	42.4	8.80%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	9.75 µg/g	9.13	6.58%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	24.7 µg/g	22.2	10.7%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	27000 µg/g	26200	3.29%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	8.86 µg/g	7.62	15.1%	40%	----





Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 992979) - continued											
VA23B3174-001	TH23-07A	Lithium	7439-93-2	E440	2.0	mg/kg	17.3 µg/g	16.9	2.19%	30%	----
		Magnesium	7439-95-4	E440	20	mg/kg	5350 µg/g	4920	8.46%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	267 µg/g	243	9.60%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.41 µg/g	0.36	0.05	Diff <2x LOR	----
		Nickel	7440-02-0	E440	0.50	mg/kg	31.9 µg/g	30.0	6.10%	30%	----
		Phosphorus	7723-14-0	E440	50	mg/kg	272 µg/g	221	52	Diff <2x LOR	----
		Potassium	7440-09-7	E440	100	mg/kg	530 µg/g	500	6.13%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	<0.20 µg/g	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	0.20 µg/g	0.18	0.03	Diff <2x LOR	----
		Sodium	7440-23-5	E440	50	mg/kg	280 µg/g	266	5.11%	40%	----
		Strontium	7440-24-6	E440	0.50	mg/kg	35.6 µg/g	33.7	5.54%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000 µg/g	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.074 µg/g	0.069	0.005	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0 µg/g	<2.0	0	Diff <2x LOR	----
		Titanium	7440-32-6	E440	1.0	mg/kg	1030 µg/g	777	27.8%	40%	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	<0.50 µg/g	<0.50	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.536 µg/g	0.493	8.34%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	82.4 µg/g	74.9	9.47%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	33.9 µg/g	30.8	9.60%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	<1.0 µg/g	<1.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 992976)											
VA23B3174-001	TH23-07A	EPH (C10-C19)	----	E601A	200	mg/kg	<200 µg/g	<200	0	Diff <2x LOR	----
		EPH (C19-C32)	----	E601A	200	mg/kg	<200 µg/g	<200	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 992975)											
VA23B3174-001	TH23-07A	Acenaphthene	83-32-9	E641A-L	0.0050	mg/kg	<0.0050 µg/g	<0.0050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A-L	0.0050	mg/kg	<0.0050 µg/g	<0.0050	0	Diff <2x LOR	----
		Acridine	260-94-6	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A-L	0.0041	mg/kg	<0.0048 µg/g	<0.0041	0.0007	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----



Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Polycyclic Aromatic Hydrocarbons (QC Lot: 992975) - continued											
VA23B3174-001	TH23-07A	Dibenz(a,h)anthracene	53-70-3	E641A-L	0.0050	mg/kg	<0.0050 µg/g	<0.0050	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Fluorene	86-73-7	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Pyrene	129-00-0	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Quinoline	91-22-5	E641A-L	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 992984)</b>						
Moisture	---	E144	0.25	%	<0.25	---
<b>Saturated Paste Extractables (QCLot: 1001664)</b>						
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	<20	---
<b>Saturated Paste Extractables (QCLot: 1001665)</b>						
% Saturation	---	E141	1	%	50.0	---
<b>Saturated Paste Extractables (QCLot: 1001666)</b>						
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	<2.0	---
<b>Saturated Paste Extractables (QCLot: 992981)</b>						
% Saturation	---	E141	1	%	50.0	---
<b>Saturated Paste Extractables (QCLot: 992982)</b>						
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	<20	---
<b>Saturated Paste Extractables (QCLot: 992983)</b>						
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	<2.0	---
<b>Metals (QCLot: 992978)</b>						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	---
<b>Metals (QCLot: 992979)</b>						
Aluminum	7429-90-5	E440	50	mg/kg	<50	---
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	---
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	---
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	---
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	---
Bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	---
Boron	7440-42-8	E440	5	mg/kg	<5.0	---
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	---
Calcium	7440-70-2	E440	50	mg/kg	<50	---
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	---
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	---
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	---
Iron	7439-89-6	E440	50	mg/kg	<50	---
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	---
Lithium	7439-93-2	E440	2	mg/kg	<2.0	---
Magnesium	7439-95-4	E440	20	mg/kg	<20	---



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Metals (QCLot: 992979) - continued</b>						
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Phosphorus	7723-14-0	E440	50	mg/kg	<50	----
Potassium	7440-09-7	E440	100	mg/kg	<100	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Sodium	7440-23-5	E440	50	mg/kg	<50	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Titanium	7440-32-6	E440	1	mg/kg	<1.0	----
Tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
<b>Hydrocarbons (QCLot: 992976)</b>						
EPH (C10-C19)	----	E601A	200	mg/kg	<200	----
EPH (C19-C32)	----	E601A	200	mg/kg	<200	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 992975)</b>						
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----



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 Work Order : VA23B3174 Amendment 1  
 Client : McElhanney Ltd.  
 Project : 2241-20128-00



Sub-Matrix: **Soil/Solid**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 992975) - continued</b>						
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 992980)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.8	95.0	105	----
Physical Tests (QCLot: 992984)									
Moisture	----	E144	0.25	%	50 %	99.7	90.0	110	----
Saturated Paste Extractables (QCLot: 1001664)									
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	100 mg/L	103	80.0	120	----
Saturated Paste Extractables (QCLot: 1001665)									
% Saturation	----	E141	1	%	100 %	100	80.0	120	----
Saturated Paste Extractables (QCLot: 1001666)									
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	50 mg/L	108	80.0	120	----
Saturated Paste Extractables (QCLot: 992981)									
% Saturation	----	E141	1	%	100 %	92.5	80.0	120	----
Saturated Paste Extractables (QCLot: 992982)									
Chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	100 mg/L	101	80.0	120	----
Saturated Paste Extractables (QCLot: 992983)									
Sodium, soluble ion content	17341-25-2	E442	2	mg/L	50 mg/L	105	80.0	120	----
Metals (QCLot: 992978)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	99.2	80.0	120	----
Metals (QCLot: 992979)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	101	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	100.0	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	105	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	103	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	95.6	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	94.6	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	104	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	102	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	100	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	103	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	97.9	80.0	120	----



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Metals (QCLot: 992979) - continued</b>									
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	107	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	97.4	80.0	120	----
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	100	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	102	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	102	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	95.8	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	100	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	96.6	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	102	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	99.8	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	94.6	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	101	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	98.2	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	89.9	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	97.2	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	98.8	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	88.9	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	98.1	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	104	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	103	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	104	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	94.5	80.0	120	----
<b>Hydrocarbons (QCLot: 992976)</b>									
EPH (C10-C19)	----	E601A	200	mg/kg	1134.37 mg/kg	101	70.0	130	----
EPH (C19-C32)	----	E601A	200	mg/kg	575.98 mg/kg	95.0	70.0	130	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 992975)</b>									
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	108	60.0	130	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	108	60.0	130	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	111	60.0	130	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	110	60.0	130	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	98.5	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	105	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	102	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	115	60.0	130	----



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 992975) - continued									
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	105	60.0	130	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	106	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	111	60.0	130	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	109	60.0	130	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	110	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	108	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	113	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	109	60.0	130	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	111	50.0	130	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	112	60.0	130	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	109	60.0	130	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	106	60.0	130	----





Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: Soil/Solid

Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Hydrocarbons (QCLot: 992976)										
VA23B3174-003	TH23-08A	EPH (C10-C19)	----	E601A	980 mg/kg	1134.37 mg/kg	99.1	60.0	140	----
		EPH (C19-C32)	----	E601A	470 mg/kg	575.98 mg/kg	93.3	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 992975)										
VA23B3174-003	TH23-08A	Acenaphthene	83-32-9	E641A-L	0.448 mg/kg	0.5 mg/kg	103	50.0	140	----
		Acenaphthylene	208-96-8	E641A-L	0.444 mg/kg	0.5 mg/kg	102	50.0	140	----
		Acridine	260-94-6	E641A-L	0.457 mg/kg	0.5 mg/kg	105	50.0	140	----
		Anthracene	120-12-7	E641A-L	0.454 mg/kg	0.5 mg/kg	105	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A-L	0.404 mg/kg	0.5 mg/kg	93.1	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.426 mg/kg	0.5 mg/kg	98.3	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.413 mg/kg	0.5 mg/kg	95.4	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.459 mg/kg	0.5 mg/kg	106	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.433 mg/kg	0.5 mg/kg	100.0	50.0	140	----
		Chrysene	218-01-9	E641A-L	0.439 mg/kg	0.5 mg/kg	101	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.442 mg/kg	0.5 mg/kg	102	50.0	140	----
		Fluoranthene	206-44-0	E641A-L	0.447 mg/kg	0.5 mg/kg	103	50.0	140	----
		Fluorene	86-73-7	E641A-L	0.451 mg/kg	0.5 mg/kg	104	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.434 mg/kg	0.5 mg/kg	100	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.461 mg/kg	0.5 mg/kg	106	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.448 mg/kg	0.5 mg/kg	103	50.0	140	----
		Naphthalene	91-20-3	E641A-L	0.457 mg/kg	0.5 mg/kg	105	50.0	140	----
		Phenanthrene	85-01-8	E641A-L	0.458 mg/kg	0.5 mg/kg	106	50.0	140	----
		Pyrene	129-00-0	E641A-L	0.444 mg/kg	0.5 mg/kg	102	50.0	140	----
		Quinoline	91-22-5	E641A-L	0.436 mg/kg	0.5 mg/kg	100	50.0	140	----



## Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

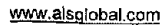
Sub-Matrix:

					Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method					
Saturated Paste Extractables (QCLot: 1001664)									
	RM	Chloride, soluble ion content	16887-00-6	E239.Cl	1237 mg/L	90.4	70.0	130	----
Saturated Paste Extractables (QCLot: 1001665)									
	RM	% Saturation	----	E141	48.3 %	97.6	70.0	130	----
Saturated Paste Extractables (QCLot: 1001666)									
	RM	Sodium, soluble ion content	17341-25-2	E442	330 mg/L	97.9	70.0	130	----
Saturated Paste Extractables (QCLot: 992981)									
	RM	% Saturation	----	E141	48.3 %	101	70.0	130	----
Saturated Paste Extractables (QCLot: 992982)									
	RM	Chloride, soluble ion content	16887-00-6	E239.Cl	1237 mg/L	90.2	70.0	130	----
Saturated Paste Extractables (QCLot: 992983)									
	RM	Sodium, soluble ion content	17341-25-2	E442	330 mg/L	88.0	70.0	130	----
Metals (QCLot: 992978)									
	SCP SS-2	Mercury	7439-97-6	E510	0.059 mg/kg	99.0	70.0	130	----
Metals (QCLot: 992979)									
	SCP SS-2	Aluminum	7429-90-5	E440	9817 mg/kg	105	70.0	130	----
	SCP SS-2	Antimony	7440-36-0	E440	3.99 mg/kg	96.3	70.0	130	----
	SCP SS-2	Arsenic	7440-38-2	E440	3.73 mg/kg	99.3	70.0	130	----
	SCP SS-2	Barium	7440-39-3	E440	105 mg/kg	100.0	70.0	130	----
	SCP SS-2	Beryllium	7440-41-7	E440	0.349 mg/kg	107	70.0	130	----
	SCP SS-2	Boron	7440-42-8	E440	8.5 mg/kg	124	40.0	160	----
	SCP SS-2	Cadmium	7440-43-9	E440	0.91 mg/kg	108	70.0	130	----
	SCP SS-2	Calcium	7440-70-2	E440	31082 mg/kg	103	70.0	130	----
	SCP SS-2	Chromium	7440-47-3	E440	101 mg/kg	113	70.0	130	----
	SCP SS-2	Cobalt	7440-48-4	E440	6.9 mg/kg	103	70.0	130	----
	SCP SS-2	Copper	7440-50-8	E440	123 mg/kg	94.2	70.0	130	----
	SCP SS-2	Iron	7439-89-6	E440	23558 mg/kg	104	70.0	130	----
	SCP SS-2	Lead	7439-92-1	E440	267 mg/kg	94.8	70.0	130	----
	SCP SS-2	Lithium	7439-93-2	E440	9.5 mg/kg	99.7	70.0	130	----



Sub-Matrix:

					Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method					
Metals (QCLot: 992979) - continued									
	SCP SS-2	Magnesium	7439-95-4	E440	5509 mg/kg	102	70.0	130	----
	SCP SS-2	Manganese	7439-96-5	E440	269 mg/kg	108	70.0	130	----
	SCP SS-2	Molybdenum	7439-98-7	E440	1.03 mg/kg	89.0	70.0	130	----
	SCP SS-2	Nickel	7440-02-0	E440	26.7 mg/kg	99.1	70.0	130	----
	SCP SS-2	Phosphorus	7723-14-0	E440	752 mg/kg	84.1	70.0	130	----
	SCP SS-2	Potassium	7440-09-7	E440	1587 mg/kg	114	70.0	130	----
	SCP SS-2	Sodium	7440-23-5	E440	797 mg/kg	98.5	70.0	130	----
	SCP SS-2	Strontium	7440-24-6	E440	86.1 mg/kg	96.7	70.0	130	----
	SCP SS-2	Thallium	7440-28-0	E440	0.0786 mg/kg	93.4	40.0	160	----
	SCP SS-2	Tin	7440-31-5	E440	10.6 mg/kg	89.1	70.0	130	----
	SCP SS-2	Titanium	7440-32-6	E440	839 mg/kg	105	70.0	130	----
	SCP SS-2	Uranium	7440-61-1	E440	0.52 mg/kg	102	70.0	130	----
	SCP SS-2	Vanadium	7440-62-2	E440	32.7 mg/kg	105	70.0	130	----
	SCP SS-2	Zinc	7440-66-6	E440	297 mg/kg	99.7	70.0	130	----
	SCP SS-2	Zirconium	7440-67-7	E440	5.73 mg/kg	90.2	70.0	130	----



COC Number: **21 -**

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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

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