COWICHAN VALLEY REGIONAL DISTRICT
ENGINEERING AND ENVIRONMENTAL SERVICES DEPARTMENT
DUNCAN, BRITISH COLUMBIA

ISSUED FOR USE

ENVIRONMENTAL REVIEW
1355 AND 1345 FISHER ROAD, COBBLE HILL, BRITISH COLUMBIA

N23101632

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EXECUTIVE SUMMARY

EBA Engineering Consultants Ltd. (EBA) was retained by the Cowichan Valley Regional District (CVRD) Engineering and Environmental Services Department to conduct an environmental review and odour generation and mitigation strategies investigation at the Fisher Road Recycling Facility (FRRF), located at 1355 Fisher Road in Cobble Hill, BC (the site) and the Central Landscape Supplies Ltd. (Central) mixed yard and garden waste composting facility at 1345 Fisher Road.

EBA understands that current land use at 1355 Fisher Road includes a composting facility and the owners have applied to the CVRD to amend its current operating plan to include a public drop-off centre for recycling and waste material. The CVRD assigned EBA to conduct an environmental review of the local aquifer, groundwater, surface water quality, and other potential environmental impacts from the ongoing compost operation and the proposed expansion works. The CVRD also requested that the environmental review include an analysis on odour generation and mitigation strategies associated with the composting operations at 1355 and 1345 Fisher Road. EBA subcontracted the odour generation and mitigation strategies portion of the project to Transform Compost Systems (TCS) of Abbotsford, BC.

EBA's environmental desktop review identified that the dominant feature most susceptible to environmental effects from land use activities at the site is the aquifer that is used for domestic and drinking water purposes, as well as commercial, agricultural, and irrigation supply. There are no surface water receptors located within two kilometres of the site.

Surficial geology and aquifer maps indicated that the area is covered by a blanket of low permeability glacial till overlying sand and gravel deposits constituting an aquifer. However, EBA's review of well record stratigraphy, aquifer vulnerability maps, and a visual inspection of surficial geology at a nearby gravel pit shows that in this area the glacial till is very thin or absent in some areas. Recent aquifer vulnerability mapping has rated the site to be moderate to highly vulnerable to surface land use activities.

At FRRF, EBA saw the leachate collection and recycling system operating during the compost curing process. FRRF stated that the operation requires extra moisture to expedite the curing process. Based on EBA observations and understanding at the time of our visit, they are not disposing excess leachate into the ground or in an environmentally harmful manner in their current process.

It was reported to EBA by FRRF and CVRD that, once the compost is finished curing and meets British Columbia Organic Matter Recycling Regulation (OMRR) standards for Class A compost it is stored outside on native ground and may be screened to remove garbage and other impurities before being transferred offsite. During our site visit, the final screened compost was stored on a concrete pad onsite.

The Class A compost may still remain biologically active and has the potential to generate leachate when rained upon. EBA's test results of the Class A compost showed elevated concentrations of fecal coliform that exceeded the BC OMRR standards for Class A compost. Measurable concentrations of ammonium were also present although there is no standard for ammonium listed

in OMRR. The compost samples tested from 1355 and 1345 Fisher Road contained nitrate concentrations that ranged from less than the laboratory detection limit to 20 mg/kg. We interpret that nitrate that may leach from compost with these levels of nitrate concentrations and seep into the subsurface would not have sufficient concentration to be a major source of the higher nitrate concentrations observed in groundwater at the onsite well. The levels of ammonium and fecal coliforms in these compost samples suggest that the product stored outside appears to be unfinished and in a state of curing. Ammonium has the ability to leach into the subsurface and can convert to nitrate down below the topsoil, but is not as likely to do so as in the topsoil where the microbes are found. The operators at 1355 Fisher Road can lower the likelihood of ammonium converting to nitrate in the piles of screened and unscreened compost by ensuring that they are processed and removed from the site within two months of exiting the processing buildings.

The nitrate concentration in the groundwater at the 1355 Fisher Road well appears to fluctuate seasonally with higher concentrations in the winter months compared to the summer months. Prior to FRR owning the property, a nitrate concentration greater than the drinking water guideline was measured in this well. The historical nitrate concentrations are not on an increasing trend and the nitrate concentrations measured in August 2010 were slightly lower than concentrations measured in 2002. Nitrate concentrations measured at the swale have met the drinking water guideline since March 2008.

TCS's odour control and leachate analysis identified that neighbours indicated that odour has been a chronic problem in the area since the composting facilities began operating. Although most people have indicated that the odours from the facilities have decreased within the last 18 months, foul odours are frequently reported and remain a concern. TCS believes that if the recommendations in their report and the operating plans are implemented, then odours at the site can be reduced to a tolerable level.

At 1355 Fisher Road much of the process is under negative pressure indoors and air is processed through three biofilters: one for the in-vessel biocells and two for the processing building. There is little odour concern about this part of the operation although other aspects of composting such as organics delivery and outside storage can generate odours. Trucks arriving at the site go onto a scale and then back into the building where they dispose their load indoors. The windrows of Class A compost when turned can release odours.

At 1345 Fisher Road, TCS recommended forced aeration to keep the windrows aerobic and to reduce the turning requirement, redesign and cover of the windrows to prevent excess moisture from entering the composting material especially during the winter months and to cover the leachate collection pit. It was suggested that Central's operating plan provide clearer instructions on what to do with the leachate generated at the site (how to recycle and manage it especially during the wet winter months).

Because there is only one well at 1355 Fisher Road (a non-potable water supply well used by both facilities and also used for groundwater sampling), it is not possible using current information to determine all potential sources, or the nature and extent of the nitrate that is impacting this onsite groundwater well. A hydrogeological site characterization and delineation program is required to determine the hydraulic gradient, direction of groundwater flow, groundwater velocity, whether a

nitrate plume exists, and the potential for offsite migration of contaminated groundwater. Such a program would include a condition survey of the current wells in the area, installation of groundwater monitoring wells specifically designed for this program's objectives, and an assessment of the subsurface soil properties that may bear on nitrate plume fate and transport.

At this point, there is not sufficient groundwater information to specifically identify the source or sources of the measured nitrate concentrations in the onsite well. This question would be one of the objectives of delineation program. An initial element of the delineation program will be to conduct a Stage 1 Preliminary Site Investigation to document historical land use practices at 1355 and 1345 Fisher Road and surrounding areas to identify potential sources of contamination in groundwater in the area.

The frequency of groundwater monitoring events at the site as mandated in the FRRF operating plan is adequate to assess the groundwater conditions on a seasonal basis; however some drinking water parameters exceeded the Guidelines for Canadian Drinking Water Quality in the tests conducted by EBA (total Hardness, total dissolved solids, and total coliforms). We recommend that the testing program should include a complete drinking water package and petroleum hydrocarbon indicator parameters (for sample points where hydrocarbon releases are possible) once the recycling and waste material drop-off facility is in operation. The samples should be collected by an independent environmental consulting company and tested at a Canadian Association for Environmental Analytical Laboratories (CAEL) accredited laboratory to ensure that the samples are collected, handled and tested appropriately.

EBA suggests that FRRF continue paving sections of the lot where the unscreened Class A compost is stored and try to drain and direct runoff from the property into a constructed impermeable pond. This water can then be redirected into the onsite leachate collection system and used for the compost curing process or disposed by an authorized liquid waste disposal company.

Runoff from the proposed recycling drop-off facility will be piped to oil/water separators. EBA recommends that a maintenance and inspection schedule be put in place to pump out any hydrocarbons and sludge on a regular basis. The separators need to be managed and maintained properly to prevent hydrocarbons from flowing into the swale and seeping into the subsurface.

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1.0 INTRODUCTION

1.1 GENERAL

EBA Engineering Consultants Ltd. (EBA) was retained by the Cowichan Valley Regional District (CVRD) Engineering and Environmental Services Department to conduct an environmental review and odour generation and mitigation strategies investigation at the Fisher Road Recycling Facility (FRRF), located at 1355 Fisher Road in Cobble Hill, BC (the site) and the Central Landscape Supplies Ltd. (Central) mixed yard and garden waste composting facility at 1345 Fisher Road. A site location plan is shown on Figure 1 attached.

EBA understands that current land use at 1355 Fisher Road includes a composting facility and the owners have applied to the CVRD to amend its current operating plan to include a public drop-off centre for recycling and waste material.

The CVRD requested EBA to conduct an environmental review of the local aquifer, groundwater, surface water quality, and other potential environmental impacts from the FRRF, Central and FRRF's proposed expansion works. Neighbouring residents use the local aquifer for domestic and commercial purposes including drinking water. The CVRD also requested that the environmental review include an analysis of odour generation and mitigation strategies associated with FRRF's and Central's operations in the area. EBA subcontracted the odour generation and mitigation strategies portion of the project to Transform Compost Systems (TCS) of Abbotsford, BC.

EBA received written authorization from CVRD to proceed with this environmental review on June 30, 2010. The CVRD requested amendments to the original scope of services to include groundwater sampling, Class A compost sampling, and an odour assessment and mitigation strategies. EBA prepared corresponding amendments to the proposal on August 10, 2010 and August 24, 2010.

1.2 BACKGROUND

The FRRF is currently licensed under CVRD Bylaw 2570 Waste Stream Management Licensing to operate as a commercial compost facility. The operation currently accepts biosolids, food waste, mixed yard and garden waste as feedstock to produce Class A compost through in-vessel processing. EBA understands that the facility contains all leachate that is generated during processing and re-uses or disposes the leachate in an authorized manner. The final compost product is stored on the native ground surface.

Central is located on a neighbouring property; however this second facility does not accept biosolids and food waste feedstock and only processes Class A compost from yard and garden materials.

The site operators currently conduct quarterly monitoring and sampling of groundwater and surface water from a drainage ditch at the site (if water is present) as required in the license issued by the CVRD. EBA understands that one well is present at the site and a second

neighbouring well located approximately 120 m northeast of the site have historically been used for monitoring purposes. However, the well at the neighbouring property is plugged or damaged and can no longer be sampled. Historical groundwater and surface water analytical results fluctuate seasonally by up to 30 per cent.

1.3 SCOPE OF SERVICES

The current amended scope of services for the environmental review included the following tasks:

- Conducting a desktop review of the Cobble Hill area aquifers and water well records available on the BC Ministry of Environment's (MoE's) web-based Water Resources Atlas. EBA also reviewed available MoE reports pertaining to the Cobble Hill area aquifers to identify, to the best the available data will allow, the neighbouring aquifer(s). The desktop review also included a review of surficial soil, geology, bedrock geology, aquifer, and aquifer vulnerability maps available for the area;
- Conducting a site visit to 1355 and 1345 Fisher Road to observe the setting, layout of the land and operating facilities;
- Identifying potential receptors of leachate runoff and provide comments on the suitability of the current monitoring and sampling program;
- Conducting an odour analysis, site visit and review of mitigation strategies. This component was subcontracted to Transform Compost Systems Ltd. (TCS) of Abbotsford, BC);
- Inspecting the monitoring stations at the site and looking for suitable alternate monitoring locations if necessary;
- Interviewing the operators of the two facilities to ask questions pertaining to the historical land use at the sites including activities prior to the current composting operations. Also attending a local resident's advisory committee meeting to hear local concerns. Reviewing the current monitoring and sampling program to assess its suitability for the current and proposed operations and providing comments on whether the list adequately assesses all potential contaminants of concern (PCOCs). EBA also provided a list of any additional PCOCs that could arise following the implementation of the public drop-off facility;
- Collecting groundwater samples from the onsite monitoring well plus four other wells located near the composting facilities. The groundwater from the five wells was tested for general drinking water potability plus chemical oxygen demand (COD), biological oxygen demand (BOD), ammonium (NH_4), orthophosphate, and tannins and lignins;
- Collecting composite samples from the piles of screened and unscreened finished Class A compost and testing the samples for regulated metals, fecal coliforms, nitrate and ammonium concentrations;

- Collecting water samples from the leachate collection pit at 1345 Fisher Road and testing the samples for ammonium, nitrate, nitrite, total nitrogen, metals, total organic carbon, and fecal coliform;
- Collecting a water sample of the runoff from the compost windrows at 1355 Fisher Road and testing the sample for nitrate, nitrite, total nitrogen;
- Other potential environmental impacts from the ongoing compost operation and the proposed expansion works such as the potential for spontaneous combustion with processed materials onsite, and vector attraction; and
- Preparing this report, issued for review and then issued for use to the CVRD.

2.0 SITE SETTING AND HYDROGEOLOGY

2.1 SURFICIAL SOILS

The *Soils of Southern Vancouver Island* Jungen, 1940) indicated that the surficial soils surrounding the site consist of Somenos 1 (80%), Dashwood Creek 1 (10%) and Quamichan 1 (10%) soil types.

Somenos soils developed in deep sandy, gravelly morainal (till) deposits and consist of gravelly sandy loam in the upper horizon and the subsoils. Dashwood Creek soils developed in shallow, gravelly fluvial, fluvioglacial and/or marine deposits normally less than 1 m thick and underlain by compact sandy, gravelly, morainal deposits. Quamichan soils developed in deep sandy, gravelly fluvial, fluvioglacial and/or marine deposits and consist of very gravelly loamy sand or gravelly loamy sand in the upper horizon and the subsoils. These soils are well drained.

2.2 SURFICIAL GEOLOGY

According to the Geological Survey Branch (BC Ministry of Energy, Mines and Petroleum Resources, 1993) the northern quarter of the map sheet (NTS 92B/12) the upper surficial geology has been mapped as a hummocky diamicton morainal blanket (dominant in area) or a silty glaciolacustrine plane overlaying sand and gravel glaciofluvial fan deposits. Diamicton is defined as poorly sorted sediments consisting of gravel with grain sizes greater than 2 mm and set in a matrix of finer grain sizes. Most of the area north of Mill Bay, south of Cowichan Bay, and east of Cobble Hill has been mapped as a diamicton morainal blanket or silty glaciolacustrian plain overlaying sand and gravel glaciofluvial deposits. According to the authors of the map Blyth, Rutter, and Sankeralli the following description of surficial deposits in this area was described as follows:

*"**Diamicton:** The surficial materials in the northern quarter of the Shawnigan Lake map sheet are a result of southeastwardly flowing Cowichan Valley ice, from Vancouver Island, stagnating at the mouth of the Cowichan Valley. This produced thick deposits of hummocky diamicton interspersed and interbedded with glaciolacustrine silts and clays which formed as ice dammed and stagnated against the westward flowing Cordilleran ice on the Vancouver Island ice…. **Sand and Gravel:** Surface or near surface concentrations of sand and gravel appear to be concentrated in the glaciofluvial deltaic deposits north of Mill Bay."*

2.3 BEDROCK GEOLOGY

The bedrock geology of the study area comprises sedimentary rocks of the upper Cretaceous Nanaimo Group, basalts of both the middle to upper Triassic Karmutsen Formation and the middle to upper Devonian Duck Lake Formation, and granodiorite of the early to middle Jurassic Island Plutonic Suite (BC Ministry of Energy, Mines and Petroleum Resources – The MapPlace).

Bedrock outcrops were not identified during the site visit and the water well records in the area did not indicate the presence of bedrock near surface, or that bedrock was encountered during drilling.

2.4 TOPOGRAPHY AND HYDROLOGY

The northern two thirds of the site slopes towards the east and the southern third of the site slopes towards the south. The adjacent property to the north consists of a sand and gravel extraction pit bordered by cliffs that separate the pit from commercial businesses that front on the Trans Canada Highway. The adjacent property to the south slopes moderately towards the south and is treed and contains a mobile residential home. The nearest surface water bodies to the site are all greater than two kilometers from the site: Hutchinson Lake is located approximately 2 km southeast of the site; Shawnigan Creek is located approximately 2.25 km south southeast of the site; and Dougan Lake is located approximately 2.5 km northwest of the site. These surface water features are reported to be fish-bearing.

A copy of the National Topographic Series (NTS) map 92B/12 Shawnigan Lake (see Appendix A) indicates that a junk yard was present at the corner of Fisher Road and Fairfield Roads (southwest of the site). The junkyard contained wrecked automobiles and was reported to be cleared during redevelopment activities at this property circa 2008. The CVRD indicated that they have little knowledge or records of this junkyard operation and if other items were disposed at the site.

2.5 HISTORICAL LAND USE AT FISHER ROAD RECYCLING FACILITY

Former land use activities at the site have the potential to impact environmental conditions in the subsurface in the area. The site is situated in a mixed commercial, agricultural and residential setting. The property at 1355 Fisher Road was originally developed as a rural residential property. EBA received anecdotal information that a chicken and/or quail farm operated at the site from circa 1993 to 2000. A 25 ft x 75 ft m barn was erected adjacent to the water well at the site to house chickens. The property was then rented or leased to a

company that raised quails. It was reported that manure was stored outside the barn near the well. The exact location of the barn and farming operations at the site require further investigation to corroborate the anecdotal information provided to EBA.

EBA is not aware of a Stage 1 Preliminary Site Investigation (PSI) conducted at 1355 or 1345 Fisher Road. A Stage 1 PSI researches the historical land use activities at the site and neighbouring properties. These investigations provide very useful information to help determine areas of potential environmental concern and potential contaminants of concern. A Stage 1 PSI was not part of the scope of services for this investigation but would be useful as an initial element in a comprehensive investigation of the area.

2.6 NEIGHBOURING WATER WELLS

A search of the MoE aquifer and water well database identified 29 registered water wells within a 500 m radius of the entrance to the site. In addition, EBA obtained a copy of the well record drilled at the site. Groundwater use in the area includes domestic, commercial, irrigation, and utility supply and wells are located in all directions from the site. MoE's Water Resources Atlas does not indicate whether the wells in the database are still in use and the accuracy of the locations may be incorrect in some instances. Some of these wells may have been abandoned or destroyed but not reported to MoE. For example; three wells are plotted near or at 1355 Fisher Road (WTN 1324, 1325, and 8929); however to EBA's knowledge there are no wells at this location. These wells are likely somewhere in the area but contain little or no information on their actual location or whether they still exist. In addition, there is very likely several other wells in use that are not in the Ministry's database as it was not a requirement for well drilling contractors to submit copies of their water well records to MoE until the BC Groundwater Protection Regulation came into effect in November 2005. A copy of the water well search results obtained from the MoE online aquifer and water well database including a copy of the well log at the site and a map of neighbouring well locations is included in Appendix B.

Of the 30 well records reviewed, three wells contained no stratigraphy (WTN 8929, 8960 and 8979). One well appears to be misplotted because the well was drilled entirely through bedrock (WTN 81988) and one other well contained a stratigraphy that does not resemble other nearby wells (WTN 1324). Of the remaining 25 wells, nine were reported to have a confining layer described as gravelly till – a low permeable glacially derived silt, sand and gravel mixture or clay that ranged in thickness from 0.9 m to 8.8 m and the remainder had no confining layer.

Based on the well logs, we interpret that the stratigraphy at the site and surrounding area to generally consists of silty sand and silty gravel overlaying sand and gravel with patches of till (a glacially derived mixture of predominantly silt and clay mixed with varying amounts of coarse-grained material such as sand, gravel and and/or cobbles) in some areas . The possibility exists that in some areas of 1355 and 1345 Fisher Road that lower permeable soils exist at the surface. The operators at 1345 Fisher Road stated that they imported till soil and placed it beneath the composting pad during construction to bring the pad up to

grade and have reported the presence of till in other areas of the site; however EBA was not presented test pit logs, geotechnical borehole logs, or grain-size distribution tests from a qualified geotechnical or materials technician to review to confirm the soil profile of the surficial soils at both sites. The onsite water well is 66.4 m deep and water-bearing sand and gravel was encountered at a depth of 57 m below ground surface. We do not currently know the depth of the bottom of the water-bearing unit. A summary of the well construction and production details of the 25 neighbouring wells that EBA reviewed at the time of drilling as reported by the drillers is listed below:

- The range of well depths within 500 m from the site is from 23.5 m to 107.9 m below ground surface. The geometric mean well depth is 58.9 m below ground surface.
- The range of confining layer thickness where it is present is from 0.9 m to 8.8 m. The geometric mean confining layer thickness is 3.5 m. A confining layer was present in 36% of the well records reviewed.
- The range of distance to static water level in the water wells where no confining layer was identified measured at the time of well completion is from 32.0 m to 56.4 m from surface. The geometric mean distance to static water level in these wells is 42.6 m from surface.
- The range of estimated well yields at the time of drilling is from 0.11 L/s to 18.9 L/s. The geometric mean well yield estimate is 0.97 L/s.

2.7 LOCAL AQUIFER

The BC MoE has developed an aquifer classification system, which classifies and ranks aquifers on the basis of their level of development and vulnerability to contamination (Kreye, R., Ronneseth, K. and Wei, M., 1994). The level of development of an aquifer (determined by assessing demand verses the aquifer's yield or productivity) can be designated as high (I), moderate (II), or low (III). The vulnerability of an aquifer to contamination from surface sources (assessed based on type, thickness and extent of geologic materials overlying the aquifer, depth to water (or top of confined aquifers), and the type of aquifer materials) can be designated as high (A), moderate (B), or low (C).

MoE's Groundwater Resource Atlas indicates the presence of aquifer #197 located at the site. Aquifer #197 is identified as a sand and gravel aquifer that has moderate demand and low vulnerability and is thus classified as IIC. A copy of the aquifer map of the area from the MoE Water Resources Atlas is presented in Appendix A.

Another approach to assessing aquifer vulnerability is by using a DRASTIC analysis. DRASTIC is an aquifer vulnerability mapping method that defines seven parameters (depth to water, net recharge, aquifer medium, soil medium, topography, impact of the vadous zone, and hydraulic conductivity) that contribute to numerical intrinsic aquifer vulnerability. Each parameter has a weighted value in relation to the others and the sum equation determines the overall intrinsic vulnerability.

The area surrounding the site was given a DRASTIC rating of medium to high (Newton and Gilchrist, 2010). A copy of the DRASTIC map of the area is included in Appendix A.

Considering the lack of or minimal thickness of a low permeability layer overlying some portions of aquifer #197 and the medium to high DRASTIC value at the site, we interpret this aquifer to have a higher degree of vulnerability than originally designated by MoE. No confining layer was reported on 64% of the well logs located within 500 m from the site. The lack of a confining layer is visible in road cuts and at the gravel pit north of the site.

EBA conducted a well protection plan for the Cobble Hill Improvement District (CHID), Braithwaite Estates Improvement District (BEID), and Miller Water Supply Society (Miller) in March 2006. This objective of that report was to provide practical protective measures to identify and manage activities within the well capture zones or recharge areas for the Cobble Hill area water supply wells with the intention of reducing risks to the water supply source.

The findings of the report did not identify contamination of the aquifer in the studied areas; however, the release of contaminants within the identified capture zones could pose a potential risk to the aquifer. Risks associated with releases from septic systems, application of agricultural chemicals and chemical spills along the Trans Canada Highway were listed as the highest risks to the aquifer. Groundwater modeling was conducted based on pumping test information provided to EBA by BEID's, CHID, and Miller for their production wells and MoE's groundwater database. Several assumptions were made regarding some unknown hydrogeological parameters for the model to work. These model limitations and assumptions used were discussed in the report. The report estimated 1-year, 5-year, and 10-year well capture zones surrounding the production wells. FRRF and Central are located between the plotted capture zones of the Miller and CHID Holland Road production wells (EBA, 2006 Figure 7). It appears that the direction of groundwater flow is towards the north or northeast; however, EBA cautions the reader that well locations and elevations of many wells used for the 2006 report were estimated based on locations from MoE's aquifer database, elevations from local topographic maps or programs and not from a professional surveying firm; therefore the piezometric elevations and direction of groundwater flow should be considered "estimated" and may vary in different locations throughout the aquifer.

The Cobble Hill aquifer was originally mapped as a low vulnerability aquifer; however, based on patchy areas with little or no low permeable soil as reported on some nearby well records EBA concluded that this aquifer should be considered as having moderate vulnerability (EBA 2006. p i).

3.0 SITE AND NEIGHBOURING FACILITIES

There are two composting facilities operating on neighbouring properties on Fisher Road. FRRF is located at 1355 Fisher Road and Central operates on the neighbouring lot to the northeast at 1345 Fisher Road. The locations of the composting facilities are shown on Figure 2. Photographs of the site and surrounding properties are presented in Appendix C.

3.1 FISHER ROAD RECYCLING FACILITY (FRRF)

FRRF is currently licensed under CVRD Bylaw 2570 Waste Stream Management Licensing to operate as a commercial compost facility and operates under the Organic Matter Recycling Regulation (OMRR), with an annual operating capacity of 18,000 metric tonnes. Photos 1 and 2 show the site operation and the finished product.

The site began operating as a composting facility under the Westcoast Landfill Diversion Corporation (Westcoast) in 2000. Westcoast sold the site and the composting operation to Fisher Road Recycling in March 2006. The new owners have made several modifications to more responsibly operate the facility by installing permanent infrastructure upgrades including:

- Indoor receiving and processing and doors to the facility that are only opened to allow truck and equipment access and to haul the indoor bunkers out of the building;
- Aerated impervious working pads;
- Leachate collection and recycle systems;
- Curing on aerated floor within the receiving and processing buildings; and,
- Installation of a 30,000 CFM biofilter to improve the odour control processing.

The indoor operation consists of a 36.5 m by 40 m tarp structure that is situated on an asphalt pad. This structure contains the receiving area, in-vessel composting boxes, a mixing area and secondary processing. Biofilters are attached by a ducting pipe. The primary composting process includes ten days in one of the in-vessel boxes followed by fourteen days curing on an aerated floor in the same receiving and processing building. Excess exhaust from the in-vessel composting boxes and the structure is ventilated through the three biofilters: one for the in-vessel biocells and two for the Processing Building. Following the curing process, the compost is then moved in outdoor windrows for storage.

From our site visit, we saw that the facility contains generated leachate and recycles the leachate by hydrating the curing compost piles (Photos 3 and 4). Leachate generating activities occur on the working pad within the operations building. The pad is surrounded by berms and sealed retainer walls. Leachate that is generated is collected in the middle of the pad and is absorbed using dry yard waste or wood waste and is included in the compost mix. The doors are protected by a grate and gutter system. The gutter is checked and cleaned where required. Leachate generated in the biocells is collected at the bottom end of each cell in a collection channel. Leachate that is generated during the indoor processing at the site is piped into a leachate collection box. The volume of leachate is monitored electronically and an alarm signal is in place to warn when the leachate levels reach a certain level. According to the operator at 1355 Fisher Road, in the event that the leachate collection tank fills to near capacity, a liquid waste management contractor is called to the site to pump the leachate from the tank and dispose it off site.

Leachate and condensations collected during the other indoor curing building is collected in gutters located near the edge of the concrete pad and is then directed by pipe to a secondary leachate collection tank. Leachate and condensation that forms in the biofilters (processing buildings) is also collected in gutters and directed to the secondary leachate collection tank (Photo 5). Leachate is recycled in the cell and used as a source of moisture. The facility requires moisture for the curing process and recycles the leachate from the tanks onto the curing piles to add moisture to enhance organic breakdown. Water from the groundwater well is also used to add moisture to the compost piles. The facility attempts to collect as much moisture as possible to assist with and expedite the curing process.

The unscreened Class A compost product was stored on the native ground surface during our site visit. This material is eventually screened to remove plastics and other objects prior to storing in the screened compost area. The final screened product is stored on a concrete pad in the west section of the site. The locations of the Class A storage areas is shown on Figure 2. During EBA's compost sampling event, there were fourteen piles of unscreened Class A compost stockpiled on the native ground and five stockpiles of screened Class A compost stockpiled on a concrete pad. There was no lip on the concrete pad to contain runoff.

The groundwater well at the site is located in a shed in the central portion of the site approximately 25 m laterally from the Class A compost piles (Photo 6). The well was constructed in December 1972 by Drillwell Enterprises Ltd. of Duncan, BC for Mr. Allan Cowen. The depth of the well is 66.4 m and the estimated yield was 1.26 L/s at the time of drilling. The distance to static water level at the time of drilling was 54.9 m below surface. The wellhead is located at the base of a 1.2 m diameter concrete ring approximately 1 m below ground surface (Photo 7). The well is flush with the base of the concrete ring with no casing stick-up. There is no surface seal in place. Modern wellhead protection measures such as casing stick-up and grouted surface seals were not a common code of practice for drilling contractors in 1972. The well was originally drilled for domestic and drinking water supply; however since the site has become a recycling facility, the well is no longer used for drinking water. The well water is used to irrigate the composting process and to hydrate the piles of finished compost when required.

The groundwater well at the site is shared with 1345 Fisher Road located next door. An informal agreement is in place between the two facilities to use the water to assist with the composting process. The operating license at 1355 Fisher Road requires the operator to test the groundwater quarterly (February, May, August, and November) for the following parameters: total nitrogen, nitrate, ammonia, BOD, pH, fecal coliform, and phosphorous.

Surface runoff from the site occurs during periods of heavy precipitation mostly during the late autumn, winter, and early spring months. Runoff generally flows down the site access road and is directed into a swale collection area located adjacent to Fisher Road (Photo 8). The water in the swale, if present during monitoring events, is sampled and tested for the required monitoring parameters. The water in the swale eventually seeps into the ground.

3.1.1 Amendment to the Operating Plan

FRRF has recently applied to the CVRD to amend their Operating Plan to include the operation of a recycling drop-off centre. The recycling centre would operate independently from the composting facility; however, some infrastructure may be shared.

The recycling centre has already been constructed and is situated in the southern portion of the site fronting onto Fisher Road. The site has been constructed on an impervious pad with storm water collection and partial treatment in two oil/water separators followed by on-site infiltration in the existing swale system (Photo 9).

The types of materials that will be disposed at the site include: general refuse/garbage, drywall, wood waste, ferrous metal, concrete/brick/rubble, asphalt roofing, cardboard, mixed waste paper, glass/metal/plastic containers, and other miscellaneous items (Product Stewardship Items - specialty plastics, fluorescent lights, used paint, batteries, e-waste, and tires).

General refuse will be received on a concrete pad within a covered building with an open front and no doors (Photo 10). All putrescible waste (i.e., odourous household garbage) will be stored in closed bins at the end of each day to be transferred to the CVRD Bings Creek facility for disposal as per their operating plan. Mixed recyclables will be sorted and stored in wheeled carts, bags, and/or other secure containers (Photo 11). Other materials will be received in a designated covered bunker area. Stored general refuse has the potential to be a source of odour during the day and at the end of each day the refuse will be loaded into a closed roll-off container for storage prior to transfer to Bings Creek facility for disposal. None of the other items that will be disposed in the recycling area are expected to be odiferous.

3.2 CENTRAL LANDSCAPE SUPPLIES LTD. RECYCLING FACILITY (CENTRAL)

Central does not accept biosolids and food waste feedstock and only processes Class A compost from yard and garden materials. This facility operates outdoors. Central began operating in 2006 (Photo 12). The design capacity is 6,000 tonnes of yard waste per year. The area for active composting, curing, and storage is approximately 1,000 m^2. The site currently has four windrows measuring 5 m wide by 3 m high by 35 m long.

The waste material is brought to the site and placed on an impermeable asphalt pad during curing and processing. Leachate and precipitation runoff that is generated is directed to a leachate collection pit constructed of grouted concrete block to prevent leaking (Photo 13). The leachate collection tank is approximately 6.75 m x 6.75 m x 2.25 m deep and floored by asphalt. The leachate is re-used on the composting piles. Once the compost meets Class A standards it is transferred to another part of the site and is stored on the native ground (Photo 14) and is sold as is or mixed with soil that is imported to the site (Photo 15) to create a top soil mix.

Central is not required to conduct monitoring and sampling of the shared well located at 1355 Fisher Road. The operators at 1345 Fisher Road add a layer of finished compost on top of processing compost windrow piles to minimize odour.

3.3 NEIGHBOURING LAND USE

Properties surrounding the site consist of a mixture of light industrial, commercial, agricultural and residential land uses.

Central is located to the northeast of the site. A sand and gravel extraction pit is located north of the site (Photo 16). Commercial properties fronting onto the Trans Canada Highway are situated at the base of the cliffs created by the sand and gravel extraction operation (Photo 17).

Raven Metal Products manufacturing currently operates in a former grain silo or milling operation located east of the site (Photo 18). Harlequin factory direct clothing outlet is located northeast of the site (Photo 19). Residential properties are located to the west and southwest. Gamboa Farms is located to the south (Photo 20). A neighbouring land use plan is shown on Figure 2.

Municipal services are not available to this area of Cobble Hill. Domestic and drinking water supply is from individual groundwater wells or supplied by one of three public utilities or improvement districts: CHID, BEID, and Miller. BEID currently operate three production wells located approximately 875 m to 1,125 m northeast of the site. The Miller production well is located near the intersection of Fisher Road and the Trans Canada Highway approximately 500 m northeast of the site. The Cobble Hill Improvement District operates production wells located to the west (approximately 375 m from the site), south (approximately 700 m from the site) and southeast of the site (approximately 1,250 m from the site). Two new wells were drilled in 2010 to augment CHID's system. The new wells are located approximately 175 m to the west and 375 m to the east of the site. The locations of these production wells are shown on Figure 3.

4.0 SAMPLING METHODOLOGY

4.1 GROUNDWATER SAMPLING

EBA sampled groundwater from the onsite well on August 11, 2010. Owners of four other wells located on properties near the site volunteered to have their groundwater tested as part of this groundwater testing program. The wells that were sampled as part of the groundwater testing program included the following:

- 1425 Galliers Road;
- 1360 Fisher Road;
- Holland & Galliers Road Well; and

- 1310 Fisher Road.

The following table presents the locations of these wells in relation to the site. The locations of these wells are shown on Figure 3.

WELLS SAMPLED FOR THE GROUNDWATER MONITORING PROGRAM	
Well Location	**Distance and Direction from 1355 Fisher Road (approximate)**
Holland & Galliers Road	375 m west
1425 Galliers Road	150 m northwest
1360 Fisher Road	100 m south
1310 Fisher Road	360 m northeast
1355 Fisher Road	Onsite

The samples were collected from a tap that is directly connected to the well. None of the water that was tested had flowed through a filtering or treatment system. The taps were turned on to purge water that was trapped in the pipes or hoses. After approximately 5 minutes samples were collected in laboratory-supplied bottles. EBA added laboratory-supplied preservative to the samples that required preservative.

The samples were placed in an ice-chilled cooler and delivered to Maxxam Analytics International Corporation (Maxxam) laboratory in Victoria, BC. The parameters that were selected for testing included those associated with drinking water potability plus others that could potentially be found in water that is subject to decomposing organic matter including biosolids and food waste and mixed yard and garden waste:

- Enhanced Drinking Water Package (includes: pH, conductivity, hardness, total metals, total coliform and e. coli, anions, turbidity, true color, alkalinity, nitrate, nitrite, and total dissolved solids);
- Fecal Coliform;
- Biological Oxygen Demand;
- Chemical Oxygen Demand;
- Ammonium-N;
- Ortho-phosphate;
- Tannin and Lignin;
- Dissolved Metals; and
- Total Kjeldahl Nitrogen.

4.2 COMPOST SAMPLING

EBA sampled the finished Class A compost at 1355 Fisher Road on September 7 and 9, 2010. Samples of the compost stockpiles were collected based on a sampling methodology recommended by TCS which was derived from an OMRR-approved methodology that included aliquot sampling to form a composite sample with rigorous decontamination procedures of the sampling equipment to avoid cross-contaminating the samples. The methodology used by EBA included the following: seven randomly selected stockpiles were selected where aliquot samples (separate subsamples) were collected and combined to form a composite sample. At each sampling location a shovel was used to dig into the stockpile to a depth that ranged between 0.3 m and 1.0 m. A trowel was then used to scoop compost into a sanitized 20 L pail. The shovel, trowel were then sanitized with a 10% bleach solution and rinsed three times with de-ionized water prior to sampling the next location. At the second sampling location the procedure was repeated and the following sanitization of the 20L pail. Once all seven aliquot samples were collected they were mixed to form a composite sample and placed in duplicate sterilized plastic bags that were supplied by the testing laboratory. Three samples were collected from the site. The samples were placed in an ice-chilled cooler and shipped by air courier to Exova Laboratory (Exova) in Calgary, Alberta for testing of BC OMRR metals, fecal coliforms, nitrate and ammonium.

EBA returned to the site on September 27, 2010 to re-test the Class A compost using the same methodology described above to confirm the analytical results. The same stockpile locations were sampled as done on September 7 and 9, 2010; however EBA can not confirm whether the same stockpile material was sampled as the operators may have turned and relocated the stockpiles as part of their processing operation. During the second sampling event BC OMRR metals testing was not conducted because the original samples contained metals concentrations well below BC OMRR standards. EBA requested Exova to test the second samples for ammonium, nitrate, fecal coliforms and total organic carbon to total nitrogen (C:N) ratio.

EBA visited 1345 Fisher Road on October 7, 2010 to test the Class A compost using the same sampling methodology described above. EBA collected seven aliquot samples from two piles of Class A compost at 1345 Fisher Road. The seven aliquots were combined to form one composite sample that was shipped on ice via courier to Exova for ammonium, nitrate, fecal coliforms, and C:N ratio.

4.3 LEACHATE COLLECTION PIT AND RUNOFF SAMPLING

EBA sampled the water in the leachate collection pit at 1345 Fisher Road on October 7, 2010. A disposable plastic bailer was lowered into the leachate collection pit to retrieve a leachate sample. The leachate was then placed into laboratory-supplied plastic bottles and preservative was added to bottles where required. The sample was placed in an ice-chilled cooler and shipped by air courier to Exova for testing of ammonium, nitrate, nitrite, total nitrogen, total organic carbon (TOC), total and fecal coliforms, and total metals.

There was no pooled runoff water present at 1355 Fisher Road during the October 7, 2010 sampling event; therefore, EBA provided the CVRD with the sample bottles and preservative required to conduct the runoff sampling at 1355 Fisher Road. The CVRD visited 1355 Fisher Road on November 15, 2010 following a period precipitation to collect a sample of the runoff water from an area of pooled water between the unscreened windrows. EBA provided written instructions to the CVRD to collect the samples that included the following tasks:

- Wear nitrile gloves while collecting the sample;
- Collect the samples by dipping the bottles into the pooled water and filling the bottles allowing room to add preservative;
- Minimize the amount of sediment and particulate matter entering the bottle;
- Add laboratory-supplied preservative as indicated on the bottles; and
- Ship the samples in an ice-chilled cooler to Exova for testing of ammonium, nitrate, nitrite, and total nitrogen.

EBA filled out the chain of custody forms for the laboratory prior to shipping the sample bottles to the CVRD.

5.0 ASSESSMENT GUIDELINES

The groundwater results were compared to the numerical guidelines contained in the following document:

- *Guidelines for Canadian Drinking Water Quality (GCDWQ),* Health Canada, Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, May 2008.

The compost test results were compared to the numerical guidelines contained in the following document:

- British Columbia *Organic Matter Recycling Regulation,* B.C. Environmental Management Act and Public Health Act, B.C. Reg. 18/2002 O.C. 84/2002 (includes amendments up to B.C. Reg. 198/2007, June 30, 2007).

Several parameters that were tested in this program do not have guidelines listed in these documents. These parameters are considered to be indicators of organic matter leachate (e.g. wood, food, manure, compost, etc.). Other regulations such as the *BC Contaminated Sites Regulation*, the *BC Approved Water Quality Guidelines* or A *Compendium of Working Water Quality Guidelines for British Columbia* have standards or guidelines for some of these parameters. These regulations pertain to groundwater, surface water, sediment or air quality and are used for assessing contaminated sites in British Columbia. Standards or guidelines are either generic numerical or matrix standards that are risk-based and depend on land use and a number of site-specific factors.

The applicable guidelines and standards used are presented on Tables 1 through 6 attached.

6.0 ANALYTICAL RESULTS

6.1 GROUNDWATER

The results of the groundwater samples collected on August 11, 2010 indicated that all of the parameters tested met the GCDWQ except for the following:

1355 Fisher Road Well:

Total Hardness was measured at a concentration of 310 mg/L, which exceeds the GCDWQ aesthetic objective range of 80 to 100 mg/L. According to the GCDWQ generally, hardness levels between 80 and 100 mg/L (as $CaCO_3$) are considered acceptable; levels greater than 200 mg/L are considered poor but can be tolerated; those in excess of 500 mg/L are normally considered unacceptable;

The total dissolved solids (TDS) concentration was 563 mg/L, which exceeded the GCDWQ aesthetic objective guideline of 500 mg/L;

The nitrate-N concentration was 45.9 mg/L, which exceeded the GCDWQ guideline of 10 mg/L;

The nitrate + nitrite concentration was 47 mg/L, which exceeded the GCDWQ guideline of 10 mg/L; and

The total coliforms concentration was 120 MPN/100 ml, which exceeded the GCDWQ guideline of 0 mg/L.

Historical analytical data from the on site well is attached in Appendix D.

1360 Fisher Road 140-foot Well:

Total Hardness was measured at a concentration of 172 mg/L, which exceeds the GCDWQ aesthetic objective of 80 to 100 mg/L, but is less than the 200 mg/L threshold that is considered poor but can be tolerated;

The nitrate-N concentration was 17.1 mg/L, which exceeded the GCDWQ guideline of 10 mg/L; and

The nitrate + nitrite concentration was 16.6 mg/L, which exceeded the GCDWQ guideline of 10 mg/L.

The 140-foot well at 1360 Fisher Road was most recently tested in 2002 and the analytical report is attached in Appendix D.

1425 Galliers Road Well:

Total Hardness was measured at a concentration of 141 mg/L, which exceeds the GCDWQ aesthetic objective of 80 to 100 mg/L, but is less than the 200 mg/L threshold that is considered poor but can be tolerated; and

The total coliforms concentration was 40 MPN/100ml, which exceeded the GCDWQ guideline of 0 mg/L.

The well at 1425 Galliers Road was previously tested in 2002 and the analytical report is attached in Appendix D.

Holland & Galliers Road Well:

Total Hardness was measured at a concentration of 152 mg/L, which exceeds the GCDWQ aesthetic objective of 80 to 100 mg/L, but is less than the 200 mg/L threshold that is considered poor but can be tolerated.

Historical analytical data from the Holland & Galliers Road well is attached in Appendix D.

1310 Fisher Road Well:

Total Hardness was measured at a concentration of 56.8 mg/L, which is less than the GCDWQ aesthetic objective of 80 to 100 mg/L. The GCDWQ does not provide an explanation on acceptability of Hardness concentrations that are less than the range considered to be acceptable; and

The total coliforms concentration was 2 MPN/100 ml, which exceeded the GCDWQ guideline of 0 mg/L.

A copy of Maxxam's analytical report is presented in Appendix D.

6.2 1355 FISHER ROAD FINISHED CLASS A COMPOST

The results of the Class A compost samples collected at 1355 Fisher Road on September 7 and 9, 2010 indicated that all of the parameters tested met the OMRR standards for Class A compost except for the following:

- The fecal coliform concentration of samples SP1 (23,000 MPN/g), SP2 (2,300 MPN/g), and SP3 (7,500 MPN/g) exceeded the OMRR guideline of 1,000 MPN/g.

The results of the Class A compost samples collected on September 27, 2010 indicated that all of the parameters tested met the OMRR standards for Class A compost except for the following:

- The fecal coliform concentration of samples SP1-A (4,300 MPN/g) and SP3-A (460,000 MPN/g) exceeded the OMRR guideline of 1,000 MPN/g.

The analytical reports from Exova for the compost samples are attached in Appendix D.

6.3 1355 FISHER ROAD POOLED RUNOFF SAMPLE

The results of the pooled runoff sample collected at 1355 Fisher Road on November 15, 2010 have not yet been reported by Exova. EBA expects the results to be available on or around November 23, 2010 and will provide a supplementary letter describing those results.

6.4 1345 FISHER ROAD FINISHED CLASS A COMPOST AND LEACHATE SAMPLE

The results of the Class A compost samples collected at 1345 Fisher Road on October 7, 2010 indicated that all of the parameters tested met the OMRR standards for Class A compost.

The results of the leachate sample collected at 1345 Fisher Road on October 7, 2010 indicated that all of the parameters tested met the GCDWQ except for total lead and total manganese. EBA notes that the GCDWQ apply to potability of drinking water at point of consumption and because the leachate is not drinking water, these guidelines do not apply to this sample. The guidelines were used in this report for comparison purposes to potable drinking water. The analytical reports from Exova for the compost and leachate sample are attached in Appendix D.

7.0 ODOUR CONTROL AND LEACHATE ANALYSIS

TCS assessed the odour generating conditions at 1355 and 1345 Fisher Road. In discussions with several neighbours indicated that odours have been reduced in the past 18 months. TCS has provided some recommendations where if followed would manage odour to a tolerable level from both facilities.

At the 1355 Fisher Road much of the process is indoors and most related air is processed through three biofilters, there is little odour or water quality concern about this part of the operation. The finished product does produce an organic odour and is still biologically active especially after it is rained upon. Trucks arriving at the site go onto a scale and then back into the building where they dispose their load indoors. The windrows of Class A compost when turned can release odours.

At 1345 Fisher Road, TCS has recommended forced aeration to keep the windrows aerobic and reduce the turning requirement, redesign and cover the windrows to prevent excess moisture from entering the composting material especially during the winter months and cover the leachate collection pit. The operating plan at 1345 Fisher Road should provide clearer instructions on what to do with the leachate generated at the site (how to recycle and manage it especially during the wet winter months).

EBA directs the reader to TCS's report on odour control and leachate analysis that is attached in Appendix E.

8.0 DISCUSSION

A discussion of the findings of this investigation is summarized in the following subsections.

8.1 SITE SETTING, GEOLOGY AND AQUIFER MAPPING

The lack of confining overburden in some areas on and surrounding 1355 and 1345 Fisher Road means that the aquifer under the study area is more vulnerable than shown on provincial mapping. This reinforces the need for a detailed contaminant delineation program, surficial soil profiles at 1355 and 1345 Fisher Road, and follow-up remedial action plan to protect the water supply systems around the composting facilities.

Recent DRASTIC mapping has rated the aquifer vulnerability near the site as moderate to high (consistent with the patchy confining overburden), and we consider this higher vulnerability to better represent conditions for the aquifer underlying the study area.

The nearest surface water bodies to the site are all greater than 2 km from the site: Hutchinson Lake, Shawnigan Creek and Dougan Lake. However, we do not expect that surface runoff or any other potential environmental issues originating from the study area would directly or substantially affect these surface water bodies.

8.2 NEIGHBOURING WATER WELLS

The well records reporting a confining layer were not centered in one area rather they were distributed in an irregular way. A surficial soil profile at 1355 and 1345 Fisher Road that includes test pits, geotechnical boreholes, and analyses of grain-size distribution from a qualified geotechnical or materials technician would help determine the presence of a confining layer at these sites.

The stratigraphy on the neighbouring well logs supports an interpretation that the aquifer underlying the site has a higher vulnerability to surface contamination than what the geological and aquifer mapping indicates. However the distance to the static water level (about 55 m below ground at the site) means that this thick unsaturated zone should act to filter harmful microbiological pathogens from migrating to the aquifer.

8.3 HISTORICAL AND NEIGHBOURING LAND USE

Land use in the Cobble Hill area and in particular the area surrounding the site contains a variety of diverse land use activities. The area contains mixed residential, agricultural, commercial and light industrial activities all within a 1 km radius from the site. There are land uses in the area other than the composting facilities that have the potential to impact the nitrate concentration in the aquifer. In addition, it is possible that older water wells may not be constructed according to current good practices and lack surface seals. This could allow nitrates or other contaminants to preferentially migrate into the aquifer at those wells, from a variety of sources.

Former land use activities at the site have the potential to impact the groundwater in the area. If the anecdotal information regarding a chicken and/or quail farm that operated at the site in the 1990s near the on site well is found to be accurate. A follow-up investigation such as a Stage 1 Preliminary Site Investigation at 1355 and 1345 Fisher Road could help identify potential sources of nitrates at the sites and surrounding properties.

8.4 FISHER ROAD RECYCLING FACILITY

8.4.1 Indoor Operation

EBA was shown the complete leachate collection and recycling system installed at the site and is convinced that the operators recycle as much of the leachate as possible and that they are not deliberately disposing leachate in an unauthorized or environmentally damaging manner. On rare occasions when there is an excess amount of leachate, the operators contract a liquid waste contractor to pump out and dispose the excess leachate to an offsite facility. According to the operators this occurs "very rarely" especially since the processing and curing is conducted indoors and precipitation does not add to the amount of leachate generated while the material is indoors. The operator at 1355 Fisher Road did not have off site leachate disposal records available for EBA to verify this statement.

8.4.2 Outdoor Operation

Once the material leaves the curing station, it is reported to meet OMRR Class A compost standards. Once the material is classified as Class A it can be stored at the site and does not require further testing to ensure it meets Class A standards.

During periods of heavy precipitation, runoff from the stockpiles migrates to the site access road and the site becomes very muddy. Vehicles at the site track mud around the site. EBA and TCS identified that the finished compost can remain biologically active and has the potential to generate leachate when rained on. This contradicts FRRF's Operating Plan that states that the finished compost is biologically inactive. EBA's testing results of the Class A compost material indicated that the finished product is still very much biologically active. During the rainy season, precipitation falls on the stockpiles and increased runoff can contain potential chemicals of concern which could potentially migrate into the subsurface. This may be the reason that the historical nitrate concentrations are higher in the winter months when compared to the summer months.

However, the analytical results of the Class A compost reported nitrate concentrations that ranged from less than the laboratory detection limit to 20 mg/kg. Based on this current information, we interpret that nitrate that may leach from compost with these levels of nitrate concentrations and seep into the subsurface would not have sufficient concentration to be a major source of the higher nitrate concentrations observed in groundwater at the onsite well. The levels of ammonium and fecal coliforms in these compost samples compared to the nitrate levels and the C:N ratios suggests that the product stored outside appears to be unfinished and in a state of curing.

The ammonium concentrations ranged from 328 mg/kg to 1,530 mg/kg. Ammonium contains nitrogen which has the ability to convert to nitrate. TCS indicated that the time to convert ammonium to nitrate can range from two to six months in a pile of Class A compost. Ammonium has the ability to leach into the subsurface. Based on first principles, the movement of a negatively charged ion (i.e., anions) can also be attracting positively charged ions as well, therefore nitrates and other negatively charged ions are not the only ions that can leach. Ammonium can convert to nitrate down below the topsoil, but is not as likely to do so as in the topsoil where the microbes are located. The operators at 1355 Fisher Road can lower the likelihood of ammonium converting to nitrate in the piles of screened and unscreened compost by ensuring that they are processed and removed from the site within two months of exiting the processing buildings.

8.4.3 Recycling Drop-off Center

FRRF has constructed a recycling goods drop-off center in anticipation of a successful application to the CVRD. EBA inspected the new facility and reviewed the operating plan pertaining to this facility and has the following opinion regarding potential environmental concerns of the proposed operation.

The household garbage drop-off area is located in a covered structure with lidded bins. This should minimize odours. The Operating Plan states that the bins will be stored in closed bins at the end of each day to be transferred periodically to the CVRD Bings Creek facility for disposal. EBA considers this to be essential to prevent increased odours at the facility and to minimize the potential for vectors attracted to the site.

Other recyclables will be dropped off at other areas that are well marked and well separated in bins or compounds. Items such as asphalt shingles or construction debris will be dropped off in a covered bunker area. EBA observed no potential environmental concerns associated with the other areas of the recycling drop-off area. According to the acceptable incoming materials in the Operating Plan, we see little potential for materials dropped off at the recycling stations to spontaneously combust.

Storm drains on the concrete pad direct runoff to two oil/water separators located in the swale that fronts onto Fisher Road. A maintenance schedule must be put in place to pump out any hydrocarbons and sludge that may accumulate there on a regular basis. It is important that the separators are managed properly to prevent failures that could result in hydrocarbon-impacted wastewater from flowing into the swale and seeping into the subsurface.

8.5 CENTRAL LANDSCAPE SUPLIES LTD.

Central operates their composting facility completely outdoors. This facility does not accept biosolids and food waste feedstock. The curing compost is stockpiled on an asphalt pad and leachate and precipitation runoff is directed into an open leachate collection pit. Central indicates that they use the leachate to add moisture to the curing process. If the leachate pit

nears capacity during the winter months the operator indicated that he has a contingency plan to pump the excess leachate into a "honey wagon" for disposal or re-use at a later date.

EBA understands that there is no environmental monitoring that is conducted at this facility and has not seen any testing results of the leachate quality or testing results of the facility. The Class A compost sampled at 1345 Fisher Road on October 7, 2010 showed that the finished product contained a nitrate concentration of 14 mg/kg. The leachate in the leachate collection pit also contained a low level of nitrate (0.010 mg/L). As stated above, EBA finds it unlikely that nitrates emanating from the compost or from the collection pit at these concentrations would not be sufficient enough to be a major source of the higher nitrate concentrations observed in groundwater at the well at 1355 Fisher Road. Nitrate source identification would be one of the objectives of a delineation program for the area.

EBA notes that during the site visit to 1345 Fisher Road, compost-derived odours were detected by smell from this facility. FRRF and Central both contribute to the odour that has been identified in the area. TCS's report (Appendix E) addresses the odour issues at both facilities, describes what FRRF has completed to lessen some of the odours it generates, and makes several recommendations to further lessen the odour impact from both facilities.

8.6 ODOUR CONTROL SUMMARY

Neighbours of the facility have indicated that odour has been a chronic problem in the area since the composting facilities began operating in the neighbourhood. Although most people have indicated that the odours from the facilities have decreased within the last 18 months; that foul odours are frequently reported and remain a concern. Many of the neighbours have given up complaining as they feel that nothing can be done unless these operations shut down or relocated.

According to TCS:

"It is difficult to make conclusions about odour emission based on one expected visit in the summer, but we are able to make some clear recommendations based on observing the design and process, and information provided in the documentation, specifically the operations plans. The overwhelming response from the neighbouring residents was that there is ongoing concern, and a lack of trust in the operators.

With the written information given, specifically the Operating Plans, it is understandable that there may be some ongoing odour emissions from one or both facilities. It is my opinion that odour concerns would be less if the recommendations were followed, and it is possible to manage odour to a tolerable level."

EBA refers the reader to Appendix E pages 12 to 14 for TCS's recommendations for both facilities.

8.7 GROUNDWATER TESTING RESULTS

The well at 1355 Fisher Road and four neighbouring drinking water wells were tested for Canadian Drinking Water Quality parameters and other parameters that are indicators of decaying organic materials (BOD, COD, alkalinity, orthophosphate, and tannins and

lignins). The results of the groundwater analytical testing showed that there were nitrate, nitrate + nitrite, TDS, and total coliforms concentrations exceeding guidelines in groundwater at the onsite well. However, this is not a serious environmental concern at present for the users of this well, since water from this well is not used for drinking; it is only used for process water at the two composting facilities.

The parameters that were tested as organic decomposition leachate indicators were not elevated above guideline values in any of the wells. Some of the drinking water wells contained total coliforms. The source of these coliform bacteria is not currently identified, but total coliform can come from a wide variety of natural environmental sources at the ground surface.

Nitrate concentrations exceeding GCDWQ guidelines were only observed in one neighbouring well (1360 Fisher Road 140-foot well, south of 1355 Fisher Road). This would pose an environmental concern if this well is used for drinking water purposes. In general, due to the detrimental human health effects, treatment and prevention methods must be considered to protect groundwater aquifers from nitrate leaching and concentrations above GCDWQ levels

The CVRD requested that the potential human health effects of nitrate in drinking water be described here. The drinking water standard for nitrate is 10 mg/L, which is based on the human health risks due to nitrate consumption. Consumption of water with nitrate concentrations greater than 10 mg/L can result in methemoglobinemia, or "blue baby syndrome". The condition prohibits the blood cells of their ability to carry oxygen. Methemoglobinemia most often affects infants less than six months in age. Infants are more susceptible to nitrate compounds compared to adults because they process much less oxidizable haemoglobin than adults, so a greater percentage of their haemoglobin is converted to methemoglobin which greatly decreases the blood's ability to carry oxygen. Pregnant women should also avoid consuming water with elevated nitrate concentrations (Haller and others).

Nitrate compounds occur in groundwater as a result of specific land uses, the leaching of organic soils, and from precipitation. Sources of nitrogen from man's activities include agricultural fertilizers, animal wastes, and human wastes. Nitrogen is transformed between organic nitrogen (TKN), ammonium, nitrite, nitrate, and other nitrogen compounds depending on oxidation/reduction conditions, microbial activity, and plant utilization. Once nitrate enters an aquifer and is isolated from environments where de-nitrification and plant fixation occur, nitrate behaves more or less conservatively and can move long distances in aquifers (St. Johns River Water Management District).

The nitrate concentration at the 1355 Fisher Road well appears to be lower in the summer months compared to the winter and spring. The annual range of historical nitrate concentrations in the groundwater at the on site well has decreased in 2009 and 2010 compared to 2007 to 2008. EBA notes that prior to June, 2007 only one set of analytical data that was collected on this well was in April 2002 and the nitrate concentrations

measured in 2010 are lower than the concentration in 2002. However, the nitrate concentration measured at the 1360 Fisher Road 140-foot well has doubled since 2002.

Five of the six test results of the surface water sampling in the swale have shown nitrate concentrations that meet the drinking water guidelines. The initial sample collected in February, 2008 contained a nitrate concentration greater than 50 mg/L; however, all subsequent samples tested contained concentrations that ranged from 0.001 mg/L to 6 mg/L.

There is insufficient evidence at present to indicate that the source of nitrates in the neighbouring wells is the result of land use activities at 1355 and 1345 Fisher Road. The nitrate concentration at the onsite well is three to ten times higher than all neighbouring wells that were tested. However, the nitrate concentration in the Holland & Galliers Road well was higher than in the 1425 Galliers Road well despite the fact that the Holland & Galliers Road well is located approximately 230 m further from the site than the 1425 Galliers Road well. It is possible that there have been multiple nitrate sources affecting well water quality in this area.

8.8 COMPOST TESTING RESULTS

The results of the compost testing at 1355 Fisher Road indicated measurable concentrations of ammonium and fecal coliforms greater than BC OMRR standards, compared to low to high concentrations of nitrates and a low C:N ratio. Metals concentrations met BC OMRR criteria. EBA requested historical data and testing methodology of the compost product from 1355 Fisher Road but were not provided this information. The CVRD requested this information from MoE and according to MoE records, the compost produced at the site meets Class A criteria at some point, which means the material is considered compost and not a waste product. The process eliminates most harmful bacteria and pathogens at least to the point where it is considered safe for storage outside.

The fecal coliform concentration of the finished product did not meet BC OMRR standard; however it is understood that compost material can become biologically active once it leaves the facility and becomes exposed to the outside elements. The fecal coliforms concentrations that were measured are representative of the material brought into the facility. Biosolids, food waste, and animal manure breakdown can cause fecal coliforms. The indoor processing cures the material and kills harmful pathogens such as e. coli bacteria, which will not form once the material leaves the facility. Typical fecal coliforms counts of human waste can be up to 13 million bacteria/gram, while typical pig and cow feces have coliform number of 3.3 million/gram and 250,000 bacteria/gram, respectively (Oasis Design website, 2010).

According to the organic gardening website the ideal ratio of carbon to nitrogen in a compost pile is 30:1 (Organic Gardening website, 2010); however the ideal C:N ratio for compost will vary depending on the material used to create the compost. EBA was not provided any information on the desired C:N ratio of the finished product at 1355 Fisher Road.

EBA requested TCS to comment on the C:N ratio, fecal coliform, ammonium and nitrate concentrations of the compost samples. According TCS, the total organic carbon and total nitrogen percentages of the compost material are within the expected range for the materials brought this site; however the C:N ratio of the unscreened compost is low. The ammonium and fecal coliforms are elevated, while the nitrate and the C:N ratios are lower than expected. This suggests that the product stored outside appears to be unfinished and in a state of curing. Regarding elevated fecal coliform concentrations, the in-vessel processing typically kills and sterilizes the compost with high temperature and processing times although this is not always an exact science with temperature variation within compost piles. Fecal coliform concentrations from compost samples typically meet the BC OMRR standards prior to the compost exiting the processing buildings. Fecal coliforms present in the finished piles outside could also be the result of re-growth of non-pathogen microorganisms. If so, further curing or turning of the material could lower fecal coliform concentrations within compost stockpiles.

The analytical results of the compost samples at 1355 and 1345 Fisher Road and the leachate collection pit at 1345 Fisher Road do not indicate that the stockpiles of Class A compost and the leachate collection pit are the main contributing sources of nitrates to the on-site groundwater well.

The operators at 1355 Fisher Road have made considerable improvements to the processing of the compost compared to the original operators; however the data show only marginal decrease in nitrate concentrations at this well over time. We do not have enough information at present to determine the nature or extent of nitrate distribution in groundwater in this area, or to attribute specific land uses or historical activities as the sources of nitrates measured in wells. A site characterization and nitrate delineation program would be needed to address these questions.

8.9 GROUNDWATER AND SURFACE WATER MONITORING PROGRAM

The groundwater monitoring program at 1355 Fisher Road is conducted quarterly by Goode Environmental Services (an independent contractor approved by CVRD) and tests for pH, nitrate, total nitrogen BOD and fecal coliforms. On occasion ammonia and total phosphorous are tested. The frequency of monitoring events at the site as mandated in the FRRF Operating Plan is adequate to assess the groundwater conditions on a seasonal basis. However in our opinion the testing program should include a complete drinking water package and, once the new recycling and waste material drop off facility is operating, should include petroleum hydrocarbon indicator parameters for samples where released hydrocarbons may be present. The samples should continue to be collected by an independent environmental consulting company and tested by a CAEL-accredited lab to ensure that the samples are collected, handled and tested appropriately.

9.0 CONCLUSIONS AND RECOMMENDATIONS

EBA's review of potential environmental receptors, geology maps, aquifer maps and neighbouring well records identified that the site is situated in an area where the dominant potential environmental receptor from land use activities at the site is the aquifer that is used for domestic and drinking water purposes, commercial agricultural, and irrigation supply. There are no surface water receptors likely to be directly or substantially affected within 2 km of the site.

Surficial geology and aquifer maps indicated that the area is covered by a blanket of low permeability glacial till overlying sand and gravel deposits. EBA's review of well record stratigraphy, aquifer vulnerability maps, and a visual inspection of surficial geology at the nearby gravel pit shows that the site is situated in an area where the glacial till is very thin or absent in some areas, which contradicts surficial geology mapping and existing provincial designation of aquifer vulnerability. A recent aquifer vulnerability determination using the DRASTIC assessment method has rated the site to be moderate to highly vulnerable to surface land use activities, which we consider is more representative for this area.

EBA has seen the leachate collection and recycling system that is in place at 1355 Fisher Road during the compost curing process. The operation at 1355 Fisher Road requires extra moisture to expedite the curing process and based on EBA observations and understanding at the time of our visit does not dispose of excess leachate into the ground or in an environmentally harmful manner.

Once compost is finished curing and meets OMRR standards for Class A compost it is stored outside on native ground and may be screened on site to remove garbage and other impurities. The final screened compost is stored on a concrete pad onsite. The final product may still be biologically active and has the potential to generate leachate when rained upon. EBA's test results of the Class A compost at 1355 Fisher Road showed elevated concentrations of fecal coliform that exceeded the BC OMRR standards for Class A compost. Measurable concentrations of ammonium were also present although there is no standard for ammonium listed in OMRR. The compost samples from 1355 and 1345 Fisher Road contained nitrate concentrations that ranged from less than the laboratory detection limit to 20 mg/kg. We interpret that nitrate that may leach from compost with these levels of nitrate concentrations and seep into the subsurface would not have sufficient concentration to be a major source of the higher nitrate concentrations observed in groundwater at the onsite well. The levels of ammonium and fecal coliforms in these compost samples compared to the nitrate levels and the C:N ratios suggests that the product stored outside appears to be unfinished and in a state of curing.

Ammonium contains nitrogen which has the ability to convert to nitrate. The time to convert ammonium to nitrate can range from two to six months in a pile of Class A compost. Ammonium has the ability to leach into the subsurface and can convert to nitrate down below the topsoil, but is not as likely to do so as in the topsoil where nitrogen fixing microbes are found. The operators at 1355 Fisher Road can lower the likelihood of

ammonium converting to nitrate in the piles of screened and unscreened compost by ensuring that they are processed and removed from the site within two months of exiting the processing buildings

The nitrate concentration in the groundwater at the 1355 Fisher Road well appears to fluctuate seasonally with higher concentrations in the winter months compared to the summer months. Prior to FRR owning the property, a nitrate concentration greater than the drinking water guideline was measured in this well. The historical nitrate concentrations are not on an increasing trend and the nitrate concentrations measured in August 2010 were slightly lower than concentrations measured in 2002. Nitrate concentrations measured at the swale have been lower than GCDWQ guideline levels for drinking water since March 2008.

Because there is only one groundwater monitoring well at the site it is not possible to determine all potential sources, nature or extent of the nitrate that is impacting the onsite groundwater well and groundwater in the area. Based on the irregular distribution of nitrate compounds detected in area wells and the varied historical land uses, it is possible there are multiple sources of nitrates affecting groundwater in the area.

A Stage 1 PSI is recommended for 1355 and 1345 Fisher Road to determine historical land use activities at these sites and surrounding properties. The investigation will identify areas of potential environmental concern and potential contaminants of concern. The next stages of the follow-up investigation should include a site characterization, surficial soil profile and nitrate delineation program that extends well beyond the lot boundaries of 1355 and 1345 Fisher Road. Such a program would address potential source areas, the existence, fate and transport of a nitrate plume in the area, and the effects of well construction on nitrate concentrations detected in groundwater samples. An initial element of the delineation program will be to document and verify all reported anecdotal historical land use practices at the 1355 Fisher Road and surrounding areas to identify potential sources of nitrates in groundwater in the area. The site characterization should include a well condition survey to see if well construction or nitrogen forming bacteria in the well is the source of the nitrates as opposed to a plume.

We consider that the frequency of monitoring events at the site as mandated in the FRRF operating plan is adequate to assess the groundwater conditions on a seasonal basis. However, we recommend that the testing program should include a complete drinking water package and petroleum hydrocarbon indicator parameters (for sample points where hydrocarbon releases are possible) once the recycling and waste material drop-off facility is in operation. The samples should continue to be collected by an independent environmental consulting company and tested at a Canadian Association for Environmental Analytical Laboratories (CAEL) accredited laboratory to ensure that the samples are collected, handled and tested appropriately. If water is present in the swale, it should be sampled at least twice a year even if it does not coincide with the scheduled dates of the quarterly monitoring program.

TCS's odour control and leachate analysis identified that neighbours have indicated that odour has been a chronic problem in the area since the composting facilities began operating in the neighbourhood. Although most people have indicated that the odours from the facilities have decreased within the last 18 months; that foul odours are frequently reported and remain a concern. TCS believes that if the recommendations in their report and the operating plans are implemented, then odours at the site can be reduced to a tolerable level.

At 1355 Fisher Road much of the process is indoors and most inside air is processed through three biofilters, there is little odour concern about this part of the operation. The finished product does produce an organic odour and is still biologically active especially after it is rained upon.

At 1345 Fisher Road, TCS recommended forced aeration to keep the windrows aerobic and reduce the turning requirement, redesign and cover the windrows to prevent excess moisture from entering the composting material especially during the winter months and cover the leachate collection pit. Central's Operating Plan should provide clearer instructions on what to do with the leachate generated at the site (how to recycle and manage it especially during the wet winter months).

To improve practices, FRRF should continue paving sections of the lot where the unscreened Class A compost is stored and try to direct runoff from the property into a constructed impermeable pond. This water can then be redirected into the onsite leachate collection system and used for the compost curing process.

Based on our understanding of the proposed operation, the proposed new recycling and waste materials drop-off centre should not increase the amount of leachate generated at the site. Runoff from the drop-off facility will be piped to oil/water separators. EBA recommends that a maintenance and inspection schedule should be put in place to pump out hydrocarbons and sludge on a regular basis. It is important that the separators are managed properly to prevent failures that could result in hydrocarbon-impacted wastewater from flowing into the swale and seeping into the subsurface.

10.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Cowichan Valley Regional District and its agents. EBA does not accept any responsibility for the accuracy of any data, any analysis or any recommendation contained or referenced in this report when the report is used or relied upon by any party other than Cowichan Valley Regional District, or for any project other than for the purpose at the Property that is identified herein. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement and EBA's General Conditions the latter of which is provided in Appendix F of this report.

11.0 CLOSURE

We trust the information in this report is sufficient for your present requirements. If you have questions or require additional information, please call Michael Gallo at 250-756-2256.

Respectfully submitted;

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TABLES

TABLE 1: Analytical Results - 1355 Fisher Road

		1355 Fisher Road Well												Canadian Drinking Water Quality Guidelines [1]	
		4-Apr-02	27-Jun-07	17-Oct-07	20-Feb-08	7-May-08	5-Aug-08	5-Nov-08	20-Feb-09	6-Aug-09	19-Nov-09	18-Mar-10	28-Jun-10	11-Aug-10	Potability at Point of Use [2]	Aesthetic Objective
Physical Parameters	**Units**															
Conductivity Lab	uS/cm	725	-	-	-	-	-	-	-	-	-	-	-	786	-	-
pH Lab	pH units	-	7.43	7.89	-	7.89	7.30	7.25	7.05	7.34	7.04	7.16	7.09	7.3	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	**297**	-	80-100 [3]
Hardness (Total)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	**310**	-	80-100 [3]
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	**563**	-	500
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	-	-	< 0.1	-	-
True Color	Col. Units	-	-	-	-	-	-	-	-	-	-	-	-	5	-	15
Misc. Inorganics																
Total Alkalinity	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	65	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	79	-	-
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-
Nutrients																
Ammonia (N)	mg/L	< 0.005	0.00693	<	0.0345	0.323	0.0953	<	<	<	<	<	0.0292	0.005	-	-
Total Phosphorous	mg/L	-	<	<	0.093	<	<	0.114	0.171	92.0	<	<	<	-	-	-
Dissolved Orthophosphate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	0.036	-	-
Anions																
Dissolved Sulphate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	43	-	500
Dissolved Chloride	mg/L	46.2	-	-	-	-	-	-	-	-	-	-	-	36	-	250
Fluoride	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	0.02	1.5	-
Nitrate (N)	mg/L	**56.7**	**49.3**	**63.9**	**61.1**	**72.2**	**65.6**	**71.7**	**62.7**	**38.8**	**50.5**	**54.8**	**52.5**	**45.9**	10	-
Nitrite (N)	mg/L	< 0.002	-	-	-	-	-	-	-	-	-	-	-	< 0.002	1	-
Nitrate + Nitrite	mg/L	**56.7**	-	-	-	-	-	-	-	-	-	-	-	**47**	10	-
Total Kjeldahl Nitrogen (Calc)	mg/L	< 0.02	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-
Total Nitrogen	mg/L	48.6	51.1	68.8	-	72.7	69.1	71.7	-	-	63.3	72.6	66.2	45	-	-
Miscellaneous Parameters																
Biochemical Oxygen Demand	mg/L	-	<	<	7.6	1.7	4.62	2.18	<	<	4.49	5.29	3.75	< 5	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
Tannins and Lignins	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-
Microbiological Parameters																
E. Coli	MPN/100ml	-	-	-	-	-	-	-	-	-	-	-	-	< 1	0	-
Total Coliforms	MPN/100ml	< 1	-	-	-	-	-	-	-	-	-	-	-	**120**	0	-
Fecal Coliforms	CFU/100ml	< 1	0	0	0	**49**	0	0	0	0	0	0	0	< 1	0	-

Bold - Concentration exceeds the aesthetic objective as set by the Guidelines for Canadian Drinking Water Quality.
Bold - Concentration exceeds the Guidelines for Canadian Drinking Water Quality for potability.

Notes:

"-" = Not analyzed or no guideline/criteria.
"<" = Less than the laboratory method detection limit

1. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, *Guidelines for Canadian Drinking Water Quality,* updated May, 2008.
2. Health criteria at point of use/distribution.

TABLE 1 (cont'd): Analytical Results - 1355 Fisher Road				
		1355 Fisher Road Well	**Canadian Drinking Water Quality Guidelines [1]**	
		11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**			
Conductivity Lab	uS/cm	786	-	-
pH Lab	pH units	7.3	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	**297**	-	80-100 [3]
Hardness (Total)	mg/L	**310**	-	80-100 [3]
Dissolved Metals				
Aluminum	mg/L	< 0.003	-	-
Antimony	mg/L	< 0.0005	0.006	-
Arsenic	mg/L	0.0003	0.01	-
Barium	mg/L	0.013	1	-
Boron	mg/L	< 0.05	5	-
Cadmium	mg/L	0.00004	0.005	-
Calcium	mg/L	11.4		-
Chromium	mg/L	0.001	0.05	-
Copper	mg/L	0.0087	-	1
Iron	mg/L	0.034	-	0.3
Lead	mg/L	0.0004	0.010	-
Magnesium	mg/L	6.43	-	-
Manganese	mg/L	< 0.001	-	0.05
Mercury	mg/L	< 0.00002	0.001	-
Nickel	mg/L	0.008	-	-
Potassium	mg/L	0.58	-	-
Selenium	mg/L	< 0.0001	0.01	-
Sodium	mg/L	5.13	-	200
Sulphur	mg/L	18	-	-
Uranium	mg/L	< 0.0001	0.02	-
Zinc	mg/L	0.007	-	5
Total Metals				
Aluminum	µg/L	< 3	-	-
Antimony	µg/L	< 0.5	6	-
Arsenic	µg/L	< 0.1	10	-
Barium	µg/L	13	1,000	-
Boron	µg/L	< 50	5,000	-
Cadmium	µg/L	0.04	5	-
Chromium	µg/L	1	50	-
Copper	µg/L	9.0	-	1,000
Iron	µg/L	37	-	300
Lead	µg/L	0.4	10	-
Magnesium	mg/L	31.2	-	-
Manganese	µg/L	< 1	-	50
Mercury	µg/L	< 0.02	1	-
Selenium	µg/L	< 0.1	10	-
Sodium	mg/L	14.0	-	200
Uranium	µg/L	< 0.1	20	-
Zinc	µg/L	6	-	5,000

Bold - Concentration exceeds the aesthetic objective as set by the Guidelines for Canadian Drinking Water Quality.
Bold - Concentration exceeds the Guidelines for Canadian Drinking Water Quality for potability.

Notes:

"-" = Not analyzed or no guideline/criteria.
"<" = Less than the laboratory method detection limit

1. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, Guidelines for Canadian Drinking Water Quality, updated May, 2008.
2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than

TABLE 1 (cont'd): Analytical Results - 1355 Fisher Road

		1355 Fisher Road Swale						Canadian Drinking Water Quality Guidelines [1]	
		20-Feb-08	12-Mar-08	10-Apr-08	23-Jan-09	19-Nov-09	18-Mar-10	Potability at Point of Use [2]	Aesthetic Objective
Physical Parameters	**Units**								
Conductivity Lab	uS/cm	-	-	-	-	-	-	-	-
pH Lab	pH units	7.33	7.24	7.95	-	7.44	7.53	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	-	-	-	-	-	-	-	80-100 [3]
Hardness (Total)	mg/L	-	-	-	-	-	-	-	80-100 [3]
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	500
Turbidity	NTU	-	-	-	-	-	-	-	-
True Color	Col. Units	-	-	-	-	-	-	-	15
Misc. Inorganics									
Total Alkalinity	mg/L	-	-	-	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	-
Nutrients									
Ammonia (N)	mg/L	3.95	0.00421	0.183	21.7	45.2	3.52	-	-
Total Phosphorous	mg/L	0.786	-	1.48	2.52	4540	386	-	-
Dissolved Orthophosphate	mg/L	-	-	-	-	-	-	-	-
Anions									
Dissolved Sulphate	mg/L	-	-	-	-	-	-	-	500
Dissolved Chloride	mg/L	-	-	-	-	-	-	-	250
Fluoride	mg/L	-	-	-	-	-	-	1.5	-
Nitrate (N)	mg/L	**50.3**	0.471	0.0529	6	0.001	3.72	10	-
Nitrite (N)	mg/L	-	-	-	-	-	-	1	-
Nitrate + Nitrite	mg/L	-	-	-	-	-	-	10	-
Total Kjeldahl Nitrogen (Calc)	mg/L	-	-	-	-	-	-	-	-
Total Nitrogen	mg/L	54.2	14.3	2.74	31	49.1	22	-	-
Miscellaneous Parameters									
Biochemical Oxygen Demand	mg/L	63	37.8	9.5	40.8	810	69.2	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-
Tannins and Lignins	mg/L	-	-	-	-	-	-	-	-
Microbiological Parameters									
E. Coli	MPN/100ml	-	-	-	-	-	-	0	-
Total Coliforms	MPN/100ml	-	-	-	-	-	-	0	-
Fecal Coliforms	CFU/100ml	**148**	**600**	**14**	**40,000**	**80,000**	**5,800**	0	-

Bold - Concentration exceeds the aesthetic objective as set by the Guidelines for Canadian Drinking Water Quality.
Bold - Concentration exceeds the Guidelines for Canadian Drinking Water Quality for potability.

Notes:

"-" = Not analyzed or no guideline/criteria.
"<" = Less than the laboratory method detection limit

1. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, *Guidelines for Canadian Drinking Water Quality* , updated May, 2008.
2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than 200 mg/L are considered poor but can be tolerated; those in excess of 500 mg/L are normally considered unacceptable.

TABLE 2: Analytical Results - 1360 Fisher Road 140-foot Well					
		1360 Fisher Road 140-foot Well		**Canadian Drinking Water Quality Guidelines [1]**	
		4-Apr-02	11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**				
Conductivity Lab	uS/cm	306	445	-	-
pH Lab	pH units	-	7.1	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	-	**166**	-	80-100 [3]
Hardness (Total)	mg/L	-	**172**	-	80-100 [3]
Total Dissolved Solids	mg/L	-	283	-	500
Turbidity	NTU	-	< 0.1	-	-
True Color	Col. Units	-	5	-	15
Misc. Inorganics					
Total Alkalinity	mg/L	-	78	-	-
Bicarbonate (HCO3)	mg/L	-	95	-	-
Carbonate (CO3)	mg/L	-	< 2	-	-
Hydroxide (OH)	mg/L	-	< 2	-	-
Nutrients					
Ammonia (N)	mg/L	< 0.005	< 0.005	-	-
Dissolved Orthophosphate	mg/L	-	0.034	-	-
Anions					
Dissolved Sulphate	mg/L	-	29	-	500
Dissolved Chloride	mg/L	24.8	20	-	250
Fluoride	mg/L	-	0.02	1.5	-
Nitrate (N)	mg/L	8.69	**17.1**	10	-
Nitrite (N)	mg/L	< 0.002	< 0.002	1	-
Nitrate + Nitrite	mg/L	8.69	**16.6**	10	-
Total Kjeldahl Nitrogen (Calc)	mg/L	< 0.02	< 0.2	-	-
Total Nitrogen	mg/L	8.07	15.8	-	-
Miscellaneous Parameters					
Biochemical Oxygen Demand	mg/L	-	< 5	-	-
Chemical Oxygen Demand	mg/L	-	0	-	-
Tannins and Lignins	mg/L	-	< 0.1	-	-
Microbiological Parameters					
E. Coli	MPN/100ml	-	< 1	0	-
Total Coliforms	MPN/100ml	-	< 1	0	-
Fecal Coliforms	CFU/100ml	-	< 1	0	-

Bold - Concentration exceeds the aesthetic objective as set by the Guidelines for Canadian Drinking Water Quality.
Bold - Concentration exceeds the Guidelines for Canadian Drinking Water Quality for potability.

Notes:

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2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than 200 mg/L are

TABLE 2 (cont'd): Analytical Results - Gamboa Farms 140-foot Well				
		1360 Fisher Rd. 140-foot Well	**Canadian Drinking Water Quality Guidelines [1]**	
		11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**			
Conductivity Lab	uS/cm	445	-	-
pH Lab	pH units	7.1	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	**166**		80-100 [3]
Hardness (Total)	mg/L	**172**		80-100 [3]
Dissolved Metals				
Aluminum	mg/L	< 0.003	-	-
Antimony	mg/L	< 0.0005	0.006	-
Arsenic	mg/L	0.0001	0.01	-
Barium	mg/L	0.008	1	-
Boron	mg/L	< 0.05	5	-
Cadmium	mg/L	0.00001	0.005	-
Calcium	mg/L	11.4		-
Chromium	mg/L	< 0.001	0.05	-
Copper	mg/L	0.0559	-	1
Iron	mg/L	0.017	-	0.3
Lead	mg/L	< 0.0002	0.010	-
Magnesium	mg/L	6.43	-	-
Manganese	mg/L	< 0.001	-	0.05
Mercury	mg/L	< 0.00002	0.001	-
Nickel	mg/L	0.003	-	-
Potassium	mg/L	0.58	-	-
Selenium	mg/L	< 0.0001	0.01	-
Sodium	mg/L	5.13	-	200
Sulphur	mg/L	11	-	-
Uranium	mg/L	< 0.0001	0.02	-
Zinc	mg/L	0.006	-	5
Total Metals				
Aluminum	µg/L	< 3	-	-
Antimony	µg/L	< 0.5	6	-
Arsenic	µg/L	0.1	10	-
Barium	µg/L	8	1,000	-
Boron	µg/L	< 50	5,000	-
Cadmium	µg/L	0.01	5	-
Chromium	µg/L	< 1	50	-
Copper	µg/L	56.7	-	1,000
Iron	µg/L	17	-	300
Lead	µg/L	< 0.2	10	-
Magnesium	mg/L	16.8	-	-
Manganese	µg/L	< 1	-	50
Mercury	µg/L	< 0.02	1	-
Selenium	µg/L	< 0.1	10	-
Sodium	mg/L	10.3	-	200
Uranium	µg/L	< 0.1	20	-
Zinc	µg/L	< 5	-	5,000

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Notes:

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2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than 200 mg/L are considered poor but can be tolerated; those in excess of 500 mg/L are normally considered unacceptable.

TABLE 3: Analytical Results - 1425 Galliers Road					
		1425 Galliers Road Well		**Canadian Drinking Water Quality Guidelines [1]**	
		4-Apr-02	11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**				
Conductivity Lab	uS/cm	247	339	-	-
pH Lab	pH units	-	7.4	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	-	**134**	-	80-100 [3]
Hardness (Total)	mg/L	-	**141**	-	80-100 [3]
Total Dissolved Solids	mg/L	-	194	-	500
Turbidity	NTU	-	1.2	-	-
True Color	Col. Units	-	5	-	15
Misc. Inorganics					
Total Alkalinity	mg/L	-	114	-	-
Bicarbonate (HCO3)	mg/L	-	139	-	-
Carbonate (CO3)	mg/L	-	< 2	-	-
Hydroxide (OH)	mg/L	-	< 2	-	-
Nutrients					
Ammonia (N)	mg/L	< 0.005	< 0.005	-	-
Dissolved Orthophosphate	mg/L	-	0.034	-	-
Anions					
Dissolved Sulphate	mg/L	-	5.9	-	500
Dissolved Chloride	mg/L	10.3	18	-	250
Fluoride	mg/L	-	0.02	1.5	-
Nitrate (N)	mg/L	1.79	2.57	10	-
Nitrite (N)	mg/L	< 0.002	< 0.002	1	-
Nitrate + Nitrite	mg/L	1.79	2.6	10	-
Total Kjeldahl Nitrogen (Calc)	mg/L	0.08	< 0.2	-	-
Total Nitrogen	mg/L	1.87	2.6	-	-
Miscellaneous Parameters					
Biochemical Oxygen Demand	mg/L	-	< 5	-	-
Chemical Oxygen Demand	mg/L	-	0	-	-
Tannins and Lignins	mg/L	-	< 0.1	-	-
Microbiological Parameters					
E. Coli	MPN/100ml	-	< 1	0	-
Total Coliforms	MPN/100ml	-	**40**	0	-
Fecal Coliforms	CFU/100ml	-	< 1	0	-

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2. Health criteria at point of use/distribution.

TABLE 3 (cont'd): Analytical Results - 1425 Galliers Road				
		1425 Galliers Road Well	**Canadian Drinking Water Quality Guidelines [1]**	
		11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**			
Conductivity Lab	uS/cm	339	-	-
pH Lab	pH units	7.4	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	**134**		80-100 [3]
Hardness (Total)	mg/L	**141**		80-100 [3]
Dissolved Metals				
Aluminum	mg/L	< 0.003	-	-
Antimony	mg/L	< 0.0005	0.006	-
Arsenic	mg/L	0.0002	0.01	-
Barium	mg/L	0.008	1	-
Boron	mg/L	< 0.05	5	-
Cadmium	mg/L	0.00001	0.005	-
Calcium	mg/L	11.4		-
Chromium	mg/L	0.002	0.05	-
Copper	mg/L	0.0057	-	1
Iron	mg/L	0.007	-	0.3
Lead	mg/L	< 0.0002	0.010	-
Magnesium	mg/L	6.43	-	-
Manganese	mg/L	< 0.001	-	0.05
Mercury	mg/L	< 0.00002	0.001	-
Nickel	mg/L	< 0.001	-	-
Potassium	mg/L	0.58	-	-
Selenium	mg/L	< 0.0001	0.01	-
Sodium	mg/L	5.13	-	200
Sulphur	mg/L	< 3	-	-
Uranium	mg/L	0.0002	0.02	-
Zinc	mg/L	0.125	-	5
Total Metals				
Aluminum	µg/L	< 3	-	-
Antimony	µg/L	< 0.5	6	-
Arsenic	µg/L	0.2	10	-
Barium	µg/L	7	1,000	-
Boron	µg/L	< 50	5,000	-
Cadmium	µg/L	0.01	5	-
Chromium	µg/L	2	50	-
Copper	µg/L	7.9	-	1,000
Iron	µg/L	124	-	300
Lead	µg/L	0.8	10	-
Magnesium	mg/L	14.9	-	-
Manganese	µg/L	1	-	50
Mercury	µg/L	< 0.02	1	-
Selenium	µg/L	< 0.1	10	-
Sodium	mg/L	8.57	-	200
Uranium	µg/L	0.2	20	-
Zinc	µg/L	176	-	5,000

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2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than 200 mg/L are considered poor but can be tolerated; those in excess of 500 mg/L are normally considered unacceptable.

TABLE 4: Analytical Results - Holland and Galliers Road											
		Holland & Galliers Road Well								Canadian Drinking Water Quality Guidelines [1]	
		4-Apr-02	17-Mar-08	16-Jun-08	8-Jan-09	26-May-10	14-Apr-10	21-Jun-10	11-Aug-10	Potability at Point of Use [2]	Aesthetic Objective
Physical Parameters	**Units**										
Conductivity Lab	uS/cm	272	-	-	-	-	-	-	352	-	-
pH Lab	pH units	-	-	-	-	-	-	-	7.9	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	-	-	-	-	-	-	-	**143**	-	80-100 [3]
Hardness (Total)	mg/L	-	-	-	-	-	-	-	**152**	-	80-100 [3]
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	217	-	500
Turbidity	NTU	-	-	-	-	-	-	-	0.4	-	-
True Color	Col. Units	-	-	-	-	-	-	-	5	-	15
Misc. Inorganics											
Total Alkalinity	mg/L	-	-	-	-	-	-	-	112	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	137	-	-
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	< 2	-	-
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	< 2	-	-
Nutrients											
Ammonia (N)	mg/L	< 0.005	-	-	-	-	-	-	< 0.005	-	-
Dissolved Orthophosphate	mg/L	-	-	-	-	-	-	-	0.030	-	-
Anions											
Dissolved Sulphate	mg/L	-	-	-	-	-	-	-	9.2	-	500
Dissolved Chloride	mg/L	16.7	-	-	-	-	-	-	19	-	250
Fluoride	mg/L	-	-	-	-	-	-	-	0.02	1.5	-
Nitrate (N)	mg/L	4.16	3.63	3.5	-	-	1.98	4.7	3.67	10	-
Nitrite (N)	mg/L	< 0.002	< 0.002	0.0001	-	-	< 0.002	< 0.002	< 0.002	1	-
Nitrate + Nitrite	mg/L	4.16	-	-	-	-	-	-	3.1	10	-
Total Kjeldahl Nitrogen (Calc)	mg/L	< 0.02	0.032	-	-	-	26.7	0.16	0.3	-	-
Total Nitrogen	mg/L	3.67	3.66	-	-	-	28.3	4.87	3.4	-	-
Miscellaneous Parameters											
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	< 5	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	0	-	-
Tannins and Lignins	mg/L	-	-	-	-	-	-	-	0.2	-	-
Microbiological Parameters											
E. Coli	MPN/100ml	-	0	0	0	0	-	-	< 1	0	-
Total Coliforms	MPN/100ml	-	0	0	0	0	-	-	< 1	0	-
Fecal Coliforms	CFU/100ml	-	0	0	0	0	-	-	< 1	0	-

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2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than 200 mg/L are considered poor but can be tolerated; those in excess of 500 mg/L are normally considered unacceptable.

TABLE 4 (cont'd): Analytical Results - Holland and Galliers Road				
		Holland & Galliers Road Well	**Canadian Drinking Water Quality Guidelines [1]**	
		11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**			
Conductivity Lab	uS/cm	352	-	-
pH Lab	pH units	7.9	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	**143**	-	80-100 [3]
Hardness (Total)	mg/L	**152**	-	80-100 [3]
Dissolved Metals				
Aluminum	mg/L	< 0.003	-	-
Antimony	mg/L	< 0.0005	0.006	-
Arsenic	mg/L	0.0001	0.01	-
Barium	mg/L	0.004	1	-
Boron	mg/L	< 0.05	5	-
Cadmium	mg/L	< 0.00001	0.005	-
Calcium	mg/L	11.4		-
Chromium	mg/L	< 0.001	0.05	-
Copper	mg/L	0.0002	-	1
Iron	mg/L	< 0.005	-	0.3
Lead	mg/L	< 0.0002	0.010	-
Magnesium	mg/L	6.43	-	-
Manganese	mg/L	< 0.001	-	0.05
Mercury	mg/L	< 0.00002	0.001	-
Nickel	mg/L	< 0.001	-	-
Potassium	mg/L	0.58	-	-
Selenium	mg/L	0.0001	0.01	-
Sodium	mg/L	5.13	-	200
Sulphur	mg/L	3	-	-
Uranium	mg/L	< 0.0001	0.02	-
Zinc	mg/L	0.011	-	5
Total Metals				
Aluminum	µg/L	< 3	-	-
Antimony	µg/L	< 0.5	6	-
Arsenic	µg/L	0.1	10	-
Barium	µg/L	4	1,000	-
Boron	µg/L	< 50	5,000	-
Cadmium	µg/L	< 0.01	5	-
Chromium	µg/L	< 1	50	-
Copper	µg/L	< 0.2	-	1,000
Iron	µg/L	19	-	300
Lead	µg/L	< 0.2	10	-
Magnesium	mg/L	6.90	-	-
Manganese	µg/L	< 1	-	50
Mercury	µg/L	< 0.02	1	-
Selenium	µg/L	0.1	10	-
Sodium	mg/L	6.42	-	200
Uranium	µg/L	< 0.1	20	-
Zinc	µg/L	15	-	5,000

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2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than 200 mg/L are considered poor but can be tolerated; those in excess of 500 mg/L are normally considered unacceptable.

TABLE 5: Analytical Results - 1310 Fisher Road				
		1310 Fisher Road Well	**Canadian Drinking Water Quality Guidelines [1]**	
		11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**			
Conductivity Lab	uS/cm	149	-	-
pH Lab	pH units	7.6	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	54.9	-	80-100 [3]
Hardness (Total)	mg/L	56.8	-	80-100 [3]
Total Dissolved Solids	mg/L	105	-	500
Turbidity	NTU	0.2	-	-
True Color	Col. Units	5	-	15
Misc. Inorganics				
Total Alkalinity	mg/L	60	-	-
Bicarbonate (HCO3)	mg/L	73	-	-
Carbonate (CO3)	mg/L	< 2	-	-
Hydroxide (OH)	mg/L	< 2	-	-
Nutrients				
Ammonia (N)	mg/L	< 0.005	-	-
Dissolved Orthophosphate	mg/L	0.036	-	-
Anions				
Dissolved Sulphate	mg/L	1	-	500
Dissolved Chloride	mg/L	3.9	-	250
Fluoride	mg/L	0.03	1.5	-
Nitrate (N)	mg/L	0.13	10	-
Nitrite (N)	mg/L	< 0.002	1	-
Nitrate + Nitrite	mg/L	0.07	10	-
Total Kjeldahl Nitrogen (Calc)	mg/L	0.04	-	-
Total Nitrogen	mg/L	0.11	-	-
Miscellaneous Parameters				
Biochemical Oxygen Demand	mg/L	< 5	-	-
Chemical Oxygen Demand	mg/L	0	-	-
Tannins and Lignins	mg/L	< 0.1	-	-
Microbiological Parameters				
E. Coli	MPN/100ml	< 1	0	-
Total Coliforms	MPN/100ml	**2**	0	-
Fecal Coliforms	CFU/100ml	< 1	0	-

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2. Health criteria at point of use/distribution.
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TABLE 5 (cont'd): Analytical Results - 1310 Fisher Road				
		1310 Fisher Road Well	**Canadian Drinking Water Quality Guidelines [1]**	
		11-Aug-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Physical Parameters	**Units**			
Conductivity Lab	uS/cm	149	-	-
pH Lab	pH units	7.6	-	6.5 - 8.5
Hardness (Dissolved)	mg/L	54.9	-	80-100 [3]
Hardness (Total)	mg/L	56.8	-	80-100 [3]
Dissolved Metals				
Aluminum	mg/L	0.004	-	-
Antimony	mg/L	< 0.0005	0.006	-
Arsenic	mg/L	0.0004	0.01	-
Barium	mg/L	0.002	1	-
Boron	mg/L	< 0.05	5	-
Cadmium	mg/L	< 0.00001	0.005	-
Calcium	mg/L	11.4		-
Chromium	mg/L	0.003	0.05	-
Copper	mg/L	0.0027	-	1
Iron	mg/L	0.022	-	0.3
Lead	mg/L	< 0.0002	0.010	-
Magnesium	mg/L	6.43	-	-
Manganese	mg/L	0.001	-	0.05
Mercury	mg/L	< 0.00002	0.001	-
Nickel	mg/L	< 0.001	-	-
Potassium	mg/L	0.58	-	-
Selenium	mg/L	< 0.0001	0.01	-
Sodium	mg/L	5.13	-	200
Sulphur	mg/L	< 3	-	-
Uranium	mg/L	< 0.0001	0.02	-
Zinc	mg/L	0.054	-	5
Total Metals				
Aluminum	µg/L	< 3	-	-
Antimony	µg/L	< 0.5	6	-
Arsenic	µg/L	0.4	10	-
Barium	µg/L	2	1,000	-
Boron	µg/L	< 50	5,000	-
Cadmium	µg/L	< 0.01	5	-
Chromium	µg/L	3	50	-
Copper	µg/L	3.2	-	1,000
Iron	µg/L	31	-	300
Lead	µg/L	0.2	10	-
Magnesium	mg/L	6.53	-	-
Manganese	µg/L	1	-	50
Mercury	µg/L	< 0.02	1	-
Selenium	µg/L	< 0.1	10	-
Sodium	mg/L	5.44	-	200
Uranium	µg/L	< 0.1	20	-
Zinc	µg/L	56	-	5,000

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2. Health criteria at point of use/distribution.
3. Hardness levels between 80 and 100 mg/L (as CaCO3) are considered acceptable; levels greater than 200 mg/L are considered poor but can be tolerated; those in excess of 500 mg/L are normally considered unacceptable.

TABLE 6: Analytical Results - Class A Compost 1355 and 1345 Fisher Road

		1355 Fisher Road Screened Compost		1355 Fisher Road Unscreened Compost				1345 Fisher Rd. Compost	BC Organic Matter Recycling Regulation Standards [1]
		SP1		SP2		SP3		SP1	
		7-Sep-10	27-Sep-10	7-Sep-10	27-Sep-10	9-Sep-10	27-Sep-10	7-Oct-10	
Available Nutrients	**Units**								
Ammonium - N	mg/kg	328	633	1,250	1,350	1,420	1,530	5.3	-
Nitrate - N	mg/kg	< 0.7	6	< 0.7	2	7.7	20	14	-
Carbon:Nitrogen (C:N) Ratio	%	-	27	-	15.8	-	18.3	16.8	-
Carbon (Total Organic)	% dry weight	-	21.4	-	24.4	-	26.9	20.0	-
Nitrogen (Total)	% dry weight	-	0.80	-	1.54	-	1.47	1.19	-
Microbiological Analysis									
Fecal Coliforms	MPN/kg	**23,000**	**4,300**	**2,300**	430	**7,500**	**460,000**	< 1	1,000
Metals									
Arsenic	mg/kg	7.4	-	3.5	-	3.4	-	1.6	13
Cadmium	mg/kg	0.38	-	0.52	-	0.61	-	0.3	3
Chromium	mg/kg	24.1	-	18.9	-	22.9	-	20.1	100
Cobalt	mg/kg	8.4	-	5.2	-	6.5	-	6.83	34
Copper	mg/kg	43	-	101	-	123	-	50.0	400
Lead	mg/kg	40.9	-	25.1	-	23.8	-	16.9	150
Mercury	mg/kg	0.07	-	0.19	-	0.18	-	0.044	2
Molybdenum	mg/kg	1	-	2	-	2	-	0.50	5
Nickel	mg/kg	16.3	-	13.4	-	17.3	-	14.2	62
Selenium	mg/kg	< 0.3	-	0.6	-	0.8	-	< 0.3	2
Zinc	mg/kg	161	-	232	-	277	-	121	500

Bold - Concentration exceeds the Guidelines for BC Organic Material Recycling Regulation standard.

Notes:
"-" = No guideline/criteria.
"<" = Less than the laboratory method detection limit

1. British Columbia Organic Matter Recycling Regulation. B.C. Environmental Management Act and Public Health Act, B.C. Reg. 18/2002 O.C. 84/2002 (includes amendments up to B.C. Reg. 198/2007, June 30, 2007).

TABLE 7: Analytical Results - Runoff and Leachate 1355 and 1345 Fisher Road					
		1355 Fisher Road Runoff	**1345 Fisher Road Leachate**	**Canadian Drinking Water Quality Guidelines [1]**	
		15-Nov-10	7-Oct-10	**Potability at Point of Use [2]**	**Aesthetic Objective**
Anions					
Nitrate (N)	mg/L		0.010	10	-
Nitrite (N)	mg/L		< 0.005	1	-
Nitrate + Nitrite (N)	mg/L		0.11	10	-
Total Nitrogen	mg/L		58.2	-	-
Inorganic Non-Metalic Parameters					
Ammonium (N)	mg/L		16.2	-	-
Total Organic Carbon	mg/L		325	-	-
Total Metals					
Aluminum	µg/L		6,910	-	-
Antimony	µg/L		1.4	6	-
Arsenic	µg/L		25.2	10	-
Barium	µg/L		273	1,000	-
Boron	µg/L		108	5,000	-
Cadmium	µg/L		0.64	5	-
Chromium	µg/L		18.8	50	-
Copper	µg/L		0.035	-	1,000
Iron	µg/L		35	-	300
Lead	µg/L		**21.0**	10	-
Magnesium	mg/L		60.9	-	-
Manganese	µg/L		**1,690**	-	50
Mercury	µg/L		-	1	-
Selenium	µg/L		< 0.2	10	-
Sodium	mg/L		80.3	-	200
Uranium	µg/L		3.6	20	-
Zinc	µg/L		143	-	5,000

Bold - Concentration exceeds the aesthetic objective as set by the Guidelines for Canadian Drinking Water Quality.
Bold - Concentration exceeds the Guidelines for Canadian Drinking Water Quality for potability.

Notes:

"-" = Not analyzed or no guideline/criteria.
"<" = Less than the laboratory method detection limit

1. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, Guidelines for Canadian Drinking Water Quality, updated May, 2008.
2. Health criteria at point of use/distribution. Guidelines presented for comparison purposes only and do not apply to water not used for human consumption.

FIGURES

Q:\Nanaimo\Environmental\N231\Projects\2006 - Present\N23101632 CVRD Cobble Hill EIA\Figure 1.dwg [FIGURE 1] November 18, 2010 - 3:31:41 pm (BY: PEARCE, EVAN)

NOTE:
Base image from Google Earth, July 17, 2005

0 2,400 m

Scale: 1:40,000

CLIENT

Cowichan Valley Regional District

Environmental Review
1355 & 1345 Fisher Road

Site Location Plan

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
N23101632	EP	MG	0

OFFICE	DATE
NAN	September 22, 2010

Figure 1

LEGEND:

1 - Gravel Pit
2 - Pacific Homes
3 - Rona
4 - Good Used Auto
5 - School Yard
6 - South Cowichan Storage
7 - S+A Wood Processing
8 - Harlequin Clothing Factory Outlet
9 - Sawmill
10 - Raven Metal Products
11 - Gamboa Farms
12 - Residential

NOTE:
Base image from Google Earth, July 17, 2005

0 250 m

Scale: 1:40,000

CLIENT
Cowichan Valley Regional District

Environmental Review
1355 & 1345 Fisher Road
Site Plan & Neighbouring Land Use

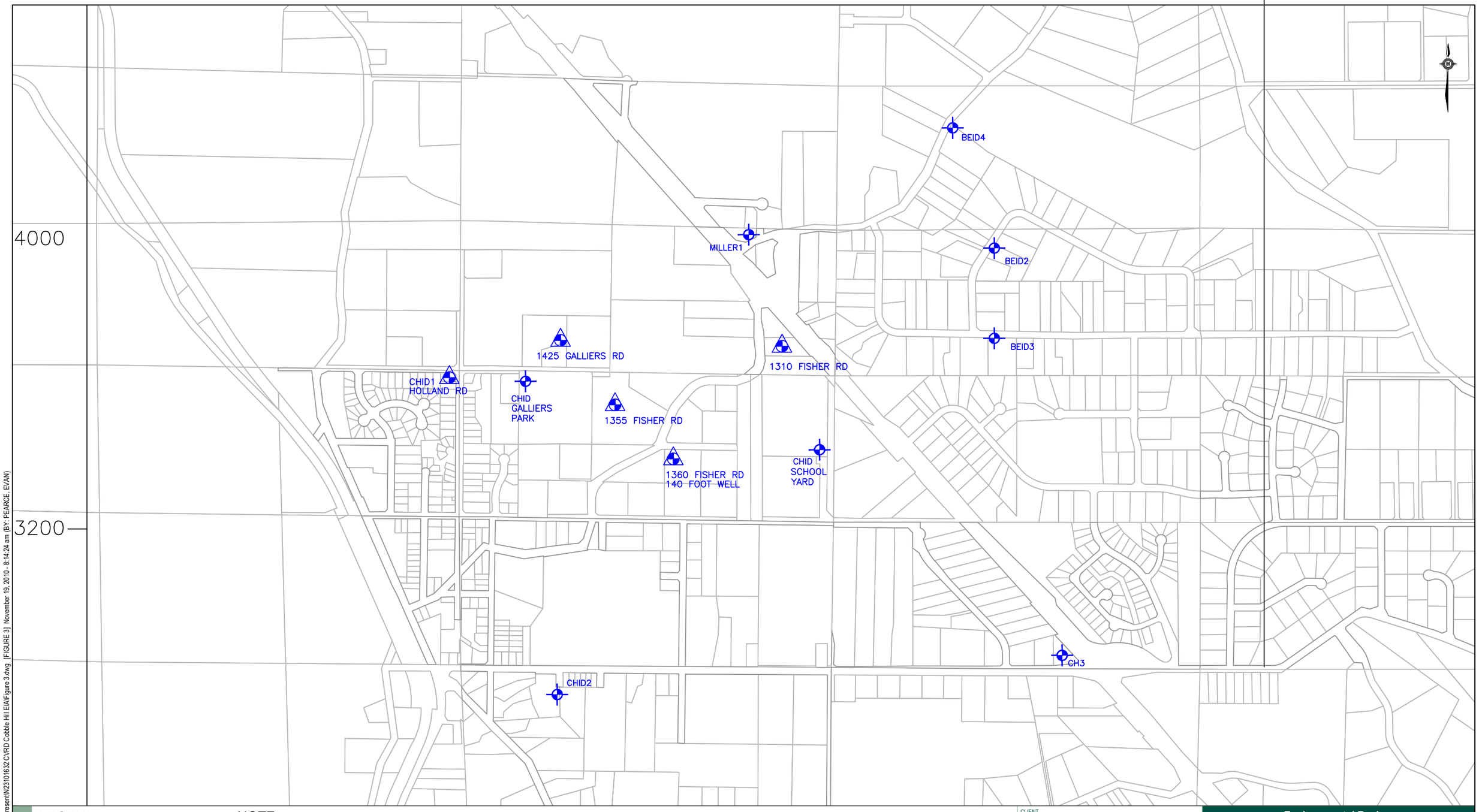
EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
N23101632	EP	MG	0

OFFICE: NAN
DATE: September 23, 2010

Figure 2

Q:\Nanaimo\Environmental\N231\Projects\21006 - Present\N23101632 CVRD Cobble Hill EIA\Figure 1.dwg [FIGURE 2] November 18, 2010 - 3:34:59 pm (BY: PEARCE, EVAN)



LEGEND:

- Utility or Improvement District Pumping Well
- Groundwater Testing Location

BEID - Braithwaite Estates Improvement District
CHID - Cobble Hill Improvement District

NOTE:

Base map provided by Braithwaite Estates Improvement District Board (BEID).

0 250 500 450 400m

SCALE: 1:10,000

CLIENT

Cowichan Valley Regional District

Environmental Review
1355 & 1345 Fisher Road

Groundwater Testing, Utility and Improvment District Well Locations

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
N23101632	EP	MG	0
OFFICE: NAN	DATE: September 23, 2010		

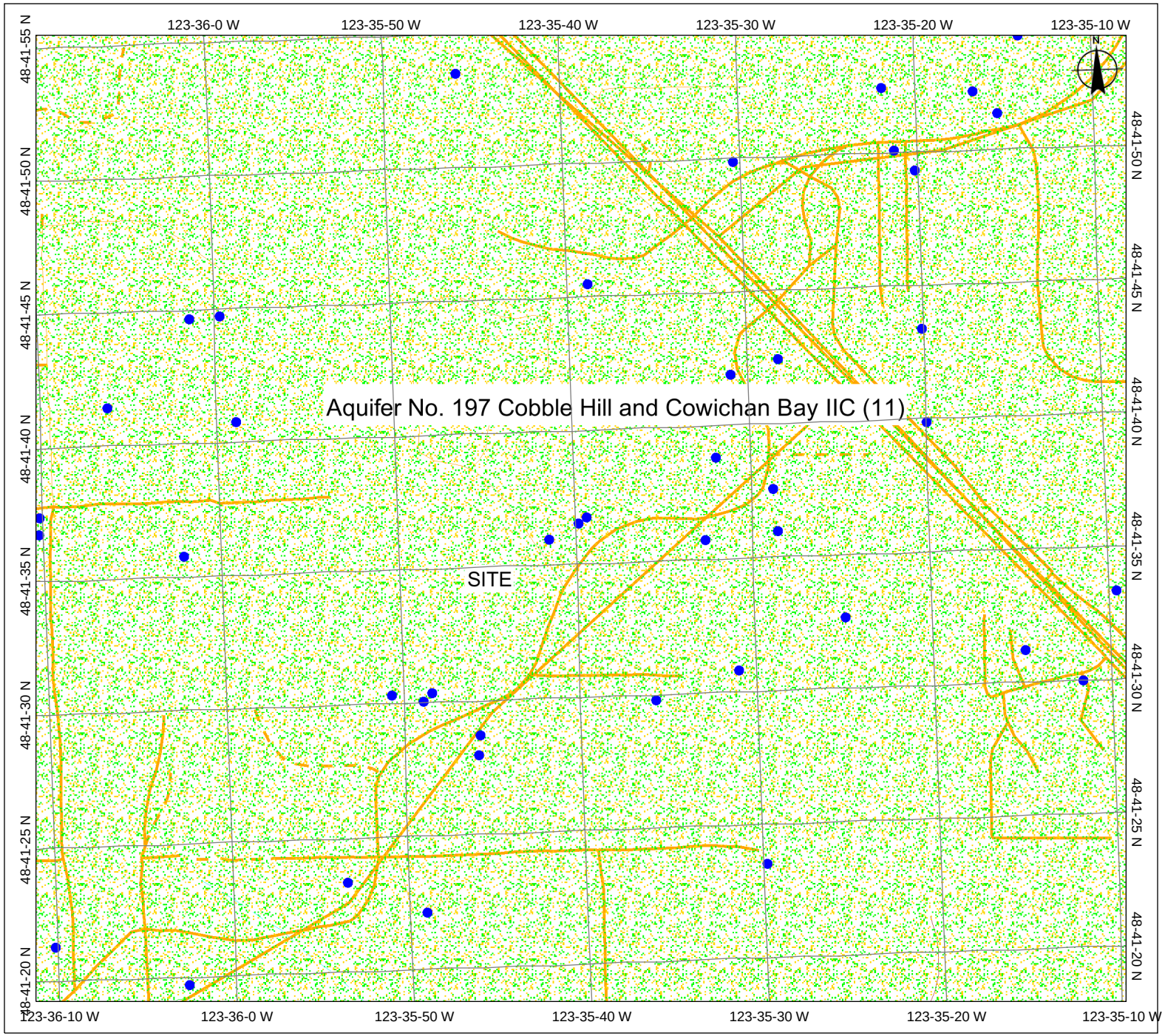
Figure 3

Q:\Nanaimo\Environmental\N2231\Projects\2006 - Present\N23101632 CVRD Cobble Hill EIA\Figure 3.dwg [FIGURE 3] November 19, 2010 - 8:14:24 am (BY: PEARCE, EVAN)

APPENDIX A

APPENDIX A NATIONAL TOPOGRAPHIC SERIES, AQUIFER, AND VULNERABILITY MAPS


Trailer Park
Golf Range
Silo
Water
Airfield
Condition Unknown
Poultry Farm
COWICHAN LAND DISTRICT
DISTRICT
Patrolas Creek
EST-PATROLAS
INDIAN RESERVE 4
Dougan Lake
Cherry Point
Garnet Creek
Boatswain Bank
Trans-Canada Highway
PADUR RIDGE
Manley Cr
School For Handicapped
Gate
Junk Yard
Cobble Hill
FOREST
RESERVE
Hutchinson Lake
Poultry Farm
Shawnigan
Private
Trans Sta
Airfield Condition Unknown
Tree Nursery
Forest Reserve
Arena
Creek
Mill
Bay
Whisky Point
Brentwood College
Shawnigan Lake
Hollings Creek
Mill Bay
SHAWNIGAN LAND DISTRICT
MALAHAT LAND DISTRICT
Water
R3
R4
R5
R6
R7
R8
R9
R10



BRITISH COLUMBIA

Aquifer Map

Legend

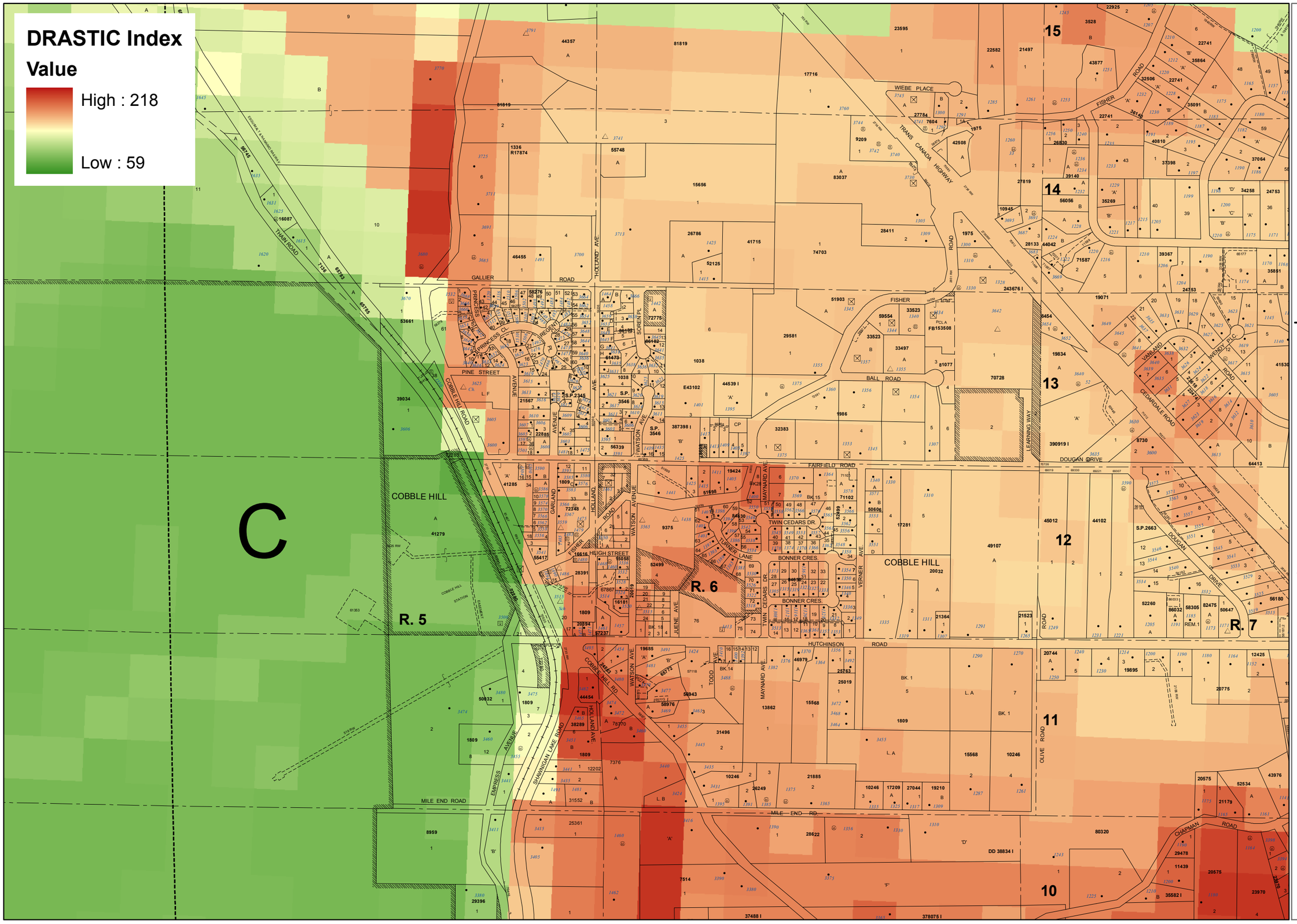
- Aquifer Boundary - Outlined
- **Aquifer Demand - Colour Themed**
  - Bedrock, High Demand
  - Bedrock, Moderate Demand
  - Bedrock, Low Demand
  - Unconsolidated, High Demand
  - Unconsolidated, Moderate Demand
  - Unconsolidated, Low Demand
- **Aquifer Productivity - Colour Themed**
  - Bedrock, High Productivity
  - Bedrock, Moderate Productivity
  - Bedrock, Low Productivity
  - Unconsolidated, High Productivity
  - Unconsolidated, Moderate Productivity
  - Unconsolidated, Low Productivity
- **Aquifer Vulnerability - Colour Themed**
  - Bedrock, High Vulnerability
  - Bedrock, Moderate Vulnerability
  - Bedrock, Low Vulnerability
  - Unconsolidated, High Vulnerability
  - Unconsolidated, Moderate Vulnerability
  - Unconsolidated, Low Vulnerability
- Water Wells

0 90 180 m.

Scale: 1:6,461

Datum/Projection: NAD83, Albers Equal Area Conic

Key Map of British Columbia



Cowichan Valley Regional District

This map is compiled from various sources for internal use and is designed for reference purposes only.

The Regional District does not warrant the accuracy.

All persons making use of this compilation are advised that amendments have been consolidated for convenience purposes only and that boundaries are representational.

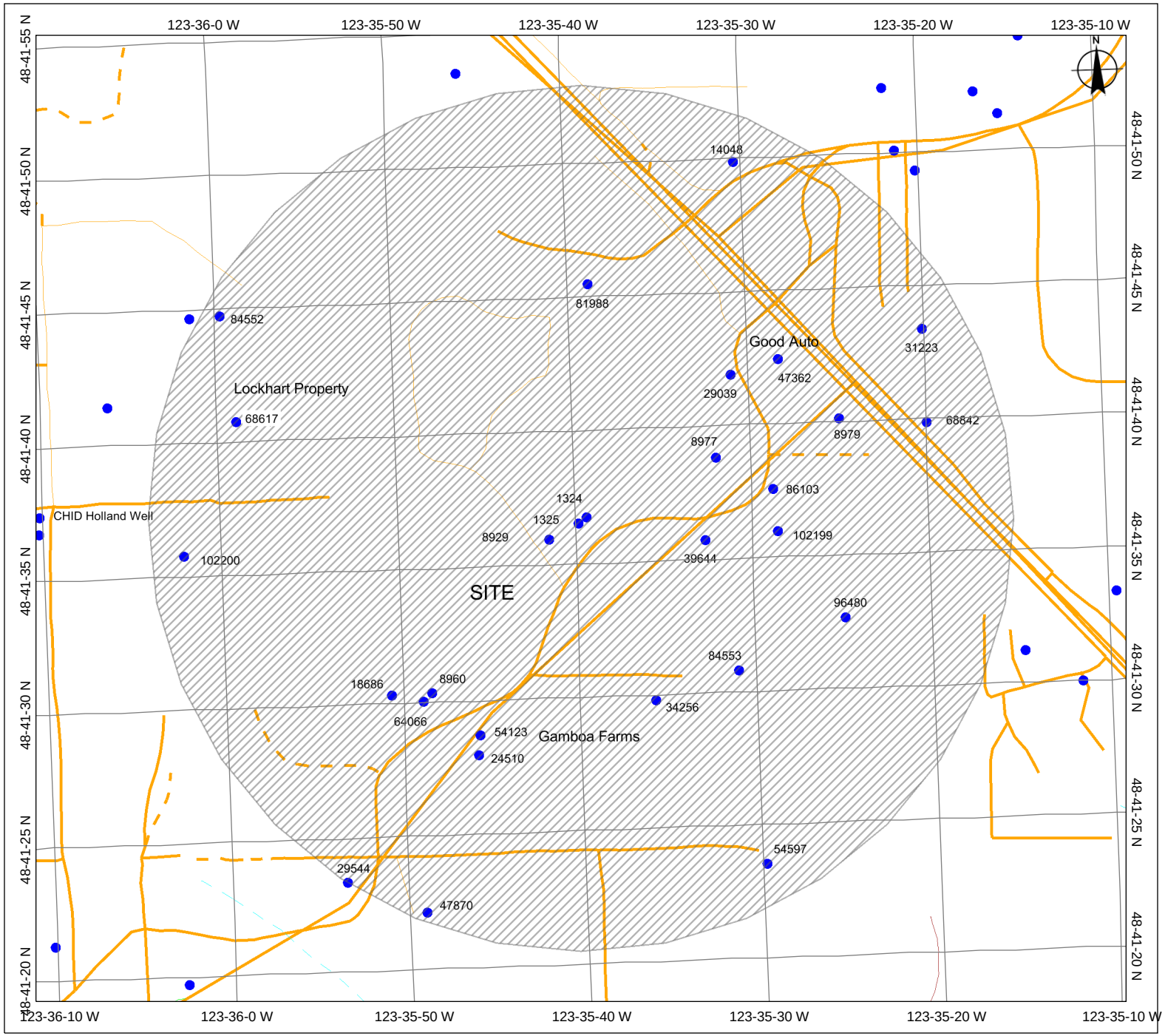
The original Bylaws should be consulted for all purposes of interpretation and applicaton of the Bylaws.

Printed: August 5, 2010

Scale: 1:8,000

APPENDIX B

APPENDIX B WELL LOCATION MAP AND WELL LOGS



British Columbia

Well Location Map

Legend

- Water Wells

0 90 180 m.

Scale: 1:6,461

Copyright/Disclaimer

Datum/Projection: NAD83, Albers Equal Area Conic

Key Map of British Columbia

13017

WELL LOG CONSTRUCTION RECORD

1980

OWNER Mr. Allan Cowan GRACE BISHOP.

Address Fisher Rd. Cobble Hill, B.C.

Well Location Hills

Date Started Nov. 29/1972 Date Completed Dec 6/1972

DRILLWELL ENTERPRISES LTD.
KEN SLADE - - Phone: 746-5268
R.R.1, COWICHAN STATION, B.C.

Drilling Method Percussion

Driller P. MISEK Helper —

File — Folio —

Signed By Peter Misek

LOG OF FORMATIONS

Depth			Descriptions
0	to	42	Sandy gravel
	to		
42	to	144	Gravely sand
	to		
144	to	167	Coarse gravel
	to		
167	to	187	Gravely sand
	to		
187	to	201	Sandy gravel waterbearing
	to		
201	to	218	Fine sand waterbearing
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		

GENERAL REMARKS

Screen slot No. 10 2 sect. (12 feet)

CASING RECORD

Dia. 6 ins. Wt. — #/ft. From 0 to 218

Dia. — ins. Wt. — #/ft. From — to —

Dia. — ins. Wt. — #/ft. From — to —

Shoe ✓ Welded ✓ Cemented —

SCREEN RECORD

Make CM Material Stainless steel

Slot opening No 10 Length 8' 2sect.

Top 210 ft. Bottom 218 ft.

Fittings Top Lead joint Fittings Bottom Lead plug

Gravel Pack — Natural ✓

Development Method Bailing

ROCK WELL DATA

Open Bore Hole — Dia. — ins.

From — ft. to — ft.

PRODUCTION DATA

Static Level 180' ft.

Measured from surface

Pumping Level — ft. at — GPM

— ft. at — GPM

Bail Test — ft. at — GPH

— ft. at — GPH

Recommended Pump Setting — ft.

Recommended Max. Pump Output 20 GPM ~~GPH~~

Duration of Test — Hrs.

PUMP DATA

Make — Type —

Model — Serial No. —

Size — HP — Drop Pipe —

GPM — Head — ft.

Motor — Volts — PH —

Well Seal —

Water Analysis — Hardness —

PH — Iron —

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 39644	Construction Date: 1978-05-01 00:00:00.0
Owner: BILL MOTHERWELL	Driller: Drillwell Enterprises Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: FISHER ROAD	
Area:	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 15 (Driller's Estimate) Gallons per Minute (U.S./Imperial) Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 145 feet
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: Lot: 2 Township: Section: 13 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 33	WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 197 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:
Site Info Details: Other Info Flag: Other Info Details:	

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
RATE: 15 GPM.

LITHOLOGY INFORMATION:

From	0	to	3 Ft.	Silty gravel
From	3	to	18 Ft.	Till gravel
From	18	to	119 Ft.	Brown, silty sand
From	119	to	135 Ft.	Brown silty gravel
From	135	to	185 Ft.	Silty sand (brown)
From	185	to	197 Ft.	Sand
From	197	to	0 Ft.	Silty sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 29544

Owner: A ROSS

Address: FISHER RD

Area: COBBLE HILL

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 19424 Lot: 1
Township: Section: 12 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 14

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well: New
Well Use: Unknown Well Use
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.0 inches
Casing drive shoe:
Well Depth: 120 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag:
File Info Flag:
Sieve Info Flag:
Screen Info Flag:

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1974-01-01 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 20 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method:
Pump Test Info Flag:
Artesian Flow:
Artesian Pressure (ft):
Static Level: 12 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag:
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
20 GPM. DEVELOPMENT METHOD PUMP.

LITHOLOGY INFORMATION:

From	0 to	18 Ft.	Br. clay till
From	18 to	21 Ft.	Coarse sand and pea gravel
From	0 to	0 Ft.	
From	0 to	0 Ft.	Deepened to 120'
From	22 to	120 Ft.	Till ?

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 47870

Owner: JOHN EVANS

Address: FISHER RD/MAYNARD RD

Area:

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 1809 Lot: 7
Township: Section: 12 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 29

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well: New
Well Use: Private Domestic
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 0.0 inches
Casing drive shoe:
Well Depth: 177 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag:
File Info Flag:
Sieve Info Flag:
Screen Info Flag:

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1981-05-05 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 30 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method:
Pump Test Info Flag:
Artesian Flow:
Artesian Pressure (ft):
Static Level: 108 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag:
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
RATE: 30 GPM

LITHOLOGY INFORMATION:

From	0	to	2 Ft.	Silty top soil
From	2	to	29 Ft.	Silty gravel till
From	29	to	40 Ft.	Sand
From	40	to	85 Ft.	Silty sand and gravel
From	85	to	165 Ft.	Silty fine sand
From	165	to	177 Ft.	Sand (med.)

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 18686	Construction Date: 1964-05-01 00:00:00.0
Owner: A SCHEURKOGEL	Driller: Pacific Water Wells
Address:	Well Identification Plate Number:
	Plate Attached By:
Area: COBBLE HILL	Where Plate Attached:
	PRODUCTION DATA AT TIME OF DRILLING:
WELL LOCATION:	Well Yield: 2 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
SHAWNIGAN Land District	Development Method:
District Lot: Plan: Lot:	Pump Test Info Flag:
Township: Section: 13 Range: 6	Artesian Flow:
Indian Reserve: Meridian: Block:	Artesian Pressure (ft):
Quarter:	Static Level: 128 feet
Island:	
BCGS Number (NAD 27): 092B063333 Well: 24	WATER QUALITY:
	Character:
Class of Well:	Colour:
Subclass of Well:	Odour:
Orientation of Well:	Well Disinfected: N
Status of Well: New	EMS ID:
Well Use: Unknown Well Use	Water Chemistry Info Flag:
Observation Well Number:	Field Chemistry Info Flag:
Observation Well Status:	Site Info (SEAM):
Construction Method: Drilled	
Diameter: 6.0 inches	Water Utility:
Casing drive shoe:	Water Supply System Name:
Well Depth: 150 feet	Water Supply System Well Name:
Elevation: 0 feet (ASL)	
Final Casing Stick Up: inches	SURFACE SEAL:
Well Cap Type:	Flag:
Bedrock Depth: feet	Material:
Lithology Info Flag:	Method:
File Info Flag:	Depth (ft):
Sieve Info Flag:	Thickness (in):
Screen Info Flag:	
	WELL CLOSURE INFORMATION:
Site Info Details:	Reason For Closure:
Other Info Flag:	Method of Closure:
Other Info Details:	Closure Sealant Material:
	Closure Backfill Material:
	Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
YIELD: 2 GPM. PUMPING LEVEL: 144'

LITHOLOGY INFORMATION:

From	0 to	28 Ft.	Dug hole
From	28 to	103 Ft.	Br. sand
From	103 to	108 Ft.	Coarse gravel, some clay
From	108 to	115 Ft.	Gravelly hardpan
From	115 to	139 Ft.	Br. sand
From	0 to	139 Ft.	Silty sand
From	139 to	150 Ft.	Br. sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 64066	Construction Date: 1988-04-28 00:00:00.0
Owner: WALLENBURG TONY	Driller: Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: 1375 FISHER ROAD	
Area:	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 12 (Driller's Estimate) Gallons per Minute (U.S./Imperial) Development Method: Pump Test Info Flag: Y Artesian Flow: Artesian Pressure (ft): Static Level: 147 feet
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: 1986 Lot: 8 Township: Section: 13 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: VANCOUVER ISLAND BCGS Number (NAD 27): 092B063333 Well: 50	WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: N Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Private Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 238 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: N File Info Flag: N Sieve Info Flag: N Screen Info Flag: N	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: N Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:
Site Info Details: Other Info Flag: Other Info Details:	

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
STEEL CASING,0.0 TO 234.0, CONTINUOUS,STAINLESS STEEL,PUMP TEST RATE 12 GPM,167 FT AFTER 1 HRS

LITHOLOGY INFORMATION:

From	0	to	25 Ft.	GRAVEL & SAND SILTY W/COBBLES & BOULDERS
From	25	to	140 Ft.	SAND W/GRAVEL LAYERS DRY
From	140	to	200 Ft.	QUITE SILTY FINE SAND WET
From	0	to	0 Ft.	BAIL AT 12 GPM 20FT OF DROWDOWK
From	0	to	0 Ft.	FINE GRAVEL SEAMS
From	0	to	0 Ft.	SET #12 SLOT SCREEN
From	200	to	240 Ft.	SAND CLEANER SLIGHTLY COURSER WITH SMALL

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 54123

Owner: S PEDERSEN

Address: FISHER ROAD

Area: COBBLE HILL

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 1986 Lot: 7
Township: Section: 13 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 34

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well: New
Well Use: Private Domestic
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.0 inches
Casing drive shoe:
Well Depth: 175 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag:
File Info Flag:
Sieve Info Flag:
Screen Info Flag:

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1984-10-07 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 20 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method:
Pump Test Info Flag:
Artesian Flow:
Artesian Pressure (ft):
Static Level: 107 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag:
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
RATE: + 20 GPM.

LITHOLOGY INFORMATION:

From	0 to	21 Ft.	Silty gravel
From	21 to	87 Ft.	Grey silty sand
From	87 to	116 Ft.	Brown silty sand
From	116 to	121 Ft.	Silty gravel
From	121 to	126 Ft.	Silty sand
From	126 to	132 Ft.	Silty gravel
From	132 to	139 Ft.	Brown sand, W-B
From	139 to	155 Ft.	Silty brown sand
From	155 to	159 Ft.	Brown sand, W-B
From	159 to	165 Ft.	Silty sand
From	165 to	170 Ft.	Brown sand, W-B
From	170 to	178 Ft.	Finer brown sand, W-B

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 24510

Owner: L R TAYLOR

Address:

Area: COBBLE HILL

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 1986 Lot: 7
Township: Section: 13 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 28

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well: New
Well Use: Unknown Well Use
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.0 inches
Casing drive shoe:
Well Depth: 144 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag:
File Info Flag:
Sieve Info Flag:
Screen Info Flag:

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1971-02-01 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 7 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method:
Pump Test Info Flag:
Artesian Flow:
Artesian Pressure (ft):
Static Level: 119 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag:
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
EST. YIELD: 7-8 GPM.

LITHOLOGY INFORMATION:

From	0 to	15 Ft.	Light sand and gravel till
From	0 to	97 Ft.	Tight br. sand, dry
From	0 to	105 Ft.	Gravelly, easy wash hardpan
From	0 to	120 Ft.	Br. sand, coarse and loose, able to bail
From	0 to	0 Ft.	plug
From	0 to	140 Ft.	Fine, blue sand, changing to fine br.
From	0 to	0 Ft.	sand
From	0 to	144 Ft.	Fine br. sand
From	0 to	144.5 Ft.	Showing clay in bailer samples
From	0 to	0 Ft.	
From	0 to	0 Ft.	Bottom 144'
From	0 to	0 Ft.	140' of pipe left in hole

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 34256	Construction Date: 1976-01-29 00:00:00.0
Owner: WILKINSON BOB	Driller: Drillwell Enterprises Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: FISHER ROAD	
Area:	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 5 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: 1986 Lot: 1 Township: Section: 13 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 30	Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level:
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 265 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Site Info Details: Other Info Flag: Other Info Details:	WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
RATE: 5 GPM.

LITHOLOGY INFORMATION:

From	0	to	33 Ft.	Sand and gravel
From	33	to	144 Ft.	Br. sand. A little silty
From	144	to	162 Ft.	Sand and gravel
From	162	to	165 Ft.	Silty sand
From	165	to	186 Ft.	Dark brown, dirty gravel
From	186	to	195 Ft.	Slightly silty sand
From	195	to	265 Ft.	Sand (br.)

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 84553

Owner: SCHOOL DISTRICT 79

Address: FISHER ROAD

Area:

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 48879 Lot: 1
Township: Section: 13 Range: 6
Indian Reserve: Meridian: Block: 1475
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 49

Class of Well: Water supply
Subclass of Well: Non-domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Observation Well
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.00 inches
Casing drive shoe: Y
Well Depth: 160 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type: HINGED CAP, HASP PLUS LOCK
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2000-06-06 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 10 (Driller's Estimate) U.S. Gallons per Minute
Development Method: Bailing
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 125 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: Y
Material: Bentonite clay and cement mixture
Method:
Depth (ft): 20 feet
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
155	160		10

Casing from	to feet	Diameter	Material	Drive Shoe
0	155	6	Steel	Y

GENERAL REMARKS:
DRILLED 8 INCHES TO 20 FEET PULLED SURFACE CASING AND INSTALLED 250 LB BENSEAL AND CONCRETE TO SURFACE. SHOE: ONE.

LITHOLOGY INFORMATION:

From	0	to	6 Ft.	SAND AND GRAVEL FILL, COBBLES, BROWN AND GRAVEL FILL, COBBLES brown sand
From	6	to	36 Ft.	SAND, LIGHT BROWN, FINE brown light-coloured sand
From	36	to	43 Ft.	SAND, SILTY BROWN, FINE FINE brown silty sand
From	43	to	50 Ft.	SAND, BROWN, MEDIUM brown medium sand
From	50	to	76 Ft.	SAND, VERY SILTY BROWN, TIGHT TIGHT brown silty sand
From	76	to	82 Ft.	GRAVEL gravel
From	82	to	86 Ft.	SAND & GRAVEL, BROWN brown gravelly sand
From	86	to	95 Ft.	SAND, BROWN, MEDIUM brown medium sand
From	95	to	105 Ft.	GRAVEL, COARSE SAND, BROWN AND GRAVEL brown coarse sand
From	105	to	130 Ft.	SAND, VERY SILTY BROWN brown silty sand
From	130	to	156 Ft.	SAND, FINE, BROWN brown fine sand
From	136	to	160 Ft.	SAND, MEDIUM, BROWN WATER BEARING WATER BEARING brown medium sand

- Return to Main
- Return to Search Options

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 1325	Construction Date: 1919-01-01 00:00:00.0
Owner: MCMILLAN	Driller: Unknown Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	
Area: COBBLE HILL	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 100 (Driller's Estimate) Gallons per Hour (U.S./Imperial) Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 177 feet
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: Lot: 7 Township: Section: 13 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 10	WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 354 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Site Info Details: Other Info Flag: Other Info Details:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
AVAILABLE YIELD ABOUT 100 GPH. ARTESION HEAD MAINTAINS ABOUT 200 GALS OF WATER IN THE CASING. WATER IS COLD AND HAS A SMOOTH TASTE.

LITHOLOGY INFORMATION:

From	0 to	15 Ft.	Coarse gravel and sand
From	15 to	18 Ft.	Hardpan
From	18 to	145 Ft.	Coarse sand
From	145 to	147 Ft.	Gravel
From	147 to	162 Ft.	Sand
From	162 to	170 Ft.	Water and sand
From	170 to	354 Ft.	Quicksand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 8977	Construction Date: 1950-01-01 00:00:00.0
Owner: P R HENDERSON	Driller: Unknown Well Identification Plate Number:
Address:	Plate Attached By: Where Plate Attached:
Area:	PRODUCTION DATA AT TIME OF DRILLING:
WELL LOCATION:	Well Yield: 0 (Driller's Estimate)
SHAWNIGAN Land District	Development Method:
District Lot: Plan: Lot:	Pump Test Info Flag:
Township: Section: 15 Range: 7	Artesian Flow:
Indian Reserve: Meridian: Block:	Artesian Pressure (ft):
Quarter:	Static Level: 74 feet
Island:	
BCGS Number (NAD 27): 092B063333 Well: 7	WATER QUALITY:
	Character:
Class of Well:	Colour:
Subclass of Well:	Odour:
Orientation of Well:	Well Disinfected: N
Status of Well: New	EMS ID:
Well Use: Unknown Well Use	Water Chemistry Info Flag:
Observation Well Number:	Field Chemistry Info Flag:
Observation Well Status:	Site Info (SEAM):
Construction Method: Unknown Constru	
Diameter: 0.0 inches	Water Utility:
Casing drive shoe:	Water Supply System Name:
Well Depth: 77 feet	Water Supply System Well Name:
Elevation: 0 feet (ASL)	SURFACE SEAL:
Final Casing Stick Up: inches	Flag:
Well Cap Type:	Material:
Bedrock Depth: feet	Method:
Lithology Info Flag:	Depth (ft):
File Info Flag:	Thickness (in):
Sieve Info Flag:	
Screen Info Flag:	WELL CLOSURE INFORMATION:
	Reason For Closure:
Site Info Details:	Method of Closure:
Other Info Flag:	Closure Sealant Material:
Other Info Details:	Closure Backfill Material:
	Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:

LITHOLOGY INFORMATION:

From	0 to	0 Ft.	Soil
From	0 to	0 Ft.	10' hard clay
From	0 to	0 Ft.	2' hardpan

From	0 to	0 Ft.	60' sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 86103

Owner: CORBY

Address: 1328 FISHER ROAD

Area: COBBLE HILL

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 1975 Lot:
Township: Section: 14 Range: 6
Indian Reserve: Meridian: Block: 4
Quarter:
Island: VANCOUVER ISLAND
BCGS Number (NAD 27): 092B063333 Well: 44

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Private Domestic
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: 8 inches
Casing drive shoe: N Y
Well Depth: 236 feet
Elevation: feet (ASL)
Final Casing Stick Up: 12 inches
Well Cap Type: STEEL PLATE
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2006-11-10 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number: 18046
Plate Attached By: RICH BOURGET
Where Plate Attached: CLAMPED TO CASING

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 50 (Driller's Estimate) U.S. Gallons per Minute
Development Method: Air lifting
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 165 feet

WATER QUALITY:
Character: Clear, Fresh
Colour:
Odour:
Well Disinfected: Y
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM): N

Water Utility: N
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: Y
Material: Bentonite clay
Method: Poured
Depth (ft): 18 feet
Thickness (in):
Liner from To: feet

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
230	232		null
232	236		100

Casing from	to feet	Diameter	Material	Drive Shoe
0	18	8	Steel	N
18	232	6	Steel	Y

GENERAL REMARKS:

LITHOLOGY INFORMATION:

From	0	to	10	Ft.	Medium GRAVEL, SAND DRY HOLE brown
From	10	to	85	Ft.	Loose DRY HOLE brown sand
From	85	to	105	Ft.	Medium SAND, SOME GRAVEL DRY HOLE brown
From	105	to	117	Ft.	Medium COARSE GRAVEL DRY HOLE brown
From	117	to	216	Ft.	Medium SAND FINE 10 Gallons per Minute (U.S./Imperial) W brown
From	216	to	220	Ft.	Medium SAND, SOME GRAVEL W brown
From	220	to	236	Ft.	Medium GRAVEL, SOME FINE SAND 50 Gallons per Minute (U.S./Imperial) W brown

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 54597	Construction Date: 1985-03-19 00:00:00.0
Owner: HANS FRUEH	Driller: Drillwell Enterprises Well Identification Plate Number: Plate Attached By:
Address: END OF FAIRFIELD ROAD	Where Plate Attached:
Area: COBBLE HILL	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 15 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: 11396 Lot: 2 Township: Section: 12 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 32	Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 150 feet WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Private Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 198 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Site Info Details: Other Info Flag: Other Info Details:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
RATE: 15 GPM.

LITHOLOGY INFORMATION:

From	0 to 14 Ft.	Silty gravel
From	14 to 72 Ft.	Slightly silty, fine brown sand
From	72 to 112 Ft.	Cleaner, coarser brown sand
From	112 to 123 Ft.	Slightly silty sand
From	123 to 144 Ft.	Slightly silty gravel
From	144 to 198 Ft.	Brown sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 96480

Owner: SCHOOL DISTRICT 79

Address:

Area:

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: VIP70728 Lot: 1
Township: Section: 13 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island: VANCOUVER ISLAND
BCGS Number (NAD 27): 092B063333 Well:

Class of Well: Monitoring
Subclass of Well:
Orientation of Well: Vertical
Status of Well: New
Well Use: Observation Well
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: inches
Casing drive shoe: Y
Well Depth: 157 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type: WELDED LID ON CASING
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2001-06-11 00:00:00.0

Driller:
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 4 (Driller's Estimate) U.S. Gallons per Minute
Development Method: Bailing
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 139 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: Y
Material: Bentonite clay
Method:
Depth (ft): 20 feet
Thickness (in):
Liner from To: feet

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
150	152		null
152	157		10

Casing from	to feet	Diameter	Material	Drive Shoe
0	152	6	Steel	Y

GENERAL REMARKS:
WELL HEAD COMPLETION CHLORINATE. INSTALLED 350 LB BENTONITE SURFACE SEAL TO 20 FT CONCRETE TO SURFACE.

LITHOLOGY INFORMATION:

From	0	to	6 Ft.	brown till
From	6	to	50 Ft.	Medium brown sand
From	50	to	55 Ft.	brown coarse sand
From	55	to	72 Ft.	brown fine sand
From	72	to	90 Ft.	SILTY brown fine sand
From	90	to	107 Ft.	TRACE GRAVEL brown coarse sand
From	107	to	113 Ft.	gravel
From	113	to	118 Ft.	SAND & GRAVEL brown
From	118	to	122 Ft.	SAND brown coarse
From	122	to	150 Ft.	SILTY brown fine sand
From	150	to	157 Ft.	WET fine sand

- Return to Main
- Return to Search Options

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 102199

Owner: Cobble Hill Improvement District

Address: Fisher Road

Area: Cobble Hill

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 70728 Lot: 1
Township: Section: 13 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island: Vancouver Island
BCGS Number (NAD 27): 092B063333 Well:

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Water Supply System
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: inches
Casing drive shoe: N Y
Well Depth: 254 feet
Elevation: 404 feet (ASL)
Final Casing Stick Up: 21 inches
Well Cap Type: weld on
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2010-04-30 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number: 33754
Plate Attached By: Alan Holmstrup
Where Plate Attached: to casing

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 300 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method: Air lifting
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 150 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: Y
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: Y
Material: Bentonite clay
Method: Poured
Depth (ft): 16 feet
Thickness (in): 2 inches
Liner from To: feet

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
234	237		null
237	242		40
242	248.5		40
248.5	254		40

Casing from	to feet	Diameter	Material	Drive Shoe
0	16	12	null	N
0	238	8	Steel	Y

GENERAL REMARKS:
WELL RECORD SUBMITTED THROUGH EWELLS.

LITHOLOGY INFORMATION:

From	0 to	20 Ft.	sand & Gravel with cobbles	brown sand
From	20 to	118 Ft.	brown fine sand	
From	118 to	129 Ft.	gravel	
From	129 to	187 Ft.	sand & gravel	wet at 155ft brown sand
From	187 to	189 Ft.	wet brown coarse sand	
From	189 to	208 Ft.	with some sand	brown gravel
From	208 to	223 Ft.	coarse gravel & sand	Water bearing brown gravel
From	223 to	254 Ft.	coarse gravel	water bearing brown gravel
From	254 to	256 Ft.	water bearing brown sand	

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 29039	Construction Date: 1973-10-11 00:00:00.0
Owner: M S WATSON	Driller: Drillwell Enterprises Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: FISHER ROAD	
Area:	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 10 (Driller's Estimate) Gallons per Minute (U.S./Imperial) Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 133 feet
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: Lot: Township: Section: 14 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 1	WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 193 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Site Info Details: Other Info Flag: Other Info Details:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
10 GPM. REC. MAX PUMP OUTPUT, 10 GPM. DURATION OF TEST, 2 HOURS.

LITHOLOGY INFORMATION:

From	0	to	12 Ft.	Boulders, gravel, sand
From	12	to	40 Ft.	Dry sand, layers of bound gravel, sandy
From	0	to	0 Ft.	silt layers
From	40	to	82 Ft.	Dry loose sand
From	82	to	112 Ft.	Tight sand
From	112	to	143 Ft.	Fine dry sand
From	143	to	178 Ft.	Wet sand, some clay layers, cavity full
From	0	to	0 Ft.	of wood
From	178	to	187 Ft.	Leaving fine brown sand
From	187	to	193 Ft.	Coarse sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 47362	Construction Date: 1981-03-09 00:00:00.0
Owner: WILLIAM LEWIS	Driller: Drillwell Enterprises
Address: FISHER ROAD	Well Identification Plate Number:
Area:	Plate Attached By:
WELL LOCATION:	Where Plate Attached:
SHAWNIGAN Land District	PRODUCTION DATA AT TIME OF DRILLING:
District Lot: Plan: 1975 Lot:	Well Yield: 20 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Township: Section: 14 Range: 6	Development Method:
Indian Reserve: Meridian: Block:	Pump Test Info Flag:
Quarter:	Artesian Flow:
Island:	Artesian Pressure (ft):
BCGS Number (NAD 27): 092B063333 Well: 22	Static Level: 140 feet
Class of Well:	WATER QUALITY:
Subclass of Well:	Character:
Orientation of Well:	Colour:
Status of Well: New	Odour:
Well Use: Private Domestic	Well Disinfected: N
Observation Well Number:	EMS ID:
Observation Well Status:	Water Chemistry Info Flag:
Construction Method: Drilled	Field Chemistry Info Flag:
Diameter: 6.0 inches	Site Info (SEAM):
Casing drive shoe:	Water Utility:
Well Depth: 195 feet	Water Supply System Name:
Elevation: 0 feet (ASL)	Water Supply System Well Name:
Final Casing Stick Up: inches	SURFACE SEAL:
Well Cap Type:	Flag:
Bedrock Depth: feet	Material:
Lithology Info Flag:	Method:
File Info Flag:	Depth (ft):
Sieve Info Flag:	Thickness (in):
Screen Info Flag:	WELL CLOSURE INFORMATION:
Site Info Details:	Reason For Closure:
Other Info Flag:	Method of Closure:
Other Info Details:	Closure Sealant Material:
	Closure Backfill Material:
	Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
RATE: 20 GPM. WATER QUALITY/QUANTITY, EXCELLENT.

LITHOLOGY INFORMATION:

From	0 to	7 Ft.	Sand and gravel
From	7 to	102 Ft.	Slightly silty fine sand
From	102 to	130 Ft.	Cleaner, coarser sand and gravel
From	130 to	170 Ft.	Silty sand
From	170 to	190 Ft.	Sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 31223	Construction Date: 1974-09-06 00:00:00.0
Owner: FRED KALLSTROM	Driller: Drillwell Enterprises Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: BETWEEN FISHER & HUTCHISON	
Area: COBBLE HILL	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 12 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: Lot: Township: Section: 14 Range: 6 Indian Reserve: Meridian: Block: 3 Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 11	Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 125 feet WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 200 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Site Info Details: Other Info Flag: Other Info Details:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
12 GPM.

LITHOLOGY INFORMATION:

From	0 to	10 Ft.	Gravel coarse
From	10 to	32 Ft.	Silty sand and gravel
From	32 to	50 Ft.	Sand
From	50 to	68 Ft.	Silty sand
From	68 to	100 Ft.	Silty sand and gravel
From	100 to	160 Ft.	Sand (dry to 125')
From	160 to	200 Ft.	Water-bearing sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 68842	Construction Date: 1994-07-28 00:00:00.0
Owner: M. & DWAYNE CRAWFORD	Driller: Drillwell Enterprises Well Identification Plate Number: Plate Attached By:
Address: 3683 TRANS CANADA HIGHWAY	Where Plate Attached:
Area: MILL BAY	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 8 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: 1975 Lot: Township: Section: 14 Range: 6 Indian Reserve: Meridian: Block: 4 Quarter: Island: VANCOUVER BCGS Number (NAD 27): 092B063333 Well: 42	Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 122 feet WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Private Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Casing drive shoe: Well Depth: 159 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Site Info Details: Other Info Flag: Other Info Details:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
STEEL CASING, 0 TO 154 FRESH, CLEAR WATER

LITHOLOGY INFORMATION:

From	0 to	14 Ft.	COARSE GRAVEL
From	14 to	30 Ft.	BROWN SAND & GRAVEL
From	30 to	68 Ft.	BROWN SAND
From	68 to	92 Ft.	BROWN SAND & GRAVEL
From	92 to	159 Ft.	BROWN SAND

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 14048

Owner: MILLER WATER UTILITY SOCIETY

Address:

Area: SHAWNIGAN LAKE

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 1875 Lot:
Township: Section: 14 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 3

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Water Supply System
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.0 inches
Casing drive shoe:
Well Depth: 190 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: N

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1953-02-01 00:00:00.0

Driller: Pacific Water Wells
Well Identification Plate Number: 13210
Plate Attached By: PUBLIC HEALTH OFFICER
Where Plate Attached: OUTLET PIPE

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 15 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method:
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 104 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name: MILLER WATER UTILITY SOCIETY
Water Supply System Well Name: MILLER WELL

SURFACE SEAL:
Flag: N
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size	
Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
YIELD: 15 GPM.

LITHOLOGY INFORMATION:

From	0 to	21 Ft.	Sand and gravel
From	21 to	42 Ft.	Hardpan
From	42 to	142 Ft.	Fine brown sand
From	142 to	152 Ft.	" " " , and coarse sand
From	152 to	155 Ft.	Coarse sand and gravel
From	155 to	168 Ft.	Fine and coarse sand
From	168 to	176 Ft.	Fine brown sand and clay
From	176 to	180 Ft.	Brown clay
From	180 to	184 Ft.	Brown clay and sand
From	184 to	186 Ft.	Coarse and fine brown sand
From	186 to	187 Ft.	Coarse sand and fine gravel
From	187 to	188 Ft.	Coarse grey sand
From	188 to	189 Ft.	Coarse grey sand and pea gravel
From	189 to	190 Ft.	Hardpan

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 68617

Owner: ROLLS W

Address: 1415 GALLIER RD

Area: COBBLE HILL

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 26786 Lot: A
Township: Section: 14 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 36

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well: New
Well Use: Private Domestic
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.0 inches
Casing drive shoe:
Well Depth: 247 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag:
File Info Flag:
Sieve Info Flag: N
Screen Info Flag:

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1991-01-18 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 20 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method:
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 185 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag:
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
STEEL CASING,.209 THICK, CONTINUOUS,STAINLESS STEEL,

LITHOLOGY INFORMATION:

From	0	to	19 Ft.	SILTY GRAVEL
From	19	to	49 Ft.	SAND
From	49	to	77 Ft.	SILTY SAND BROWN
From	77	to	98 Ft.	SAND FINE
From	98	to	135 Ft.	AND SILTY
From	247	to	0 Ft.	SILT SAND
From	148	to	218 Ft.	SILTY SAND
From	218	to	226 Ft.	SAND
From	226	to	237 Ft.	SILTY SAND
From	237	to	247 Ft.	SAND MED FINE GRAVEL
From	135	to	148 Ft.	SAND FINE GRAVEL

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 84552

Owner: AIKEN

Address:

Area:

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 15656 Lot: 1
Township: Section: 14 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 48

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Private Domestic
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.00 inches
Casing drive shoe: Y
Well Depth: 216 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type: WELDED LID
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1992-07-17 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 15 (Driller's Estimate) U.S. Gallons per Minute
Development Method: Other
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 140 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: Y
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
212	216		10

Casing from	to feet	Diameter	Material	Drive Shoe
0	213	6	Steel	Y

GENERAL REMARKS:

LITHOLOGY INFORMATION:

From	0 to	12 Ft.	SILTY GRAVEL	silty gravel
From	12 to	140 Ft.	FINE TO MED BROWN SAND-DRY	FINE TO MEDIUM brown dry sand
From	140 to	216 Ft.	MED TO FINE BROWN SAND-WATER BEARING	WATER BEARING. brown fine sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 54090

Owner: COBBLE HILL IMPROVEMENT DISTRICT

Address: GULLIER & HOLLAND AVES

Area: COBBLE HILL

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 1802 Lot: D
Township: Section: 13 Range: 5
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B062444 Well: 10

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Water Supply System
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6 inches
Casing drive shoe:
Well Depth: 244 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1984-09-28 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number: 13054
Plate Attached By: PUBLIC HEALTH OFFICER
Where Plate Attached: PIPE COMING OUT OF TOP OF WELL

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 85 (Driller's Estimate) U.S. Gallons per Minute
Development Method:
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 105 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM): N

Water Utility: N
Water Supply System Name: COBBLE HILL IMPROVEMENT DISTRICT
Water Supply System Well Name: HOLLAND WELL

SURFACE SEAL:
Flag: N
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
231.33	235.83		50
235.83	240.33		50
240.33	244		40

Casing from	to feet	Diameter	Material	Drive Shoe
250	231	6	Other	null

GENERAL REMARKS:

LITHOLOGY INFORMATION:

From	0	to	7 Ft.	Brown silty sand and gravel
From	7	to	40 Ft.	Grey shilty sand and gravel
From	40	to	107 Ft.	Brown silty sand
From	107	to	114 Ft.	Brown silty sand and gravel
From	114	to	120 Ft.	Brown silty sand
From	120	to	124 Ft.	Brown silty sand and gravel
From	124	to	129 Ft.	Brown silty sand
From	129	to	134 Ft.	Brown silty sand and gravel
From	134	to	155 Ft.	Brown silty sand
From	155	to	167 Ft.	Clean brown sandy gravel
From	167	to	189 Ft.	Brown sand
From	189	to	214 Ft.	Brown sandy gravel
From	214	to	227 Ft.	Brown sand
From	227	to	245 Ft.	Clean coarse gravel
From	227	to	245 Ft.	Clean coarse gravel

From 245 to 0 Ft. Very silty brown sand

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Information Disclaimer
The Province disclaims all responsibility for the accuracy of information provided. Information provided should not be used as a basis for making financial or any other commitments.

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 102200

Owner: Cobble Hill Improvement District

Address: Gallier Park

Area: Cobble Hill

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: 72775 Lot: A
Township: Section: 13 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well:

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Water Supply System
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: inches
Casing drive shoe: N Y N
Well Depth: 269.5 feet
Elevation: 360 feet (ASL)
Final Casing Stick Up: 18 inches
Well Cap Type: welded
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2010-04-19 00:00:00.0

Driller: Drillwell Enterprises
Well Identification Plate Number: 33745
Plate Attached By: DRILLER
Where Plate Attached: to casing

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 100 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method: Air lifting
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 151 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: Y
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: Y
Material: Bentonite clay
Method: Poured
Depth (ft): 15 feet
Thickness (in): 2 inches
Liner from To: feet

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
256.7	258.7		null
258.7	263.1		40
263.1	269.6		40

Casing from	to feet	Diameter	Material	Drive Shoe
0	15	12	null	N
0	276	8	Steel	Y
258	276	8	null	N

GENERAL REMARKS:
well casing pulled back to 258ft. WELL RECORD SUBMITTED THROUGH EWELLS.

LITHOLOGY INFORMATION:

From	0	to	38	Ft.	Medium cobbles & gravel	brown cobbles
From	38	to	65	Ft.	Soft	brown gravel
From	65	to	150	Ft.	Soft sand and silt	brown sand
From	150	to	170	Ft.	Medium	brown gravel
From	170	to	215	Ft.	Medium silty sand & gravel	wet brown silty sand
From	215	to	224	Ft.	Medium	wet brown gravel
From	224	to	234	Ft.	Soft	wet brown fine sand
From	234	to	243	Ft.	Medium coarse gravel	wet brown gravel
From	243	to	255	Ft.	Soft	wet brown fine sand
From	255	to	271	Ft.	Medium	wet brown gravel
From	271	to	276	Ft.	Soft fine silty sand	wet brown silty fine sand

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 8929	Construction Date: 1950-01-01 00:00:00.0
Owner: MCMILLAN	Driller: Unknown Well Identification Plate Number:
Address:	Plate Attached By: Where Plate Attached:
Area:	PRODUCTION DATA AT TIME OF DRILLING:
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: Lot: Township: Section: 13 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 2	Well Yield: 0 (Driller's Estimate) Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 70 feet WATER QUALITY: Character:
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Casing drive shoe: Well Depth: 336 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag:	Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in):
Site Info Details: Other Info Flag: Other Info Details:	WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
RECORD OF THIS WELL IN THE LANDS DEPT. V.L.A. 300' DRILLED IN 1919.

LITHOLOGY INFORMATION:
From 0 to 0 Ft. No log given.

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 8960	Construction Date: 1950-01-01 00:00:00.0
Owner: PAUL MICHELIN	Driller: Unknown Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	
Area:	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 0 (Driller's Estimate) Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level:
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: Lot: Township: Section: 13 Range: 6 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 20	WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 0.0 inches Casing drive shoe: Well Depth: 34 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in):
Site Info Details: Other Info Flag: Other Info Details:	WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:

LITHOLOGY INFORMATION:

From	0 to	0 Ft.	Hardpan visible at the surface, well
From	0 to	0 Ft.	doesn't fill up, went dry in 1952.

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 8979	Construction Date: 1950-01-01 00:00:00.0
Owner: BRAITHWAITE	Driller: Unknown Well Identification Plate Number: Plate Attached By:
Address:	Where Plate Attached:
Area:	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 0 (Driller's Estimate)
WELL LOCATION: SHAWNIGAN Land District District Lot: Plan: Lot: Township: Section: 15 Range: 7 Indian Reserve: Meridian: Block: Quarter: Island: BCGS Number (NAD 27): 092B063333 Well: 6	Development Method: Pump Test Info Flag: Artesian Flow: Artesian Pressure (ft): Static Level: 84 feet WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM):
Class of Well: Subclass of Well: Orientation of Well: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 0.0 inches Casing drive shoe: Well Depth: 86 feet Elevation: 0 feet (ASL) Final Casing Stick Up: inches Well Cap Type: Bedrock Depth: feet Lithology Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Site Info Details: Other Info Flag: Other Info Details:	Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: Material: Method: Depth (ft): Thickness (in): WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:

LITHOLOGY INFORMATION:

From	0 to	0 Ft.	A, 86' deep, 2' of water
From	0 to	0 Ft.	B, 34' deep, good supply

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 1324

Owner: MCMILLAN

Address:

Area: COBBLE HILL

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: Lot: 7
Township: Section: 13 Range: 6
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 13

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well: New
Well Use: Unknown Well Use
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.0 inches
Casing drive shoe:
Well Depth: 175 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag:
File Info Flag:
Sieve Info Flag:
Screen Info Flag:

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1919-01-01 00:00:00.0

Driller: Fritts, H. C.
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 0 (Driller's Estimate)
Development Method:
Pump Test Info Flag:
Artesian Flow:
Artesian Pressure (ft):
Static Level:

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag:
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe

GENERAL REMARKS:
HOLE WAS ABANDONED.

LITHOLOGY INFORMATION:

From	0 to	11 Ft.	Large boulders
From	11 to	13 Ft.	Gravel
From	13 to	21 Ft.	Very hard sand and boulders
From	21 to	33 Ft.	Coarse and fine sand & boulders v. hard

From	33	to	50	Ft.	Grey coarse sand mixed with wash gravel
From	0	to	0	Ft.	& boulders very hard driving
From	50	to	54	Ft.	Cemented fine sand
From	54	to	56	Ft.	Clay
From	56	to	60	Ft.	Sand with white gravel, little water
From	60	to	71	Ft.	Cemented grey sand
From	71	to	72	Ft.	Clay
From	72	to	85	Ft.	Coarse grey sand, sharp little white
From	0	to	0	Ft.	wash gravel, mixed with coarse gravel
From	85	to	87	Ft.	Clay
From	87	to	110	Ft.	Fine & coarse sand, very hard
From	110	to	112	Ft.	Fine gravel
From	112	to	122	Ft.	Sand and fine gravel
From	122	to	123	Ft.	Fine gravel
From	123	to	145	Ft.	Fine & coarse sand and fine wash gravel
From	145	to	150	Ft.	Coarse gravel wash
From	150	to	165	Ft.	Clay with little fine sand
From	165	to	170	Ft.	Formation changing to clayey sands and
From	0	to	0	Ft.	gravels
From	170	to	175	Ft.	Clay sand and fine wash gravel
From	175	to	0	Ft.	Gravel, black sand, some rusty yellow
From	0	to	0	Ft.	clay

- Return to Main
- Return to Search Options
- Return to Search Criteria

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 81988

Owner: Rainey

Address: 3730 TRANS CANADA HIGHWAY

Area: MALAHAT

WELL LOCATION:
SHAWNIGAN Land District
District Lot: Plan: VIP 83037 Lot: A
Township: Section: Range:
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 092B063333 Well: 54

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well: New
Well Use: Private Domestic
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: 6.00 inches
Casing drive shoe:
Well Depth: 350 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: 14 feet
Lithology Info Flag: N
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: N

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date:

Driller: Tri-K Drilling
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 25 (Driller's Estimate) Gallons per Minute (U.S./Imperial)
Development Method:
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level:

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: N
Material:
Method:
Depth (ft):
Thickness (in):
Liner from To: feet
Liner from To: feet
Liner from To: feet

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe
2	22	null	Steel	null

GENERAL REMARKS:
Aluminium well lid

LITHOLOGY INFORMATION:

From		to	Ft.	Drilled 350 ft with 22 ft casing installed and grouted
From	14	to 130	Ft.	blue/grey volcanic bedrock- medium hardness- medium grained
From	40	to	Ft.	fracture- traces of water
From	120	to	Ft.	fracture- total water @ 1/2 gpm
From	130	to 170	Ft.	blue green volcanic- traces of feldspar
From	170	to 180	Ft.	broken area in rock- water increased to 1.5 gpm
From	180	to 225	Ft.	blue/green volcanic- hard fine grained
From	225	to 350	Ft.	blue/green volcanic- medium hardness- medium grained
From	300	to 330	Ft.	no changes
From	331	to	Ft.	fracture- 12 gpm
From	346	to	Ft.	fracture- water increased to 25 gpm
From		to	Ft.	**360 ft liner installed
From		to	Ft.	water quality and quantity not guaranteed by drilling contractor
From		to	Ft.	total estimated yield= 25 gpm

- Return to Main
- Return to Search Options
- Return to Search Criteria

APPENDIX C

APPENDIX C PHOTOGRAPHS

Photo 1
View of the entrance to the indoor facility at Fisher Road Recycling Facility.

Photo 2
View of the finished screened Class A compost on concrete pad.

Photo 3
View of the leachate collection tank.

Photo 4
View of the leachate and condensation collection tank and associated piping for recycling.

Photo 5
View of the condensation collecting gutter system on the concrete pad inside the biofilter.

Photo 6
View of the shed containing the onsite groundwater well.

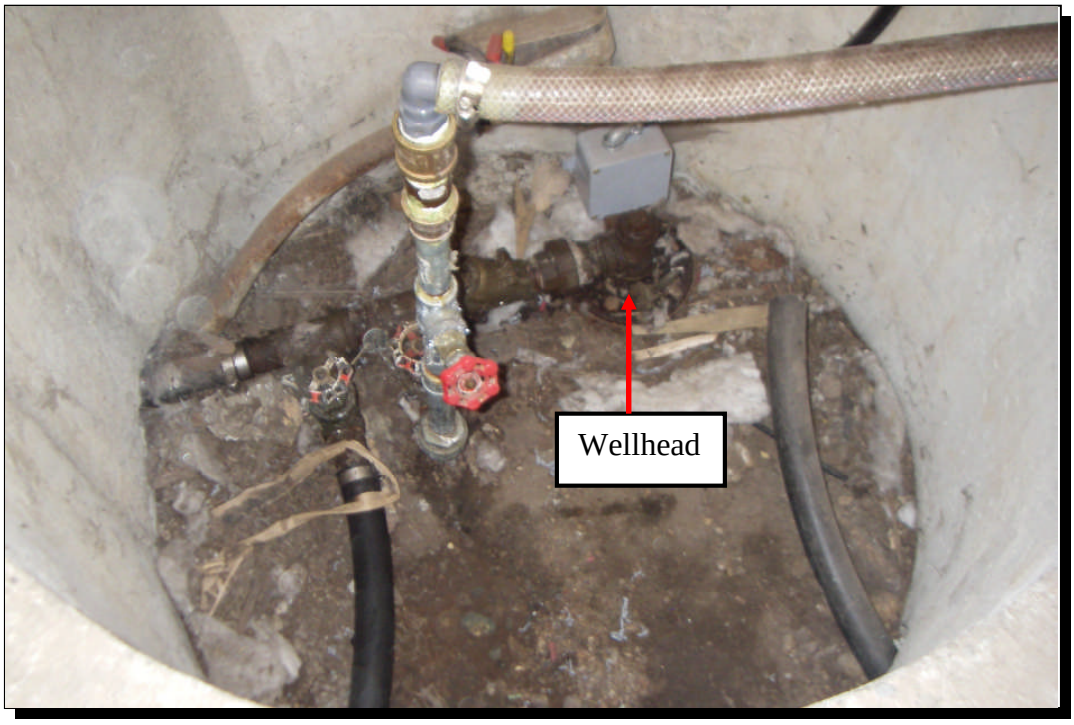

Photo 7
View of the wellhead at the base of a 1 m concrete ring.

Photo 8
View of the Swale that parallels Fisher Road. Runoff from the infiltrates into the subsurface here.

Photo 9
View of one oil/water separator that collects runoff from the newly constructed recycling drop-off area.

Photo 10
Household garbage drop-off area.

Photo 11
New recycling goods drop off facility.

Photo 12
Access road to Central Landscape Supplies Ltd. composting facility.

Photo 13
Constructed leachate collection pit at Central.

Photo 14
View of Central's Class A compost finished product.

Photo 15
Imported mixing soil for Class A compost to create a topsoil mix at Central.

Photo 16
Sand and gravel extraction pit looking south towards the site from Pacific Homes.

Photo 17
Commercial businesses located at the base of the sand and gravel extraction pit north of the site.

Photo 18
Raven metal products located east of the site at Fisher Road and Ball Road.

Photo 19
Harlequin factory direct clothing outlet located northeast of the site on Fisher Road.

Photo 20
Gamboa Farms greenhouses located south of the site.

APPENDIX D

APPENDIX D HISTORICAL ANALYTICAL DATA AND LABORATORY ANALYTICAL REPORTS

Your Project #: N23101632 CVRD FISHER RD
Your C.O.C. #: G014715

Attention: Mike Gallo
EBA ENGINEERING CONSULTANTS LTD.
NANAIMO - Rebate
#1 - 4376 BOBAN DRIVE
NANAIMO, BC
Canada V9T 6A7

Report Date: 2010/11/18
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B069962
Received: 2010/08/11, 16:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water (1)	1	2010/08/12	2010/08/12	56-C-001	Based on SM2320B
Biochemical Oxygen Demand (1)	1	2010/08/13	2010/08/13	56-C-002	Based on SM-5210
Chloride by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00234 R3.0	Based on EPA 325.2
Chemical Oxygen Demand (1)	1	N/A	2010/08/17	70-C-001	Based on SM-5200 A,D
Colour (True) (1)	1	N/A	2010/08/13	56-C-011	Based on SM-2120B
Coliforms & E.coli by Quantitray (MPN) (1)	1	N/A	2010/08/12	56-C-015	Based on SM-9223
Conductance - water (1)	1	N/A	2010/08/12	56-C-003	Based on SM-2510
Fluoride	1	N/A	2010/08/19	BRN SOP-00282 R4.0	Based SM - 4500 F C
Fecal Coliform by membrane filtration (1)	1	N/A	2010/08/12	70-C-200	Based on SM-9222
Hardness Total (calculated as CaCO3)	1	N/A	2010/08/20		
Hardness (calculated as CaCO3)	1	N/A	2010/08/19		
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (dissolved)	1	N/A	2010/08/18	BRN SOP-00206	Based on EPA 200.8
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2010/08/20	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (total)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Nitrogen (Total)	1	2010/08/13	2010/08/17	BRN SOP-00242 R3.0	Based on SM-4500N C
Ammonia-N	1	N/A	2010/08/18	BBY6SOP-00044	Based on EPA 350.1
Nitrate + Nitrite (N)	1	N/A	2010/08/19		Based on USEPA 353.2
Nitrite (N) by CFA (1)	1	N/A	2010/08/12	56-C-006	Based SM-4500 NO2 B
Nitrate (N) (1)	1	N/A	2010/08/13	56-C-016	Based SM 4500 NO3 B
Filter and HNO3 Preserve for Metals	1	N/A	2010/08/12	BRN WI-00006 R1.0	Based on EPA 200.2
pH Water (1)	1	N/A	2010/08/12	56-C-007	Based on SM-4500 pH
Phosphate-P (Ortho) (1)	1	N/A	2010/08/12	56-C-008	Based on SM 4500 P E
Sulphate by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00243 R1.0	Based on EPA 375.4
Total Dissolved Solids (Filt. Residue) (1)	1	N/A	2010/08/12	56-C-009	Based on SM 2540C
TKN (Calc. TN, N/N) total	1	N/A	2010/08/20		
Tannin & Lignin (Total) (1)	1	N/A	2010/08/13	56-C-020	Based on SM-5550 A
Turbidity (1)	1	N/A	2010/08/13	56-C-012	Based on SM - 2130

* Results relate only to the items tested.

(1) This test was performed by Maxxam Victoria

../2

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Maxxam Job #: B069962
Report Date: 2010/11/18

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CYNDY WILKINSON, B.Sc, Burnaby Customer Service
Email: CWilkinson@maxxam.ca
Phone# (604) 639-2605

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Maxxam Job #: B069962
Report Date: 2010/11/18

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13799		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1355 FISHER ROAD**	**RDL**	**QC Batch**
ANIONS						
Nitrite (N)	mg/L	**1**		<0.002	0.002	4194014
Misc. Inorganics						
Fluoride (F)	mg/L	**1.5**		0.02	0.01	4191823
Alkalinity (Total as CaCO3)	mg/L			65	2	4176419
Bicarbonate (HCO3)	mg/L			79	2	4176419
Carbonate (CO3)	mg/L			<2	2	4176419
Hydroxide (OH)	mg/L			<2	2	4176419
Anions						
Dissolved Sulphate (SO4)	mg/L		**500**	43	0.5	4195017
Dissolved Chloride (Cl)	mg/L		**250**	36	0.5	4194799
MISCELLANEOUS						
True Colour	Col. Unit		**15**	5	5	4167006
Nutrients						
Nitrate (N)	mg/L	**10**		**45.9**	0.04	4200720
Physical Properties						
Conductivity	uS/cm			786	1	4175569
pH	pH Units		**6.5:8.5**	7.3		4176428
Physical Properties						
Total Dissolved Solids	mg/L		**500**	**563**	10	4174873
Turbidity	NTU			<0.1	0.1	4179239

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13799		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1355 FISHER ROAD**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L			<3	3	4187948
Total Antimony (Sb)	ug/L	**6**		<0.5	0.5	4187948
Total Arsenic (As)	ug/L	**10**		<0.1	0.1	4187948
Total Barium (Ba)	ug/L	**1000**		13	1	4187948
Total Boron (B)	ug/L	**5000**		<50	50	4187948
Total Cadmium (Cd)	ug/L	**5**		0.04	0.01	4187948
Total Chromium (Cr)	ug/L	**50**		1	1	4187948
Total Copper (Cu)	ug/L		**1000**	9.0	0.2	4187948
Total Iron (Fe)	ug/L		**300**	37	5	4187948
Total Lead (Pb)	ug/L	**10**		0.4	0.2	4187948
Total Manganese (Mn)	ug/L		**50**	<1	1	4187948
Total Mercury (Hg)	ug/L	**1**		<0.02	0.02	4187948
Total Selenium (Se)	ug/L	**10**		<0.1	0.1	4187948
Total Uranium (U)	ug/L	**20**		<0.1	0.1	4187948
Total Zinc (Zn)	ug/L		**5000**	6	5	4187948
Total Magnesium (Mg)	mg/L			31.2	0.05	4172131
Total Sodium (Na)	mg/L		**200**	14.0	0.05	4172131
Microbiological Param.						
E. coli	MPN/100mL	**0**		<1	1	4178064
Total Coliforms	MPN/100mL	**0**		**120**	1	4178064

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID					W13799		
Sampling Date					2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**1355 FISHER ROAD**	**RDL**	**QC Batch**
Calculated Parameters							
Filter and HNO3 Preservation	N/A				FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L	**5**	20	100	310	0.5	4173097
Demand Parameters							
Chemical Oxygen Demand	mg/L				0	0	4185140
Biochemical Oxygen Demand	mg/L				<5	5	4190082
MISCELLANEOUS							
Tannins and Lignins	mg/L				0.8	0.1	4166913
Nutrients							
Ammonia (N)	mg/L				0.005	0.005	4188649
Dissolved Orthophosphate (P)	mg/L				0.036	0.003	4176615

MICROBIOLOGY (WATER)

Maxxam ID		W13799		
Sampling Date		2010/08/11 00:00		
	Units	**1355 FISHER ROAD**	**RDL**	**QC Batch**
MICROBIOLOGY				
Fecal Coliforms	CFU/100mL	<1	1	4178070

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13799		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1355 FISHER ROAD**	**RDL**	**QC Batch**
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	**5**	20	100		297	0.5	4173098

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13799		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1355 FISHER ROAD**	**RDL**	**QC Batch**
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L					<0.003	0.003	4187820
Dissolved Antimony (Sb)	mg/L	**0.006**				<0.0005	0.0005	4187820
Dissolved Arsenic (As)	mg/L	**0.01**				0.0003	0.0001	4187820
Dissolved Barium (Ba)	mg/L	**1**				0.013	0.001	4187820
Dissolved Beryllium (Be)	mg/L					<0.0001	0.0001	4187820
Dissolved Bismuth (Bi)	mg/L					<0.001	0.001	4187820
Dissolved Boron (B)	mg/L	**5**				<0.05	0.05	4187820
Dissolved Cadmium (Cd)	mg/L	**0.005**				0.00004	0.00001	4187820
Dissolved Chromium (Cr)	mg/L	**0.05**				0.001	0.001	4187820
Dissolved Cobalt (Co)	mg/L					<0.0005	0.0005	4187820
Dissolved Copper (Cu)	mg/L				**1**	0.0087	0.0002	4187820
Dissolved Iron (Fe)	mg/L				**0.3**	0.034	0.005	4187820
Dissolved Lead (Pb)	mg/L	**0.01**				0.0004	0.0002	4187820
Dissolved Lithium (Li)	mg/L					<0.005	0.005	4187820
Dissolved Manganese (Mn)	mg/L				**0.05**	<0.001	0.001	4187820
Dissolved Mercury (Hg)	mg/L	**0.001**				<0.00002	0.00002	4187820
Dissolved Molybdenum (Mo)	mg/L					<0.001	0.001	4187820
Dissolved Nickel (Ni)	mg/L					0.008	0.001	4187820
Dissolved Selenium (Se)	mg/L	**0.01**				<0.0001	0.0001	4187820
Dissolved Silicon (Si)	mg/L					13.6	0.1	4187820
Dissolved Silver (Ag)	mg/L					<0.00002	0.00002	4187820
Dissolved Strontium (Sr)	mg/L					0.286	0.001	4187820
Dissolved Thallium (Tl)	mg/L					<0.00005	0.00005	4187820
Dissolved Tin (Sn)	mg/L					<0.005	0.005	4187820
Dissolved Titanium (Ti)	mg/L					<0.005	0.005	4187820
Dissolved Uranium (U)	mg/L	**0.02**				<0.0001	0.0001	4187820
Dissolved Vanadium (V)	mg/L					<0.005	0.005	4187820
Dissolved Zinc (Zn)	mg/L				**5**	0.007	0.005	4187820
Dissolved Zirconium (Zr)	mg/L					<0.0005	0.0005	4187820
Dissolved Calcium (Ca)	mg/L					68.1	0.05	4171426
Dissolved Magnesium (Mg)	mg/L					30.8	0.05	4171426
Dissolved Potassium (K)	mg/L					0.98	0.05	4171426
Dissolved Sodium (Na)	mg/L				**200**	13.4	0.05	4171426

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13799		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1355 FISHER ROAD**	**RDL**	**QC Batch**
Dissolved Sulphur (S)	mg/L					18	3	4171426

TOTAL TKN IN WATER (WATER)

Maxxam ID			W13799		
Sampling Date			2010/08/11 00:00		
	Units	**Criteria A**	**1355 FISHER ROAD**	**RDL**	**QC Batch**
Nutrients					
Total Kjeldahl Nitrogen (Calc)	mg/L		<2	2	4171438
Nitrate plus Nitrite (N)	mg/L	**10**	**47**(1)	2	4193877
Total Nitrogen (N)	mg/L		45	2	4186093

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."
(1) - Sample analysed past recommended hold time

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Package 1	14.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4166913	Tannins and Lignins	2010/08/13					<0.1	mg/L	NC	20
4167006	True Colour	2010/08/13			100	N/A	<5	Col. Unit	NC	10
4174873	Total Dissolved Solids	2010/08/12			103	80 - 120	<10	mg/L	1.6	20
4175569	Conductivity	2010/08/12			100	96 - 104	<1	uS/cm	0	20
4176419	Alkalinity (Total as CaCO3)	2010/08/12			98	N/A	<2	mg/L	0.6	20
4176419	Bicarbonate (HCO3)	2010/08/12					<2	mg/L		
4176419	Carbonate (CO3)	2010/08/12					<2	mg/L		
4176419	Hydroxide (OH)	2010/08/12					<2	mg/L		
4176615	Dissolved Orthophosphate (P)	2010/08/12	101	90 - 110	100	90 - 106	<0.003	mg/L	1.7	20
4178064	E. coli	2010/08/12							NC	50
4178064	Total Coliforms	2010/08/12							NC	45
4178070	Fecal Coliforms	2010/08/12							NC	N/A
4179239	Turbidity	2010/08/13			102	N/A	<0.1	NTU	NC	20
4185140	Chemical Oxygen Demand	2010/08/17	96	84 - 113	103	N/A	0, RDL=0	mg/L	14.9	20
4186093	Total Nitrogen (N)	2010/08/17	NC	80 - 120	85	80 - 120	<0.02	mg/L	7.0	20
4187820	Dissolved Arsenic (As)	2010/08/18	NC	80 - 120	97	80 - 120	<0.0001	mg/L	0.6	20
4187820	Dissolved Beryllium (Be)	2010/08/18	100	80 - 120	98	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Cadmium (Cd)	2010/08/18	98	80 - 120	98	80 - 120	<0.00001	mg/L	NC	20
4187820	Dissolved Chromium (Cr)	2010/08/18	99	80 - 120	97	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Cobalt (Co)	2010/08/18	97	80 - 120	98	80 - 120	<0.0005	mg/L	NC	20
4187820	Dissolved Copper (Cu)	2010/08/18	93	80 - 120	98	80 - 120	<0.0002	mg/L	3.3	20
4187820	Dissolved Lead (Pb)	2010/08/18	95	80 - 120	98	80 - 120	<0.0002	mg/L	NC	20
4187820	Dissolved Lithium (Li)	2010/08/18	100	80 - 120	101	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Nickel (Ni)	2010/08/18	95	80 - 120	96	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Selenium (Se)	2010/08/18	102	80 - 120	96	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Uranium (U)	2010/08/18	99	80 - 120	96	80 - 120	<0.0001	mg/L	0.07	20
4187820	Dissolved Vanadium (V)	2010/08/18	102	80 - 120	95	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Zinc (Zn)	2010/08/18	96	80 - 120	92	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Aluminum (Al)	2010/08/18					<0.003	mg/L	NC	20
4187820	Dissolved Antimony (Sb)	2010/08/18					<0.0005	mg/L	NC	20
4187820	Dissolved Barium (Ba)	2010/08/18					<0.001	mg/L	0.02	20
4187820	Dissolved Bismuth (Bi)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Boron (B)	2010/08/18					<0.05	mg/L	NC	20
4187820	Dissolved Iron (Fe)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Manganese (Mn)	2010/08/18					<0.001	mg/L	1.4	20
4187820	Dissolved Mercury (Hg)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Molybdenum (Mo)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Silicon (Si)	2010/08/18					<0.1	mg/L	0.1	20
4187820	Dissolved Silver (Ag)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Strontium (Sr)	2010/08/18					<0.001	mg/L	0.3	20

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4187820	Dissolved Thallium (Tl)	2010/08/18					<0.00005	mg/L	NC	20
4187820	Dissolved Tin (Sn)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Titanium (Ti)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Zirconium (Zr)	2010/08/18					<0.0005	mg/L	NC	20
4187948	Total Arsenic (As)	2010/08/19	106	80 - 120	98	80 - 120	<0.1	ug/L	3.7	20
4187948	Total Cadmium (Cd)	2010/08/19	106	80 - 120	98	80 - 120	<0.01	ug/L	NC	20
4187948	Total Chromium (Cr)	2010/08/19	106	80 - 120	101	80 - 120	<1	ug/L	NC	20
4187948	Total Copper (Cu)	2010/08/19	104	80 - 120	102	80 - 120	<0.2	ug/L	6.5	20
4187948	Total Lead (Pb)	2010/08/19	101	80 - 120	97	80 - 120	<0.2	ug/L	NC	20
4187948	Total Selenium (Se)	2010/08/19	110	80 - 120	102	80 - 120	<0.1	ug/L	NC	20
4187948	Total Uranium (U)	2010/08/19	106	80 - 120	97	80 - 120	<0.1	ug/L	2.4	20
4187948	Total Zinc (Zn)	2010/08/19	105	80 - 120	98	80 - 120	<5	ug/L	NC	20
4187948	Total Aluminum (Al)	2010/08/19					<3	ug/L	NC	20
4187948	Total Antimony (Sb)	2010/08/19					<0.5	ug/L	NC	20
4187948	Total Barium (Ba)	2010/08/19					<1	ug/L	0.1	20
4187948	Total Boron (B)	2010/08/19					<50	ug/L	NC	20
4187948	Total Iron (Fe)	2010/08/19					<5	ug/L	0.3	20
4187948	Total Manganese (Mn)	2010/08/19					<1	ug/L	2.4	20
4187948	Total Mercury (Hg)	2010/08/19					<0.02	ug/L		
4188649	Ammonia (N)	2010/08/18	97	80 - 120	97	80 - 120	<0.005	mg/L	5.3	20
4190082	Biochemical Oxygen Demand	2010/08/13			90	N/A	<5	mg/L	5.2	20
4191823	Fluoride (F)	2010/08/19	85	80 - 120	95	80 - 120	0.01, RDL=0.01	mg/L	0.5	20
4193877	Nitrate plus Nitrite (N)	2010/08/19	105	80 - 120	107	80 - 120	<0.02	mg/L	0.7 (1)	25
4194014	Nitrite (N)	2010/08/12	104	79 - 115	93	80 - 122	<0.002	mg/L	NC	20
4194799	Dissolved Chloride (Cl)	2010/08/19	NC	80 - 120	97	80 - 120	<0.5	mg/L	3.9	20
4195017	Dissolved Sulphate (SO4)	2010/08/19	NC	80 - 120	99	80 - 120	<0.5	mg/L	1.8	20
4200720	Nitrate (N)	2010/08/13	100	N/A	110	N/A	<0.04	mg/L	NC	20

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Sample analysed past recommended hold time

Maxxam

4606 Canada Way, Burnaby, BC Canada V5G 1K5 Ph: 604 734 7276 Toll Free: 1 800 665 8566 Fax: 604 731 2386

CHAIN OF CUSTODY RECORD

Page: 1 of 1

Maxxam Job#: B069962

G 014715

Invoice To: Require Report? Yes [X] No [ ]

Company Name: EBA Engineering
Contact Name: Mike Gallo
Address: 1-4376 Boban Drive
Nanaimo BC PC: V9T 6A7
Phone / Fax#: Ph: 250-756-2256 Fax: 250-756-2686
E-mail: mgallo@eba.ca

Report To:

Company Name: SAME
Contact Name:
Address:
PC:
Phone / Fax#: Ph: Fax:
E-mail

PO #:
Quotation #:
Project #: N23101632
Proj. Name: CVRD FISHER ROAD ENV. REVIEW
Location: COBBLE HILL, BC
Sampled By: MIKE GALLO

REGULATORY REQUIREMENTS SERVICE REQUESTED:

- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other
- [X] DRINKING WATER

- [X] Regular Turn Around Time (TAT) (5 days for most tests)
- [ ] RUSH (Please contact the lab)
- [ ] 1 Day [ ] 2 Day [ ] 3 Day
- Date Required:

Special Instructions:

Return Cooler [ ] **Ship Sample Bottles (please specify)** [ ]

ANALYSIS REQUESTED (Full scan)

Printed analysis columns: BTEX/VPH, MTBE, VOC/VPH, EPH, TEH, PAH, LEPH/HEPH, CCME-PHC (Fractions 1-4 Plus BTEX), CCME-PHC (Fractions 2-4), CCME BTEX (Fraction 1 Plus BTEX), PCB, Phenols by 4AAP, Phenols by GCMS, TOG, MOG, SWOG, Dissolved (Field Filtered? Y [X] N), Metals (Field Acidified? Y [X] N), Totals Metals Field Acidified? (Y [X] N), Nitrate [X], Nitrite [X], Ammonia [X], Chloride [X], Fluoride [X], Sulphate [X], Total Suspended Solids-TSS, TDS [X], pH [X], Conductivity [X], Alkalinity [X], BOD [X], COD [X], Coliform, Total & E.coli [X], Fecal [X], Asbestos, DW PKG (ICT. ENPOT), Tannin & Lignin, NH4, Ortho Phosphate, TKN (Tot Kjeldahl N), HOLD

	Sample Identification	Lab Identification	Sample Type	Date/Time Sampled	Dissolved	Metals	BOD	COD	Coliform, Total & E.coli	DW PKG (ICT. ENPOT)	Tannin & Lignin	NH4	Ortho Phosphate	TKN (Tot Kjeldahl N)	HOLD
1	FRRC		GW	Aug 11/10	X	X	X	X	X	X	X	X	X	X	
2	Lockhart		GW	Aug 11/10	X	X	X	X	X	X	X	X	X	X	
3	Gamboa		GW	Aug 11/10	X	X	X	X	X	X	X	X	X	X	
4	Good Auto (G.A.)		GW	Aug 11/10	X	X	X	X	X	X	X	X	X	X	
5	CHID		GW	Aug 11/10	X	X	X	X	X	X	X	X	X	X	
6															
7															
8															
9															
10															
11															
12															

Samples are from a Drinking Water Source? YES [✓] NO [ ]
Does source supply multiple households? YES [✓] NO [ ]

*Relinquished by:	Date (YY/MM/DD):	Time:	Received by:	Date (YY/MM/DD):	Time:
M Gallo			Debbie Nordbrugt	11 Aug 2010	1600

Time Sensitive [✓]

Laboratory Use Only

Temperature on Receipt (°C): 13.8°C

Custody Seal Intact on Cooler? Yes [ ] No [ ] NA

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

COC-1020 (05/10)

Maxxam International Corporation o/a Maxxam Analytics

Your Project #: N23101632 CVRD FISHER RD
Your C.O.C. #: G014715

Attention: Mike Gallo
EBA ENGINEERING CONSULTANTS LTD.
NANAIMO - Rebate
#1 - 4376 BOBAN DRIVE
NANAIMO, BC
Canada V9T 6A7

Report Date: 2010/11/18
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B069962
Received: 2010/08/11, 16:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water (1)	1	2010/08/12	2010/08/12	56-C-001	Based on SM2320B
Biochemical Oxygen Demand (1)	1	2010/08/13	2010/08/13	56-C-002	Based on SM-5210
Chloride by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00234 R3.0	Based on EPA 325.2
Chemical Oxygen Demand (1)	1	N/A	2010/08/17	70-C-001	Based on SM-5200 A,D
Colour (True) (1)	1	N/A	2010/08/13	56-C-011	Based on SM-2120B
Coliforms & E.coli by Quantitray (MPN) (1)	1	N/A	2010/08/12	56-C-015	Based on SM-9223
Conductance - water (1)	1	N/A	2010/08/12	56-C-003	Based on SM-2510
Fluoride	1	N/A	2010/08/19	BRN SOP-00282 R4.0	Based SM - 4500 F C
Fecal Coliform by membrane filtration (1)	1	N/A	2010/08/12	70-C-200	Based on SM-9222
Hardness Total (calculated as CaCO3)	1	N/A	2010/08/20		
Hardness (calculated as CaCO3)	1	N/A	2010/08/19		
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (dissolved)	1	N/A	2010/08/18	BRN SOP-00206	Based on EPA 200.8
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2010/08/20	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (total)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Nitrogen (Total)	1	2010/08/13	2010/08/17	BRN SOP-00242 R3.0	Based on SM-4500N C
Ammonia-N	1	N/A	2010/08/18	BBY6SOP-00044	Based on EPA 350.1
Nitrate + Nitrite (N)	1	N/A	2010/08/19		Based on USEPA 353.2
Nitrite (N) by CFA (1)	1	N/A	2010/08/12	56-C-006	Based SM-4500 NO2 B
Nitrate (N) (1)	1	N/A	2010/08/13	56-C-016	Based SM 4500 NO3 B
Filter and HNO3 Preserve for Metals	1	N/A	2010/08/12	BRN WI-00006 R1.0	Based on EPA 200.2
pH Water (1)	1	N/A	2010/08/12	56-C-007	Based on SM-4500 pH
Phosphate-P (Ortho) (1)	1	N/A	2010/08/12	56-C-008	Based on SM 4500 P E
Sulphate by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00243 R1.0	Based on EPA 375.4
Total Dissolved Solids (Filt. Residue) (1)	1	N/A	2010/08/12	56-C-009	Based on SM 2540C
TKN (Calc. TN, N/N) total	1	N/A	2010/08/20		
Tannin & Lignin (Total) (1)	1	N/A	2010/08/13	56-C-020	Based on SM-5550 A
Turbidity (1)	1	N/A	2010/08/13	56-C-012	Based on SM - 2130

* Results relate only to the items tested.

(1) This test was performed by Maxxam Victoria

../2

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Maxxam Job #: B069962
Report Date: 2010/11/18

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CYNDY WILKINSON, B.Sc, Burnaby Customer Service
Email: CWilkinson@maxxam.ca
Phone# (604) 639-2605

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Maxxam Job #: B069962
Report Date: 2010/11/18

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13801		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
ANIONS						
Nitrite (N)	mg/L	**1**		<0.002	0.002	4194014
Misc. Inorganics						
Fluoride (F)	mg/L	**1.5**		0.02	0.01	4191823
Alkalinity (Total as CaCO3)	mg/L			78	2	4176419
Bicarbonate (HCO3)	mg/L			95	2	4176419
Carbonate (CO3)	mg/L			<2	2	4176419
Hydroxide (OH)	mg/L			<2	2	4176419
Anions						
Dissolved Sulphate (SO4)	mg/L		**500**	29	0.5	4195017
Dissolved Chloride (Cl)	mg/L		**250**	20	0.5	4194799
MISCELLANEOUS						
True Colour	Col. Unit		**15**	5	5	4167006
Nutrients						
Nitrate (N)	mg/L	**10**		**17.1**	0.04	4200720
Physical Properties						
Conductivity	uS/cm			445	1	4175569
pH	pH Units		**6.5:8.5**	7.1		4176428
Physical Properties						
Total Dissolved Solids	mg/L		**500**	283	10	4174873
Turbidity	NTU			<0.1	0.1	4179239

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13801		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L			<3	3	4187948
Total Antimony (Sb)	ug/L	**6**		<0.5	0.5	4187948
Total Arsenic (As)	ug/L	**10**		0.1	0.1	4187948
Total Barium (Ba)	ug/L	**1000**		8	1	4187948
Total Boron (B)	ug/L	**5000**		<50	50	4187948
Total Cadmium (Cd)	ug/L	**5**		0.01	0.01	4187948
Total Chromium (Cr)	ug/L	**50**		<1	1	4187948
Total Copper (Cu)	ug/L		**1000**	56.7	0.2	4187948
Total Iron (Fe)	ug/L		**300**	17	5	4187948
Total Lead (Pb)	ug/L	**10**		<0.2	0.2	4187948
Total Manganese (Mn)	ug/L		**50**	<1	1	4187948
Total Mercury (Hg)	ug/L	**1**		<0.02	0.02	4187948
Total Selenium (Se)	ug/L	**10**		<0.1	0.1	4187948
Total Uranium (U)	ug/L	**20**		<0.1	0.1	4187948
Total Zinc (Zn)	ug/L		**5000**	<5	5	4187948
Total Magnesium (Mg)	mg/L			16.8	0.05	4172131
Total Sodium (Na)	mg/L		**200**	10.3	0.05	4172131
Microbiological Param.						
E. coli	MPN/100mL	**0**		<1	1	4178064
Total Coliforms	MPN/100mL	**0**		<1	1	4178064

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID					W13801		
Sampling Date					2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
Calculated Parameters							
Filter and HNO3 Preservation	N/A				FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L	**5**	20	100	172	0.5	4173097
Demand Parameters							
Chemical Oxygen Demand	mg/L				0	0	4185140
Biochemical Oxygen Demand	mg/L				<5	5	4190082
MISCELLANEOUS							
Tannins and Lignins	mg/L				<0.1	0.1	4166913
Nutrients							
Ammonia (N)	mg/L				<0.005	0.005	4188649
Dissolved Orthophosphate (P)	mg/L				0.034	0.003	4176615

MICROBIOLOGY (WATER)

Maxxam ID		W13801		
Sampling Date		2010/08/11 00:00		
	Units	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
MICROBIOLOGY				
Fecal Coliforms	CFU/100mL	<1	1	4178070

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13801		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	**5**	20	100		166	0.5	4173098

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13801		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L					<0.003	0.003	4187820
Dissolved Antimony (Sb)	mg/L	**0.006**				<0.0005	0.0005	4187820
Dissolved Arsenic (As)	mg/L	**0.01**				0.0001	0.0001	4187820
Dissolved Barium (Ba)	mg/L	**1**				0.008	0.001	4187820
Dissolved Beryllium (Be)	mg/L					<0.0001	0.0001	4187820
Dissolved Bismuth (Bi)	mg/L					<0.001	0.001	4187820
Dissolved Boron (B)	mg/L	**5**				<0.05	0.05	4187820
Dissolved Cadmium (Cd)	mg/L	**0.005**				0.00001	0.00001	4187820
Dissolved Chromium (Cr)	mg/L	**0.05**				<0.001	0.001	4187820
Dissolved Cobalt (Co)	mg/L					<0.0005	0.0005	4187820
Dissolved Copper (Cu)	mg/L				**1**	0.0559	0.0002	4187820
Dissolved Iron (Fe)	mg/L				**0.3**	0.017	0.005	4187820
Dissolved Lead (Pb)	mg/L	**0.01**				<0.0002	0.0002	4187820
Dissolved Lithium (Li)	mg/L					<0.005	0.005	4187820
Dissolved Manganese (Mn)	mg/L				**0.05**	<0.001	0.001	4187820
Dissolved Mercury (Hg)	mg/L	**0.001**				<0.00002	0.00002	4187820
Dissolved Molybdenum (Mo)	mg/L					<0.001	0.001	4187820
Dissolved Nickel (Ni)	mg/L					0.003	0.001	4187820
Dissolved Selenium (Se)	mg/L	**0.01**				<0.0001	0.0001	4187820
Dissolved Silicon (Si)	mg/L					13.3	0.1	4187820
Dissolved Silver (Ag)	mg/L					<0.00002	0.00002	4187820
Dissolved Strontium (Sr)	mg/L					0.172	0.001	4187820
Dissolved Thallium (Tl)	mg/L					<0.00005	0.00005	4187820
Dissolved Tin (Sn)	mg/L					<0.005	0.005	4187820
Dissolved Titanium (Ti)	mg/L					<0.005	0.005	4187820
Dissolved Uranium (U)	mg/L	**0.02**				<0.0001	0.0001	4187820
Dissolved Vanadium (V)	mg/L					<0.005	0.005	4187820
Dissolved Zinc (Zn)	mg/L				**5**	0.006	0.005	4187820
Dissolved Zirconium (Zr)	mg/L					<0.0005	0.0005	4187820
Dissolved Calcium (Ca)	mg/L					38.8	0.05	4171426
Dissolved Magnesium (Mg)	mg/L					16.8	0.05	4171426
Dissolved Potassium (K)	mg/L					0.78	0.05	4171426
Dissolved Sodium (Na)	mg/L				**200**	9.91	0.05	4171426

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13801		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
Dissolved Sulphur (S)	mg/L					11	3	4171426

TOTAL TKN IN WATER (WATER)

Maxxam ID			W13801		
Sampling Date			2010/08/11 00:00		
	Units	**Criteria A**	**1360 FISHER ROAD 140-FOOT WELL**	**RDL**	**QC Batch**
Nutrients					
Total Kjeldahl Nitrogen (Calc)	mg/L		<0.2	0.2	4171438
Nitrate plus Nitrite (N)	mg/L	**10**	**16.6**(1)	0.2	4193877
Total Nitrogen (N)	mg/L		15.8	0.2	4186093

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."
(1) - Sample analysed past recommended hold time

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Package 1	14.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4166913	Tannins and Lignins	2010/08/13					<0.1	mg/L	NC	20
4167006	True Colour	2010/08/13			100	N/A	<5	Col. Unit	NC	10
4174873	Total Dissolved Solids	2010/08/12			103	80 - 120	<10	mg/L		
4175569	Conductivity	2010/08/12			100	96 - 104	<1	uS/cm	0	20
4176419	Alkalinity (Total as CaCO3)	2010/08/12			98	N/A	<2	mg/L	0.6	20
4176419	Bicarbonate (HCO3)	2010/08/12					<2	mg/L		
4176419	Carbonate (CO3)	2010/08/12					<2	mg/L		
4176419	Hydroxide (OH)	2010/08/12					<2	mg/L		
4176615	Dissolved Orthophosphate (P)	2010/08/12	101	90 - 110	100	90 - 106	<0.003	mg/L	1.7	20
4178064	E. coli	2010/08/12							NC	50
4178064	Total Coliforms	2010/08/12							NC	45
4178070	Fecal Coliforms	2010/08/12							NC	N/A
4179239	Turbidity	2010/08/13			102	N/A	<0.1	NTU	NC	20
4185140	Chemical Oxygen Demand	2010/08/17	96	84 - 113	103	N/A	0, RDL=0	mg/L	14.9	20
4186093	Total Nitrogen (N)	2010/08/17	NC	80 - 120	85	80 - 120	<0.02	mg/L	7.0	20
4187820	Dissolved Arsenic (As)	2010/08/18	NC	80 - 120	97	80 - 120	<0.0001	mg/L	0.6	20
4187820	Dissolved Beryllium (Be)	2010/08/18	100	80 - 120	98	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Cadmium (Cd)	2010/08/18	98	80 - 120	98	80 - 120	<0.00001	mg/L	NC	20
4187820	Dissolved Chromium (Cr)	2010/08/18	99	80 - 120	97	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Cobalt (Co)	2010/08/18	97	80 - 120	98	80 - 120	<0.0005	mg/L	NC	20
4187820	Dissolved Copper (Cu)	2010/08/18	93	80 - 120	98	80 - 120	<0.0002	mg/L	3.3	20
4187820	Dissolved Lead (Pb)	2010/08/18	95	80 - 120	98	80 - 120	<0.0002	mg/L	NC	20
4187820	Dissolved Lithium (Li)	2010/08/18	100	80 - 120	101	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Nickel (Ni)	2010/08/18	95	80 - 120	96	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Selenium (Se)	2010/08/18	102	80 - 120	96	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Uranium (U)	2010/08/18	99	80 - 120	96	80 - 120	<0.0001	mg/L	0.07	20
4187820	Dissolved Vanadium (V)	2010/08/18	102	80 - 120	95	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Zinc (Zn)	2010/08/18	96	80 - 120	92	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Aluminum (Al)	2010/08/18					<0.003	mg/L	NC	20
4187820	Dissolved Antimony (Sb)	2010/08/18					<0.0005	mg/L	NC	20
4187820	Dissolved Barium (Ba)	2010/08/18					<0.001	mg/L	0.02	20
4187820	Dissolved Bismuth (Bi)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Boron (B)	2010/08/18					<0.05	mg/L	NC	20
4187820	Dissolved Iron (Fe)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Manganese (Mn)	2010/08/18					<0.001	mg/L	1.4	20
4187820	Dissolved Mercury (Hg)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Molybdenum (Mo)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Silicon (Si)	2010/08/18					<0.1	mg/L	0.1	20
4187820	Dissolved Silver (Ag)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Strontium (Sr)	2010/08/18					<0.001	mg/L	0.3	20

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4187820	Dissolved Thallium (Tl)	2010/08/18					<0.00005	mg/L	NC	20
4187820	Dissolved Tin (Sn)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Titanium (Ti)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Zirconium (Zr)	2010/08/18					<0.0005	mg/L	NC	20
4187948	Total Arsenic (As)	2010/08/19	106	80 - 120	98	80 - 120	<0.1	ug/L	3.7	20
4187948	Total Cadmium (Cd)	2010/08/19	106	80 - 120	98	80 - 120	<0.01	ug/L	NC	20
4187948	Total Chromium (Cr)	2010/08/19	106	80 - 120	101	80 - 120	<1	ug/L	NC	20
4187948	Total Copper (Cu)	2010/08/19	104	80 - 120	102	80 - 120	<0.2	ug/L	6.5	20
4187948	Total Lead (Pb)	2010/08/19	101	80 - 120	97	80 - 120	<0.2	ug/L	NC	20
4187948	Total Selenium (Se)	2010/08/19	110	80 - 120	102	80 - 120	<0.1	ug/L	NC	20
4187948	Total Uranium (U)	2010/08/19	106	80 - 120	97	80 - 120	<0.1	ug/L	2.4	20
4187948	Total Zinc (Zn)	2010/08/19	105	80 - 120	98	80 - 120	<5	ug/L	NC	20
4187948	Total Aluminum (Al)	2010/08/19					<3	ug/L	NC	20
4187948	Total Antimony (Sb)	2010/08/19					<0.5	ug/L	NC	20
4187948	Total Barium (Ba)	2010/08/19					<1	ug/L	0.1	20
4187948	Total Boron (B)	2010/08/19					<50	ug/L	NC	20
4187948	Total Iron (Fe)	2010/08/19					<5	ug/L	0.3	20
4187948	Total Manganese (Mn)	2010/08/19					<1	ug/L	2.4	20
4187948	Total Mercury (Hg)	2010/08/19					<0.02	ug/L		
4188649	Ammonia (N)	2010/08/18	97	80 - 120	97	80 - 120	<0.005	mg/L	5.3	20
4190082	Biochemical Oxygen Demand	2010/08/13			90	N/A	<5	mg/L	5.2	20
4191823	Fluoride (F)	2010/08/19	85	80 - 120	95	80 - 120	0.01, RDL=0.01	mg/L	0.5	20
4193877	Nitrate plus Nitrite (N)	2010/08/19	105	80 - 120	107	80 - 120	<0.02	mg/L	NC(1)	25
4194014	Nitrite (N)	2010/08/12	104	79 - 115	93	80 - 122	<0.002	mg/L	NC	20
4194799	Dissolved Chloride (Cl)	2010/08/19	NC	80 - 120	97	80 - 120	<0.5	mg/L	3.9	20
4195017	Dissolved Sulphate (SO4)	2010/08/19	NC	80 - 120	99	80 - 120	<0.5	mg/L	1.8	20
4200720	Nitrate (N)	2010/08/13	100	N/A	110	N/A	<0.04	mg/L	NC	20

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Sample analysed past recommended hold time

Maxxam

4606 Canada Way, Burnaby, BC Canada V5G 1K5 Ph: 604 734 7276 Toll Free: 1 800 665 8566 Fax: 604 731 2386

CHAIN OF CUSTODY RECORD

Page: 1 of 1

Maxxam Job#: B069962

G 014715

Invoice To: Require Report? Yes [X] No [ ]

Company Name: EBA Engineering
Contact Name: Mike Gallo
Address: 1-4376 Boban Drive
Nanaimo BC PC: V9T 6A7
Phone / Fax#: Ph: 250-756-2256 Fax: 250-756-2686
E-mail: mgallo@eba.ca

Report To:

Company Name: SAME
Contact Name:
Address:
PC:
Phone / Fax#: Ph: Fax:
E-mail

PO #:	
Quotation #:	
Project #:	N23101632
Proj. Name:	CVRD Fisher Road Env. Review
Location:	Cobble Hill, BC
Sampled By:	Mike Gallo

REGULATORY REQUIREMENTS SERVICE REQUESTED:

- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other
- [X] DRINKING WATER

- [X] Regular Turn Around Time (TAT) (5 days for most tests)
- [ ] RUSH (Please contact the lab) [ ] 1 Day [ ] 2 Day [ ] 3 Day
- Date Required:

Special Instructions:
Return Cooler [ ] **Ship Sample Bottles (please specify)** [ ]

Full suite

ANALYSIS REQUESTED

#	Sample Identification	Lab Identification	Sample Type	Date/Time Sampled	BTEX/VPH (MTBE)	VOC/VPH	EPH (TEH)	PAH (LEPH/HEPH)	CCME-PHC (Fractions 1-4 Plus BTEX)	CCME-PHC (Fractions 2-4)	CCME BTEX (Fraction 1 Plus BTEX)	PCB	Phenols by 4AAP / Phenols by GCMS	TOG / MOG / SWOG	Dissolved (Field Filtered? Y [X] N)	Metals (Field Acidified? Y [X] N)	Totals Metals Field Acidified? Y [X] N	Nitrate [X] / Nitrite [X] / Ammonia [X]	Chloride [X] / Fluoride [X] / Sulphate [X]	Total Suspended Solids-TSS / TDS [X]	pH [X] / Conductivity [X] / Alkalinity [X]	BOD [X]	COD [X]	Coliform, Total & E.coli [X] / Fecal [X]	Asbestos	DW PKG (yct. ENPOT)	Tannin & Lignin	NH_4	Ortho Phosphate	TKN (Tot Kjeldahl N)		HOLD
1	FRRC		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
2	Lockhart		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
3	Gamboa		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
4	Good Auto (G.A.)		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
5	CHID		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Samples are from a Drinking Water Source? YES ✓ NO
Does source supply multiple households? YES ✓ NO

*Relinquished by:	Date (YY/MM/DD):	Time:	Received by:	Date (YY/MM/DD):	Time:
M Gallo			Debbie Nordbrugt	11 Aug 2010	1600

Laboratory Use Only

Time Sensitive [✓]

Temperature on Receipt (°C): 13.8°C

Custody Seal Intact on Cooler? Yes / No — NA

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

COC-1020 (05/10)

Maxxam International Corporation o/a Maxxam Analytics

Your Project #: N23101632 CVRD FISHER RD
Your C.O.C. #: G014715

Attention: Mike Gallo
EBA ENGINEERING CONSULTANTS LTD.
NANAIMO - Rebate
#1 - 4376 BOBAN DRIVE
NANAIMO, BC
Canada V9T 6A7

Report Date: 2010/11/18
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B069962
Received: 2010/08/11, 16:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water (1)	1	2010/08/12	2010/08/12	56-C-001	Based on SM2320B
Biochemical Oxygen Demand (1)	1	2010/08/13	2010/08/13	56-C-002	Based on SM-5210
Chloride by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00234 R3.0	Based on EPA 325.2
Chemical Oxygen Demand (1)	1	N/A	2010/08/17	70-C-001	Based on SM-5200 A,D
Colour (True) (1)	1	N/A	2010/08/13	56-C-011	Based on SM-2120B
Coliforms & E.coli by Quantitray (MPN) (1)	1	N/A	2010/08/12	56-C-015	Based on SM-9223
Conductance - water (1)	1	N/A	2010/08/12	56-C-003	Based on SM-2510
Fluoride	1	N/A	2010/08/19	BRN SOP-00282 R4.0	Based SM - 4500 F C
Fecal Coliform by membrane filtration (1)	1	N/A	2010/08/12	70-C-200	Based on SM-9222
Hardness Total (calculated as CaCO3)	1	N/A	2010/08/20		
Hardness (calculated as CaCO3)	1	N/A	2010/08/19		
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (dissolved)	1	N/A	2010/08/18	BRN SOP-00206	Based on EPA 200.8
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2010/08/20	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (total)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Nitrogen (Total)	1	2010/08/13	2010/08/17	BRN SOP-00242 R3.0	Based on SM-4500N C
Ammonia-N	1	N/A	2010/08/18	BBY6SOP-00044	Based on EPA 350.1
Nitrate + Nitrite (N)	1	N/A	2010/08/19		Based on USEPA 353.2
Nitrite (N) by CFA (1)	1	N/A	2010/08/12	56-C-006	Based SM-4500 NO2 B
Nitrate (N) (1)	1	N/A	2010/08/13	56-C-016	Based SM 4500 NO3 B
Filter and HNO3 Preserve for Metals	1	N/A	2010/08/12	BRN WI-00006 R1.0	Based on EPA 200.2
pH Water (1)	1	N/A	2010/08/12	56-C-007	Based on SM-4500 pH
Phosphate-P (Ortho) (1)	1	N/A	2010/08/12	56-C-008	Based on SM 4500 P E
Sulphate by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00243 R1.0	Based on EPA 375.4
Total Dissolved Solids (Filt. Residue) (1)	1	N/A	2010/08/12	56-C-009	Based on SM 2540C
TKN (Calc. TN, N/N) total	1	N/A	2010/08/20		
Tannin & Lignin (Total) (1)	1	N/A	2010/08/13	56-C-020	Based on SM-5550 A
Turbidity (1)	1	N/A	2010/08/13	56-C-012	Based on SM - 2130

* Results relate only to the items tested.

(1) This test was performed by Maxxam Victoria

../2

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Maxxam Job #: B069962
Report Date: 2010/11/18

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CYNDY WILKINSON, B.Sc, Burnaby Customer Service
Email: CWilkinson@maxxam.ca
Phone# (604) 639-2605

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13800		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
ANIONS						
Nitrite (N)	mg/L	**1**		<0.002	0.002	4194014
Misc. Inorganics						
Fluoride (F)	mg/L	**1.5**		0.02	0.01	4191823
Alkalinity (Total as CaCO3)	mg/L			114	2	4176419
Bicarbonate (HCO3)	mg/L			139	2	4176419
Carbonate (CO3)	mg/L			<2	2	4176419
Hydroxide (OH)	mg/L			<2	2	4176419
Anions						
Dissolved Sulphate (SO4)	mg/L		**500**	5.9	0.5	4195017
Dissolved Chloride (Cl)	mg/L		**250**	18	0.5	4194799
MISCELLANEOUS						
True Colour	Col. Unit		**15**	5	5	4167006
Nutrients						
Nitrate (N)	mg/L	**10**		2.57	0.04	4200720
Physical Properties						
Conductivity	uS/cm			339	1	4175569
pH	pH Units		**6.5:8.5**	7.4		4176428
Physical Properties						
Total Dissolved Solids	mg/L		**500**	194	10	4174873
Turbidity	NTU			1.2	0.1	4179239

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13800		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L			<3	3	4187948
Total Antimony (Sb)	ug/L	**6**		<0.5	0.5	4187948
Total Arsenic (As)	ug/L	**10**		0.2	0.1	4187948
Total Barium (Ba)	ug/L	**1000**		7	1	4187948
Total Boron (B)	ug/L	**5000**		<50	50	4187948
Total Cadmium (Cd)	ug/L	**5**		0.01	0.01	4187948
Total Chromium (Cr)	ug/L	**50**		2	1	4187948
Total Copper (Cu)	ug/L		**1000**	7.9	0.2	4187948
Total Iron (Fe)	ug/L		**300**	124	5	4187948
Total Lead (Pb)	ug/L	**10**		0.8	0.2	4187948
Total Manganese (Mn)	ug/L		**50**	1	1	4187948
Total Mercury (Hg)	ug/L	**1**		<0.02	0.02	4187948
Total Selenium (Se)	ug/L	**10**		<0.1	0.1	4187948
Total Uranium (U)	ug/L	**20**		0.2	0.1	4187948
Total Zinc (Zn)	ug/L		**5000**	176	5	4187948
Total Magnesium (Mg)	mg/L			14.9	0.05	4172131
Total Sodium (Na)	mg/L		**200**	8.57	0.05	4172131
Microbiological Param.						
E. coli	MPN/100mL	**0**		<1	1	4178064
Total Coliforms	MPN/100mL	**0**		**40**	1	4178064

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID					W13800		
Sampling Date					2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
Calculated Parameters							
Filter and HNO3 Preservation	N/A				FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L	**5**	20	100	141	0.5	4173097
Demand Parameters							
Chemical Oxygen Demand	mg/L				0	0	4185140
Biochemical Oxygen Demand	mg/L				<5	5	4190082
MISCELLANEOUS							
Tannins and Lignins	mg/L				<0.1	0.1	4166913
Nutrients							
Ammonia (N)	mg/L				<0.005	0.005	4188649
Dissolved Orthophosphate (P)	mg/L				0.034	0.003	4176615

MICROBIOLOGY (WATER)

Maxxam ID		W13800		
Sampling Date		2010/08/11 00:00		
	Units	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
MICROBIOLOGY				
Fecal Coliforms	CFU/100mL	<1	1	4178070

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13800		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	**5**	20	100		134	0.5	4173098

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13800		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L					<0.003	0.003	4187820
Dissolved Antimony (Sb)	mg/L	**0.006**				<0.0005	0.0005	4187820
Dissolved Arsenic (As)	mg/L	**0.01**				0.0002	0.0001	4187820
Dissolved Barium (Ba)	mg/L	**1**				0.008	0.001	4187820
Dissolved Beryllium (Be)	mg/L					<0.0001	0.0001	4187820
Dissolved Bismuth (Bi)	mg/L					<0.001	0.001	4187820
Dissolved Boron (B)	mg/L	**5**				<0.05	0.05	4187820
Dissolved Cadmium (Cd)	mg/L	**0.005**				0.00001	0.00001	4187820
Dissolved Chromium (Cr)	mg/L	**0.05**				0.002	0.001	4187820
Dissolved Cobalt (Co)	mg/L					<0.0005	0.0005	4187820
Dissolved Copper (Cu)	mg/L				**1**	0.0057	0.0002	4187820
Dissolved Iron (Fe)	mg/L				**0.3**	0.007	0.005	4187820
Dissolved Lead (Pb)	mg/L	**0.01**				<0.0002	0.0002	4187820
Dissolved Lithium (Li)	mg/L					<0.005	0.005	4187820
Dissolved Manganese (Mn)	mg/L				**0.05**	<0.001	0.001	4187820
Dissolved Mercury (Hg)	mg/L	**0.001**				<0.00002	0.00002	4187820
Dissolved Molybdenum (Mo)	mg/L					<0.001	0.001	4187820
Dissolved Nickel (Ni)	mg/L					<0.001	0.001	4187820
Dissolved Selenium (Se)	mg/L	**0.01**				<0.0001	0.0001	4187820
Dissolved Silicon (Si)	mg/L					12.0	0.1	4187820
Dissolved Silver (Ag)	mg/L					<0.00002	0.00002	4187820
Dissolved Strontium (Sr)	mg/L					0.124	0.001	4187820
Dissolved Thallium (Tl)	mg/L					<0.00005	0.00005	4187820
Dissolved Tin (Sn)	mg/L					<0.005	0.005	4187820
Dissolved Titanium (Ti)	mg/L					<0.005	0.005	4187820
Dissolved Uranium (U)	mg/L	**0.02**				0.0002	0.0001	4187820
Dissolved Vanadium (V)	mg/L					<0.005	0.005	4187820
Dissolved Zinc (Zn)	mg/L				**5**	0.125	0.005	4187820
Dissolved Zirconium (Zr)	mg/L					<0.0005	0.0005	4187820
Dissolved Calcium (Ca)	mg/L					29.4	0.05	4171426
Dissolved Magnesium (Mg)	mg/L					14.7	0.05	4171426
Dissolved Potassium (K)	mg/L					0.73	0.05	4171426
Dissolved Sodium (Na)	mg/L				**200**	8.37	0.05	4171426

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13800		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
Dissolved Sulphur (S)	mg/L					<3	3	4171426

TOTAL TKN IN WATER (WATER)

Maxxam ID			W13800		
Sampling Date			2010/08/11 00:00		
	Units	**Criteria A**	**1425 GALLIERS ROAD**	**RDL**	**QC Batch**
Nutrients					
Total Kjeldahl Nitrogen (Calc)	mg/L		<0.2	0.2	4171438
Nitrate plus Nitrite (N)	mg/L	**10**	2.6(1)	0.1	4193877
Total Nitrogen (N)	mg/L		2.6	0.2	4186093

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."
(1) - Sample analysed past recommended hold time

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Package 1	14.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4166913	Tannins and Lignins	2010/08/13					<0.1	mg/L	NC	20
4167006	True Colour	2010/08/13			100	N/A	<5	Col. Unit	NC	10
4174873	Total Dissolved Solids	2010/08/12			103	80 - 120	<10	mg/L		
4175569	Conductivity	2010/08/12			100	96 - 104	<1	uS/cm	0	20
4176419	Alkalinity (Total as CaCO3)	2010/08/12			98	N/A	<2	mg/L	0.6	20
4176419	Bicarbonate (HCO3)	2010/08/12					<2	mg/L		
4176419	Carbonate (CO3)	2010/08/12					<2	mg/L		
4176419	Hydroxide (OH)	2010/08/12					<2	mg/L		
4176615	Dissolved Orthophosphate (P)	2010/08/12	101	90 - 110	100	90 - 106	<0.003	mg/L	1.7	20
4178064	E. coli	2010/08/12							NC	50
4178064	Total Coliforms	2010/08/12							NC	45
4178070	Fecal Coliforms	2010/08/12							NC	N/A
4179239	Turbidity	2010/08/13			102	N/A	<0.1	NTU	NC	20
4185140	Chemical Oxygen Demand	2010/08/17	96	84 - 113	103	N/A	0, RDL=0	mg/L	14.9	20
4186093	Total Nitrogen (N)	2010/08/17	NC	80 - 120	85	80 - 120	<0.02	mg/L	7.0	20
4187820	Dissolved Arsenic (As)	2010/08/18	NC	80 - 120	97	80 - 120	<0.0001	mg/L	0.6	20
4187820	Dissolved Beryllium (Be)	2010/08/18	100	80 - 120	98	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Cadmium (Cd)	2010/08/18	98	80 - 120	98	80 - 120	<0.00001	mg/L	NC	20
4187820	Dissolved Chromium (Cr)	2010/08/18	99	80 - 120	97	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Cobalt (Co)	2010/08/18	97	80 - 120	98	80 - 120	<0.0005	mg/L	NC	20
4187820	Dissolved Copper (Cu)	2010/08/18	93	80 - 120	98	80 - 120	<0.0002	mg/L	3.3	20
4187820	Dissolved Lead (Pb)	2010/08/18	95	80 - 120	98	80 - 120	<0.0002	mg/L	NC	20
4187820	Dissolved Lithium (Li)	2010/08/18	100	80 - 120	101	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Nickel (Ni)	2010/08/18	95	80 - 120	96	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Selenium (Se)	2010/08/18	102	80 - 120	96	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Uranium (U)	2010/08/18	99	80 - 120	96	80 - 120	<0.0001	mg/L	0.07	20
4187820	Dissolved Vanadium (V)	2010/08/18	102	80 - 120	95	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Zinc (Zn)	2010/08/18	96	80 - 120	92	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Aluminum (Al)	2010/08/18					<0.003	mg/L	NC	20
4187820	Dissolved Antimony (Sb)	2010/08/18					<0.0005	mg/L	NC	20
4187820	Dissolved Barium (Ba)	2010/08/18					<0.001	mg/L	0.02	20
4187820	Dissolved Bismuth (Bi)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Boron (B)	2010/08/18					<0.05	mg/L	NC	20
4187820	Dissolved Iron (Fe)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Manganese (Mn)	2010/08/18					<0.001	mg/L	1.4	20
4187820	Dissolved Mercury (Hg)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Molybdenum (Mo)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Silicon (Si)	2010/08/18					<0.1	mg/L	0.1	20
4187820	Dissolved Silver (Ag)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Strontium (Sr)	2010/08/18					<0.001	mg/L	0.3	20

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4187820	Dissolved Thallium (Tl)	2010/08/18					<0.00005	mg/L	NC	20
4187820	Dissolved Tin (Sn)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Titanium (Ti)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Zirconium (Zr)	2010/08/18					<0.0005	mg/L	NC	20
4187948	Total Arsenic (As)	2010/08/19	106	80 - 120	98	80 - 120	<0.1	ug/L	3.7	20
4187948	Total Cadmium (Cd)	2010/08/19	106	80 - 120	98	80 - 120	<0.01	ug/L	NC	20
4187948	Total Chromium (Cr)	2010/08/19	106	80 - 120	101	80 - 120	<1	ug/L	NC	20
4187948	Total Copper (Cu)	2010/08/19	104	80 - 120	102	80 - 120	<0.2	ug/L	6.5	20
4187948	Total Lead (Pb)	2010/08/19	101	80 - 120	97	80 - 120	<0.2	ug/L	NC	20
4187948	Total Selenium (Se)	2010/08/19	110	80 - 120	102	80 - 120	<0.1	ug/L	NC	20
4187948	Total Uranium (U)	2010/08/19	106	80 - 120	97	80 - 120	<0.1	ug/L	2.4	20
4187948	Total Zinc (Zn)	2010/08/19	105	80 - 120	98	80 - 120	<5	ug/L	NC	20
4187948	Total Aluminum (Al)	2010/08/19					<3	ug/L	NC	20
4187948	Total Antimony (Sb)	2010/08/19					<0.5	ug/L	NC	20
4187948	Total Barium (Ba)	2010/08/19					<1	ug/L	0.1	20
4187948	Total Boron (B)	2010/08/19					<50	ug/L	NC	20
4187948	Total Iron (Fe)	2010/08/19					<5	ug/L	0.3	20
4187948	Total Manganese (Mn)	2010/08/19					<1	ug/L	2.4	20
4187948	Total Mercury (Hg)	2010/08/19					<0.02	ug/L		
4188649	Ammonia (N)	2010/08/18	97	80 - 120	97	80 - 120	<0.005	mg/L	5.3	20
4190082	Biochemical Oxygen Demand	2010/08/13			90	N/A	<5	mg/L	5.2	20
4191823	Fluoride (F)	2010/08/19	85	80 - 120	95	80 - 120	0.01, RDL=0.01	mg/L	0.5	20
4193877	Nitrate plus Nitrite (N)	2010/08/19	105	80 - 120	107	80 - 120	<0.02	mg/L	NC(1)	25
4194014	Nitrite (N)	2010/08/12	104	79 - 115	93	80 - 122	<0.002	mg/L	NC	20
4194799	Dissolved Chloride (Cl)	2010/08/19	NC	80 - 120	97	80 - 120	<0.5	mg/L	3.9	20
4195017	Dissolved Sulphate (SO4)	2010/08/19	NC	80 - 120	99	80 - 120	<0.5	mg/L	1.8	20
4200720	Nitrate (N)	2010/08/13	100	N/A	110	N/A	<0.04	mg/L	NC	20

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Sample analysed past recommended hold time

Maxxam

4606 Canada Way, Burnaby, BC Canada V5G 1K5 Ph: 604 734 7276 Toll Free: 1 800 665 8566 Fax: 604 731 2386

CHAIN OF CUSTODY RECORD

Page: 1 of 1

G 014715

Maxxam Job#: B069962

Invoice To: Require Report? Yes [X] No [ ]

Company Name: EBA Engineering
Contact Name: Mike Gallo
Address: 1-4376 Boban Drive
Nanaimo BC PC: V9T 6A7
Phone / Fax#: Ph: 250-756-2256 Fax: 250-756-2686
E-mail: mgallo@eba.ca

Report To:

Company Name: SAME
Contact Name:
Address:
PC:
Phone / Fax#: Ph: Fax:
E-mail

PO #:
Quotation #:
Project #: N23101632
Proj. Name: CVRD FISHER ROAD ENV. REVIEW
Location: COBBLE HILL, BC
Sampled By: MIKE GALLO

REGULATORY REQUIREMENTS SERVICE REQUESTED:

- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other
- [X] DRINKING WATER

- [X] Regular Turn Around Time (TAT) (5 days for most tests)
- [ ] RUSH (Please contact the lab)
- [ ] 1 Day [ ] 2 Day [ ] 3 Day
- Date Required:

Special Instructions:

Return Cooler [ ] **Ship Sample Bottles (please specify)** [ ]

ANALYSIS REQUESTED (Full scan)

#	Sample Identification	Lab Identification	Sample Type	Date/Time Sampled	BTEX/VPH	VOC/VPH	EPH	PAH	CCME-PHC (Fractions 1-4 Plus BTEX)	CCME-PHC (Fractions 2-4)	CCME BTEX (Fraction 1 Plus BTEX)	PCB	Phenols by 4AAP	TOG	Dissolved (Field Filtered? Y)	Metals (Field Acidified? Y)	Totals Metals Field Acidified? Y	Nitrate	Chloride	Total Suspended Solids-TSS	pH	BOD	COD	Coliform, Total & E.coli	Asbestos	DW PKG (YCT. ENPOT)	Tannin & Lignin	NH4	Ortho Phosphate	TKN (Tot Kjeldahl N)		HOLD
1	FRRC		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
2	Lockhart		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
3	Gamboa		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
4	Good Auto (G.A.)		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
5	CHID		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Other boxes marked in the header: Ammonia [X], Sulphate [X], TDS [X], Alkalinity [X], Fecal [X], Nitrite [X], Fluoride [X], Conductivity [X].

Samples are from a Drinking Water Source? YES ✓ NO
Does source supply multiple households? YES ✓ NO

*Relinquished by:	Date (YY/MM/DD):	Time:	Received by:	Date (YY/MM/DD):	Time:
M Gallo			Debbie Nordbrecht	11 Aug 2010	1600

Time Sensitive ✓

Laboratory Use Only

Temperature on Receipt (°C): 13.8°C

Custody Seal Intact on Cooler? Yes NA No

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

COC-1020 (05/10)

Maxxam International Corporation o/a Maxxam Analytics

Your Project #: N23101632 CVRD FISHER RD
Your C.O.C. #: G014715

Attention: Mike Gallo
EBA ENGINEERING CONSULTANTS LTD.
NANAIMO - Rebate
#1 - 4376 BOBAN DRIVE
NANAIMO, BC
Canada V9T 6A7

Report Date: 2010/11/18
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B069962
Received: 2010/08/11, 16:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water (1)	1	2010/08/12	2010/08/12	56-C-001	Based on SM2320B
Biochemical Oxygen Demand (1)	1	2010/08/13	2010/08/13	56-C-002	Based on SM-5210
Chloride by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00234 R3.0	Based on EPA 325.2
Chemical Oxygen Demand (1)	1	N/A	2010/08/17	70-C-001	Based on SM-5200 A,D
Colour (True) (1)	1	N/A	2010/08/13	56-C-011	Based on SM-2120B
Coliforms & E.coli by Quantitray (MPN) (1)	1	N/A	2010/08/12	56-C-015	Based on SM-9223
Conductance - water (1)	1	N/A	2010/08/12	56-C-003	Based on SM-2510
Fluoride	1	N/A	2010/08/19	BRN SOP-00282 R4.0	Based SM - 4500 F C
Fecal Coliform by membrane filtration (1)	1	N/A	2010/08/12	70-C-200	Based on SM-9222
Hardness Total (calculated as CaCO3)	1	N/A	2010/08/20		
Hardness (calculated as CaCO3)	1	N/A	2010/08/19		
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (dissolved)	1	N/A	2010/08/18	BRN SOP-00206	Based on EPA 200.8
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2010/08/20	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (total)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Nitrogen (Total)	1	2010/08/13	2010/08/17	BRN SOP-00242 R3.0	Based on SM-4500N C
Ammonia-N	1	N/A	2010/08/18	BBY6SOP-00044	Based on EPA 350.1
Nitrate + Nitrite (N)	1	N/A	2010/08/19		Based on USEPA 353.2
Nitrite (N) by CFA (1)	1	N/A	2010/08/12	56-C-006	Based SM-4500 NO2 B
Nitrate (N) (1)	1	N/A	2010/08/13	56-C-016	Based SM 4500 NO3 B
Filter and HNO3 Preserve for Metals	1	N/A	2010/08/12	BRN WI-00006 R1.0	Based on EPA 200.2
pH Water (1)	1	N/A	2010/08/12	56-C-007	Based on SM-4500 pH
Phosphate-P (Ortho) (1)	1	N/A	2010/08/12	56-C-008	Based on SM 4500 P E
Sulphate by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00243 R1.0	Based on EPA 375.4
Total Dissolved Solids (Filt. Residue) (1)	1	N/A	2010/08/12	56-C-009	Based on SM 2540C
TKN (Calc. TN, N/N) total	1	N/A	2010/08/20		
Tannin & Lignin (Total) (1)	1	N/A	2010/08/13	56-C-020	Based on SM-5550 A
Turbidity (1)	1	N/A	2010/08/13	56-C-012	Based on SM - 2130

* Results relate only to the items tested.

(1) This test was performed by Maxxam Victoria

../2

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Maxxam Job #: B069962
Report Date: 2010/11/18

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CYNDY WILKINSON, B.Sc, Burnaby Customer Service
Email: CWilkinson@maxxam.ca
Phone# (604) 639-2605

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13803		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
ANIONS						
Nitrite (N)	mg/L	**1**		<0.002	0.002	4194014
Misc. Inorganics						
Fluoride (F)	mg/L	**1.5**		0.02	0.01	4191823
Alkalinity (Total as CaCO3)	mg/L			112	2	4176419
Bicarbonate (HCO3)	mg/L			137	2	4176419
Carbonate (CO3)	mg/L			<2	2	4176419
Hydroxide (OH)	mg/L			<2	2	4176419
Anions						
Dissolved Sulphate (SO4)	mg/L		**500**	9.2	0.5	4195017
Dissolved Chloride (Cl)	mg/L		**250**	19	0.5	4194799
MISCELLANEOUS						
True Colour	Col. Unit		**15**	5	5	4167006
Nutrients						
Nitrate (N)	mg/L	**10**		3.67	0.04	4200720
Physical Properties						
Conductivity	uS/cm			352	1	4175569
pH	pH Units		**6.5:8.5**	7.9		4176428
Physical Properties						
Total Dissolved Solids	mg/L		**500**	217	10	4174873
Turbidity	NTU			0.3	0.1	4179239

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13803		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L			<3	3	4187948
Total Antimony (Sb)	ug/L	**6**		<0.5	0.5	4187948
Total Arsenic (As)	ug/L	**10**		0.1	0.1	4187948
Total Barium (Ba)	ug/L	**1000**		4	1	4187948
Total Boron (B)	ug/L	**5000**		<50	50	4187948
Total Cadmium (Cd)	ug/L	**5**		<0.01	0.01	4187948
Total Chromium (Cr)	ug/L	**50**		<1	1	4187948
Total Copper (Cu)	ug/L		**1000**	<0.2	0.2	4187948
Total Iron (Fe)	ug/L		**300**	19	5	4187948
Total Lead (Pb)	ug/L	**10**		<0.2	0.2	4187948
Total Manganese (Mn)	ug/L		**50**	<1	1	4187948
Total Mercury (Hg)	ug/L	**1**		<0.02	0.02	4187948
Total Selenium (Se)	ug/L	**10**		0.1	0.1	4187948
Total Uranium (U)	ug/L	**20**		<0.1	0.1	4187948
Total Zinc (Zn)	ug/L		**5000**	15	5	4187948
Total Magnesium (Mg)	mg/L			6.90	0.05	4172131
Total Sodium (Na)	mg/L		**200**	6.42	0.05	4172131
Microbiological Param.						
E. coli	MPN/100mL	**0**		<1	1	4178064
Total Coliforms	MPN/100mL	**0**		<1	1	4178064

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID					W13803		
Sampling Date					2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
Calculated Parameters							
Filter and HNO3 Preservation	N/A				FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L	**5**	20	100	152	0.5	4173097
Demand Parameters							
Chemical Oxygen Demand	mg/L				0	0	4185140
Biochemical Oxygen Demand	mg/L				<5	5	4190082
MISCELLANEOUS							
Tannins and Lignins	mg/L				0.2	0.1	4166913
Nutrients							
Ammonia (N)	mg/L				<0.005	0.005	4188649
Dissolved Orthophosphate (P)	mg/L				0.030	0.003	4176615

MICROBIOLOGY (WATER)

Maxxam ID		W13803		
Sampling Date		2010/08/11 00:00		
	Units	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
MICROBIOLOGY				
Fecal Coliforms	CFU/100mL	<1	1	4178070

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13803		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	**5**	20	100		143	0.5	4173098

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13803		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L					<0.003	0.003	4187820
Dissolved Antimony (Sb)	mg/L	**0.006**				<0.0005	0.0005	4187820
Dissolved Arsenic (As)	mg/L	**0.01**				0.0001	0.0001	4187820
Dissolved Barium (Ba)	mg/L	**1**				0.004	0.001	4187820
Dissolved Beryllium (Be)	mg/L					<0.0001	0.0001	4187820
Dissolved Bismuth (Bi)	mg/L					<0.001	0.001	4187820
Dissolved Boron (B)	mg/L	**5**				<0.05	0.05	4187820
Dissolved Cadmium (Cd)	mg/L	**0.005**				<0.00001	0.00001	4187820
Dissolved Chromium (Cr)	mg/L	**0.05**				<0.001	0.001	4187820
Dissolved Cobalt (Co)	mg/L					<0.0005	0.0005	4187820
Dissolved Copper (Cu)	mg/L				**1**	0.0002	0.0002	4187820
Dissolved Iron (Fe)	mg/L				**0.3**	<0.005	0.005	4187820
Dissolved Lead (Pb)	mg/L	**0.01**				<0.0002	0.0002	4187820
Dissolved Lithium (Li)	mg/L					<0.005	0.005	4187820
Dissolved Manganese (Mn)	mg/L				**0.05**	<0.001	0.001	4187820
Dissolved Mercury (Hg)	mg/L	**0.001**				<0.00002	0.00002	4187820
Dissolved Molybdenum (Mo)	mg/L					<0.001	0.001	4187820
Dissolved Nickel (Ni)	mg/L					<0.001	0.001	4187820
Dissolved Selenium (Se)	mg/L	**0.01**				0.0001	0.0001	4187820
Dissolved Silicon (Si)	mg/L					11.0	0.1	4187820
Dissolved Silver (Ag)	mg/L					<0.00002	0.00002	4187820
Dissolved Strontium (Sr)	mg/L					0.082	0.001	4187820
Dissolved Thallium (Tl)	mg/L					<0.00005	0.00005	4187820
Dissolved Tin (Sn)	mg/L					<0.005	0.005	4187820
Dissolved Titanium (Ti)	mg/L					<0.005	0.005	4187820
Dissolved Uranium (U)	mg/L	**0.02**				<0.0001	0.0001	4187820
Dissolved Vanadium (V)	mg/L					<0.005	0.005	4187820
Dissolved Zinc (Zn)	mg/L				**5**	0.011	0.005	4187820
Dissolved Zirconium (Zr)	mg/L					<0.0005	0.0005	4187820
Dissolved Calcium (Ca)	mg/L					46.1	0.05	4171426
Dissolved Magnesium (Mg)	mg/L					6.88	0.05	4171426
Dissolved Potassium (K)	mg/L					0.42	0.05	4171426
Dissolved Sodium (Na)	mg/L				**200**	6.12	0.05	4171426

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13803		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
Dissolved Sulphur (S)	mg/L					3	3	4171426

TOTAL TKN IN WATER (WATER)

Maxxam ID			W13803		
Sampling Date			2010/08/11 00:00		
	Units	**Criteria A**	**HOLLAND & GALLIERS ROAD**	**RDL**	**QC Batch**
Nutrients					
Total Kjeldahl Nitrogen (Calc)	mg/L		0.3	0.2	4171438
Nitrate plus Nitrite (N)	mg/L	**10**	3.1(1)	0.1	4193877
Total Nitrogen (N)	mg/L		3.4	0.2	4186093

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."
(1) - Sample analysed past recommended hold time

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Package 1	14.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4166913	Tannins and Lignins	2010/08/13					<0.1	mg/L	NC	20
4167006	True Colour	2010/08/13			100	N/A	<5	Col. Unit	NC	10
4174873	Total Dissolved Solids	2010/08/12			103	80 - 120	<10	mg/L		
4175569	Conductivity	2010/08/12			100	96 - 104	<1	uS/cm	0	20
4176419	Alkalinity (Total as CaCO3)	2010/08/12			98	N/A	<2	mg/L	0.6	20
4176419	Bicarbonate (HCO3)	2010/08/12					<2	mg/L		
4176419	Carbonate (CO3)	2010/08/12					<2	mg/L		
4176419	Hydroxide (OH)	2010/08/12					<2	mg/L		
4176615	Dissolved Orthophosphate (P)	2010/08/12	101	90 - 110	100	90 - 106	<0.003	mg/L	1.7	20
4178064	E. coli	2010/08/12							NC	50
4178064	Total Coliforms	2010/08/12							NC	45
4178070	Fecal Coliforms	2010/08/12							NC	N/A
4179239	Turbidity	2010/08/13			102	N/A	<0.1	NTU	NC	20
4185140	Chemical Oxygen Demand	2010/08/17	96	84 - 113	103	N/A	0, RDL=0	mg/L	NC	20
4186093	Total Nitrogen (N)	2010/08/17	NC	80 - 120	85	80 - 120	<0.02	mg/L	7.0	20
4187820	Dissolved Arsenic (As)	2010/08/18	NC	80 - 120	97	80 - 120	<0.0001	mg/L	0.6	20
4187820	Dissolved Beryllium (Be)	2010/08/18	100	80 - 120	98	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Cadmium (Cd)	2010/08/18	98	80 - 120	98	80 - 120	<0.00001	mg/L	NC	20
4187820	Dissolved Chromium (Cr)	2010/08/18	99	80 - 120	97	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Cobalt (Co)	2010/08/18	97	80 - 120	98	80 - 120	<0.0005	mg/L	NC	20
4187820	Dissolved Copper (Cu)	2010/08/18	93	80 - 120	98	80 - 120	<0.0002	mg/L	3.3	20
4187820	Dissolved Lead (Pb)	2010/08/18	95	80 - 120	98	80 - 120	<0.0002	mg/L	NC	20
4187820	Dissolved Lithium (Li)	2010/08/18	100	80 - 120	101	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Nickel (Ni)	2010/08/18	95	80 - 120	96	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Selenium (Se)	2010/08/18	102	80 - 120	96	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Uranium (U)	2010/08/18	99	80 - 120	96	80 - 120	<0.0001	mg/L	0.07	20
4187820	Dissolved Vanadium (V)	2010/08/18	102	80 - 120	95	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Zinc (Zn)	2010/08/18	96	80 - 120	92	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Aluminum (Al)	2010/08/18					<0.003	mg/L	NC	20
4187820	Dissolved Antimony (Sb)	2010/08/18					<0.0005	mg/L	NC	20
4187820	Dissolved Barium (Ba)	2010/08/18					<0.001	mg/L	0.02	20
4187820	Dissolved Bismuth (Bi)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Boron (B)	2010/08/18					<0.05	mg/L	NC	20
4187820	Dissolved Iron (Fe)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Manganese (Mn)	2010/08/18					<0.001	mg/L	1.4	20
4187820	Dissolved Mercury (Hg)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Molybdenum (Mo)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Silicon (Si)	2010/08/18					<0.1	mg/L	0.1	20
4187820	Dissolved Silver (Ag)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Strontium (Sr)	2010/08/18					<0.001	mg/L	0.3	20

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4187820	Dissolved Thallium (Tl)	2010/08/18					<0.00005	mg/L	NC	20
4187820	Dissolved Tin (Sn)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Titanium (Ti)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Zirconium (Zr)	2010/08/18					<0.0005	mg/L	NC	20
4187948	Total Arsenic (As)	2010/08/19	106	80 - 120	98	80 - 120	<0.1	ug/L	3.7	20
4187948	Total Cadmium (Cd)	2010/08/19	106	80 - 120	98	80 - 120	<0.01	ug/L	NC	20
4187948	Total Chromium (Cr)	2010/08/19	106	80 - 120	101	80 - 120	<1	ug/L	NC	20
4187948	Total Copper (Cu)	2010/08/19	104	80 - 120	102	80 - 120	<0.2	ug/L	6.5	20
4187948	Total Lead (Pb)	2010/08/19	101	80 - 120	97	80 - 120	<0.2	ug/L	NC	20
4187948	Total Selenium (Se)	2010/08/19	110	80 - 120	102	80 - 120	<0.1	ug/L	NC	20
4187948	Total Uranium (U)	2010/08/19	106	80 - 120	97	80 - 120	<0.1	ug/L	2.4	20
4187948	Total Zinc (Zn)	2010/08/19	105	80 - 120	98	80 - 120	<5	ug/L	NC	20
4187948	Total Aluminum (Al)	2010/08/19					<3	ug/L	NC	20
4187948	Total Antimony (Sb)	2010/08/19					<0.5	ug/L	NC	20
4187948	Total Barium (Ba)	2010/08/19					<1	ug/L	0.1	20
4187948	Total Boron (B)	2010/08/19					<50	ug/L	NC	20
4187948	Total Iron (Fe)	2010/08/19					<5	ug/L	0.3	20
4187948	Total Manganese (Mn)	2010/08/19					<1	ug/L	2.4	20
4187948	Total Mercury (Hg)	2010/08/19					<0.02	ug/L		
4188649	Ammonia (N)	2010/08/18	97	80 - 120	97	80 - 120	<0.005	mg/L	5.3	20
4190082	Biochemical Oxygen Demand	2010/08/13			90	N/A	<5	mg/L	5.2	20
4191823	Fluoride (F)	2010/08/19	85	80 - 120	95	80 - 120	0.01, RDL=0.01	mg/L	0.5	20
4193877	Nitrate plus Nitrite (N)	2010/08/19	105	80 - 120	107	80 - 120	<0.02	mg/L	NC(1)	25
4194014	Nitrite (N)	2010/08/12	104	79 - 115	93	80 - 122	<0.002	mg/L	NC	20
4194799	Dissolved Chloride (Cl)	2010/08/19	NC	80 - 120	97	80 - 120	<0.5	mg/L	0.8	20
4195017	Dissolved Sulphate (SO4)	2010/08/19	NC	80 - 120	99	80 - 120	<0.5	mg/L	1.8	20
4200720	Nitrate (N)	2010/08/13	100	N/A	110	N/A	<0.04	mg/L	NC	20

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Sample analysed past recommended hold time

Maxxam

4606 Canada Way, Burnaby, BC Canada V5G 1K5 Ph: 604 734 7276 Toll Free: 1 800 665 8566 Fax: 604 731 2386

CHAIN OF CUSTODY RECORD

Page: 1 of 1

G 014715

Maxxam Job#: B069962

Invoice To: Require Report? Yes [X] No [ ]

	Invoice To		Report To
Company Name:	EBA Engineering	Company Name:	SAME
Contact Name:	Mike Gallo	Contact Name:	
Address:	1-4376 Boban Drive, Nanaimo BC PC: V9T 6A7	Address:	PC:
Phone / Fax#:	Ph: 250-756-2256 Fax: 250-756-2686	Phone / Fax#:	Ph: Fax:
E-mail	mgallo@eba.ca	E-mail	

PO #:	
Quotation #:	
Project #:	N23101632
Proj. Name:	CVRD FISHER ROAD ENV. REVIEW
Location:	COBBLE HILL, BC
Sampled By:	MIKE GALLO

REGULATORY REQUIREMENTS SERVICE REQUESTED:

- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other
- [X] DRINKING WATER

- [X] Regular Turn Around Time (TAT) (5 days for most tests)
- [ ] RUSH (Please contact the lab)
- [ ] 1 Day [ ] 2 Day [ ] 3 Day
- Date Required:

Special Instructions:

Return Cooler [ ] **Ship Sample Bottles (please specify)** [ ]

ANALYSIS REQUESTED (Full scan)

	Sample Identification	Lab Identification	Sample Type	Date/Time Sampled	BTEX/VPH (MTBE)	VOC/VPH	EPH (TEH)	PAH (LEPH/HEPH)	CCME-PHC (Fractions 1-4 Plus BTEX)	CCME-PHC (Fractions 2-4)	CCME BTEX (Fraction 1 Plus BTEX)	PCB	Phenols by 4AAP / Phenols by GCMS	TOG / MOG / SWOG	Dissolved (Field Filtered? Y [X] N)	Metals (Field Acidified? Y [X] N)	Totals Metals Field Acidified? Y [X] N	Nitrate [X] / Nitrite [X] / Ammonia [X]	Chloride [X] / Fluoride [X] / Sulphate [X]	Total Suspended Solids-TSS / TDS [X]	pH [X] / Conductivity [X] / Alkalinity [X]	BOD [X]	COD [X]	Coliform, Total & E.coli [X] / Fecal [X]	Asbestos	DW PKG (LCT. ENPOT)	Tannin & Lignin	NH4	Ortho Phosphate	TKN (Tot Kjeldahl N)		HOLD
1	FRRC		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
2	Lockhart		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
3	Gamboa		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
4	Good Auto (G.A.)		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
5	CHID		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Samples are from a Drinking Water Source? YES [✓] NO [ ]

Does source supply multiple households? YES [✓] NO [ ]

*Relinquished by:	Date (YY/MM/DD):	Time:	Received by:	Date (YY/MM/DD):	Time:
M Gallo			Debbie Nordbrugt	11 Aug 2010	1600

Time Sensitive [✓]

Laboratory Use Only

Temperature on Receipt (°C): 13.8°C

Custody Seal Intact on Cooler? Yes [ ] No [ ] NA

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

COC-1020 (05/10)

Maxxam International Corporation o/a Maxxam Analytics

Your Project #: N23101632 CVRD FISHER RD
Your C.O.C. #: G014715

Attention: Mike Gallo
EBA ENGINEERING CONSULTANTS LTD.
NANAIMO - Rebate
#1 - 4376 BOBAN DRIVE
NANAIMO, BC
Canada V9T 6A7

Report Date: 2010/11/18
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B069962
Received: 2010/08/11, 16:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water (1)	1	2010/08/12	2010/08/12	56-C-001	Based on SM2320B
Biochemical Oxygen Demand (1)	1	2010/08/13	2010/08/13	56-C-002	Based on SM-5210
Chloride by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00234 R3.0	Based on EPA 325.2
Chemical Oxygen Demand (1)	1	N/A	2010/08/17	70-C-001	Based on SM-5200 A,D
Colour (True) (1)	1	N/A	2010/08/13	56-C-011	Based on SM-2120B
Coliforms & E.coli by Quantitray (MPN) (1)	1	N/A	2010/08/12	56-C-015	Based on SM-9223
Conductance - water (1)	1	N/A	2010/08/12	56-C-003	Based on SM-2510
Fluoride	1	N/A	2010/08/19	BRN SOP-00282 R4.0	Based SM - 4500 F C
Fecal Coliform by membrane filtration (1)	1	N/A	2010/08/12	70-C-200	Based on SM-9222
Hardness Total (calculated as CaCO3)	1	N/A	2010/08/20		
Hardness (calculated as CaCO3)	1	N/A	2010/08/19		
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (dissolved)	1	N/A	2010/08/18	BRN SOP-00206	Based on EPA 200.8
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2010/08/20	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (total)	1	N/A	2010/08/19	BRN SOP-00206	Based on EPA 200.8
Nitrogen (Total)	1	2010/08/13	2010/08/17	BRN SOP-00242 R3.0	Based on SM-4500N C
Ammonia-N	1	N/A	2010/08/18	BBY6SOP-00044	Based on EPA 350.1
Nitrate + Nitrite (N)	1	N/A	2010/08/19		Based on USEPA 353.2
Nitrite (N) by CFA (1)	1	N/A	2010/08/12	56-C-006	Based SM-4500 NO2 B
Nitrate (N) (1)	1	N/A	2010/08/13	56-C-016	Based SM 4500 NO3 B
Filter and HNO3 Preserve for Metals	1	N/A	2010/08/12	BRN WI-00006 R1.0	Based on EPA 200.2
pH Water (1)	1	N/A	2010/08/12	56-C-007	Based on SM-4500 pH
Phosphate-P (Ortho) (1)	1	N/A	2010/08/12	56-C-008	Based on SM 4500 P E
Sulphate by Automated Colourimetry	1	N/A	2010/08/19	BRN-SOP 00243 R1.0	Based on EPA 375.4
Total Dissolved Solids (Filt. Residue) (1)	1	N/A	2010/08/12	56-C-009	Based on SM 2540C
TKN (Calc. TN, N/N) total	1	N/A	2010/08/20		
Tannin & Lignin (Total) (1)	1	N/A	2010/08/13	56-C-020	Based on SM-5550 A
Turbidity (1)	1	N/A	2010/08/13	56-C-012	Based on SM - 2130

* Results relate only to the items tested.

(1) This test was performed by Maxxam Victoria

../2

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

Maxxam Job #: B069962
Report Date: 2010/11/18

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CYNDY WILKINSON, B.Sc, Burnaby Customer Service
Email: CWilkinson@maxxam.ca
Phone# (604) 639-2605

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13802		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1310 FISHER ROAD**	**RDL**	**QC Batch**
ANIONS						
Nitrite (N)	mg/L	**1**		<0.002	0.002	4194014
Misc. Inorganics						
Fluoride (F)	mg/L	**1.5**		0.03	0.01	4191823
Alkalinity (Total as CaCO3)	mg/L			60	2	4176419
Bicarbonate (HCO3)	mg/L			73	2	4176419
Carbonate (CO3)	mg/L			<2	2	4176419
Hydroxide (OH)	mg/L			<2	2	4176419
Anions						
Dissolved Sulphate (SO4)	mg/L		**500**	1.3	0.5	4195017
Dissolved Chloride (Cl)	mg/L		**250**	3.9	0.5	4194799
MISCELLANEOUS						
True Colour	Col. Unit		**15**	5	5	4167006
Nutrients						
Nitrate (N)	mg/L	**10**		0.13	0.04	4200720
Physical Properties						
Conductivity	uS/cm			149	1	4175569
pH	pH Units		**6.5:8.5**	7.6		4176428
Physical Properties						
Total Dissolved Solids	mg/L		**500**	105	10	4174873
Turbidity	NTU			0.2	0.1	4179239

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

ENHANCED POTABILITY WITH MICRO (WATER)

Maxxam ID				W13802		
Sampling Date				2010/08/11 00:00		
	Units	**Criteria A**	**Criteria 2 A**	**1310 FISHER ROAD**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L			<3	3	4187948
Total Antimony (Sb)	ug/L	**6**		<0.5	0.5	4187948
Total Arsenic (As)	ug/L	**10**		0.4	0.1	4187948
Total Barium (Ba)	ug/L	**1000**		2	1	4187948
Total Boron (B)	ug/L	**5000**		<50	50	4187948
Total Cadmium (Cd)	ug/L	**5**		<0.01	0.01	4187948
Total Chromium (Cr)	ug/L	**50**		3	1	4187948
Total Copper (Cu)	ug/L		**1000**	3.2	0.2	4187948
Total Iron (Fe)	ug/L		**300**	31	5	4187948
Total Lead (Pb)	ug/L	**10**		0.2	0.2	4187948
Total Manganese (Mn)	ug/L		**50**	1	1	4187948
Total Mercury (Hg)	ug/L	**1**		<0.02	0.02	4187948
Total Selenium (Se)	ug/L	**10**		<0.1	0.1	4187948
Total Uranium (U)	ug/L	**20**		<0.1	0.1	4187948
Total Zinc (Zn)	ug/L		**5000**	56	5	4187948
Total Magnesium (Mg)	mg/L			6.53	0.05	4172131
Total Sodium (Na)	mg/L		**200**	5.44	0.05	4172131
Microbiological Param.						
E. coli	MPN/100mL	**0**		<1	1	4178064
Total Coliforms	MPN/100mL	**0**		**2**	1	4178064

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

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EBA ENGINEERING CONSULTANTS LTD.
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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID					W13802		
Sampling Date					2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**1310 FISHER ROAD**	**RDL**	**QC Batch**
Calculated Parameters							
Filter and HNO3 Preservation	N/A				FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L	**5**	20	100	56.8	0.5	4173097
Demand Parameters							
Chemical Oxygen Demand	mg/L				0	0	4185140
Biochemical Oxygen Demand	mg/L				<5	5	4190082
MISCELLANEOUS							
Tannins and Lignins	mg/L				<0.1	0.1	4166913
Nutrients							
Ammonia (N)	mg/L				<0.005	0.005	4188649
Dissolved Orthophosphate (P)	mg/L				0.036	0.003	4176615

MICROBIOLOGY (WATER)

Maxxam ID		W13802		
Sampling Date		2010/08/11 00:00		
	Units	**1310 FISHER ROAD**	**RDL**	**QC Batch**
MICROBIOLOGY				
Fecal Coliforms	CFU/100mL	<1	1	4178070

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13802		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1310 FISHER ROAD**	**RDL**	**QC Batch**
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	**5**	20	100		54.9	0.5	4173098

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
Report Date: 2010/11/18

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13802		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1310 FISHER ROAD**	**RDL**	**QC Batch**
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L					0.004	0.003	4187820
Dissolved Antimony (Sb)	mg/L	**0.006**				<0.0005	0.0005	4187820
Dissolved Arsenic (As)	mg/L	**0.01**				0.0004	0.0001	4187820
Dissolved Barium (Ba)	mg/L	**1**				0.002	0.001	4187820
Dissolved Beryllium (Be)	mg/L					<0.0001	0.0001	4187820
Dissolved Bismuth (Bi)	mg/L					<0.001	0.001	4187820
Dissolved Boron (B)	mg/L	**5**				<0.05	0.05	4187820
Dissolved Cadmium (Cd)	mg/L	**0.005**				<0.00001	0.00001	4187820
Dissolved Chromium (Cr)	mg/L	**0.05**				0.003	0.001	4187820
Dissolved Cobalt (Co)	mg/L					<0.0005	0.0005	4187820
Dissolved Copper (Cu)	mg/L				**1**	0.0027	0.0002	4187820
Dissolved Iron (Fe)	mg/L				**0.3**	0.022	0.005	4187820
Dissolved Lead (Pb)	mg/L	**0.01**				<0.0002	0.0002	4187820
Dissolved Lithium (Li)	mg/L					<0.005	0.005	4187820
Dissolved Manganese (Mn)	mg/L				**0.05**	0.001	0.001	4187820
Dissolved Mercury (Hg)	mg/L	**0.001**				<0.00002	0.00002	4187820
Dissolved Molybdenum (Mo)	mg/L					<0.001	0.001	4187820
Dissolved Nickel (Ni)	mg/L					<0.001	0.001	4187820
Dissolved Selenium (Se)	mg/L	**0.01**				<0.0001	0.0001	4187820
Dissolved Silicon (Si)	mg/L					10.7	0.1	4187820
Dissolved Silver (Ag)	mg/L					<0.00002	0.00002	4187820
Dissolved Strontium (Sr)	mg/L					0.053	0.001	4187820
Dissolved Thallium (Tl)	mg/L					<0.00005	0.00005	4187820
Dissolved Tin (Sn)	mg/L					<0.005	0.005	4187820
Dissolved Titanium (Ti)	mg/L					<0.005	0.005	4187820
Dissolved Uranium (U)	mg/L	**0.02**				<0.0001	0.0001	4187820
Dissolved Vanadium (V)	mg/L					<0.005	0.005	4187820
Dissolved Zinc (Zn)	mg/L				**5**	0.054	0.005	4187820
Dissolved Zirconium (Zr)	mg/L					<0.0005	0.0005	4187820
Dissolved Calcium (Ca)	mg/L					11.4	0.05	4171426
Dissolved Magnesium (Mg)	mg/L					6.43	0.05	4171426
Dissolved Potassium (K)	mg/L					0.58	0.05	4171426
Dissolved Sodium (Na)	mg/L				**200**	5.13	0.05	4171426

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."

Maxxam Job #: B069962
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EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

CCME DISSOLVED METALS IN WATER (WATER)

Maxxam ID						W13802		
Sampling Date						2010/08/11 00:00		
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**Criteria 2 A**	**1310 FISHER ROAD**	**RDL**	**QC Batch**
Dissolved Sulphur (S)	mg/L					<3	3	4171426

TOTAL TKN IN WATER (WATER)

Maxxam ID			W13802		
Sampling Date			2010/08/11 00:00		
	Units	**Criteria A**	**1310 FISHER ROAD**	**RDL**	**QC Batch**
Nutrients					
Total Kjeldahl Nitrogen (Calc)	mg/L		0.04	0.02	4171438
Nitrate plus Nitrite (N)	mg/L	**10**	0.07(1)	0.02	4193877
Total Nitrogen (N)	mg/L		0.11	0.02	4186093

RDL = Reportable Detection Limit
Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs
Criteria 2 A: Aesthetic Objective as set by "Guidelines for Canadian Drinking Water Quality."
(1) - Sample analysed past recommended hold time

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EBA ENGINEERING CONSULTANTS LTD.
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Package 1	14.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B069962
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EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4166913	Tannins and Lignins	2010/08/13					<0.1	mg/L	NC	20
4167006	True Colour	2010/08/13			100	N/A	<5	Col. Unit	NC	10
4174873	Total Dissolved Solids	2010/08/12			103	80 - 120	<10	mg/L		
4175569	Conductivity	2010/08/12			100	96 - 104	<1	uS/cm	0	20
4176419	Alkalinity (Total as CaCO3)	2010/08/12			98	N/A	<2	mg/L	0.6	20
4176419	Bicarbonate (HCO3)	2010/08/12					<2	mg/L		
4176419	Carbonate (CO3)	2010/08/12					<2	mg/L		
4176419	Hydroxide (OH)	2010/08/12					<2	mg/L		
4176615	Dissolved Orthophosphate (P)	2010/08/12	101	90 - 110	100	90 - 106	<0.003	mg/L	1.7	20
4178064	E. coli	2010/08/12							NC	50
4178064	Total Coliforms	2010/08/12							NC	45
4178070	Fecal Coliforms	2010/08/12							NC	N/A
4179239	Turbidity	2010/08/13			102	N/A	<0.1	NTU	NC	20
4185140	Chemical Oxygen Demand	2010/08/17	96	84 - 113	103	N/A	0, RDL=0	mg/L	14.9	20
4186093	Total Nitrogen (N)	2010/08/17	NC	80 - 120	85	80 - 120	<0.02	mg/L	7.0	20
4187820	Dissolved Arsenic (As)	2010/08/18	NC	80 - 120	97	80 - 120	<0.0001	mg/L	0.6	20
4187820	Dissolved Beryllium (Be)	2010/08/18	100	80 - 120	98	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Cadmium (Cd)	2010/08/18	98	80 - 120	98	80 - 120	<0.00001	mg/L	NC	20
4187820	Dissolved Chromium (Cr)	2010/08/18	99	80 - 120	97	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Cobalt (Co)	2010/08/18	97	80 - 120	98	80 - 120	<0.0005	mg/L	NC	20
4187820	Dissolved Copper (Cu)	2010/08/18	93	80 - 120	98	80 - 120	<0.0002	mg/L	3.3	20
4187820	Dissolved Lead (Pb)	2010/08/18	95	80 - 120	98	80 - 120	<0.0002	mg/L	NC	20
4187820	Dissolved Lithium (Li)	2010/08/18	100	80 - 120	101	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Nickel (Ni)	2010/08/18	95	80 - 120	96	80 - 120	<0.001	mg/L	NC	20
4187820	Dissolved Selenium (Se)	2010/08/18	102	80 - 120	96	80 - 120	<0.0001	mg/L	NC	20
4187820	Dissolved Uranium (U)	2010/08/18	99	80 - 120	96	80 - 120	<0.0001	mg/L	0.07	20
4187820	Dissolved Vanadium (V)	2010/08/18	102	80 - 120	95	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Zinc (Zn)	2010/08/18	96	80 - 120	92	80 - 120	<0.005	mg/L	NC	20
4187820	Dissolved Aluminum (Al)	2010/08/18					<0.003	mg/L	NC	20
4187820	Dissolved Antimony (Sb)	2010/08/18					<0.0005	mg/L	NC	20
4187820	Dissolved Barium (Ba)	2010/08/18					<0.001	mg/L	0.02	20
4187820	Dissolved Bismuth (Bi)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Boron (B)	2010/08/18					<0.05	mg/L	NC	20
4187820	Dissolved Iron (Fe)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Manganese (Mn)	2010/08/18					<0.001	mg/L	1.4	20
4187820	Dissolved Mercury (Hg)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Molybdenum (Mo)	2010/08/18					<0.001	mg/L	NC	20
4187820	Dissolved Silicon (Si)	2010/08/18					<0.1	mg/L	0.1	20
4187820	Dissolved Silver (Ag)	2010/08/18					<0.00002	mg/L	NC	20
4187820	Dissolved Strontium (Sr)	2010/08/18					<0.001	mg/L	0.3	20

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EBA ENGINEERING CONSULTANTS LTD.
Client Project #: N23101632 CVRD FISHER RD

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
4187820	Dissolved Thallium (Tl)	2010/08/18					<0.00005	mg/L	NC	20
4187820	Dissolved Tin (Sn)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Titanium (Ti)	2010/08/18					<0.005	mg/L	NC	20
4187820	Dissolved Zirconium (Zr)	2010/08/18					<0.0005	mg/L	NC	20
4187948	Total Arsenic (As)	2010/08/19	106	80 - 120	98	80 - 120	<0.1	ug/L	3.7	20
4187948	Total Cadmium (Cd)	2010/08/19	106	80 - 120	98	80 - 120	<0.01	ug/L	NC	20
4187948	Total Chromium (Cr)	2010/08/19	106	80 - 120	101	80 - 120	<1	ug/L	NC	20
4187948	Total Copper (Cu)	2010/08/19	104	80 - 120	102	80 - 120	<0.2	ug/L	6.5	20
4187948	Total Lead (Pb)	2010/08/19	101	80 - 120	97	80 - 120	<0.2	ug/L	NC	20
4187948	Total Selenium (Se)	2010/08/19	110	80 - 120	102	80 - 120	<0.1	ug/L	NC	20
4187948	Total Uranium (U)	2010/08/19	106	80 - 120	97	80 - 120	<0.1	ug/L	2.4	20
4187948	Total Zinc (Zn)	2010/08/19	105	80 - 120	98	80 - 120	<5	ug/L	NC	20
4187948	Total Aluminum (Al)	2010/08/19					<3	ug/L	NC	20
4187948	Total Antimony (Sb)	2010/08/19					<0.5	ug/L	NC	20
4187948	Total Barium (Ba)	2010/08/19					<1	ug/L	0.1	20
4187948	Total Boron (B)	2010/08/19					<50	ug/L	NC	20
4187948	Total Iron (Fe)	2010/08/19					<5	ug/L	0.3	20
4187948	Total Manganese (Mn)	2010/08/19					<1	ug/L	2.4	20
4187948	Total Mercury (Hg)	2010/08/19					<0.02	ug/L		
4188649	Ammonia (N)	2010/08/18	97	80 - 120	97	80 - 120	<0.005	mg/L	5.3	20
4190082	Biochemical Oxygen Demand	2010/08/13			90	N/A	<5	mg/L	5.2	20
4191823	Fluoride (F)	2010/08/19	85	80 - 120	95	80 - 120	0.01, RDL=0.01	mg/L	0.5	20
4193877	Nitrate plus Nitrite (N)	2010/08/19	105	80 - 120	107	80 - 120	<0.02	mg/L	NC(1)	25
4194014	Nitrite (N)	2010/08/12	104	79 - 115	93	80 - 122	<0.002	mg/L	NC	20
4194799	Dissolved Chloride (Cl)	2010/08/19	NC	80 - 120	97	80 - 120	<0.5	mg/L	3.9	20
4195017	Dissolved Sulphate (SO4)	2010/08/19	NC	80 - 120	99	80 - 120	<0.5	mg/L	1.8	20
4200720	Nitrate (N)	2010/08/13	100	N/A	110	N/A	<0.04	mg/L	NC	20

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Sample analysed past recommended hold time

Maxxam

4606 Canada Way, Burnaby, BC Canada V5G 1K5 Ph: 604 734 7276 Toll Free: 1 800 665 8566 Fax: 604 731 2386

CHAIN OF CUSTODY RECORD

Page: 1 of 1

Maxxam Job#: B069962

G 014715

Invoice To: Require Report? Yes [X] No [ ]

Company Name: EBA Engineering
Contact Name: Mike Gallo
Address: 1-4376 Boban Drive
Nanaimo BC PC: V9T 6A7
Phone / Fax#: Ph: 250-756-2256 Fax: 250-756-2686
E-mail: mgallo@eba.ca

Report To:

Company Name: SAME
Contact Name:
Address:
PC:
Phone / Fax#: Ph: Fax:
E-mail

PO #:
Quotation #:
Project #: N23101632
Proj. Name: CVRD FISHER ROAD ENV. REVIEW
Location: COBBLE HILL, BC
Sampled By: MIKE GALLO

REGULATORY REQUIREMENTS SERVICE REQUESTED:

- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other
- [X] DRINKING WATER

- [X] Regular Turn Around Time (TAT) (5 days for most tests)
- [ ] RUSH (Please contact the lab)
- [ ] 1 Day [ ] 2 Day [ ] 3 Day
- Date Required:

Special Instructions:

Return Cooler [ ] **Ship Sample Bottles (please specify)** [ ]

ANALYSIS REQUESTED (Full scan)

#	Sample Identification	Lab Identification	Sample Type	Date/Time Sampled	BTEX/VPH / MTBE	VOC/VPH	EPH / TEH	PAH / LEPH/HEPH	CCME-PHC (Fractions 1-4 Plus BTEX)	CCME-PHC (Fractions 2-4)	CCME BTEX (Fraction 1 Plus BTEX)	PCB	Phenols by 4AAP / Phenols by GCMS	TOG / MOG / SWOG	Dissolved (Field Filtered? Y [X] N)	Metals (Field Acidified? Y [X] N)	Totals Metals Field Acidified? Y [X] N	Nitrate [X] / Nitrite [X] / Ammonia [X]	Chloride [X] / Fluoride [X] / Sulphate [X]	Total Suspended Solids-TSS / TDS [X]	pH [X] / Conductivity [X] / Alkalinity [X]	BOD [X]	COD [X]	Coliform, Total & E.coli [X] / Fecal [X]	Asbestos	DW PKG (VCT-ENPOT)	Tannin & Lignin	NH4	Ortho Phosphate	TKN (Tot Kjeldahl N)		HOLD
1	FRRC		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
2	Lockhart		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
3	Gamboa		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
4	Good Auto (G.A.)		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
5	CHID		GW	Aug 11/10											X	X						X	X	X		X	X	X	X	X		
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Samples are from a Drinking Water Source? YES [✓] NO [ ]

Does source supply multiple households? YES [✓] NO [ ]

*Relinquished by:	Date (YY/MM/DD):	Time:	Received by:	Date (YY/MM/DD):	Time:
M. Gallo			Debbie Nordbrugt	11 Aug 2010	1600

Time Sensitive [✓]

Laboratory Use Only

Temperature on Receipt (°C): 13.8°C

Custody Seal Intact on Cooler? Yes / No: NA

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

COC-1020 (05/10)

Maxxam International Corporation o/a Maxxam Analytics

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W: www.exova.com

Report Transmission Cover Page

Bill To:	EBA Engineering Consultants	Project:		Lot ID:	**761706**
Report To:	EBA Engineering Consultants	ID:	N23101632	Control Number:	A159347
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review	Date Received:	Sep 10, 2010
	Nanaimo, BC, Canada	Location:	1355 Fisher Road	Date Reported:	Nov 18, 2010
	V9T 6A7	LSD:		Report Number:	1389555
Attn:	Mike Gallo	P.O.:			
Sampled By:	Mike Gallo	Acct code:			
Company:	EBA				

Contact & Affiliation	Address	Delivery Commitments
Mike Gallo EBA Engineering Consultants Ltd -	#1 - 4376 Boban Drive Nanaimo, British Columbia V9T 6A7 Phone: (250) 756-2256 Fax: (250) 756-2686 Email: mgallo@eba.ca	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report, COC) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

Notes To Clients:

- Report was re-issued to change the project location as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389555 replaces report 1356423.

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W: www.exova.com

Sample Custody

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**761706**
Control Number:	A159347
Date Received:	Sep 10, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389555

Sample Disposal Date: December 14, 2010

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

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Exova

Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**761706**
Control Number:	A159347
Date Received:	Sep 10, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389555

Reference Number	761706-1	761706-2
Sample Date	Sep 07, 2010	Sep 07, 2010
Sample Time	NA	NA
Sample Location		
Sample Description	SP1	SP2
Matrix	Compost	Compost

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Available Nutrients						
Ammonium - N	Available-dry basis	mg/kg	328	1250		0.3
Nitrate - N	Available-dry basis	mg/kg	<0.7	<0.7		0.5
Metals Strong Acid Digestion						
Mercury	Strong Acid Extractable	mg/kg	0.07	0.19		0.01
Strong Acid Leachable Metals						
Arsenic	Strong Acid Extractable	ug/g	7.4	3.5		0.2
Cadmium	Strong Acid Extractable	ug/g	0.38	0.52		0.01
Chromium	Strong Acid Extractable	ug/g	24.1	18.9		0.5
Cobalt	Strong Acid Extractable	ug/g	8.4	5.2		0.1
Copper	Strong Acid Extractable	ug/g	43	101		1
Lead	Strong Acid Extractable	ug/g	40.9	25.1		0.1
Molybdenum	Strong Acid Extractable	ug/g	1	2		1
Nickel	Strong Acid Extractable	ug/g	16.3	13.4		0.5
Selenium	Strong Acid Extractable	ug/g	<0.3	0.6		0.3
Zinc	Strong Acid Extractable	ug/g	161	232		1
Microbiological Analysis						
Fecal Coliforms	MPN	MPN/g	23000	2300		

Approved by:

Bonnie Garbutt
Microbiology Team Leader

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Methodology and Notes

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**761706**
Control Number:	A159347
Date Received:	Sep 10, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389555

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Ammonium-N (Extractable) in Soil	Carter	*	Extraction of NO3-N and NH4-N with 2.0 M KCl, 6.2	13-Sep-10	Exova Edmonton
Coliforms- MPN (Enviro)	APHA		Fecal Coliform Procedure, 9221 E	10-Sep-10	Exova Calgary
Mercury (Hot Block) in Soil	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	13-Sep-10	Exova Edmonton
Metals ICP-MS (BCMOE SALM) in soil	B.C.M.O.E	*	Strong Acid Leachable Metals (SALM) in Soil, V 1.0, SALM	13-Sep-10	Exova Edmonton

** Reference Method Modified*

References

APHA	Standard Methods for the Examination of Water and Wastewater
B.C.M.O.E	B.C. Ministry of Environment
McKeague	Manual on Soil Sampling and Methods of Analysis
US EPA	US Environmental Protection Agency Test Methods

Comments:

- Report was re-issued to change the project location as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389555 replaces report 1356423.

761706

Control Number A159347

Exova

www.exova.com

Environmental Sample Information Sheet

Note: Proper completion of this form is required in order to proceed with analysis

See reverse for your nearest Exova location and proper sampling protocol

Billing Address:	Copy of Report:	**Copy of Report To:**	Copy of invoice:
Company: EBA Engineering Ltd.		Company: SAME	Send invoice to this address for approval ☐
Address: 1-4376 Boban Dr. Nanaimo BC V9T 6A7	QA/QC Report ☒	Address:	
Attention: Mike Gallo	Report Result:	Attention:	Report Result:
Phone: (250) 756 2256	e-mail ☒	Phone:	e-mail ☐
Fax:	Results Online ☐	Fax:	Results Online ☐
Cell: (250) 756 2686	Fax ☒	Cell:	Fax ☐
e-mail: MGallo@eba.ca	Mail ☐	e-mail:	Mail ☐

Information to be included on Report and Invoice

Project ID: N23101632
Project Name: CVRD FISHER RD. GW. REVIEW
Project Location: FISHER RD. RECYCLING FACILITY
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

PRIORITY

Please contact laboratory prior to submitting any RUSH samples.

Upon filling out this section, client accepts that surcharges will be applied to this analysis.

If not all samples require RUSH, please indicate in special instructions.

Date Required: REG. 1 week
Signature:

Sample Custody (Please Print)
Sampled by: Mike Gallo
Company EBA Signature

I authorize Exova to proceed with the work indicated on this form:
Date: Sept 7/10 Initial: MB

Received by: Sample Temp.
Waybill #: D0169250 Date
Company DHL Time SEP 10 '10 8:43

Special Instructions / Comments

Samples collected at 3:30 PM & 4:20 PM PDT

Please indicate which regulations you are required to meet:

- ☐ Health Canada Drinking Water Quality
- ☐ Alberta Tier 1
- ☒ Other: BC OMRR

	Sample Identification	Location	Depth IN	Depth CM	Depth M	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	Enter tests above (✓ relevant samples below): 1° Dry & Grind	F1 - NH4, NO3-N	OMRR - BC Metals	SS3 - Fecal Coliforms
	SP1					Sept 7/10	Compost		2	X	X	X	X
	SP2					Sept 7/10	Compost		2	X	X	X	X

NOTE: All hazardous samples must be labeled according to WHMIS guidelines.

Page 1 of 1

ED 077-00

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Report Transmission Cover Page

Bill To:	EBA Engineering Consultants	Project:		Lot ID:	**761707**
Report To:	EBA Engineering Consultants	ID:	N23101632	Control Number:	A159346
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review	Date Received:	Sep 10, 2010
	Nanaimo, BC, Canada	Location:	1355 Fisher Road	Date Reported:	Nov 18, 2010
	V9T 6A7	LSD:		Report Number:	1389553
Attn:	Mike Gallo	P.O.:			
Sampled By:	Mike Gallo	Acct code:			
Company:	EBA				

Contact & Affiliation	Address	Delivery Commitments
Mike Gallo EBA Engineering Consultants Ltd -	#1 - 4376 Boban Drive Nanaimo, British Columbia V9T 6A7 Phone: (250) 756-2256 Fax: (250) 756-2686 Email: mgallo@eba.ca	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report, COC) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

Notes To Clients:

- Report was re-issued to change the project location as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389553 replaces report 1356425.

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Sample Custody

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**761707**
Control Number:	A159346
Date Received:	Sep 10, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389553

Sample Disposal Date: December 14, 2010

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

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F: +1 (403) 291-2021
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W: www.exova.com

Exova

Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**761707**
Control Number:	A159346
Date Received:	Sep 10, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389553

Reference Number	761707-1
Sample Date	Sep 09, 2010
Sample Time	NA
Sample Location	
Sample Description	SP3
Matrix	Compost

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Available Nutrients						
Ammonium - N	Available-dry basis	mg/kg	1420			0.3
Nitrate - N	Available-dry basis	mg/kg	7.7			0.5
Metals Strong Acid Digestion						
Mercury	Strong Acid Extractable	mg/kg	0.18			0.01
Strong Acid Leachable Metals						
Arsenic	Strong Acid Extractable	ug/g	3.4			0.2
Cadmium	Strong Acid Extractable	ug/g	0.61			0.01
Chromium	Strong Acid Extractable	ug/g	22.9			0.5
Cobalt	Strong Acid Extractable	ug/g	6.5			0.1
Copper	Strong Acid Extractable	ug/g	123			1
Lead	Strong Acid Extractable	ug/g	23.8			0.1
Molybdenum	Strong Acid Extractable	ug/g	2			1
Nickel	Strong Acid Extractable	ug/g	17.3			0.5
Selenium	Strong Acid Extractable	ug/g	0.8			0.3
Zinc	Strong Acid Extractable	ug/g	277			1
Microbiological Analysis						
Fecal Coliforms	MPN	MPN/g	7500			

Approved by:

Bonnie Garbutt
Microbiology Team Leader

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T1Y-5L3, Canada

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E: Calgary@exova.com
W: www.exova.com

Methodology and Notes

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd Env Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**761707**
Control Number:	A159346
Date Received:	Sep 10, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389553

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Ammonium-N (Extractable) in Soil	Carter	*	Extraction of NO3-N and NH4-N with 2.0 M KCl, 6.2	13-Sep-10	Exova Edmonton
Coliforms- MPN (Enviro)	APHA		Fecal Coliform Procedure, 9221 E	10-Sep-10	Exova Calgary
Mercury (Hot Block) in Soil	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	13-Sep-10	Exova Edmonton
Metals ICP-MS (BCMOE SALM) in soil	B.C.M.O.E	*	Strong Acid Leachable Metals (SALM) in Soil, V 1.0, SALM	13-Sep-10	Exova Edmonton

** Reference Method Modified*

References

APHA	Standard Methods for the Examination of Water and Wastewater
B.C.M.O.E	B.C. Ministry of Environment
McKeague	Manual on Soil Sampling and Methods of Analysis
US EPA	US Environmental Protection Agency Test Methods

Comments:

- Report was re-issued to change the project location as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389553 replaces report 1356425.

761707

Exova

Control Number A159346

Environmental Sample Information Sheet

Note: Proper completion of this form is required in order to proceed with analysis
See reverse for your nearest Exova location and proper sampling protocol

www.exova.com

Billing Address: Copy of Report: [ ]	**Copy of Report To:** Copy of invoice: [ ]
Company: EBA Engineering Ltd.	Company:
Address: 1-4376 Boban Drive, Nanaimo BC, V9T [illegible] 6A7	Address: SAME
QA/QC Report [X]	Send invoice to this address for approval [ ]
Attention: Mike Gallo	Attention:
Phone: (250) 756-2256	Phone:
Fax: (250) 756-2686	Fax:
Cell:	Cell:
e-mail: mgallo@eba.ca	e-mail:
Report Result: e-mail [X] Results Online [ ] Fax [X] Mail [ ]	Report Result: e-mail [ ] Results Online [ ] Fax [ ] Mail [ ]

Information to be included on Report and Invoice

Project ID: N23101632
Project Name: CVRD Fisher Rd. Env. Review
Project Location: Fisher Rd. Recycling Facility
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

PRIORITY
Please contact laboratory prior to submitting any RUSH samples.
Upon filling out this section, client accepts that surcharges will be applied to this analysis.
If not all samples require RUSH, please indicate in special instructions.

Date Required: Reg. 1 week
Signature: MGallo

Sample Custody (Please Print)
Sampled by: Mike Gallo
Company: EBA Signature: MGallo
I authorize Exova to proceed with the work indicated on this form:
Date: Sep 9/10 Initial: MG
Received by: [illegible] Sample Temp.
Waybill #: D0169259 3
Company: DHL Date: SEP 10 '10 Time: 8:45

Special Instructions / Comments

Sample Collected at 1:45 PM PDT Sep 9/10

Please indicate which regulations you are required to meet:
[ ] Health Canada Drinking Water Quality
[ ] Alberta Tier 1
[X] Other: BC OMRR

Tests (Enter tests above): Number of Containers; 11-Dry & Grind; F1-NH4 NO3-N; OMRR BC-metals; SS3 Fecal Coliform

Sample Identification	Location	Depth (IN / CM / M)	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	11-Dry & Grind	F1-NH4 NO3-N	OMRR BC-metals	SS3 Fecal Coliform
SP3			Sep 9/10	Compost			X	X	X	X

NOTE: All hazardous samples must be labeled according to WHMIS guidelines.

Page 1 of 1

ED 077-00

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Report Transmission Cover Page

Bill To:	EBA Engineering Consultants	Project:		Lot ID:	**764701**
Report To:	EBA Engineering Consultants	ID:	N23101632	Control Number:	A164698
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd. Env. Review	Date Received:	Sep 28, 2010
	Nanaimo, BC, Canada	Location:	1355 Fisher Road	Date Reported:	Nov 19, 2010
	V9T 6A7	LSD:		Report Number:	1389551
Attn:	Mike Gallo	P.O.:			
Sampled By:	Mike Gallo	Acct code:			
Company:	EBA				

Contact & Affiliation	Address	Delivery Commitments
Mike Gallo EBA Engineering Consultants Ltd -	#1 - 4376 Boban Drive Nanaimo, British Columbia V9T 6A7 Phone: (250) 756-2256 Fax: (250) 756-2686 Email: mgallo@eba.ca	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report, COC) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

Notes To Clients:

- Report was re-issued to change the project location as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389551 replaces report 1361658.

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Sample Custody

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd. Env. Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**764701**
Control Number:	A164698
Date Received:	Sep 28, 2010
Date Reported:	Nov 19, 2010
Report Number:	1389551

Sample Disposal Date: January 05, 2011

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

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W: www.exova.com

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd. Env. Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**764701**
Control Number:	A164698
Date Received:	Sep 28, 2010
Date Reported:	Nov 19, 2010
Report Number:	1389551

		Reference Number	764701-1	764701-2	764701-3	
		Sample Date	Sep 27, 2010	Sep 27, 2010	Sep 27, 2010	
		Sample Time	11:15	12:15	13:15	
		Sample Location				
		Sample Description	SP1-A	SP2-A	SP3-A	
		Matrix	Compost	Compost	Compost	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Available Nutrients						
Ammonium - N	Available-dry basis	mg/kg	633	1350	1530	0.3
Nitrate - N	Available-dry basis	mg/kg	6	2	20	0.5
Classification						
C:N Ratio			27	15.8	18.3	
Organic Matter		%	42.9	48.8	53.8	0.15
Carbon	Total Organic	% dry weight	21.4	24.4	26.9	0.05
Nitrogen	Total	% dry weight	0.80	1.54	1.47	0.02
Microbiological Analysis						
Fecal Coliforms	MPN	MPN/g	4300	430	460000	

Approved by:

Darlene Lintott, MSc
Consulting Scientist

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Methodology and Notes

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	CVRD Fisher Rd. Env. Review
	Nanaimo, BC, Canada	Location:	1355 Fisher Road
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Mike Gallo	Acct code:	
Company:	EBA		

Lot ID:	**764701**
Control Number:	A164698
Date Received:	Sep 28, 2010
Date Reported:	Nov 19, 2010
Report Number:	1389551

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Ammonium-N (Extractable) in Soil	Carter	*	Extraction of NO3-N and NH4-N with 2.0 M KCl, 6.2	30-Sep-10	Exova Edmonton
Carbon and Nitrogen in soil (FSJ)	SSSA Book Series 5	*	Nitrogen-Total, Ch 37	05-Oct-10	Exova Fort St. John
Carbon and Nitrogen in soil (FSJ)	SSSA Book Series 5	*	Total Carbon, Organic Carbon, and Organic Matter, Ch 34	05-Oct-10	Exova Fort St. John
Coliforms- MPN (Enviro)	APHA		Fecal Coliform Procedure, 9221 E	30-Sep-10	Exova Calgary

** Reference Method Modified*

References

APHA	Standard Methods for the Examination of Water and Wastewater
McKeague	Manual on Soil Sampling and Methods of Analysis
SSSA Book Series 5	Methods of Soil Analysis, Part 3

Comments:

- Report was re-issued to change the project location as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389551 replaces report 1361658.

Exova

LOT: 764701 COC

764701

Control Number A164698

Environmental Sample Information Sheet

Proper completion of this form is required in order to proceed with analysis

See reverse for your nearest Exova location and proper sampling protocol

www.exova.com

Billing Address:	Copy of Report:	**Copy of Report To:**	Copy of invoice:
Company: EBA Engineering Ltd.	QA/QC Report ☒	Company:	Send invoice to this address for approval ☐
Address: 1-4376 Boban Drive Nanaimo, BC V9T 6A7		Address: SAME	
Attention: Mike Gallo	Report Result: e-mail ☑	Attention:	Report Result: e-mail ☐
Phone: (250) 756-2256	Results Online ☐	Phone:	Results Online ☐
Fax: (250) 714-5577	Fax ☒	Fax:	Fax ☐
Cell:	Mail ☐	Cell:	Mail ☐
e-mail: mgallo@eba.ca		e-mail:	

Information to be included on Report and Invoice

Project ID: N2310632
Project Name: CVRD FISHER RD. ENV. REVIEW
Project Location: FISHER RD. RECYCLING FACILITY
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

PRIORITY

Please contact laboratory prior to submitting any RUSH samples.

Upon filling out this section, client accepts that surcharges will be applied to this analysis.

If not all samples require RUSH, please indicate in special instructions.

Date Required: Regular 1 week TAT
Signature:

Sample Custody (Please Print)
Sampled by: Mike Gallo
Company EBA Signature

I authorize Exova to proceed with the work indicated on this form:
Date: Sept 27/10 Initial:

Received by: Sample Temp.
Waybill #: SEP 28 '10 10:37 Date
Company Time

Special Instructions / Comments

Samples collected between 11:15 AM and 1:15 PM PDT.

Please indicate which regulations you are required to meet:

- ☐ Health Canada Drinking Water Quality
- ☐ Alberta Tier 1
- ☒ Other: BC OMRR

	Sample Identification	Location	Depth IN CM M	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	Enter tests above (✓ relevant samples below): 11-Dry & Grind	F1-NH4, NO3-N	SB3-Fecal Coliforms	24-C:N Ratio											
	SP1-A			Sept 27/10	Compost	Grab	2	x	x	x	x											
	SP2-A			Sept 27/10	Compost	Grab	2	x	x	x	x											
	SP3-A			Sept 27/10	Compost	Grab	2	x	x	x	x											

NOTE: All hazardous samples must be labeled according to WHMIS guidelines.

Page _____ of _____

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Report Transmission Cover Page

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	Environmental Review
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Joel Shandro	Acct code:	
Company:	EBA		

Lot ID:	**766987**
Control Number:	A157824
Date Received:	Oct 8, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389549

Contact & Affiliation	Address	Delivery Commitments
Mike Gallo EBA Engineering Consultants Ltd -	#1 - 4376 Boban Drive Nanaimo, British Columbia V9T 6A7 Phone: (250) 756-2256 Fax: (250) 756-2686 Email: mgallo@eba.ca	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report, COC) by Automated Fax On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

Notes To Clients:

- Report was re-issued to change the sample descriptions as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389549 replaces report 1365041.

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Sample Custody

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	Environmental Review
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Joel Shandro	Acct code:	
Company:	EBA		

Lot ID:	**766987**
Control Number:	A157824
Date Received:	Oct 8, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389549

Sample Disposal Date: January 12, 2011

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	Environmental Review
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Joel Shandro	Acct code:	
Company:	EBA		

Lot ID:	**766987**
Control Number:	A157824
Date Received:	Oct 8, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389549

Reference Number	766987-1
Sample Date	Oct 07, 2010
Sample Time	NA
Sample Location	
Sample Description	1345 Fisher Rd. SP1
Matrix	Compost

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Available Nutrients						
Ammonium - N	Available-dry basis	mg/kg	5.3			0.3
Nitrate - N	Available-dry basis	mg/kg	14			0.5
Classification						
C:N Ratio			16.8			0.1
Nitrogen	Total	%	1.19			0.01
Organic Matter	Total	%	39.9			
Carbon	Total Organic	%	20.0			0.02
Metals Strong Acid Digestion						
Antimony	Strong Acid Extractable	ug/g	0.8			0.5
Arsenic	Strong Acid Extractable	ug/g	1.6			0.2
Barium	Strong Acid Extractable	ug/g	112			0.03
Beryllium	Strong Acid Extractable	ug/g	0.17			0.01
Cadmium	Strong Acid Extractable	ug/g	0.3			0.05
Chromium	Strong Acid Extractable	ug/g	20.1			0.04
Cobalt	Strong Acid Extractable	ug/g	6.83			0.05
Copper	Strong Acid Extractable	ug/g	50.0			0.05
Lead	Strong Acid Extractable	ug/g	16.9			0.3
Manganese	Strong Acid Extractable	ug/g	496			0.3
Mercury	Strong Acid Extractable	ug/g	0.044			0.003
Molybdenum	Strong Acid Extractable	ug/g	0.50			0.05
Nickel	Strong Acid Extractable	ug/g	14.2			0.1
Selenium	Strong Acid Extractable	ug/g	<0.3			0.3
Silver	Strong Acid Extractable	ug/g	<0.2			0.2
Strontium	Strong Acid Extractable	ug/g	87.0			0.02
Thallium	Strong Acid Extractable	ug/g	1.7			0.3
Tin	Strong Acid Extractable	ug/g	0.3			0.2
Vanadium	Strong Acid Extractable	ug/g	34.4			0.1
Zinc	Strong Acid Extractable	ug/g	121			0.1

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	Environmental Review
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Joel Shandro	Acct code:	
Company:	EBA		

Lot ID:	**766987**
Control Number:	A157824
Date Received:	Oct 8, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389549

Reference Number		766987-1	766987-2
Sample Date		Oct 07, 2010	Oct 07, 2010
Sample Time		NA	NA
Sample Location			
Sample Description		1345 Fisher Rd. SP1	1345 Fisher Rd.
Matrix		Compost	Leachate Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Microbiological Analysis						
Total Coliforms	Membrane Filtration	CFU/100 mL		20000		1
Fecal Coliforms	Membrane Filtration	CFU/100 mL		<1		1
Fecal Coliforms	MPN	MPN/g	93			

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	Environmental Review
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Joel Shandro	Acct code:	
Company:	EBA		

Lot ID:	**766987**
Control Number:	A157824
Date Received:	Oct 8, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389549

Reference Number	766987-2
Sample Date	Oct 07, 2010
Sample Time	NA
Sample Location	
Sample Description	1345 Fisher Rd. Leachate
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Inorganic Nonmetallic Parameters						
Ammonium - N		mg/L	16.2			0.05
Nitrogen	Total	mg/L	58.2			0.06
Organic Carbon	Total Nonpurgeable	mg/L	325			0.5
Metals Total						
Calcium	Total	mg/L	138			0.2
Iron	Total	mg/L	13.0			0.05
Magnesium	Total	mg/L	60.9			0.1
Manganese	Total	mg/L	1.69			0.005
Potassium	Total	mg/L	485			0.4
Silicon	Total	mg/L	25.4			0.05
Sodium	Total	mg/L	80.3			0.4
Sulfur	Total	mg/L	6.6			0.3
Aluminum	Total	mg/L	6.91			0.005
Antimony	Total	mg/L	0.0014			0.0002
Arsenic	Total	mg/L	0.0252			0.0002
Barium	Total	mg/L	0.273			0.001
Beryllium	Total	mg/L	0.0006			0.0001
Bismuth	Total	mg/L	<0.0005			0.0005
Boron	Total	mg/L	0.108			0.002
Cadmium	Total	mg/L	0.00064			0.00001
Chromium	Total	mg/L	0.0188			0.0005
Cobalt	Total	mg/L	0.0092			0.0001
Copper	Total	mg/L	0.035			0.001
Lead	Total	mg/L	0.0210			0.0001
Lithium	Total	mg/L	0.012			0.001
Molybdenum	Total	mg/L	0.003			0.001
Nickel	Total	mg/L	0.0280			0.0005
Selenium	Total	mg/L	<0.0002			0.0002
Silver	Total	mg/L	0.00036			0.00001
Strontium	Total	mg/L	0.791			0.001
Thallium	Total	mg/L	0.00011			0.00005
Tin	Total	mg/L	0.001			0.001
Titanium	Total	mg/L	0.306			0.0005
Uranium	Total	mg/L	0.0036			0.0005
Vanadium	Total	mg/L	0.0208			0.0001
Zinc	Total	mg/L	0.143			0.001

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:		Lot ID:	**766987**
Report To:	EBA Engineering Consultants	ID:	N23101632	Control Number:	A157824
	#1 - 4376 Boban Drive	Name:	Environmental Review	Date Received:	Oct 8, 2010
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC	Date Reported:	Nov 18, 2010
	V9T 6A7	LSD:		Report Number:	1389549
Attn:	Mike Gallo	P.O.:			
Sampled By:	Joel Shandro	Acct code:			
Company:	EBA				

Reference Number	766987-2
Sample Date	Oct 07, 2010
Sample Time	NA
Sample Location	
Sample Description	1345 Fisher Rd. Leachate
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Zirconium	Total	mg/L	0.010			0.001
Routine Water						
Nitrate - N		mg/L	0.11			0.01
Nitrite - N		mg/L	<0.005			0.005
Nitrate and Nitrite - N		mg/L	0.11			0.01

Approved by:

Bonnie Garbutt
Microbiology Team Leader

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Methodology and Notes

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	Environmental Review
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Joel Shandro	Acct code:	
Company:	EBA		

Lot ID:	**766987**
Control Number:	A157824
Date Received:	Oct 8, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389549

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Ammonium-N (Extractable) in Soil	Carter	*	Extraction of NO3-N and NH4-N with 2.0 M KCl, 6.2	12-Oct-10	Exova Edmonton
Ammonium-N in Water	APHA	*	Automated Phenate Method, 4500-NH3 G	13-Oct-10	Exova Edmonton
Anions (Routine) by Ion Chromatography	APHA	*	Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	12-Oct-10	Exova Edmonton
Carbon Organic (Total) in water (TOC)	APHA		High-Temperature Combustion Method, 5310 B	12-Oct-10	Exova Edmonton
Coliforms - Membrane Filtration	APHA		Fecal Coliform Membrane Filter Procedure, 9222 D	08-Oct-10	Exova Calgary
Coliforms - Membrane Filtration	APHA		Standard Total Coliform Membrane Filter Procedure, 9222 B	08-Oct-10	Exova Calgary
Coliforms- MPN (Enviro)	APHA		Fecal Coliform Procedure, 9221 E	08-Oct-10	Exova Calgary
Metals (Strong Acid Leachable) in soils	B.C.M.O.E	*	Strong Acid Leachable Metals (SALM) in Soil, V 1.0, SALM	12-Oct-10	Exova Surrey
Metals ICP-MS (Total) in water	US EPA	*	Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	09-Oct-10	Exova Edmonton
Metals Trace (Total) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	09-Oct-10	Exova Edmonton
Total and Kjeldahl Nitrogen (Total) in Water	ISO	*	Water Quality - Determination of nitrogen, ISO/TR 11905-2	12-Oct-10	Exova Edmonton
Total Carbon, Nitrogen & Sulfur by Leco Combustion	SSSA Book Series 5	*	Nitrogen-Total, Ch 37	12-Oct-10	Exova Surrey
Total Carbon, Nitrogen & Sulfur by Leco Combustion	SSSA Book Series 5	*	Total Carbon, Organic Carbon, and Organic Matter, Ch 34	12-Oct-10	Exova Surrey

** Reference Method Modified*

References

APHA	Standard Methods for the Examination of Water and Wastewater
B.C.M.O.E	B.C. Ministry of Environment
ISO	International Organization for Standardization
McKeague	Manual on Soil Sampling and Methods of Analysis
US EPA	US Environmental Protection Agency Test Methods

Comments:

- Report was re-issued to change the sample descriptions as per Mike Gallo of EBA engineering on Nov. 18/10. Report 1389549 replaces report 1365041.

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Methodology and Notes

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	N23101632
	#1 - 4376 Boban Drive	Name:	Environmental Review
	Nanaimo, BC, Canada	Location:	Cobble Hill, BC
	V9T 6A7	LSD:	
Attn:	Mike Gallo	P.O.:	
Sampled By:	Joel Shandro	Acct code:	
Company:	EBA		

Lot ID:	**766987**
Control Number:	A157824
Date Received:	Oct 8, 2010
Date Reported:	Nov 18, 2010
Report Number:	1389549

Exova

766987

Control Number A157824

www.exova.com

Environmental Sample Information Sheet

Note: Proper completion of this form is required in order to proceed with analysis

See reverse for your nearest Exova location and proper sampling protocol

Billing Address:	Copy of Report: ✓	**Copy of Report To:**	Copy of invoice:
Company: EBA Engineering Consultants Ltd.		Company:	Send invoice to this address for approval ☐
Address: #1-4376 Boban Drive, Nanaimo BC, V9T 6A7	QA/QC Report ✓	Address:	
Attention: Mike Gallo	Report Result:	Attention:	Report Result:
Phone: 250-756-2256	e-mail ✓	Phone:	e-mail ☐
Fax: 250-756-2686	Results Online ✓	Fax:	Results Online ☐
Cell: 250-714-5577	Fax ☐	Cell:	Fax ☐
e-mail: mgallo@eba.ca	Mail ☐	e-mail:	Mail ☐

Information to be included on Report and Invoice

Project ID: N23101632
Project Name: Environmental Review
Project Location: Cobble Hill, BC
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

PRIORITY

Please contact laboratory prior to submitting any RUSH samples.

Upon filling out this section, client accepts that surcharges will be applied to this analysis.

If not all samples require RUSH, please indicate in special instructions.

Date Required: Oct 15/10
Signature: Mgallo

Sample Custody (Please Print)
Sampled by: Joel Shandro
Company EBA Signature
I authorize Exova to proceed with the work indicated on this form:
Date: Oct 7/10 Initial:
Received by: Sample Temp. 3.3°C
Waybill #: 1944 221 Date 5728
Company Pure Time 8:46

Special Instructions / Comments

Please verify codes are correct for leachate samples
I need the following parameters tested:
Fecal Coliforms, Total Metals, Ammonium, Nitrate, Nitrite, Nitrate + Nitrite, total nitrogen, and TOC

Please indicate which regulations you are required to meet:
☐ Health Canada Drinking Water Quality
☐ Alberta Tier 1
✓ Other: BC OMRR

Sample Identification	Location	Depth IN	Depth CM	Depth M	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	1 - Dry & Grind	F1 - NH4, NO3-N	SS3 - Fecal Coliforms	CL41 - C:N Ratio	OMRR - BC small Metals	WW1 - Fecal Coliforms	TW2WW1 - Total Metals	NH4 - Ammonium	N02-Nitrate Nitrite NO3+NO2	TN1 - Total Nitrogen	TOC
								Enter tests above (✓ relevant samples below)											
CLS SP1					Oct 7/10	Compost	GRAB		X	X	X	X	X						
CLS Leachate					Oct 7/10	leachate	Bailer							X	X	X	X	X	X
~~FRRF~~ Runoff																			

NOTE: All hazardous samples must be labeled according to WHMIS guidelines.

Page 1 of 1

ED 077-00

BRITISH COLUMBIA

Original:	Copies to: DSY BWDD T. Anderson M. T. Appett F. Simpson
Board:	
Commitee(s):	
Directed by: Date.	Dir. Hughes Andrews F. Hugo
File # 5380-03/WLDC/2002	

FAX SHEET

Date: Tuesday April 16, 2002

\# of pages (including this sheet) 10

To: Brian Dennison

Fax # 250 746-5678

Office: Cowichan Valley Regional District

Phone # 250 746-2630

From: Al Leuschen, Environmental Protection Compliance Officer

Phone # 250 751-3199

Fax # 250 751-3103

Re: SAMPLE RESULTS - Cobble Hill Fisher Road water well sampling

On April 4 & 9, 2002, Ministry of Water, Land and Air Protection (WLAP), Environmental Protection staff sampled a total of eight water wells on and near the Westcoast Landfill Diversion Corp. (WCLD) composting facility on Fisher Road near Cobble Hill.

Sample results indicate that all water wells satisfied the drinking water guidelines for the parameters tested, with the exception of the WCLD water well. Results are attached.

For the WCLD water well, sample results indicate that nitrate-nitrogen and specific conductance exceeded the drinking water guidelines. Nitrate nitrogen was 47.7 mg/L versus the 10 mg/L maximum acceptable concentration (based on health considerations) specified in the drinking water guidelines. Specific conductance was 725 uS/cm versus the 700 uS/cm aesthetic objective (non-health related) specified in the drinking water guidelines.

On April 8, 2002, the Environmental Health Officer from the Vancouver Island Health Authority sampled the WCLD water well for fecal and total coliform. Fecal and total coliform were not detected. Results are attached.

WLAP will work with the Environmental Health Officer, and WCLD to determine if improvements are required to the WCLD water well.

URGENT: No CONFIDENTIAL: No ORIG. IN MAIL: No

Ministry of Water, Land and Air Protection
Vancouver Island Region
Mailing Address: 2080A Labieux Road Nanaimo BC V9T 6J9
Telephone: 250 751-3100
Facsimile: 250 751-3103

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069277

Sampling site : WCLD
Submitted by : R. PATTERSON

Philip ID :	12019374
Client ID :	20020404
	1110

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	725	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041334	Chloride Dissolved	46.2	mg/L	0.5	00/00	Ion chromatography
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	0.92	mg/L		--/--	Calculated Result
TN-WDGWA	Total Nitrogen	48.6	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	0.92	mg/L		--/--	Calculated Result
11082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Automated Berthelot meth
1110CALC	Nitrate Nitrogen Dissolved (N)	47.7	mg/L		--/--	Calculated Result
11092350	Nitrate+Nitrite (N)	47.7	mg/L	0.002	00/00	Auto. Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazonization

Matrix :	Water
Sampled on:	02/04/04 11:10

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069278

Sampling site : 1415 GALLIER RD ROLLS RESIDENCE
Submitted by : R. PATTERSON

Philip ID : 12019375
Client ID : 20020404
1145

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	486	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041334	Chloride Dissolved	84.4	mg/L	0.5	00/00	Ion chromatography
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	0.20	mg/L		--/--	Calculated Result
TN-WDGWA	Total Nitrogen	3.00	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	0.20	mg/L		--/--	Calculated Result
11082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Automated Berthelot meth
1110CALC	Nitrate Nitrogen Dissolved (N)	2.80	mg/L		--/--	Calculated Result
11092350	Nitrate+Nitrite (N)	2.80	mg/L	0.002	00/00	Auto. Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazotization

Matrix : Water
Sampled on: 02/04/04 11:45

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069279

Sampling site : 1425 GALLIER RD LOCKHART RESIDENCE
Submitted by : R. PATTERSON

Philip ID : 12019376
Client ID : 20020404
1158

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	247	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041534	Chloride Dissolved	10.3	mg/L	0.5	00/00	Ion chromatography
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	0.08	mg/L		-/-	Calculated Result
TN-WDGWA	Total Nitrogen	1.87	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	< 0.10	mg/L		-/-	Calculated Result
1082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Ammonated Berthelot meth
1110CALC	Nitrate Nitrogen Dissolved (N)	1.79	mg/L		-/-	Calculated Result
11092350	Nitrate+Nitrite (N)	1.79	mg/L	0.002	00/00	Auto. Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazotization

Matrix : Water
Sampled on: 02/04/04 11:58

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069280

Sampling site : 1360 FISHER RD GAMBOA GREENHOUSE
Submitted by : R. PATTERSON

Philip ID : 12019377
Client ID : 20020404
1227

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	306	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041334	Chloride Dissolved	24.8	mg/L	0.5	00/00	Ion chromatography
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	0.56	mg/L		--/--	Calculated Result
TN-WDGWA	Total Nitrogen	8.07	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	0.56	mg/L		--/--	Calculated Result
11082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Automated Berthelot meth
1110CALC	Nitrate Nitrogen Dissolved (N)	7.51	mg/L		--/--	Calculated Result
11092350	Nitrate+Nitrite (N)	7.51	mg/L	0.002	00/00	Auto. Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazonization

Matrix : Water
Sampled on: 02/04/04 12:27

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069281

Sampling site : COBBLE HILL IMP DIST GALLIER AND HOLLAND WELL
Submitted by : R. PATTERSON

Philip ID :	12019378
Client ID :	20020404
	1315

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	272	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041334	Chloride Dissolved	16.7	mg/L	0.5	00/00	Ion chromatography
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	0.22	mg/L		--/--	Calculated Result
TN-WDGWA	Total Nitrogen	3.67	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	0.22	mg/L		--/--	Calculated Result
11082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Ammonated Berthelot mech
1110CALC	Nitrate Nitrogen Dissolved (N)	3.44	mg/L		--/--	Calculated Result
11092350	Nitrate+Nitrite (N)	3.44	mg/L	0.002	00/00	Auto. Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazonization

Matrix :	Water
Sampled on:	02/04/04 13:15

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069283

Sampling site : MOTHERWELL COMMUNITY WELL FISHER ROAD

Philip ID : 12019817
Client ID : 20020409
1000

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	157	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041354	Chloride Dissolved	4.9	mg/L	0.5	00/00	Ion chromatography
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	0.02	mg/L		--/--	Calculated Result
TN-WDGWA	Total Nitrogen	0.60	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	< 0.10	mg/L		--/--	Calculated Result
11082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Automated Berthelot meth
1110CALC	Nitrate Nitrogen Dissolved (N)	0.58	mg/L		--/--	Calculated Result
11092350	Nitrate+Nitrite (N)	0.579	mg/L	0.002	00/00	Auto, Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazotization

Matrix : Water
Sampled on: 02/04/09 10:00

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069284

Sampling site : 1375 FISHER ROAD

Philip ID : 12019811
Client ID : 20020409
0915

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	270	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041334	Chloride Dissolved	17.1	mg/L	0.5	00/00	Ion chromamgraphy
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	< 0.02	mg/L		-/-	Calculated Result
TN-WDGWA	Total Nitrogen	0.53	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	< 0.10	mg/L		-/-	Calculated Result
11082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Automated Berthelot meth
1110CALC	Nitrate Nitrogen Dissolved (N)	0.52	mg/L		-/-	Calculated Result
11092350	Nitrate+Nitrite (N)	0.523	mg/L	0.002	00/00	Auto. Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazotization

Matrix : Water
Sampled on: 02/04/09 09:15

ANALYTICAL SERVICES

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ANALYTICAL REPORT
Form 50069285

Sampling site : CEDAR MILL 1353 FAIRFIELD

Philip ID : 12019812
Client ID : 20020409
0940

Sparcode	Parameter		Unit	MDL	Media	Workroute
PHYSICAL						
00111160	Specific Conductance	159	uS/cm	1	00/00	Cond.Meter Radiometer
ANIONS						
11041334	Chloride Dissolved	7.5	mg/L	0.5	00/00	Ion chromatography
NITROGEN						
0113CALC	Total Kjeldahl Nitrogen (N)	0.12	mg/L		--/--	Calculated Result
TN-WDGWA	Total Nitrogen	1.84	mg/L	0.02	00/00	Digested Water for TN
0112CALC	Total Organic Nitrogen (N)	0.12	mg/L		--/--	Calculated Result
11082351	Ammonia Nitrogen (N)	< 0.005	mg/L	0.005	00/00	Automated Berthelot meth
1110CALC	Nitrate Nitrogen Dissolved (N)	1.72	mg/L		--/--	Calculated Result
11092350	Nitrate+Nitrite (N)	1.72	mg/L	0.002	00/00	Auto. Cadmium Reduction
11112354	Nitrite Nitrogen (N)	< 0.002	mg/L	0.002	00/00	Auto. Diazotization

Matrix : Water
Sampled on: 02/04/09 09:40

B. Centre for Disease Control Society

BCCDC LABORATORY SERVICES
655 12th Avenue West
Vancouver, B.C. V5Z 4R4

Fax: (604)660-6073

ENVIRONMENTAL BACTERIOLOGY
Phone Number :

Printed :2002 APR 10
Requisition :A2WW001331
Submitter Ref :

CEN. VANCOUVER ISLAND HEALTH REGIO* - 224 Specimen Submitter
1665 GRANT AVE
NANAIMO BC V9S 5K7

:224-CEN. VANCOUVER ISLAND HEAL*

Site Information
Code/Name :02T4707 - 02T4707
Site Desc :WEST COAST LANDFILL DIVERSION, OFFICE
City/Area :
Type :
Source :Well

Specimen
Treatment :UNTREATED
Nature :WATER
Ph Level:
Free Chlorine Level: ppm
Exams Req :Total Coliform
:Fecal Coliform

EHO :A RIDEOUT

Collected :2002 APR 8
Received :2002 APR 9

RESULTS

Reported on 2002 APR 10

	Test	Result	Units
1.	Total Coliform (Membrane Filtration)	L1	TC Count/100ml
2.	Fecal Coliform (Membrane Filtration)	L1	FC Count/100ml

L:LESS THAN

Up

Specimen was 24 hours in transit
Coliform test may NOT be valid if specimen was more than 30 hrs in transit

FISHER ROAD RECYCLING LTD.
ENVIRONMENTAL MONITORING PROGRAM (11.1 (e) / see p. 8 of Operating Plan 12/21/2006)

Item	Location(s)		Frequency	Parameters	Notes
Non Contact Storm Water	Infiltration ditch (S2)	Swale	Monthly	Nitrogen, Ammonia, Nitrate, pH, BOD, fecal coliform, phosphorous	Review monitoring schedule after 1 year
Ground Water	On-site well (S1)	two adjacent wells (:	quarterly	Nitrogen, Ammonia, Nitrate, pH, fecal coliform, phosphorous	

MONITORING SCHEDULE

Location	Scheduled Date	Actual Date	Notes
Wells (S1)	20-Feb-08		
	7-May-08		
	6-Aug-08	5-Aug-08	
	5-Nov-08		
Infiltration ditch (S2)	20-Feb-08		
	12-Mar-08		
	9-Apr-08		
	7-May-08		
	11-Jun-08		
	9-Jul-08		
	6-Aug-08		
	10-Sep-08		
	8-Oct-08		
	5-Nov-08		
	10-Dec-08		

MONITORING SCHEDULE

Location	Scheduled Date	Actual Date	Total Nitrogen (TN)	Ammonia-Nitrogen (NH_3-N)	Nitrate-Nitrogen (NO_3-N)	pH	BOD5	FC	TPO_4^{3-}-P	Temp. (C) (field)	Notes
*Maximum Acceptable Concentrations:			45 mg/L	no guidelines	10 mg/L	5.5 - 8.5	no guidelines	0 CFU/100mL	no guidelines	≤ 15.0	* Maximum Acceptable Concentration as per Health Canada's "Guideline
Onsite Well (S1)	27-Jun-07	27-Jun-07	51.1	0.00693	49.3	7.43	ND	0	ND	12.5	
	17-Oct-07	17-Oct-07	68.8	ND	63.9	7.89	ND	0	ND		
	20-Feb-08	20-Feb-08		0.0345	61.1		7.6	0	0.093		
	7-May-08	7-May-08	72.7	ND	72.2	7.49 (field)	1.7	0	ND	13.1	
	7-May-08		7.8	0.323	0.383	7.89	219	49	2.51		
	6-Aug-08	5-Aug-08	69.1	0.0953	65.6	7.3	4.62	0	ND	15.1	
	5-Nov-08	5-Nov-08	71.7	ND	71.7	7.25	2.18	0	0.114	12.1	
	11-Feb-09	20-Feb-09		ND	62.7	7.05	ND	0	0.171		
	7-May-09										
	5-Aug-09	6-Aug-09		ND	38.8	7.34	ND	0	92.0	NA	Sample clear; no noticeable turbidty or odour.
	4-Nov-09	19-Nov-09	63.3	ND	50.5	7.04	4.49	0	ND	NA	
	18-Mar-10		72.6	ND	54.8	7.16	5.29	0	ND	NA	
	11-Jun-10	28-Jun-10	66.2	0.0292	52.5	7.09	3.75	0	ND	NA	
Well No. 1325	27-Jun-07	27-Jun-07	0.144	0.021	0.0109	7.93		0	0.018	13.3	
	17-Oct-07	17-Oct-07	0.066	0.0194	0.00185	7.37	ND	0	0.0352		
Infiltration ditch (S2)	20-Feb-08	20-Feb-08	54.2	3.95	50.3	7.33	63	148	0.786		
	12-Mar-08	12-Mar-08	14.3	0.00421	0.471	7.24	37.8	600			
	9-Apr-08	10-Apr-08	2.74	0.183	0.0529	7.95	9.5	14	1.48	1.48	
	7-May-08		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	11-Jun-08		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	9-Jul-08		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	6-Aug-08		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	10-Sep-08		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	8-Oct-08		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	5-Nov-08		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	10-Dec-08										
	7-Jan-09	23-Jan-09	31	21.7	6		40.8	40000	2.52		
	11-Feb-09										
	11-Mar-09										
	8-Apr-09										
	6-May-09		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
	4-Nov-09	19-Nov-09	49.1	45.2	0.001	7.44	810	80000	4540	NA	
	18-Mar-10		22	3.52	3.72	7.53	69.2	5800	386	NA	

COBBLE HILL IMPROVEMENT DISTRICT
Water Sample results

2006	Jan 16/06	Feb 13/06	Mar 20/06	Apr 18/06	May 15/06	June 19/06	June 26/06	July 4/06	July 10/06	July 17/06	July 24/06	July 31/06	Aug 8/06	Aug 14/06
Nitrite	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002				<0.002			
Nitrate	<0.002	3.5	3.36	3.36	0.728	0.002	0.04				0.99			
Ammonia	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01				<0.01			
T. Kjeldahl Nitrogen	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				0.4			
Total Nitrogen	<0.2	3	3.4	3.63	0.73	0.2	0.2				1.4			
Total Coliform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	6
Faecal Coliform	<1	<1	<1	<1	<1	<1	<1	<1			<1	<1	<1	<1
Non-coliform bacteria	<1	<1	<1	<1	<1	<1	<1							
E. Coli	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

	Aug 21/06	Aug28/06	Sept 5/06	Sept 11/06	Sept 18/06	Sept 25/06	Oct 2/06	Oct 10/06	Oct 16/06	Oct 23/06	Oct 30/06	Nov 6/06	Nov 14/06	Nov 20/06
Location	McCormack	McCormack	School	Bakery	School	Bakery	Well head	Bakery	School	Bakery	School	Bakery	School	Bakery
Nitrite	<0.002				<0.002					<0.002				<0.001
Nitrate	3.17				3.43					3.42				3.11
Ammonia	0.01				<0.01					<0.01				<0.01
T. Kjeldahl Nitrogen	<0.2				<0.2					<0.2				0.023
Total Nitrogen	3.2				3.4					3.4				3.13
Total Coliform	1	<1	<1	<1	1	3	<1	1	<1	<1	<1	<1	0	0
Faecal Coliform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0	0
Non-coliform bacteria													0	0
E. Coli	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	0	0

	Dec 4/06	Dec 11/06	Dec 18/06
Location	Bakery	School	Bakery
Nitrite			
Nitrate			
Ammonia			
T. Kjeldahl Nitrogen			
Total Nitrogen			
Total Coliform	0	0	0
Faecal Coliform	0	0	0
Non-coliform bacteria	0	0	0
E. Coli	0	0	0

If an * appears beside a result then that result does not comply with "Guidelines for Canadian Drinking Water Quality and/or "BC Health Act-Safe Drinking Water."

Drinking water guidelines:

Nitrite	BC Health Act, Safe drinking water regulation	1.0 mg/L
Nitrate	BC Health Act, Safe drinking water regulation	10.0mg/L
Ammonia	BC Health Act, Safe drinking water regulation	no guideline
Total Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml reported as <1 CFU/100 ml
Faecal Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml
Noncoliform bacteria	Guidelines for Canadian Drinking Water	200 CFU/10 ml
E. Coli	Guidelines for Canadian Drinking Water	0 CFU/100 ml

*Changed from Cantest Lab to MB Lab November 14, 2006 test date.

2005	Jan 17/05	Feb 14/05	Mar 14/05	Apr 18/05	May 16/05	June 13/05	July 25/05	Aug 15/05	Sept 19/05	Oct 18/05	Nov 14/05	Dec 12/05
Nitrite	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nitrate	3.55	3.55	3.60	3.56	3.50	3.7	3.4	3.8	3.64	3.6	4	3.43
Ammonia	0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.03	0.01	0.006	<0.2	0.01	<0.01
T. Kjeldahl Nitrogen	0.20	<0.2	<0.2	0.2	<0.2	<0.2	0.5	0.2	0.7	0.06	0.5	<0.2
Total Nitrogen	3.55	3.55	3.60	3.78	3.50	3.7	3.9	4	4.34	3.6	4.5	3.4
Total Coliform	<1	<1	<1	<1	<1	<1	<1	5*	<1	<1	<1	<1
Faecal Coliform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-coliform bacteria	<1	<1	<1	<1	59	<1	<1	<1	<1	<1	<1	1
E. Coli	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

If an * appears beside a result then that result does not comply with "Guidelines for Canadian Drinking Water Quality and/or "BC Health Act-Safe Drinking Water."

Drinking water guidelines:

Nitrite	BC Health Act, Safe drinking water regulation	1.0 mg/L	
Nitrate	BC Health Act, Safe drinking water regulation	10.0mg/L	
Ammonia	BC Health Act, Safe drinking water regulation	no guideline	
Total Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml	reported as <1 CFU/100 ml
Faecal Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml	
Noncoliform bacteria	Guidelines for Canadian Drinking Water	200 CFU/10 ml	
E. Coli	Guidelines for Canadian Drinking Water	0 CFU/100 ml	

COBBLE HILL IMPROVEMENT DISTRICT
Water Sample results

2004	Jan 19/04	Feb 23/04	Mar 15/04	Apr 19/04	May 17/04	June 14/04	July 23/04	Aug 16/04	Sept 20/04	Sept 27/04	Oct 4/04	Oct 18/04	Nov 15/04	Dec 20/04
Nitrite	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002
Nitrate	3.31	3.75	4.04	0.65	3.32	3.36	3.52	3.40	3.58		3.62	3.85	3.41	4.04
Ammonia	<0.003	0.015	<0.003	0.009	<0.003	<0.003	0.004	<0.003	<0.003		<0.003	0.010	<0.003	<0.003
T. Kjeldahl Nitrogen	<0.003	0.079	<0.003	0.041	<0.003	<0.003	0.083	<0.003	<0.003		<0.003	0.012	<0.003	<0.003
Total Nitrogen	3.31	3.75	4.04	0.69	3.32	3.36	3.60	3.40	3.58		3.62	3.85	3.41	4.04
Total Coliform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Faecal Coliform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-coliform bacteria	<1	<1	<1	<1	<1	<1	<1	<1	>680*	10	<1	4	3	<1
E. Coli	Negative	Negative	Negative	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1

If an * appears beside a result then that result does not comply with "Guidelines for Canadian Drinking Water Quality and/or "BC Health Act-Safe Drinking Water."

Drinking water guidelines:

Nitrite	BC Health Act, Safe drinking water regulation	1.0 mg/L	
Nitrate	BC Health Act, Safe drinking water regulation	10.0mg/L	
Ammonia	BC Health Act, Safe drinking water regulation	no guideline	
Total Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml	reported as <1 CFU/100 ml
Faecal Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml	
Noncoliform bacteria	Guidelines for Canadian Drinking Water	200 CFU/10 ml	
E. Coli	Guidelines for Canadian Drinking Water	0 CFU/100 ml	

COBBLE HILL IMPROVEMENT DISTRICT
Water Sample results

2007	Jan 2	Jan 5	Jan 15	Jan 22	Jan 24	Jan 29	Jan 29	Jan 29	Jan 29	Feb 5	Feb 12	Feb 19	Feb 19	Feb 19
Location	Bakery	McCormack	School #79	Bakery	Bakery	School #79	Cobblestone	Holland Well	Bakery	Bakery	Bakery	Bakery Sample #1	Bakery Sample #2	Bakery Sample #3
Nitrite NO_2 (ug/L)			0.73										1.48	0.712
Nitrate NO_3 (mg/L)			3.36										3.16	3.37
Ammonia NH_3 (ug/L)			9.88										ND	ND
T. Kjeldahl Nitrogen (mg/L)			0.269										ND	ND
Total Nitrogen			3.64										3.26	3.51
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0		
Faecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0		
Non-coliform bacteria	560	0	0	26	60	0	0	0	0	10	18	0		
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0		

	Feb 26	Mar 5	Mar 12	Mar 12	Mar 12	Mar 19	Mar 26	Apr 2	Apr 10	Apr 10	Apr 16	Apr 23	Apr 27	Apr 30
Location	School #79	Bakery	Hydrant-Bakery	Hydrant-Rona	Bakery	Bakery	Bakery	School #79	Holland Well	School #79	Rona	School #79	School #79	Bakery
Nitrite NO_2 (ug/L)					1.91						0.118			
Nitrate NO_3 (mg/L)					3.45						3.17			
Ammonia NH_3 (ug/L)					ND						ND			
T. Kjeldahl Nitrogen (mg/L)					ND						ND			
Total Nitrogen					3.45						3.17			
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Faecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	0	12	0	40	0	2	0	2	2	0	10	14	0	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	May 7	May 14	May 22	May 28	May 28	June 4	June 4	June 11	June 18	June 18	June 18	June 18	June 25	June 25
Location	Rona	Rona	Bakery	Bakery	Rona	Holland Well	Hutchinson Well	School #79	Bakery	Hydrant-Bakery	Hydrant-Rona	School #79	Reservoir hyd	CH School hyd
Nitrite NO_2 (ug/L)			0.764									ND		
Nitrate NO_3 (mg/L)			2.48									3.04		
Ammonia NH_3 (ug/L)			7.94									0.085		
T. Kjeldahl Nitrogen (mg/L)			1.65									ND		
Total Nitrogen			4.39									3.04		
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Faecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	53	10	60	18	2	0	0	18	12	12	110	12	0	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Drinking water guidelines:

Nitrite	BC Health Act, Safe drinking water regulation	1.0 mg/L
Nitrate	BC Health Act, Safe drinking water regulation	10.0mg/L
Ammonia	BC Health Act, Safe drinking water regulation	no guideline
Total Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml reported as <1 CFU/100 ml
Faecal Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml
Noncoliform bacteria	Guidelines for Canadian Drinking Water	200 CFU/10 ml
E. Coli	Guidelines for Canadian Drinking Water	0 CFU/100 ml

ND = none detected

COBBLE HILL IMPROVEMENT DISTRICT
Water Sample results

2007	June 25	June 25	June 25	July 3	July 9	July 16	July 23	July 30	Aug 7	Aug 13	Aug 20	Aug 27	Sept 4	Sept 10
Location	Bakery Hyd	1486 Fisher	Rona Hyd	S & A Wood	Creative Wd	Cobblestone	Hydrant-Bakery	Hydrant-Holland & Fairfield	S& A Wood	Cow Joinery	Hydrant-Bakery	Cobblestone	Cobblestone	School #79
Nitrite NO_2 (ug/L)						0.311					ND			ND
Nitrate NO_3 (mg/L)						3.15					ND			11.2
Ammonia NH_3 (ug/L)						2.96					31.4			ND
T. Kjeldahl Nitrogen (mg/L)						0.056					0.033			0.031
Total Nitrogen						3.2					0.033			0.042
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Faecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	0	2	2	2	6	0	4	0	4	2	8	0	2	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Sept 17	Sept 18	Sept 24	Oct 1	Oct 9	Oct 15	Oct 22	Oct 29	Nov 6	Nov 13	Nov 19	Nov 26	Dec 3	Dec 10
Location	Bakery	Forget me not	School #79	Cobblestone	School #79	3578 Verner	Hydrant	Bakery	School #79	Bakery	Cobblestone	Old School Coffee	Cobblestone	McCormack
Nitrite NO_2 (ug/L)	ND					ND	Hutchinson/Verner				ND			
Nitrate NO_3 (mg/L)	11.2					3.32					3.13			
Ammonia NH_3 (ug/L)	ND					ND								
T. Kjeldahl Nitrogen (mg/L)	0.031					0.390					0.323			
Total Nitrogen	0.042					3.71					3.45			
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Faecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	0	0	32	0	0	2	0	0	0	0	0	0	10	10
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Dec 17
Location	McCormack
Nitrite NO_2 (ug/L)	
Nitrate NO_3 (mg/L)	
Ammonia NH_3 (ug/L)	
T. Kjeldahl Nitrogen (mg/L)	
Total Nitrogen	
Total Coliform	0
Faecal Coliform	0
Non-coliform bacteria	0
E. Coli	0

Drinking water guidelines:

Nitrite	BC Health Act, Safe drinking water regulation	1.0 mg/L	
Nitrate	BC Health Act, Safe drinking water regulation	10.0mg/L	
Ammonia	BC Health Act, Safe drinking water regulation	no guideline	
Total Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml	reported as <1 CFU/100 ml
Faecal Coliforms	BC Health Act, Safe drinking water regulation	0 CFU/100 ml	
Noncoliform bacteria	Guidelines for Canadian Drinking Water	200 CFU/10 ml	
E. Coli	Guidelines for Canadian Drinking Water	0 CFU/100 ml	

ND = none detected

COBBLE HILL IMPROVEMENT DISTRICT - Water Sample Test Results

2008	Jan 2	Jan 7	Jan 14	Jan 21	Jan 28	Feb 4	Feb 11	Feb 19	Feb 25	Mar 3	Mar 10	Mar 17	Mar 25	Mar 31	Apr 7
Location	Bakery	Barry's Garage	CH School	Bakery	Cobblestone	Bakery	CH School	Old School Coffee	CH School	Cobblestone	Bakery	Holland Well	OS Coffee	School	Bakery
Nitrite NO_2 (ug/L)				ND				ND				ND			
Nitrate NO_3 (mg/L)				2.84				3.36				3.63			
T. Kjeldahl Nitrogen (mg/L)				0.21				ND				0.032			
Total Nitrogen				3.05				3.36				3.66			
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	0	0	0	2	0	0	0	0	0	66	2	0	0	0	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Apr 14	Apr 21	Apr 28	May 5/08	May 12/08	May 20/08	May 26/08	June 2/08	June 9/08	June 16/08	June 23/08	July 2/08	July 7/08	July 14/08	July 21/08
Location	OS Coffee	McCormack	Bakery	OS Coffee	Bakery	School	Hutchison Well	OS Coffee	Bakery	Holland Well	OS Coffee	McCormack	Bakery	OS Coffee	Bakery
Nitrite NO_2 (ug/L)		2				0				0.0001					
Nitrate NO_3 (mg/L)		3.25				3.2				3.5					
Ammonia NH_3 (ug/L)										unknown at this time					
T. Kjeldahl Nitrogen (mg/L)		0.266				1.05				unknown at this time					
Total Nitrogen		3.51				4.24				0	0	0	0	0	0
Total Coliform (TC)	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Fecal Coliform (FC)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Non-coliform bacteria (NC)	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
E. Coli	0	0	0	0	0	0	0	0	0						

	July 28/08	Aug 5/08	Aug 11/08	Aug 18/08	Aug 18/08	Aug 25/08	Aug 25/08	Aug 25/08	Aug 25/08	Aug 25/08	9/2/2008	9/8/2008	9/16/2008	9/16/2008	9/16/2008
Location	OS Coffee	Bakery	Bakery	Bakery	Bakery Hydran	Hyd - Tire	Hyd Fisher	Hyd Rona	Rona	Hyd - Bakery	OS Coffee	School	JW Hall	Fisher Road	Hutchinson Well
Nitrite NO_2 (ug/L)	0								0.27						
Nitrate NO_3 (mg/L)	3.11								3.29						
T. Kjeldahl Nitrogen (mg/L)	1.41								0.38						
Total Nitrogen	4.52								3.67						
Total Coliform	0	0	0	0	0						0	0	0	0	0
Fecal Coliform	0	0	0	0	0						0	0	0	0	0
Non-coliform bacteria	0	48	30	4	18	2	4	8	2	6	0	0	8	2	2
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	9/16/2008	9/22/2008	9/22/2008	9/22/2008	9/22/2008	9/22/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	10/6/2008	10/6/2008	10/6/2008	10/13/2008	10/13/2008
Location	RONA	RONA	Isl Bakery	JW Hall	Hutchinson We	CH School	RONA	Island Bakery	1344 Fisher	Old School Coff	1471 Princess	Isl Bakery	JW Hall	Hutchinson Well	RONA
Nitrite NO_2 (ug/L)															
Nitrate NO_3 (mg/L)															
T. Kjeldahl Nitrogen (mg/L)															
Total Nitrogen															
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	0	6	6	14	2	0	0	8	0	0	0	0	4	40	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	10/13/2008	10/20/2008	10/20/2008	10/27/2008	11/3/2008	11/3/2008	11/12/2008	11/17/2008	11/24/2008	11/24/2008	12/1/2008	12/1/2008	12/8/2008	12/8/2008	12/15/2008
Location	JW Hall	Island Bakery	JW Hall	Old School Coff	1481 Fairfield	Hutch Well	OS Coffee	CH Elementary	Hutch Well	Island Bakery	Island Bakery	Temp Line	Hutch Well	CH School	CH School
Nitrite NO_2 (ug/L)										0					
Nitrate NO_3 (mg/L)										3.51					
T. Kjeldahl Nitrogen (mg/L)										0.329					
Total Nitrogen										3.84					
Total Coliform	0	0	0	0		4	0	0	0	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	8	0	0	0	2	76	12	8	84	0	0	0	0	4	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	12/13/2008	12/29/2008	1/5/2009	1/7/2009					1/8/2009		January 12/2009				Jan 19/2009
Location	New Line	OS Coffee	OS Coffee	OS Coffee	3578 Verner	1486 Fisher	Dougan Dr	1481 Fairfield	Hydrant OSC	Holland Well	1471 Hutchins	1475 Hutchinson	OS Coffee	Tr Plant Twin Cdrs	1471 Hutchinson
Nitrite NO2 (ug/L)			*before flushing*												
Nitrate NO3 (mg/L)															
T. Kjeldahl Nitrogen (mg/L)															
Total Nitrogen															
Total Coliform	0	8	0	0	0	0	0	0	0	0					0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0					0
Non-coliform bacteria	0	400	20,000	5,800	106	0	0	0	108	0	52	398	183	2	100
E. Coli	0	0	0	0	0	0	0	0	0	0					0

	1/26/09	1/26/09	2/02/09		2/09/09	2/16/09	2/23/09	3/02/09	3/09/09	3/18/09	3/23/09	3/30/09	4/06/09	4/14/09	4/20/09
Location	Isl. Bakery	OS Coffee	OS Coffee	E Hutch Main	OS Coffee	OS Coffee	OS Coffee	OS Coffee	OS Coffee	OS Coffee	Hutchinson We	Rona Test Stn	Learn Test Stn	Rona Test Stn	Learn Test Stn
Nitrite NO2 (ug/L)															
Nitrate NO3 (mg/L)															
T. Kjeldahl Nitrogen (mg/L)															
Total Nitrogen															
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	0	28	218	6400	22	16	20	4	18	0	0	0	0	0	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	4/29/09	5/04/09	5/11/09	5/19/09	5/25/09	6/01/09	6/09/09	6/17/09		6/22/09	7/06/09	7/13/09	7/20/09	7/27/09	8/01/09
Location	Rona Stn	Rona Stn	Hutch W Stn	McCormack	Princess Port	Hutch W Stn	Hutch W Stn	Hutch W Stn	Rona Stn	Hutch W Stn	Hutch W Stn	Hutch W Stn	Learning Stn	Learning Stn	Rona Stn
Temperature of Sample								14.8 C	16.4 C						
Nitrite NO2 (ug/L)				did not remove				ND							
Nitrate NO3 (mg/L)				aerator or				3.02							
T. Kjeldahl Nitrogen (mg/L)				burnish				1.99							
Total Nitrogen								5.01							
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	2	0	104	12	0	257	50	214	0	28	20	0	2	0	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	8/17/2009	8/24/2009	8/31/2009	9/4/2009	9/14/2009	9/14/2009	9/21/2009	9/21/2009	Sept 28/2009					Oct 5/2009
Location	Princess Stn	Hutchinson W	Hutchinson W	Hutchinson W	Hutchinson W	1471 Hutchin	Hutchinson W	1471 Hutchin	1431 Hutch	3520 Watson	Hutch Rd W	1471 Hutch	CH Stand	1471 Hutchin
Temperature of Sample														
Nitrite NO2 (ug/L)														
Nitrate NO3 (mg/L)														
T. Kjeldahl Nitrogen (mg/L)														
Total Nitrogen														
Total Coliform	0	0	6	0	0	0	0	2	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	0	134	131	18	26	10	22	69	0	52	42	42	6	118
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Oct 5/2009		Oct 13/2009			October 19/2009					October 26/2009			Nov 2/2009	
Location	3520 Watson	CH Rd. SP	3514 Watson	CH Rd. SP	1471 Hutch Rd	Reservoir	1485 Fisher	3514 Watson	1471 Hutch	Cob Hill Rd SP	3514 Watson	1471 Hutch	Cob Hill Rd SP	1471 Hutch	Cob Hill Rd SP
Temperature of Sample															
Nitrite NO_2 (ug/L)															
Nitrate NO_3 (mg/L)															
T. Kjeldahl Nitrogen (mg/L)															
Total Nitrogen															
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	50	70	60	64	48	16	0	16	32	16	0	14	18	6	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	11/9/2009	11/12/2009	11/23/2009	11/30/2009	12/21/2009	1/11/2010	1/18/2010	2/9/2010	2/22/2010	3/8/2010	3/15/2010	3/22/2010	3/29/2010	4/12/2010	4/19/2010
Location	1471 Hutch	1471 Hutch	1471 Hutch	1471 Hutch	1471 Hutch	1475 Hutch	Learning Way	RONA SP	Hutch W Stn	Learning Way	Princess SP	Holland Well	Hutch W Stn	Rona	Hutch Road Well
Temperature of Sample	9.0C	7.0 C **	8.0 C	6.0 C								6.0 C	4.0 C	6.0C	
Nitrite NO_2 (ug/L)															
Nitrate NO_3 (mg/L)															
T. Kjeldahl Nitrogen (mg/L)															
Total Nitrogen															
Total Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliform	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-coliform bacteria	2	6	20	6	2	0	0	0	0	0	0	0	0	0	0
E. Coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

** sample done in adverse conditions

	4/26/2010	5/10/2010	5/17/2010	5/26/2010	5/31/2009	6/14/2010	6/14/2010	6/14/2010	6/21/2010	6/21/2010	6/21/2010	7/12/2010	7/19/2010	7/26/2010	
Location	Learning Way	Hutch Well	Rona	Holland Well	Princess Port	Hutch W Port	Holland Well	Hutch Well	Holland Well	system test port	Hutch W Port	Hutch W Port	Learning Way	Hutch W Port	
Temperature of Sample	12.0C	9.0C	12.0C	7.0C	9.0C	12.0C	12.0C	12.0C	6.0 C	6.0 C	6.0 C		13.0 C	7.0C	
EC (electrical Conductivity)									331	309					
Nitrite NO_2 (ug/L)							ND	ND	ND	ND					
Nitrate NO_3 (mg/L)							1.98	0.047	4.7	3.57					
T. Kjeldahl Nitrogen (mg/L)							26.4	0.121	0.16	0.591					
Total Nitrogen							28.3	0.169	4.87	4.16					
Total Coliform	0	0	0	0	0	0					0	0	0	0	
Fecal Coliform	0	0	0	0	0	0					0	0	0	0	
Non-coliform bacteria	0	0	0	0	0	4					0	0	0	0	
E. Coli	0	0	0	0	0	0					0	0	0	0	

Re test test of system water

COBBLE HILL IMPROVEMENT DISTRICT
Weather at the time of water sampling

2008 Date	Jan 2	Jan 7	Jan 18	Jan 21	Jan 28	Feb 4	Feb 11	Feb 19	Feb 25	Mar 3	Mar 10	Mar 17	Mar 25	Mar 31	Apr 7
Time (am)	9:35	9:55	10:20	9:40	9:45	9:30	9:50	9:43	9:40	9:35	10:16	10:34	10:38	11:00	10:16
Conditions	Cloudy	Sunny	Rain	Sunny	Sunny	Cloudy	Cloudy	Sunny	Sunny	Rain	Rain	Cloudy	Overcast	Partly Cloudy	Cloudy
Temperature (C)	4	-1	6	-2	-6	-3	4	3	2	3	5	5	2	2	8
Relative Humidity	93%	85%	88%	77%	83%	84%	84%	77%	84%	85%	85%	83%	84%	84%	70%

Date	Apr 14	Apr 21	Apr 28	May 5/08	May 12/08	May 20/08	May 26/08	June 2/08	June 9/08	June 16/08
Time (am)	9:30	10:05	10:45	9:20	9:30	9:30	9:20	9:40	9:40	9:15
Conditions	Sunny	Cloudy	partly cloudy	partly cloudy	sunny	cloudy	sunny	sunny	lt rain	sunny
Temperature (C)	8	3	11	10	10	11	16	13	9	15
Relative Humidity	64%	84%	85%	80%	64%	64%	77%	75%	78%	66%

Date
Time (am)
Conditions
Temperature (C)
Relative Humidity

Date
Time (am)
Conditions
Temperature (C)
Relative Humidity

COBBLE HILL IMPROVEMENT DISTRICT
Weather at the time of water sampling

2007

Date	Jan 2	Jan 5	Jan 15	Jan 22	Jan 24	Jan 29	Feb 5	Feb 12	Feb 19	Feb 26	Mar 5	Mar 12	Mar 19	Mar 26	Apr 2
Time (am)	10:00	11:35	8:55	10:10	9:00	9:10	9:12	10:14	9:50	10:10	9:50	9:55	9:30	10:05	9:55
Conditions	Heavy Rain	Cloudy	Clear sky	Rain	Sunny	Part Sunny	Fog	Cloudy	Cloudy	Part Sunny	Cloudy	Sunny	Raining	Clear	Sunny
Temperature (C)	8		-7	5	2	3	5	5	4	5	8	7	7	6	4
Relative Humidity	88%		83%	86%	88%	85%	87%	87%	82%	64%	86%	60%	85%	69%	65%

Date	Apr 10	Apr16	Apr 23	Apr 27	Apr 30	May 7	May 14	May 22	May 28	June 4	June 11	June 18	June 25	July 3	July 9
Time (am)	9:45	9:55	10:00	10:00	9:48	9:36	10:15	10:23	10:30	10:00	10:30	10:00	11:45	9:48	10:07
Conditions	Cloudy	Raining	Sunny	Raining	Sunny	Cloudy	Sunny	Sunny	Sunny	Overcast	Cloudy	Cloudy	Part Cloudy	Cloudy	Sunny
Temperature (C)	7	6	8	10	10	13	12	11	13	16	11	11	15	16	20
Relative Humidity	63%	82%	70%	88%	65%	74%	66%	75%	65%	74%	65%	71%	58%	78%	57%

Date	July 16	July 23	July 30	Aug 7	Aug 13	Aug 20	Aug 27	Sept 4	Sept 10	Sept 17	Sept 18	Sept 24	Oct 1	Oct 9	Oct 15
Time (am)	10:28	10:05	10:20	10:10	11:07	9:35	9:50	9:45	10:05	9:50	10:40	10:15	9:30	10:25	11:05
Conditions	Sunny	Raining	Sunny	Overcast	Part Sunny	Raining	Sunny	Cloudy	Sunny	Cloudy	Sunny	Foggy	Cloudy	Raining	Cloudy
Temperature (C)	19	16	17	15	16	13	15	16	15	11	14	8	9	9	10
Relative Humidity	65%	85%	60%	72%	77%	76%	70%	82%	72%	85%	64%	84%	86%	83%	83%

Date	Oct 22	Oct 29	Nov 6	Nov 13	Nov 19	Nov 26	Dec 3	Dec 10	Dec 17
Time (am)	10:50	10:15	9:50	10:40	9:22	9:50	9:40	9:30	10:55
Conditions	Cloudy	Part Cloudy	Cloudy	Sunny	Misty	Cloudy	Raining	Cloudy	Cloudy
Temperature (C)	10	9	6	8	3	0	8	2	3
Relative Humidity	84%	81%	84%	82%	85%	85%	100%	96%	87%

COBBLE HILL IMPROVEMENT DISTRICT												
Weather at the time of water sampling												
2006												
Date	**Jan 16/06**	**Feb 13/06**	**Mar 20/06**	**Apr 18/06**	**May 15/06**	**June 19/06**	**June 26/06**	**July 10/06**	**July 17/06**	**July 24/06**	**July 31/06**	**Aug 8/06**
Time (am)	10:15	9:45	9:30	9:15	9:50	10:20	9:20	10:40	9:45	9:50	10:05	9:15
Conditions	Overcast Rain	Overcast Calm	Clear	Overcast	Clear	Sunny	Sunny	Cloudy	Sunny	Sunny	Sunny	Cloudy
Temperature (C)	3	4	5	8	16	16	20	18	17	24	17	
Relative Humidity	84%	86%	53%	67%	45%	54%	55%	64%	60%	60%	65%	
Date	**Aug 14/06**	**Aug 21/06**	**Aug 28/06**	**Sept 5/06**	**Sept 11/06**	**Sept 18/06**	**Sept 25/06**	**Oct 2/06**	**Oct 10/06**	**Oct 16/06**	**Oct 23/06**	**Oct 30/06**
Time (am)	10:20	9:50	9:48		10:15	9:40	10:00	10:00	9:27	10:05	10:15	10:10
Conditions	Sunny	Sunny	Sunny		Clear	Clear	Sunny	Partly Cloudy	Clear	Partly Cloudy	Sunny	Clear
Temperature (C)					18	13	16	10	6	9	10	4
Relative Humidity					60%	82%	69%	76%	78%	82%	50%	54%
Date	**Nov 6/06**	**Nov 14/06**	**Nov 20/06**	**Dec 4/06**	**Dec 11/06**	**Dec 18/06**						
Time (am)	9:55	10:15	9:45	9:30	11:00	9:50						
Conditions	Raining	Raining	Cloudy	Light rain	Light rain	Light rain						
Temperature (C)	14	4	5	0	7	1%						
Relative Humidity	86%	88%	86%	88%	87%	86%						

COBBLE HILL IMPROVEMENT DISTRICT

Weather at the time of water sampling

2005

Date	Jan 17/05	Feb 14/05	Mar 14/05	Apr 18/05	May 16/05	June 13/05	July 25/05	Aug 15/05	Sept 19/05	Oct 18/05	Nov 14/05	Dec 12/05
Time (am)	9:30	9:30	9:00	9:15	9:00	9:00	9:00	9:00	9:15	9:30	9:45	no reading
Conditions	Raining hard snow on the ground	Clear	Clear	Sunny	Raining	Windy & partly cloudy	Clear	Partly Cloudy	Partly Cloudy	Overcast	Clear & calm	
Temperature (C)	6	2	7	8	10	13	17	22	14	9	3	
Relative Humidity	not recorded	70%	60%	70%	84%	74%	59%	60%	72%	86%	88%	

2004

Date	Sept 27/04	Oct 4/04	Oct 18/04	Nov 15/04	Dec 20/04
Time (am)	9:00	9:15	7:30	9:30	9:15
Conditions	Clear	Foggy with Light Breeze	Clear	Cloudy	Clear
Temperature (C)	14	9	2	8	3
Relative Humidity	86%	86%	90%	68%	85%

APPENDIX E

APPENDIX E TRANSFORM COMPOST SYSTEMS ODOUR ANALYSIS AND LEACHATE GENERATION REPORT

Transform Compost Systems

turning waste into an opportunity

Cobble Hill Compost Facilities Compost Facility Review **November 23, 2010**

Dr. John Paul of Transform Compost Systems was commissioned by EBA Engineering Consultants Ltd. to do a brief evaluation of odour emission and composting practices from two compost facilities in Cobble Hill, BC. The two compost facilities were the Fisher Road Recycling Compost Facility at 1355 Fisher Rd., and the Central Landscape Compost Facility at 1345 Fisher Rd. The context is that Fisher Road Recycling has an application to expand their operation to receive other waste and recycling materials as a transfer station. The community is concerned because of long standing odour concerns from composting in the area.

Transform's Scope of Work

Transform agreed to the following scope of work for a one day visit followed by a report:

1. An odour evaluation will be done on site. This will include a site visit, reviewing the existing operation and operational practices, and interviewing operators. It will also include short interviews with some of the complainants on the timing and intensity of odour.
2. Although odour generation and emission is difficult to fully assess in a one day visit, we can evaluate whether there is inherent odour emission concerns with the technology, or whether odour generation and emission can be mitigated through good management. In a composting facility, the three main sources of odour are the incoming feedstock, emission from the primary composting process, and odour from leachate.
3. We will review the existing odour mitigation strategy and make recommendations for improvement. Many odour concerns can be mitigated through improving incoming feedstock management and processing, enclosing or covering the primary windrow process to allow exhaust air to be biofiltered, and ensuring that any leachate is collected and managed well.

On Site Interviews

Dr. John Paul of Transform Compost Systems visited the Fisher Road Recycling Facility, the Central Landscape Compost Facility, and interviewed two of the concerned neighbours, Doug and Linda Lockhart, and Edward and Rennie Gamboa on August 4, 2010. Rob Williams, Environmental Technologist for the Cowichan Valley Regional District and Mike Gallo, Environmental Scientist with EBA Engineering Consultants Ltd. attended the visits to the composting facilities, and Rob Williams attended the interviews with the neighbours. Dr John Paul interviewed two other residents; Henry Vandermeulen and Karren Herriot by telephone on September 17, 2010. Dr Paul also reviewed some laboratory results from the finished compost at Fisher Road Recycling Facility, received Sept 18, 2010. Additional information from the facilities received on November 16, 2010 was incorporated into the report.

Further Information

Further information on both of the compost facilities was requested from the compost facility owners, and provided by Rob Williams of the CVRD. These documents included:

Transform Compost Systems Ltd.
3911 Mt. Lehman Rd.
Abbotsford, BC V4X 2N1

Phone (604) 856-2722 Fax: (604) 856-8444
Email: info@transformcompost.com
Website: www.transformcompost.com

- Fisher Road Recycling Operating plan
- Fisher Road Recycling Waste Stream Management License
- Fisher Road Recycling Scott Gamble Report
- Fisher Road Recycling Dr. Tinari Letter & Report
- Fisher Road Recycling HVAC Floor Plan
- Central Landscape Supplies Operating Plan
- Central Landscape supplies Waste Stream Management License
- Central Landscape supplies Scott Gamble Report

These documents provided helpful information on the operating plans for the facility.

Location of the Composting Facilities

The map below shows the location of the two composting facilities. The map is from 2005, which predates the upgrades to the Fisher Road Recycling Facility and the Central Landscape Composting Facility.

Fisher Road Recycling Facility

The Fisher Road Recycling Facility was opened in 2000 by Westcoast Landfill Diversion Corporation (Westcoast) using then "new and improved" composting technology that required only 7-14 days for primary composting. The thought by some technology providers at the time was that aerobic composting did not produce odour. Time has unfortunately proved this theory wrong, as evidenced by ongoing odour complaints from the neighbours. This error in thinking was documented again in the Macleans, August 2, 2010 issue in an article, "This company really stinks".which is about a company doing a two week foodwaste composting process in Ontario.

Fisher Road Recycling purchased this facility from Westcoast in 2006. The new owners have made a number of upgrades to the composting operation as documented in the various reports that are available. The most notable is the indoor receiving, mixing and secondary processing, which include a biofilters for odour control.

The photograph to the left shows the receiving and mixing area in the 120 ft wide by 130 ft long tarp structure. This building has an air extraction rate of 30,000 CFM, which is directed through two biofilters located to the south of the building.

The photograph on the right shows the in-vessel composting boxes that have a capacity of 200 yd^3 (150 m^3, or 97.5 tonnes at a bulk density of 650 kg per cubic meter).

The primary composting process currently includes ten days in one of the in-vessel boxes, followed by curing on an aerated floor in the same receiving and processing building

The minimum time in the in-vessel boxes is 7 days ("Active composting beings in the bio-cells over a period of 7-14 days" p 5, Fisher Road Recycling Operating Plan, Jan 5, 2010 "Fisher Operating Plan").

Excess exhaust air from the in-vessel composting boxes is ventilated through a biofilter, as is the 30,000 cubic ft of air from the receiving, mixing and curing building.

The photograph on the right shows the secondary composting inside the receiving, mixing and processing building. The material is further processed in aerated cells following primary composting in the in-vessel boxes.

The photograph below shows the covered building where the biofilter is located that processes the air from the primary in-vessel composting boxes.

At the time of our visit, the facilities were clean, the air inside the receiving, mixing and curing building had minimal odour, and the biofilters appeared to be functioning very well.

Following the curing process on the aerated floors in the receiving, mixing and curing building, the compost is placed in outdoor windrows for storage.

According to the Fisher Operating Plan (p5), the compost that goes outside is Class A compost, and can be stored outdoors.

The photograph on the right shows one of the covered biofilter buildings that process the air from the receiving, mixing and curing building.

Fisher Road Recycling was in the process of constructing another aerated concrete pad for the material coming from the curing process inside the receiving, mixing and curing building. This area will have a complete leachate collection system as well. It was not known if the material

would be covered.

It was clear from the brief visit that the owners of the Fisher Road Recycling Facility have made extensive improvements to this compost facility compared to Westcoast's operation between 2000 and 2006. It should be further noted that we were allowed to see any and all parts of the compost facility, and invited to ask further questions at any time.

The above left photo shows the storage and further curing of the compost after processing in the composting and curing building. The above right photo shows a new curing and storage floor that the owners were installing to allow them to store and further process the material in an environmentally safe manner.

Central Landscape Supplies Compost Facility

The Central Landscape Supplies compost facility was opened in 2006 as a yard waste only composting facility to produced Class A compost. The design capacity is 6000 tonnes of yard waste per year. The entire process is outside on a 1,800 m^2 asphalt pad. Leachate from the composting material is collected in a concrete block lined leachate collection tank.

The photograph to the right shows the greenwaste receiving and grinding area.

The photograph on the left shows the composting windrows. These windrows are approximately 5 m wide and 3 m high.

The area for active composting, curing and storage appears to be approximately 1000 m^3 (25 m wide by 40 m long), which is confirmed in Scott Gamble's Assessment of Compliance dated March 27, 2009. This allows 4 windrows measuring 5 m wide by 3 m high by 35 m long.

The leachate collection tank (photograph on right) measures approximately 6.75 m by 6.75 m by 2.25 m deep (3 layers of blocks?) to the asphalt layer. Discolouring on the blocks show that the level of leachate in this tank has been higher than the intake at the west end.

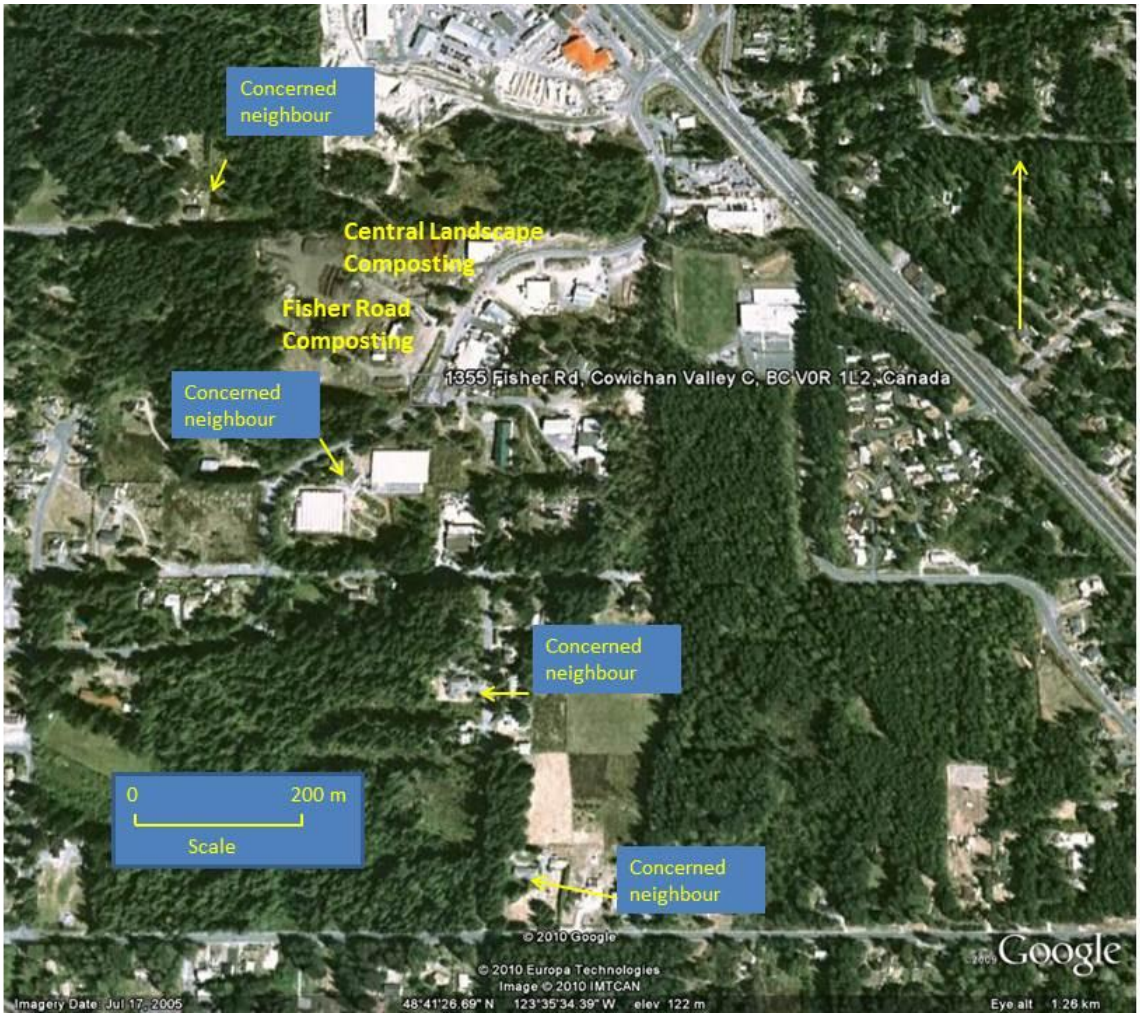
There is no active aeration in any of the composting material, and the leachate collection tank did contain leachate. Some odour was evident at this facility. It was not possible to distinguish whether it was odour from the leachate collection tank, or from the active windrows.

Discussions With Neighbours

Interviews with four of the neighbouring residents indicated that the odour from the composting facilities have diminished significantly in the last 18 months, but odour concerns are ongoing. Odour emission was not reported to be limited to working hours, but sometimes even more pervasive in the evening and on weekends.

The residents that were interviewed were located 100 to 600 m away from the composting facilities. One resident noted that sometimes the odour seemed more intense at their own residence than when they drove past the facility. This may be due to wind direction, but it has been observed by others that odour can actually be more intense a distance away from a composting facility than when standing next to it.

There was an increase in the number of odour complaints in April 2010, which coincided with Fisher Road Recycling's application for expanding its scope of business. Two of the four residents interviewed confirmed that the increased odour concerns were indeed related to Fisher Road Recycling's application for expansion. They stated that their odour concerns had never diminished, but that they were tired of continually reporting and not feeling respected for their concerns. Two of the residents reported frustration about claims and promises to reduce odour, when the odour remains ongoing.



The intensity and duration of the odour was reported to be significantly diminished since 2006 by three of the four residents interviewed. During this period, the receiving, mixing and curing building was constructed and the biofilters installed and upgraded. One resident suggested a further reduction in odour emissions occurred after installing and improving the biofilters.

All residents stated that the odour is ongoing and random in time and intensity. One resident indicated significantly increased odour during the weekend, and in the evenings. One resident noted that the type of smell is exactly the same now as it was ten years ago.

Three of the residents interviewed mentioned that their ongoing nuisance concern was odour, but water quality was another real concern. They were concerned about information that was withheld following promises in 2006 that all information would be available to the public.

We detected faint odour near the residences to the west of the facilities.

Noise level from the grinders were mentioned as an additional item of concern.

Increased truck traffic and soiled roads from trucks was also mentioned by one of the residents.

A Review of the Documents – Fisher Road Recycling Facility

The air emissions information prepared by Dr. Tinari in his report dated February 11, 2009 was very clearly laid out in the design documents. It appears that the facility odour control system was upgraded according to his recommendations. We would recommend some additional clarification and information to be included in the The Fisher Road Recycling Operating Plan of January 5, 2010, hereafter called "Fisher Operating Plan"

Capacity

The stated capacity of the Fisher Road Recycling Facility is 18,000 tonnes per year (p 1, Fisher Operating Plan), although the average annual tonnage is reported to be 9,906 tonnes per year (p 3, Fisher Operating Plan). There was no specific information in the text of the Fisher Operating Plan to be able to assess the capacity and material flow through this composting process. In Dr. Tinari's report dated Feb 11, 2009, it states that there are three in-vessel composting cells, each with a capacity of 200 yd^3 (p 7). This is equal to 150 m^3, or 97.5 tonnes (using 650 kg m^3 – maximum density - Fisher Operating Plan, p 6). The Fisher Operating Plan states that incoming material is placed into one cell for 7 to 14 days.

In order to process 18,000 tonnes of material per year, a residence time of 6 days in the primary in-vessel composting cells would be required (18,000 tonnes x 650 kg/m^3 = 27,692 m^3/450 (150 m^3 per cell x 3 cells) = 61 cycles per year equals 5.9 days/batch. Assuming 97.5 tonnes x 7 days x 3 cells, the annual tonnage is 15,210 tonnes per year. We will base the calculations on 15,210 tonnes per year, although the actual throughput has been reported as being an average 9,906 tonnes per year.

Based on the observed size of the aerated curing area inside the receiving, mixing and curing building (35 ft long x 130 ft wide by 8 ft high), we calculated a capacity of 1030 cubic meters, or 515 tonnes (using 500 kg m^3 as a bulk density). Based on the capacity of 15,210 tonnes per year (and material is cycling through the primary in-vessel composting cells every 7 days, we have a total of 23,400 cubic meters composting material per year (less an estimated 10% volume loss during a 7 days composting process) = 21,060 m^3 entering the curing area per year. With the volume capacity of 1030 m^3 in the aerated curing area, we then have a residence time of 18 days, for a total residence time of 25 days in primary composting and during curing. If the temperatures for potential pathogen reduction and vector attraction reduction are met, this time period is adequate to meet the Schedule 1 and Schedule 2 requirements of the Organic Matter Recycling Regulation (OMRR). At the present reported annual tonnage of 9,906 tonnes per year, and a stated 10 days in the in-vessel composting cells, followed by further aerated processing inside the receiving and processing building, this is provides a total residence time of approximately 37 days inside the building.

Class A Compost and Finished Product Storage

According to the OMRR, the approximately 37 days of indoor processing (based on an average of 9,906 tonnes per year) may be enough to produce Class A compost if all Class A compost requirements as outlined in the OMRR were met. If the Fisher Road facility were at its stated capacity of 18,000 tonnes per year, the indoor processing time would be 22 days, which is still enough to meet Class A compost requirements. It must be understood that the composting process is a continuum, and compost can remain biologically active for many weeks, but its activity decreases with time. Compost after 8 weeks of processing cannot be classified as biologically inactive, and still has the potential for leaching nutrients. There is no information in the Fisher Operating Plan as to how Class A compost is determined

in this facility.

If the material coming from the receiving, mixing and curing building does not meet Class A compost standards, it is still defined as curing, and is required to be on an impermeable surface with a leachate collection system.

We did observe that a large outdoor concrete pad is being constructed, which will provide additional curing and storage for the composting material. We will assume that the Fisher Operating Plan will be updated to include this new information.

Review of Finished Compost Analysis

We provided Mike Gallo of EBA Engineering Consultants Ltd with the methodology for taking and sending representative samples of the finished compost at the Fisher Road Recycling Facility to the laboratory for analysis. Representative samples were taken on Sept 7 and 9, 2010, and received at Exova laboratories on Sept 10.

The results showed that the heavy metals were within the limits for Class A compost under the OMRR. Ammonium concentrations were high, and in only one of the three samples had a measurable amount of nitrate. As a compost matures, ammonium concentrations typically decrease and nitrate concentrations increase. We are not seeing this yet with this compost. A maturity test such as the Solvita maturity test may be a simpler and more accurate representation of the maturity status of this compost.

All three samples had coliform bacteria in excess of the OMRR requirements. At first glance, it would suggest that this compost did not meet pathogen kill requirements, but it was noted that the sample that was taken from the oldest material actually had the highest coliform count. This observation reminded me of other discussions and observations that we have had regarding coliform counts in compost.

Coliform counts as done by some laboratories may not provide an accurate representation of potentially pathogenic bacteria, as there seems to be an interference or something that includes Bacillus sp in these test results. We first observed this in a pulp sludge composting trial in 1998, where we composted pulp sludge at 70 C for four weeks. Laboratory results showed that coliform counts were far in excess of the requirement. Suspecting that something with the laboratory methodology may be causing a problem, we heated a sample of compost at 100 C for one hour before sending it to the laboratory. The results came back with the same extremely high number. Since that time, this phenomenon has come up a number of times in discussion with other composters. We recommend an E. coli analysis as a better and more specific test for ensuring potential pathogen kill.

Leachate

Most of this composting process is indoors, and hence generates little leachate. There will be some condensate from the biofilters and the ducts that is being collected. There is no information in the Fisher Operating Plan about condensate collection and reuse.

The outdoor compost storage is currently not on an impervious pad. The compost that is deposited outside typically has a moisture content of 30-50%, and can absorb a significant amount of rainfall. It must be understood that this compost is still very biologically active, especially when rewetted. It is possible that rewetting of this compost during fall and winter may increase the moisture content to the

point of saturation, which may result in anaerobic decomposition and the production of odour compounds.

A Review of the Documents – Central Landscape Supplies Composting Facility

My overall recommendation is the Central Landscape Supplies Compost Operating Plan Dec 14, 2009 (Central Operating Plan) provide some more guidance on the required composting process. It does not provide detail on site capacity and space utilization, composting time, required turning frequencies as required by OMRR, and the necessary calculations required for leachate collection and storage. It also uses the word "fermentation" which is incorrect as it refers to anaerobic decomposition, not composting.

Capacity

It is very difficult to reconcile the stated design capacity with the actual operation. The stated design capacity of this composting facility is 6,000 tonnes per year (Central Operating Plan). Assuming four windrows that are 6 m wide and 3 m high and 35 m long, we have a maximum volume capacity of approximately 1660 cubic meters of product (which doesn't provide space for turning the compost). Assuming a density of 0.4 tonnes/m^3 (provided by the qualified professional in the CH2M Hill Assessment Report), we have a tonnage of 664 tonnes at any given time.

Although a residence time is not provided in the Central Operating Plan, in order to process 6,000 tonnes per year, a total of 9 operating cycles are required, assuming that the pad is full at all times. This is equivalent to 40 days, or slightly less than 6 weeks. There is no room in this calculation for turning, or allowing space for creating the windrows.

Turning

The Central Operating Plan does not provide consistent guidance for turning, which impacts the development of anaerobic conditions and odour formation. Under section 5.2 of the Central Operating Plan, it states, "in order to meet the OMRR criteria for Class A compost pathogen reduction in a windrow composting process during the initial fermentation stage, a temperature of not less than 55 ^{o}C must be maintained for at least 15 days with not less than 5 turnings carried out during the high temperature period to ensure uniform heating. This means that the compost must be turned every three days during this critical period".

In other sections of the Central Operating Plan, this turning requirement is not very clearly stated, or not stated at all.

Upon site observations, it is difficult to imagine how the requirements for turning (5 times in 15 days) as suggested in the Central Operating Plan (p 5.2) are being met in the present design and operation. The pad was completely full with windrows of composting material. I would suggest that the Central Operations Plan be amended to be less ambiguous, and that the turning schedule be updated and this information made available to the CVRD.

Turning the composting material is required to maintain aerobic conditions as mentioned in the Central Operations Plan (p 3). Based on our experience, oxygen concentrations can fall to 0% within hours of turning in an active composting pile.

The challenge with a non-aerated windrow process composting yard waste is that the center of the pile becomes anaerobic between turnings, especially during the spring with high amounts of grass clippings, resulting in odour dispersion upon turning. The challenge further increases in that turning increases odour emission, and not turning results in anaerobic conditions in the pile and slows down the composting process. It is very difficult to follow the turning schedule as outlined in the Central Operating Plan and minimize odour emission in a non-aerated windrow composting process.

Leachate

The leachate management plan in the Central Operating Plan is minimal. There have been references to leachate in a couple of sections, but it would be valuable to have a more detailed water budget. There is a statement that "the leachate pond has proven to be more than adequate to accept any leachate generated at the facility" which does not match with our observations. Leachate is collected in a block-like pit, and this pit has overflowed into the composting area as evidenced by staining on the blocks.

It is recommended to calculate the expected precipitation and calculate where this precipitation will go as part of the Operating Plan.

It was recommended to leave a 0.5 m space between windrows. One reason for this is to allow excess moisture to escape. Under the current layout of the windrows, any precipitation or leachate must migrate underneath the piles to reach the leachate collection tank. This means that some of the composting material will be significantly higher than the 50-60% suggested (p 10).

Using Shawnigan Lake precipitation records, we see that average rainfall for this area is 104.2, 207.2, 189.5, 172.2, 139, and 114.7 mm during the months of October through March. This totals 0.927 m of rainfall during these six months at a time where evaporation is minimal and the number of growing degree days above 15 ^{o}C is 1. Given that the pad is 1800 m^2, we have a total rainfall collection of 1669 cubic meters. Assuming no evaporation, or moisture loss, this would require a collection tank of 556 m^2, assuming a 4 m depth (3 m is for collection from the pad, 0.927 m depth is for precipitation directly into the pit, with 7 cm depth left for freeboard. This is based on average rainfall, not 25 year storm precipitations, which should be the design criteria for a compost facility.

The size and capacity of the collection pit is not provided in the Central Operating Plan, but was estimated to be 6.75 m x 6.75 m x 2.25 m deep, which provides a storage capacity of approximately 55 cubic meters (assuming 1 m of precipitation directly into the collection pit). This means that we have to account for 1669 m^3 – 55 m^3= 1614 m^3 of water. Given a total of 1663 m^3 of compost in 4 windrows that are 3 m high, 6 m wide and 35 m long, and four cycles of compost during this period, each m^3 of compost must absorb or evaporate 250 liters of water. If we assumed that the moisture content of the incoming yard waste was 30%, each cubic meter would contain 120 L of water (1 m^3 x 400 kg m^3 x 30% = 120 kg = 120 L). Addition of a further 250 liters of water would increase the moisture content to well over saturation.

Greenwaste that is received during this period is usually at 50-70% moisture content already, and hence has little ability to absorb more moisture to maintain the 50-60% moisture desired for optimum composting.

There is suggestion in the guidelines for composting that the composting process can evaporate

moisture. The Compost Facility Requirements Guideline: How to Comply With Part 5 of the Organic Matter Recycling Regulation (March 2004) (http://www.env.gov.bc.ca/epd/codes/omr/pdf/compost.pdf) makes reference to active composting being able to evaporate moisture, in fact up to 20.8 m^3 of water per 25 mm rainfall event in a windrow composting operation with 3 m high by 7.6 m wide windrows. Given a total rainfall of 927 mm, this would an evaporation potential of 771 m^3. This type of water budget would still mean that there is more water than the collection tank could hold.

In reality, this theoretical moisture loss has never been realized. Our observations and measurements in British Columbia during the months of October through March indicate that there is actually very little moisture loss during composting, even when the compost is being processed under cover.

In reality, all outdoor yard waste composting operations in south coastal British Columbia will have > 60% moisture content during the months of November through March, which increase the odour potential of this material, as well as resulting in excess leachate, which has the potential to pollute, but also to create additional odour. On this pad, it is very likely that during the winter months, when the composting material is saturated, that a 2.5 cm rainfall event will result in an accumulation of 45 m^3 of leachate, which is almost the capacity of the leachate collection tank.

Summary and Recommendations

It is difficult to make conclusions about odour emission based on one expected visit during the summer, but we are able to make some clear recommendations based on observing the design and process, and the information provided in the documentation, specifically the operations plans. The overwhelming response from the neighbouring residents was that there is ongoing concern, and a lack of trust in the operators.

With the written information given, specifically the Operating Plans, it is understandable that there may be some ongoing odour emissions from one or both of the facilities. It is my opinion that it is possible to manage odour to a tolerable level.

It is interesting to note that the new air quality rules in California (draft AQMD 1133.3 Emission Reduction from Greenwaste Composting Operations) both do not allow static pile or passively aerated composting, and require 22 days of active composting, followed by a minimum of 40 days of curing, with the cured compost meeting specific maturity readings defined by either carbon dioxide emission or oxygen emission.

I would suggest that these guidelines are very helpful for us in British Columbia as well so that we can produce quality composts with minimal environmental and neighbourhood impact. Although the southern California AQMD rules relate to volatile organic carbon (VOC) emission, most odour compounds are included in VOCs.

Recommendations for Fisher Road Recycling

Fisher Operating Plan

1. It would be helpful to provide more specific information on product flow, as the stated capacity of 18,000 tonnes does not match the product flow information that we were able to glean from other documents.

2. The Plan should provide more specific instructions on how Class A compost will be determined at this facility.

3. The Plan should recognize that the finished compost is not biologically inactive and has the ability to generate leachate when rained on.

4. The Plan should include a management plan for the outdoor curing/storage including windrow orientation and water management (we recognize that this will change with the new outdoor pad being constructed).

5. The Plan should include a management plan for the condensate generated in the process.

For the actual operation, the fact that much of the process is indoors and all air is processed through a biofilter, there is little odour or water quality concern about this part of the operation. It is my opinion that the owners have done a very good job to address these concerns and lessen the environmental impact. My recommendations for the operators are as follows:

1. Ensure that Class A compost is placed on an impermeable pad, as curing compost is still biologically active, and is required under OMRR.

2. Orient the storage windrows on an impermeable pad in the direction of the slope so that the compost does not absorb all of the precipitation

3. Cover the outdoor windrows with Compostex or other breathable fabric to minimize the amount of precipitation that enters the compost – this also allows much easier screening of the product.

Recommendations for Central Landscape Composting Facility

Central Operating Plan

1. The Plan should provide calculations and estimates on capacity of the composting facility, and material flow through the facility.

2. The Plan should provide specific turning instructions as to how it will meet the suggested turning requirements (as per p 9 of the operating plan) and capacity and flow through the facility.

3. The Plan should include a water budget, which utilizes highest rainfall in 25 years, which includes precipitation, and where the water is going on a month by month basis.

4. The Plan should have instructions on water management, given the potential rainfall during October through March in this climate. This should include directions on diverting precipitation away from the piles to maintain moisture contents of the composting material to less than 60%.

5. The Plan should have instructions on what to do with the leachate. The plan makes one reference to recycling it on the incoming material, but more specific instruction on how to do this when the incoming material is already greater than the recommended 60% moisture content would be helpful to the operators.

6. The Plan should replace the word "fermentation" with composting, as the concept of fermentation usually refers to an anaerobic process.

My recommendations for reducing the potential odour emission during composting include a change in the composting process because using a passively aerated windrow composting process will generate anaerobic conditions, and the required turning requirements as per the Central Operating Plan will release this odour into the atmosphere. My recommendations are as follows:

1. Use forced aeration to keep the windrows aerobic and reduce the turning requirements according to the Central Operating Plan. This will make better use of the space, and eliminate the current Central Operating Plan requirement for 5 turnings in 15 days.

2. Use covers on the composting windrows, especially between October and March, to reduce the amount of precipitation that enters the composting material.

3. Maintain the 0.5 m space between windrows to allow excess precipitation to run off without passing through the compost.

4. Redesign the collection area so that excess precipitation does not have to pass through the composting windrows to get to the leachate collection pit.

5. Cover the leachate collection pit for two reasons: a) to prevent the average 0.927 m of rainfall from falling directly into the pit, and b) to be able to capture odourous exhaust gases from the pit, and vent them through a small biofilter. Aerating this leachate collection pit is not recommended.

California has a draft set of regulations for greenwaste and co-composting operations that consider VOC emission (odour is part of the VOC emission). The heart of this regulation is that a minimum period is required for composting and for curing, and the Class A compost has to meet a simple but reliable maturity test.

The heart of the OMRR regulation is that the composting process does not cause environmental concerns, specifically water and odour quality concerns, and produces a safe product. It is my opinion that the heart of this regulation can be met more simply in a manner that is easier for a local community such as the CVRD to administer. The goal will be to allow the CVRD to work with the composters and the community in a positive manner.

Documents Reviewed

BC Ministry of the Environment. 2007. Organic Matter Recycling Regulation. BC Reg. 18/2002, includes ammendments up to BC Reg. 198/2007.

C&F Land Resource Consultants Ltd. 2009. Central Landscape Supplies Ltd. Compost Operating Plan, revised December 14, 2009.

CH2M Hill 2009. Assessment of Compliance with CVRD Requirements Central Landscape Compost Facility.

CH2M Hill 2009. Assessment of Compliance with CVRD Requirements: Fisher Road Compost Facility.

Cowichan Valley Regional District. 2010. CVRD Solid Waste Management Licence 003-06, Fisher Road Holdings Ltd. 1355 Fisher Rd. Amended February 5, 2010.

Cowichan Valley Regional District. 2010. CVRD Solid Waste Management Licence 004-06, Central Landscape Supplies Ltd. Composting Facility 1345 Fisher Rd. Amended March 10, 2010.

Tinari, P.D. 2009. Report Prepared for Fisher Road Holdings Compost Facility (FRHCF) Third Draft, Feb 11, 2009.

Timmenga & Associates Inc. 2010. Fisher Road Recycling Operating Plan. Version January 5, 2010.

APPENDIX F

APPENDIX F GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT – GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

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In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

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