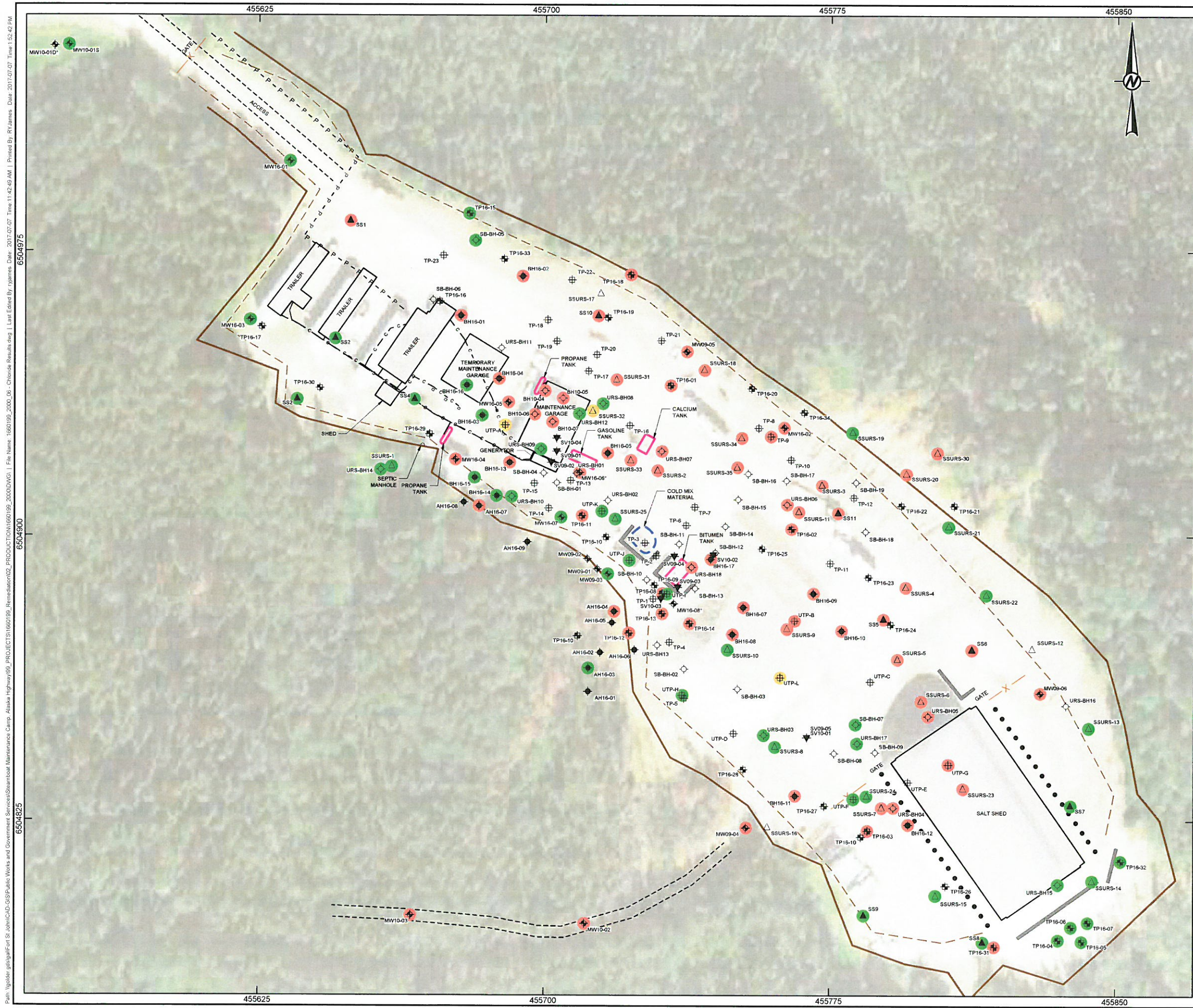


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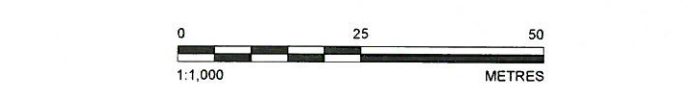


**LEGEND**

- STRUCTURE
- CONCRETE BARRIER
- TREELINE
- CREST OF SLOPE
- POWERLINE
- BURIED CABLE
- BURIED PIPE
- ABOVE GROUND STORAGE TANK
- COLD MIX MATERIAL
- FENCELINE / GATE
- EDGE OF ROAD
- ANCHOR PILE
- MONITORING WELL LOCATION
- \* INDICATES A DECOMMISSIONED WELL
- APPROXIMATE BOREHOLE LOCATION (2016)
- APPROXIMATE TEST PIT LOCATION (2016)
- APPROXIMATE SURFICIAL SOIL SAMPLE LOCATION (2016)
- APPROXIMATE SOIL VAPOUR LOCATION (2002-2015)
- APPROXIMATE BOREHOLE LOCATION (2002-2015)
- APPROXIMATE TEST PIT LOCATION (2002-2015)
- APPROXIMATE SURFICIAL SOIL SAMPLE LOCATION (2002-2015)
- MEASURED CONCENTRATIONS OF SODIUM, CHLORIDE AND SAR IN SOIL BELOW CSR R/LIL STANDARDS AND CCME R/LIL GUIDELINES.
- MEASURED CONCENTRATION OF SODIUM, CHLORIDE AND/OR SAR IN SOIL ABOVE THE CCME R/LIL GUIDELINES.
- MEASURED CONCENTRATION OF SODIUM, CHLORIDE AND/OR SAR IN SOIL ABOVE THE CSR R/LIL STANDARD. MEASURED CONCENTRATIONS MAY ALSO BE ABOVE THE CCME R/LIL GUIDELINES.

- NOTES**
- BUILDINGS/INFRASTRUCTURE ARE AS OF SEPTEMBER 9, 2016 AND ARE BASED ON GOLDBER SITE OBSERVATIONS AND A SURVEY CONDUCTED BY VECTOR GEOMATICS LAND SURVEYING LTD.
  - FOR DETAILS REGARDING TEST HOLE GEOLOGY AND SOIL CHEMISTRY RESULTS SEE APPENDICES
  - LOCATION AND DIMENSIONS OF THE TEMPORARY MAINTENANCE GARAGE ARE APPROXIMATE
  - CONTAMINATED SITES REGULATION (CSR) - STANDARDS ARE FROM THE CONTAMINATED SITES REGULATION B.C. REG. 375/96, O.C. 1480/96 AND M271/2004 INCLUDING AMENDMENTS UP TO MINISTERIAL ORDER NO. M426 (ALSO REFERRED TO AS STAGE 10 AMENDMENTS, OR OMNIBUS), INCLUDING UP TO ERRATA VERSION 2 (JANUARY 27, 2017).
  - CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME).
  - SOIL ON-SITE SHOULD BE ASSUMED TO HAVE SODIUM AND CHLORIDE CONCENTRATIONS ABOVE CSR STANDARDS UNLESS TESTED AND DEMONSTRATED TO BE OTHERWISE. BECAUSE OF VARIABLE SITE USAGE AND SALT STORAGE PRACTICES OVER TIME, HISTORICAL TEST LOCATIONS THAT WERE BELOW STANDARDS/GUIDELINES CANNOT BE ASSUMED TO BE REPRESENTATIVE OF CURRENT CONDITIONS.
  - SAR = SODIUM ABSORPTION RATIO, RL = RESIDENTIAL LAND USE, IL = INDUSTRIAL LAND USE

- REFERENCES**
- SURVEY PLAN OBTAINED FROM VECTOR GEOMATICS LAND SURVEYING LTD. CAD FILE: 1609392SP\_R0\_EMAIL.DWG. DATED: SEPTEMBER 9, 2016.
  - BACKGROUND IMAGE SUPPLIED BY AND SOURCED UNDER LICENSE FROM BING IMAGES FOR ARCMAP ON: MARCH 28, 2017. IMAGE DATE: JULY, 2010. IMAGE GEOREFERENCED BY GOLDBER AND INTENDED FOR INDICATIVE PURPOSES ONLY. DATUM: NAD83 PROJECTION: UTM ZONE 10.



CLIENT  
**PUBLIC WORKS AND GOVERNMENT SERVICES CANADA**

PROJECT  
**STEAMBOAT MAINTENANCE CAMP, KILOMETRE 537.9 ALASKA HIGHWAY, B.C.**

TITLE  
**SUMMARY OF SODIUM, CHLORIDE AND SAR ANALYTICAL RESULTS IN SOIL**

CONSULTANT  
**Golder Associates**

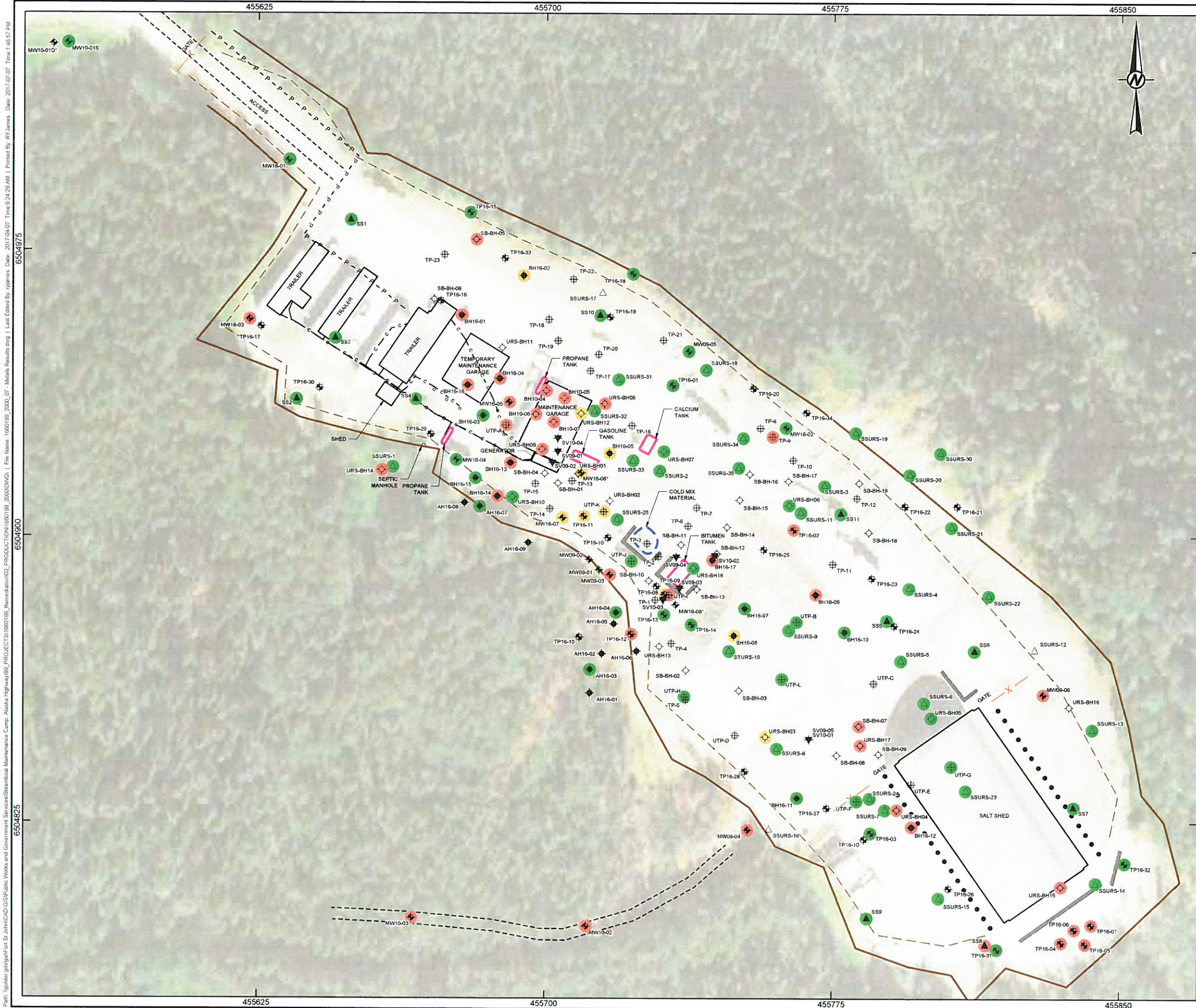
PROJECT NO.  
**1660199**

REV.  
**0**

DRAWING  
**6**

2017-07-07  
AV  
RTJ  
AM  
JL



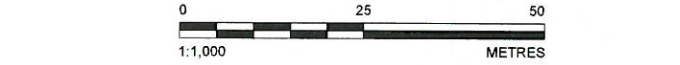


**LEGEND**

- STRUCTURE
- CONCRETE BARRIER
- TREELINE
- CREST OF SLOPE
- POWERLINE
- BURIED CABLE
- BURIED PIPE
- ABOVE GROUND STORAGE TANK
- COLD MIX MATERIAL
- FENCELINE / GATE
- EDGE OF ROAD
- UTILITY PEDESTAL
- ANCHOR PILE
- MONITORING WELL LOCATION
- \* INDICATES A DECOMMISSIONED WELL
- APPROXIMATE BOREHOLE LOCATION (2016)
- APPROXIMATE TEST PIT LOCATION (2016)
- APPROXIMATE SURFICIAL SOIL SAMPLE LOCATION (2016)
- APPROXIMATE SOIL VAPOUR LOCATION (2002-2015)
- APPROXIMATE BOREHOLE LOCATION (2002-2015)
- APPROXIMATE TEST PIT LOCATION (2002-2015)
- APPROXIMATE SURFICIAL SOIL SAMPLE LOCATION (2002-2015)
- MEASURED CONCENTRATION OF METALS PARAMETERS (EXCLUDING SODIUM) IN SOIL BELOW CSR R/L STANDARDS AND CCME R/L GUIDELINES.
- MEASURED CONCENTRATION OF ONE OR MORE METALS PARAMETERS (EXCLUDING SODIUM) IN SOIL ABOVE THE CCME R/L GUIDELINES.
- MEASURED CONCENTRATION OF ONE OR MORE METALS PARAMETERS (EXCLUDING SODIUM) IN SOIL ABOVE THE CSR R/L STANDARD.
- MEASURED CONCENTRATIONS MAY ALSO BE ABOVE THE CCME R/L GUIDELINES.

- NOTES**
- BUILDINGS/INFRASTRUCTURE ARE AS OF SEPTEMBER 9, 2016 AND ARE BASED ON GOLDER SITE OBSERVATIONS AND A SURVEY CONDUCTED BY VECTOR GEOMATICS LAND SURVEYING LTD.
  - FOR DETAILS REGARDING TEST HOLE GEOLOGY AND SOIL CHEMISTRY RESULTS SEE APPENDICES
  - LOCATION AND DIMENSIONS OF THE TEMPORARY MAINTENANCE GARAGE ARE APPROXIMATE
  - CONTAMINATED SITES REGULATION (CSR) - STANDARDS ARE FROM THE CONTAMINATED SITES REGULATION B.C. REG. 375/96, O.C. 1480/96 AND M271/2004 INCLUDING AMENDMENTS UP TO MINISTERIAL ORDER NO. M426 (ALSO REFERRED TO AS STAGE 10 AMENDMENTS, OR OMNIBUS), INCLUDING UP TO ERRATA VERSION 2 (JANUARY 27, 2017).
  - CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME).
  - SOIL ON-SITE SHOULD BE ASSUMED TO HAVE METALS CONCENTRATIONS ABOVE CSR AND/OR CCME STANDARDS/GUIDELINES UNLESS TESTED AND DEMONSTRATED OTHERWISE.
  - IL = INDUSTRIAL LAND USE, RL = RESIDENTIAL LAND USE

- REFERENCES**
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CLIENT  
**PUBLIC WORKS AND GOVERNMENT SERVICES CANADA**

PROJECT  
**STEAMBOAT MAINTENANCE CAMP, KILOMETRE 537.9  
ALASKA HIGHWAY, B.C.**

TITLE  
**SUMMARY OF METALS ANALYTICAL RESULTS IN SOIL**

CONSULTANT	YYY-MM-DD	2017-07-07
DESIGNED	AV	
PREPARED	RTJ	
REVIEWED	AM	
APPROVED	JL	

PROJECT NO.  
**1660199**

REV.  
**0**

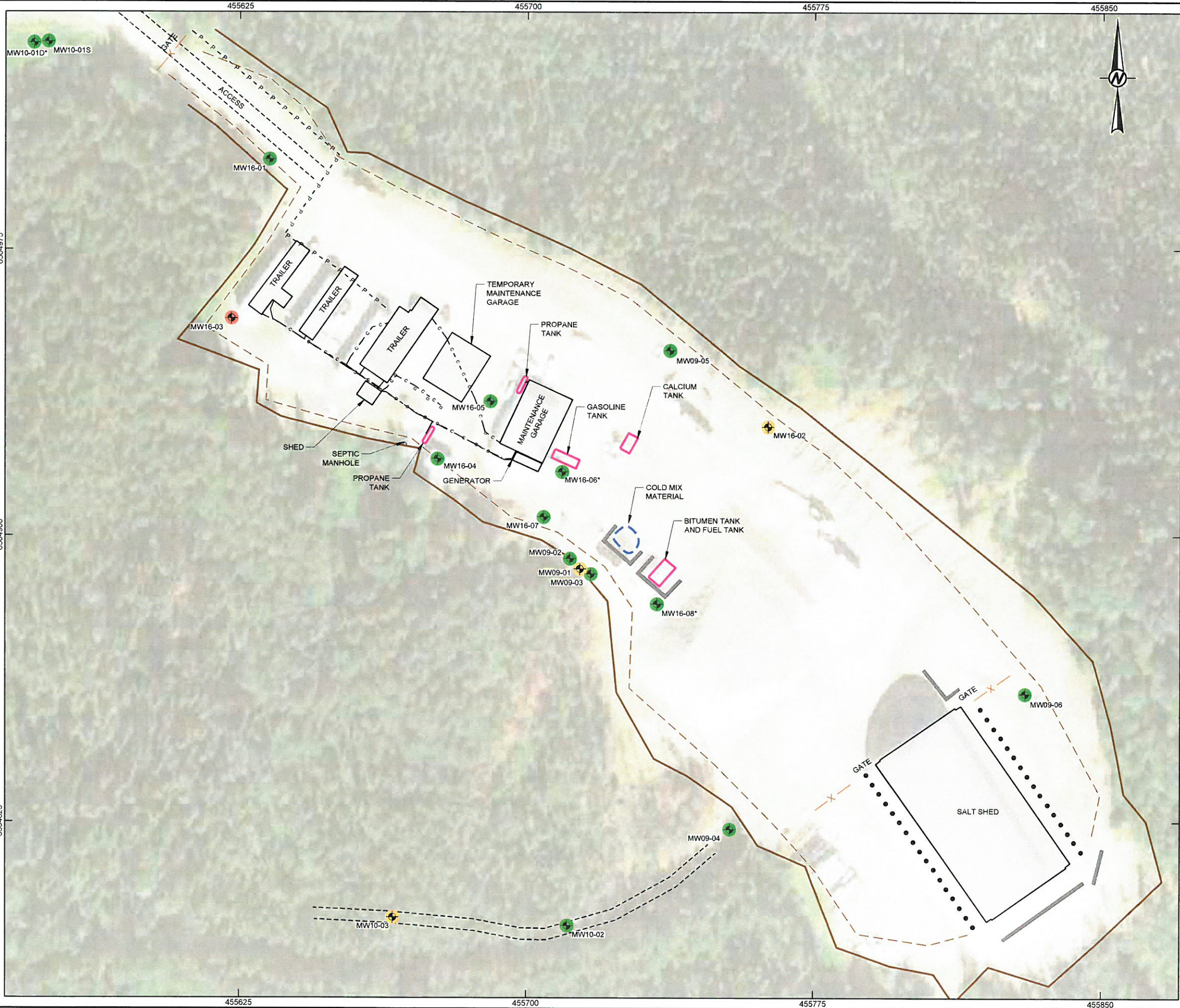
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



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**LEGEND**

- STRUCTURE
- CONCRETE BARRIER
- TREELINE
- CREST OF SLOPE
- POWERLINE
- BURIED CABLE
- BURIED PIPE
- ABOVE GROUND STORAGE TANK
- COLD MIX MATERIAL
- FENCELINE / GATE
- EDGE OF ROAD
- UTILITY PEDESTAL
- ANCHOR PILE
- MONITORING WELL LOCATION
- \* INDICATES A DECOMMISSIONED WELL
- MEASURED CONCENTRATIONS OF PETROLEUM HYDROCARBONS AND/OR VOCs BELOW THE CSR AW STANDARDS, CSR DW STANDARDS, FIGQ GUIDELINES AND HEALTH CANADA DRINKING WATER GUIDELINES
- MEASURED CONCENTRATIONS OF PETROLEUM HYDROCARBONS AND/OR VOCs IN ONE OR MORE GROUNDWATER SAMPLE WAS ABOVE THE FIGQ GUIDELINE OR HEALTH CANADA DRINKING WATER GUIDELINES
- MEASURED CONCENTRATIONS OF PETROLEUM HYDROCARBONS AND/OR VOCs IN ONE OR MORE GROUNDWATER SAMPLE WAS ABOVE THE CSR DW STANDARDS, PETROLEUM HYDROCARBONS AND VOCs CONCENTRATIONS MAY ALSO BE ABOVE FIGQ GUIDELINES OR HEALTH CANADA DRINKING WATER GUIDELINES
- MEASURED CONCENTRATIONS OF PETROLEUM HYDROCARBONS AND VOCs IN ONE OR MORE GROUNDWATER SAMPLE WAS ABOVE THE CSR AW STANDARDS, PETROLEUM HYDROCARBONS AND VOCs CONCENTRATIONS MAY ALSO BE ABOVE CSR DW STANDARDS, FIGQ GUIDELINES OR HEALTH CANADA DRINKING WATER GUIDELINES

- NOTES**
- BUILDINGS/INFRASTRUCTURE ARE AS OF SEPTEMBER 9, 2016 AND ARE BASED ON GOLDER SITE OBSERVATIONS AND A SURVEY CONDUCTED BY VECTOR GEOMATICS LAND SURVEYING LTD.
  - FOR DETAILS REGARDING TEST HOLE GEOLOGY AND GROUNDWATER CHEMISTRY RESULTS SEE APPENDICES
  - LOCATION AND DIMENSIONS OF THE TEMPORARY MAINTENANCE GARAGE ARE APPROXIMATE
  - CONTAMINATED SITES REGULATION (CSR) - STANDARDS ARE FROM THE CONTAMINATED SITES REGULATION B.C. REG. 375/96, O.C. 1480/96 AND M271/2004 INCLUDING AMENDMENTS UP TO MINISTERIAL ORDER NO. M426 (ALSO REFERRED TO AS STAGE 10 AMENDMENTS, OR OMNIBUS), INCLUDING UP TO ERRATA VERSION 2 (JANUARY 27, 2017).
  - FEDERAL INTERIM GROUNDWATER QUALITY GUIDELINES (FIGQ)(MARCH 2014) - THE MOST CONSERVATIVE VALUE OF THE SITE-SPECIFIC EXPOSURE PATHWAYS WERE APPLIED: PROTECTION OF FRESHWATER AQUATIC LIFE, SOIL ORGANISMS DIRECT CONTACT AND INHALATION
  - VOC = VOLATILE ORGANIC COMPOUND, AW = AQUATIC LIFE, DW = DRINKING WATER

- REFERENCES**
- SURVEY PLAN OBTAINED FROM VECTOR GEOMATICS LAND SURVEYING LTD. CAD FILE: 1609392SP\_R0\_EMAIL.DWG. DATED: SEPTEMBER 9, 2016.
  - BACKGROUND IMAGE SUPPLIED BY AND SOURCED UNDER LICENSE FROM BING IMAGES FOR ARCMAP ON : MARCH 28, 2017 IMAGE DATE: JULY, 2010 IMAGE GEOREFERENCED BY GOLDER AND INTENDED FOR INDICATIVE PURPOSES ONLY DATUM: NAD83 PROJECTION: UTM ZONE 10.



CLIENT  
**PUBLIC WORKS AND GOVERNMENT SERVICES CANADA**

PROJECT  
**STEAMBOAT MAINTENANCE CAMP, KILOMETRE 537.9  
ALASKA HIGHWAY, B.C.**

TITLE  
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS -  
PETROLEUM HYDROCARBONS AND VOLATILE ORGANIC  
COMPOUNDS**

CONSULTANT	XXXX-MM-DD	2017-07-07
DESIGNED	AV	
PREPARED	RTJ	
REVIEWED	AM	
APPROVED	JL	

PROJECT NO.  
**1660199**

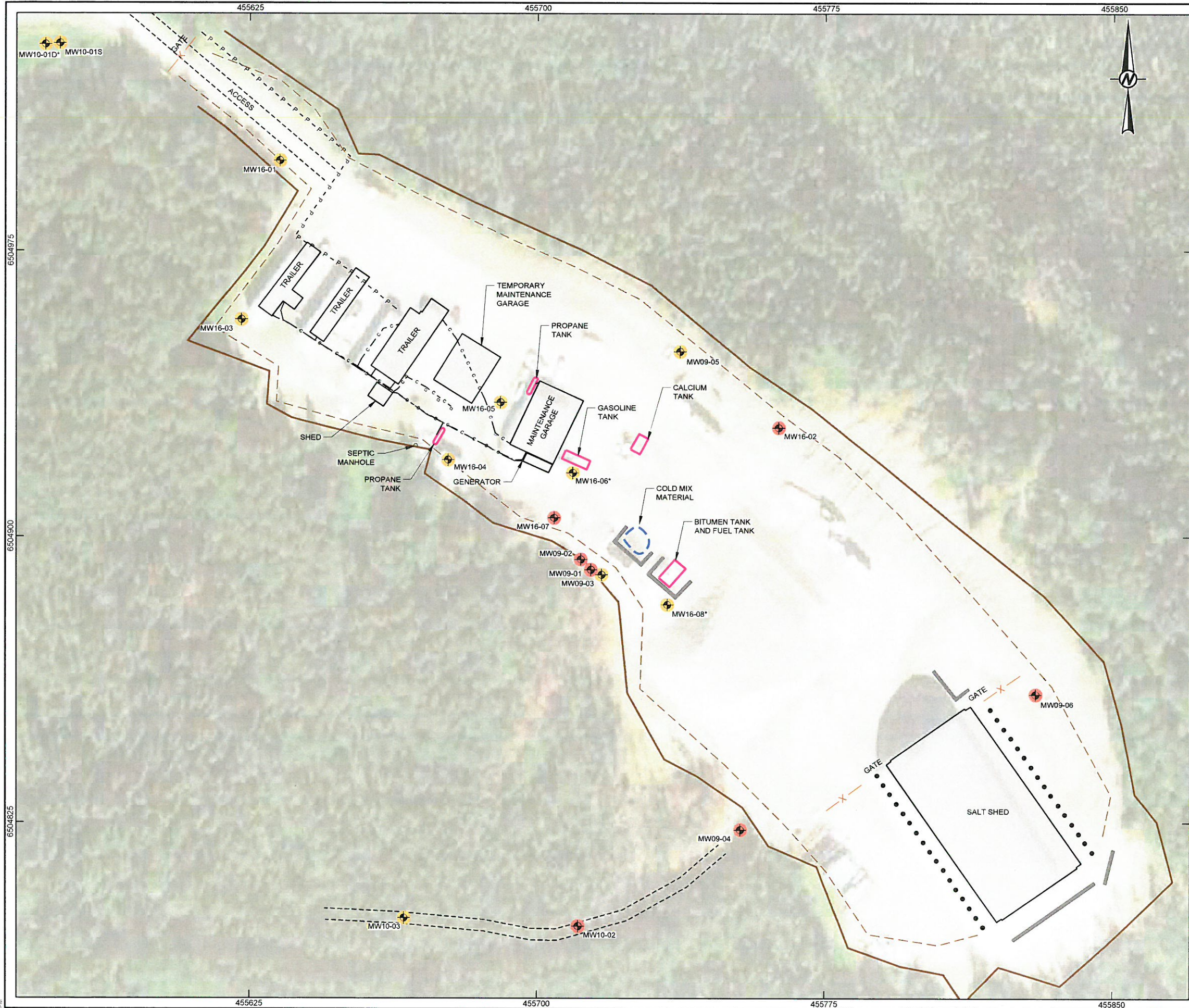
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



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**LEGEND**

- STRUCTURE
- CONCRETE BARRIER
- TREELINE
- CREST OF SLOPE
- POWERLINE
- BURIED CABLE
- BURIED PIPE
- ABOVE GROUND STORAGE TANK
- COLD MIX MATERIAL
- FENCELINE / GATE
- EDGE OF ROAD
- UTILITY PEDESTAL
- ANCHOR PILE
- MONITORING WELL LOCATION
- \* INDICATES A DECOMMISSIONED WELL
- MEASURED CONCENTRATIONS OF METALS BELOW THE CSR AW STANDARDS, CSR DW STANDARDS, FIGQ GUIDELINES AND HEALTH CANADA DRINKING WATER GUIDELINES
- MEASURED CONCENTRATIONS OF METALS IN ONE OR MORE GROUNDWATER SAMPLE WAS ABOVE THE FIGQ GUIDELINE OR HEALTH CANADA DRINKING WATER GUIDELINES
- MEASURED CONCENTRATIONS OF METALS IN ONE OR MORE GROUNDWATER SAMPLE WAS ABOVE THE CSR DW STANDARDS, METALS CONCENTRATIONS MAY ALSO BE ABOVE FIGQ GUIDELINES OR HEALTH CANADA DRINKING WATER GUIDELINES
- MEASURED CONCENTRATIONS OF METALS IN ONE OR MORE GROUNDWATER SAMPLE WAS ABOVE THE CSR AW STANDARDS, METALS CONCENTRATIONS MAY ALSO BE ABOVE CSR DW STANDARDS, FIGQ GUIDELINES OR HEALTH CANADA DRINKING WATER GUIDELINES

- NOTES**
- BUILDINGS/INFRASTRUCTURE ARE AS OF SEPTEMBER 9, 2016 AND ARE BASED ON GOLDER SITE OBSERVATIONS AND A SURVEY CONDUCTED BY VECTOR GEOMATICS LAND SURVEYING LTD.
  - FOR DETAILS REGARDING TEST HOLE GEOLOGY AND GROUNDWATER CHEMISTRY RESULTS SEE APPENDICES
  - LOCATION AND DIMENSIONS OF THE TEMPORARY MAINTENANCE GARAGE ARE APPROXIMATE
  - CONTAMINATED SITES REGULATION (CSR) - STANDARDS ARE FROM THE CONTAMINATED SITES REGULATION B.C. REG. 375/96, O.C. 1480/96 AND M271/2004 INCLUDING AMENDMENTS UP TO MINISTERIAL ORDER NO. M426 (ALSO REFERRED TO AS STAGE 10 AMENDMENTS, OR OMNIBUS), INCLUDING UP TO ERRATA VERSION 2 (JANUARY 27, 2017).
  - FEDERAL INTERIM GROUNDWATER QUALITY GUIDELINES (FIGQ)(MARCH 2014) - THE MOST CONSERVATIVE VALUE OF THE SITE-SPECIFIC EXPOSURE PATHWAYS WERE APPLIED: PROTECTION OF FRESHWATER AQUATIC LIFE, SOIL ORGANISMS DIRECT CONTACT AND INHALATION
  - AW = AQUATIC LIFE, DW = DRINKING WATER

- REFERENCES**
- SURVEY PLAN OBTAINED FROM VECTOR GEOMATICS LAND SURVEYING LTD. CAD FILE: 1609392SP\_R0\_EMAIL.DWG, DATED: SEPTEMBER 9, 2016.
  - BACKGROUND IMAGE SUPPLIED BY AND SOURCED UNDER LICENSE FROM BING IMAGES FOR ARCMAP ON: MARCH 28, 2017. IMAGE DATE: JULY, 2010
  - DATUM: NAD83 PROJECTION: UTM ZONE 10.



CLIENT  
**PUBLIC WORKS AND GOVERNMENT SERVICES CANADA**

PROJECT  
**STEAMBOAT MAINTENANCE CAMP, KILOMETRE 537.9 ALASKA HIGHWAY, B.C.**

TITLE  
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - METALS, SODIUM AND CHLORIDE**

CONSULTANT	J. LEVENICK # 35939 Golder Associates ENGINEER	YYYY-MM-DD	2017-07-07
DESIGNED	AV		
PREPARED	RTJ		
REVIEWED	AM		
APPROVED	JL		

PROJECT NO.  
**1660199**

REV.  
**0**

DRAWING  
**8B**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/B







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Proposed Year of Excavation	Excavation Area	Area (m <sup>2</sup> )	Depth (m)	Volume of Soil (m <sup>3</sup> )	Volume of Bedrock (m <sup>3</sup> )	Total Volume (m <sup>3</sup> )
1	E5	225	2	450	0	450
1	E6	545	3.5	1,910	0	1,910
1	F1	385	4	1,540	0	1,540
1	F2	400	6	2,200	200	2,400
1	F3	110	5	495	55	550
1	H	50	2	100	0	100
1	J	25	1	25	0	25
	<b>Total</b>	<b>1740</b>	-	<b>6,720</b>	<b>255</b>	<b>6,975</b>

**LEGEND**

- STRUCTURE
- POTENTIAL LOCATION OF FUTURE SALT SHED (TO BE CONSTRUCTED IN 2017 AFTER REMEDIATION YEAR 1)
- CONCRETE BARRIER
- TREELINE
- CREST OF SLOPE
- POWERLINE
- BURIED CABLE
- BURIED PIPE
- ABOVE GROUND STORAGE TANK
- COLD MIX MATERIAL
- FENCELINE / GATE
- EDGE OF ROAD
- UTILITY PEDESTAL
- ANCHOR PILE
- 1 mbgs EXCAVATION
- 2 mbgs EXCAVATION
- 2.5 mbgs EXCAVATION
- 3 mbgs EXCAVATION
- 3.5 mbgs EXCAVATION
- 4 mbgs EXCAVATION
- 5 mbgs EXCAVATION
- 6 mbgs EXCAVATION

**NOTES**

- BUILDINGS/INFRASTRUCTURE ARE AS OF SEPTEMBER 9, 2016 AND ARE BASED ON GOLDER SITE OBSERVATIONS AND A SURVEY CONDUCTED BY VECTOR GEOMATICS LAND SURVEYING LTD.
- LOCATION AND DIMENSIONS OF THE TEMPORARY MAINTENANCE GARAGE ARE APPROXIMATE
- mbgs = METRES BELOW GROUND SURFACE
- VOLUMES ARE APPROXIMATE
- ACCESS TO TRAILERS, ASTs AND SALT SHED MUST BE MAINTAINED AT ALL TIMES
- BARRICADES AND SIGNAGE MUST BE PROVIDED BY THE CONTRACTOR WHEN THE EXCAVATION IS LEFT OPEN.
- MATERIAL WITHIN THE EXCAVATION BOUNDS HAS CSR AND/OR CCME EXCEEDANCES AND MUST BE DISPOSED OF AT A PERMITTED FACILITY
- MATERIAL EXCAVATED OUTSIDE THE EXCAVATION LIMITS MAY HAVE CSR AND/OR CCME EXCEEDANCES AND SHOULD BE GEOTECHNICALLY AND ENVIRONMENTALLY ASSESSED FOR BACKFILL SUITABILITY IF TO BE PLACED BACK INTO THE EXCAVATION.
- CONTAMINATED SITES REGULATION (CSR) - STANDARDS ARE FROM THE CONTAMINATED SITES REGULATION B.C. REG. 375/96, O.C. 1480/96 AND M271/2004 INCLUDING AMENDMENTS UP TO MINISTERIAL ORDER NO. M426 (ALSO REFERRED TO AS STAGE 10 AMENDMENTS, OR OMNIBUS), INCLUDING UP TO ERRATA VERSION 2 (JANUARY 27, 2017).
- CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME) - CANADA WIDE STANDARDS FOR PETROLEUM HYDROCARBONS (PHC) IN SOIL (JANUARY 2008) AND CANADIAN SOIL QUALITY GUIDELINES FOR THE PROTECTION OF ENVIRONMENTAL AND HUMAN HEALTH POLYCYCLIC AROMATIC HYDROCARBONS (2010).
- EXCAVATIONS MAY ENCOUNTER DEBRIS OR OTHER OBSTRUCTIONS NOT IDENTIFIED DURING BOREHOLE DRILLING AND TEST PITTING.
- LAYOUT OF FUTURE SALT SHED WAS PROVIDED BY PUBLIC SERVICES AND PROCUREMENT CANADA MAY 26, 2017

**REFERENCES**

- SURVEY PLAN OBTAINED FROM VECTOR GEOMATICS LAND SURVEYING LTD. CAD FILE: 1609392SP\_R0\_EMAIL.DWG, DATED: SEPTEMBER 9, 2016.
- BACKGROUND IMAGE SUPPLIED BY AND SOURCED UNDER LICENSE FROM BING IMAGES FOR ARCMAP ON : MARCH 28, 2017 IMAGE DATE: JULY, 2010 IMAGE GEOREFERENCED BY GOLDER AND INTENDED FOR INDICATIVE PURPOSES ONLY
- DATUM: NAD83 PROJECTION: UTM ZONE 10.

0 25 50  
1:1,000 METRES

CLIENT  
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT  
STEAMBOAT MAINTENANCE CAMP, KILOMETRE 537.9  
ALASKA HIGHWAY, B.C.

TITLE  
PROPOSED REMEDIAL EXCAVATION EXTENTS - YEAR 1

CONSULTANT: L. LEVENICK

YYYY-MM-DD	2017-07-07
DESIGNED	AV
PREPARED	RTJ
REVIEWED	AM
APPROVED	JL

PROJECT NO.  
1660199

REV.  
0

DRAWING  
10

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

25 mm



## 1.0 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 lbf/ft<sup>3</sup>) (600 kN/m<sup>3</sup>)
  - .2 2012 Standard Specifications for Highway Construction, British Columbia Ministry of Transportation and Infrastructure (BC MoTI 2012)

## 2.0 TESTS AND INSPECTIONS

- .1 Quality Assurance testing of materials and compaction of backfill will be carried out by testing laboratory designated by Departmental Representative.
- .2 Not later than one week before backfilling or filling, provide to the designated testing agency, 23 kg sample of backfill materials proposed for use.
- .3 Do not begin backfilling or filling operations until material has been approved for use by Departmental Representative.
- .4 Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative so that Quality Assurance compaction tests can be carried out by designated testing agency.
- .5 Before commencing work, conduct, with Departmental Representative, condition survey of existing structures, trees and other plants, fencing, service poles, survey bench marks and monuments which may be affected by work.

### 3.0 SAMPLES

- .1 Provide grain size analysis testing results for all proposed backfill material types including material source identification a minimum of two weeks prior to placement.
- .2 Allow continual sampling by Departmental Representative during aggregate production.
- .3 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

## 4.0 MATERIALS

- .1 Surfacing Aggregate - HFSA to BC MoTI 2012 Standard Specifications, gradation as per Table 202-C.
- .2 Subbase - SGBS to BC MoTI 2012 Standard Specifications, gradation as per Table 202-C.
- .3 Subgrade Fill - to be well graded granular material, substantially free from clay lumps, organic matter and other extraneous material, screened to remove all stones in excess of maximum 200 mm diameter. Material to conform to following gradation:

Sieve Designation	Percent Passing
200mm	100
75mm	100
50mm	70-100
25mm	50-100
4.75mm	22-100
2.36mm	10-85
0.075mm	2-8

- .4 Aggregate quality: to be sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
- .5 Imported fill materials produced by the crushing of rock or pit run materials that contain cobble sized or larger (>64 mm) rock particles must be tested by the Contractor for Acid Rock Drainage (ARD) and Metal Leaching (ML) potential prior to being brought onsite. Testing shall be carried out using the following test methods:
  - .1 Modified Acid Base Accounting (modified ABA) for the assessment of ARD potential (solid phase rock material)
  - .2 Total metals analysis by ICP-MS for assessment of metal content (solid phase rock material)
  - .3 Shake Flask Extraction (SFE) for assessment of metal leaching potential (SFE test leachate)
  - .4 Details on the above test methods and interpretation of test results are outlined in the guidance document titled "Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials MEND Report 1.20.1, Natural Resources Canada, 2009
- .6 Imported fill materials must originate from a clean source.

## 5.0 AGGREGATE SOURCE

1. Contractor may use the existing gravel stockpiles at the PWGSC Mill Creek Gravel Pit on the Alaska Highway (km 554) for designated types of aggregates to be placed. However the existing stockpiled aggregates will have to be screened/processed by the Contractor to meet the designated gradations.
2. Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least two weeks prior to commencing production.
3. If, in opinion of Departmental Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
4. Advise Departmental Representative two weeks in advance of proposed change of material source to allow sampling and testing.
5. Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

## 6.0 MATERIALS HANDLING

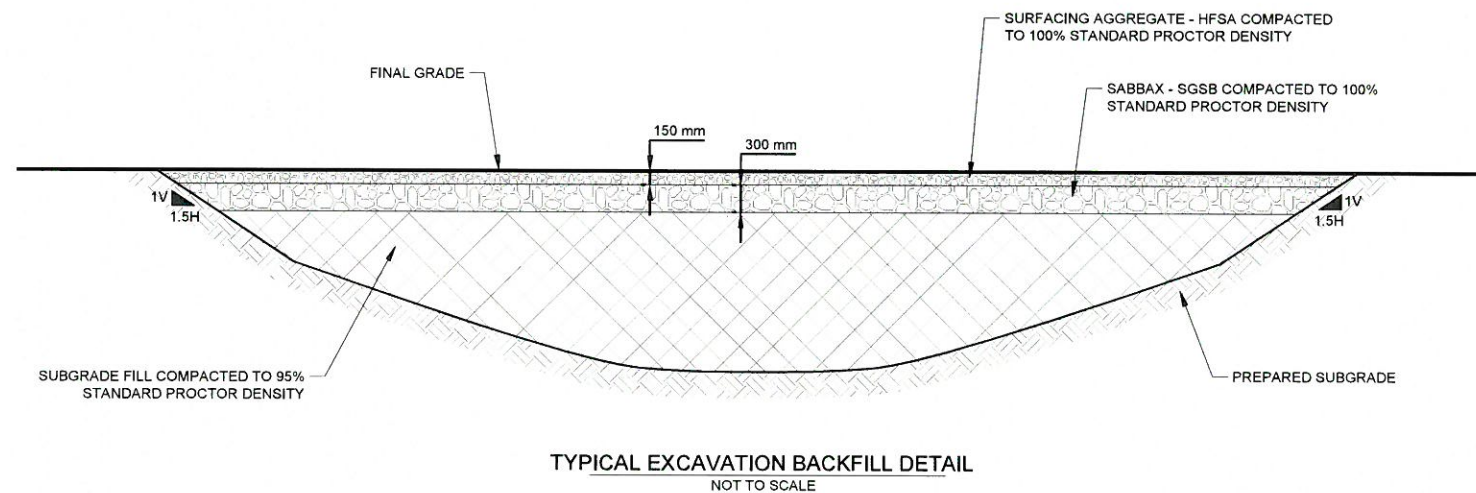
- .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- .2 Do not use intermixed or contaminated materials. Remove and dispose rejected materials within 48 hours of rejection.

## 7.0 BACKFILLING

1. Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by Departmental Representative.
2. Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
3. Subgrade Preparation: Shape subgrade surface to avoid surface ponding and promote drainage. Roll subgrade surface as directed by Departmental Representative to obtain a relatively smooth, even and uniformly compacted subgrade surface..
4. Placing:
  1. Place Subgrade Fill in lifts not exceeding a loose thickness of 300 mm.
  2. Place Subbase and Surfacing Aggregate material in lifts not exceeding a compacted thickness of 150 mm.
5. Compaction: compact each layer of material to following densities for material to ASTM D698:
  1. Subgrade Fill - to underside of subbase: 95%.
  2. Subbase: 100%.
  3. Surfacing Aggregate: 100%.
6. Wet and dry the backfill material as required to achieve specified density.
7. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected to value not greater than 2 to 3% moisture above optimum value for compaction in accordance with ASTM D698.
8. Reshape compacted surfaces to within 25 mm of elevations as indicated.

## 8.0 GRADING

- .1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by Departmental Representative. Grade to be gradual between finished spot elevations shown on drawings.
- .2 Grade soil and backfill, establishing natural contours and eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Verify that grades are correct and notify Departmental Representative if discrepancies occur.



**DRAFT**

**NOTE**

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TECHNICAL SPECIFICATIONS DOCUMENT.

CLIENT

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT

STEAMBOAT MAINTENANCE CAMP, KILOMETRE 537.9  
ALASKA HIGHWAY, B.C.

TITLE

## SITE RESTORATIONS

CONSULTANT

YYYY-MM-DD 2017-07-07

DESIGNED AV

PREPARED	RTJ
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REVIEWED AV

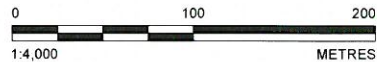
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LEGEND

 APPROXIMATE PROPOSED BACKFILL SOURCE, FINAL BOUNDARIES TO BE DETERMINED FOLLOWING A SITE VISIT WITH PUBLIC SERVICES AND PROCUREMENT CANADA

NOTE

1. SUITABILITY OF BACKFILL TO BE CONFIRMED BY CONTRACTOR

REFERENCE

BACKGROUND IMAGE SUPPLIED BY AND SOURCED UNDER LICENSE FROM BING IMAGES FOR ARCMAP ON : JUNE 15, 2017 IMAGE DATE: DECEMBER 2009 - MAY, 2016  
IMAGE GEOREFERENCED BY GOLDER AND INTENDED FOR INDICATIVE PURPOSES ONLY  
DATUM: NAD83, PROJECTION: UTM ZONE 10

CLIENT  
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT  
STEAMBOAT MAINTENANCE CAMP, KILOMETRE 537.9  
ALASKA HIGHWAY, B.C.

TITLE  
MILL CREEK GRAVEL PIT

CONSULTANT



YYYY-MM-DD 2017-07-07

PREPARED RTJ

DESIGN AV

REVIEW AM

APPROVED JL

PROJECT No. 1660199  
PHASE 2000

Rev. 0

FIGURE 12

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