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British Columbia
V6Z 0B9
Bid Fax: (604) 775-9381

SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

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Title - Sujet Rock Bay Remediation Proj. Stage 3	
Solicitation No. - N° de l'invitation EZ899-142200/B	Amendment No. - N° modif. 001
Client Reference No. - N° de référence du client	Date 2014-04-02
GETS Reference No. - N° de référence de SEAG PW-\$PWY-026-7231	
File No. - N° de dossier PWY-3-36278 (026)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2014-04-17	Time Zone Fuseau horaire Pacific Daylight Saving Time PDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Liu (PWY), Patty	Buyer Id - Id de l'acheteur pwy026
Telephone No. - N° de téléphone (604) 775-6227 ()	FAX No. - N° de FAX (604) 775-6633
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: TC - Rock Bay, BC	

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Signature	Date

Amendment 001**Clarification to Questions****Question #1:**

Can the AutoCAD files for the AutoCAD Drawings in Specifications be provided?

Answer #1:

The AutoCAD Drawings in Specifications will be provided on a CD to all companies that sign-in to mandatory proponent's conference and site visit.

Question #2:

Can the analytical results for the soil and sediment from the Stage 3 area be provided?

Answer #2:

The analytical results for the soil and sediment from the Stage 3 area will be provided as Appendix J Analytical Results for Stage 3 Area on a CD to all companies that sign-in for the mandatory proponent's conference and site visit.

The following should be considered when reviewing the data:

" Not all data collected from the Site within the Stage 3 area is included. Some data was considered suspect or was missing information (eg location) and was not included.

" Concentrations of substances in material to be excavated as part of the Work may exceed concentrations identified in spreadsheet due to inherent limitations of investigations and variability in contamination

" Sodium and Chloride were not analysed. As per the Specifications 1.2.4, all Contaminated Waste below the high water mark should be considered to have Sodium and Chloride values above the Remedial Objectives.

Question #3:

Can existing fencing be removed and replaced with temporary fencing during the construction lifetime of the project if it is replaced at the end of construction?

Answer #3:

Yes, the temporary fence may be removed and replaced but the Site must remain secure (ie fenced) at all times, as per 015200 1.10.2.

Question #4:

As per section 31 23 33.01 3.12 where is the water from outfall 626 and 627 to be directed to?

Is a dissipation structure required to prevent turbidity in the receiving waters? Is the water at the discharge point subject to water quality testing? Is turbidity or TSS being measured in the harbour at the discharge point? Are silt curtains or other sediment reduction measures required at the discharge point?

Answer #4:

The City of Victoria would be responsible for the discharge quality from the outfalls. The Contractor is responsible for protection of property as per GC4.2, and this must be considered when locating the bypass for outfalls 626 and 627 (eg the bypass cannot cause erosion of the shoreline).

Question #5:

As per section 312333.01 3.7, where can the water that is discharged from behind the cofferdam be discharged to in Rock Bay? Is a dissipation structure required to prevent the water, which may meet the discharge requirements, but by the act of discharging, may cause turbidity. Is turbidity or TSS being measured in the Harbour? Are silt curtains required or other sediment reduction measures required at the discharge point?

Answer #5:

As per 011100 1.4.2.9 and 312333.01 3.7, the dewatering behind the Cofferdam is part of the Work, and must be done in accordance with the Contract, including environmental protection as per 013543 1.17. The Contractor shall determine the specific methods and means to ensure compliance with the Contract as per GC3.4

Question #6:

The specifications, including drawing 33, indicates that the whole Stage 2 area requires paving, is this the case?

Answer #6:

As per Drawing 33, the Contractor is required to pave the entire Site. The Contractor is responsible for the construction means and methods

Question #7:

Is Asphalt removal required once the project is complete? Please clarify.

Answer #7:

As per 011100 1.4.2.20 the Site must be restored to be suitable for use as a gravel parking lot. As per 015200 1.7.6 and 026100.02 3.5.4 all temporary construction facilities (including paving) must be removed after use.

Question #8:

The Unit Price Form states that there will be 61,568 tonnes of material loaded for direct transport for treatment and disposal. What type of quality assurance and quality control is the owner going to conduct to ensure that the sediment/soil quality is in fact the quality that it is being designated in the field by the owners representative?

Answer #8:

The material identified for Excavation and Loading for Direct Offsite Transport has been characterized insitu to the satisfaction of a third party consultant. Suspect material will be characterized exsitu. Any field observations that contradict the insitu estimates as per 013513.43 1.22.3 will result in either the material being conservatively recharacterized for Excavation and Loading for Direct Offsite Transport or tested exsitu. If the Contractor or a Subcontractor (eg Disposal Facility) requires additional testing (including due to suspect characterization), then this is the responsibility of the Contractor as per 013513.43 1.22.6.

Question #9:

Section 312333.01 3.11 refers to the Geoduck Hole Excavation. It states the dimensions of the required hole to be excavated, wherein there is a minimum depth specified. Is there a maximum depth of excavation required?

Answer #9:

The requirement is to remove the geoduck holes with contamination. No maximum depth is specified, the Contractor must determine what is a reasonable assumption.

Question #10:

Is there any work that is being conducted on neighbouring properties on the east boundary of the site that may impact the design and construction of shoring support required at that location? Can it be assumed that the soil on the neighbouring property to the east is the same as cross section Drawing 8?

Answer #10:

The conditions anticipated to be encountered at the Site are described in the Contract and were shown at the Site Visit as per 017100. The process if the Contractor encounters subsurface conditions that are substantially different from reasonably assumed subsurface conditions is described in GC6.2.

Question #11:

Is there a drawing associated with the Department of Fisheries and Oceans Authorization No. 99-HPAC-PA3-000-000747 that illustrate where the alteration, disruption and destruction of fish habitat is authorized?

Answer #11:

The impounded areas identified in the permit application for the DFO Authorization was approximately 4,500 m2 in the vicinity of the contaminated sediment.

Question #12:

In Section 6.3.2.1 (Technical Evaluation Criteria #1: Experience of Key Personnel) of the RFP, how does key role 4 (Analyst for Project Management) differ from role 5 (WBS, Schedule and Budget Analysis and Reporting).

Answer #12:

With respect to Role 4, the Analyst for Project Management:

" Qualifications could include: specific project management training, experience in managing major projects, and have a professional designation.

" Role would typically be: with other experts the Analyst for Project Management would provide project management expertise (eg risk management, cash flow projections, schedule dependencies).

With respect to the Role 5, the WBS, Schedule, and Budget Analysis and Reporting person:

" Qualifications could include: specific training in project management software, and experience in generating project management reports (eg risk monitoring, cash flows, Gantt charts).

" Role would typically be: based on direction from the Analyst for Project Management run different scenarios and generate project management reports.

Question #13:

Can PWGSC provide quantity estimates for substrate materials discussed in Section 312333.01 of the specifications used in backfilling?

Answer #13:

The Sand/Silt Substrate material identified in 312333.01 2.2.2 is part of the Shoreline Remediation, which will be paid as lump sum as per 011100 1.1.24. The Contractor is responsible for estimating the quantity in accordance with the Contract.

Question #14:

Can PWGSC provide flow data for outfall 626 and 627?

Answer #14:

The federal government does not own, maintain, or monitor outfalls 626 or 627. The City of Victoria would be responsible for the discharge quantity from the outfalls.

Question #15:

Section 013513.43, item 1.25.2.2, please confirm that all treatable waste (items 21a, 21b, 21c and 21d of the unit price table) needs to be treated so that final concentrations meet the CSR Schedule 7, Column II standards prior to final disposal. Please confirm that these are the treatment objectives, and that the waste, whether it is classified as hazardous or non-hazardous, and whether it has been treated or not, cannot be sent to disposal facilities that hold the necessary approvals to dispose of waste with higher levels of contamination than the CSR Schedule 7, Column II standards.

Answer #15:

Contaminated Waste with contaminants amenable to treatment (eg material with Hazardous Waste hydrocarbons or with CL+ hydrocarbons), including material comingled with contaminants not amenable to treatment, requires treatment prior to disposal at a Disposal Facility as per 013513.43 1.24. Contaminated Waste that has no contaminants amenable to

treatment (eg material with only CL+ metals) can be disposed directly at a Disposal Facility as per 013513.43 1.24.

Question #16:

Does Clause 1.25.2.2 of the specifications under Section 013513.43 - Special Project Procedures for Contaminated Sites that requires waste to be treated below BC Contaminated Sites Regulation Schedule 7 Column II apply to hydrocarbon soil including PAHs? Does this treatment requirement apply to all hazardous and non-hazardous waste?

Answer #16:

All Contaminated Waste (including Hazardous Waste and Non-Hazardous Contaminated Waste) which has hydrocarbon contaminants, including Polycyclic Aromatic Hydrocarbons, must be treated as per 013513.43 1.24.

Question #17:

Is a certificate of treatment required for payment of item #21 in Appendix 2 - Unit Price Table (Contaminated Waste Treatment)?

Answer #17:

Yes, a Certificate of Treatment is required for payment of Contaminated Waste Treatment as per 0111001.1.21.

Question #18:

Is analytical testing required to support certificates of treatment? If so, what is the frequency of testing (ie. Sample support weight/volume) required to verify treatment as defined in Clause 1.25.2.2 Special Project Procedures for Contaminated Sites (Section 013513.43)?

Answer #18:

Yes, analytical testing is required for Certificates of Treatment as per 013513.43 1.3.7.7. The sample frequency for this analytical testing will vary by Treatment Facility, including: treatment methodology, authorizations, and requirements of subsequent Disposal Facility.

Question #19:

Are disposal facilities such as landfills located on Aboriginal land acceptable as final disposal options for all classifications of waste? If not, what classifications of wastes are acceptable?

Answer #19:

Provincial or territorial authorizations are not normally issued on Aboriginal land. The Disposal Facility must have an authorization issued by a province or territory, as per 013513.43 1.26.2.

Question #20:

The work may be curtailed based on odours or public complaints. How will this be implemented during the Work? Will the exceedence of an air quality criteria result in stoppage of the Work?

Answer #20:

The Contractor has a responsibility to ensure that the Work does not infringe upon the public as per GC4.2. Work Activity levels will be implemented as decided by the Departmental Representative to protect the public, as per 013513.43 1.15.

Question #21:

Is screening of 2mm material required?

Answer #21:

The screening of 2mm material is a project requirement.

Question #22:

There appears to be some missing test hole information. Can these be provided?

Answer #22:

The borehole logs for BH07-501 to 504 and 509 to 519 are attached to this Amendment.

Question #23:

Please provide shear strength data from the field testing (vanes, both peak and remolded) and correlations for shear strength with the CPT, for the relevant holes.

Answer #23:

Vane data and CPT plots are provided in Specifications Appendix F "Geo-Environmental and Geotechnical Investigation Report - Marine Works Rock Bay Remediation Project Stage 3 Planning Victoria, BC". Interpreted correlations for shear strength are the responsibility of the Qualified Professional responsible for design.

Question #24:

Was the location of test holes BH07-537 been omitted from the site plan?

Answer #24:

The location of BH07-537 is shown in Specifications Appendix F "Geo-Environmental and Geotechnical Investigation Report - Marine Works Rock Bay Remediation Project Stage 3 Planning Victoria, BC", Figure 3 "Borehole Location Plan", in the very southeastern corner of the Site.

Question #25:

In the Request For Proposal 6.3.2.2, 6.3.2.3, and 6.3.2.4, what is the definition of a "completed" project?

Answer #25:

A project is considered complete when it meets the requirements of, or the equivalence of, GC5.6.

Question #26:

In the Request For Proposal 6.3.2.7 what is considered "Design Work"? For example, there is no need in this project to design a Contaminated Material Treatment facility.

Answer #26:

In the Request For Proposal "Design" refers to the stage of the Work. For example, during the design stage of the Work, the Contractor must design a Cofferdam, and so the Proposal could describe the design process. As another example, the Contractor must design for soil treatment, and so the Proponent could describe how they plan to ensure the Treatment Facility can meet the project scope and schedule requirements, and that risks, quality, safety, communications, and environmental protection are addressed.

Question #27:

In the Request For Proposal 6.3.2.8 what is considered "Construction Work". For example, there is noneed in this project to construct a Contaminated Material Treatment facility.

Answer #27:

In the Request For Proposal "Construction" refers to the stage of the Work. For example, during the construction stage of the Work, the Contractor must construct a Cofferdam, and so the Proposal could describe the methodology of the construction process. As another example, the Contractor must treat soil during construction, and so the Proponent could describe how they are going to treat the soil (eg. Treatment Facility process).

Question #28:

Can PWGSC provide a cross section of the sand seam seal area?

Answer #28:

The sand seam seal area is shown in cross-section in Drawing 10.

Question #29:

Section 31 23 33.01 - 3.16 states, "A sand seam seal must be placed along the southern project Site Boundary in the area of the sand seam excavation in accordance with the contract". What is the classification for transport, treatment and disposal of the soil shown in the locations of the sand seam seal excavation shown in drawings 22 to 24 and depicted as Clay overburden and sand seam (cyanide in groundwater).

Answer #29:

"Clay overburden" is classified as Non-Contaminated Waste CL. "Sand seam (cyanide in groundwater)" is classified as Non-Hazardous Waste Nontreatable (CL+ Metals). As per 013513.43 1.22.3, classification is as directed by the Departmental Representative.

Question #30:

Please advise if the soil classification for transport, disposal and payment will be based on CCME or CSR standards as there is minor variability or will it be based on the more conservative of the two

Answer #30:

Soil classification for material removed offsite is based on BC Contaminated Sites Regulation. As per 014100 1.4.1, generally, provincial and municipal laws, regulations and requirements do not apply on federal lands, activities or undertakings. Soil and other materials that are removed from federal lands may become subject to provincial or municipal laws and regulations.

Question #31:

As per Section 31 23 33.01 - 2.1 what will be the required CCME or BC Contaminated Sites Regulation classification for backfill?

Answer #31:

Imported backfill environmental quality requirements are identified in 026100.02 2.1.3. Note that all material (eg discrete samples) must meet the import backfill environmental quality requirements. Statistical characterization of analytical results (eg compositing, averaging, upper 90th percentile, upper 95% confidence limit) or modification to numerical criteria (eg site-specific numerical standards, regional background release, local background release) are not allowed.

Question #32:

Section 31 23 33.01 - 3.6.1.6 and 3.8.1.6 states that the cofferdam and shoring must not flex or bend. Traditional shoring and cofferdams have some flex in them, can you further define this requirement and state if there is any tolerance at all allowed within this requirement?

Answer #32:

Flexing or bending of the shoring support must not result in significant settlement or instability of supported soils.

Question #33:

The specifications call for removal of contaminated and uncontaminated soil to a vertical face at the property lines of the site. At the January 22, 2014 pre-bid conference of EZ899-142200/A it was implied that any soil remaining at the property line needs to be removed to the satisfaction of a C SAP. Please confirm whether soil trapped in the sheet pile

flutes can be left behind to the satisfaction of a C SAP, or that bidders must allow for the installation of steel backing plates and removal of this soil from behind the sheet pile wall.

Answer #33:

Material left behind in crenulated sheet pile flutes does not meet the requirement of 013513.43 1.22.1. All contaminated material must be removed to the extent practicable so that there is no representative volume of material left to sample. Note that as per 011100 1.6.3.5 and the Appendices, the Contractor should be prepared to encounter significant obstructions during upland shoring, and the sequence, methods and means must be able to cope with difficult ground conditions.

Question #34:

As per Section 31 23 33.01 - 2.1 would 75mm to 19mm crush be acceptable as backfill material, where 0% is passing a 19mm sieve? As an alternative to using 3" with bottom 2 mm screened backfill as per SPECS - Excavating, Trenching and Backfilling 2.1.1, can 3" clear (rock size is between 1" and 3" in diameter) be used? As an alternative to using 3" with bottom 2 mm screened backfill as per SPECS - Excavating, Trenching and Backfilling 2.1.1, can 3" with the bottom 0.75" screened be used?

Answer #34:

Further to 312333.01 2.1.1, the 75 mm Coarse granular backfill material must meet the following specified gradations:

Sieve Size (mm)	Percent Passing (%)
75	100
50	55 to 100
37.5	40 to 80
19	17 to 40
12.5	--
9.5	--
6.3	--
4.75	--
2.36	0 to 25
1.18	--

0.6	--
0.3	--
0.075	--

Question #35:

If a Contractor can mobilize on site on 2014April01 (Section 01 11 00 - 1.11) but cannot submit any pre-construction submittals earlier than 2014April01, it would restrict one from mobilizing on site and doing work on that date. Can the submittals (e.g. utility plan) be submitted and reviewed earlier than 2014April01 to allow for works to commence for 2014April01?

Answer #35:

No submittals will be accepted prior to 2014Apr01, as per 011100 1.11.2.

Question #36:

If submittals are only final after the review (Section 01 11 00 - 1.2.39), how long can the Contractor expect the departmental representative to review the submittals?

Answer #36:

As per GC1.5, time is of the essence, and as per GC3.2.6 the Departmental Representative will promptly review Submittals. The time required by the Departmental Representative to review individual Submittals depends on numerous factors including: completeness of Submittal, other Submittals under review, complexity of Submittal, and requirement for expert review of Submittal.

Question #37:

Please define what is to be expected from the fish and marine life to be salvaged behind the Cofferdam as stated in Section 31 23 33.01 - 3.7.5. What can the Contractor expect to have to remove from the area behind the Cofferdam? Is there a size restriction, does this include plant life, shelled species? Please define more clearly. Has an inventory been done to assess what fish and marine life are presently in the bay for what the Contractor can expect?

Answer #37:

There is no inventory of fish and marine life presently in the bay. The Contractor must remove any commercial, recreational, or aboriginal fisheries species. Further, any other large, significant marine animal life that can be collected incidentally must be removed. Note that as

per 014100 1.4.4, the Contractor may be required to obtain a permit for fish and marine life salvage.

Question #38:

The various reports make references to historical documents. Will these documents be made available?

Answer #38:

No other documents will be made available that have not already been issued as part of this solicitation. The historical documents are either drafts that have been superseded by more recent documents, or are not available to PWGSC for distribution.

Question #39:

The RFP contains CPT sounding logs. However, some of the graphical scales are relatively large so it is difficult to get accurate and precise values of the measurements from the graphical logs. Will the digital CPT files be available to the successful bidder?

Answer #39:

The digital CPT files will be available to the successful Proponent.

Question #40:

Referring to section 1.17 Waterway Impact Requirements in specification 01 35 43 Environmental Procedures, please clarify the intent of the statement that Waterway Impact Requirements must meet the more stringent of section 1.17.2.1 BC Approved Water Quality Guidelines for Marine & Estuarine Aquatic Life water use or 1.17.2.3 CCME Canadian Environmental Quality Guidelines for the Protection of Aquatic Life. What criteria selects the use of one or the other of the referenced guidelines, or is the intent to develop a site specific criteria by using the more stringent criteria of both guidelines combined?

Answer #40:

All discharge, including that from the onsite Contaminated Wastewater Treatment Plant, must meet the more stringent of the two referenced criteria, with the exception of Naphthalene which has a site-specific criteria (which is greater than the referenced criteria), as per 013543 1.17. No other site-specific criteria will be developed.

Question #41:

Data provided in the tender package indicates that there is significant risk associated with treating the potential for dissolved metals to the approved marine discharge criteria using

commercially available water process technology. Please provide any additional data, reports and/or modeling studies to support the design of an onsite water treatment system.

Answer #41:

The groundwater at the Site is contaminated with cyanide, which will need to be treated by the Contaminated Wastewater Treatment Plant prior to discharge, as per 013513.43 1.8.1.6. Other groundwater Contaminants of Concern are identified in the Contract, including Appendix I "Compendium of Stage 3 Groundwater Quality and Quantity Investigations/Assessments, Rock Bay Remediation Project, Victoria Harbour, BC". No other information regarding groundwater quality is available.

Question #42:

The DFO Authorization incorporated into the RFP as Appendix B to the Specifications requires that all work related to the cofferdam and removal of contaminated sediments must conform to the mitigative conditions outlined by Hemmera Envirochem, Inc. in the report dated October 2003. We respectfully request that this report be provided as it is not possible for a bidder to plan for compliance with specific requirements and provisions that have not been provided.

Answer #42:

All of the mitigative requirements relevant to the Work have been incorporated into the Contract. The DFO Authorization requires additional mitigative requirements which are not part of the Work. A copy of the Hemmera Envirochem Inc report dated 2003Oct will be made available to the successful Proponent.

Question #43:

How much of the sand seam (cyanide in groundwater) area shown in blue on Drawings 24 and 25 is required to be excavated and sealed? All of it, or just that portion needed to install the seal?

Answer #43:

All of the soil identified as "sand seam (cyanide in groundwater)" shown in blue is considered part of the "Excavation Extents", as per Drawings 24 and 25, and therefore all of this soil is required to be excavated. Not all of this excavated soil needs to be replaced by the sand seam seal, which is only required to seal the southern boundary (to prevent offsite migration to recontaminate the Site), as per 312333.01 3.16.

Question #44:

The sand seam seal cross section (Section I-VII), Drawing 10, illustrates the silty sand to a depth of approximately -11m geodetic, which is a discrepancy from Drawing 25 and 26 which shows that the sand seam does not extend past -8m geodetic. Which of the drawings are

correct? This 3m deep differential, is a significant impact on methodology, cost and schedule.

Answer #44:

The unit identified in the cross-section in Drawing 10 does not necessarily represent the sand seam. The sand seam excavation is accurately shown in the plan views eg Drawing 25. The excavation depths the Contractor is required to achieve are shown in the plan drawings as the "Excavation Extents".

Question #45:

Is PWGSC aware of any new developments on the neighbouring properties that may affect the Work?

Answer #45:

We have been made aware that BC Hydro is planning to remediate the property immediately to the east of the Site, including the former Super Save mall and the adjacent Ocean Cement property between the mall and the Site. This offsite work may include installing a secant wall and a flat-faced steel sheet pile wall along a portion of the TC-Ocean Cement property line, and may start as early as 2014March. This offsite work will not affect the Site Work and will not change any of the Project requirements. The Contractor is required to complete all Work within the Site boundaries and not rely on any offsite work, as per 011100 1.9. The Contractor is also required to install Temporary Support Walls around the Site boundary, as per 312333.01 3.8.

Question #46:

In specification 01 41 00 Regulatory Requirements, section 1.5.4 states that authorization from the Transport Canada Harbour Master is required for water discharge approval. What information will the Harbour Master require to issue such a permit or authorization? What terms and conditions will be attached to the discharge approval? How long does it normally take to obtain this water discharge approval?

Answer #46:

The Transport Canada Harbour Master is responsible for issuing the Discharge Approval under the authority of the Canada Marine Act. The Harbour Master will not issue a Discharge Approval to Proponent's, only to the Contractor. The Discharge Approval will require all discharge from the Site into the marine environment to comply with the same environmental criteria and other conditions described in the Contract. The Discharge Approval will also require the Contractor to demonstrate compliance (eg reporting). If the Contractor does not comply with the Discharge Approval, the Harbour Master may revoke the Discharge Approval, and no discharge from the site to the marine environment will be allowed. The Harbour Master will issue the Discharge Approval within 20 Working Days of receipt of a complete application.

Question #47:

In specification 01 31 23 33.01 Excavating, Trenching and Backfilling, section 3.6.4.1 states that approval is required "from the Harbour Master for the installation and operation of the Cofferdam as per the Canada Marine Act." What information will the Harbour Master require to issue such an approval? Will terms and conditions be attached to the cofferdam installation and operating approval? How long does it normally take to obtain this approval?

Answer #47:

The Transport Canada Harbour Master is responsible for issuing a Cofferdam Approval under the authority of the Canada Marine Act. The Harbour Master will not issue a Cofferdam Approval to Proponent's, only to the Contractor. The Cofferdam Approval will require the Cofferdam installation and maintenance comply with: conditions described in the Contract; the Canada Marine Act; and any associated requirements (including Navigable Waters Permit). The Cofferdam Approval will also require the Contractor to demonstrate compliance (eg reporting). If the Contractor does not comply with the Cofferdam Approval, the Harbour Master may revoke the Cofferdam Approval, and the Cofferdam will not be allowed. The Harbour Master will issue the Cofferdam Approval within 20 Working Days of receipt of a complete application.

Question #48:

In specification 01 35 13.43 Special Project Procedures for Contaminated Sites, section 1.8.4.2 regarding operational testing of the waste water treatment plant states "Collect, analyze, and assess samples as recommended by a Qualified Professional." What type of technical specialist will be considered a Qualified Professional in this particular instance? What professional associations or affiliations will be acceptable for this Qualified Professional?

Answer #48:

The operational testing of the Water Treatment Plant would be considered to fall under the auspices of an environmental professional. There are several disciplines that could be considered environmental professionals, including professional chemists, engineers, geoscientists, agrologists, and biologists. In addition to their professional designation, a Qualified Professional must also be qualified to perform the required Work, as per 011100 1.2.33.

Addendum #1

ADD the following clauses:

011100 1.10.1.2 Canadian Environmental Assessment Act Screening Report.

011100 1.10.1.3 Navigable Water Protection Act Approval.

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- 015200 1.4.3 Storm sewer is not available at existing Site and must be supplied at the Contractor's expense.
- 015200 1.4.3 Sanitary sewer is not available at existing Site and must be supplied at the Contractor's expense.
- 015200 1.4.3 Telecommunication lines are not available at existing Site and must be supplied at the Contractor's expense.

ADD "Schedule 2" Drawing

The area of the Site has been changed as per the attached Drawing "Schedule 2".
Specifically:

1. BC Hydro License Area A has been added to the Site.
2. BC Hydro License Area B has been added to the Site.
3. Transport Canada Area has been removed from the Site.

For those Areas added to the Site, all Work must be in accordance with the Contract, and in addition the following restrictions will apply:

1. The Areas may only be used for:
 - a. Movement of vehicles and equipment.
 - b. Placement and operation of a temporary bypass storm water outflow pipe.
 - c. Transport, but not the storage or treatment, of soils and ground water containing Contaminants from Transport Canada Properties.
 - d. Short term storage of supplies, including vehicles and equipment.
2. BC Hydro must have unfettered access to the numerous monitoring wells located in the Areas.
3. The existing numerous monitoring wells located in the Areas must not be damaged in any way; damaged monitoring wells must be repaired at the Contractor's sole expense and as instructed by the Departmental Representative..
4. The Contractor is responsible for replacing any infrastructure (eg pavement, permanent fences, curbing) that is damaged or removed as part of the Contractor's activities.
5. Asphalt curbing similar to that existing must be placed along the property lines between the Areas and neighbouring properties.
6. All unpaved or inadequately paved areas in the Areas must be paved as per 312333.013.4.
7. The Areas must be returned to their original condition as instructed by the Departmental Representative, including matching pre-existing grades and removal of all improvements made by the Contractor.

Solicitation No. - N° de l'invitation

EZ899-142200/B

Amd. No. - N° de la modif.

001

Buyer ID - Id de l'acheteur

pw026

Client Ref. No. - N° de réf. du client

File No. - N° du dossier

CCC No./N° CCC - FMS No/ N° VME

PWY-3-36278

8. If the Contractor does not meet the intent of these requirements, the Areas added will be removed from the Site (ie unavailable for the Contractor's use) at no increase to the Contract Amount nor Extension of Time for completion of the Work

All other terms and conditions remain unchanged.

The abbreviations commonly employed on each “Record of Borehole”, on the figures and in the text of the report, are as follows:

SAMPLE TYPES

<i>AS</i> auger sample	<i>FS</i> foil sample	<i>TP</i> thin-walled, piston
<i>CS</i> chunk sample	<i>RC</i> rock core	<i>WS</i> wash sample
<i>DO</i> drive open (split spoon)	<i>ST</i> slotted tube	
<i>DS</i> Denison type sample	<i>TO</i> thin-walled, open	

PENETRATION RESISTANCES

Dynamic Penetration Resistance:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to “A” size drill rods for a distance of 0.3 m (12 in.).

Standard Penetration Resistance, *N*:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) drive open sampler for a distance of 0.3 m (12 in.).

WH sampler advanced by static weight – weight, hammer

PH sampler advanced by pressure – pressure, hydraulic

PM sampler advanced by pressure – pressure, manual

SOIL DESCRIPTION

Cohesionless Soils	
Relative Density	<i>N</i> Blows/0.30 m or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	Over 50

Cohesive Soils		
	<i>Cu</i>	
Consistency	kPa	psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1000
Stiff	50 to 100	1000 to 2000
Very stiff	100 to 200	2000 to 4000
Hard	over 200	over 4000

SOIL TESTS

<i>C</i> consolidation test	<i>Q</i> undrained triaxial ²
<i>G</i> organic content and mass loss on ignition	<i>R</i> consolidated undrained triaxial ²
<i>H</i> hydrometer analysis	<i>S</i> drained triaxial
<i>M</i> sieve analysis	<i>U</i> unconfined compression
<i>MH</i> combined analysis, sieve and hydrometer ¹	<i>V</i> field vane test

NOTES:

¹Combined analyses when 5 to 95 per cent of the material passes the No. 200 sieve.

²Undrained triaxial tests in which pore pressures are measured are shown as \bar{Q} and \bar{R} .

CLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364548.36 E: 472717.10

DRILLING DATE: June 4-5, 2007

INCLINATION: -90°

[illegible]

DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-501

SHEET 2 OF 4

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

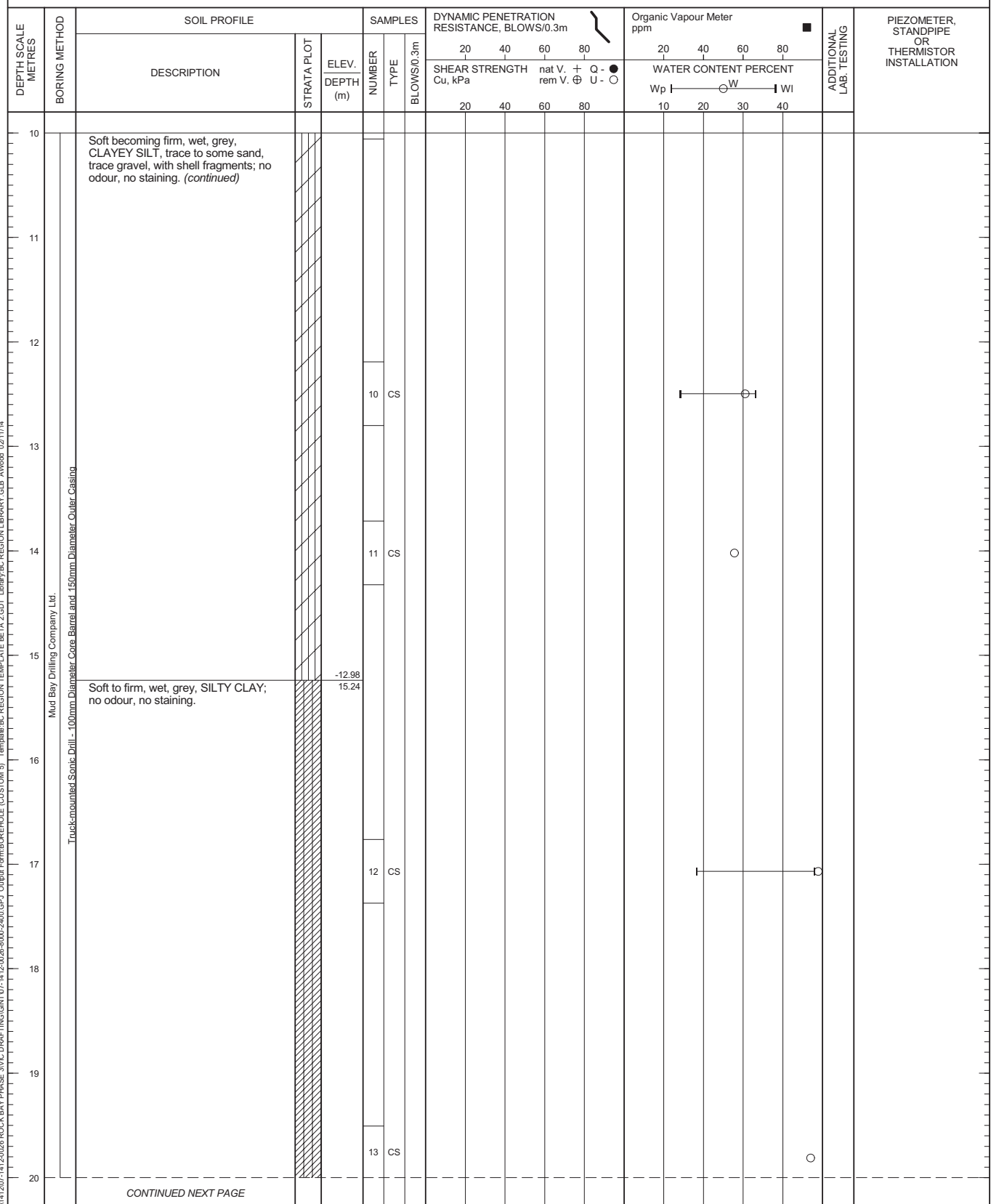
LOCATION: See Figure 2.

N: 5364548.36 E: 472717.10

DRILLING DATE: June 4-5, 2007

DATUM: Geodetic

INCLINATION: -90°



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DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

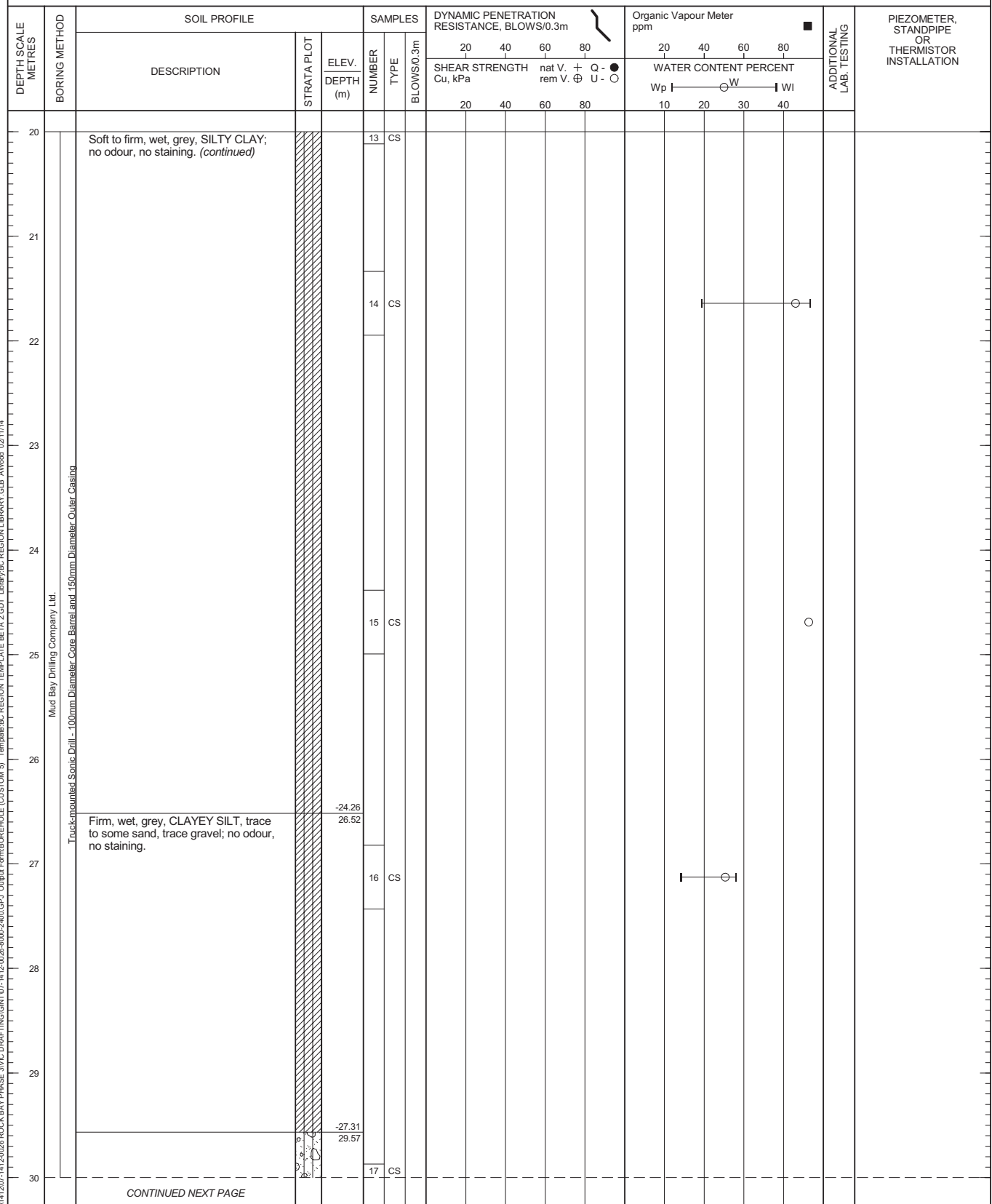
PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-501

SHEET 3 OF 4
DATUM: GeodeticCLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364548.36 E: 472717.10

DRILLING DATE: June 4-5, 2007

INCLINATION: -90°



DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM



PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-501

SHEET 4 OF 4
DATUM: GeodeticCLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364548.36 E: 472717.10

DRILLING DATE: June 4-5, 2007

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa		nat V. + Q - ● rem V. ⊕ U - ○		WATER CONTENT PERCENT Wp I — W — I Wi				
								20	40	60	80	20	40	60		
30		Dense becoming very dense, wet becoming moist, grey, silty SAND and GRAVEL (well-graded), with cobbles; no odour, no staining. <i>(continued)</i>		-28.53	17	CS										
31		BEDROCK		30.78												
				-29.44	18	CS										
				31.70												
32		End of Borehole.														
33																
34																
35																
36																
37																
38																
39																
40																

DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-502

SHEET 1 OF 3

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

DRILLING DATE: June 5, 2007

DATUM: Geodetic

LOCATION: See Figure 2.
N: 5364577.13 E: 472745.25

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m					Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT						
								Cu, kPa	nat V. rem V.	+ V. ⊕	Q - U - ○	Wp	W	Wi				
								20	40	60	80	20	40	60	80			
0		Ground Surface		2.20														
		CONCRETE		2.07														
		Wood debris, with wire. [FILL]		0.13														
1		No Sample Recovered		1.29 0.91														
2							DO	WH										
		Possible Void		-0.24 2.44														
3																		
4		Soft, wet, mottled blue-grey and dark grey, fissured SILTY CLAY; hydrocarbon-like odour and staining in fissures.		-1.61 3.81	1	CS												
5		Firm, moist, grey with brown mottle, SILTY CLAY, trace to some fine sand; no odour, no staining.		-2.68 4.88	2	DO	2											
6		Soft, wet, grey, SILTY CLAY, with shell fragments; no odour, no staining.		-3.59 5.79	3	CS												
7																		
8		Loose, wet, grey, silty fine SAND, trace to some clay, trace to some gravel; no odour, no staining.		-5.42 7.62	4	CS												
		Soft to firm, moist to wet, grey, SILTY CLAY, with shell fragments; no odour, no staining.		-6.03 8.23	5	CS												
9																		
10																		
CONTINUED NEXT PAGE																		

CONTINUED NEXT PAGE

DEPTH SCALE

LOGGED: RSW/RM

1 : 50

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-502

SHEET 2 OF 3
DATUM: GeodeticCLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364577.13 E: 472745.25

DRILLING DATE: June 5, 2007

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		Organic Vapour Meter ppm		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa	nat V. + rem V. ⊕	Q - ● U - ○			WATER CONTENT PERCENT Wp I — W — I Wi
10	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	Soft to firm, moist to wet, grey, SILTY CLAY, with shell fragments; no odour, no staining. (continued)										
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
CONTINUED NEXT PAGE												

DEPTH SCALE

1 : 50

LOGGED: RSW/RM

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-502

SHEET 3 OF 3
DATUM: GeodeticCLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364577.13 E: 472745.25

DRILLING DATE: June 5, 2007

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m					Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION				
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	RESISTANCE, BLOWS/0.3m				WATER CONTENT PERCENT									
								SHEAR STRENGTH Cu, kPa				nat V. + Q - rem V. ⊕ U - ○						Wp ———— W ———— WI			
								20	40	60	80	20	40	60	80			10	20	30	40
20		Soft to firm, moist to wet, grey, SILTY CLAY, with shell fragments; no odour, no staining. <i>(continued)</i>																			
21				7	CS											○					
22																					
23																					
24																					
25																					
26																					
27																					
28		Stiff becoming hard, moist, grey, SAND and SILT, some gravel, trace to some clay; no odour, no staining. [TILL-LIKE]		-25.54 27.74																	
29		Very dense, moist, grey, sandy GRAVEL, some silt, with cobbles.		-26.76 28.96	8	CS									○	M.H					
		BEDROCK		-27.06 29.26																	
30		End of Borehole.		-27.67 29.87																	

DEPTH SCALE

1 : 50

LOGGED: RSW/RM

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

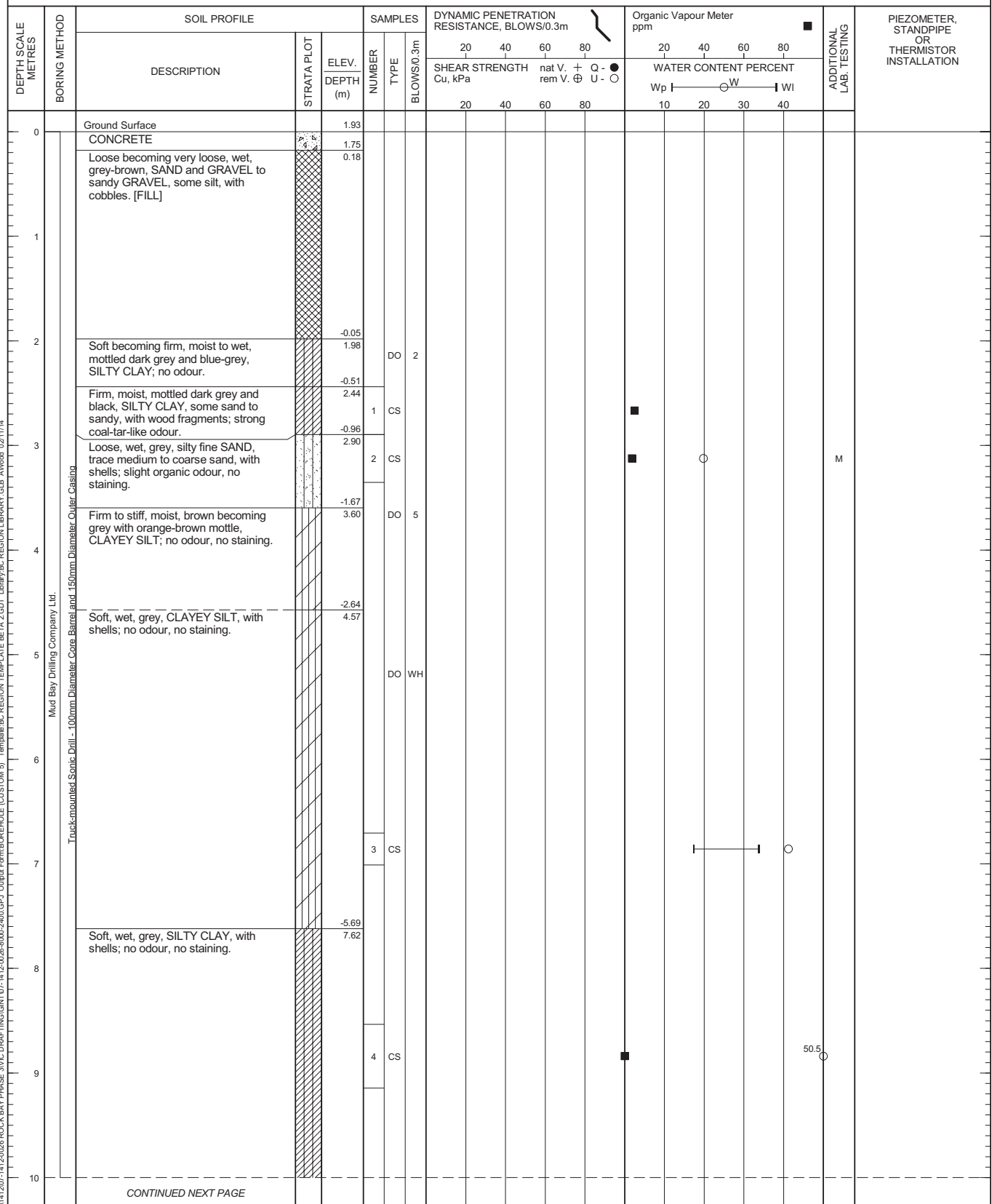
CLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364559.52 E: 472731.89

RECORD OF BOREHOLE: BH07-503

DRILLING DATE: June 6, 2007

SHEET 1 OF 2
DATUM: Geodetic

INCLINATION: -90°



DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-503

SHEET 2 OF 2
DATUM: GeodeticCLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364559.52 E: 472731.89

DRILLING DATE: June 6, 2007

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION									
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60		80			20		40		60		80		
								Cu, kPa		nat V. rem V.		+ ⊕		Q - U			● ⊖		Wp		W		WI		
								20	40	60	80														
10	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	Soft, wet, grey, SILTY CLAY, with shells; no odour, no staining. <i>(continued)</i>																							
11		Loose, wet, grey, fine SAND and SILT, trace to some clay, trace medium to coarse sand, trace fine gravel; no odour, no staining.		-8.74 10.67	5	CS																			
12																									
13		Firm, wet, grey, CLAYEY SILT, trace to some sand, trace gravel, with shell fragments; no odour, no staining.		-10.87 12.80	6	CS																			
14																									
15																									
16		End of Borehole.		-13.92 15.85	7	CS																			
17																									
18																									
19																									
20																									

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

CLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364548.89 E: 472733.93

DRILLING DATE: June 6, 2007

INCLINATION: -90°

[illegible]

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM


PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-504

SHEET 2 OF 3
DATUM: GeodeticCLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364548.89 E: 472733.93

DRILLING DATE: June 6, 2007

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		Organic Vapour Meter ppm		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa	nat V. + rem V. ⊕	Q - ● U - ○			WATER CONTENT PERCENT Wp — W — Wi
10	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	Soft becoming firm, wet, grey, CLAYEY SILT to SILTY CLAY, with shells above 11.6 m depth; no odour, no staining. (continued)										
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
CONTINUED NEXT PAGE												

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-504

SHEET 3 OF 3
DATUM: GeodeticCLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364548.89 E: 472733.93

DRILLING DATE: June 6, 2007

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION								
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60		80				20		40		60		80	
								SHEAR STRENGTH Cu, kPa		nat V. rem V.		+ ⊕		Q - U -				Wp		W		WI			
								20	40	60	80														
20		Soft becoming firm, wet, grey, CLAYEY SILT to SILTY CLAY, with shells above 11.6 m depth; no odour, no staining. (continued)																							
21																									
22																									
23					7	CS																			
24																									
25																									
26																									
27		Very stiff becoming hard, moist, grey, well-graded SAND and SILT, some gravel, trace to some clay; no odour, no staining. [TILL-LIKE]		-24.98 27.13																					
28					8	CS													M,H						
		Very dense, moist, grey, sandy GRAVEL, some silt, with cobbles.		-26.20 28.35																					
		BEDROCK		-26.50 28.65																					
29				-26.96 29.11																					
		End of Borehole.																							
30																									

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

SHEET 1 OF 2
DATUM: Geodetic

INCLINATION: -90°

File: E:\ACTIVE\2007\141\2\07-1412-0026 ROCK BAY PHASE 3\VIC DRAFTING\GINT\07-1412-0026-8000.GPJ Output Form: BOREHOLE (CUSTOM 5) Template: BC REGION TEMPLATE BETA 2.GDT Library: BC REGION LIBRARY.GLB A\Wood 02/11/14

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-509

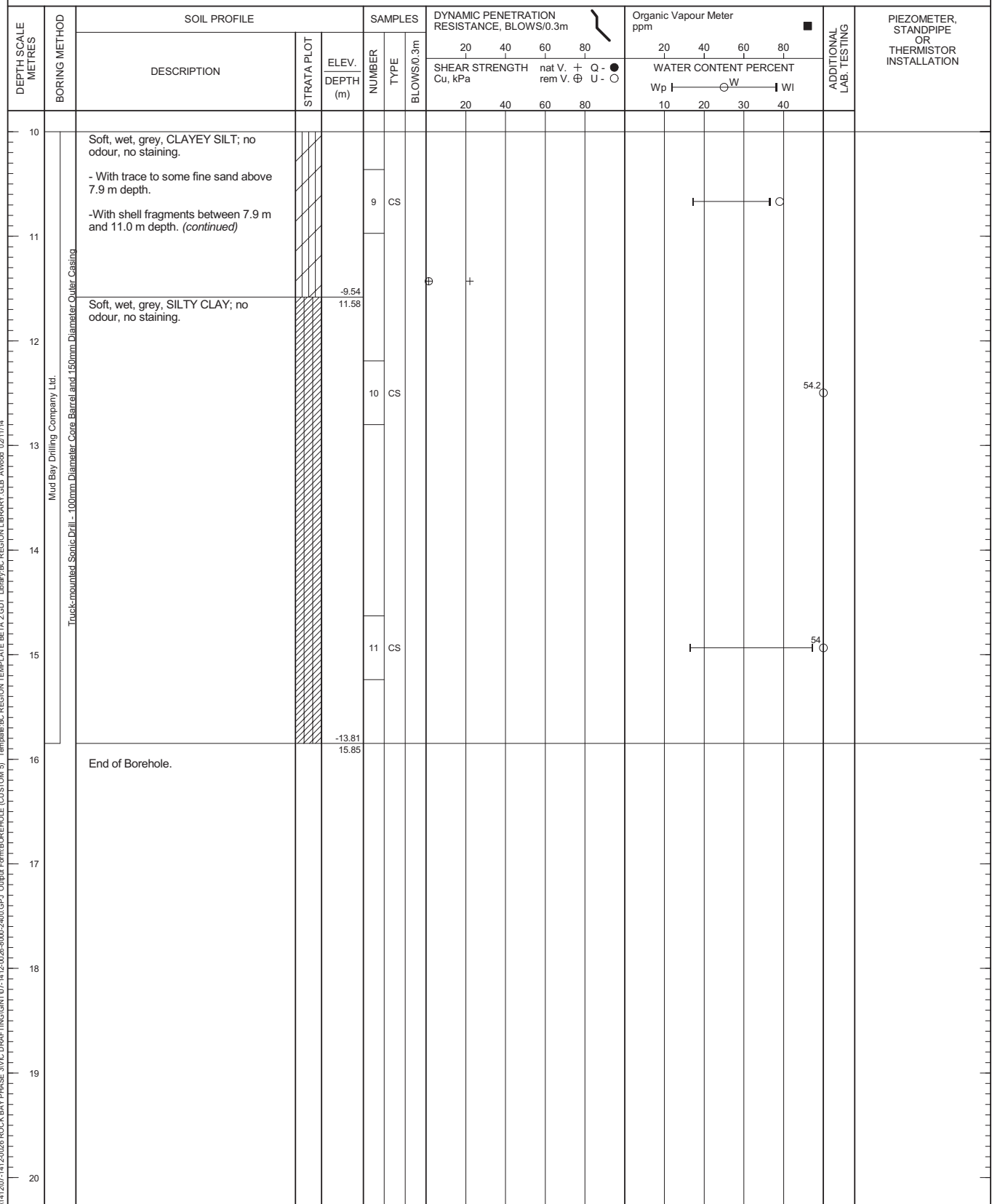
SHEET 2 OF 2

CLIENT: Transport Canada
 PROJECT: Rock Bay (Stage 3) - Uplands
 LOCATION: See Figure 2.
 N: 5364554.91 E: 472746.97

DRILLING DATE: June 7, 2007

DATUM: Geodetic

INCLINATION: -90°



DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-511

SHEET 1 OF 1

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

DRILLING DATE: June 11, 2007

DATUM: Geodetic

LOCATION: See Figure 2.
N: 5364607.02 E: 472746.75

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION								
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60		80				20		40		60		80	
								Cu, kPa		nat V. rem V. ⊕		+ Q - ●		U - ○				Wp		W		WI			
								20	40	60	80														
0		Ground Surface		2.24																					
		CONCRETE		2.08																					
		Compact to loose, moist, brown, SAND and GRAVEL to sandy GRAVEL (fine and coarse gravel), some silt, with cobbles; no odour, no staining. [FILL]		0.15																					
1					1	CS												M							
2		Loose, wet, dark brown, WOOD WASTE, some sand, some silt, some gravel, with cobbles and construction debris (wire); hydrogen sulphide-like odour, no staining. [FILL]		0.41																					
				1.83	2	DO	10																		
		- 2.3 m to 2.4 m depth: Loose, wet, grey, SAND; no odour, no staining.																							
3		Soft, wet, dark grey, fine SAND and SILT, trace clay, with wood debris; hydrogen sulphide-like odour. [FILL]		-0.66																					
				-0.81																					
		Very loose, wet, black, WOOD WASTE and silty SAND; hydrogen sulphide-like odour. [FILL]		-0.96																					
				3.20																					
		Very loose, wet, light brown, SAWDUST. [FILL]		-1.27	3	DO	3																		
				3.51																					
4		Firm, wet, grey, fine SAND and SILT, trace clay; no odour, no staining.		-1.73																					
				3.96																					
		Stiff becoming firm, moist, mottled brown/orange-brown/grey, CLAYEY SILT, some sand; no odour, no staining.																							
5					4	DO	4																		
6		Soft, wet, grey, SILTY CLAY; no odour, no staining.		-3.55	5	CS																			
				5.79																					
7																									
8		End of Borehole.		-5.69																					
				7.92																					
9																									
10																									

DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-514

SHEET 1 OF 2

CLIENT: Transport Canada
 PROJECT: Rock Bay (Stage 3) - Uplands
 LOCATION: See Figure 2.
 N: 5364604.02 E: 472748.67

DRILLING DATE: June 18, 2007

DATUM: Geodetic

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION						
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT									
								Cu, kPa				nat V. + Q - ● rem V. ⊕ U - ○									
								20	40	60	80	20	40			60	80	Wp	W	WI	
0		Ground Surface		2.23																	
		CONCRETE		0.00																	
				1.90																	
		Compact, wet, grey to brown, SAND and GRAVEL to sandy GRAVEL, trace to some silt, with cobbles; no odour, no staining. [FILL]		0.33																	
1					1	GS															
2				0.09																	
		Loose to very loose, wet, grey to dark grey, SAND. [FILL]		2.13	2	DO	17														
		- with wood fibres and slight organic odour above 2.4 m depth - with wood fibres, black staining and slight hydrogen sulphide-like odour below 2.7 m depth.																			
3				-0.97		3	GS														
		Very loose, wet, brown, SAWDUST, with sand; strong hydrogen sulphide-like odour. [FILL]		3.20																	
		Soft, wet, grey, sandy SILT, trace clay; slight hydrocarbon-like odour.		-1.33																	
				3.56	4	DO	3														
		Soft to firm, wet, blue-grey, CLAYEY SILT, trace sand; no odour, no staining.		-1.58																	
				3.81																	
4				-2.65																	
		Firm to stiff, moist, mottled brown and grey, SILTY CLAY; no odour, no staining.		4.88	5	DO	7														
5				-3.56																	
		Soft, wet, grey, SILTY CLAY; no odour, no staining.		5.79																	
		- trace sand, trace gravel, with shell fragments above 7.3 m depth			6	GS															
6																					
7																					
8																					
9																					
10																					
CONTINUED NEXT PAGE																					

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF BOREHOLE: BH07-514

SHEET 2 OF 2

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands





LOCATION: See Figure 2.

N: 5364604.02 E: 472748.67

DRILLING DATE: June 18, 2007

DATUM: Geodetic

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION										
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60				80		20		40		60		80	
								Cu, kPa		nat V. rem V.		+ ⊕				Q - ● U - ○		Wp		W		WI			
								20	40	60	80														
10		Soft, wet, grey, SILTY CLAY; no odour, no staining. - trace sand, trace gravel, with shell fragments above 7.3 m depth <i>(continued)</i>																							
	7			GS																					
11																									
12																									
13	Mud Bay Drilling Company Ltd. Truckmounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing																								
14				8	GS																				
						-11.95 14.17																			
15																									
16		Compact becoming very dense, moist, grey, well-graded silty SAND, some gravel to gravelly, with cobbles; no odour, no staining. [TILL-LIKE]																							
17		BEDROCK																							
					-14.84 17.07	9	GS																		
18																									
		End of Borehole.																							
					-16.06 18.29																				
19																									
20																									

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

SHEET 1 OF 2
DATUM: Geodetic

INCLINATION: -90°

File: E:\ACTIVE\2007\141\2\07-1412-0026 ROCK BAY PHASE 3\VIC DRAFTING\GINT\07-1412-0026-8000.GPJ Output Form: BOREHOLE (CUSTOM 5) Template: BC REGION TEMPLATE BETA 2.GDT Library: BC REGION LIBRARY.GLB A\Wood 02/11/14

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

CLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364647.87 E: 472723.27

RECORD OF BOREHOLE: BH07-517

DRILLING DATE: June 19, 2007

SHEET 2 OF 2
DATUM: Geodetic

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ○		WATER CONTENT PERCENT Wp I — W — I Wi				
								20	40	60	80	20	40	60		
10		Soft, wet, grey, SILTY CLAY; no odour, no staining. (continued)														
11																
12																
13																
14		Very dense, moist, grey, silty SAND, some gravel to gravelly; no odour, no staining. [TILL-LIKE]		-10.74 13.31												
		BEDROCK		-11.22 13.79												
				-11.45 14.02												
		End of Borehole.														
15																
16																
17																
18																
19																
20																

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

SHEET 1 OF 2
DATUM: Geodetic

DRILLING DATE: June 8, 2007

[illegible]

LOGGED: RSW

CHECKED: SEM

File: E:\ACTIVE\2007\1412\07-1412-0026 ROCK BAY PHASE 3\VIC DRAFTING\GINT\07-1412-0026-8000-2400.GPJ Output Form: BOREHOLE (CUSTOM 5) Template: BC REGION TEMPLATE BETA 2.GDT Library: BC REGION LIBRARY.GLB AWood 02/11/14

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW/BH07-510

SHEET 2 OF 2

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

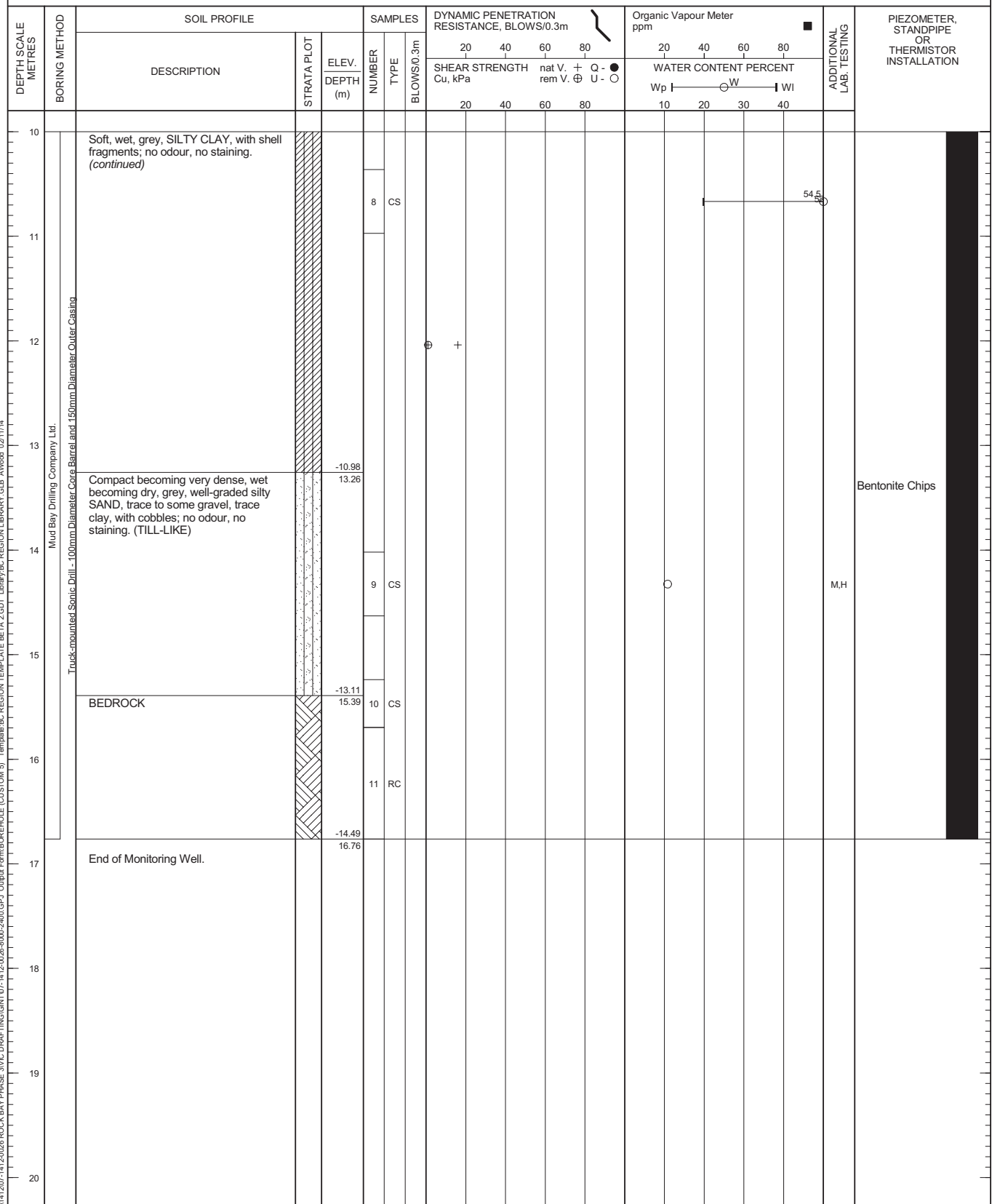
LOCATION: See Figure 2.

N: 5364645.32 E: 472727.04

DRILLING DATE: June 8, 2007

DATUM: Geodetic

INCLINATION: -90°



DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW/BH07-512

SHEET 1 OF 3

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

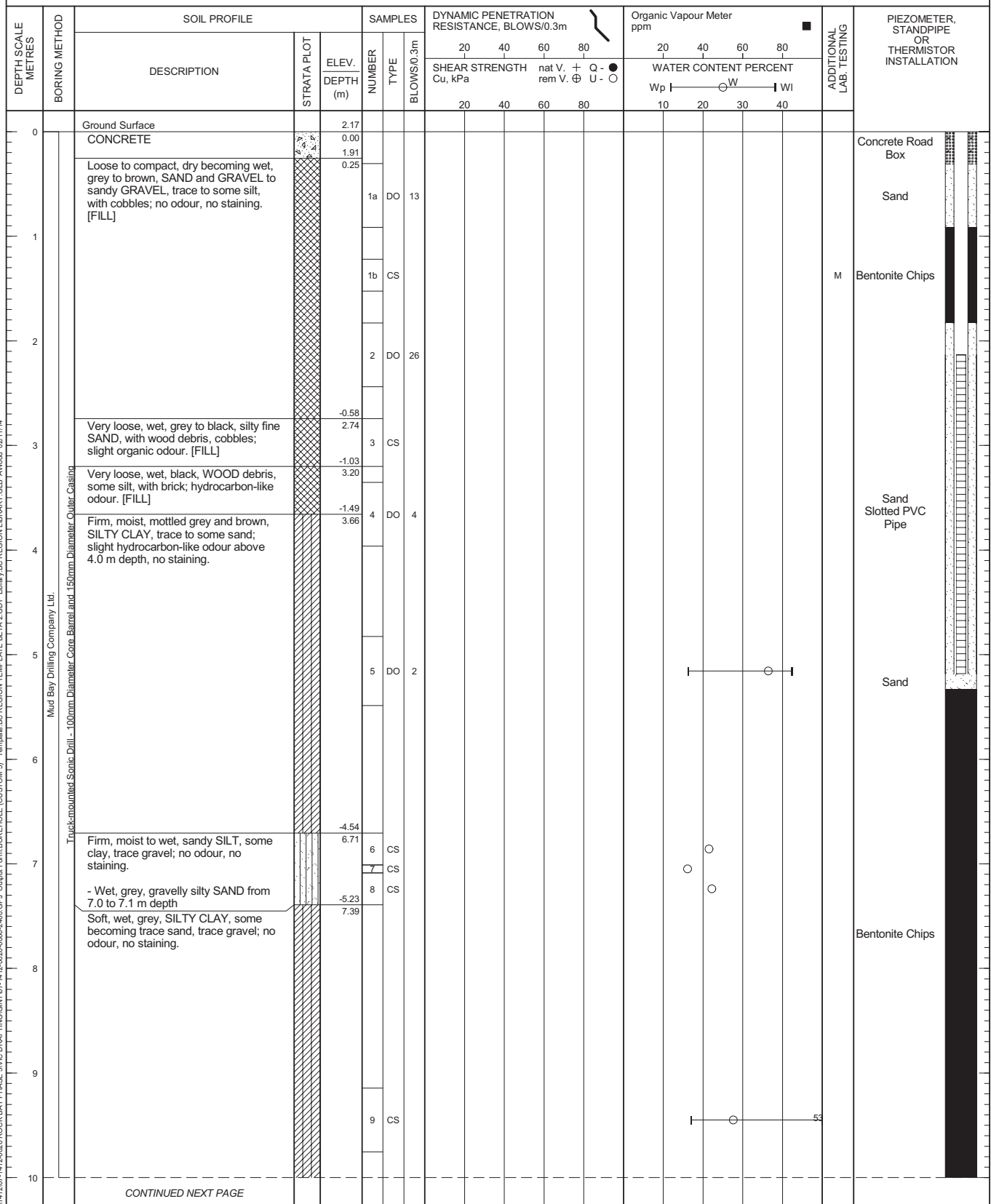
DRILLING DATE: June 15, 2007

DATUM: Geodetic

LOCATION: See Figure 2.

N: 5364595.95 E: 472746.46

INCLINATION: -90°



DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW/BH07-512

SHEET 2 OF 3

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

DRILLING DATE: June 15, 2007

DATUM: Geodetic

LOCATION: See Figure 2.
N: 5364595.95 E: 472746.46

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		Organic Vapour Meter ppm		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH Cu, kPa	nat V. + rem V. ⊕	Q - U -	WATER CONTENT PERCENT Wp — W — Wi			
10	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	Soft, wet, grey, SILTY CLAY, some becoming trace sand, trace gravel; no odour, no staining. (continued)										
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM




PROJECT No.: 07-1412-0026-8000 (2400)
CLIENT: Transport Canada
PROJECT: Rock Bay (Stage 3) - Uplands
LOCATION: See Figure 2.
N: 5364595.95 E: 472746.46

RECORD OF MONITORING WELL: MW/BH07-512

SHEET 3 OF 3
DATUM: Geodetic

DRILLING DATE: June 15, 2007

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U -		WATER CONTENT PERCENT Wp I — W — I Wi				
								20	40	60	80	20	40			60
20		Dense becoming very dense, moist becoming dry, grey, silty gravelly SAND to silty SAND and GRAVEL, with cobbles; no odour, no staining. [TILL-LIKE]		-17.95												
	20.12															
				14a	CS											
21																
		BEDROCK		-19.17												
	21.34			14b	CS											
22				-19.78												
				21.95												
		End of Monitoring Well.														
23																
24																
25																
26																
27																
28																
29																
30																

DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW/BH07-516

SHEET 1 OF 1

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

DRILLING DATE: June 19, 2007

DATUM: Geodetic

LOCATION: See Figure 2.
N: 5364555.05 E: 472721.03

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m					Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT					
								nat V. + Q -									
								Cu, kPa				rem V. ⊕ U - ○					
							20	40	60	80		20	40	60	80		
							20	40	60	80		Wp	W	WI			
							10	20	30	40							
0	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	Ground Surface		2.06													Flush-mounted Well Protector in Concrete Sand Bentonite Chips Sand 51 mm diameter Slotted PVC Pipe Bentonite Chips
		CONCRETE		1.88													
		Loose, moist, black, SAND, with coal fragments; moderate hydrocarbon-like odour. [FILL]		0.18	1	CS											
		Firm, moist to wet, grey-brown, CLAYEY SILT to SILTY CLAY, trace to some sand; no odour, no staining.		1.35													
1		-Heavy black staining and strong hydrocarbon-like odour from 2.6 to 2.75 m depth.		0.71													
					2	CS											
2																	
		Loose, wet, dark grey, sandy SILT, trace gravel; strong hydrocarbon-like odour, no staining.		-0.79													
3				2.84	3	CS											
		Stiff, moist, grey-brown, SILTY CLAY; slight hydrocarbon-like odour, no staining.		-1.24													
				3.30	4	CS											
		Loose, wet, dark grey, sandy SILT; moderate hydrocarbon-like odour.		-1.65													
4				-1.80	5	CS											
		Stiff, moist, grey-brown, SILTY CLAY; no odour, no staining.		3.86													
					6	CS											
			-2.82														
5		End of Monitoring Well.		4.88													
6																	
7																	
8																	
9																	
10																	

DEPTH SCALE

LOGGED: RM

1 : 50

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW/BH07-518

SHEET 1 OF 1

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

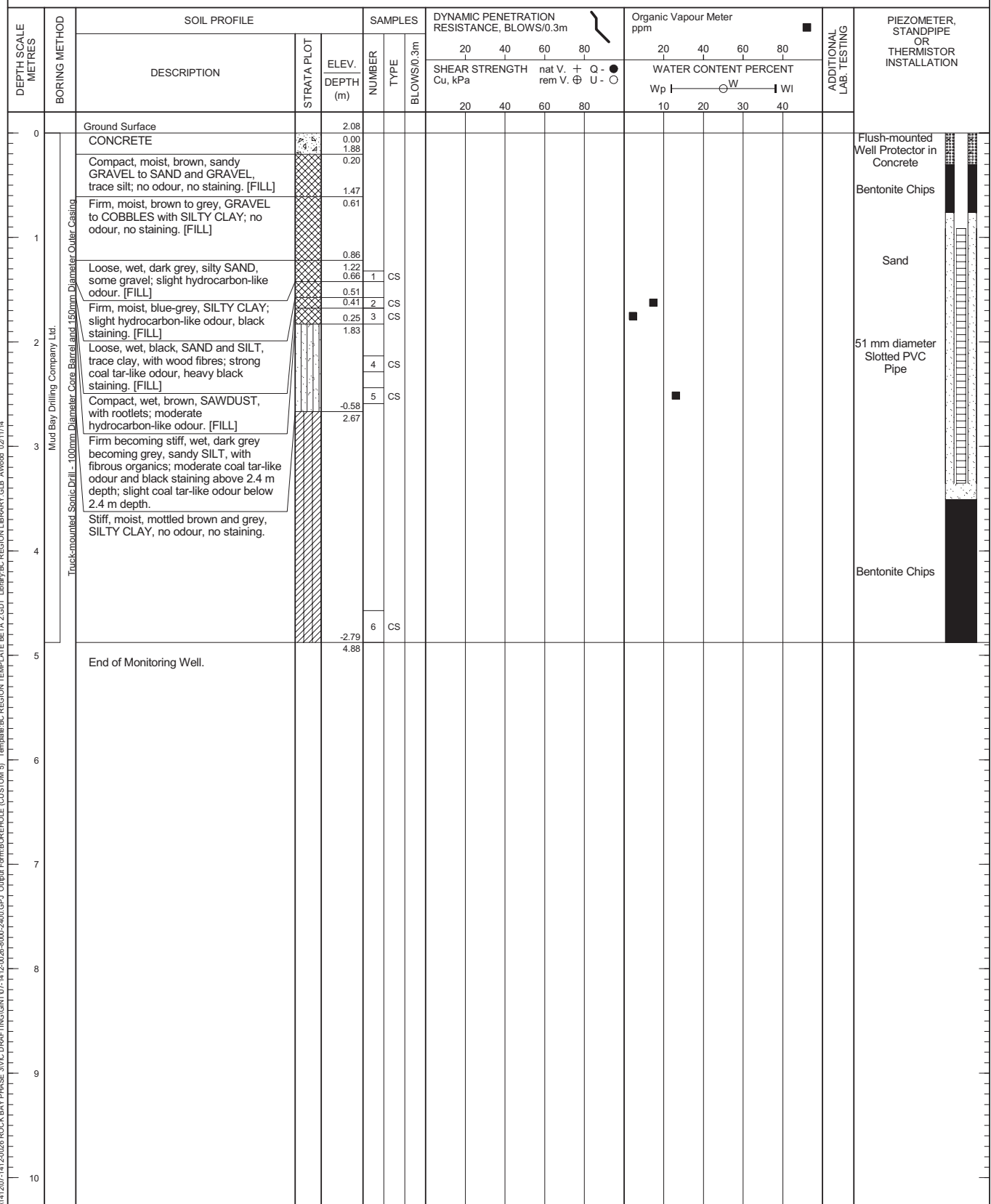
DRILLING DATE: June 19, 2007

DATUM: Geodetic

LOCATION: See Figure 2.

N: 5364560.96 E: 472746.44

INCLINATION: -90°



DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW/BH07-519

SHEET 2 OF 2

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

DRILLING DATE: June 20, 2007

DATUM: Geodetic

LOCATION: See Figure 2.
N: 5364653.17 E: 472746.76

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT					
								20 Cu, kPa	40	60	80	nat V. rem V.	+ ⊕			Q - U -	● ○
10	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	Firm to soft, moist to wet, grey, CLAYEY SILT; no odour, no staining. <i>(continued)</i>															
				9	CS												
11																	
12																	
13				Compact becoming very dense, wet becoming moist, grey, silty SAND, trace to some gravel, trace clay, with cobbles; no odour, no staining. [TILL-LIKE]	-9.79 12.50	10	CS										
14																	
15		BEDROCK	-11.78 14.48		11	CS								M			
16	End of Monitoring Well.		-12.84 15.54														
17																	
18																	
19																	
20																	

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW07-513

SHEET 1 OF 1

CLIENT: Transport Canada

PROJECT: Rock Bay (Stage 3) - Uplands

DRILLING DATE: June 15, 2007

DATUM: Geodetic

LOCATION: See Figure 2.

N: 5364579.23 E: 472747.18

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m					Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20 40 60 80				20 40 60 80						
								SHEAR STRENGTH				WATER CONTENT PERCENT						
								Cu, kPa				nat V. + Q - rem V. ⊕ U - ○						Wp — W — WI
								20	40	60	80	10	20	30	40			
0		Ground Surface		2.12													Flush-mounted Well Protector in Concrete Sand	
	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	CONCRETE		0.00														
				1.83														
		Loose, wet, brown, sandy GRAVEL, some silt; no odour, no staining. [FILL]		0.29														
				1.41														
1			Soft, wet, black, sandy SILT, some gravel, trace to some clay, with cobbles and construction debris (brick and wood); slight hydrocarbon-like odour. [FILL]		0.71													Bentonite Chips
					0.29													
			Soft, wet, grey, silty fine SAND, trace to some gravel, trace to some clay; no odour, no staining. [FILL]		1.83													
					-0.78													
3			Wet, black, WOOD debris, some silt; hydrocarbon-like odour. [FILL]		2.90													
					-2.15													
		Firm, moist, mottled grey and brown, SILTY CLAY; no odour, no staining.		4.27														
				-3.57														
6		Soft, wet, grey, SILTY CLAY, some becoming trace fine sand; no odour, no staining.		5.69														
		- 7.9 m to 8.15 m fine sandy SILT, trace to some clay.																
				-7.33														
				9.45														
		End of Monitoring Well.																
10																		

DEPTH SCALE

1 : 50

LOGGED: RSW

CHECKED: SEM

PROJECT No.: 07-1412-0026-8000 (2400)

RECORD OF MONITORING WELL: MW07-515

SHEET 1 OF 1

CLIENT: Transport Canada
 PROJECT: Rock Bay (Stage 3) - Uplands
 LOCATION: See Figure 2.
 N: 5364548.20 E: 472693.62

DRILLING DATE: June 19, 2007

DATUM: Geodetic

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				Organic Vapour Meter ppm				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION								
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60		80				20		40		60		80	
								Cu, kPa		nat V. rem V. ⊕		+ Q - ● U - ○		Wp				W		WI					
								20	40	60	80			10	20	30	40								
0	Mud Bay Drilling Company Ltd. Truck-mounted Sonic Drill - 100mm Diameter Core Barrel and 150mm Diameter Outer Casing	Ground Surface		2.13																Flush-mounted Well Protector in Concrete Bentonite Chips Sand 51 mm diameter Slotted PVC Pipe Sand Bentonite Chips					
CONCRETE			1.98																						
Loose, moist, brown to black, SAND, trace silt; no odour, no staining. [FILL]			0.15																						
				1	GS																				
			1.21																						
Compact, moist, light grey, SAND, trace gravel; no odour, no staining. [FILL]			0.99																						
			0.83																						
Compact, moist, black, SAND, some gravel; moderate hydrocarbon-like odour, no staining. [FILL]			1.30																						
Soft, wet, grey-brown, SILTY CLAY; no odour, no staining. [FILL]			0.22		2	GS																			
			1.91																						
Loose, wet, black, SAND and GRAVEL, with cobbles, fine wood fragments, glass; strong coal-tar-like odour, heavy black staining. [FILL]		-0.16		3	GS																				
		2.29																							
Firm, moist, dark grey, CLAYEY SILT, with shells; moderate coal-tar-like odour, no staining.				4	GS																				
				-1.22																					
		Firm, moist, grey, sandy SILT, trace to some clay, with shells; no odour, no staining.		3.35																					
				-2.14																					
		Stiff, moist, blue-grey, SILTY CLAY; no odour, no staining.		4.27																					
				-2.75																					
				4.88																					
5		End of Monitoring Well.																							
6																									
7																									
8																									
9																									
10																									

DEPTH SCALE

1 : 50

LOGGED: RM

CHECKED: SEM

