AEC 21

AEC 21: Upper Scrap Areas (Former Boneyard)

Area Description		
Location	Southwest and upslope of Mill Building.	
Topography	Generally flat on surface with a slight slope to northeast. Steep decline from northeast boundary of AEC towards Mill Building.	
Surface Drainage	Northeast	
Background	Used historically for storage and/or disposal of mining heavy equipment and as a staging area for general solid waste. Waste material included machinery, engines, steel, drums, tires, insulation, asphalt with oxidized gravel, and hoses. Mine ore, and lesser waste rock, is currently stockpiled on portions of AEC.	
Historical Assessment Information		
Phase II Environmental Site Assessment (EBA, 2008)	Number of surface soil samples:	6
	Number of soil samples analyzed for metals:	6
	Number of soil samples analyzed for petroleum hydrocarbons:	6
	Number of soil samples with metal impacts:	6
	Number of soil samples with petroleum hydrocarbons impacts:	3
Comments: Two distinct occurrences of near-surface stained soil within Upper Scrap Area contained CWS fractions F2 and F3 concentrations that exceeded NWT IL criteria. EBA inferred that contaminated soil occurrence was continuous at depth. Identified soil contamination was not delineated. EBA inferred that identified soil contamination occurred above a depth of approximately 1.0 m. Soil contained concentrations of one or more of arsenic, copper, selenium, and zinc that exceed NWT IL criteria. Except for selenium in some soil, soil does not contain metals concentrations that exceed their estimated local background concentrations.		
2017/2018 Environmental Site Assessment Details		
Environmental Site Assessment Scope		
Utility Locate SOP followed?		Yes
EM 31 Geophysics Completed?		Yes
Number of test pits advanced		8 (2017), 3 (2018)
Number of boreholes advanced		0
Number of hand auger locations advanced		0
Number of soil samples submitted for laboratory chemical analysis		9 (2017), 6 (2018)
Number of rock samples collected for acid-rock drainage and metal leaching		3 (2017)
Number of rock samples submitted for acid-base accounting analysis		3 (2017)
Number of boreholes completed as groundwater monitoring wells		0
Number of historical groundwater monitoring wells		0
Number of groundwater samples collected		N/A
Number of sediment and surface soil samples collected		N/A
Geophysics (EM 31 Apparent Terrain Conductivity) Findings		
▪ As indicated on Figure A21-3 survey was completed along upper scrap areas and former Boneyard. ▪ Background apparent terrain conductivity values for area are generally between 5 to 20 mS/m. These values are represented by cool colours shown on figure. ▪ Areas of higher than background apparent terrain conductivity values are observed and are indicated by hot colours shown on figure. ▪ Areas with negative (pink) apparent terrain conductivity values are likely caused from a metallic response. ▪ An area of negative apparent terrain conductivities is located in western area (West end of Coarse Ore Stockpile Area) near Test Pit 17A21TP8. Surface metal was not observed, suggesting potential buried metals in that area.		

AEC 21: Upper Scrap Areas (Former Boneyard)

Soil Investigation and Conditions			
Maximum Depth of Investigation	3.0 mbgs (September 21, 2017)		
General Stratigraphy			
Description	**Depth from (mbgs)**	**Depth to (mbgs)**	**Observations**
Various intervals of silt, sand, gravel and cobbles	0	3.0	Fill soil. Buried organics, metal debris, and wood debris observed in several test pits. Slight hydrocarbon odour observed at 18A21TP9.
Combustible Vapour Concentrations (CVCs)			
All CVCs were less than 10 parts per million by volume (ppmv).			
Groundwater Conditions			
Depth to Groundwater	Inferred depth to groundwater based on estimated groundwater contours is approximately 18 m		
Free Product Thickness (if present)	N/A		

2017/2018 Environmental Site Assessment Results Summary

- Figure A21-1 shows test pit locations.
- Figure A21-3 provides results of geophysical assessment.
- Table A21-1 summarizes soil chemical results relative to guidelines and management limits.

General Site Observations

- Tetra Tech did not show historical sampling locations on Figure A21-1 because we consider that sampling locations shown on Figure 12 in EBA (2009) may be inaccurate.
- No spent equipment or debris was observed.
- Mine Ore stockpiles were observed on southwest and northeast portions of AEC. Majority of ore stockpiles are located between sample locations 17A21-02 and 17A21-03.
- Main body of ore stockpile volume estimated as 8,000 m^3 (100mx20mx4m). Additional coarse ore stockpile across road with estimated volume of 6,000 m^3 (50 m x 30 m x 4 m).
- Ore stockpile material is composed of a mix of low to high grade ore material and lesser amounts of variably mineralized waste rock. Majority of material is sulphide and metal-rich pyrrhotite skarn and Swiss cheese limestone with high potential for acid generation and metal leaching.
- Test pit excavations intercepted soils (sand and gravels) with orange-red oxidation coating from leachate of overlying rock. Elevated metals in soil beneath stockpile is believed to be partially a result of metal leachate infiltration from overlying material.
- Buried debris including metal and wood was observed in several test pits advanced. Soil with a slight hydrocarbon odour was observed at test pit 18A21TP9 from 0.9 to 1.0 mbgs.

Soil: Petroleum Hydrocarbons (PHC)

2017

- Laboratory results all less than the CCME/CSR guidelines with exception of:
  - Sample 17A21TP4-2 at a depth of 1.0 mbgs contained PHCs greater than the CCME/CSR guidelines. This soil sample also exceeded the management limits for PHC F3.
  - Sample 17A21TP5-3 at a depth of 1.6 mbgs contained PHCs greater than the CCME/CSR guidelines.

2018

- Three test pits (18A21TP9, 18A21TP10 and 18A21TP11) were excavated at 3 m to 5 m step-out distances from 17A21TP4 to the east, northwest and southwest, respectively, to delineate the PHC management limit exceedance found at 1.0 mbgs. Laboratory results from the two soil samples tested for PHCs F2-F4 at each of the three test pit locations were less than the management limits.

AEC 21: Upper Scrap Areas (Former Boneyard)

Soil: Metals

- Various metal concentrations exceeded CCME CEQG including arsenic, barium, cadmium, copper, nickel, selenium, tin, and zinc.
- With the exception of copper (no background yet established), most metals concentrations were below the preliminary background concentrations. The following metals exceeded proposed preliminary background concentrations:
  - Arsenic (17A21TP5 at 1.6 mbgs).
  - Cadmium (17A21TP6 at 0.25 mbgs and 17A21TP7 at 1.0 mbg).
  - Selenium (17A21TP4 at 1.0 mbg, 17A21TP6 at 0.25 mbg, and 17A21TP7 at 1.0 mbg).
  - Zinc (17A21TP6 at 0.25 mbg and 17A21TP7 at 1.0 mbg).

Soil: Other PCOCs (Glycols, VOCs, PAHs, PCBs)

- Laboratory chemical results less than detection limits and guidelines with exception of:
  - Detection limits for PCBs in sample 17A21TP6-1 were greater than guidelines due to matrix interferences.
  - Detection limits for PAHs in sample 17A21TP4-2 were greater than guidelines due to elevated PHCs.

Soil: Routine (pH)

- Laboratory results within guidelines.

Rock: Acid Rock Drainage (see Geochemistry Report, Tetra Tech, 2019g)

Groundwater: Petroleum Hydrocarbons

N/A

Groundwater: Metals/Routine Parameters

N/A

Groundwater: Other PCOCs

N/A

Sediment: Petroleum Hydrocarbons

N/A

Sediment: Metals

N/A

Sediment: Other PCOCs

N/A

Surface Water: Petroleum Hydrocarbons

N/A

Surface Water: Metals/Nutrients

N/A

Surface Water: Other PCOCs

N/A

Grainsize Analysis

- Soil sample 17A21TP2-2 at a depth of 1.0 mbgs classified as coarse-grained (69% >75 µm).
- Soil sample 17A21TP5-3 at a depth of 1.6 mbgs classified as coarse-grained (77% >75 µm).
- Soil sample 17A21TP8-1 at a depth of 0.25 mbgs classified as coarse-grained (69% >75 µm).

Environmental Concerns

Location in AEC	Potential Source(s)	Identified Contaminated Media	Parameters Assessed and Contaminant(s) of Concern (COCs; bold & underline)
Surface of whole area	Leaks, spills from spent equipment storage, scrap metal oxidation and leaching	Soil	**Soil:** Cyanide, **metals, petroleum hydrocarbons (PHCs)**, glycols, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs)

AEC 21: Upper Scrap Areas (Former Boneyard)

Mine ore stockpiles	Oxidation of and metal leaching from sulphide-rich and metal-rich mine ore and waste rock	Rock	**ARD/ML**

Discussion (Significance of the Results)

Soils:

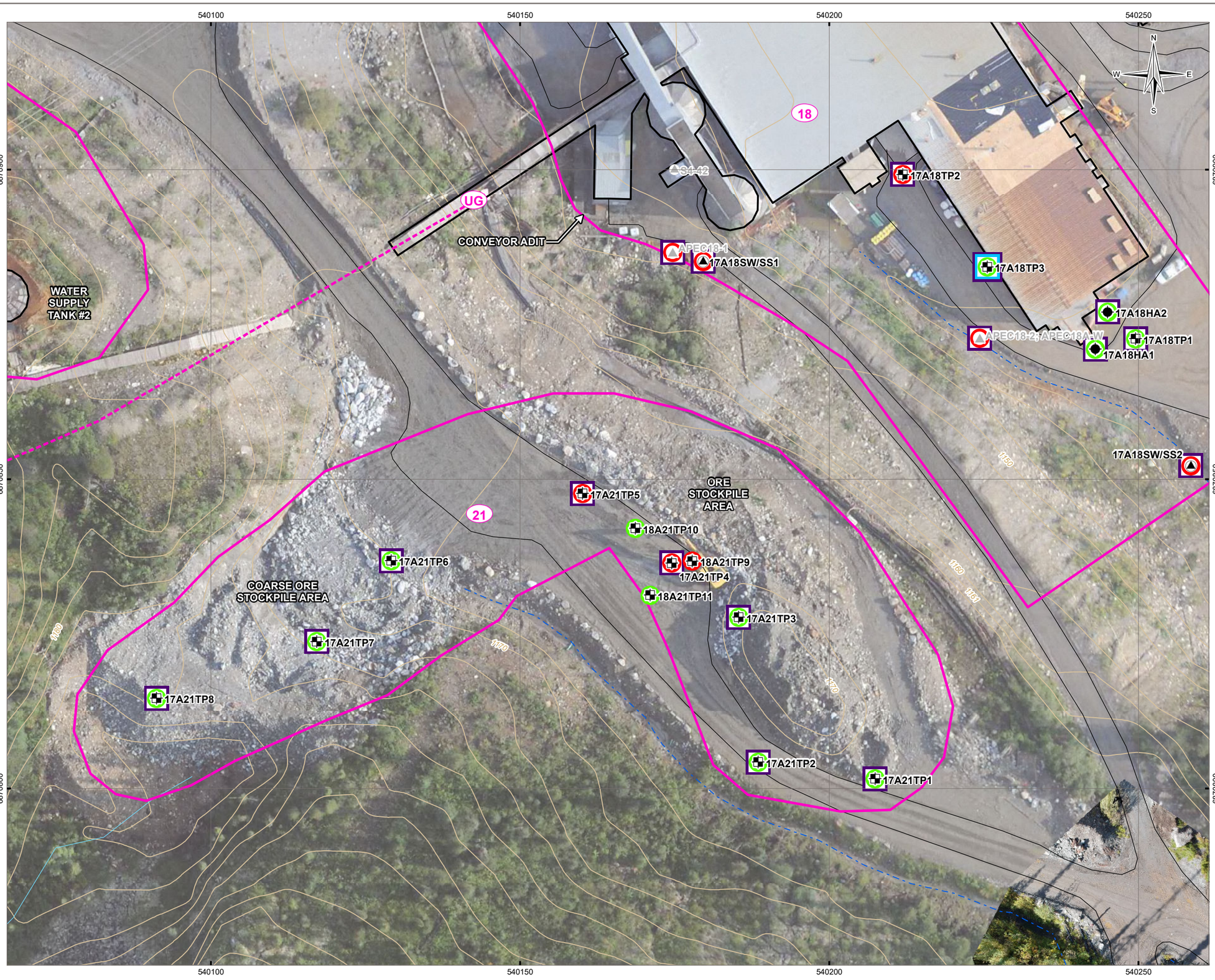
- PHC impacts in soil exceeding the management limits have been horizontally delineated. The estimated depth of PHC impacts greater than the management limits used to calculate the contaminated soil volume is 1.0 mbgs.
- There was no obvious point source of environmental impacts observed on site which suggests that PHC affected area is likely a result of buried debris-containing fill soil that was historically impacted from spent equipment storage.
- Glycols, PCBs, PAHs and VOCs were not detected and are no longer considered PCOCs in soil at this AEC.
- Based on PAHs and PCBs results from other samples submitted for analysis (i.e., less than detection limit and less than guideline), elevated detection limit for PCBs in sample 17A21TP6-1 and PAHs in sample 17A21TP4-2 is not considered a concern.
- Samples from coarse ore stockpile (17A21TP6 and 17A21TP7) generally contained highest metal concentrations and most exceedances of proposed background concentrations.
- Samples from 17A21TP1 and 17A21TP2 collected at southern edge of AEC 21 had lowest metals concentrations.
- High metals concentrations appear to be related to stockpiled mine rock material.

Rock:

- Historical data is available for ore and waste rock lithologies, and this information was considered and relied upon in analysis and assessment.
- For ARD/ML discussion, see geochemistry report (Tetra Tech, 2020e)

Attachments

Figure A21-1 – Soil and Sediment Results
Figure A21-2 – Groundwater and Surface Water Results
Figure A21-3 – EM31 Apparent Terrain Conductivity Survey
Figure A21-4 – Acid Rock Drainage Results
Table A21-1 – Soil Analytical Results
Test pit Logs
Photographs

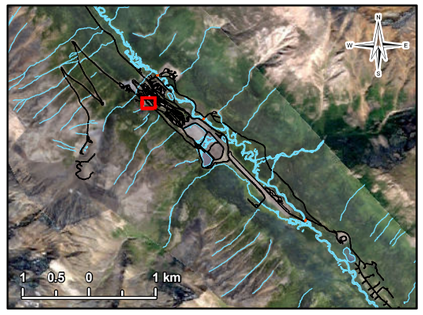


LEGEND

- Area of Environmental Concern (AEC)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- 2017 Surface Water/Sediment Sample (SW/SS)
- Historical Shallow Soil Sample
- Historical Surface Water Sample

Soil/Sediment Analytical Results

- PHC Impacts
- No PHC Impact
- Metals exceedance of preliminary background concentrations, or in the absence of background concentrations, exceedance of CCME guidelines
- Metals exceedance, vertically delineated
- Building
- Road
- Ditch
- Watercourse
- Contour (2 m)



NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 21
Former Upper Scrap Areas
Soil and Sediment Results

PROJECTION UTM Zone 9	**DATUM** NAD83			**CLIENT** NORTH AMERICAN TUNGSTEN CORPORATION LTD
Scale: 1:600 (10 5 0 10 Metres)				TETRA TECH
FILE NO. WENW03039-03_Summary_A21-1.mxd				
OFFICE Tt-VANC	**DWN** SL	**CKD** BB	**APVD** BB	**REV** 0
DATE June 23, 2020	**PROJECT NO.** ENW.WENW03039-03			**A21-1**

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FIGWQG	Federal Interim Groundwater Quality Guidelines
CCME	Canadian Council of Ministers of the Environment
WQG	Water Quality Guidelines
AW	Freshwater Aquatic Life
EQGASW	Environmental Quality Guidelines for Alberta Surface Waters

LEGEND

- Area of Environmental Concern (AEC)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- 2017 Surface Water/Sediment Sample (SW/SS)
- Historical Shallow Soil Sample
- Historical Surface Water Sample
- Inferred Groundwater Flow Direction
- Groundwater Contour (5 m asl; Fall 2017)

2017/2018 Groundwater Analytical Results

- Samples contain parameters that exceeded the preliminary background concentrations, or in the absence of background concentrations, FIGWQG

2017 Surface Water Analytical Results

- Samples contain parameters that met the Flat River WQOs, or in the absence of WQOs, CCME WQG for the protection of AW or EQGASW
- Building
- Road
- Ditch
- Watercourse
- Contour (2 m)

NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 21
Former Upper Scrap Areas
Groundwater and Surface Water Results

PROJECTION: UTM Zone 9	DATUM: NAD83	CLIENT: NORTH AMERICAN TUNGSTEN CORPORATION LTD	
Scale: 1:600 (10 5 0 10 Metres)		TETRA TECH	
FILE NO.: WENW03039-03_Summary_A21-2.mxd			
OFFICE: Tt-VANC	DWN: SL / CKD: BB / APVD: SS / REV: 0		A21-2
DATE: June 23, 2020	PROJECT NO.: ENW.WENW03039-03		

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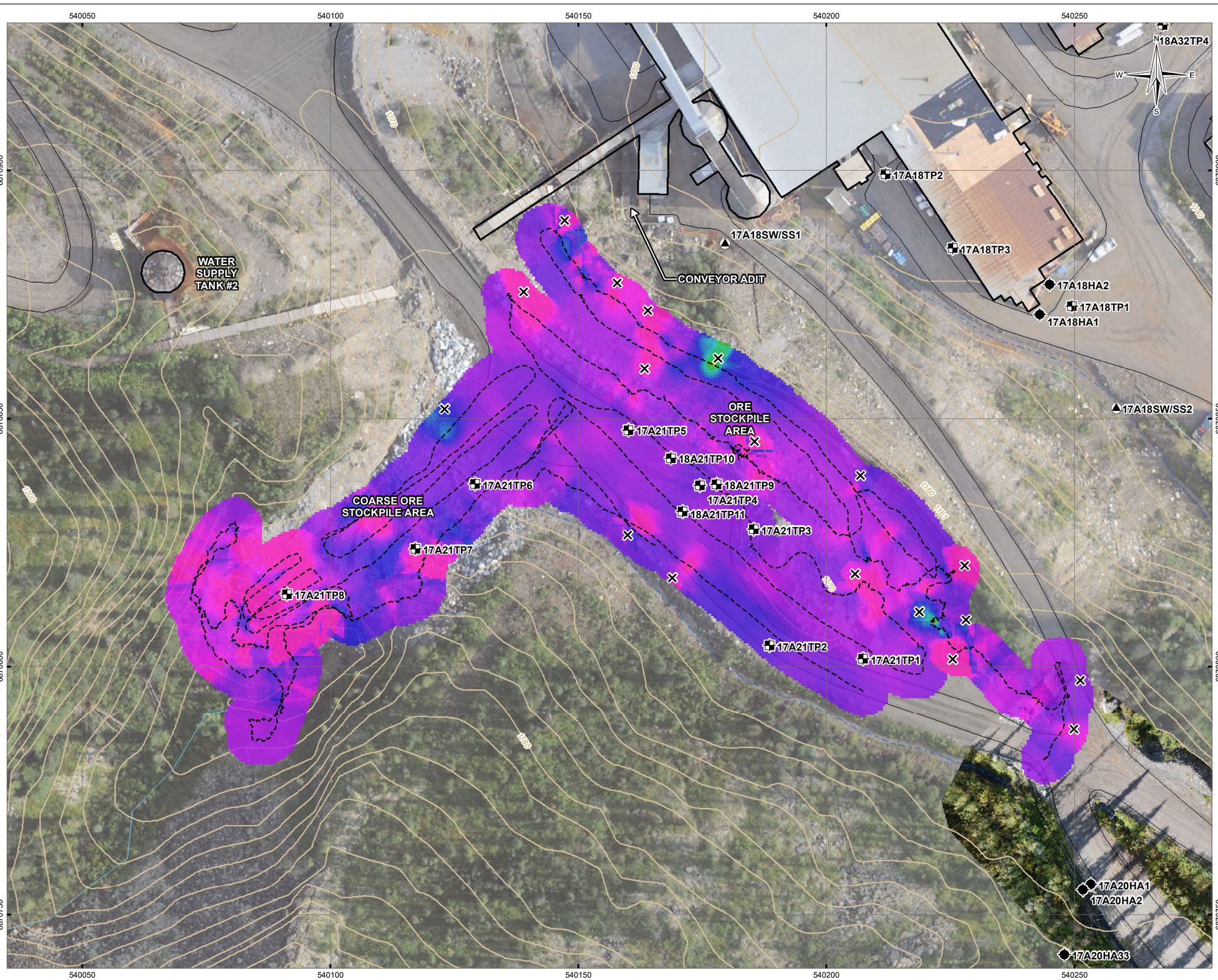

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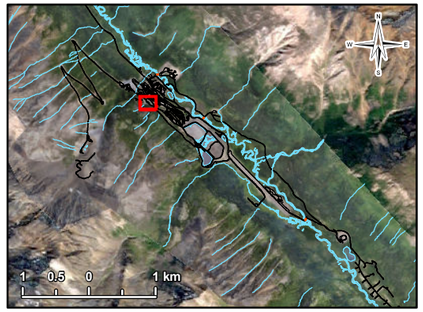
LEGEND

- Survey Track
- Surface Metal
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- 2017 Surface Water/Sediment Sample (SW/SS)
- Building
- Road
- Ditch
- Watercourse
- Contour (2 m)

Apparent Terrain Conductivity (mS/m)

500
200
150
100
50
0



NOTES

All locations and area boundaries are approximate.
Negative apparent terrain conductivity values likely due to metal response.
EM31 S/N: 8411031 | Data collected: September 7 & 9, 2017.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 21
Former Upper Scrap Areas
EM31 Apparent Terrain Conductivity Survey

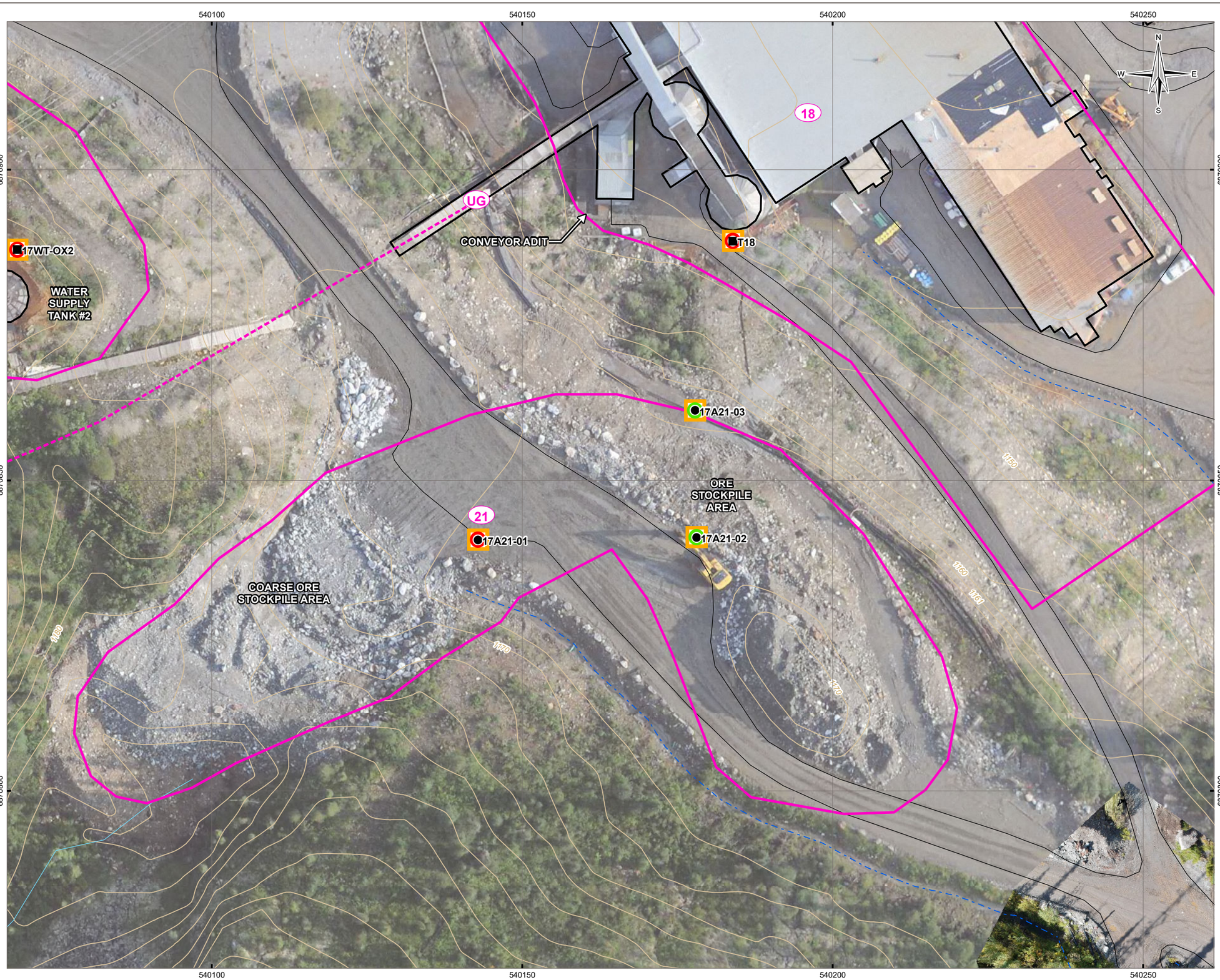
PROJECTION	DATUM	CLIENT
UTM Zone 9	NAD83	NORTH AMERICAN TUNGSTEN CORPORATION LTD

Scale: 1:750
10 5 0 10
Metres

TETRA TECH

FILE NO.				
WENW03039-03_Summary_A21-3.mxd				
OFFICE	**DWN**	**CKD**	**APVD**	**REV**
Tt-VANC	SL	DSM	SS	0
DATE	**PROJECT NO.**			
June 23, 2020	ENW.WENW03039-03			

A21-3



LEGEND

- Area of Environmental Concern (AEC)
- 2017 Rock Sample for ARD/ML
- 2017 Tailings Sample for ARD/ML

Acid Rock Drainage (ARD) Analytical Results

- Paste pH <7
- Paste pH >7
- Potentially Acid Generating (PAG)/Uncertain
- Building
- Road
- Ditch
- Watercourse
- Contour (2 m)

NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 21
Former Upper Scrap Areas
Acid Rock Drainage Results

PROJECTION UTM Zone 9	**DATUM** NAD83			**CLIENT** NORTH AMERICAN TUNGSTEN CORPORATION LTD
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DATE June 23, 2020	**PROJECT NO.** ENW.WENW03039-03			**A21-4**

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Table A21-1: Soil Analytical Results

				AEC	AEC 21														
				Location	TP1	TP2		TP3	TP4	TP5	TP6	TP7	TP8	TP9-2	TP9-3	TP10-2	TP10-3	TP11-2	TP11-3
				Sample Depth	1.0 m	1.0 m	2.7 m	1.0 m	1.0 m	1.6 m	0.25 m	1.0 m	0.25 m	0.5 m	1.0 m	0.5 m	1.0 m	0.5 m	1.0 m
				Field ID	17A21TP1-2	17A21TP2-2	17A21TP2-4	17A21TP3-2	17A21TP4-2	17A21TP5-3	17A21TP6-1	17A21TP7-2	17A21TP8-1	18A21TP9-2	18A21TP9-3	18A21TP10-2	18A21TP10-3	18A21TP11-2	18A21TP11-3
				Sample Date	20-Sep-2017	20-Sep-2017	20-Sep-2017	20-Sep-2017	20-Sep-2017	21-Sep-2017	21-Sep-2017	21-Sep-2017	21-Sep-2017	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018
				Laboratory Report Number	8762356	8762362	8762367	8762371	8762373	8757653	8757654	8757660	8757663	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306
				Laboratory Sample ID	17Y265105	17Y265105	17Y265105	17Y265105	17Y265105	17Y264579	17Y264579	17Y264579	17Y264579	9372335	9372336	9372338	9372340	9372342	9372343
Parameter	**Unit**	**CCME[1,2] and NWT CSR[3]**	**Background Concentration[4]**	**Management Limits[5]**															
Physical Parameters																			
pH	pH Units	6-8	-	-	7.6	7.92	6.72	7.44	7.41	7.6	7.75	7.11	7.21	-	-	-	-	-	-
Moisture	%	-	-	-	5.58	5.47	32	7.92	7.35	8.61	6.09	18.2	17	2.4	5.2	5.2	3.9	7.7	3.9
Carbon																			
Carbon	%	-	-	-	0.28	-	-	1.29	-	-	-	-	-	-	-	-	-	-	-
Asbestos Fibres																			
Asbestos fibres	%	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide																			
Cyanide (SAD)	mg/kg	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (WAD)	mg/kg	0.9	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																			
Antimony	mg/kg	20	-	-	0.7	0.7	0.4	1.5	1.3	0.6	0.7	0.5	0.4	-	-	-	-	-	-
Arsenic	mg/kg	12	64	-	**19.8**	**23**	**54**	**20.9**	**22.1**	120	8.3	**42.7**	**14.9**	-	-	-	-	-	-
Barium	mg/kg	500	946	-	380	256	113	**787**	**877**	326	52.8	111	147	-	-	-	-	-	-
Beryllium	mg/kg	4	-	-	0.8	0.7	3	1.6	1.3	1.3	2.7	2.8	1.6	-	-	-	-	-	-
Cadmium	mg/kg	1.4	2.8	-	0.72	1.14	0.48	**2.08**	**2.46**	0.9	**15.5**	**8.02**	0.8	-	-	-	-	-	-
Chromium	mg/kg	64	-	-	21	19	38	20	20	22	8	32	24	-	-	-	-	-	-
Cobalt	mg/kg	40	-	-	10.5	11.3	34.2	14.3	17.3	16.2	23.2	32.2	18.5	-	-	-	-	-	-
Copper	mg/kg	63	-	-	**198**	58	**128**	**393**	**642**	**242**	**1120**	**435**	**455**	-	-	-	-	-	-
Lead	mg/kg	70	-	-	14.1	10.5	25.7	20	23.4	11.9	15.8	22.5	12.1	-	-	-	-	-	-
Mercury	mg/kg	6.6	-	-	<0.01	0.18	0.07	0.21	0.03	0.7	0.39	1.48	1.68	-	-	-	-	-	-
Molybdenum	mg/kg	5	10	-	1.4	1.2	3.2	4.4	3.3	2.1	3.3	3.2	1.5	-	-	-	-	-	-
Nickel	mg/kg	45	72	-	24	24.8	**59.9**	29.3	28	28	9.3	**52.3**	25.9	-	-	-	-	-	-
Selenium	mg/kg	1	1.7	-	**1.2**	0.9	**1.1**	**1.6**	**1.9**	**1.3**	**4**	**2.2**	**1.3**	-	-	-	-	-	-
Silver	mg/kg	20	-	-	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	1.3	<0.5	<0.5	-	-	-	-	-	-
Thallium	mg/kg	1	-	-	0.3	0.2	0.4	0.4	0.4	0.3	0.8	0.5	0.4	-	-	-	-	-	-
Tin	mg/kg	5	-	-	1	0.8	2.1	3.4	2.8	3.1	**8.5**	3.2	1.7	-	-	-	-	-	-
Uranium	mg/kg	23	-	-	1.2	1.1	12.8	2.1	2.7	1.8	3.3	5.6	1.7	-	-	-	-	-	-
Vanadium	mg/kg	130	160	-	37	38	47	46	40	30	22	39	30	-	-	-	-	-	-
Zinc	mg/kg	200	462	-	97	129	179	**222**	**273**	127	**1370**	**629**	120	-	-	-	-	-	-
Particle Size																			
>75 µm	%	-	-	-	-	69	-	-	-	77	-	-	69	-	-	-	-	-	-
Grain Size	N/A	-	-	-	-	Coarse	-	-	-	Coarse	-	-	Coarse	-	-	-	-	-	-
Petroleum Hydrocarbons																			
Benzene	mg/kg	0.03	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-
Toluene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.082	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-	-
Xylene (m)	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-
Xylene (o)	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-
Xylenes Total	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
F1 (C_6-C_{10})	mg/kg	30	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
F1 (C_6-C_{10}) - BTEX	mg/kg	30	-	700	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
F2 (C_{10}-C^{16})	mg/kg	150	-	1000	<20	<20	<20	<20	38	72	26	33	<20	<20	**206**	<20	<20	<20	<20
F3 (C_{16}-C_{34})	mg/kg	300	-	2500	<20	<20	27	266	**3520**	**600**	122	87	<20	54	**355**	241	101	87	260
F4 (C_{34}-C_{50})	mg/kg	2800	-	10,000	<20	<20	<20	98	2010	222	62	59	34	76	64	85	55	36	59
Glycols																			
Diethylene glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
Ethylene glycol	mg/kg	960	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
Propylene glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
Tetraethylene Glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
Triethylene Glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008), for coarse textured soils under Agricultural and Residential/Parkland soils

[2] Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 1999), for coarse textured soils under Agricultural and Residential/Parkland soils

[3] Northwest Territories Environmental Guideline for Contaminated Site Remediation (NWT CSR 2003), for coarse textured soils under Agricultural and Residential/Parkland land use

[4] Preliminary Background Concentration

[5] Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil Technical Supplement, for coarse textured soil under Agricultural land use, management limit pathway only

BOLD - Exceeds most stringent CCME or NWT CSR standard/guideline

Red - Exceeds Preliminary Background Concentration

Shaded - Exceeds Management Limits

Italic - Laboratory detection limit is greater than one or more referenced guidelines

"-" Not analyzed or no applicable standard/guideline

TETRA TECH

Table A21-1: Soil Analytical Results

				AEC	AEC 21														
				Location	TP1	TP2		TP3	TP4	TP5	TP6	TP7	TP8	TP9-2	TP9-3	TP10-2	TP10-3	TP11-2	TP11-3
				Sample Depth	1.0 m	1.0 m	2.7 m	1.0 m	1.0 m	1.6 m	0.25 m	1.0 m	0.25 m	0.5 m	1.0 m	0.5 m	1.0 m	0.5 m	1.0 m
				Field ID	17A21TP1-2	17A21TP2-2	17A21TP2-4	17A21TP3-2	17A21TP4-2	17A21TP5-3	17A21TP6-1	17A21TP7-2	17A21TP8-1	18A21TP9-2	18A21TP9-3	18A21TP10-2	18A21TP10-3	18A21TP11-2	18A21TP11-3
				Sample Date	20-Sep-2017	20-Sep-2017	20-Sep-2017	20-Sep-2017	20-Sep-2017	21-Sep-2017	21-Sep-2017	21-Sep-2017	21-Sep-2017	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018
				Laboratory Report Number	8762356	8762362	8762367	8762371	8762373	8757653	8757654	8757660	8757663	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306
				Laboratory Sample ID	17Y265105	17Y265105	17Y265105	17Y265105	17Y265105	17Y264579	17Y264579	17Y264579	17Y264579	9372335	9372336	9372338	9372340	9372342	9372343
Parameter	**Unit**	**CCME[1,2] and NWT CSR[3]**	**Background Concentration[4]**	**Management Limits[5]**															
Polycyclic Aromatic Hydrocarbons (PAHs)																			
B(a)P Total Potency Equivalent	mg/kg	0.6	-	-	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
IACR (CCME)	mg/kg	1	-	-	<0.6	<0.6	<0.6	<0.6	*<6*	<0.6	<0.6	<0.6	<0.6	-	-	-	-	-	-
Acenaphthene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-
Anthracene	mg/kg	2.5	-	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	-	-	-	-	-	-
Benz(a)anthracene	mg/kg	0.1	-	-	<0.03	<0.03	<0.03	<0.03	*<0.3*	<0.03	<0.03	<0.03	<0.03	-	-	-	-	-	-
Benzo(a) pyrene	mg/kg	0.1	-	-	<0.03	<0.03	<0.03	<0.03	*<0.3*	<0.03	<0.03	<0.03	<0.03	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	*<0.5*	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Benzo(b+j)fluoranthene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Benzo(e)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Benzo(j)fluoranthene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	*<0.5*	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Chrysene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	-	-	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-
Fluoranthene	mg/kg	50	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-	-
Fluorene	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	-	-	<0.02	<0.02	<0.02	<0.02	*<0.2*	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-
Naphthalene	mg/kg	0.013	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-
Phenanthrene	mg/kg	0.046	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-
Pyrene	mg/kg	0.1	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-	-
Quinoline	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls (PCBs)																			
Aroclor 1242	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<5	<0.05	<0.05	-	-	-	-	-	-
Aroclor 1254	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<5	<0.05	<0.05	-	-	-	-	-	-
Aroclor 1260	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<5	<0.05	<0.05	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.5	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*<5*	<0.05	<0.05	-	-	-	-	-	-
Volatile Organic Compounds (VOCs)																			
Acetone	mg/kg	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
Bromodichloromethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Bromoform	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Bromomethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
2-Butanone	mg/kg	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.1	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Chloroethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Chloroform	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Chloromethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Dibromochloromethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,2-Dibromoethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,1-Dichloroethane	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,2-Dichloroethane	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,1-Dichloroethene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,2-Dichloroethene (cis)	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,2-Dichloroethene (trans)	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,2-Dichloropropane	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,3-Dichloropropene [cis]	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,3-Dichloropropene [trans]	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Methyl t-Butyl Ether (MTBE)	mg/kg	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
Methylene Chloride	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
Styrene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Tetrachloroethene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Trichloroethene	mg/kg	0.1	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
Vinyl chloride	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-

Notes:

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BOLD - Exceeds most stringent CCME or NWT CSR standard/guideline

Red - Exceeds Preliminary Background Concentration

Shaded - Exceeds Management Limits

Italic - Laboratory detection limit is greater than one or more referenced guidelines

"-" Not analyzed or no applicable standard/guideline

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP1**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1166.548 m
Tungsten, Northwest Territories	UTM: 540207.421 E; 6870801.56 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND (FILL) - gravelly, some silt, trace cobbles, damp, dense, grey brown, (100 mm thick)						1166
		GRAVEL (FILL) - some cobbles, some sand, trace boulders, damp, dense, reddish brown, wood debris, angular gravel, (300 mm thick)		1-1				
		COBBLES (FILL) - gravelly, some sand to sandy, trace to some boulders, damp, grey brown, wood debris, angular cobbles						
1				1-2				1165
				1-3				
		END OF TESTPIT (1.7 metres) Note: Stopped due to refusal Backfilled at completion						
2								1164
3								1163
4								1162
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.7 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 20
Logged By: NH	Completion Date: 2017 September 20
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP2**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1167.309 m
Tungsten, Northwest Territories	UTM: 540188.521 E; 6870804.266 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	GRAVEL (FILL) - sandy, some silt, some cobbles, damp, dense, brown		2-1				1167
		COBBLES (FILL) - silty, some gravel, trace to some boulders, damp, dense, brown, wood debris						
1				2-2		31% particles <75 µm (ie. smaller than sand particle)		1166
		SILT (FILL) - some sand, trace clay, organics, trace rootlets, damp, soft, dark brown		2-3				
2								1165
				2-4				
3		END OF TESTPIT (2.7 metres) Note: Backfilled at completion						1164
4								1163
5								

TETRA TECH

Contractor: NATC	Completion Depth: 2.7 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 20
Logged By: NH	Completion Date: 2017 September 20
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP3**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1167.017 m
Tungsten, Northwest Territories	UTM: 540185.357 E; 6870827.689 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								1167
	Excavated	SILT (FILL) - sandy, some gravel, some cobbles, damp, firm, brown, (150 mm thick)						
		GRAVEL (FILL) - sandy, some silt, some cobbles, trace to some boulders, damp, dense, brown, wood debris		3-1				
1				3-2				1166
		END OF TESTPIT (1.1 metres) Note: Stopped due to refusal Backfilled at completion						
2								1165
3								1164
4								1163
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.1 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 20
Logged By: NH	Completion Date: 2017 September 20
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP4**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1167.647 m
Tungsten, Northwest Territories	UTM: 540174.531 E; 6870836.478 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
	Excavated	GRAVEL (FILL) - sandy, some silt, some cobbles, damp, dense, brown, subangular gravel, (300 mm thick)		4-1				
		COBBLES (FILL) - some gravel, some sand, trace to some boulders, damp, dense, brown						1167
1				4-2				
				4-3				
		END OF TESTPIT (1.6 metres) Note: Stopped due to refusal Backfilled at completion						1166
2								
								1165
3								
								1164
4								
								1163
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.6 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 20
Logged By: NH	Completion Date: 2017 September 20
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP5**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1168.042 m
Tungsten, Northwest Territories	UTM: 540160.129 E; 6870847.705 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0		GRAVEL (FILL) - silty, sandy, some cobbles, trace to some boulders, trace silt, damp, dense, brown						1168
		- reddish brown		5-1				
	Excavated	- (COLLUVIUM), silty, some boulders, dark brown						
1				5-2				1167
				5-3		23% particles <75 µm (ie. smaller than sand particle)		
		END OF TESTPIT (1.6 metres) Note: Backfilled at completion						
2								1166
3								1165
4								1164
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.6 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 21
Logged By: NH	Completion Date: 2017 September 21
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP6**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1168.122 m
Tungsten, Northwest Territories	UTM: 540129.191 E; 6870836.819 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND (FILL) - some gravel, some silt, trace cobbles, damp, dense, grey, (100 mm thick)						1168
		GRAVEL (FILL) - some sand, some silt, trace cobbles, damp, dense, grey, angular gravel, (200 mm thick)		6-1				
		SAND (FILL) - silty, some gravel, trace cobbles, trace boulders, reddish brown						
1				6-2				1167
2				6-3				1166
				6-4				
		END OF TESTPIT (2.7 metres) Note: Backfilled at completion						
3								1165
4								1164
5								

TETRA TECH

Contractor: NATC	Completion Depth: 2.7 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 21
Logged By: NH	Completion Date: 2017 September 21
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP7**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1168.781 m
Tungsten, Northwest Territories	UTM: 540117.156 E; 6870823.775 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
	Excavated	COBBLES (FILL) - gravelly, some sand, some boulders, trace silt, damp, dense, grey, metal debris		7-1				
		SILT (FILL) - some sand, trace gravel, trace clay, damp to moist, firm, brown						1168
1				7-2				
								1167
2				7-3				
								1166
3		END OF TESTPIT (3.0 metres) Note: Backfilled at completion		7-4				
								1165
4								
								1164
5								

TETRA TECH

Contractor: NATC	Completion Depth: 3 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 21
Logged By: NH	Completion Date: 2017 September 21
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A21TP8**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1171.585 m
Tungsten, Northwest Territories	UTM: 540091.254 E; 6870814.587 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	COBBLES (FILL) - silty, sandy, some boulders, damp, loose, brown		8-1		31% particles <75 µm (ie. smaller than sand particle)		
		SAND (FILL) - gravelly, some cobbles, trace to some boulders, damp, firm, brown						1171
1				8-2				
		- some silt, some gravel, trace to some boulders, trace organics, trace rootlets						1170
2				8-3				
								1169
3		END OF TESTPIT (3.0 metres) Note: Backfilled at completion		8-4				
								1168
4								
								1167
5								

TETRA TECH

Contractor: NATC	Completion Depth: 3 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 21
Logged By: NH	Completion Date: 2017 September 21
Reviewed By: JW	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A21TP9**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1167.583 m
Cantung, Northwest Territories	UTM: 540177.864 E; 6870836.774 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL - cobbly, some sand, well graded, moist, brown, fine to coarse angular gravel and cobbles to 300 mm diameter		9-1			
0.2		- light brown to orange					1167.4
0.4				9-2			1167.2
0.6							1167.0
0.8							1166.8
		- slight hydrocarbon odour		9-3			
1.0		END OF TESTPIT (1.00 metre) Location: Ore stockpile, 3 m northeast of 17A21TP4 Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1166.6
1.2							1166.4
1.4							1166.2
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 27
Logged By: BB	Completion Date: 2018 June 27
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A21TP10**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1167.998 m
Cantung, Northwest Territories	UTM: 540168.664 E; 6870842.053 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL - cobbly, some sand, moist, brown, 100 mm thick rusty brown layers, fine to angular gravel and cobbles to 300 mm diameter		10-1			
0.2							1167.8
0.4				10-2			1167.6
0.6							1167.4
0.8							1167.2
				10-3			
1.0		END OF TESTPIT (1.00 metre) Location: Ore stockpile, northwest of 17A21TP4 Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1167.0
1.2							1166.8
1.4							1166.6
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 27
Logged By: BB	Completion Date: 2018 June 27
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A21TP11**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1167.9 m
Cantung, Northwest Territories	UTM: 540171.027 E; 6870831.245 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0	Excavated	GRAVEL - cobbly, some sand, well graded, moist, rusty brown to brown, fine to coarse angular gravel and cobbles to 300 mm diameter		11-1			1167.8
0.2							1167.6
0.4				11-2			1167.4
0.6							1167.2
0.8							1167.0
1.0				11-3			
		END OF TESTPIT (1.00 metre) Location: 5 m southwest of 17A21TP4 at ore stockpile Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1166.8
1.2							1166.6
1.4							
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 27
Logged By: BB	Completion Date: 2018 June 27
Reviewed By: SS	Page 1 of 1

Photo 1: Facing southeast towards upper scrap yard and former boneyard. (September 7, 2017)

Photo 2: Facing east towards upper scrap yard and former boneyard. Photo provided by NATC. (August 13, 2013)

Photo 3: Ore stockpile at road edge, facing southeast.
(September 29, 2017)

Photo 4: Close-up of ore stockpile material, facing southeast.
(September 29, 2017)

Photo 5: Ore stockpile dominated by skarnified swiss-cheese limestone including sulphide-rich pyrrhotite skarn. (September 29, 2017)

Photo 6: High sulphide content pyrrhotite skarn in ore stockpile. (September 29, 2017)

AEC 23

AEC 23: Fuel Transfer Area Beside Tank Farm

Area Description			
Location	Southwest of Mill Building and southeast of Active Tank Farm.		
Topography	Generally flat on surface with a slight slope to northeast. Steep decline at northeast boundary of area. Berm of Active Tank Farm (AEC 33) bounds northwest limit of AEC.		
Surface Drainage	Northeast		
Background	A fuel transfer shed is used to replenish diesel fuel tanks in Active Tank Farm (AEC 33) and distribute fuel from Active Tank Farm to remainder of mine. An apparent underground storage tank located adjacent to fuel transfer shed was reportedly used historically to measure fuel levels for decommissioned tank farm infrastructure (i.e., piping) that was subsequently replaced with new infrastructure. A partially buried aboveground storage tank was also located adjacent to fuel transfer shed and was reportedly used to contain potential overflow during tank refueling.		
Historical Assessment Information			
Phase II Environmental Site Assessment (EBA, 2008)	Number of test pits	2	
	Number of surface soil samples	10	
	Number of soil samples analyzed for metals	5	
	Number of soil samples analyzed for petroleum hydrocarbons	14	
	Number of soil samples with petroleum hydrocarbons impacts	13	
	Number of soil samples with metal impacts	0	
Comments: Petroleum hydrocarbons identified in shallow soils, but not fully delineated.			
2017/2018 Environmental Site Assessment Details			
Environmental Site Assessment Scope			
Utility Locate SOP followed?		Yes	
EM 31 Geophysics Complete?		N/A	
Number of test pits advanced		5 (2017), 6 (2018)	
Number of boreholes advanced		7 (2017)	
Number of hand auger locations advanced		0	
Number of soil samples submitted for laboratory chemical analysis		19 (2017), 12 (2018)	
Number of boreholes completed as groundwater monitoring wells		2 (2017)	
Number of historical groundwater monitoring wells		0	
Number of groundwater samples collected		2 (2017), 1 (2018)	
Number of sediment and surface soil samples collected		0	
Geophysics Findings			
N/A			
Soil Investigation and Conditions			
Maximum Depth of Investigation	12.19 mbgs (September 20, 2017)		
General Stratigraphy			
Description	**Depth from (mbgs)**	**Depth to (mbgs)**	**Observations**
Various intervals of silt, sand, gravel, and cobbles	0	4.0	Fill soil. Potential tailings observed in several test pits and boreholes.
Boulders and cobbles	4.0	5.5	Native soil

AEC 23: Fuel Transfer Area Beside Tank Farm

Various intervals of silt, sand, gravel and cobbles	5.5	12.19	Native soil

Combustible Vapour Concentrations (CVCs)

Ranged from less than instrument detection limit to 507 parts per million by volume (ppmv) in sample 17A23BH4-6.

Groundwater Conditions

Depth to Groundwater	7.76 – 7.21 mbgs (October 1, 2017); 7.14 mbgs (June 29, 2018). Based on groundwater contours, depth to groundwater below upper portion of AEC is likely about 10 m.
Free Product Thickness (if present)	Slight hydrocarbon sheen at 17A23MW4 (2017); **0.27 m product** in 17A23MW4 (June 29, 2018)

2017/2018 Environmental Site Assessment Results Summary

- Figure A23-1 shows borehole, monitoring well, and test pit locations.
- Figure A23-2 shows groundwater chemical results.
- Table A23-1 summarizes soil chemical results relative to guidelines and management limits.
- Table A23-2 summarizes groundwater chemical results relative to guidelines.

General Site Observations

- Underground storage tank and partially buried above-ground storage tank observed next to fuel transfer shed.
- No staining observed on surface soils surrounding fuel transfer shed; but there may be new gravel in area.
- Potential tailings observed in several boreholes and test pits advanced.
- Petroleum hydrocarbon staining and/or odour observed in several borehole and test pits advanced. Liquid product (diesel) encountered in only one MW (17A23MW4; 2018).

Soil: Petroleum Hydrocarbons (PHC and PAHs)

2017

- Laboratory results all less than the CCME/CSR guidelines with exception of:
  - Sample 17A23BH3-3 at a depth of 4.0 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A23BH4-5 at a depth of 5.4 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines. This soil sample also exceeded the management limits for PHC F2.
  - Sample 17A23BH4-6 at a depth of 8.7 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines.
  - Sample 17A23BH6-1 at a depth of 1.7 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A23TP1-2 at a depth of 0.3 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines. This soil sample also exceeded the management limits for PHC F2 and F3.
  - Sample 17A23TP3-1 at a depth of 0.25 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A23TP3-3 at a depth of 2.0 mbgs contained PHCs greater than the CCME/CSR guidelines. This soil sample also exceeded the management limits for PHC F2.
  - Sample 17A23TP4-1 at a depth of 0.25 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A23TP5-1 at a depth of 0.25 mbgs contained PHCs greater than the CCME/CSR guidelines.

2018

- Six test pits (18A23TP6 to 18A23TP11) were excavated to a depth of 1 mbgs to the southwest and west of the Diesel Transfer Station to delineate past management limit exceedances. Laboratory results from the two soil samples tested for PHCs F2-F4 at each of the six test pit locations were less than the management limits with exception of:
  - Sample 18A23TP6-3 at a depth of 1.0 mbgs.
  - Sample 18A23TP7-2 at a depth of 0.5 mbgs.
  - Sample 18A23TP7-3 at a depth of 1.0 mbgs.
  - Sample 18A23TP8-3 at a depth of 1.0 mbgs.
  - Sample 18A23TP9-3 at a depth of 1.0 mbgs.

Soil: Metals

2017

- Parameters with exceedances of CCME CEQGs include arsenic, barium, cadmium, copper, molybdenum, nickel, selenium, tin, and zinc.

AEC 23: Fuel Transfer Area Beside Tank Farm

- Following metals concentrations also exceeded preliminary background concentrations:
  - Barium (17A23TP1 at 0.30 mbgs).
  - Cadmium (17A23TP1 at 0.30 mbgs).
  - Selenium (17A23BH1 at 1.95 mbgs, 17A23BH4 at 8.7 mbgs, 17A23TP3 at 0.25 mbgs).

2018 (see discussion of risk-based metals delineation by Risk Management Unit (RMU) in report text)

Soil: Other PCOCs (Glycols)

- Laboratory chemical results less than detection limits and guidelines.

Soil: Routine (pH)

- Laboratory results within the CCME/CSR guidelines with exception of:
  - Sample 17A23BH1-2 at a depth of 1.95 mbgs had a pH value outside the CCME/CSR guideline range.
  - Sample 17A23BH3-6 at a depth of 7.9 mbgs had a pH value outside the CCME/CSR guideline range.
  - Sample 17A23BH4-4 at a depth of 4.3 mbgs had a pH value outside the CCME/CSR guideline range.
  - Sample 17A23BH4-5 at a depth of 5.4 mbgs had a pH value outside the CCME/CSR guideline range.
  - Sample 17A23BH4-6 at a depth of 8.7 mbgs had a pH value outside the CCME/CSR guideline range.

Groundwater: Petroleum Hydrocarbons (PHCs and PAHs)

2017

- Laboratory chemical results less than guidelines with exception of:
  - Sample 17A23MW4 had PHC F2 concentration greater than guidelines.
  - Sample 17A23MW4 had naphthalene and phenanthrene concentrations greater than guidelines.

2018

- Laboratory chemical results less than detection limits in 17A23MW5.
- 0.27 m of diesel product measured in 17A23MW4 (June 29, 2018)

Groundwater: Metals/Routine Parameters

2017

- Laboratory chemical results less than guidelines with exception of:
  - Sample 17A23MW5 had sulphate concentration greater than guidelines and preliminary background concentration.
  - Sample 17A23MW4 had arsenic, barium, and iron concentrations greater than guidelines.
  - Sample 17A23MW5 had cadmium concentration greater than guidelines but below preliminary background concentration.
- Detection limits for acridine and anthracene were raised above guidelines for sample 17A23MW4 due sample matrix interference.

2018

- Laboratory chemical results less than guidelines with exception of:
  - Sulphate exceeded guidelines and background concentrations at 17A23MW5.

Groundwater: Other PCOCs

N/A

Sediment: Petroleum Hydrocarbons

N/A

Sediment: Metals

N/A

Sediment: Other PCOCs

N/A

Surface Water: Petroleum Hydrocarbons

N/A

Surface Water: Metals/Nutrients

N/A

AEC 23: Fuel Transfer Area Beside Tank Farm

Surface Water: Other PCOCs

N/A

Grainsize Analysis

- Soil sample 17A23BH5-4 at a depth of 10.1 mbgs classified as fine-grained (10% >75 µm).
- Soil sample 17A23TP1-2 at a depth of 0.3 mbgs classified as coarse-grained (84% >75 µm).
- Soil sample 17A23TP3-3 at a depth of 2.0 mbgs classified as coarse-grained (74% >75 µm).
- Soil sample 18A23TP6-3 at a depth of 1.0 mbgs classified as coarse-grained (88% >75 µm).
- Soil sample 18A23TP7-2 at a depth of 0.5 mbgs classified as coarse-grained (83% >75 µm).
- Soil sample 17A23TP9-2 at a depth of 0.5 mbgs classified as coarse-grained (71% >75 µm).

Environmental Concerns

Location in AEC	Potential Source(s)	Identified Contaminated Media	Parameters Assessed and Contaminant(s) of Concern (COCs; bold & underline)
Surface of whole area	Leaks or releases from fueling infrastructure	Soil and groundwater	**Soil: Metals**, **petroleum hydrocarbons (PHCs)**, glycols, **polycyclic aromatic hydrocarbons (PAHs)**. **Groundwater: Metals**, **sulphate**, nutrients **petroleum hydrocarbons (PHCs)**, **polycyclic aromatic hydrocarbons (PAHs)**.

Discussion (Significance of Results)

Soils:

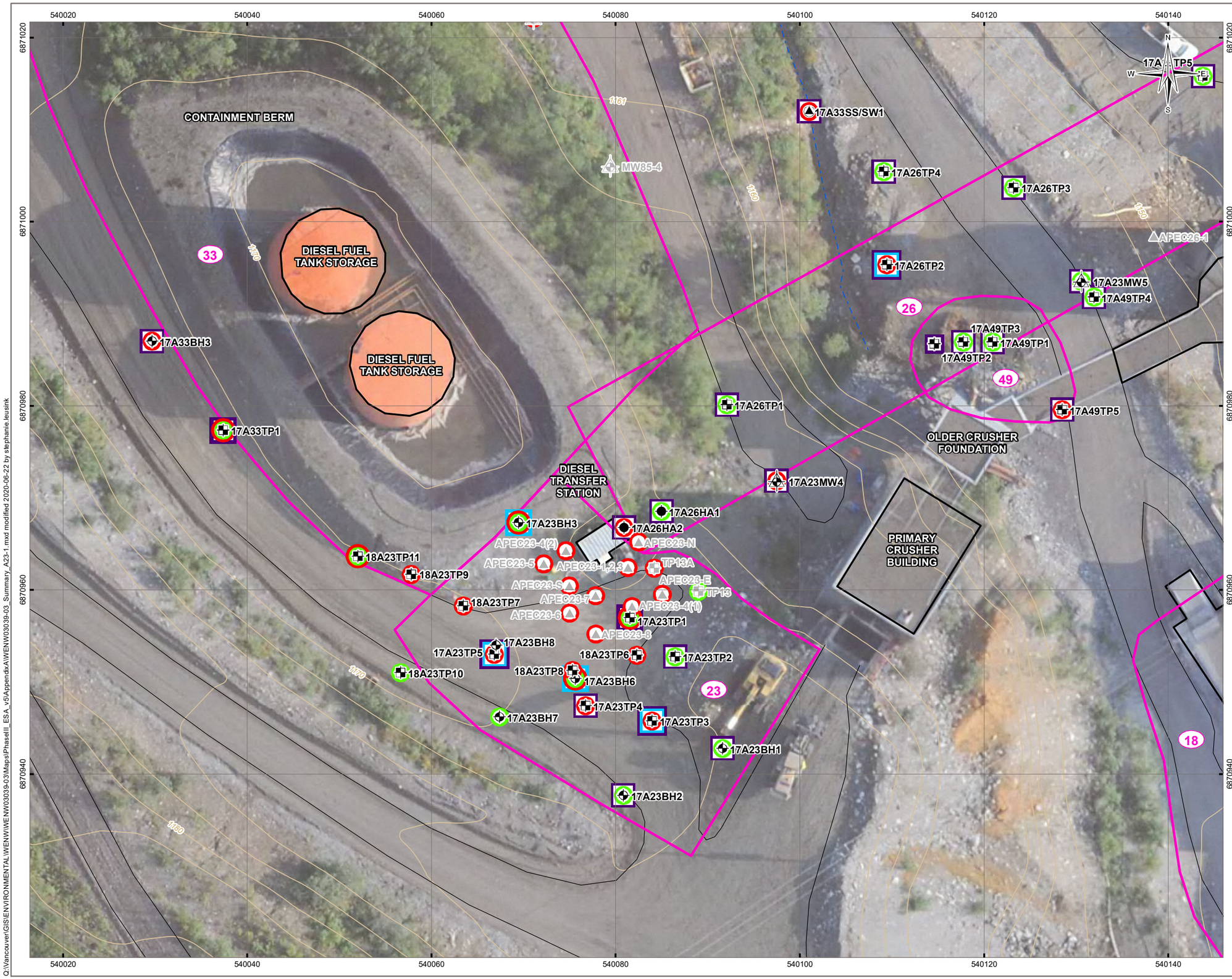
- PHC impacts measured in boreholes 17A23BH3 and 17A23BH4 were encountered at a deeper stratigraphic interval than other impacts observed. These deeper impacts are suspected to be associated with a historical fuel release at the Active Tank Farm (AEC 23). Based on this assessment conducted for AEC 33, PHC impacts related to the historical Active Tank Farm release have been horizontally delineated to north and east, and vertically delineated.
- For management limit exceedances, in general, the PHC impacts in soil were horizontally delineated except to the north towards the bermed diesel tank storage area and to the east where a steep bank is present. The estimated depth of PHC impacts greater than the management limits used to calculate the contaminated soil volume is 1.0 mbgs.
- Glycols were not detected and are no longer considered PCOCs in soil at this AEC.
- Metals concentrations were generally high in test pit samples and significantly lower in most borehole samples, i.e., highest metals concentrations were observed in shallow samples.

Groundwater:

- PHC and PAH impacts to groundwater quality at 17A23MW4 may be related to a historical fuel release at AEC 33; diesel product measured in 2018 at this well will require remediation and product recovery as part of ROA; PHC contamination in groundwater further down-gradient (at 17A23MW5) was not detected
- Most dissolved metals parameters at 17A23MW4 had concentrations at least two times higher than concentrations at 17A23MW5 (2017).

Attachments

Figure A23-1 – Soil and Sediment Results
Figure A23-2 – Groundwater and Surface Water Results
Table A23-1 – Soil Analytical Results
Table A23-2 – Groundwater Chemical Results
Borehole and Test pit Logs
Photographs



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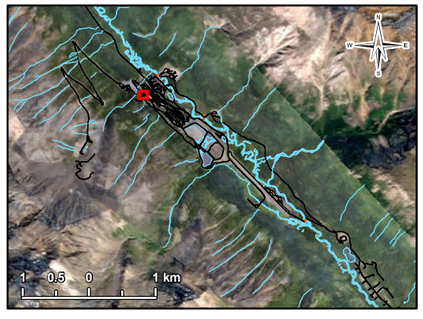
LEGEND

- Area of Environmental Concern (AEC)
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- 2017 Surface Water/Sediment Sample (SW/SS)
- Historical Monitoring Well
- Historical Testpit
- Historical Shallow Soil Sample

Soil/Sediment Analytical Results

- PHC Impacts
- PHC Impacts, vertically delineated
- No PHC Impact
- Metals exceedance of preliminary background concentrations, or in the absence of background concentrations, exceedance of CCME guidelines
- Metals exceedance, vertically delineated
- No metals exceedance of CCME guidelines or preliminary background concentrations
- Building
- Road
- Ditch
- Contour (2 m)



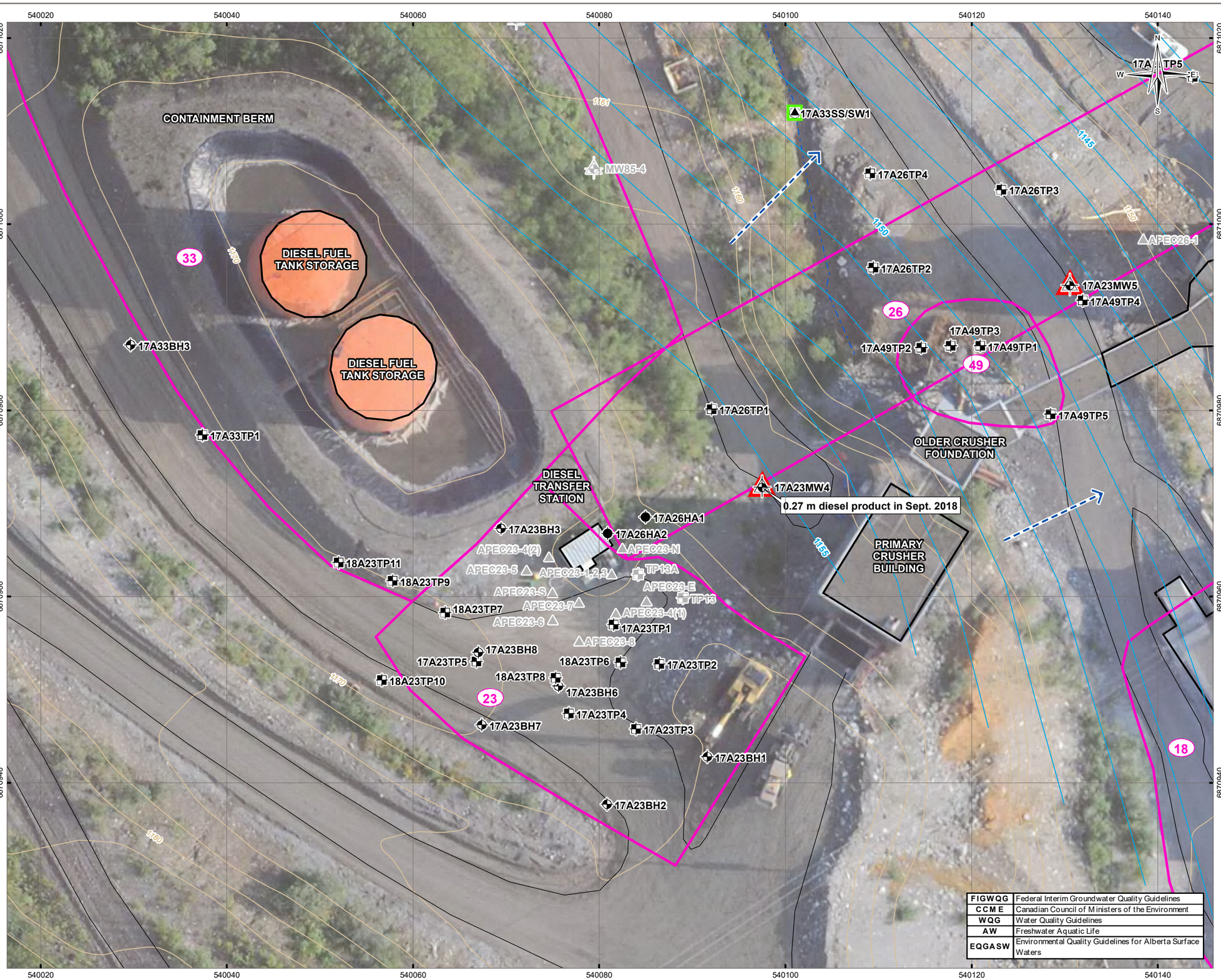
NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 23
Fuel Transfer Area Beside Tank Farm
Soil and Sediment Results

PROJECTION UTM Zone 9	**DATUM** NAD83			**CLIENT** NORTH AMERICAN TUNGSTEN CORPORATION LTD
Scale: 1:400 — 5 2.5 0 5 — Metres				TETRA TECH
FILE NO. WENW03039-03_Summary_A23-1.mxd				
OFFICE Tt-VANC	**DWN** SL	**CKD** BB	**APVD** BB	**REV** 0
DATE June 22, 2020	**PROJECT NO.** ENW.WENW03039-03			**A23-1**



LEGEND

- Area of Environmental Concern (AEC)
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- 2017 Surface Water/Sediment Sample (SW/SS)
- Historical Monitoring Well
- Historical Testpit
- Historical Shallow Soil Sample
- Inferred Groundwater Flow Direction
- Groundwater Contour (1 m asl; Fall 2017)

2017/2018 Groundwater Analytical Results

- Samples contain parameters that exceeded the preliminary background concentrations, or in the absence of background concentrations, FIGWQG

2017 Surface Water Analytical Results

- Samples contain parameters that met the Flat River WQOs, or in the absence of WQOs, CCME WQG for the protection of AW or EQGASW
- Building
- Road
- Ditch
- Contour (2 m)

FIGWQG	Federal Interim Groundwater Quality Guidelines
CCME	Canadian Council of Ministers of the Environment
WQG	Water Quality Guidelines
AW	Freshwater Aquatic Life
EQGASW	Environmental Quality Guidelines for Alberta Surface Waters

NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 23
Fuel Transfer Area Beside Tank Farm Groundwater and Surface Water Results

PROJECTION: UTM Zone 9	DATUM: NAD83			CLIENT: North American Tungsten Corporation Ltd.
Scale: 1:400 (5 2.5 0 5 Metres)				TETRA TECH
FILE NO.: WENW03039-03_Summary_A23-2.mxd				
OFFICE: Tt-VANC	DWN: SL	CKD: BB	APVD: CF	REV: 0
DATE: June 22, 2020	PROJECT NO.: ENW.WENW03039-03			A23-2

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Table A23-1: Soil Analytical Results

AEC					AEC 23																			
Location					BH1	BH2	BH3			BH4			BH5	BH6		BH7	TP1		TP2	TP3		TP4	TP5	
Sample Depth					1.95 m	2.0 m	4.0 m	7.9 m	4.3 m	5.4 m	8.7 m		10.1 m	1.7 m	3.5 m	3.3 m	0.3 m	2.0 m	0.25 m	0.25 m	2.0 m	0.25 m	0.2 m	1.25 m
Field ID					17A23BH1-2	17A23BH2-2	17A23BH3-3	17A23BH3-6	17A23BH4-4	17A23BH4-5	17A23BH4-6	17A23BH5-4	17A23BH6-1	17A23BH6-2	17A23BH7-2	17A23TP1-2	17A23TP1-4	17A23TP2-1	17A23TP3-1	17A23TP3-3	17A23TP4-1	17A23TP5-1	17A23TP5-3	
Sample Date					17-Sep-2017	17-Sep-2017	18-Sep-2017	18-Sep-2017	18-Sep-2017	18-Sep-2017	18-Sep-2017	20-Sep-2017	26-Sep-2017	26-Sep-2017	26-Sep-2017	11-Sep-2017	12-Sep-2017	12-Sep-2017	12-Sep-2017	12-Sep-2017	12-Sep-2017	12-Sep-2017	12-Sep-2017	
Laboratory Report Number					8742804	8742807	8740331	8740334	8740350	8740351	8740352	8762382	8783554	8783555	8783558	8728468	8728472	8728474	8728489	8728495	8728498	8728510	8728519	
Laboratory Sample ID					17Y263066	17Y263066	17Y262746	17Y262746	17Y262746	17Y262746	17Y262746	17Y265105	17Y267738	17Y267738	17Y267738	17Y261400	17Y261400	17Y261400	17Y261400	17Y261400	17Y261400	17Y261400	17Y261400	
Parameter	**Unit**	**CCME[1,2] and NWT CSR[3]**	**Background Concentration[4]**	**Management Limits[5]**																				
Physical Parameters																								
pH	pH Units	6-8	-	-	**4.35**	7.7	7.78	**8.18**	**8.03**	**8.03**	**8.53**	7.95	7.62	-	-	7.35	7.49	7.66	7.36	7.7	7.42	7.37	7.96	
Moisture	%	-	-	-	16.5	11.9	6.8	8.3	-	8.5	8.7	24.3	2.35	4.04	3.82	8	15.3	7	8.1	8.5	5.4	4.5	-	
Metals																								
Antimony	mg/kg	20	-	-	0.4	0.8	0.2	0.4	0.2	0.5	1.3	3.1	0.5	-	-	4	0.5	1.1	0.8	0.4	1.5	0.6	0.2	
Arsenic	mg/kg	12	64	-	8.4	**28.5**	**18.7**	7.6	**33.9**	9.2	**14**	**25.9**	**18.9**	-	-	**16.2**	**14.5**	8.8	8.8	**15.3**	**15.1**	7.3	**12.3**	
Barium	mg/kg	500	946	-	49.7	142	74.9	138	61.2	169	478	164	93.2	-	-	**3010**	262	**566**	322	383	**817**	309	131	
Beryllium	mg/kg	4	-	-	1.9	1	0.8	0.9	1.4	0.6	0.4	1.9	0.6	-	-	0.5	0.8	0.8	1.4	1.1	0.8	1.3	1.3	
Cadmium	mg/kg	1.4	2.8	-	0.61	0.85	0.43	0.31	0.58	0.45	0.83	0.77	0.79	-	-	**2.85**	1.01	1.19	**2.03**	0.61	**1.69**	1.23	0.24	
Chromium	mg/kg	64	-	-	8	36	24	20	20	18	16	40	17	-	-	20	31	13	18	21	19	17	32	
Cobalt	mg/kg	40	-	-	28.5	12.1	9.4	12.2	14.3	8.4	8	16.3	8.6	-	-	14.9	10.8	10.5	18.4	12.8	15.2	15	13.9	
Copper	mg/kg	63	-	-	**1990**	41	24.5	35.3	59.7	24.9	19.6	32.8	50.8	-	-	**123**	**79.9**	**224**	**753**	55.1	**503**	**509**	44.7	
Lead	mg/kg	70	-	-	4.9	16.4	11	12.6	15.2	7.4	10.9	**299**	13.8	-	-	31.7	16.4	24.2	13.4	28.3	16.9	12.7	18.6	
Mercury	mg/kg	6.6	-	-	1.71	0.16	0.05	0.02	<0.01	0.03	0.04	<0.01	0.74	-	-	0.52	0.39	0.29	0.13	0.24	0.42	0.16	0.05	
Molybdenum	mg/kg	5	10	-	2	1.9	1.4	1.4	0.9	1	1.2	2.9	2	-	-	**5.8**	1.6	**6.5**	3.2	2	4.1	2.1	0.5	
Nickel	mg/kg	45	72	-	8.1	29.5	19.3	33.1	31.4	20.7	23.2	33.8	27.7	-	-	**59.3**	25.6	17.5	19.9	24.3	29.3	18.1	33.8	
Selenium	mg/kg	1	1.7	-	12.4	0.6	0.7	0.6	0.7	0.8	2.5	1	0.8	-	-	**1.3**	0.6	0.9	2.3	1	**1.6**	**1.6**	0.7	
Silver	mg/kg	20	-	-	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Thallium	mg/kg	1	-	-	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.5	0.2	-	-	0.4	0.3	0.5	0.4	0.2	0.3	0.3	0.3	
Tin	mg/kg	5	-	-	4.1	**5.3**	1.4	0.7	0.9	0.9	0.3	1	0.7	-	-	0.9	1	2.5	3.3	0.6	2.2	2.1	0.5	
Uranium	mg/kg	23	-	-	0.8	2	1.6	1.2	1	0.8	1.1	2.7	1.1	-	-	2.7	2	5	2.5	1.2	2.5	2.1	0.9	
Vanadium	mg/kg	130	160	-	12	60	28	30	32	28	33	64	34	-	-	89	45	36	33	34	50	27	42	
Zinc	mg/kg	200	462	-	82	98	69	66	76	63	99	35	114	-	-	**312**	114	147	**232**	96	195	142	54	
Particle Size																								
>75 µm	%	-	-	-	-	-	-	-	-	-	-	10	-	-	-	84	-	-	-	74	-	-	-	
Grain Size	N/A	-	-	-	-	-	-	-	-	-	-	Fine	-	-	-	Coarse	-	-	-	Coarse	-	-	-	
Petroleum Hydrocarbons																								
Benzene	mg/kg	0.03	-	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	0.027	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	
Toluene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**0.13**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
Ethylbenzene	mg/kg	0.082	-	-	<0.01	<0.01	<0.01	<0.01	-	0.06	**0.3**	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	
Xylene (m)	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	-	0.11	0.15	<0.02	<0.02	<0.02	<0.02	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	
Xylene (o)	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	-	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	
Xylenes Total	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	-	**0.11**	**0.2**	<0.05	<0.05	<0.05	<0.05	**0.26**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
F1 (C_6-C_{10})	mg/kg	30	-	-	<10	<10	<10	<10	-	**56**	**87**	<10	<10	<10	<10	<10	<10	<10	<10	27	<10	<10	-	
F1 (C_6-C_{10}) - BTEX	mg/kg	30	-	700	<10	<10	<10	<10	-	**56**	**86**	<10	<10	<10	<10	<10	<10	<10	<10	27	<10	<10	-	
F2 (C_{10}-C^{16})	mg/kg	150	-	1000	<20	<20	63	<20	-	**2440**	**482**	<20	**248**	<20	<20	**18,300**	90	<20	22	**2640**	<20	99	-	
F3 (C_{16}-C_{34})	mg/kg	300	-	2500	30	<20	**681**	<20	-	**417**	55	<20	100	<20	25	**9670**	206	133	**773**	**512**	**563**	**984**	-	
F4 (C_{34}-C_{50})	mg/kg	2800	-	10,000	<20	<20	177	<20	-	<20	<20	<20	<20	<20	<20	432	37	36	466	81	289	749	-	
Glycols																								
Diethylene glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	
Ethylene glycol	mg/kg	960	-	-	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	
Propylene glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	
Tetraethylene Glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	
Triethylene Glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	
Polycyclic Aromatic Hydrocarbons (PAHs)																								
B(a)P Total Potency Equivalent	mg/kg	0.6	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
IACR (CCME)	mg/kg	1	-	-	<0.6	<0.6	<0.6	<0.6	-	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	*<6*	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	-	
Acenaphthene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	-	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	-	
Acenaphthylene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	-	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	-	
Anthracene	mg/kg	2.5	-	-	<0.004	<0.004	<0.004	<0.004	-	<0.04	<0.04	<0.004	<0.004	<0.004	<0.004	<0.4	<0.004	<0.004	<0.004	<0.04	<0.004	<0.004	-	
Benz(a)anthracene	mg/kg	0.1	-	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	*<0.3*	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	-	
Benzo(a) pyrene	mg/kg	0.1	-	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	*<0.3*	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	-	
Benzo(b)fluoranthene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*<0.5*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
Benzo(b+j)fluoranthene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
Benzo(g,h,i)perylene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
Benzo(j)fluoranthene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
Benzo(k)fluoranthene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*<0.5*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
Chrysene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	
Dibenz(a,h)anthracene	mg/kg	0.1	-	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	
Fluoranthene	mg/kg	50	-	-	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	
Fluorene	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	-	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<2	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	-	-	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*<0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	
1-Methylnaphthalene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	-	0.33	0.61	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005	<0.005	<0.005	0.39	<0.005	<0.005	-	
2-Methylnaphthalene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	-	<0.05	1.08	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	-	
Naphthalene	mg/kg	0.013	-	-	<0.005	<0.005	<0.005	<0.005	-	**0.33**	**0.35**	<0.005	<0.005	<0.005	<0.005	*<0.5*	<0.005	<0.005	<0.005	*<0.05*	<0.005	<0.005	-	
Phenanthrene	mg/kg	0.046	-	-	<0.02	<0.02	<0.02	<0.02	-	*<0.2*	*<0.2*	<0.02	<0.02	<0.02	<0.02	*<2*	<0.02	<0.02	<0.02	*<0.2*	<0.02	<0.02	-	
Pyrene	mg/kg	0.1	-	-	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.6**	0.01	<0.01	0.01	<0.01	<0.01	<0.01	-	

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008), for coarse textured soils under Agricultural and Residential/Parkland soils

[2] Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 1999), for coarse textured soils under Agricultural and Residential/Parkland soils

[3] Northwest Territories Environmental Guideline for Contaminated Site Remediation (NWT CSR 2003), for coarse textured soils under Agricultural and Residential/Parkland land use

[4] Preliminary Background Concentration

[5] Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil Technical Supplement, for coarse textured soil under Agricultural land use, management limit pathway only

BOLD - Exceeds most stringent CCME or NWT CSR standard/guideline

Red - Exceeds Preliminary Background Concentration

Shaded - Exceeds Management Limits

Italic - Laboratory detection limit is greater than one or more referenced guidelines

"-" Not analyzed or no applicable standard/guideline

TETRA TECH

Table A23-1: Soil Analytical Results

				AEC	AEC 23												
				Location	TP6-2	TP6-3	TP7-2	TP7-2	TP7-3	TP8-2	TP8-3	TP9-2	TP9-3	TP10-0.4m	TP10-1.0m	TP11-0.4m	TP11-0.8m
				Sample Depth	0.5 m	1.0 m	0.5 m	0.5 m	1.0 m	0.5 m	1.0 m	0.5 m	1.0 m	0.4 m	1.0 m	0.4 m	0.8 m
				Field ID	18A23TP6-2	18A23TP6-3	18A23TP7-2	18A23BTP7-2	18A23TP7-3	18A23TP8-2	18A23TP8-3	18A23TP9-2	18A23TP9-3	18A23TP10-0.4m	18A23TP10-1.0m	18A23TP11-0.4m	18A23TP11-0.8m
				Sample Date	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	27-Jun-2018	28-Aug-2018	28-Aug-2018	28-Aug-2018	28-Aug-2018
				Laboratory Report Number	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306	18Y357306	18Y379937	18Y379937	18Y379937	18Y379937
				Laboratory Sample ID	9372345	9372346	9372348	9372349	9372350	9372352	9372353	9372355	9372356	9511535	9511536	9511539	9511540
Parameter	**Unit**	**CCME[1,2] and NWT CSR[3]**	**Background Concentration[4]**	**Management Limits[5]**													
Physical Parameters																	
pH	pH Units	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture	%	-	-	-	5.4	6.2	4.0	5.3	12.3	8.0	16.7	13.0	8.6	16.1	9.4	7.9	6.8
Metals																	
Antimony	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	12	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/kg	500	946	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	1.4	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	mg/kg	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	6.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	5	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	45	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	1	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	mg/kg	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	130	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	200	462	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Particle Size																	
>75 µm	%	-	-	-	-	88	-	83	-	-	-	71	-	-	-	-	-
Grain Size	N/A	-	-	-	-	Coarse	-	Coarse	-	-	-	Coarse	-	-	-	-	-
Petroleum Hydrocarbons																	
Benzene	mg/kg	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.082	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (m)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (o)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes Total	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C_6-C_{10})	mg/kg	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C_6-C_{10}) - BTEX	mg/kg	30	-	700	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C_{10}-C^{16})	mg/kg	150	-	1000	<20	**3830**	<20	**3080**	**2980**	52	**2140**	**397**	**1420**	<20	<20	<20	<20
F3 (C_{16}-C_{34})	mg/kg	300	-	2500	**419**	**2650**	68	**2160**	**2100**	**446**	**550**	**328**	**501**	<20	63	**1230**	<20
F4 (C_{34}-C_{50})	mg/kg	2800	-	10,000	219	193	<20	156	85	209	<20	39	38	<20	29	488	<20
Glycols																	
Diethylene glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene glycol	mg/kg	960	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylene glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetraethylene Glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Triethylene Glycol	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																	
B(a)P Total Potency Equivalent	mg/kg	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IACR (CCME)	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a) pyrene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(j)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	0.013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	0.046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
[1] Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008), for coarse textured soils under Agricultural and Residential/Parkland soils
[2] Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 1999), for coarse textured soils under Agricultural and Residential/Parkland soils
[3] Northwest Territories Environmental Guideline for Contaminated Site Remediation (NWT CSR 2003), for coarse textured soils under Agricultural and Residential/Parkland land use
[4] Preliminary Background Concentration
[5] Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil Technical Supplement, for coarse textured soil under Agricultural land use, management limit pathway only
BOLD - Exceeds most stringent CCME or NWT CSR standard/guideline
Red - Exceeds Preliminary Background Concentration
Shaded - Exceeds Management Limits
Italic - Laboratory detection limit is greater than one or more referenced guidelines
"-" Not analyzed or no applicable standard/guideline

Table A23-2: Groundwater Analtyical Results

				AEC	AEC 23		
				Location	17A23MW4	17A23MW5	
				Field ID	17A23MW4	17A23MW5	17A23MW5
				Sample Date	1-Oct-2017	1-Oct-2017	30-Jun-2018
				Laboratory Report Number	17Y269471	17Y269471	18Y358442
				Laboratory Sample ID	8797135	8797136	9378834
Parameter	**Unit**	**Federal Interim Guideline[1]**		**Preliminary Background Concentrations**			
		Agricultural	**Res / Park**				
Field Parameters							
Field Temperature	^{0}C	-	-	-	1.6	1.5	2.3
Field pH	pH Units	6.5-9	6.5-9	-	6.84	7.05	7.17
Field Conductivity	µS/cm	-	-	-	873	762	845
Routine							
pH	pH Units	6.5-9	6.5-9	-	7.57	7.8	7.37
Electrical Conductivity (EC)	µS/cm	-	-	-	938	733	1040
Total Dissolved Solids (TDS)	mg/L	3000	-	-	535	470	738
Hardness as $CaCO_3$	mg/L	-	-	-	503	373	395
Alkalinity (total as $CaCO_3$)	mg/L	-	-	-	528	210	239
Bromide	mg/L	-	-	-	<0.05	<0.05	<0.05
Chloride	mg/L	100	120	-	6	0.4	1.37
Fluoride	mg/L	0.12	0.12	0.39	0.03	0.09	0.07
Sulphate	mg/L	100	100	182	8	197	356
Nutrients							
Ammonia	mg/L	0.021-231 [2]	0.021-231 [2]	-	-	-	<0.01
Nitrate (as NO_3-N)	mg/L	13	13	-	<0.005	0.034	0.114
Nitrite (as NO_2-N)	mg/L	0.06	0.06	-	<0.005	<0.005	<0.005
Nitrogen (Total)	mg/L	-	-	-	-	-	0.31
Dissolved Metals							
Aluminum	mg/L	0.005 / 0.1 [3]	0.005 / 0.1 [3]	-	0.02	0.016	<0.002
Antimony	mg/L	2	2	-	0.0003	<0.0002	<0.0002
Arsenic	mg/L	0.005	0.005	-	**0.0058**	0.0003	0.0003
Barium	mg/L	0.5	0.5	-	**0.865**	0.0235	0.0229
Beryllium	mg/L	0.0053	0.0053	-	0.00001	<0.00001	<0.00001
Boron	mg/L	0.5	1.5	-	0.03	0.013	0.006
Cadmium	mg/L	0.00012	0.00012	0.000047	<0.00001	0.00002	0.00002
Calcium	mg/L	-	-	-	133	115	120
Chromium	mg/L	0.0089	0.0089	-	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	0.05	-	-	0.00213	0.0006	<0.00005
Copper	mg/L	0.002	0.002	-	0.0003	0.0002	0.0003
Iron	mg/L	0.3	0.3	-	**4.11**	0.037	<0.01
Lead	mg/L	0.001-0.002 [4]	0.001-0.002 [4]	-	0.00007	<0.00005	<0.00005
Lithium	mg/L	-	-	-	0.0315	0.0085	0.0078
Magnesium	mg/L	-	-	-	41.6	20.9	23.2
Manganese	mg/L	0.2	-	-	**0.393**	0.111	0.004
Mercury	mg/L	0.000016	0.000016	-	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	0.073	0.073	-	0.00187	0.00058	0.00043
Nickel	mg/L	0.025-0.083 [4]	0.025-0.083 [4]	-	0.0044	0.0006	0.0003
Potassium	mg/L	-	-	-	4.52	1.88	1.87
Selenium	mg/L	0.001	0.001	-	<0.0005	<0.0005	<0.0005
Silver	mg/L	0.00025	0.00025	-	<0.00002	<0.00002	<0.00002
Sodium	mg/L	-	-	-	5.35	2.31	6.23
Strontium	mg/L	-	-	-	-	-	0.168
Thallium	mg/L	0.0008	0.0008	-	<0.00001	0.00001	0.00001
Tin	mg/L	-	-	-	-	-	<0.00005
Titanium	mg/L	0.1	0.1	-	0.0024	0.0012	0.0011
Tungsten	mg/L	-	-	-	-	-	0.00035
Uranium	mg/L	0.01	0.015	-	0.00205	0.00214	0.00246
Vanadium	mg/L	0.1		-	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.01	0.01	-	0.006	<0.002	<0.002

Notes:

[1] Environment Canada (June 2016). Guidance Document on Federal Interim Groundwater Quality Guidelines (FIGQG) for Federal Contaminated Sites, for fine and coarse textured soil under Agricultural and Residential/Parkland land use

[2] Guideline varies with pH and temperature

[3] Guideline varies with pH

[4] Guideline varies hardness

"-" No applicable guideline or not analyzed

BOLD - Greater than Guideline

RED - Greater than Preliminary Background Concentration

Italic - Detection limit greater than guideline

Table A23-2: Groundwater Analtyical Results

				AEC	AEC 23		
				Location	17A23MW4	17A23MW5	
				Field ID	17A23MW4	17A23MW5	17A23MW5
				Sample Date	1-Oct-2017	1-Oct-2017	30-Jun-2018
				Laboratory Report Number	17Y269471	17Y269471	18Y358442
				Laboratory Sample ID	8797135	8797136	9378834
Parameter	**Unit**	**Federal Interim Guideline[1]**		**Preliminary Background Concentrations**			
		Agricultural	**Res / Park**				
Hydrocarbons							
Benzene	mg/L	0.088	0.14	-	0.0054	<0.0005	<0.0005
Toluene	mg/L	0.083	0.083	-	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/L	3.2	11	-	0.0454	<0.0005	<0.0005
Xylene (m)	mg/L	-	-	-	0.0136	<0.0005	<0.0005
Xylene (o)	mg/L	-	-	-	0.0012	<0.0005	<0.0005
Xylenes Total	mg/L	3.9	3.9	-	0.015	<0.001	<0.001
F1 (C_6-C_{10})	mg/L	-	-	-	0.31	<0.1	<0.1
F1 (C_6-C_{10}) - BTEX	mg/L	0.81	0.81	-	0.24	<0.1	<0.1
F2 (C_{10}-C_{16})	mg/L	1.3	1.3	-	**3.68**	<0.1	<0.1
F3 (C_{16}-C_{34})	mg/L	-	-	-	0.53	0.12	<0.1
F4 (C_{34}-C_{50})	mg/L	-	-	-	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	mg/L	0.0058	0.0058	-	<0.0002	<0.00002	<0.00002
Acenaphthylene	mg/L	0.046	0.046	-	<0.0002	<0.00002	<0.00002
Acridine	mg/L	0.00005	0.00005	-	*<0.0005*	<0.00005	<0.00005
Anthracene	mg/L	0.000012	0.000012	-	*<0.0001*	<0.00001	<0.00001
Benz(a)anthracene	mg/L	0.000018	0.000018	-	<0.00001	<0.00001	<0.00001
Benzo(a) pyrene	mg/L	0.00001	0.00001	-	<0.00001	<0.00001	<0.00001
Benzo(b)fluoranthene	mg/L	-	-	-	<0.00001	<0.00001	<0.00001
Benzo(b+j)fluoranthene	mg/L	0.00048	0.00048	-	<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene	mg/L	0.00017	0.00017	-	<0.00001	<0.00001	<0.00001
Benzo(j)fluoranthene	mg/L	-	-	-	<0.00001	<0.00001	<0.00001
Benzo(k)fluoranthene	mg/L	0.00048	0.00048	-	<0.00001	<0.00001	<0.00001
Chrysene	mg/L	0.0001	0.0001	-	<0.00001	<0.00001	<0.00001
Dibenz(a,h)anthracene	mg/L	0.00026	0.00026	-	<0.00001	<0.00001	<0.00001
Fluoranthene	mg/L	0.00004	0.00004	-	<0.00002	<0.00002	<0.00002
Fluorene	mg/L	0.003	0.003	-	0.0027	<0.00002	<0.00002
Indeno(1,2,3-c,d)pyrene	mg/L	0.00021	0.00021	-	<0.00001	<0.00001	<0.00001
1-Methylnaphthalene	mg/L	0.18	0.18	-	-	-	<0.00005
2-Methylnaphthalene	mg/L	0.18	0.18	-	-	-	<0.00005
Naphthalene	mg/L	0.0011	0.0011	-	**0.0874**	<0.00005	<0.00005
Phenanthrene	mg/L	0.0004	0.0004	-	**0.0009**	<0.00004	<0.00004
Pyrene	mg/L	0.000025	0.000025	-	<0.00002	<0.00002	<0.00002
Quinoline	mg/L	0.0034	0.0034	-	<0.001	<0.0001	<0.00005

Notes:

[1] Environment Canada (June 2016). Guidance Document on Federal Interim Groundwater Quality Guidelines (FIGQG) for Federal Contaminated Sites, for fine and coarse textured soil under Agricultural and Residential/Parkland land use

[2] Guideline varies with pH and temperature

[3] Guideline varies with pH

[4] Guideline varies hardness

"-" No applicable guideline or not analyzed

BOLD - Greater than Guideline

RED - Greater than Preliminary Background Concentration

Italic - Detection limit greater than guideline

TETRA TECH

North American Tungsten Corporation Ltd.

Borehole No: 17A23BH1

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1172.223 m
Tungsten, Northwest Territories	UTM: 540091.607 E; 6870942.807 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0		SILT (FILL) - trace to some sand and gravel, moist, brown, fine to coarse sand and gravel						1172
		SAND AND GRAVEL (FILL) - trace silt, damp, brown, fine to coarse sand and gravel						
1	Sonic	SAND (TAILINGS) - trace gravel, damp, reddish brown, fine sand		1-1				1171
2		- some silt, moist		1-2				1170
		SILT - some gravel, trace sand, damp, light brown, fine to coarse gravel						
		BOULDER						
3		SILT - some gravel, trace sand, damp, light brown, fine to coarse gravel		1-3				1169
		SAND - some gravel, damp, brown, fine to medium sand and gravel						
4		COBBLES - some sand and gravel, dry, greyish brown						1168
		SAND - some gravel, trace silt, damp, light brown						
5		END OF BOREHOLE (4.50 metres) Note: Backfilled at completion						1167
6								1166
7								1165
8								1164
9								1163
10								1162
11								1161
12								1160
13								1159
14								1158
15								

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 4.5 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 17
Logged By: MG	Completion Date: 2017 September 17
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A23BH2

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1171.345 m
Tungsten, Northwest Territories	UTM: 540080.849 E; 6870937.704 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Sonic	SAND AND GRAVEL (FILL) - road base, trace to some silt, damp, brown, fine to coarse sand and gravel						1171
1		SILT (FILL) - some sand, trace gravel, trace organics, moist to wet, soft, brown, black streaks, fine sand, fine gravel		2-1				1170
		- wet, burnt streaks						
2		- damp		2-2				1169
		SAND AND GRAVEL (FILL) - some silt, poorly graded, damp, brown, black streaks, fine to coarse gravel and sand		2-3				
3		SAND (FILL) - some silt, some gravel, damp, dark grey, no discernible odour						1168
		SILT (FILL) - some sand, some gravel, occasional cobbles, moist, brown, fine to coarse sand and gravel		2-4				
4		SAND (FILL) - some gravel, trace silt, damp, brown, fine to coarse sand						1167
5		END OF BOREHOLE (4.50 metres) Note: Backfilled at completion						1166
6								1165
7								1164
8								1163
9								1162
10								1161
11								1160
12								1159
13								1158
14								1157
15								

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 4.5 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 17
Logged By: MG	Completion Date: 2017 September 17
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A23BH3

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1171.977 m
Tungsten, Northwest Territories	UTM: 540069.451 E; 6870967.321 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
1	Sonic	SAND (FILL) - trace to some gravel, trace silt, damp, brown, fine to medium sand and gravel		3-1				1171
		- silty						
2				3-2				1170
3		GRAVEL (FILL) - sandy, trace silt, damp, brown						1169
		SILT (FILL) - some sand, trace to some gravel, damp, grey, fine sand						
4		SAND (FILL) - trace gravel, trace silt, damp, brown, fine to medium sand, slight hydrocarbon odour		3-3				1168
		GRANITE BOULDERS						
5								1167
6		SILT - some sand and gravel, brown, fine to coarse sand and gravel, hydrocarbon odour		3-4				1166
		BOULDER						
7		SILT - some sand, some gravel, light brown, fine to coarse sand and gravel, slight hydrocarbon odour		3-5				1165
		SAND - trace to some gravel, trace silt, damp, brown		3-6				
8								1164
		SILT - trace to some sand and gravel, occasional cobbles, damp						
9								1163
				3-7				
10		- rock layer						1162
11		END OF BOREHOLE (10.60 metres) Note: Backfilled at completion						1161
12								1160
13								1159
14								1158
15								1157

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 10.6 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 17
Logged By: MG	Completion Date: 2017 September 18
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A23BH4/MW4

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1162.855 m
Tungsten, Northwest Territories	UTM: 540097.487 E; 6870971.859 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	MW4	Elevation (m)
0		SAND (FILL) - gravelly, trace silt, damp, greyish brown, fine to medium sand						
		- reddish brown		4-1				
1		- some gravel, occasional cobbles, light brown, fine sand, fine cobbles						1162
		SILT (FILL) - trace sand, trace gravel, damp to moist, dark brown		4-2				
		COBBLES (FILL)						
2								1161
		SILT (FILL) - some sand, trace gravel, damp, brown						
		SAND AND GRAVEL (FILL) - trace to some silt, greyish to light brown, fine to coarse sand and gravel		4-3				
3		SILT, SAND AND GRAVEL (FILL) - moist, brown, fine to medium sand and gravel						1160
		GRAVEL AND COBBLES (FILL) - some sand						
		SILT (FILL) - trace sand, trace gravel, fine sand, fine to medium gravel						
4		- large cobble		4-4				1159
		SAND (TAILINGS) - trace to some gravel, reddish brown, fine to medium sand, fine gravel						
		SILT - trace to sand and gravel, damp, black, fine sand, fine to medium gravel, strong hydrocarbon odour						
5	Sonic			4-5	423			1158
		SILT AND SAND - some gravel, occasional fine cobbles, damp, brown, hydrocarbon odour						
6								1157
7		- moist to wet						1156
		SILT - some sand, trace gravel, moist, light brown, hydrocarbon odour						
8								1155
		SAND - trace gravel, wet, fine gravel, hydrocarbon odour		4-6	507			
9								1154
		BEDROCK						
10								1153
		END OF BOREHOLE (10.67 metres)						
11		water - 6.76 metres on October 1, 2017						1152
		Monitoring well installed to 9.14 metres						
12								1151
13								1150
14								1149
15								1148

Oct1/17

Oct1/17

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 10.367 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 18
Logged By: MG	Completion Date: 2017 September 18
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A23BH5/MW5

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1154.856 m
Tungsten, Northwest Territories	UTM: 540130.55 E; 6870993.535 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	MW5	Elevation (m)
0		SAND AND GRAVEL (FILL) - brown, fine to medium sand and gravel						1154
1								
		GRAVEL (FILL) - some sand, some silt, damp, brown						1153
2		SAND (FILL) - silty, some gravel, damp, brown, fine to coarse sand						
3		- moist						1152
		SILT (FILL) - sandy, trace large gravel, moist to wet, brown						
4		BOULDER AND COBBLES (FILL)		5-1				1151
5								1150
		SAND (FILL) - silty, trace gravel, moist to wet, brown, fine sand, fine to medium gravel		5-2				
6	Sonic							1149
7		- cobble						1148
	Oct1/17	- some sand, moist, fine to medium sand, fine gravel					Oct1/17	
8		- wet		5-3				1147
9		- cobble						1146
10		- trace silt - organic, trace sand, moist, black, fine sand		5-4		90% particles <75 µm (ie. smaller than sand particle)		1145
		SAND - some gravel, some silt, moist, brown, fine to medium sand - trace gravel, moist to wet						
11								1144
12								1143
		END OF BOREHOLE (12.19 metres) water - 7.21 metres on October 1, 2017 Monitoring well installed to 10.67 metres						
13								1142
14								1141
15								1140

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 12.19 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 20
Logged By: MG	Completion Date: 2017 September 20
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: **17A23BH6**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1170.49 m
Tungsten, Northwest Territories	UTM: 540075.632 E; 6870950.378 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
0	Sonic	SAND (FILL) - gravelly, some silt, trace cobbles, damp, brown, fine sand						1170
1		- red, trace plastic debris						
		- no visible staining, hydrocarbon odour		6-1				1169
2								
								1168
3								
				6-2				1167
		- silty						
4								
								1166
		END OF BOREHOLE (4.50 metres) Note: Backfilled at completion						
5								1165
6								1164
7								1163
8								1162
9								1161
10								1160
11								1159
12								1158
13								1157
14								1156
15								

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 4.5 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 26
Logged By: NH	Completion Date: 2017 September 26
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A23BH7

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1170.153 m
Tungsten, Northwest Territories	UTM: 540067.383 E; 6870946.213 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Sonic	SAND (FILL) - gravelly, trace to some silt, damp, reddish brown, fine sand - brown - silty						1170
1								1169
2		- trace to some cobbles		7-1				1168
3				7-2				1167
4								1166
4.5		END OF BOREHOLE (4.50 metres) Note: Backfilled at completion						
5								1165
6								1164
7								1163
8								1162
9								1161
10								1160
11								1159
12								1158
13								1157
14								1156
15								

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 4.5 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 26
Logged By: NH	Completion Date: 2017 September 26
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: **17A23BH8**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	
Tungsten, Northwest Territories	UTM: 540067 E; 6870954 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Depth (ft)
0								0
1	Sonic	SAND (FILL) - gravelly, some silt, damp, brownish grey						2
		- trace organics						4
		- trace to some cobbles						
2		- silty, trace to some gravel, dark brown, fine sand		8-1	■			6
		SAND - some gravel, trace to some silt, damp, brown						8
3		- pulverized white rock						10
				8-2	■			12
4								14
5		END OF BOREHOLE (4.50 metres) Note: Backfilled at completion						16
								18
6								20
								22
7								24
								26
8								28
								30
9								32
								34
10								36
								38
11								40
								42
12								44
								46
13								48
14								
15								

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 4.5 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 26
Logged By: NH	Completion Date: 2017 September 26
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: 17A23TP1

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1170.201 m
Tungsten, Northwest Territories	UTM: 540081.546 E; 6870956.995 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
	Excavated	SAND (FILL) - some silt, some gravel, trace clay, damp to moist, soft, brown		1-1	258			1170
		- black staining, moderate hydrocarbon odour		1-2		16% particles <75 µm (ie. smaller than sand particle)		
		GRAVEL (FILL) - sandy, some silt, some cobbles, damp, dense, brown						
1				1-3				1169
		COBBLES (FILL) - some boulders, some sand, trace gravel, damp, dense, brown						
2				1-4				
		END OF TESTPIT (2.0 metres) Note: Stopped due to refusal Backfilled at completion						1168
3								1167
4								1166
5								

TETRA TECH

Contractor: NATC	Completion Depth: 2 m
Drilling Rig Type: Track Excavator	Start Date: 2017 September 11
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A23TP2**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1170.546 m
Tungsten, Northwest Territories	UTM: 540086.461 E; 6870952.774 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
	Excavated	GRAVEL (FILL) - sandy, some silt, some cobbles, damp, loose, brown, (300 mm thick)		2-1				
		BOULDERS (FILL) - some cobbles, trace to some sand, trace silt, damp, dense, brown						1170
1				2-2				
		END OF TESTPIT (1.2 metres) Note: Backfilled at completion						1169
2								
								1168
3								
								1167
4								
								1166
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.2 m
Drilling Rig Type: Track Excavator	Start Date: 2017 September 12
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: 17A23TP3

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1171.222 m
Tungsten, Northwest Territories	UTM: 540083.964 E; 6870945.803 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0		SAND (FILL) - some silt, some gravel, trace clay, damp, soft, brownish grey, (300 mm thick)						
		- red staining, oxidation		3-1	■			1171
		GRAVEL (FILL) - some sand, some cobbles, trace silt, damp, grey, (300 mm thick)						
		SAND (FILL) - some gravel, trace cobbles, trace silt, trace boulders, damp, firm, light brown, wood debris, wire debris						
1	Excavated			3-2	■			
		- brown						1170
		- light brown						
		SAND (TAILINGS) - silty, trace gravel, damp, loose, red						
2				3-3	■	26% particles <75 µm (ie. smaller than sand particle)		
		END OF TESTPIT (2.2 metres) Note: Stopped due to refusal on boulder Backfilled at completion						1169
3								1168
4								1167
5								

TETRA TECH

Contractor: NATC	Completion Depth: 2.2 m
Drilling Rig Type: Track Excavator	Start Date: 2017 September 12
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A23TP4**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1170.61 m
Tungsten, Northwest Territories	UTM: 540076.725 E; 6870947.451 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND (FILL)- silty, some gravel, trace clay, damp, soft, brownish grey, (300 mm thick)		4-1				1170
		- red staining, oxidation						
		GRAVEL (FILL) - sandy, some silt, damp, dense, reddish grey, (200 mm thick)						
		SAND - gravelly, some cobbles, trace boulders, damp, dense, brownish grey						
		- weathered rock, extremely weak, white		4-2				
1		- silty, sandy, black, no discernible hydrocarbon odour		4-3				
				4-4				
		END OF TESTPIT (1.4 metres)						1169
		Note: Stopped due to refusal on boulder						
		Backfilled at completion						
2								1168
3								1167
4								1166
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.4 m
Drilling Rig Type: Track Excavator	Start Date: 2017 September 12
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A23TP5**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1170.062 m
Tungsten, Northwest Territories	UTM: 540066.807 E; 6870953.018 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
	Excavated	SAND (FILL) - silty, some gravel, trace clay, damp, soft, reddish brown						1170
		- grey, no discernible odour		5-1				
		- gravelly, some silt, some cobbles, trace boulders, dense, blackish grey						
1				5-2				1169
		- 250 mm thick sand layer - red		5-3				
		END OF TESTPIT (1.25 metres) Note: Backfilled at completion						
2								1168
3								1167
4								1166
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.25 m
Drilling Rig Type: Track Excavator	Start Date: 2017 September 12
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A23TP6**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1170.456 m
Cantung, Northwest Territories	UTM: 540082.274 E; 6870952.925 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL (FILL) - some sand, well graded, moist, brown, medium angular gravel, (200 mm thick)		6-1			1170.4
0.2		SAND AND GRAVEL - cobbly, some boulders, well graded, moist, brown, fine to coarse sand, angular cobbles to 300 mm diameter, boulders to 500 mm diameter					1170.2
0.4				6-2			1170.0
0.6							1169.8
0.8							1169.6
1.0				6-3			
		END OF TESTPIT (1.00 metre) Location: 11 m south of the diesel pump station Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1169.4
1.2							1169.2
1.4							1169.0
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 27
Logged By: BB	Completion Date: 2018 June 27
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A23TP7**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1170.029 m
Cantung, Northwest Territories	UTM: 540063.454 E; 6870958.281 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							1170.0
	Excavated	GRAVEL (FILL) - sandy, some silt, well graded, moist, brown, medium angular gravel		7-1			
0.2		- grey, strong hydrocarbon odour					1169.8
0.4				7-2			1169.6
0.6		SAND (FILL) - silty, cobbly, well graded, moist, brown, fine to medium sand					1169.4
0.8							1169.2
1.0				7-3			
		END OF TESTPIT (1.00 metre) Location: 9 m southwest of diesel pump Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1169.0
1.2							1168.8
1.4							1168.6
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 27
Logged By: BB	Completion Date: 2018 June 27
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A23TP8**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1170.469 m
Cantung, Northwest Territories	UTM: 540075.326 E; 6870951.283 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL (FILL) - some sand, well graded, moist, brown, medium angular gravel, (150 mm thick)		8-1			1170.4
0.2		SAND (FILL) - cobbly, some silt, some gravel, well graded, moist, brown grey, fine to coarse sand, angular cobbles to 300 mm diameter					1170.2
		- hydrocarbon odour		8-2			
0.4							1170.0
0.6							1169.8
0.8							1169.6
				8-3			
1.0		END OF TESTPIT (1.00 metre) Location: 10.5 m southwest of the diesel pump station Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1169.4
1.2							1169.2
1.4							1169.0
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 27
Logged By: BB	Completion Date: 2018 June 27
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A23TP9**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1169.476 m
Cantung, Northwest Territories	UTM: 540037.269 E; 6870977.977 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0		GRAVEL (FILL) - some sand, well graded, moist, light brown, medium angular gravel, (150 mm thick)		9-1			1169.4
0.2		GRAVEL - cobbly, some sand, some boulders, well graded, moist, grey, fine to coarse angular gravel					1169.2
0.4		- rusty brown		9-2			1169.0
0.6							1168.8
0.8		- light brown		9-3			1168.6
1.0		END OF TESTPIT (1.00 metre) Location: 13.5 m southwest of diesel fueling station at southeast corner of tank farm Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1168.4
1.2							1168.2
1.4							
1.5							1168.0

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 27
Logged By: BB	Completion Date: 2018 June 27
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A23TP10**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1169.72 m
Cantung, Northwest Territories	UTM: 540056.656 E; 6870951.02 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	SAND AND GRAVEL - silty, cobbly, homogenous, well graded, moist, very compact, medium brown, subrounded gravel, fine to coarse sand and gravel, cobbles to 150 mm diameter		10-1			1169.6
0.2				10-2			1169.4
		- trace grey staining, no discernible odour					
0.4		SAND AND GRAVEL - cobbly, some boulders, trace silt, well graded, light to yellowish brown, subrounded gravel, fine to coarse sand and gravel, subangular to subrounded cobbles to 200 mm diameter, subrounded boulders to 450 mm diameter					1169.2
0.6							
							1169.0
0.8				10-3			1168.8
1.0		END OF TESTPIT (1.00 metre) Note: Testpit location surveyed by Tetra Tech on August 28, 2018					
							1168.6
1.2							
							1168.4
1.4							
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 August 28
Logged By: DT	Completion Date: 2018 August 28
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A23TP11**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1169.748 m
Cantung, Northwest Territories	UTM: 540052.004 E; 6870963.681 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	SAND AND GRAVEL - silty, cobbly, homogenous, well graded, moist, very compact, grey to medium brown, subrounded gravel, fine to coarse sand and gravel, cobbles to 150 mm diameter, (200 mm thick)		11-1			1169.6
0.2		SAND AND GRAVEL - cobbly, some boulders, trace silt, well graded, medium brown, subrounded gravel, fine to coarse sand and gravel, subangular to subrounded cobbles to 200 mm diameter, subrounded boulders to 450 mm diameter		11-2			1169.4
0.4							
		SILT AND SAND - some gravel, moist, very compact, light grey, fine to coarse sand, very fine gravel, possible staining, no discernible odour or sheen					1169.2
0.6				11-3			
							1169.0
0.8		END OF TESTPIT (0.80 metres) Note: Stopped due to risk of damaging tank farm berm Testpit location surveyed by Tetra Tech on August 28, 2018					
							1168.8
1.0							
							1168.6
1.2							
							1168.4
1.4							
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 0.8 m
Drilling Rig Type: Backhoe	Start Date: 2018 August 28
Logged By: DT	Completion Date: 2018 August 28
Reviewed By: SS	Page 1 of 1

Photo 1: Facing northwest at fuel transfer area. Current tank farm visible in background. (September 17, 2017)

Photo 2: Panorama of fuel transfer area (on other side of truck, between truck and tank farm). Tank farm visible on the left. (September 4, 2017)

Photo 3: Facing east at current tank farm and fuel transfer area (circled). Photo provided by NATC. (May 29, 2014)

AEC 26

AEC 26: Diesel Line Between Tank Farm and Fueling Area

Area Description		
Location	Northwest of Mill Building, extending from Fuel Transfer Area (AEC 23) to Old Tank Farm and Fueling Area (AEC 14).	
Topography	Intervals of slight declines and steep declines to northeast due to mine road switchbacks	
Surface Drainage	Northeast	
Background	Pipeline that transfers fuel from Fuel Transfer Shed to fueling area in vicinity of old Tank Farm.	
Historical Assessment Information		
Phase II Environmental Site Assessment (EBA, 2009)	Number of surface soil samples:	3
	Number of soil samples analyzed for metals:	0
	Number of soil samples analyzed for petroleum hydrocarbons:	3
	Number of soil samples with petroleum hydrocarbons impacts:	2
Comments: Two of three soil samples contained PHC impacts. It was inferred that impacts were from pipeline leaks and/or from AEC 23 (Fuel Transfer Station). The PHC impacts were not delineated.		
2017 Environmental Site Assessment Details		
Environmental Site Assessment Scope		
Utility Locate SOP followed?		Yes
EM 31 Geophysics Complete?		N/A
Number of test pits advanced		5
Number of boreholes advanced		0
Number of hand auger locations advanced		2
Number of soil samples submitted for laboratory chemical analysis		9
Number of boreholes completed as groundwater monitoring wells		0
Number of historical groundwater monitoring wells		0
Number of groundwater samples collected		N/A
Number of sediment and surface soil samples collected		N/A
Geophysics Findings		
N/A		
Soil Investigation and Conditions		
Maximum Depth of Investigation	3.0 mbgs (September 12, 2017)	
General Stratigraphy		

Description	Depth from (mbgs)	Depth to (mbgs)	Observations
Various intervals of sand, gravel and boulders	0	3.0	Fill soil. Buried organics, metal debris, and wood debris observed in several test pits. PHC staining observed in test pit 17A26TP2.

Combustible Vapour Concentrations (CVCs)	
Ranged from 0.2 ppm in several samples to 3.6 ppm in sample 17A26TP5-3	
Groundwater Conditions	
Depth to Groundwater	Varies – see groundwater contour map (Figure A21-2)
Free Product	N/A

AEC 26: Diesel Line Between Tank Farm and Fueling Area

2017 Environmental Site Assessment Results Summary

- Figure A21-1 shows hand auger and test pit locations.
- Figure A21-2 shows groundwater contours, and nearby AEC groundwater and surface water sampling results.
- Table A21-1 summarizes soil lab results relative to guidelines.

General Site Observations

- Current fuel line is HDPE, portions of decommissioned metal fuel line located parallel to existing active fuel line.
- No staining was observed on surface soils surrounding decommissioned and active fuel lines.
- Buried debris including metal and wood was observed in several test pits advanced.
- PHC staining observed in test pit 17A26TP2 at depth of approximately 0.3 mbgs.

Soil: Petroleum Hydrocarbons (PHC)

- Laboratory results less than guidelines with exception of:
  - Sample 17A26HA2-1 at depth of 0.25 mbgs contained PHCs greater than guidelines.
  - Sample 17A26TP2-1 at depth of 0.3 mbgs contained PHCs greater than guidelines.

Soil: Metals

- Various metals exceeded CCME CEQGs including arsenic, barium, cadmium, copper, molybdenum, nickel, selenium, tin, and zinc.
- The following metals also exceeded preliminary background concentrations:
  - Arsenic (17A26TP5 at 0.25 mbgs).
  - Barium (17A26HA1 at 0.25 mbgs, 17A26HA2 at 0.25 mbgs, 17A26TP3 at 1.0 mbgs).
  - Cadmium, (17A26HA1 at 0.25 mbgs, 17A26HA2 at 0.25 mbgs, 17A26TP2 at 0.3 mbgs, 17A26TP3 at 0.35 mbgs, 17A26TP4 at 0.25 mbgs).
  - Selenium (17A26HA1 at 0.25 mbgs, 17A26TP2 at 0.3 mbgs, 17A26TP3 at 0.35 mbgs, 17A26TP4 at 0.25 mbgs, 17A26TP5 at 0.25 mbgs).
  - Zinc (17A26TP2 at 0.3 mbgs, 17A26TP3 at 0.35 mbgs, 17A26TP4 at 0.25 mbgs).

Soil: Other PCOCs (PAHs)

- Laboratory results less than detection limits and guidelines.

Soil: Routine (pH)

- Laboratory results within guidelines.

Groundwater: Petroleum Hydrocarbons

N/A

Groundwater: Metals/Routine Parameters

N/A

Groundwater: Other PCOCs

N/A

Sediment: Petroleum Hydrocarbons

N/A

Sediment: Metals

N/A

Sediment: Other PCOCs

N/A

Surface Water: Petroleum Hydrocarbons

N/A

Surface Water: Metals/Nutrients

N/A

Surface Water: Other PCOCs

N/A

Grainsize Analysis

N/A

AEC 26: Diesel Line Between Tank Farm and Fueling Area

Environmental Concerns			
Location in AEC	**Potential Source(s)**	**Identified Contaminated Media**	**Parameters Assessed and Contaminant(s) of Concern (COCs; bold & underline)**
Extending from Fuel Transfer Shed to Old Tank Farm	Leaks from fuel line	Soil	**Soil:** Metals, **petroleum hydrocarbons (PHCs)**, polycyclic aromatic hydrocarbons (PAHs)

Discussion (Significance of Results)

Soils:

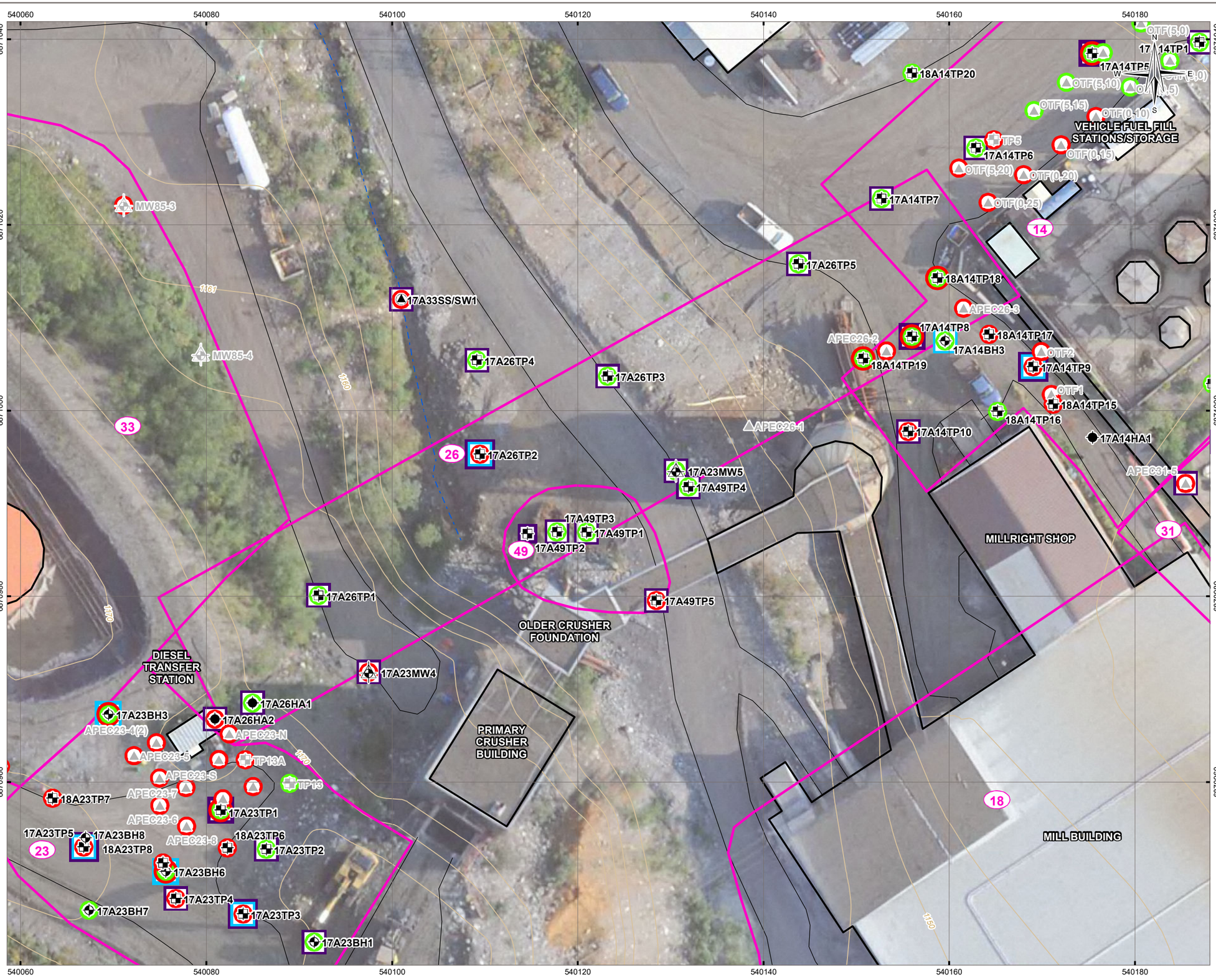
- The PHC impacts identified at 17A26TP2 have been horizontally delineated to northwest and northeast, and have also been delineated to southeast based on results of assessment conducted for AEC 49. Further, PHC affected area is bounded to southwest by mountain face. The PHC impacts have not been vertically delineated, however based on site observations PHC impacts appear to be limited to depth of 0.5 mbgs.
- The PHC impacts identified at 17A26HA2 are suspected to be associated with surface release at fuel transfer shed (AEC 23). These impacts have been horizontally delineated to southeast, northeast, and have been vertically delineated based on this assessment and assessment conducted for AEC 23.
- PAHs were not detected and are no longer considered PCOCs in soil at this AEC.
- Based on current assessment results, maximum estimated depth of PHC impacts used to calculate contaminated soil volumes in affected area is 0.5 mbgs.
- Metals concentrations are generally high with multiple exceedances of both CCME CEQGs and preliminary background concentrations.

Further Assessment Requirements

- None

Attachments

Figure A26-1 – Soil and Sediment Results
Figure A26-2 – Groundwater contours, and nearby surface water and groundwater Results
Table A26-1 – Soil Analytical Results
Hand Auger and Test pit Logs
Photographs

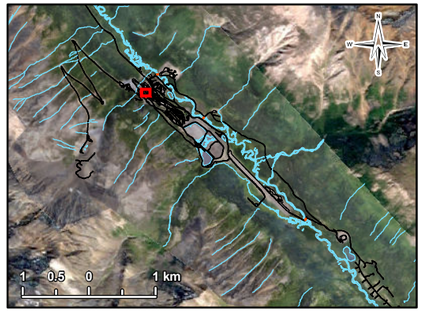


LEGEND

- Area of Environmental Concern (AEC)
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- 2017 Surface Water/Sediment Sample (SW/SS)
- Historical Monitoring Well
- Historical Testpit
- Historical Shallow Soil Sample

Soil/Sediment Analytical Results

- PHC Impacts
- PHC Impacts, vertically delineated
- No PHC Impact
- Metals exceedance of preliminary background concentrations, or in the absence of background concentrations, exceedance of CCME guidelines
- Metals exceedance, vertically delineated
- No metals exceedance of CCME guidelines or preliminary background concentrations
- Building
- Road
- Ditch
- Contour (2 m)



NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 26
Diesel Line Between Tank Farm and Fueling Area
Soil and Sediment Results

PROJECTION	DATUM	CLIENT
UTM Zone 9	NAD83	NORTH AMERICAN TUNGSTEN CORPORATION LTD

Scale: 1:400
5 2.5 0 5
Metres

TETRA TECH

FILE NO.
WENW03039-03_Summary_A26-1.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	BB	BB	0

DATE
June 22, 2020

PROJECT NO.
ENW.WENW03039-03

A26-1

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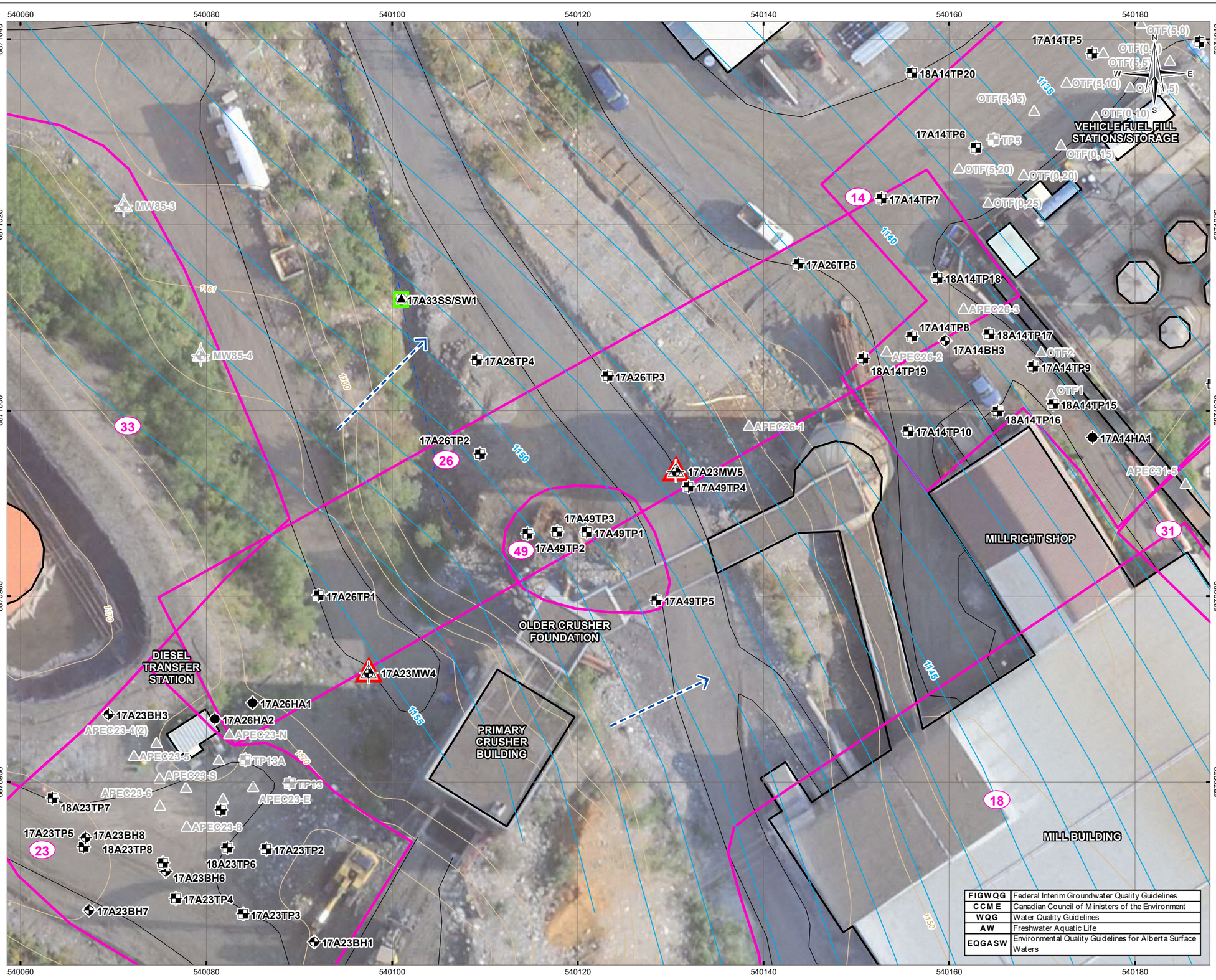


FIGWQG	Federal Interim Groundwater Quality Guidelines
CCME	Canadian Council of Ministers of the Environment
WQG	Water Quality Guidelines
AW	Freshwater Aquatic Life
EQGASW	Environmental Quality Guidelines for Alberta Surface Waters

LEGEND

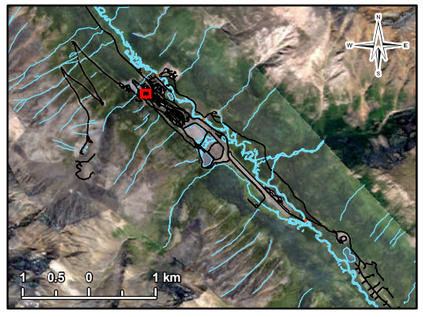
- Area of Environmental Concern (AEC)
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- 2017 Surface Water/Sediment Sample (SW/SS)
- Historical Monitoring Well
- Historical Testpit
- Historical Shallow Soil Sample
- Inferred Groundwater Flow Direction
- Groundwater Contour (1 m asl; Fall 2017)

2017/2018 Groundwater Analytical Results

- Samples contain parameters that exceeded the preliminary background concentrations, or in the absence of background concentrations, FIGWQG

2017 Surface Water Analytical Results

- Samples contain parameters that met the Flat River WQOs, or in the absence of WQOs, CCME WQG for the protection of AW or EQGASW
- Building
- Road
- Ditch
- Contour (2 m)



NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 26
Diesel Line Between Tank Farm and Fueling Area
Groundwater and Surface Water Results

PROJECTION: UTM Zone 9		DATUM: NAD83		CLIENT: NORTH AMERICAN TUNGSTEN CORPORATION LTD	
Scale: 1:400 (5 2.5 0 5 Metres)				TETRA TECH	
FILE NO.: WENW03039-03_Summary_A26-2.mxd					
OFFICE: Tt-VANC	DWN: SL	CKD: BB	APVD: SS	REV: 0	A26-2
DATE: June 22, 2020	PROJECT NO.: ENW.WENW03039-03				

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Table A26-1: Soil Analytical Results

Parameter	Unit	Most Stringent of Referenced Guidelines[1,2,3]	Preliminary Background Concentration[4]	A26								
				17A26HA1	17A26HA2	17A26TP1	17A26TP2		17A26TP3		17A26TP4	17A26TP5
				17A26HA1-1	17A26HA2-1	17A26TP1-1	17A26TP2-1	17A26TP2-3	17A26TP3-1	17A26TP3-2	17A26TP4-1	17A26TP5-1
				0.25 m	0.25 m	0.3 m	0.3 m	2.0 m	0.35 m	1.0 m	0.25 m	0.25 m
				9/13/2017	9/13/2017	9/12/2017	9/12/2017	9/12/2017	9/12/2017	9/12/2017	9/14/2017	9/15/2017
Asbestos Fibres												
Asbestos fibres	%		NG	-	-	-	-	-	-	-	-	-
Cyanide												
Cyanide (SAD)	mg/kg	NG	NG	-	-	-	-	-	-	-	-	-
Cyanide (WAD)	mg/kg	0.9	NG	-	-	-	-	-	-	-	-	-
Routine / Salinity												
pH	pH Units	6-8	NG	7.62	7.92	7.42	7.11	7.93	7.34	7.62	6.84	7.19
Moisture	%	NG	NG	9.71	10.3	12.2	8.2	-	8.7	-	5.45	22.8
Metals												
Antimony	mg/kg	20	NG	4.6	4.4	1.2	0.3	0.4	0.8	1.1	0.6	0.8
Arsenic	mg/kg	12	64	**29.4**	**20.1**	**25.2**	5.2	**24.1**	**31.4**	**21.9**	7.4	**69**
Barium	mg/kg	500	946	**2000**	**2850**	**773**	37.6	237	339	**972**	139	147
Beryllium	mg/kg	4	NG	0.7	0.5	1.1	2.6	0.8	1.5	1.2	1.5	1.5
Cadmium	mg/kg	1.4	2.8	**3.3**	**3.05**	1.26	**6.22**	0.54	**6.18**	**1.93**	**3.78**	1.15
Chromium	mg/kg	64	NG	24	18	27	12	25	22	17	21	34
Cobalt	mg/kg	40	NG	18.8	12.9	16	28.7	10.2	19.4	18.5	24.2	16.7
Copper	mg/kg	63	NG	**276**	**98.6**	**352**	**2020**	52.3	**909**	**417**	**1100**	**330**
Lead	mg/kg	70	NG	30.6	19.8	16.2	8.8	14	14.1	11	10.5	15
Mercury	mg/kg	6.6	NG	1.26	0.68	0.69	0.09	0.24	0.4	0.82	1.62	0.52
Molybdenum	mg/kg	5	10	**7.8**	**7.2**	2.9	3.6	1.5	3.2	3.6	6	**5.3**
Nickel	mg/kg	45	72	**61.8**	**60.5**	32.4	9	21.1	25	22.6	22.3	34.2
Selenium	mg/kg	1	1.7	**2**	**1.5**	**1.5**	**6**	0.5	**2.2**	**1.5**	**3.7**	**2.3**
Silver	mg/kg	20	NG	<0.5	<0.5	<0.5	1.3	<0.5	0.6	0.6	0.9	0.5
Thallium	mg/kg	1	NG	0.4	0.4	0.3	0.6	0.2	0.4	0.4	0.5	0.6
Tin	mg/kg	5	NG	2.6	0.8	1.5	**6.4**	1.1	3.7	2.8	5	2.8
Uranium	mg/kg	23	NG	2.8	1.9	1.6	2.5	1.7	2.4	1.8	2.3	2.4
Vanadium	mg/kg	130	160	85	94	50	14	35	44	38	22	53
Zinc	mg/kg	200	462	**343**	**365**	161	**688**	62	**537**	**207**	**747**	**254**
Petroleum Hydrocarbons												
Benzene	mg/kg	0.03	NG	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005
Toluene	mg/kg	0.1	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Ethylbenzene	mg/kg	0.082	NG	<0.01	<0.01	<0.01	<0.01	-	<0.01	-	<0.01	<0.01
Xylenes (m & p)	mg/kg	NG	NG	-	-	-	-	-	-	-	-	-
Xylene (m)	mg/kg	NG	NG	<0.02	0.02	<0.02	<0.02	-	<0.02	-	<0.02	<0.02
Xylene (o)	mg/kg	NG	NG	<0.02	<0.02	<0.02	<0.02	-	<0.02	-	<0.02	<0.02
Xylenes Total	mg/kg	0.1	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Volatile Hydrocarbons (VH6-10)	mg/kg	NG	NG	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	mg/kg	30	NG	<10	<10	<10	<10	-	<10	-	<10	<10
VPH C6-C10	mg/kg	NG	NG	-	-	-	-	-	-	-	-	-
F1 (C6-C10 / BTEX CORRECTED)	mg/kg	30	NG	<10	<10	<10	<10	-	<10	-	<10	<10
F2 (C10-C16)	mg/kg	150	NG	<20	**216**	<20	<20	-	<20	-	<20	<20
F3 (C16-C34)	mg/kg	300	NG	152	**714**	248	321	-	69	-	183	38
F4: (C34-C50)	mg/kg	2800	NG	62	182	104	192	-	33	-	64	<20
Polycyclic Aromatic Hydrocarbons (PAHs)												
IACR (CCME)	mg/kg	1	NG	<0.6	<0.6	<0.6	<0.6	-	<0.6	-	<0.6	<0.6
B(a)P Total Potency Equivalent	mg/kg	0.6	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
2-methylnaphthalene	mg/kg	NG	NG	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005
Acenaphthene	mg/kg	NG	NG	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005
Acenaphthylene	mg/kg	NG	NG	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005
Anthracene	mg/kg	2.5	NG	0.004	<0.004	<0.004	<0.004	-	<0.004	-	<0.004	<0.004
Benz(a)anthracene	mg/kg	0.1	NG	<0.03	<0.03	<0.03	<0.03	-	<0.03	-	<0.03	<0.03
Benzo(a) pyrene	mg/kg	0.1	NG	<0.03	<0.03	<0.03	<0.03	-	<0.03	-	<0.03	<0.03
Benzo(b)fluoranthene	mg/kg	0.1	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg	NG	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Benzo(e)pyrene	mg/kg	NG	NG	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	NG	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Benzo(k)fluoranthene	mg/kg	0.1	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Chrysene	mg/kg	NG	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Dibenz(a,h)anthracene	mg/kg	0.1	NG	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005
Fluoranthene	mg/kg	50	NG	<0.01	<0.01	<0.01	<0.01	-	<0.01	-	<0.01	<0.01
Fluorene	mg/kg	NG	NG	<0.02	<0.02	<0.02	<0.02	-	<0.02	-	<0.02	<0.02
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	NG	<0.02	<0.02	<0.02	<0.02	-	<0.02	-	<0.02	<0.02
Naphthalene	mg/kg	0.013	NG	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005
Phenanthrene	mg/kg	0.046	NG	<0.02	<0.02	<0.02	<0.02	-	<0.02	-	<0.02	<0.02
Pyrene	mg/kg	0.1	NG	<0.01	0.01	<0.01	0.01	-	<0.01	-	<0.01	<0.01
Benzo(j)fluoranthene	ug/g	NG	NG	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05
Volatile Organic Compounds (VOCs)												
1-Methylnaphthalene	mg/kg	NG	NG	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005
Acetone	mg/kg	NG	NG	-	-	-	-	-	-	-	-	-
			Sample ID	8737241	8737251	8728526	8728549	8728554	8728567	8728572	8736055	8738039
			Lab Report Number	17Y262351	17Y262351	17Y261400	17Y261400	17Y261400	17Y261400	17Y261400	17Y262211	17Y262409

Notes:

[1] - Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008)

[2] - Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 1999)

[3] - Northwest Territories Environmental Guideline for Contaminated Site Remediation (NWT CSR 2003)

[4] - Preliminary Background Concentration

Italic - Laboratory detection limit is greater one or more referenced guidelines

NG - No guideline

Shaded - Exceeds most stringent CCME CEQG or CWS PHC land-use guideline value

Bold - Exceeds most stringent NWT CSR land-use guideline value

Bold and Shaded - Exceeds most stringent CCME CEQC or CWS PHC land-use guideline value, and exceeds most stringent NWT CSR land-use guideline value

Red - Exceeds Preliminary Background Concentration

N/A - Not applicable

Blank - Not analyzed

North American Tungsten Corporation Ltd.

Testpit No: **17A26TP1**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1162.433 m
Tungsten, Northwest Territories	UTM: 540092.079 E; 6870980.118 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND (FILL) - silty, some gravel, some cobbles, damp, soft, brown						
		- red						
		- wood and metal debris		1-1				
		- some gravel, some cobbles, some boulders, no visible silt or debris						1162
		- buried organics for 300 mm		1-2				
1								1161
		- weathered rock, extremely weak, black						
2				1-3				
				1-4				1160
		END OF TESTPIT (2.5 metres) Note: Stopped due to refusal Backfilled at completion						
3								1159
4								1158
5								

TETRA TECH

Contractor: NATC	Completion Depth: 2.5 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 12
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A26TP2**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1155.018 m
Tungsten, Northwest Territories	UTM: 540109.452 E; 6870995.319 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								1155
	Excavated	SAND (FILL) - silty, some gravel, trace clay, damp to moist, soft, brown red						
		- grey staining, slight hydrocarbon odour		2-1				
		GRAVEL (FILL) - sandy, some cobbles, some boulders, damp, dense, reddish brown		2-2				
1		BOULDERS (GLACIOFLUVIAL/GLACIAL TILL FILL) - some sand, some cobbles, some gravel						1154
		- wood debris						
2				2-3				1153
		- metal box buried						
				2-4				
3		END OF TESTPIT (2.7 metres) Note: Stopped due to refusal on boulders Backfilled at completion						1152
4								1151
5								

TETRA TECH

Contractor: NATC	Completion Depth: 2.7 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 12
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A26TP3**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1154.685 m
Tungsten, Northwest Territories	UTM: 540123.215 E; 6871003.709 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND (FILL) - silty, some gravel, trace clay, damp to moist, soft, reddish brown		3-1				1154
		- some cobbles, some boulders, damp, dense, reddish brown						
1		BOULDERS (GLACIOFLUVIAL/GLACIAL TILL FILL) - sandy, some cobbles, some gravel - wood debris		3-2				1153
2				3-3				
		- buried wood debris						1152
3				3-4				
		END OF TESTPIT (3.0 metres) Note: Backfilled at completion						1151
4								
								1150
5								

TETRA TECH

Contractor: NATC	Completion Depth: 3 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 12
Logged By: NH	Completion Date: 2017 September 12
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A26TP4**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1155.021 m
Tungsten, Northwest Territories	UTM: 540109.121 E; 6871005.447 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								1155
	Excavated	SAND (FILL) - silty, some gravel, some cobbles, damp, soft, reddish brown, no visible staining, no discernible hydrocarbon odour, (300 mm thick)		4-1				
		GRAVEL (FILL) - sandy, some cobbles, some boulders, trace silt, damp, dense, brown, wood and metal debris, no visible staining, no discernible hydrocarbon odour						
1		END OF TESTPIT (1.0 metre) Note: Backfilled at completion						1154
2								1153
3								1152
4								1151
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 14
Logged By: NH	Completion Date: 2017 September 14
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A26TP5**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1145.614 m
Tungsten, Northwest Territories	UTM: 540143.761 E; 6871015.813 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
	Excavated	SAND (FILL) - silty, some gravel, trace cobbles, damp, soft, reddish brown						
		- trace organics, rootlets		5-1				
		- gravelly, some cobbles, trace silt, trace boulders, no visible organics or rootlets, damp, dense, brown						1145
		- some boulders		5-2				
1								1144
				5-3				
		END OF TESTPIT (1.8 metres) Note: Backfilled at completion						
2								1143
3								1142
4								1141
5								

TETRA TECH

Contractor: NATC	Completion Depth: 1.8 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 15
Logged By: NH	Completion Date: 2017 September 15
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A26HA1**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1169.117 m
Tungsten, Northwest Territories	UTM: 540084.977 E; 6870968.532 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Hand auger	SAND (FILL) - silty, some gravel, trace rootlets, damp to moist, brown, trace oxides		1-1				1169
		- trace to some cobbles		1-2				
		END OF HAND AUGER (0.6 metres) Note: Stopped due to refusal on cobbles Backfilled at completion						
1								1168
2								1167
3								1166
4								1165
5								

TETRA TECH

Contractor:	Completion Depth: 0.6 m
Drilling Rig Type:	Start Date: 2017 September 13
Logged By: NH	Completion Date: 2017 September 13
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A26HA2**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1169.278 m
Tungsten, Northwest Territories	UTM: 540080.905 E; 6870966.797 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Hand auger	SAND (FILL) - some silt, some gravel, trace rootlets, damp, soft, brown, trace oxides, plastic debris - trace to some cobbles		2-1				1169
		END OF HAND AUGER (0.3 metres) Note: Stopped due to refusal on cobbles Backfilled at completion						
1								1168
2								1167
3								1166
4								1165
5								

TETRA TECH

Contractor:	Completion Depth: 0.3 m
Drilling Rig Type:	Start Date: 2017 September 13
Logged By: NH	Completion Date: 2017 September 13
Reviewed By: JW	Page 1 of 1

Photo 1: Facing west at diesel line from elevation of old tank farm and fueling area. Tank farm visible in background. (September 21, 2017)

Photo 2: Diesel line runs up the slope to the right towards tank farm. (September 21, 2017)

AEC 27

AEC 27: Main Portal and Former Portal Fueling Area

Area Description		
Location	Southwest of Compressor Building/Backfill Plant	
Topography	Generally flat with slight slope to northeast	
Surface Drainage	Northeast	
Background	A former fuel aboveground storage tank and fueling area was located on north portion of area. There was significant historical mine vehicle traffic in and out of the main portal.	
Historical Assessment Information		
Phase II Environmental Site Assessment (EBA, 2009)	Number of surface soil samples	8
	Number of soil samples analyzed for metals	8
	Number of soil samples analyzed for petroleum hydrocarbons	8
	Number of soil samples with petroleum hydrocarbons impacts	8
	Number of soil samples with metal impacts	8
Comments: All soil samples contained PHC impacts. The impacts were not delineated and groundwater was not assessed as part of study.		
2017/2018 Environmental Site Assessment Details		
Environmental Site Assessment Scope		
Utility Locate SOP followed?		Yes - power de-energized as mitigation in 2017
EM 31 Geophysics Complete?		N/A
Number of test pits advanced		7 (2017), 1 (2018)
Number of boreholes advanced		1 (2017)
Number of hand auger locations advanced		0
Number of soil samples submitted for laboratory chemical analysis		7 (2017), 1 (2018)
Number of boreholes completed as groundwater monitoring wells		0
Number of historical groundwater monitoring wells		0
Number of groundwater samples collected		N/A
Number of sediment and surface soil samples collected		N/A
Geophysics Findings		
N/A		
Soil Investigation and Conditions		
Maximum Depth of Investigation	2.1 mbgs (September 11, 2017)	
General Stratigraphy		

Description	Depth from (mbgs)	Depth to (mbgs)	Observations
Various intervals of silt, sand, gravel and cobbles	0	0.5	Fill soil. Buried asphalt slab observed in several test pits. PHC staining and/or odour observed in 17A27BH1, 17A27TP1 and 17A27TP2.
Bedrock	0.5	2.1	-

Combustible Vapour Concentrations (CVCs)
Ranged from less than 10 parts per million by volume (ppmv) to 125 ppmv in sample 17A27BH1-1

AEC 27: Main Portal and Former Portal Fueling Area

Groundwater Conditions	
Depth to Groundwater	Likely about 4 m as observed at nearby 17A17MW2 (Sept 28, 2017)
Free Product	N/A

2017/2018 Environmental Site Assessment Results Summary

- Figure A27-1 shows borehole and test pit locations.
- Figure A27-2 shows nearby groundwater sampling results at AEC 17.
- Table A27-1 summarizes soil lab results relative to guidelines and management limits.

General Site Observations

- No fuel aboveground storage tanks were observed in AEC.
- No surface stains were observed in area; although appears freshly graded.
- Shallow bedrock was observed in most test pits advanced.
- A discrete interval of stained soil or soil exhibiting PHC odour approximately 5 cm thick was observed in test pits 17A27BH1, 17A27TP1, and 17A27TP2 between surface and approximately 0.75 mbgs.
- Buried asphalt slab observed in several test pits.

Soil: Petroleum Hydrocarbons (PHC, PAHs)

2017

- Laboratory chemical results greater than the CCME/CSR guidelines for one or more of PHCs and PAHs with exception of:
  - Sample 17A27TP4-1 at depth of 0.25 mbgs contained PHCs and PAHs less than guidelines.

2018

- Test pit 18A27TP8 was excavated to delineate the western extent of the management limit exceedance previously identified at 2008 soil sample APEC17-10. The soil sample collected from test pit 18A27TP8 at a depth of 0.5 mbgs and tested for PHCs F2-F4 contained concentrations less than the management limits.

Soil: Metals

- Various metal concentrations exceeded CCME CEQGs including arsenic, cadmium, copper, molybdenum, selenium, and zinc.
- The following metals also exceeded preliminary background concentrations:
  - Cadmium (17A27TP1 at 0.25 mbgs, 17A27TP6 at 0.2 mbgs).
  - Molybdenum (17A27TP1 at 0.25 and 0.75 mbgs).
  - Selenium (17A27TP1 at 0.25 mbgs, 17A27TP6 at 0.2 mbgs).

Soil: Other PCOCs (Glycols)

- Laboratory results less than detection limits and guidelines.

Soil: Routine (pH)

- Laboratory results within guidelines with exception of:
  - Sample 17A27BH1-1 at depth of 0.3 mbgs had pH value outside guideline range.

Groundwater: Petroleum Hydrocarbons

N/A

Groundwater: Metals/Routine Parameters

N/A

Groundwater: Other PCOCs

N/A

Sediment: Petroleum Hydrocarbons

N/A

Sediment: Metals

N/A

Sediment: Other PCOCs

N/A

AEC 27: Main Portal and Former Portal Fueling Area

Surface Water: Petroleum Hydrocarbons
N/A

Surface Water: Metals/Nutrients
N/A

Surface Water: Other PCOCs
N/A

Grainsize Analysis
N/A

Environmental Concerns

Location in AEC	Potential Source(s)	Identified Contaminated Media	Parameters Assessed and Contaminant(s) of Concern (COCs; bold & underline)
Surface of whole area	Leaks, spills from former fuel storage. Leaks/spills from mine vehicles	Soil	**Soil: <u>Metals</u>, <u>petroleum hydrocarbons (PHCs)</u>**, glycols, **<u>polycyclic aromatic hydrocarbons (PAHs)</u>**

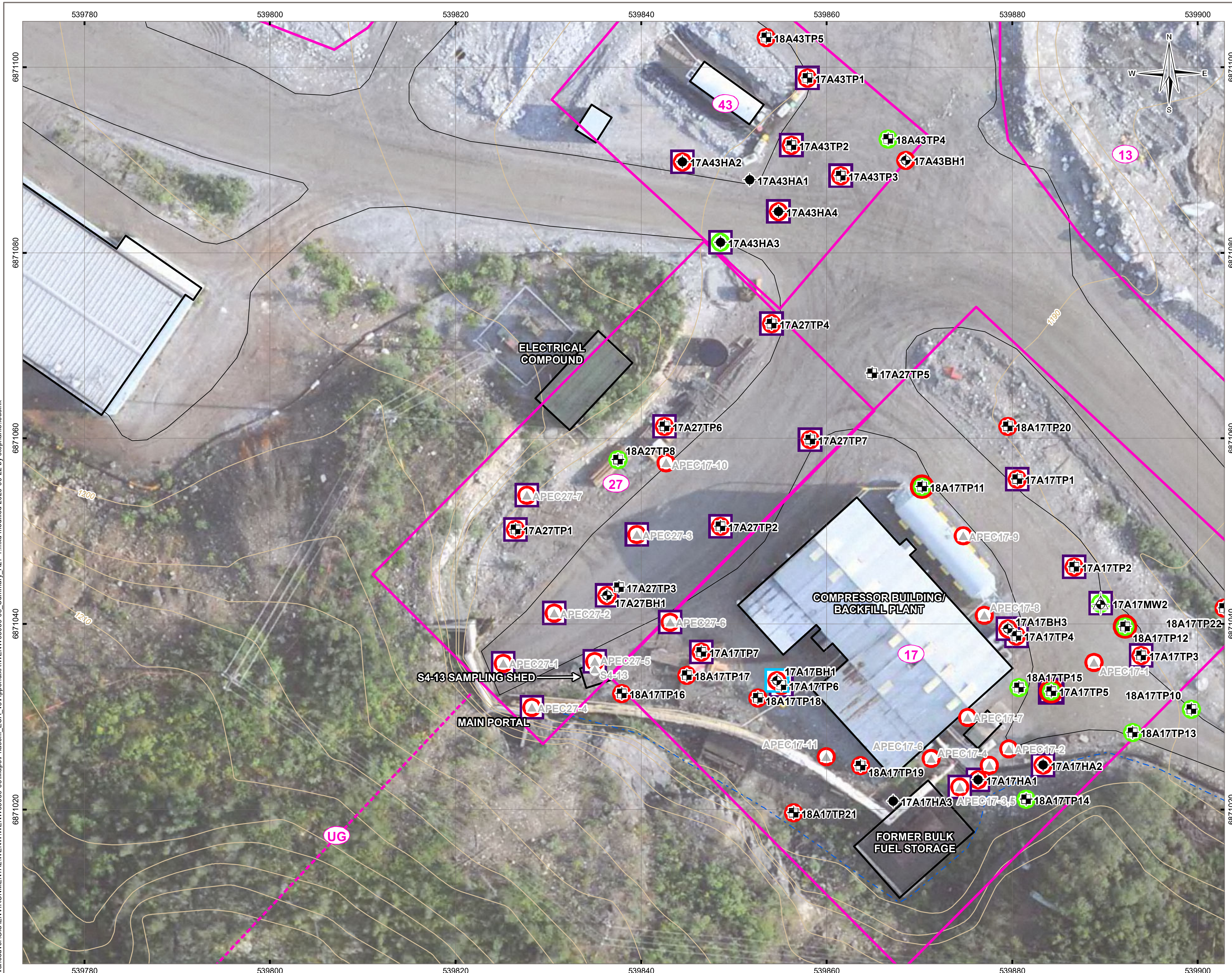
Discussion (Significance of Results)

<u>Soils:</u>

- The PHC affected area appears to be comprised of discrete intervals of stained soil or soil exhibiting PHC odour approximately 5 cm thick between surface and depth of approximately 0.75 mbgs. These shallow impacts appear to extend southeast to APEC 17.
- The bedrock at AEC is generally shallow (i.e., less than 1.5 mbgs).
- The AEC is bounded to northwest and southwest by mountain-face and as result, assessment locations cannot be extended further northwest and southwest from PHC affected area with standard methods (i.e., drilling or test pitting).
- The AEC is bounded to southeast by compressor building (AEC 17) that was also assessed and has similarly PHC affected soils.
- The PHC impacts exceeding the management limits have been horizontally delineated at AEC 27.
- Based on current assessment results, maximum estimated average depth of PHC and PAH impacts used to calculate contaminated soil volumes in affected area is 1.0 mbgs.
- Glycols were not detected and are no longer considered PCOCs in soil at this AEC.
- Metals concentrations moderately high with some parameters exceeding background concentrations.
- In addition, copper in all samples exceeded CCME CEQG.

Attachments

Figure A27-1 – Soil and Sediment Results
Figure A27-2 – Groundwater Results from nearby AEC 17
Table A27-1 – Soil Analytical Results
Borehole and Test pit Logs
Photographs



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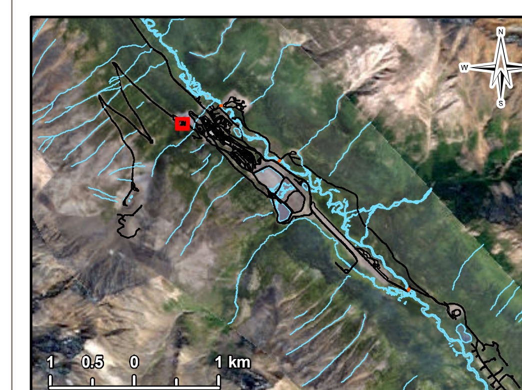
LEGEND

- Area of Environmental Concern (AEC)
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- Historical Shallow Soil Sample
- Historical Surface Water Sample

Soil/Sediment Analytical Results

- PHC Impacts
- PHC Impacts, vertically delineated
- No PHC Impact
- Metals exceedance of preliminary background concentrations, or in the absence of background concentrations, exceedance of CCME guidelines
- No metals exceedance of CCME guidelines or preliminary background concentrations
- Building
- Road
- Ditch
- Contour (2 m)



NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE PHASE III ESA

AEC 27 Main Portal and Former Portal Fueling Area Soil and Sediment Results

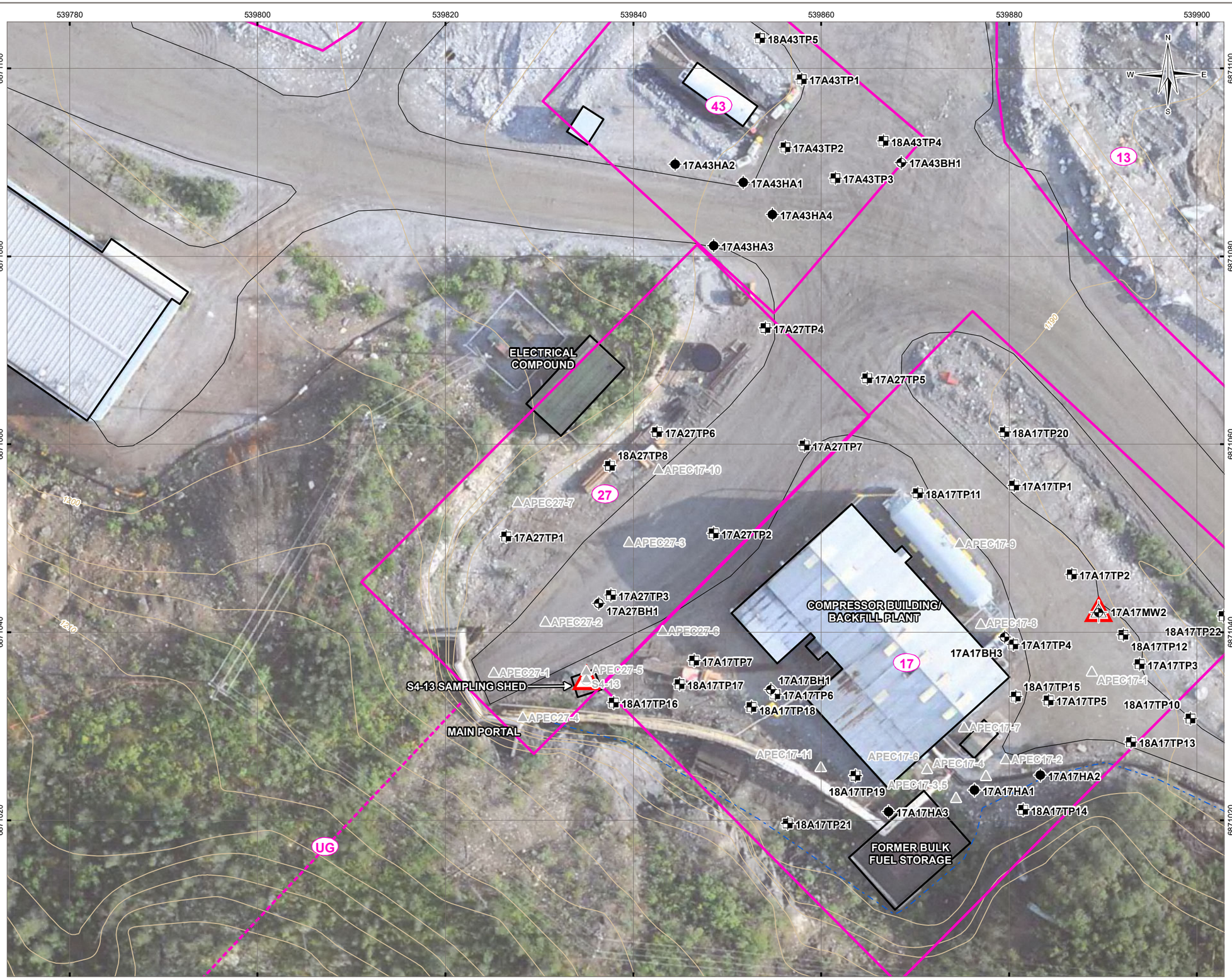
PROJECTION	DATUM	CLIENT
UTM Zone 9	NAD83	NORTH AMERICAN TUNGSTEN CORPORATION LTD

Scale: 1:400
5 2.5 0 5
Metres

TETRA TECH

FILE NO.				
WENW03039-03_Summary_A27-1.mxd				
OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	BB	BB	0
DATE	PROJECT NO.			
June 22, 2020	ENW.WENW03039-03			

A27-1



LEGEND

- Area of Environmental Concern (AEC)
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- Historical Shallow Soil Sample
- Historical Surface Water Sample

2017/2018 Groundwater Analytical Results

- Samples contain parameters that exceeded the preliminary background concentrations, or in the absence of background concentrations, FIGWQG
- Building
- Road
- Ditch
- Contour (2 m)

FIGWQG	Federal Interim Groundwater Quality Guidelines
CCME	Canadian Council of Ministers of the Environment
WQG	Water Quality Guidelines
AW	Freshwater Aquatic Life
EQGASW	Environmental Quality Guidelines for Alberta Surface Waters

NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 27
Main Portal and Former Portal Fueling Area
Groundwater and Surface Water Results

PROJECTION: UTM Zone 9	DATUM: NAD83	CLIENT: NORTH AMERICAN TUNGSTEN CORPORATION LTD		
Scale: 1:400 (5 2.5 0 5 Metres)		TETRA TECH		
FILE NO.: WENW03039-03_Summary_A27-2.mxd				
OFFICE: Tt-VANC	DWN: SL	CKD: BB	APVD: SS	REV: 0
DATE: June 22, 2020	PROJECT NO.: ENW.WENW03039-03			A27-2

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Table A27-1: Soil Analytical Results

				AEC	AEC 27							
				Location	BH1	TP1		TP2	TP4	TP6	TP7	TP8-2
				Sample Depth	0.3 m	0.25 m	0.75 m	0.20 m	0.25 m	0.2 m	0.25 m	0.5 m
				Field ID	17A27BH1-1	17A27TP1-1	17A27TP1-2	17A27TP2-1	17A27TP4-1	17A27TP6-1	17A27TP7-1	18A27TP8-2
				Sample Date	17-Sep-2017	10-Sep-2017	10-Sep-2017	10-Sep-2017	11-Sep-2017	10-Sep-2017	10-Sep-2017	28-Jun-2018
				Laboratory Report Number	8742776	8721651	8721655	8721656	8721694	8721675	8721686	18Y357306
				Laboratory Sample ID	17Y263066	17Y260675	17Y260675	17Y260675	17Y260675	17Y260675	17Y260675	9372364
Parameter	**Unit**	**CCME[1,2] and NWT CSR[3]**	**Background Concentration[4]**	**Management Limits[5]**								
Physical Parameters												
pH	pH Units	6-8	-	-	**8.45**	7.54	7.56	7.72	7.53	7.99	7.54	-
Moisture	%	-	-	-	1.32	18.9	12.3	3.5	9.4	18.2	5.6	13.6
Metals												
Antimony	mg/kg	20	-	-	<0.1	0.6	0.6	0.5	0.4	0.4	0.4	-
Arsenic	mg/kg	12	64	-	1.1	5.8	11.2	4.1	**17.6**	**12.5**	5.3	-
Barium	mg/kg	500	946	-	59.9	89.1	119	156	277	134	193	-
Beryllium	mg/kg	4	-	-	0.8	1.4	1.2	0.9	0.8	1.5	1	-
Cadmium	mg/kg	1.4	2.8	-	0.31	3.29	**2.65**	0.95	0.79	3.85	**1.47**	-
Chromium	mg/kg	64	-	-	17	20	23	15	25	16	11	-
Cobalt	mg/kg	40	-	-	7.4	14.7	14.2	11.5	12.5	14.6	10.3	-
Copper	mg/kg	63	-	-	**260**	**536**	**307**	**445**	**126**	**646**	**319**	-
Lead	mg/kg	70	-	-	8.5	12.7	14.9	14.3	13.5	12.5	18.9	-
Mercury	mg/kg	6.6	-	-	0.13	2.24	1.49	1.45	0.62	2.33	1.36	-
Molybdenum	mg/kg	5	10	-	1.9	13.9	12.2	2.2	1.4	**6.5**	2.7	-
Nickel	mg/kg	45	72	-	13.7	14.6	21.6	12.6	25.5	13.6	12.1	-
Selenium	mg/kg	1	1.7	-	0.8	1.8	**1.6**	**1.3**	0.9	2	**1.1**	-
Silver	mg/kg	20	-	-	<0.5	0.5	<0.5	<0.5	<0.5	0.6	<0.5	-
Thallium	mg/kg	1	-	-	0.3	0.4	0.4	0.4	0.3	0.4	0.3	-
Tin	mg/kg	5	-	-	2.7	4.8	3.1	3.3	1.4	3.8	2.4	-
Uranium	mg/kg	23	-	-	4.5	3.2	2.8	1.9	1.5	2.4	1.7	-
Vanadium	mg/kg	130	160	-	39	28	38	23	36	23	19	-
Zinc	mg/kg	200	462	-	48	**371**	**269**	116	105	**385**	159	-
Petroleum Hydrocarbons												
Benzene	mg/kg	0.03	-	-	0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
Toluene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-
Ethylbenzene	mg/kg	0.082	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
Xylene (m)	mg/kg	-	-	-	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Xylene (o)	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Xylenes Total	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-
F1 (C_6-C_{10})	mg/kg	30	-	-	<10	<10	<10	<10	<10	<10	<10	-
F1 (C_6-C_{10}) - BTEX	mg/kg	30	-	700	<10	<10	<10	<10	<10	<10	<10	-
F2 (C_{10}-C_{16})	mg/kg	150	-	1000	23	79	24	**175**	<20	24	127	<20
F3 (C_{16}-C_{34})	mg/kg	300	-	2500	187	**2480**	**392**	**1970**	262	**384**	**2100**	235
F4 (C_{34}-C_{50})	mg/kg	2800	-	10,000	1260	1800	973	504	171	112	322	56
Glycols												
Diethylene glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	-
Ethylene glycol	mg/kg	960	-	-	<10	<10	<10	<10	<10	<10	<10	-
Propylene glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	-
Tetraethylene Glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	-
Triethylene Glycol	mg/kg	-	-	-	<10	<10	<10	<10	<10	<10	<10	-
Polycyclic Aromatic Hydrocarbons (PAHs)												
B(a)P Total Potency Equivalent	mg/kg	0.6	-	-	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-
IACR (CCME)	mg/kg	1	-	-	0.6	*<6*	<0.6	<0.6	<0.6	<0.6	<0.6	-
Acenaphthene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
Acenaphthylene	mg/kg	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
Anthracene	mg/kg	2.5	-	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	-
Benz(a)anthracene	mg/kg	0.1	-	-	<0.03	*<0.3*	<0.03	<0.03	<0.03	<0.03	<0.03	-
Benzo(a) pyrene	mg/kg	0.1	-	-	<0.03	*<0.3*	<0.03	<0.03	<0.03	<0.03	<0.03	-
Benzo(b)fluoranthene	mg/kg	0.1	-	-	<0.05	*<0.5*	<0.05	<0.05	<0.05	<0.05	<0.05	-
Benzo(b+j)fluoranthene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-
Benzo(j)fluoranthene	mg/kg	-	-	-	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-
Benzo(k)fluoranthene	mg/kg	0.1	-	-	<0.05	*<0.5*	<0.05	<0.05	<0.05	<0.05	<0.05	-
Chrysene	mg/kg	-	-	-	0.17	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-
Dibenz(a,h)anthracene	mg/kg	0.1	-	-	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	-
Fluoranthene	mg/kg	50	-	-	0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	-
Fluorene	mg/kg	-	-	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	-	-	<0.02	*<0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	-
1-Methylnaphthalene	mg/kg	-	-	-	0.242	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
2-Methylnaphthalene	mg/kg	-	-	-	0.293	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
Naphthalene	mg/kg	0.013	-	-	**0.111**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
Phenanthrene	mg/kg	0.046	-	-	**0.07**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Pyrene	mg/kg	0.1	-	-	0.03	<0.1	0.01	0.01	0.01	<0.01	<0.01	-

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008), for coarse textured soils under Agricultural and Residential/Parkland soils

[2] Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 1999), for coarse textured soils under Agricultural and Residential/Parkland soils

[3] Northwest Territories Environmental Guideline for Contaminated Site Remediation (NWT CSR 2003), for coarse textured soils under Agricultural and Residential/Parkland land use

[4] Preliminary Background Concentration

[5] Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil Technical Supplement, for coarse textured soil under Agricultural land use, management limit pathway only

BOLD - Exceeds most stringent CCME or NWT CSR standard/guideline

Red - Exceeds Preliminary Background Concentration

Shaded - Exceeds Management Limits

Italic - Laboratory detection limit is greater than one or more referenced guidelines

"-" Not analyzed or no applicable standard/guideline

TETRA TECH

North American Tungsten Corporation Ltd.

Borehole No: 17A27BH1

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1191.203 m
Tungsten, Northwest Territories	UTM: 539836.317 E; 6871043.093 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0		SAND (FILL) - gravelly, trace to some silt, dry, brown, (150 mm thick)						1191
		ASPHALT - (100 mm thick)						
	Sonic	SAND AND GRAVEL (FILL) - trace to some silt, occasional cobble, brown, slight hydrocarbon odour		1-1	■			
1		- no discernible hydrocarbon odour						1190
		BEDROCK						
		END OF BOREHOLE (1.50 metres)						
		Note: Backfilled at completion						
2								1189
3								1188
4								1187
5								1186
6								1185
7								1184
8								1183
9								1182
10								1181
11								1180
12								1179
13								1178
14								1177
15								

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 1.5 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 17
Logged By: MG	Completion Date: 2017 September 17
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A27TP1

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1191.458 m
Tungsten, Northwest Territories	UTM: 539826.47 E; 6871050.199 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	GRAVEL (FILL) - moist, dense, grey, (50 mm thick)		1-1				1191
		CLAY (FILL) - some silt, trace sand, trace gravel, damp, grey, slight hydrocarbon odour, (250 mm thick)		1-2				
1		ASPHALT - (150 mm thick)						1190
		CLAY (FILL) - gravelly, some sand, some silt, damp to moist, low plastic, brown, trace oxides						
		BEDROCK - no visible staining, no discernible odour						
2		END OF TESTPIT (1.5 metres)						1189
		Note: Backfilled at completion						
3								1188
4								1187
5								1186
6								1185
7								1184
8								1183
9								1182
10								1181
11								1180
12								1179
13								1178
14								1177
15								

TETRA TECH

Contractor: NATC	Completion Depth: 1.5 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 10
Logged By: NH	Completion Date: 2017 September 10
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A27TP2

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1190.938 m
Tungsten, Northwest Territories	UTM: 539848.539 E; 6871050.54 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
	Excavated	GRAVEL (FILL) - sandy, some silt, some cobbles, damp to moist, brownish grey, (100 mm thick)		2-1	■			
		ASPHALT - (50 mm thick)		2-2	■			
1		GRAVEL (FILL) - sandy, trace silt, damp, hard, grey, hydrocarbon staining, moderate hydrocarbon odour						1190
		- no visible staining, no discernible hydrocarbon odour						
2		BEDROCK						1189
		END OF TESTPIT (0.6 metres)						
		Note: Backfilled at completion						
3								1188
4								1187
5								1186
6								1185
7								1184
8								1183
9								1182
10								1181
11								1180
12								1179
13								1178
14								1177
15								1176

TETRA TECH

Contractor: NATC	Completion Depth: 0.6 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 10
Logged By: NH	Completion Date: 2017 September 10
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A27TP3

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1191.251 m
Tungsten, Northwest Territories	UTM: 539837.596 E; 6871043.951 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	GRAVEL (FILL) - sandy, moist, dense, grey, (200 mm thick)		3-2				1191
		ASPHALT		3-1				
1		END OF TESTPIT (0.2 metres) Note: Stopped due to auger refusal on asphalt Backfilled at completion						1190
2								1189
3								1188
4								1187
5								1186
6								1185
7								1184
8								1183
9								1182
10								1181
11								1180
12								1179
13								1178
14								1177
15								

TETRA TECH

Contractor: NATC	Completion Depth: 0.2 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 10
Logged By: NH	Completion Date: 2017 September 10
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A27TP4

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1191.094 m
Tungsten, Northwest Territories	UTM: 539854.085 E; 6871072.383 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	GRAVEL (FILL) - sandy, some silt, some cobbles, trace clay, damp, dense, grey, no visible staining, no discernible hydrocarbon odour		4-1				1191
		- red staining						
1		COBBLES (FILL) - some gravel, trace to some sand, damp, dense, brown		4-2				1190
		SILT (FILL) - some gravel, trace to some cobbles, trace sand, stiff, low plastic, brown		4-4				
		- 200 mm thick sand lens - damp, brown, medium sand, on one side of testpit		4-3				
2		- buried organics						1189
		COBBLES - some gravel, trace boulders, trace sand, damp, dense, brownish grey						
		END OF TESTPIT (2.1 metres)						
		Note: Backfilled at completion						
3								1188
4								1187
5								1186
6								1185
7								1184
8								1183
9								1182
10								1181
11								1180
12								1179
13								1178
14								1177
15								

TETRA TECH

Contractor: NATC	Completion Depth: 2.1 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 11
Logged By: NH	Completion Date: 2017 September 11
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: **17A27TP5**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1190.613 m
Tungsten, Northwest Territories	UTM: 539864.912 E; 6871067.033 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND AND GRAVEL (FILL) - some silt, some cobbles, trace clay, damp, dense, brown, trace oxides		5-1				1190
		BEDROCK						
1		END OF TESTPIT (0.2 metres)						1189
		Note: Stopped due to refusal on bedrock						
		Backfilled at completion						
2								1188
3								1187
4								1186
5								1185
6								1184
7								1183
8								1182
9								1181
10								1180
11								1179
12								1178
13								1177
14								1176
15								

TETRA TECH

Contractor: NATC	Completion Depth: 0.2 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 11
Logged By: NH	Completion Date: 2017 September 11
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: **17A27TP6**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1191.148 m
Tungsten, Northwest Territories	UTM: 539842.537 E; 6871061.29 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND AND GRAVEL (FILL) - some silt, moist, dense, grey, (300 mm thick)		6-1				1191
		- broken rock						
		- some oxides						
1		BEDROCK						1190
		END OF TESTPIT (0.3 metres)						
		Note: Stopped due to refusal on bedrock						
2		Backfilled at completion						1189
3								1188
4								1187
5								1186
6								1185
7								1184
8								1183
9								1182
10								1181
11								1180
12								1179
13								1178
14								1177
15								

TETRA TECH

Contractor: NATC	Completion Depth: 0.3 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 11
Logged By: NH	Completion Date: 2017 September 11
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Borehole No: 17A27TP7

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1190.813 m
Tungsten, Northwest Territories	UTM: 539858.222 E; 6871059.866 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	GRAVEL (FILL) - sandy, some silt, moist, dense, grey, (200 mm thick)		7-1				1190
		COBBLES (FILL) - some gravel, trace to some sand, damp, dense, light brown		7-2				
		BEDROCK						
1		END OF TESTPIT (0.6 metres) Note: Stopped due to refusal on bedrock Backfilled at completion						1189
2								1188
3								1187
4								1186
5								1185
6								1184
7								1183
8								1182
9								1181
10								1180
11								1179
12								1178
13								1177
14								1176
15								

TETRA TECH

Contractor: NATC	Completion Depth: 0.6 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 10
Logged By: NH	Completion Date: 2017 September 10
Reviewed By: JW	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A27TP8**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1191.163 m
Cantung, Northwest Territories	UTM: 539839.3 E; 6871059.05 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL AND SAND (FILL) - some cobbles, well graded, moist, light brown, fine to coarse angular gravel		8-1			1191.0
0.2							
							1190.8
0.4				8-2			
		END OF TESTPIT (0.50 metres) Location: 4 m west of 2008 soil sample APEC17-10 Note: Stopped due to refusal on bedrock Testpit location surveyed by Tetra Tech on August 28, 2018					1190.6
0.6							
							1190.4
0.8							
							1190.2
1.0							
							1190.0
1.2							
							1189.8
1.4							
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 0.5 m
Drilling Rig Type: Backhoe	Start Date: 2018 June 28
Logged By: BB	Completion Date: 2018 June 28
Reviewed By: SS	Page 1 of 1

Photo 1: Drilling in front of main portal.
(September 17, 2017)

Photo 2: Panorama of main portal and former fuel area.
(September 17, 2017)

Photo 3: Main Portal visible in centre of photo. Photo provided by NATC. (August 13, 2013)

AEC 31

AEC 31: Between Tungsten Concentrate Storage and Mill Buildings

Area Description		
Location	Adjacent northeast of the Mill Building including the Tungsten Concentrate Storage Building	
Topography Surface Drainage	Generally flat with a slight slope to the northeast.	
Surface Drainage	Northeast	
Background	Chemical storage area adjacent to the mill with loading and unloading bays. Numerous reported surface spills of industrial chemicals and metals from forklift traffic.	
Historical Assessment Information		
Phase II Environmental Site Assessment (EBA, 2008)	Number of surface soil samples:	5
	Number of soil samples analyzed for metals:	5
	Number of soil samples analyzed for petroleum hydrocarbons:	5
	Number of soil samples with metal impacts:	5
	Number of soil samples with petroleum hydrocarbons impacts:	3
Comments: Shallow surfaces soil samples collected contained PHC and metal impacts. The soil impacts were not delineated and groundwater was not assessed as part of the study.		
2017/2018 Environmental Site Assessment Details		
Environmental Site Assessment Scope		
Utility Locate SOP followed?		Yes
EM 31 Geophysics Complete?		Yes
Number of test pits advanced		7 (2017), 3 (2018)
Number of boreholes advanced		1 (2017)
Number of hand auger locations advanced		2 (2017)
Number of soil samples submitted for laboratory chemical analysis		14 (2017), 8 (2018)
Number of boreholes completed as groundwater monitoring wells		0
Number of historical groundwater monitoring wells		0
Number of groundwater samples collected		0
Number of sediment and surface soil samples collected		2 (2017)
Geophysics (EM 31 Apparent Terrain Conductivity) Findings		
▪ Survey was completed from the Powerhouse (AEC 32) to the Heavy Duty Maintenance Shop Building (AEC 16) (see Figure A31-2). ▪ Background apparent terrain conductivity values generally between 5 to 20 mS/m (represented by cool colours on Figure A31-2). ▪ Areas of higher-than-background apparent terrain conductivity values indicated by the warm colours shown on Figure A31-2). ▪ Areas with data affected by buried cables and utilidors marked with a thick black rectangle. ▪ Areas with negative and higher than background apparent terrain conductivity values are consistent with data caused by surface metals and utilities. ▪ Negative (pink) apparent terrain conductivity values near Borehole 17A31BH1 and 17A31TP3 are possibly caused by concrete made with rebar on the surface. ▪ Conductive (red) values near Test pit 17A31TP2 are possibly caused by surface metal or conductive pore fluids due to leaching.		
Soil Investigation and Conditions		
Maximum Depth of Investigation	9.1 mbgs (September 23, 2017)	

AEC 31: Between Tungsten Concentrate Storage and Mill Buildings

General Stratigraphy

Description	Depth from (mbgs)	Depth to (mbgs)	Observations
Surface gravel overlying Sand with varying amounts of gravel and silt	0	8.5	Fill soil. Petroleum hydrocarbon staining and odour observed throughout this layer. Possible tailings observed in 17A31TP3 and 17A31TP5.
Silt with a trace of gravel and cobbles	7.9	9.1	-

Combustible Vapour Concentrations (CVC)

Shallow Soil Samples: Ranged from less than 10 parts per million by volume (ppmv) to 634 ppmv in soil sample 18A31TP9-3.

Deep Soil Samples: Ranged from less than 10 ppmv to 216.2 ppmv at 17A31BH1-2.

Groundwater Conditions

Depth to Groundwater	N/A
Free Product	N/A

2017/2018 Environmental Site Assessment Results Summary

- Figure A31-1 shows the borehole, test pit, and hand auger locations.
- Figure A31-2 shows the EM31 apparent terrain conductivity survey.
- Table A31-1 summarizes soil lab results relative to guidelines and management limits.

Soil: Petroleum Hydrocarbons (PHCs, PAHs)

2017

- Laboratory results all less than the CCME/CSR guidelines with exception of:
  - Sample 17A31BH1-1 at a depth of 4.3 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines.
  - Sample 17A31BH1-2 at a depth of 7.3 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines.
  - Sample 17A31HA2-1 at a depth of 0.25 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines. This soil sample also exceeded the management limits for PHC F2.
  - Sample 17A31TP1-2 at a depth of 1.0 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines. This soil sample also exceeded the management limits for PHC F2.
  - Sample 17A31TP1-4 at a depth of 3.2 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A31TP2-4 at a depth of 3.0 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A31TP3-2 at a depth of 0.5 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A31TP4-1 at a depth of 0.3 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A31TP5-4 at a depth of 3.0 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A31TP6-2 at a depth of 1.0 mbgs contained PHCs greater than the CCME/CSR guidelines.
  - Sample 17A31TP7-1 at a depth of 0.9 mbgs contained PHCs and PAHs greater than the CCME/CSR guidelines.

2018

- Test pits 18A31TP8 and 18A31TP10 were excavated at approximately 4 m and 15 m step-out distances, respectively, from 17A31HA2 to delineate the PHC management limit exceedance found at 0.25 mbgs. Both soil samples tested from 18A31TP8 contained PHC F2 concentrations greater than the management limits. None of the two samples tested at 18A31TP10 exceeded the management limits.
- Test pit 18A31TP9 was excavated to delineate management limit exceedances identified in the 2008 Phase II ESA at sample locations APEC11A-W, APEC11A-1B, APEC11A-N, APEC11A-E and APEC11-2 located between the powerhouse and the mill building. All three of the soil samples tested from 18A31TP9 contained PHC F2 concentrations greater than the management limits.

Soil: Metals

- Metals concentrations were generally high, especially in samples collected near surface.
- Metals concentrations in samples from 17A31BH1 below 4.3 mbgs were low.

AEC 31: Between Tungsten Concentrate Storage and Mill Buildings

- Various metals exceeded CCME CEQGs including arsenic, barium, cadmium, cobalt, copper, molybdenum, nickel, selenium, tin, vanadium, and zinc.
- The following metals also exceeded the preliminary background concentrations:
  - Barium (17A31TP1 at 1.0 and 3.2 mbgs, 17A31TP2 at 3.0 mbgs, 17A31TP6 at 1.0 mbgs).
  - Cadmium (17A31TP1 at 1.0 and 3.2 mbgs, 17A31TP2 at 1.0 and 3.0 mbgs, 17A31TP6 at 1.0 mbgs).
  - Molybdenum (17A31HA1 at 0.25 mbgs, 17A31TP1 at 1.0 and 3.2 mbgs, 17A31TP6 at 1.0 mbgs).
  - Nickel (17A31TP1 at 1.0 and 3.2 mbgs, 17A31TP6 at 1.0 mbgs).
  - Selenium (17A31HA1 at 0.25 mbgs, 17A31HA2 at 0.25 mbgs, 17A31TP1 at 1.0 and 3.2 mbgs, 17A31TP2 at 1.0 mbgs, 17A31TP3 at 0.5 mbgs, 17A31TP4 at 3.0 mbgs, 17A31TP6 at 1.0 mbgs, 17A31TP7 at 0.9 mbgs).
  - Zinc (17A31TP1 at 1.0 and 3.2 mbgs, 17A31TP2 at 1.0 mbgs, 17A31TP6 at 1.0 mbgs).

Soil: Other PCOCs (glycols, VOCs)

- Laboratory chemical results less than detection limits and guidelines with the exception of the following:
  - 1,2,4 Trichlorobenzene at 17A31BH1 at 4.3 mbgs.

Soil: Routine (pH)

- Laboratory results within the CCME/CSR guidelines with exception of:
  - Sample 17A31BH1-3 at a depth of 8.5 mbgs had a pH value outside the CCME/CSR guideline range.
  - Sample 17A31TP2-2 at a depth of 1.0 mbgs had a pH value outside the CCME/CSR guideline range.
  - Sample 17A31TP5-4 at a depth of 3.0 mbgs had a pH value outside the CCME/CSR guideline range.

Groundwater: Petroleum Hydrocarbons

N/A

Groundwater: Metals/Routine Parameters

N/A

Groundwater: Other PCOCs

N/A

Sediment: Petroleum Hydrocarbons

N/A

Sediment: Metals

N/A

Sediment: Other PCOCs

N/A

Surface Water: Petroleum Hydrocarbons

N/A

Surface Water: Metals/Nutrients

N/A

Surface Water: Other PCOCs

N/A

Grainsize Analysis

- Soil sample 17A31BH1-1 at a depth of 4.3 mbgs classified as coarse-grained (57% >75 µm).
- Soil sample 17A31BH1-3 at a depth of 8.5 mbgs classified as fine-grained (14% >75 µm).
- Soil sample 17A31TP6-2 at a depth of 1.0 mbgs classified as coarse-grained (92% >75 µm).
- Soil sample 17A31TP7-1 at a depth of 0.9 mbgs classified as coarse-grained (77% >75 µm).
- Soil sample 18A31TP10-3 at a depth of 1.0 mbgs classified as coarse-grained (76% >75 µm).

AEC 31: Between Tungsten Concentrate Storage and Mill Buildings

Environmental Concerns			
Location in AEC	**Potential Source(s)**	**Identified Contaminated Media**	**Parameters Assessed and Contaminant(s) of Concern (COCs; bold & underline)**
Between the northeast corner of Mill and Tungsten Concentrate Storage Building. Northeast end of Tungsten Concentrate Storage Building	Fuel, glycol and other chemical releases	Soil	**Soil: <u>Metals,</u> <u>petroleum hydrocarbons (PHCs)</u>**, glycols, **<u>polycyclic aromatic hydrocarbons</u> (PAHs)**, **<u>volatile organic compounds (VOCs),</u>**

Discussion (Significance of the Results)

<u>Soils:</u>

- PHC impacts were identified surrounding the Tungsten Concentration Building that appear to extend from surface to depths ranging from 6 to 8 mbgs.
- Two areas of PHC soil contamination were found to exceed the management limits. The horizontal extents of the area immediately east of the Tungsten Concentration Building has been delineated except to the northwest. The area between the Mill Building, Tungsten Concentration Building and Powerhouse has been delineated to the north and south only. For both areas, the estimated depth of PHC impacts greater than the management limits used to calculate the contaminated soil volume is 1.0 mbgs.
- The deep PHC impacts measured in borehole 17A31BH1 was vertically delineated.
- The deep VOC (i.e., 1,2,4 trichlorobenzene) impact measured in borehole 17A31BH1 was not vertically delineated, however based on the PHC results the impacts are likely limited to a depth of approximately 8.0 mbgs.
- Glycols were not detected and are no longer considered PCOCs in soil at this AEC.
- Metals concentrations were observed to be generally high, especially in shallow samples, with multiple exceedances of both CCME CEQGs and preliminary background concentrations.

Attachments

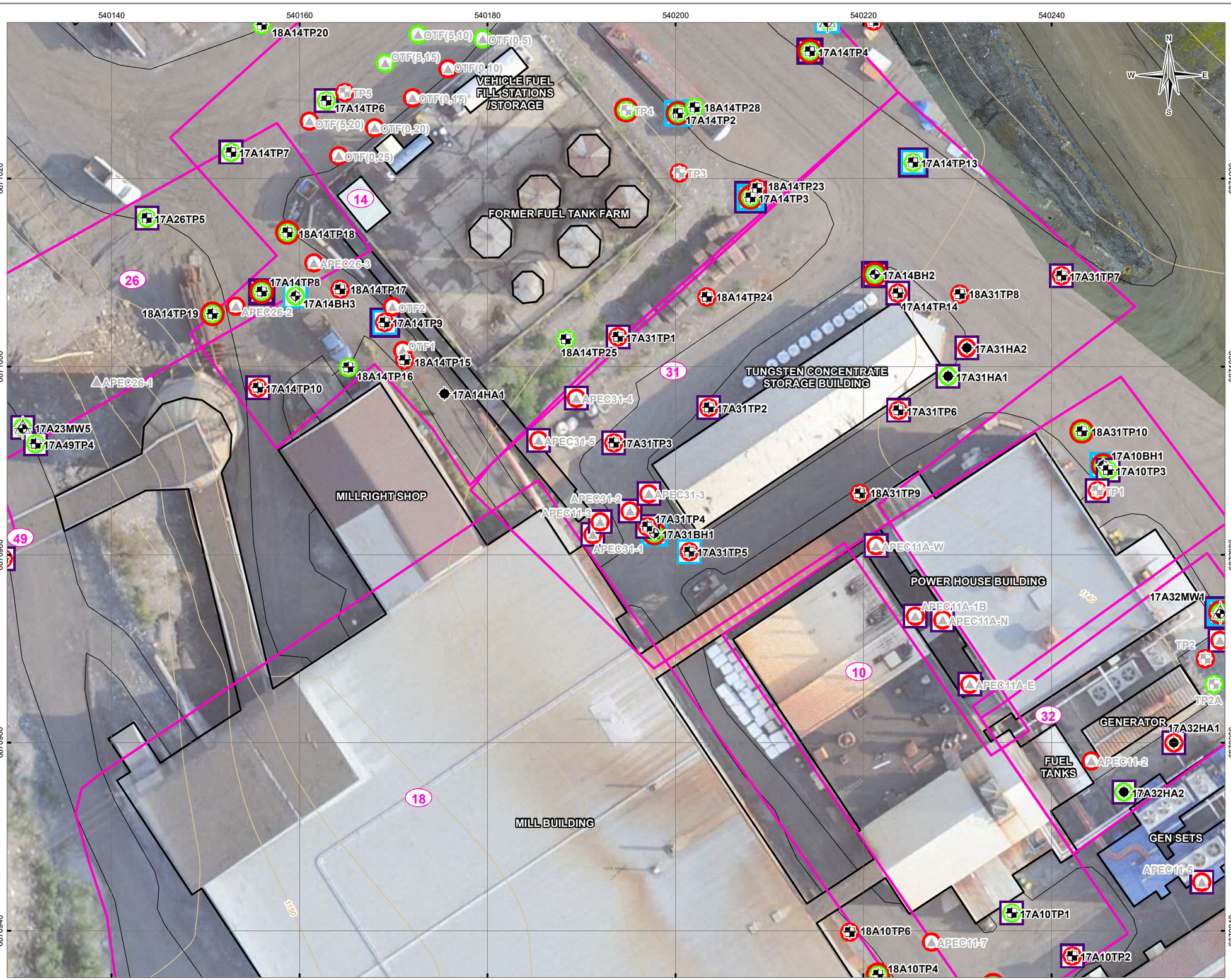
Figure A31-1 – Soil and Sediment Results

Figure A31-2 – AEC 31 Between Tungsten Concentrate Storage Building and Mill Buildings EM31 Apparent Terrain Conductivity Survey

Table A31-1 – Soil Analytical Results

Borehole, Test pit and Hand Auger Logs

Photographs

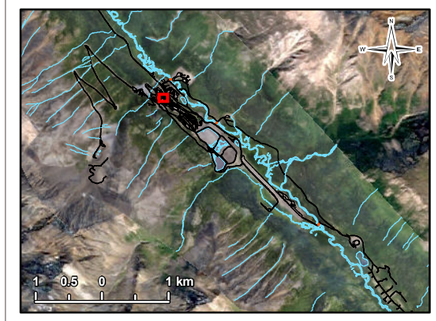


LEGEND

- Area of Environmental Concern (AEC)
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- Historical Testpit
- Historical Shallow Soil Sample

Soil/Sediment Analytical Results

- PHC Impacts
- PHC Impacts, vertically delineated
- No PHC Impact
- Metals exceedance of preliminary background concentrations, or in the absence of background concentrations, exceedance of CCME guidelines
- Metals exceedance, vertically delineated
- No metals exceedance of CCME guidelines or preliminary background concentrations
- Building
- Road
- Ditch
- Contour (2 m)



NOTES
All locations and area boundaries are approximate.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 31
Between Tungsten Concentrate Storage and Mill Buildings
Soil and Sediment Results

PROJECTION	DATUM	CLIENT
UTM Zone 9	NAD83	NORTH AMERICAN TUNGSTEN CORPORATION LTD

Scale: 1:400
5 2.5 0 5
Metres

TETRA TECH

FILE NO.
WENW03039-03_Summary_A31-1.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	BB	BB	0

DATE
June 22, 2020

PROJECT NO.
ENW.WENW03039-03

A31-1

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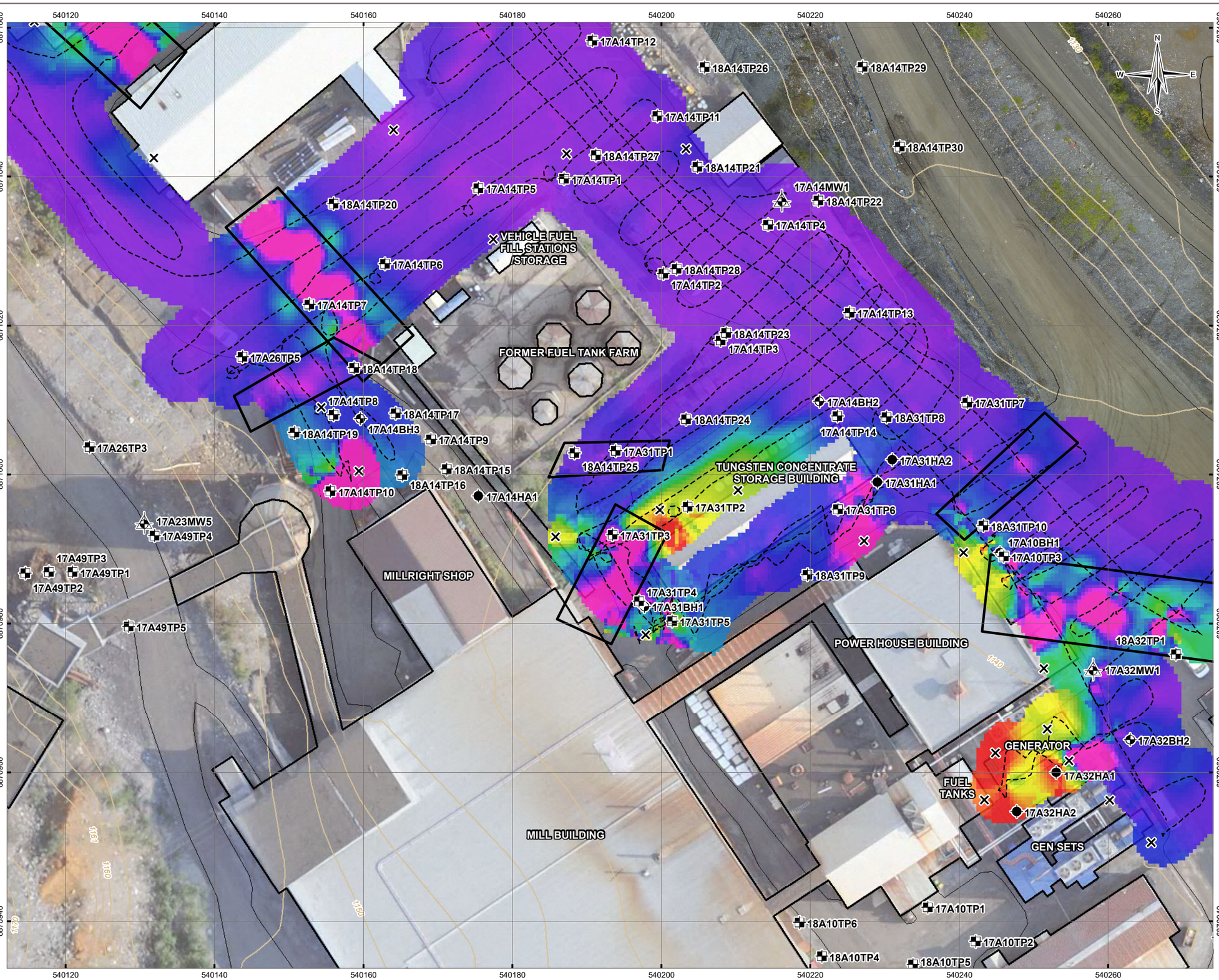
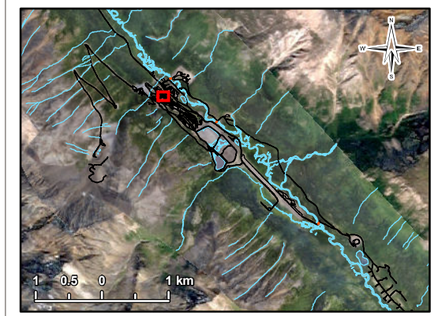


LEGEND

- Survey Track
- Surface Metal
- Potential Buried Cables/Utilidor
- 2017 Monitoring Well (MW)
- 2017 Borehole (BH)
- 2017 Hand Auger (HA)
- 2017/2018 Testpit (TP)
- Building
- Road
- Ditch
- Contour (2 m)

Apparent Terrain Conductivity (mS/m)

500
200
150
100
50
0



NOTES

All locations and area boundaries are approximate.
Negative apparent terrain conductivity values likely due to EM field created by a utility or metal response.
EM31 S/N: 8411031 | Data collected: September 8, 2017.
Base data source:
Data provided by INAC (2013).
Drone imagery at the borrow pit, tailings ponds, and interceptor ditch collected in 2018.

STATUS
ISSUED FOR USE

CANTUNG MINE
PHASE III ESA

AEC 31
Between Tungsten Concentrate Storage and Mill Buildings
EM31 Apparent Terrain Conductivity Survey

PROJECTION UTM Zone 9	**DATUM** NAD83	**CLIENT** NORTH AMERICAN TUNGSTEN CORPORATION LTD	
Scale: 1:500 — 10 5 0 10 Metres		TETRA TECH	
FILE NO. WENW03039-03_Summary_A31-2.mxd			
OFFICE Tt-VANC	**DWN** SL / **CKD** DSM / **APVD** SS / **REV** 0		**A31-2**
DATE June 22, 2020	**PROJECT NO.** ENW.WENW03039-03		

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Table A31-1: Soil Analytical Results

AEC					AEC 31																					
Location					BH1			HA1	HA2	TP1		TP2		TP3	TP4	TP5	TP6	TP7	TP8-2	TP8-3	TP8-3	TP9-1	TP9-2	TP9-3	TP10-1	TP10-1	TP10-3
Sample Depth					4.3 m	7.3 m	8.5 m	0.25 m	0.25 m	1.0 m	3.2 m	1.0 m	3.0 m	0.5 m	0.30 m	3.0 m	1.0 m	0.9 m	0.5 m	1.0 m	1.0 m	0.2 m	0.5 m	1.0 m	0.2 m	0.2 m	1.0 m
Field ID					17A31BH1-1	17A31BH1-2	17A31BH1-3	17A31HA1-1	17A31HA2-1	17A31TP1-2	17A31TP1-4	17A31TP2-2	17A31TP2-4	17A31TP3-2	17A31TP4-1	17A31TP5-4	17A31TP6-2	17A31TP7-1	18A31TP8-2	18A31TP8-3	18A31BTP8-3	18A31TP9-1	18A31TP9-2	18A31TP9-3	18A31TP10-1	18A31BTP10-1	18A31TP10-3
Sample Date					23-Sep-2017	23-Sep-2017	23-Sep-2017	5-Oct-2017	5-Oct-2017	16-Sep-2017	16-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018
Laboratory Report Number					8774122	8774124	8774125	8807800	8807801	8740954	8740956	8756076	8756079	8756083	8756084	8756217	8756220	8756227	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151
Laboratory Sample ID					17Y266562	17Y266562	17Y266562	17Y270680	17Y270680	17Y262775	17Y262775	17Y264351	17Y264351	17Y264351	17Y264351	17Y264351	17Y264351	17Y264351	9376846	9376847	9376848	9376849	9376850	9376851	9376852	9376853	9376855
Parameter	**Unit**	**CCME[1,2] and NWT CSR[3]**	**Background Concentration[4]**	**Management Limits[5]**																							
Physical Parameters																											
pH	pH Units	6-8	-	-	6.71	-	**8.27**	7.11	6.95	6.77	7.74	**5.2**	7.51	7.07	7.18	**8.35**	7.91	7.21	-	-	-	-	-	-	-	-	-
Moisture	%	-	-	-	6.6	14.7	18.4	8.49	8.19	12.6	8.56	15	5.21	6.32	4.94	6.78	6.37	7.46	9.4	8.5	9.9	5.8	10.4	9.1	7.7	6.9	9.1
Carbon																											
Carbon	%	-	-	-	0.09	0.18	-	-	-	-	0.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide																											
Cyanide (SAD)	mg/kg	-	-	-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (WAD)	mg/kg	0.9	-	-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																											
Antimony	mg/kg	20	-	-	1.3	-	0.7	0.7	1.3	7.3	11	0.4	4.2	1.4	2.3	1.8	8.3	1.7	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	12	64	-	**17.8**	-	**19.5**	8.4	**13.1**	**37.5**	**36.3**	7.8	**22.3**	10.9	**41.5**	**24.1**	**32.4**	**26.8**	-	-	-	-	-	-	-	-	-
Barium	mg/kg	500	946	-	**535**	-	222	263	441	**1130**	**5030**	31	**2420**	314	354	**906**	**11300**	**761**	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	4	-	-	0.3	-	0.5	1.4	1.2	0.8	0.5	1	0.3	0.8	0.7	0.4	0.8	1.3	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	1.4	2.8	-	0.97	-	1.11	**2.75**	**2.33**	**4.4**	**6.16**	**9**	**3.24**	**1.95**	**2.66**	1.34	**6.91**	**1.45**	-	-	-	-	-	-	-	-	-
Chromium	mg/kg	64	-	-	12	-	20	20	19	31	20	7	22	17	18	16	28	25	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	40	-	-	8.2	-	12	17.6	19.6	26	26	**76.8**	14.5	21.4	20.8	10.6	19.3	22.2	-	-	-	-	-	-	-	-	-
Copper	mg/kg	63	-	-	20.9	-	26	**882**	**2940**	**270**	**90.2**	**2770**	38.1	**911**	**787**	55.2	**200**	**811**	-	-	-	-	-	-	-	-	-
Lead	mg/kg	70	-	-	11	-	12.5	16.3	21.1	50.9	37.1	7	21.6	23.4	26.7	12.6	35.2	20.1	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	6.6	-	-	0.04	-	0.06	0.32	1	0.58	0.16	0.68	0.06	<0.01	3.83	0.2	0.77	0.56	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	5	10	-	1.9	-	0.9	**10.3**	3.5	**10.5**	**13.6**	1.9	**5.2**	4.5	**6.4**	2.6	**12.1**	4.1	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	45	72	-	25.5	-	35.7	19.9	22.6	**80.8**	**104**	12.9	**55.8**	24.4	33.2	31.8	**91.5**	33.9	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	1	1.7	-	0.6	-	0.5	**2.2**	**3.1**	**2.8**	**2.4**	**11.1**	0.9	**2.9**	**2.7**	0.9	**2.4**	**2.8**	-	-	-	-	-	-	-	-	-
Silver	mg/kg	20	-	-	<0.5	-	<0.5	0.6	1	<0.5	<0.5	1.6	<0.5	0.6	0.8	<0.5	0.5	0.7	-	-	-	-	-	-	-	-	-
Thallium	mg/kg	1	-	-	0.2	-	0.2	0.4	0.3	0.5	0.7	0.5	0.4	0.4	0.3	0.2	0.9	0.4	-	-	-	-	-	-	-	-	-
Tin	mg/kg	5	-	-	0.4	-	0.7	3.3	2.9	0.7	0.3	**6.2**	0.2	2.6	2.4	0.6	1	2.7	-	-	-	-	-	-	-	-	-
Uranium	mg/kg	23	-	-	1	-	1.1	4	2	3	2.9	1.9	1.3	2.5	1.9	1.3	3.5	2.3	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	130	160	-	33	-	26	30	32	**134**	116	8	92	37	40	51	**142**	50	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	200	462	-	106	-	129	**287**	**261**	**729**	**713**	**862**	**369**	**266**	**338**	139	**694**	187	-	-	-	-	-	-	-	-	-
Particle Size																											
>75 µm	%	-	-	-	57	-	14	-	-	-	-	-	-	-	-	-	92	77	-	-	-	-	-	-	-	-	76
Grain Size	N/A	-	-	-	Coarse	-	Fine	-	-	-	-	-	-	-	-	-	Coarse	Coarse	-	-	-	-	-	-	-	-	Coarse
Petroleum Hydrocarbons																											
Benzene	mg/kg	0.03	-	-	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	0.022	<0.005	0.006	<0.005	<0.005	<0.005	0.007	<0.005	-	-	-	-	<0.005	<0.005	-	-	-
Toluene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	**0.14**	<0.05	0.07	<0.05	<0.05	<0.05	0.07	<0.05	-	-	-	-	0.10	0.05	-	-	-
Ethylbenzene	mg/kg	0.082	-	-	<0.01	<0.01	<0.01	<0.01	**0.39**	0.02	0.01	<0.01	0.01	<0.01	<0.01	0.02	0.01	<0.01	-	-	-	-	0.05	<0.01	-	-	-
Xylenes (m & p)	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.02	0.09	<0.02	<0.02	<0.02	0.07	<0.02	-	-	-	-	-	-	-	-	-
Xylene (m)	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	0.05	<0.02	0.09	<0.02	<0.02	<0.02	0.07	<0.02	-	-	-	-	0.06	0.07	-	-	-
Xylene (o)	mg/kg	-	-	-	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.05	<0.02	-	-	-	-	<0.02	<0.02	-	-	-
Xylenes Total	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	**0.11**	0.05	<0.05	**0.12**	<0.05	<0.05	<0.05	**0.13**	<0.05	-	-	-	-	0.06	0.07	-	-	-
F1 (C_6-C_{10})	mg/kg	30	-	-	**108**	**72**	<10	<10	26	**105**	<10	<10	<10	<10	<10	26	<10	26	-	-	-	-	**100**	691	-	-	-
F1 (C_6-C_{10}) - BTEX	mg/kg	30	-	700	**108**	**72**	<10	<10	26	**105**	<10	<10	<10	<10	<10	26	<10	26	-	-	-	-	**100**	**691**	-	-	-
F2 (C_{10}-C_{16})	mg/kg	150	-	1000	**616**	**362**	<20	<20	**2230**	**9760**	**912**	<20	51	**236**	132	**753**	48	**682**	**3860**	**2970**	**2390**	**5750**	**1640**	**12,800**	**624**	**443**	<20
F3 (C_{16}-C_{34})	mg/kg	300	-	2500	173	86	<20	220	**1970**	**1540**	285	97	101	**899**	**1380**	122	73	**1470**	**1500**	**758**	**714**	**4220**	**666**	**2250**	**1230**	**815**	50
F4 (C_{34}-C_{50})	mg/kg	2800	-	10,000	<20	<20	<20	106	318	29	<20	<20	<20	207	247	<20	<20	531	250	41	46	857	73	32	310	171	<20
VH_{6-10}	mg/kg	-	-	-	-	-	-	-	-	-	-	<10	<10	<10	<10	86	<10	15	-	-	-	-	-	-	-	-	-
VPH_{6-10}	mg/kg	-	-	-	-	-	-	-	-	-	-	<10	<10	<10	<10	86	<10	15	-	-	-	-	-	-	-	-	-
Glycols																											
Diethylene glycol	mg/kg	-	-	-	<10	-	-	-	<10	-	-	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-	-	-
Ethylene glycol	mg/kg	960	-	-	<10	-	-	-	<10	-	-	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-	-	-
Propylene glycol	mg/kg	-	-	-	<10	-	-	-	<10	-	-	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-	-	-
Tetraethylene Glycol	mg/kg	-	-	-	<10	-	-	-	<10	-	-	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-	-	-
Triethylene Glycol	mg/kg	-	-	-	<10	-	-	-	<10	-	-	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-	-	-

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008), for coarse textured soils under Agricultural and Residential/Parkland soils

[2] Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 1999), for coarse textured soils under Agricultural and Residential/Parkland soils

[3] Northwest Territories Environmental Guideline for Contaminated Site Remediation (NWT CSR 2003), for coarse textured soils under Agricultural and Residential/Parkland land use

[4] Preliminary Background Concentration

[5] Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil Technical Supplement, for coarse textured soil under Agricultural land use, management limit pathway only

BOLD - Exceeds most stringent CCME or NWT CSR standard/guideline

Red - Exceeds Preliminary Background Concentration

Shaded - Exceeds Management Limits

Italic - Laboratory detection limit is greater than one or more referenced guidelines

"-" Not analyzed or no applicable standard/guideline

TETRA TECH

Table A31-1: Soil Analytical Results

AEC					AEC 31																					
Location					BH1			HA1	HA2	TP1		TP2		TP3	TP4	TP5	TP6	TP7	TP8-2	TP8-3	TP8-3	TP9-1	TP9-2	TP9-3	TP10-1	TP10-1	TP10-3
Sample Depth					4.3 m	7.3 m	8.5 m	0.25 m	0.25 m	1.0 m	3.2 m	1.0 m	3.0 m	0.5 m	0.30 m	3.0 m	1.0 m	0.9 m	0.5 m	1.0 m	1.0 m	0.2 m	0.5 m	1.0 m	0.2 m	0.2 m	1.0 m
Field ID					17A31BH1-1	17A31BH1-2	17A31BH1-3	17A31HA1-1	17A31HA2-1	17A31TP1-2	17A31TP1-4	17A31TP2-2	17A31TP2-4	17A31TP3-2	17A31TP4-1	17A31TP5-4	17A31TP6-2	17A31TP7-1	18A31TP8-2	18A31TP8-3	18A31BTP8-3	18A31TP9-1	18A31TP9-2	18A31TP9-3	18A31TP10-1	18A31BTP10-1	18A31TP10-3
Sample Date					23-Sep-2017	23-Sep-2017	23-Sep-2017	5-Oct-2017	5-Oct-2017	16-Sep-2017	16-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	22-Sep-2017	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018	2-Jul-2018
Laboratory Report Number					8774122	8774124	8774125	8807800	8807801	8740954	8740956	8756076	8756079	8756083	8756084	8756217	8756220	8756227	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151	18Y358151
Laboratory Sample ID					17Y266562	17Y266562	17Y266562	17Y270680	17Y270680	17Y262775	17Y262775	17Y264351	17Y264351	17Y264351	17Y264351	17Y264351	17Y264351	17Y264351	9376846	9376847	9376848	9376849	9376850	9376851	9376852	9376853	9376855
Parameter	**Unit**	**CCME[1,2] and NWT CSR[3]**	**Background Concentration[4]**	**Management Limits[5]**																							
Polycyclic Aromatic Hydrocarbons (PAHs)																											
B(a)P Total Potency Equivalent	mg/kg	0.6	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-	-
IACR (CCME)	mg/kg	1	-	-	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	-	<0.6	<0.6	-	-	-
Acenaphthene	mg/kg	-	-	-	<0.05	<0.05	<0.005	<0.005	<0.05	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.1	<0.01	<0.01	-	<0.01	<0.01	-	-	-
Acenaphthylene	mg/kg	-	-	-	<0.05	<0.05	<0.005	<0.005	<0.05	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.1	<0.01	<0.01	-	<0.01	<0.01	-	-	-
Anthracene	mg/kg	2.5	-	-	<0.04	<0.04	<0.004	<0.004	<0.04	<0.4	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.04	<0.2	<0.02	<0.02	-	<0.02	<0.02	-	-	-
Benz(a)anthracene	mg/kg	0.1	-	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.02	<0.02	<0.02	-	<0.02	<0.02	-	-	-
Benzo(a) pyrene	mg/kg	0.1	-	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	-	<0.02	<0.02	-	-	-
Benzo(b+j)fluoranthene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-	-
Benzo(e)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-	-
Benzo(j)fluoranthene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	-	<0.02	<0.02	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	-	<0.02	<0.02	-	-	-
Chrysene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.02	-	<0.02	<0.02	-	-	-
Fluoranthene	mg/kg	50	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-	-
Fluorene	mg/kg	-	-	-	<0.2	<0.2	<0.02	<0.02	0.4	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	0.60	0.28	0.19	-	0.12	0.25	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.02	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	<0.05	<0.05	<0.005	<0.005	0.66	10.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	0.32	3.20	0.64	0.42	-	1.21	1.94	-	-	-
2-Methylnaphthalene	mg/kg	-	-	-	<0.05	<0.05	<0.005	<0.005	4.16	8.7	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	0.67	6.70	<0.01	<0.01	-	2.56	2.56	-	-	-
Naphthalene	mg/kg	0.013	-	-	*<0.05*	*<0.05*	<0.005	<0.005	**0.54**	**1.2**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	*<0.05*	**2.4**	**0.80**	**0.58**	-	**0.60**	**1.4**	-	-	-
Phenanthrene	mg/kg	0.046	-	-	*<0.2*	*<0.2*	<0.02	<0.02	**0.3**	**1.2**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.2**	**0.70**	**0.25**	**0.18**	-	**0.11**	**0.19**	-	-	-
Pyrene	mg/kg	0.1	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.02	<0.02	-	<0.02	<0.02	-	-	-
Quinoline	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	-	-
Volatile Organic Compounds (VOCs)																											
Acetone	mg/kg	-	-	-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Bromomethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
2-Butanone	mg/kg	-	-	-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.1	-	-	<0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Chloroethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Chloromethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (cis)	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (trans)	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,3-Dichloropropene [cis]	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,3-Dichloropropene [trans]	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Methyl t-Butyl Ether (MTBE)	mg/kg	-	-	-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	-	-	-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Tetrachloroethene	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.05	-	-	**0.11**	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/kg	0.1	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Trichloroethene	mg/kg	0.1	-	-	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	-	-	-	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008), for coarse textured soils under Agricultural and Residential/Parkland soils

[2] Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 1999), for coarse textured soils under Agricultural and Residential/Parkland soils

[3] Northwest Territories Environmental Guideline for Contaminated Site Remediation (NWT CSR 2003), for coarse textured soils under Agricultural and Residential/Parkland land use

[4] Preliminary Background Concentration

[5] Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil Technical Supplement, for coarse textured soil under Agricultural land use, management limit pathway only

BOLD - Exceeds most stringent CCME or NWT CSR standard/guideline

Red - Exceeds Preliminary Background Concentration

Shaded - Exceeds Management Limits

Italic - Laboratory detection limit is greater than one or more referenced guidelines

"-" Not analyzed or no applicable standard/guideline

TETRA TECH

North American Tungsten Corporation Ltd.

Borehole No: 17A31BH1

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1141.681 m
Tungsten, Northwest Territories	UTM: 540197.732 E; 6870982.29 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0								
1	Sonic	SAND (FILL) - gravelly, some silt, trace cobbles, damp, brown						1141
		- black, hydrocarbon odour for 160 mm						
		GRAVEL (FILL) - sandy, some silt, damp, brown, hydrocarbon odour						
2		SAND (FILL) - gravelly, trace silt, trace cobbles, brown, fine to coarse sand, hydrocarbon odour						1140
3								1139
4		SAND AND SILT (POSSIBLE TAILINGS) - damp, light brown, hydrocarbon odour						1138
				1-1		43% particles <75 µm (ie. smaller than sand particle)		
5		SAND - gravelly, some silt, trace cobbles, damp, brown, hydrocarbon odour						1137
6		- silty, some gravel, wet, some black staining						1136
		- some silt, fine to coarse sand						
7				1-2				1135
		- black staining						
8		SAND - trace silt, trace cobbles, wet, brown						1134
				1-3		86% particles <75 µm (ie. smaller than sand particle)		
9		END OF BOREHOLE (9.10 metres) Note: Backfilled at completion						1133
10								1132
11								1131
12								1130
13								1129
14								1128
15								1127

TETRA TECH

Contractor: Boart Longyear	Completion Depth: 9.1 m
Drilling Rig Type: Track Mounted	Start Date: 2017 September 23
Logged By: MH	Completion Date: 2017 September 23
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31TP1**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1142.478 m
Tungsten, Northwest Territories	UTM: 540193.883 E; 6871003.182 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0		SAND (FILL) - silty, some gravel, trace clay, damp, soft, brown, buried pipe debris		1-1				1142
1	Excavated	- grey black staining, hydrocarbon odour		1-2	551			1141
		- buried organics, wood debris						
2		SAND - some gravel, trace silt, trace cobbles, damp, loose, brown, coarse sand		1-3				1140
3				1-4				1139
		END OF TESTPIT (3.2 metres) Note: Backfilled at completion						
4								1138
5								

TETRA TECH

Contractor: NATC	Completion Depth: 3.2 m
Drilling Rig Type: Track Excavator	Start Date: 2017 September 16
Logged By: MH/NH	Completion Date: 2017 September 16
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31TP2**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1141.303 m
Tungsten, Northwest Territories	UTM: 540203.539 E; 6870995.673 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	GRAVEL (FILL) - some sand, trace silt, trace cobbles, damp, dense, grey, wood debris		2-1				1141
1		SAND (POSSIBLE TAILINGS) - some silt, trace to some gravel, trace cobbles, damp, soft, reddish brown, fine sand		2-2				1140
		- some gravel, trace silt, no visible cobbles, grey, medium sand						
2				2-3				1139
		- medium to coarse sand						
3				2-4				1138
		END OF TESTPIT (3.0 metres) Note: Backfilled at completion						
4								1137
5								

TETRA TECH

Contractor: NATC	Completion Depth: 3 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31TP3**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1141.664 m
Tungsten, Northwest Territories	UTM: 540193.437 E; 6870991.918 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	GRAVEL (FILL) - some silt, some sand, trace cobbles, damp, dense, brown, wire debris, plastic, wood, angular gravel		3-1	■			1141
		CONCRETE		3-2	■			
		END OF TESTPIT (0.50 metres) Note: Stopped due to refusal Backfilled at completion						
1								1140
2								1139
3								1138
4								1137
5								

TETRA TECH

Contractor: NATC	Completion Depth: 0.5 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31TP4**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	
Tungsten, Northwest Territories	UTM: 540197 E; 6870983 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Depth (ft)
0								0
	Excavated	GRAVEL (FILL) - sandy, some silt, damp, dense, grey, wood debris, (300 mm thick)						
		- reddish brown		4-1				
		CONCRETE						1
		END OF TESTPIT (0.3 metres) Note: Stopped due to refusal Backfilled at completion						
1								2
								3
								4
								5
2								6
								7
								8
								9
3								10
								11
								12
4								13
								14
								15
								16
5								

TETRA TECH

Contractor: NATC	Completion Depth: 0.3 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31TP5**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	Ground Elev: 1141.349 m
Tungsten, Northwest Territories	UTM: 540201.463 E; 6870980.336 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Elevation (m)
0	Excavated	SAND (FILL) - silty, some gravel, damp, dense, grey, coarse sand		5-1				1141
		- black staining, moderate hydrocarbon odour						
		GRAVEL (FILL) - sandy, some silt, some cobbles, damp, dense, grey, subangular gravel, hydrocarbon staining and odour						
1		SAND (POSSIBLE TAILINGS) - trace to some gravel, trace silt, damp, soft, grey, fine sand, slight hydrocarbon odour		5-2				1140
2		- moderate hydrocarbon odour		5-3				1139
3		END OF TESTPIT (3.0 metres) Note: Backfilled at completion		5-4				1138
4								1137
5								

TETRA TECH

Contractor: NATC	Completion Depth: 3 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31TP6**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	
Tungsten, Northwest Territories	UTM: 540223.728 E; 6870995.345 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Depth (ft)
0								0
	Excavated	SAND (FILL) - silty, some gravel to gravelly, damp, dense, greyish brown						
		- trace to some gravel, black hydrocarbon staining and odour		6-1	■			1
		GRAVEL (GLACIOFLUVIAL FILL) - some sand, trace silt, trace cobbles, damp, dense, brown, rounded gravel						2
1				6-2	■	8% particles <75 µm (ie. smaller than sand particle)		3
		END OF TESTPIT (1.1 metres) Note: Backfilled at completion						4
								5
2								6
								7
								8
								9
3								10
								11
								12
4								13
								14
								15
5								16

TETRA TECH

Contractor: NATC	Completion Depth: 1.1 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31TP7**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	
Tungsten, Northwest Territories	UTM: 540241.07 E; 6871009.676 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Depth (ft)
0								0
	Excavated	SAND (FILL) - silty, some gravel, damp, dense, brown, (300 mm thick)						
		GRAVEL (GLACIAL TILL FILL) - sandy, some cobbles, trace silt, damp, dense, brown						
1		- silty - grey black hydrocarbon staining, hydrocarbon odour		7-1		23% particles <75 µm (ie. smaller than sand particle)		3
		END OF TESTPIT (1.1 metres) Note: Backfilled at completion						
2								7
3								10
4								13
5								16

TETRA TECH

Contractor: NATC	Completion Depth: 1.1 m
Drilling Rig Type: Rubber Tire backhoe	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31HA1**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	
Tungsten, Northwest Territories	UTM: 540229 E; 6870999 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Depth (ft)
0								0
	Hand auger	SAND (FILL) - gravelly, some silt, moist, brown, fine gravel, (250 mm thick)						
		CONCRETE PAD		1-1				
		END OF HAND AUGER (0.25 metres) Note: Backfilled at completion						
1								1
								2
								3
								4
								5
2								6
								7
								8
								9
3								10
								11
								12
4								13
								14
								15
								16
5								

TETRA TECH

Contractor:	Completion Depth: 0.25 m
Drilling Rig Type:	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corporation Ltd.

Testpit No: **17A31HA2**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-02 Task 002.2.2.6
Location: Cantung Mine	
Tungsten, Northwest Territories	UTM: 540231 E; 6871002 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 50 100 150 200	Notes and Comments	Backfill	Depth (ft)
0								0
	Hand auger	SILT (FILL) - some sand, some gravel, damp, orangey brown, fine gravel, (220 mm thick)						
		SAND (FILL) - some gravel, trace to some silt, damp, grey and black, strong hydrocarbon odour		2-1	■			1
		END OF HAND AUGER (0.35 metres) Note: Backfilled at completion						
1								2
								3
								4
								5
								6
2								7
								8
								9
								10
3								11
								12
								13
4								14
								15
								16
5								

TETRA TECH

Contractor:	Completion Depth: 0.35 m
Drilling Rig Type:	Start Date: 2017 September 22
Logged By: NH	Completion Date: 2017 September 22
Reviewed By: JW	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A31TP8**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1140.014 m
Cantung, Northwest Territories	UTM: 540230.26 E; 6871007.721 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL (FILL) - some sand, well graded, moist, brown, fine to coarse subangular gravel, (100 mm thick)					1140.0
0.2		SAND AND GRAVEL (FILL) - some cobbles, well graded, moist, brown to grey, fine to coarse sand, fine to coarse subangular gravel, subangular cobbles to 250 mm diameter		8-1	■		1139.8
0.4		- hydrocarbon odour		8-2	■		1139.6
0.6							1139.4
0.8							1139.2
1.0				8-3	■		1139.0
		END OF TESTPIT (1.00 metre) Location: 3 m from east side of tungsten concentrate storage building, 4 m northwest of sample 17A31HA2 Note: Testpit location surveyed by Tetra Tech on August 28, 2018					
1.2							1138.8
1.4							1138.6
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 July 2
Logged By: BB	Completion Date: 2018 July 2
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A31TP9**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1143.05 m
Cantung, Northwest Territories	UTM: 540219.611 E; 6870986.537 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL (FILL) - some sand, well graded, damp, light brown, fine to coarse subangular gravel, (250 mm thick)					1143.0
0.2				9-1	529		1142.8
		SAND AND GRAVEL - trace cobbles, well graded, moist, grey, fine to coarse sand, fine to coarse subangular gravel, subrounded cobbles to 150 mm diameter, hydrocarbon odour					
0.4							1142.6
				9-2			
0.6							1142.4
0.8							1142.2
				9-3	634		
1.0		END OF TESTPIT (1.00 metre) Location: Between tungsten storage and powerhouse buildings Note: Testpit location surveyed by Tetra Tech on August 28, 2018					1142.0
1.2							1141.8
1.4							1141.6
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 July 2
Logged By: BB	Completion Date: 2018 July 2
Reviewed By: SS	Page 1 of 1

North American Tungsten Corp.

Testpit No: **18A31TP10**

Project: Phase III Environmental Site Assessment	Project No: ENW.WENW03039-03
Location: Cantung Mine	Ground Elev: 1139.525 m
Cantung, Northwest Territories	UTM: 540243.225 E; 6870993.132 N; Z 9

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Vapour readings (ppmv) 100 200 300 400	Notes and Comments	Elevation (m)
0							
	Excavated	GRAVEL (FILL) - some sand, well graded, moist, light brown, medium angular gravel, (150 mm thick)					1139.4
0.2		SAND - gravelly, some cobbles, well graded, moist, brown, fine to coarse sand, fine to coarse subangular gravel		10-1			1139.2
0.4							
				10-2			1139.0
0.6							
							1138.8
0.8							
				10-3			1138.6
1.0		END OF TESTPIT (1.00 metre) Location: 4 m northeast from northern corner of powerhouse, >5 m from high voltage line Note: Testpit location surveyed by Tetra Tech on August 28, 2018					
							1138.4
1.2							
							1138.2
1.4							
1.5							

TETRA TECH

Contractor: NATC	Completion Depth: 1 m
Drilling Rig Type: Backhoe	Start Date: 2018 July 2
Logged By: BB	Completion Date: 2018 July 2
Reviewed By: SS	Page 1 of 1

Photo 1: Facing south between Power House Building and Tungsten Concentrate Storage Building. Mill Building is visible on the right. (September 20, 2017)

Photo 2: Panorama of Mill Building. Concentrate building (white) visible on left. (September 5, 2017)

Photo 3: Facing northwest at 17A31TP1. Old Tank Farm in background. (September 16, 2017)

Photo 4: 17A31TP5 (September 22, 2017)