DISTRICT OF SECHELT SEPTAGE FACILITY LONG-TERM PLAN

Technical Memorandum No. 2:

Demand Forecast and Statement of Requirements

July 2023

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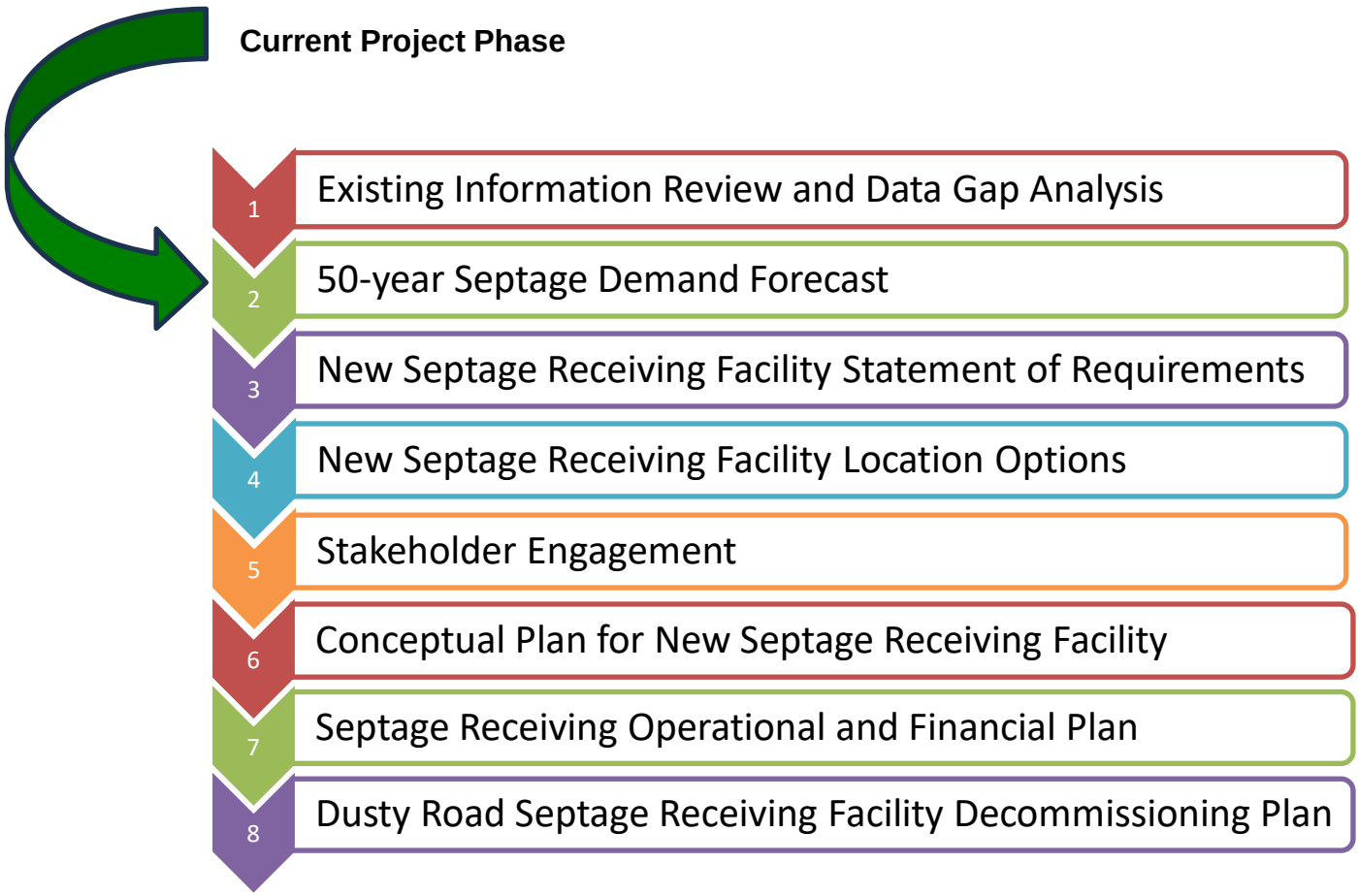
1 INTRODUCTION

The District of Sechelt (the District) is in the process of developing a Septage Receiving Facility Long-Term Plan (the Plan) to replace the Dusty Road Septage Receiving Facility (DRF). The Plan will guide the District in reviewing design options and locations for the new facility and servicing plans with project stakeholders.

Sperling Hansen Associates (SHA) was hired in February 2023 to develop the Plan. This Technical Memorandum (TM) outlines the 50-year Septage Demand Forecast and the New Septage Receiving Facility Statement of Requirements as outlined in SHA's project proposal.



2 CONTEXT AND SCOPE

SHA understands that it is necessary to determine the future demand forecast for the new Sechelt Septage Receiving Facility to support facility design with the potential for phased upgrades of the facility. To assist with projecting long term volume requirements, SHA is in the process of engaging the following key stakeholders as planned:

- Septic Tank Cleaning and Pumping Service Companies
- Local Government and First Nations including the District of Sechelt, Town of Gibsons, Sunshine Coast Regional District and shíshálh Nation Government District
- Commercial Generators including BC Ferries, RV Parks, Campgrounds
- Aquaculture Farms, Breweries, and other large generators of septage

The General Public will be engaged later in the project.

SHA understands that it is important to determine and gain approval for the facility requirements prior to short listing potential locations. Approved requirements will support the conceptual facility design including site area, topography, access, and other important features.

SHA reviewed the following sources for guidance, including those listed in the District's Request for Proposal (RFP):

- Labour-market constraints
- Provincial and Federal environmental quality regulations and standards
- Wastewater legislation
- Septage receiving facility best practices
- Market demand and volume forecasting
- Spatial considerations and land acquisition
- Logistical constraints
- Mitigation of neighborhood impacts
- Incorporation of emerging technologies
- Building code requirements
- Zoning and other pertinent local government bylaws

A Statement of Requirements has been presented in Section 8.

3 DEMAND FORECAST ANALYSIS

3.1.1 Population Forecast

SHA summarized the District's population from Statistics Canada since the 2001 census. An annual increase over five year was observed, and from there, an average annual increase was determined. The average annual increase was found to be 1.74% as shown in Table 3-1.

Table 3-1 District of Sechelt Population (Source: Statistics Canada)

Year	Population	% Change (5 years)	Annual % Change
2,001	7,775		
2,006	8,454	8.73	1.75
2,011	9,291	9.90	1.98
2,016	10,216	9.96	1.99
2,021	10,847	6.18	1.24
		Average	1.74

SHA also confirmed the population growth rate used by the District's Planning Department is 2% which is slightly higher than the calculated average. SHA has used the District's 2% population growth rate in this report.

SHA understands that a significant contribution of septic tank pumpage is from outside the District boundary and within the broader Sunshine Coast Regional District (SCRD). To forecast long-term demand, SHA reviewed the 2021 Census and available information to estimate the baseline population for the contributing area.

Alpine Water & Energy (Alpine, 2019) discussed service area population in their District of Sechelt, Dusty Road Septage Receiving Facility Site Operation Review and Medium-Term Planning report. According to the 2016 census, the total population for the SCRD was reported to be in the order of 30,000. Total population served by the DRF was estimated by Alpine to be 18,000 in 2019. The SCRD population as per the 2021 census is in the order of 32,200. Based on the available data, SHA estimated the population served by community sewage systems to be in the order of 12,700. Therefore, SHA estimates that the total population served by onsite septic systems is in the order of 19,500. The population and dwelling estimates are attached as Appendix A.

4 HISTORICAL SEPTAGE VOLUME

4.1.1 Historical Septage Flow

From the District septage receiving data for May to October of the year 2019, Alpine estimated an average monthly volume of 625 m^3/month. This average monthly value was then extrapolated to an annual volume of 7,500 m^3. Alpine suggested in their report that the receiving volumes in winter are typically lower than summer and recommended an annual volume of 7,000 m^3/yr for planning purposes (Alpine, 2019).

The District provided septage data from 2017 to 2022. Figure 4-1 below shows the trend of septage flow during this period. The information indicates the annual volumes have decreased significantly since 2019. The District informed SHA that the local septage haulers are currently disposing their liquid waste loads into a system on their property to separate the solids and bring only the septage sludge to the DRF. This practice reduces their DRF disposal volumes substantially as the liquid is typically the larger component of the waste.

There are standards in place for wastewater disposal that are regulated. This commercial type dewatering practice of sewage waste and effluent disposal will also require some form of approval. In addition, accepting these modified septic tank pumpage materials will need to be reviewed more closely under applicable regulations, particularly for compliance with the WRC effluent standards. A more stringent waste acceptance process should be considered to ensure haulers are fully aware of the required disposal standards and consideration for hauler licenses may be required to manage compliance. In the event a hauler fails to continuously meet these standards or fails to respond with directed corrective actions, the hauler privileges will need to be revoked to reduce risk to District.

Figure 4-1 confirms the annual volumes in 2017 – 2022 and the reduced volume starting in 2020. The flows for 2020, 2021 and 2022 are 5,313 m^3, 3,286 m^3 and 4,001 m^3 respectively.

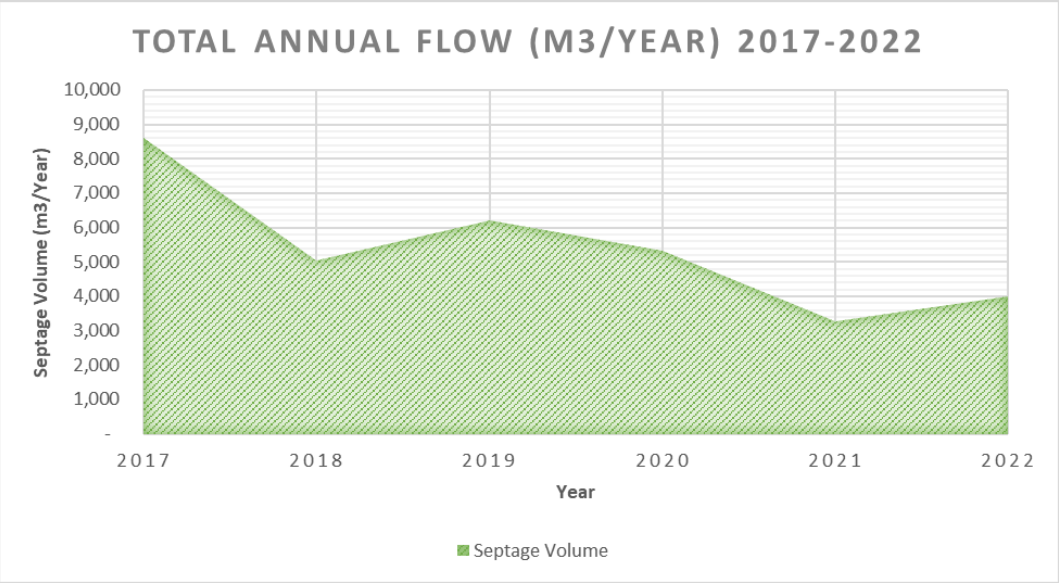


Figure 4-1 Total Annual Flow from 2017-2022

SHA also analyzed average monthly data received for the period of 2017-2022 as presented in Figure 4-2. As can be seen in this figure, maximum average monthly flow was achieved in the month of September while the lowest flow was in December.

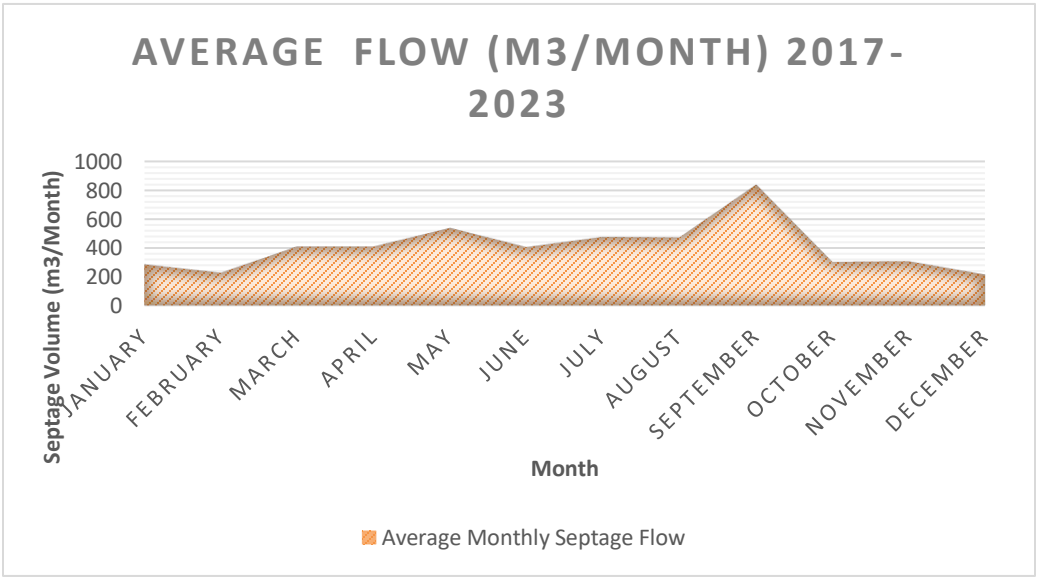


Figure 4-2 Average Monthly Flow from 2017-2022

4.1.2 Historical Types of Waste Received

SHA analyzed the types of waste received at the DRF. Complete data was available for the year 2021 and 2022 as presented in Table 4-1 below. This data shows that septic tank waste is the largest stream ranging from 74.8 to 82.9%.

Table 4-1 Types of Waste Received at Dusty Road Facility

Waste Type	2021		2022	
	Volume (m3)	Percentage	Volume (m3)	Percentage
Septic Tank	2,386	74.76%	3,434	82.92%
Porta-Potties	47	1.52%	175	4.44%
Septic/Grease	19	0.60%	54	1.38%
Grease			1	0.02%
Brew stuff	112	3.57%	66	1.67%
Treatment	604	19.33%	368	9.35%
Other	7	0.20%	10	0.25%

It is important to characterize the waste types received at the facility and SHA will discuss this further under the Statement of Requirements for the facility in Section 8. It is important to note that we are assuming, for the purpose of this TM, that the new facility will continue to receive all current waste types. Alternatively, the system could be designed for septage only and not manhole cleanout, grit, wastewater treatment plant sludge and other non-septage liquid waste. As the size of the new facility depends on the types of liquid waste it will receive, confirmation is required from the District on what the new facility will accept. SHA recommends the sludge from the wastewater treatment facilities in the contributing area and the District's Water Resource Centre, as well as manhole cleanout, grit, and other non-septage liquid waste, not be accepted at the DRF. The sludge would be sent elsewhere for composting and use at the SCRD Landfill as an example. The following section provides estimated septage volumes for residential septic tanks only.

5 ESTIMATED SEPTAGE VOLUME

With the diversion of waste in 2019 by septic haulers, SHA developed an estimate of septage volume to be received from septic tanks using data based on expected septic tank cleaning frequency. Based on the 2021 Census Reports, the average household size in the SCRD is estimated to be 2.1 persons per dwelling occupied by usual residents and 1.79 persons per total private dwelling which would capture seasonal use residents. Using the estimated 2021 service area population of 19,526 and 1.79 persons per dwelling, there would be in the order of 10,908 total dwellings. Using a 750-gallon tank (3.4 m^3) and based on an average 5-year emptying/pumping frequency (US EPA, 1991), the total estimated 2021 volume of septage is estimated to be in the order of 7,418 m^3. Therefore, the 50-year residential use septage volume projection is estimated at 7,418 m^3 and has been used for the year of 2021. Based on a typical 20% solids accumulation in a septic tank over the five-year period, approximately 1,484 m^3 of solids is expected to be generated annually. This corresponds to 0.08 m^3 of solids per person in 2021. This estimate does not include non-residential waste volumes. In 2022, the District data indicates that of the 4,000.7 m^3 received, 82.92% or 3,317 m^3 was from septic tanks with the remaining 683 m3 from non-residential users. 368 m^3 of this non-residential volume is sludge from wastewater treatment plants. With the remaining 305 m^3 of waste from porta-potties, grease traps, brewery waste and other sources such as sewage lift stations. These non-residential wastes are reduced in volume based on haulers dewatering waste prior to disposal at the DRF. Should haulers not be able or allowed to continue this 'pre-dewatering' practice, the volumes would be much higher.

6 PREDICTED SEPTAGE VOLUME FOR 50 YEARS

SHA has projected the 50-year septage volume for the current residential population starting from 2021 and the above estimated volume of 7418 m^3. The District's 2% growth rate in population was used for this forecast. Figure 6-1 below presents the projection of population and septage volume for 50 years from 2021 to 2071. In the year 2071, the total population for the residential septic tanks servicing area is estimated to be 52,556 and the volume of septage is projected to be 19,996 m^3.

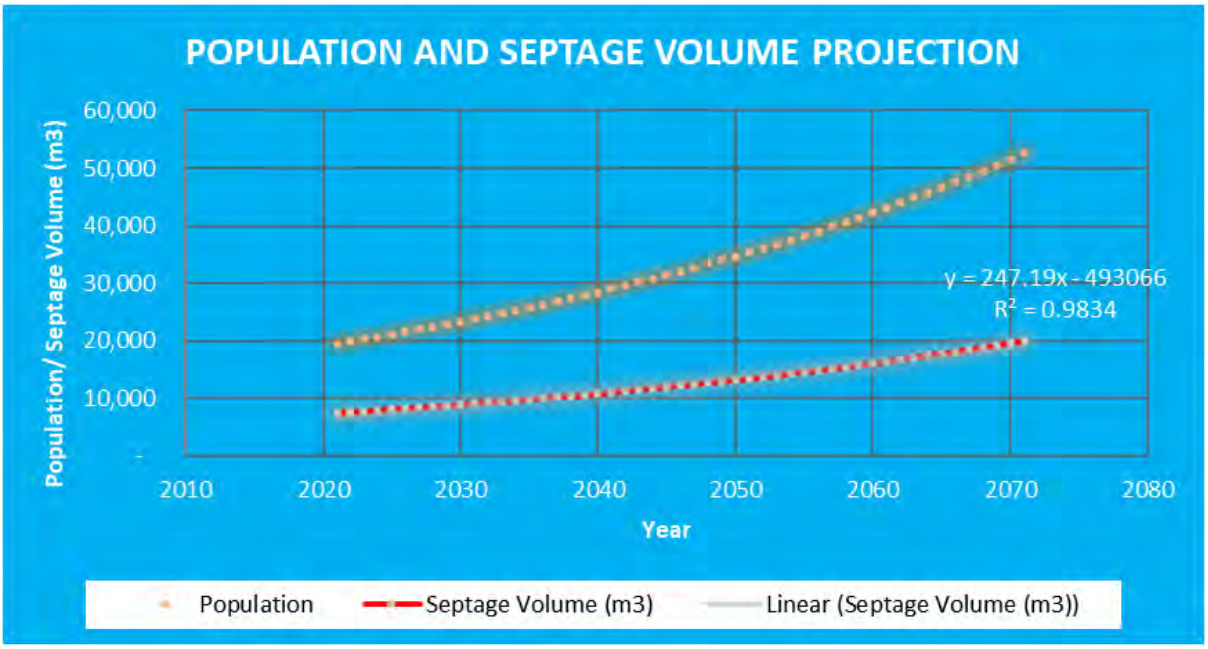


Figure 6-1 Population and Septage Volume Projections for 50 Years

7 SPECIFIC PREDICTED VOLUME FOR EVERY 5 YEARS

SHA developed a graph showing specific predicted volumes for every five years of the modeling period between 2021 and 2071 as presented in Figure 7-1. The graph assumes haulers are not dewatering residential septage prior to disposal at a septage receiving facility.

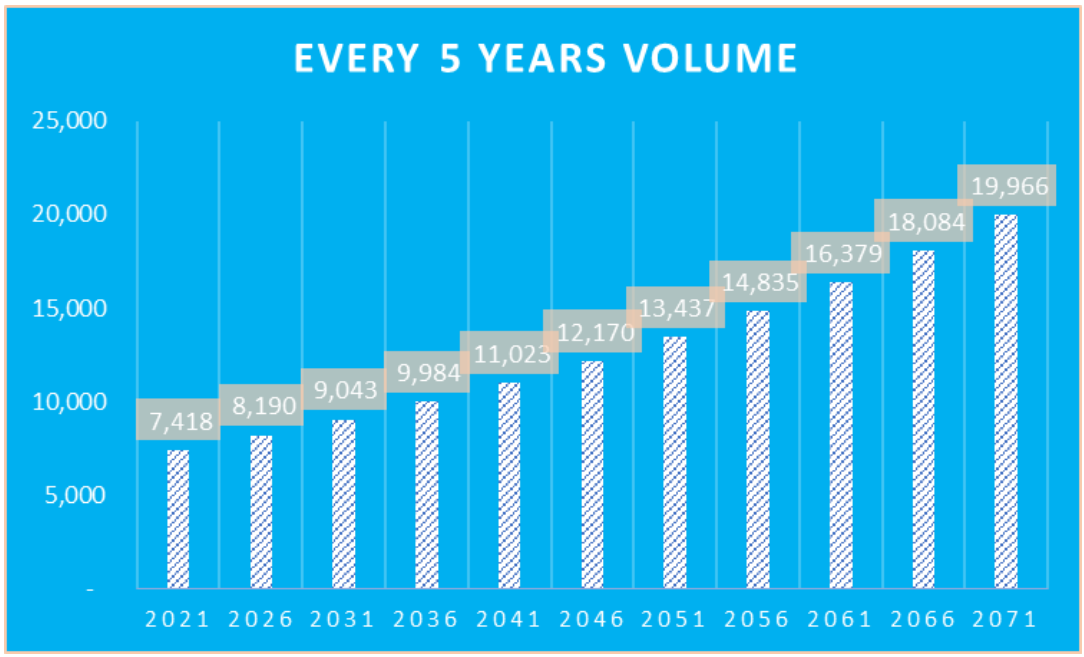


Figure 7-1 Specific Predicted Volume for Every Five Years

8 STATEMENT OF REQUIREMENTS

In order to develop a comprehensive statement of requirements, SHA reviewed the criteria and parameters identified in the RFP. The following sections elaborate on each.

8.1 Labour Market Constraints

To date, SHA has not received sufficient information on the labour market constraints that would influence the development of a new septage management facility. However, at this point SHA assumes that the following constraints will impact the design and planning of the facility:

- Availability of Qualified Contractors and skilled tradespersons
- Economic development opportunities in the area
- Other potential projects requiring the same levels of high skilled tradespersons
- Availability of skilled persons to operate the new facility.

SHA expects to be able to learn more on the labour market constraints through the planned stakeholder engagement.

8.2 Provincial and Federal Environmental Quality Regulations and Standards

Below is a list of Provincial and Federal Environmental Quality Regulations, Acts and standards that may be directly or indirectly related to the development of the new septage facility and therefore have been reviewed by SHA:

1. Environmental Management Act (Provincial)
    - To ensure that the system is fully contained and no leakage to the surrounding environment
    - To ensure solids quality meet organic matter composting regulations
2. Fisheries Act (Federal)
    - To ensure that there is no leakage to the surrounding environment
3. Public Health Act (Provincial)
    - Septage contains constituents that may cause risk to public health
    - Septage may attract vectors which may transfer pathogenic organism
    - Dry septage sludge may carry air-born contaminants and pathogens
4. Sewerage Systems Regulation (Provincial)
    - Applies to users of the DRF

5. BC Drinking Water Protection Act, 2023 (Provincial)
    - To protect environment and human health
    - To protect drinking water sources from contamination
6. Canadian Drinking Water Guidelines (Federal)
    - To protect environment and human health
    - To protect drinking water sources from contamination
7. BC Organic Matter Recycling Regulation (Provincial)
    - Storage and management of dewatered sludge and biosolids
    - Biosolids must be of a quality to meet requirements of Class A compost. Class A compost is required for most applications, however Class B can be utilized in soil cover and growing medium mixtures at landfill facilities.

8.3 Wastewater Legislation

Septage disposal regulations in Canada fall under provincial jurisdictions. British Columbia (BC) regulates septage and other wastewater solids and agricultural wastes under the Organic Matter Recycling Regulation. This regulation applies to the production, distribution, storage, sale and use or land application of Class A and B biosolids and compost.

Wastewater discharge from the septage management facility will need to meet the District of Sechelt Bylaw No. No 112, 1990 (See Appendix B).

8.4 Septage Receiving Facility Best Practices

The available best practices that we reviewed are as follows:

- Sewerage System Standard Practice Manual, Version 3, September 2014, Health Protection Branch, Ministry of Health, BC – For users of the DRF
- USEPA Guide to Septage Treatment and Disposal, 1994
- USEPA Decentralized Systems Technology Fact Sheet – Septage Treatment/Disposal
- Ontario Design Guidelines for Sewage Works
- Environment Canada - Atlantic Canada Wastewater Guidelines Manual 2006
- Alberta Environment – Septage Management Advisory Committee- Technical and Regulatory Literature Review.

Based on our review of best practices, the following sections provide details on the important elements that need to be considered when designing the new facility.

8.4.1 Septage Characteristics

Septage is liquid and/or solid material removed and hauled from a septic tank, holding tank, pit toilet or similar systems that receive domestic liquid waste. Septage does not include process wastewater generated from commercial and industrial processes, solids from a community wastewater treatment facility, or wastes from grease traps and catch basins. It contains liquid (water), settled organic and inorganic solids, scum from grease and other organic solids, and soluble organic and inorganic materials.

The physical characteristics of septage is affected by multiple factors such as user habits, design of the system, septic tank size and frequency of pumping water conservation fixtures, household chemicals and water softeners and septic tank conditioners. As the septage is classified according to the systems or environment where it was generated, the characteristics of septage can vary significantly with the source.

Some features that characterize septage and need attention during a facility design are (USEPA, 1994):

- Objectionable odour
- Resistance to settling
- Dewatering
- Potential to foam resulting in windblown debris and fouling of equipment.

While the USEPA listed the conventional parameters of domestic septage, Alberta Environment summarized septage characteristics for conventional wastewater parameters, nutrients, metals, and organics for three main sources of domestic septage such as septic tanks, holding tanks and pit toilets, as presented in Table 8-1. The strengths of conventional parameters of septic tank waste and municipal wastewater are compared in the table. It was found that septage may be 6 to 8 times higher in concentration than typical domestic wastewater.

Wastewater from portable toilets generally has higher concentrations of pathogens and ammonia than wastewater from septic tanks and holding tanks. Septage from portable toilets may contain chemicals such as odour control, disinfectant, and bacterial agents. Commonly used chemicals are biodegradable according to Alberta Environment (Alberta Environment, 2004).

Knowledge of septage characteristics and their variability is important in determining treatment and disposal methods. Substantial quantities of phosphorus, Total Kjeldahl Nitrogen (TKN), total ammonia-nitrogen, bacterial growth inhibitor chemicals, such as ammonium and formaldehyde-based compounds, may be present in septage depending on the source.

Septage solids are biologically different than typical solids generated from raw wastewater treatment systems. The easily biodegradable components of septage are consumed in the septic tank as the sludge is formed leaving the supernatant portion and a sludge that has less volatile organics available for an aerobic composting process. Nevertheless, SHA expects that it is possible to achieve a Class A compost using the biosolids generated at a septage receiving facility, with or without the addition of wastewater treatment system solids, using a high-temperature composting process.

Table 8-1 Septage Characteristics (Source: Alberta Environment, 2004)

Parameter	Septic Tank[1,2] mg/L	Holding Tank/ Typical Municipal Wastewater[1,2] mg/L	Pit Toilets[3] mg/L	Ratio of Septic Tank to Wastewater[4]
Conventional Parameters				
Total Solids	34,100	720	78,140	56
Total Volatile Solids	23,100	365	60,582	68
Total Suspended Solids	12,900	220	-	68
Volatile Suspended Solids	9,000	165	-	61
Biochemical Oxygen Demand	6,500	220	-	32
Chemical Oxygen Demand	31,900	500	110,360	30
Total Kjeldahl nitrogen	590	40	8,070	18
Ammonia-N	97	25	3,920	6
Total phosphorus	210	31	3,730	31
Alkalinity	970	100	14,990	10
Oil and Grease	5,600	100	-	80
PH (pH units)	5.2-9.0[5]	-	-	-
Metals				
Aluminum	48	-	-	-
Arsenic	0.16	-	-	-
Cadmium	0.27	-	-	-
Chromium	0.92	-	-	-
Copper	8.27	-	-	-
Iron	191	-	-	-
Mercury	0.23	-	-	-
Manganese	3.97	-	-	-
Nickel	0.75	-	-	-
Lead	5.2	-	-	-
Selenium	0.076	-	-	-
Zinc	27.4	-	-	-

Parameter	Septic Tank[1,2] mg/L	Holding Tank/ Typical Municipal Wastewater[1,2] mg/L	Pit Toilets[3] mg/L	Ratio of Septic Tank to Wastewater[4]
Organics				
Methyl alcohol	1	-	-	-
Isopropyl alcohol	1	-	-	-
Acetone	0	-	-	-
Methyl ethyl ketone	1	-	-	-
Toluene	0.005	-	-	-
Methylene chloride	0.005	-	-	-
Ethylbenzene	0.005	-	-	-
Benzene	0.005	-	-	-
Xylene	0.005	-	-	-

[1,2] USEPA 1984, 1994
[3] Environment Canada (1996)
[4] Metcalf & Eddy, Inc., 1991
[5] Canadian ranges reported by USEPA (1984). U.S. reported wider ranges are 1.5-12.6

8.4.2 Recommended Theoretical Design Values for Indicator Parameters

The data for the current waste received at the facility needs to be collected to finalize the design. As mentioned earlier, characteristics of septage should be expected to vary widely from load to load depending on the source.

Table 8-2 presents theoretical design values for the selected/indicator parameters based on the incoming source ratios as described in Table 8-1 and the concentrations of two main sources such as septic tanks and holding tanks. The average of 2021 and 2022 septic tank and holding tank flow percentages are around 79% and 14% respectively with the remaining 7% from other sources. Since data is not available for other sources, USEPA's mean values for the concentrations have been considered for the remaining flow. There is no USEPA value for alkalinity; hence an average value of septic tank and holding tank has been used for alkalinity.

Table 8-2 Initial Design Values of Indicator Parameters

Parameter	Septic Tank (mg/L)	Holding Tank/Typical Municipal Waster(mg/L)	EPA Mean (mg/L)	Suggested Design Value (mg/L)
Average Day Flow (%)	79%	14%	7%	
Total Solids (TS)	34,100	720	38,800	29,634
Total Volatile Solids (TVS)	23,100	365	25,300	19,990
Total Suspended Solids (TSS)	12,900	220	13,000	11,089
Volatile Solids (VSS)	9,000	100	8,700	7,703
BOD5	6,500	400	5,000	5,523
COD	31,900	1,500	42,800	28,284
TKN	600	100	700	535
Total Ammonia Nitrogen	100	5	160	90
Total Phosphorus	200	20	250	178
Alkalinity	1,000	500	750	911
Grease	5,600	200	9,100	5,064

8.4.3 Sampling Data from the Dusty Road Facility

SHA reviewed the May 9th, 2023 sampling results from the following four sampling locations as follows:

- Truck R: liquid waste from Port Stalashen Treatment Plant
- Truck A: 20% liquid waste from porta potties and 80% from septic tanks
- Lagoon
- Contact tank.

The results are summarized in Table 8-3 along with District of Sechelt Bylaw No. 112., and the lab data is presented in Appendix C.

Table 8-3 Sampling Results, May 2023

Parameters	Truck R (Treatment Plant) (mg/L)	Truck A (20% Portapotties 80% Septic Tanks) (mg/L)	Lagoon (mg/L)	Contact Tank (mg/L)	District of Sechelt Bylaw No. 112 (mg/L)
Total Solids (TS)	3,297	6,199	20,800	69	
Total Suspended Solids (TSS)	1,650	3,100	10,400	34.6	600
Fixed Suspended Solids (FSS)	187	349	1,710	5.3	
Volatile Suspended Solids (VSS)	1,460	2,750	8,690	29.3	
Total Volatile Suspended Solids(TVS)	1,647	3,099	10,400	35	
BOD5 (CBOD)	2,100	2,920	606	26.9	
COD	36,600	11,800	14,900	292	
Total Kjeldahl Nitrogen (TKN)	484	799	487	104	
Total Ammonia Nitrogen	146	477	15	119	
Total Phosphorus	128	89	109	29.7	
Total Organic Carbon (TOC)	11,500	2,140	3,120	69.6	
Alkalinity					
Oil and Grease	908	325	211	6.2	300*
pH	6.18	7	7.16	8.3	5.5-9.5
Cyanide	<0.200	<0.200	<0.200	<0.200	1
Metals					
Arsenic	0.0417	0.0444	0.0576	0.00636	1
Cadmium	0.0562	0.00854	0.0256	0.0000469	1
Chromium (Total)	0.264	0.0446	0.142	<0.00050	5
Copper	5.18	2.39	3.75	0.0128	2
Iron	295	8.45	40.8	0.231	10
Lead	0.413	0.0584	0.206	0.000499	2
Nickel	0.236	0.071	0.14	0.00638	3
Zinc	36.7	7.98	12.3	0.0298	4
Phenol & Cresols	0.0178	0.461	0.00046	0.00373	1
Note: * Amended through District of Sechelt Bylaw No. 112-8, 2022					

The DRF effluent for discharge flow through the Contact Tank prior to being conveyed to the Water Resource Centre. This effluent can have a significant impact on the wastewater treatment process if the quality does not meet Bylaw requirements. As shown in Table 8-3, none of the parameters from the Contact Tank exceed the Bylaw limits. It is to be noted that the contact tank has higher ammonia than the lagoon. Concentrations of all other parameters are found to be lower than those of the lagoon and within acceptable limits.

When undertaking the new facility design it is recommended that multiple cross-sectional samples of influent, as well as the lagoon concentrations, should be analyzed.

June 2023 sampling results have not yet been reviewed.

8.5 Key Considerations

SHA reviewed the available best management practices and identified the following key considerations:

- Availability of adequate space for the facility
- Odour potential
- Septage receiving facility
- Treatment plant loading versus capacity
- Hauling distances
- Suitable technologies for treatment
- Dewatering and containment for leachate capture
- Sludge handling process and solids management
- Operations and maintenance costs
- Energy management
- Solids storage and disposal
- Distance from the residences and commercial facilities
- Capital funding for treatment methods
- Geography and site conditions
- Buffer zone requirements
- Climate conditions
- Public perception.

Septage also attracts disease causing viruses, bacteria, and parasites. Therefore, septage requires special handling and treatment. Current practices at many septage receiving facilities use polymers and available conditioners which have reduced these requirements considerably (USEPA, 1999).

As Alpine (2019) identified in their report, septage at the DRF presents several challenges, including:

- Large volume of septage solids compared to wastewater solids
- Large variation in daily septage receiving volumes leads to a large variation in daily solids loading
- Interference of septage solids with the biological wastewater treatment process
- Odour issues.

Alpine suggested that the following studies should be undertaken for long-term planning:

- Future Growth in Septage Volumes
- Various Septage Receiving and Dewatering Options
- Options for Processing of Dewatered Septage
- Possibilities for Co-processing of Water Resource Centre Biosolids
- Site Servicing and Area Requirements.

8.6 Market Demand and Volume Forecasting

The previous sections discussed volume projections based on the available data and theoretical estimates for septic systems in the contributing area. With respect to any variations in demand for the new facility, communication with the stakeholders has shown the following:

Note - Stakeholder communication summary to be included following planned consultation.

8.7 Spatial Consideration and Land Acquisition

Several factors should be considered when selecting a site for a septage receiving facility. The new facility should have adequate space to accommodate receiving, treatment, dewatering, and biosolids management, which may not be required if managed off-site. The required buffers from sensitive land uses such as residential, institutional, commercial, surface water bodies, and protected areas should be considered in the preliminary site selection process and conceptual designs.

The siting requirements will also be impacted by the need for incremental growth in capacity. It is anticipated that the initial capacity will be designed for 30 years and then the facility will be expanded for another 20 years.

With respect to odour management, the provincial requirement for no odour impact assumes a 100 - 300 m buffer or setback (Forgie et al, 2004; Environment Canada, 2006).

While selecting a site it is also important to consider whether the property can be leased or owned. Leased land may have more restrictions and requirements than owned land, especially with respect to the longevity of a lease.

SHA has started to develop an evaluation matrix for selecting proposed sites/locations for the new facility and are collecting information for populating the matrix. To size the new facility a treatment technology review is required. A brief review of these technologies is presented in Section 8.1.8.

8.8 Mitigation of Neighborhood Impacts

The proposed site should meet the following requirements to minimize neighborhood impacts:

- Maintain vegetated or well landscaped perimeter buffers that will help mitigate any unsightly aesthetics of the facility that can impact property values
- Any leakage should be captured on site and managed according to regulations
- Odours should be managed so as not to adversely impact adjacent land users
- Noise should not be created above established local bylaw levels
- The entrance to the new facility, if off a neighborhood road, must take into consideration truck frequency, schedule, noise, odour and leakage

Biosolids should be managed on or off site. If on site, biosolids should be managed in accordance with best practices, regulations and good neighbor policies including mixing with woodchips and other materials to mitigate odours and produce a product for market or disposal including landfill cover.

8.9 Incorporation of Emerging Technologies

Septage requires adequate considerations and attention in terms of treatment and disposal to avoid and/or mitigate odour, noise, traffic congestion, safety, environmental and public health issues. As presented by Alberta Environment (2004), the Water Environment Federation (WEF, 1997) suggested that there are four alternatives for the treatment and disposal of septage as shown in Figure 8-1 including landfilling, land application, independent septage treatment plants, and wastewater treatment plant trucked liquid waste infrastructure.

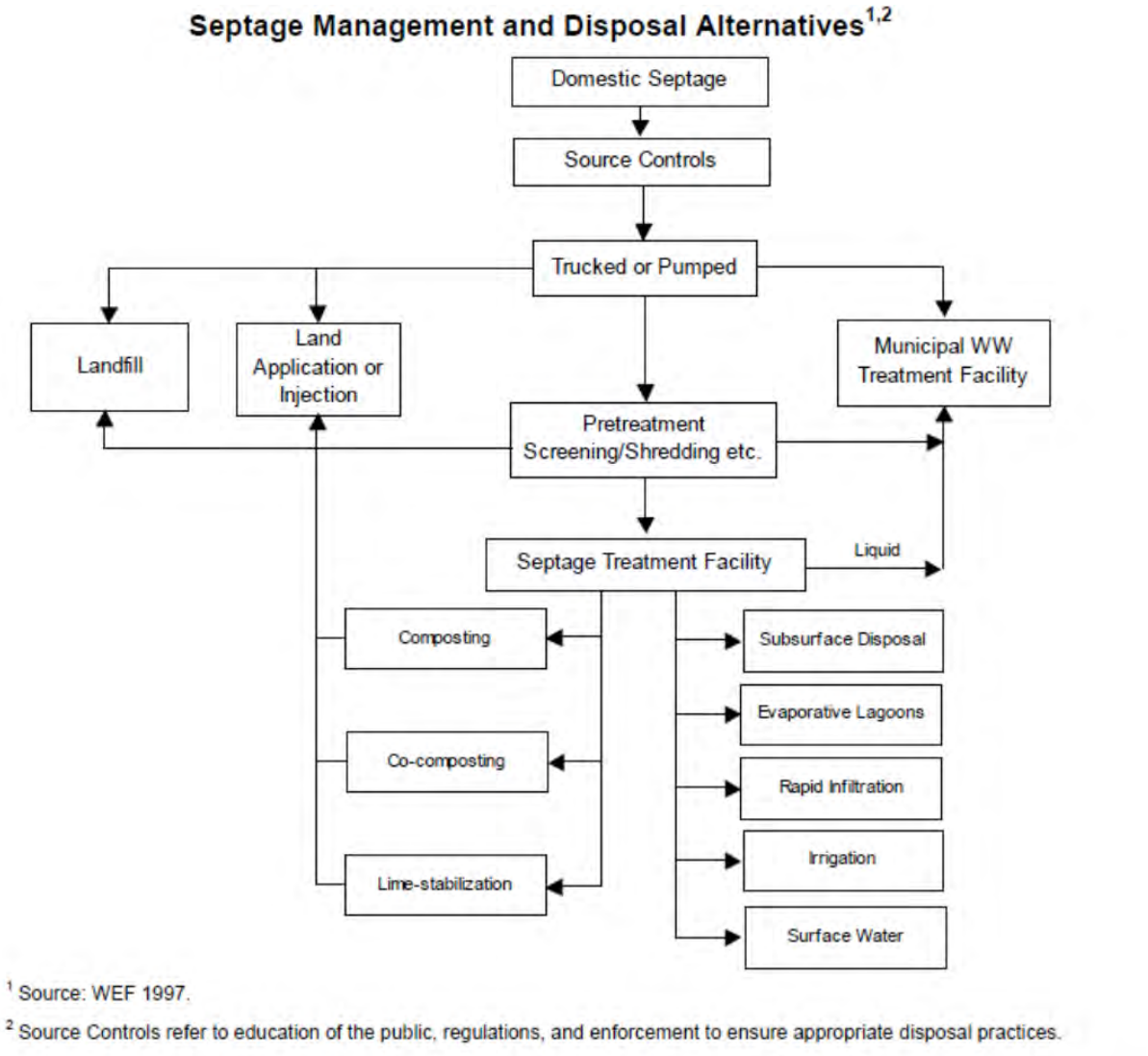


Figure 8-1 Septage Management and Disposal Alternatives (Alberta Environment, 2004)

SHA reviewed available technologies for septage receiving, dewatering, septage/liquid treatment, solids stabilization and biosolids management.

Septage Receiving. A septage receiving facility should include flow metering, screening, rock/grit removal, flow equalization and odour control. SHA understands that the existing 'muffin monster' at the DRF is working well (see Photo 1). A dual-shafted grinder on the inflow maximizes surface area of solids for better washing and compacting. SHA envisions that this same technology will be included in the proposed new facility.

Photo 8-1 Road Septage Receiving Facility

Dewatering. SHA understands that it is important to the District that the new facility includes a suitable area to dewater the septage tank pumpage to reduce the overall cost of managing the solids. This area will need to be designed to dewater the solids, contain the dewatered effluent, and convey effluent back to the treatment facility. Dewatering is used to prepare septage for solids stabilization. Dewatering options generally include:

- Natural Drying Beds
- Dewatering Bags or Geotubes
- Lagoon Decanting Cells
- Vacuum Assisted Drying Beds
- Crew and/or Rotary Presses
- Belt Filter Presses
- Centrifuges.

SHA developed dewatering facilities for the Regional District of Kitimat-Stikine (RDKS) in 2017 and the City of Prince Rupert in 2022 with two lock block decanting cells which were geomembrane lined. A 500 mm thick gravel drainage layer was placed over the concrete slab at the base of the cells to facilitate dewatering of the septage. A non-woven geotextile layer was then placed over the drainage layer to prevent fouling. An additional 300 mm filtration layer was then placed over the geotextile. Once the drainage cell reaches capacity, that cell is closed and operations switch to the adjacent bed.

Photo 8-2 Septage Dewatering Facility at Forceman Ridge Landfill, RDKS

Sludge is bulked up and excavated out of the cell taking precautions to not disturb the drainage layers whenever the water level reaches within 500 mm of the top of the cell walls. When cleaning out the septage, a trash pump with a filter is used to pump all free-standing water into the adjacent cell. The remaining sludge is then bulked up with sawdust and hauled to a composting area.

Currently, Geotubes are used at the DRF (see Photo 8-3). Geotubes involve a simple dewatering method and function as both dewatering and waterproof storage of the dewatered sludge. A mechanical dewatering method such as a centrifuge requires the dewatered solids to be disposed immediately or be stored in a contained and covered facility.

Photo 8-3 Geotubes at the Dusty Road Facility

SHA will review all the available dewatering technologies and will work with the District to identify the most suitable one for a given site. SHA understands that the dewatering facility will generate leachate that must be contained and conveyed back to a treatment system.

Septage Liquid Treatment. Liquid separated from the solids needs to be treated before disposal to a wastewater treatment facility or outfall that will meet the respective discharge criteria. For the proposed new facility, the effluent must meet the District of Sechelt Bylaw No. 112, 1990 requirements as the effluent is discharged to the municipal sewer. Similar technologies used for municipal wastewater treatment are normally used for septage treatment, depending on the strengths of the liquid. The technologies include:

- Facultative Lagoons with no Aeration
- Aerated Lagoons
- Constructed Wetlands.

For typical residential septic tank pumpage, generally an adequately sized Equalization/Settling Pond to settle most settleable solids and a suitable Aeration Lagoon will achieve the required quality.

With the current waste being accepted at the DRF such as brewery waste, grease trap waste, sewer system lift station waste, porta-potties and parking lot catch basins, an additional level of treatment will likely be required to reduce the risk to the Water Resource Centre. Should the District choose to continue accepting these non-residential wastes, grease traps and oil water separators may need to be included in the new treatment facility. Additional aeration may also be required to manage BOD and ammonia

concentrations. Flocculation may also be required to achieve the required solids removal if the parcels available to build the new treatment facility are not large enough to rely on adequately sized retention ponds.

Solids Stabilization and Biosolids Management. Septage solids, after the dewatering steps, require necessary treatment before disposal to reduce volatile organic compounds and pathogen content. Options for stabilization of septage solids include:

- Alkaline Stabilization
- Composting
- Aerobic Digestion
- Anaerobic Digestion.

There are pros and cons for each method. Alkaline Stabilization is a simple method that requires minimum operational attention; however, this method increases the mass of solids and creates dust problems. Composting, with a medium to high operating cost, has a potential to generate a marketable product to off-set costs. However, composting requires careful and consistent monitoring to ensure no odour impacts on neighboring properties and a useable product.

SHA anticipates that sludge will be dried in drying beds as shown in Photo 8-2. Woodchips would be mixed for bulking the sludge for composting on or off site to generate a useable product for sale or for landfill cover and closure. Should composting be desired by the District within the service, the design will be developed as per the BC Compost Facility Guidelines under the Organic Matter Recycling Regulation. A suitable arrangement would also be required with the SCRD for use at the landfill.

8.9.1 Preliminary Treatment Concept at the New Facility

Based on the review of the emerging technologies for the septage management SHA has developed a preliminary treatment concept. The following discussion outlines this concept.

Dewatering

SHA understands that the septage sludge should be dewatered quickly. Available dewatering technologies can be classified into the following two broad categories:

- Mechanical Dewatering Systems
- Retention/Settlement in lagoons or engineered cells.

Mechanical dewatering systems require smaller footprint and involve a higher level of maintenance, arrangements for solids management, more complex operations, and higher risks of equipment failure resulting in downtime.

On the other hand, retention/settlement in lagoons or engineered cells are less complex with less maintenance and risks to service disruptions. Although these systems require larger footprints.

A mechanical system may need an area similar to the Dusty Road Facility, while the retention/settlement in lagoons or engineered cells would require a larger footprint than the Dusty Road Facility.

SHA will also explore the pros and cons of employing Geotubes for dewatering although Geotubes often face challenges in confinement of liquid.

Treatment
For the septage liquid treatment, SHA envisions one or two (one as back-up) lined lagoon (s) with surface aerators or aeration systems with floating or submerged diffusers.
Solids Management
There are several options for the solids management component. The current practice of dewatering in geotubes appears to work well. SHA anticipates that the bulked-up sludge from the chosen dewatering system will be dried in drying beds. Woodchips would be mixed to bulk the sludge for composting.

SHA will continue to examine the options in parallel to the discussion of options as discussions proceed with the project team and stakeholders.

8.10 Building Code Requirements

Relevant building codes will be referenced for design of any buildings on site. At this point, SHA does not have enough design data or design requirements to specify the Building Code sections to be followed. As the design evolves, we will specify the design requirements as per the Building Code. Building parcels considered will need to be appropriately zoned for the intended use.

9 SUMMARY AND CONCLUSION

It is important to determine and gain approval for the facility requirements prior to considering potential locations.

SHA understands that local septage haulers disposing of some liquid waste loads in a system on their property and bringing only the septage sludge to the DRF has likely resulted in the distinct drop in the flow volume recorded since 2019. SHA developed an estimate of residential septage volume to be received from septic tanks to generate a more accurate projection of overall expected waste volumes based on estimated number of dwellings normally occupied from recent census data and a 5-year septic tank pumping frequency that assumes no dewatering by septic haulers. For the 50-year septage volume projection, the annual estimated volume of 7,418 m^3 for residential septage has been used for the year 2021. SHA feels this estimate is sufficient at this point to project all incoming wastes based on the 2019 volume of 7,000 m^3 and the fact that the predicted residential values are considered at the upper end of this estimate.

Using the District's 2% population growth rate and no changes to the type of property disposal methods, we can expect in the year 2071, the total population for the septic tanks servicing area to be in the order of 52,556 and the volume of residential septage to be in the order of 19,996 m^3.

Through the planned stakeholder consultation, we may learn that new development and subsequent increases in population may be served by community sewer systems that do not need to utilize the new septage receiving facility.

In addition, certain areas currently utilizing onsite disposal systems may be converted to community sewer systems. This information will change the 50-year projection. SHA analyzed types of waste received at the DRF and found that 2022 data indicates that of the 4,000.7 m^3 received, 82.92% or 3,317 m^3 was from septic tanks with the remaining 683 m^3 from non-residential users. In addition to septic tank pumpage, sludge from wastewater treatment plants, porta-potties, grease traps, brewery waste and other sources such as sewage lift stations is also being accepted. The District will need to confirm what wastes will be accepted at the new facility. Waste types will influence projected volumes and required treatment.

SHA reviewed the criteria and parameters identified in the RFP to develop a statement of requirements and analyzed theoretical design values for the selected/indicator parameters. SHA also analyzed the recent influent and effluent data at the DRF.

When undertaking the new facility design it is recommended that multiple influent samples from different sources as well as the lagoon concentrations be analyzed.

SHA reviewed the available best management practices and identified the key considerations. The new facility should have adequate space to accommodate receiving, treatment, dewatering, and potential biosolids management.

Septage receiving facilities require adequate considerations and attention in terms of treatment and disposal to avoid and/or mitigate odour, noise, traffic congestion, public safety, environmental protection and public health issues. SHA reviewed available technologies for septage receiving, dewatering, septage/liquid treatment, solids stabilization and biosolids management and recommended a preliminary concept. SHA will design a facility that meets the social, environmental, and economic requirements based on the wastes and priorities approved by the District for the new facility.

10REFERENCES

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11LIMITATIONS

This report has been prepared by Sperling Hansen Associates (SHA) on behalf of the District of Sechelt in accordance with generally accepted engineering practices to a level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions in British Columbia, subject to the time limits and financial and physical constraints applicable to the services.

The report, which specifically includes all tables and figures, is based on engineering analysis by SHA staff of data compiled during the course of the project. Except where specifically stated to the contrary, the information on which this study is based has been obtained from external sources. This external information has not been independently verified or otherwise examined by SHA to determine its accuracy and completeness. SHA has relied in good faith on this information and does not accept responsibility of any deficiency, misstatements or inaccuracies contained in the reports as a result of omissions, misinterpretation and/or fraudulent acts of the persons interviewed or contacted, or errors or omissions in the reviewed documentation.

The report is intended solely for the use of the District of Sechelt. Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. SHA does not accept any responsibility for other uses of the material contained herein nor for damages, if any, suffered by any third party because of decisions made or actions based on this report. Copying of this intellectual property for other purposes is not permitted.

The findings and conclusions of this report are valid only as of the date of this report. The interpretations presented in this report and the conclusions and recommendations that are drawn are based on information that was made available to SHA during the course of this project. Should additional new data become available in the future, Sperling Hansen Associates should be requested to re-evaluate the findings of this report and modify the conclusions and recommendations drawn, as required.

We appreciate the opportunity to work with the District of Sechelt on this project. Please do not hesitate to contact the undersigned if you have any questions.

Sincerely,

SPERLING HANSEN ASSOCIATES

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APPENDICES

APPENDIX A
Population and Dwelling Estimate

Population Estimates Compared with 2019 Alpine Report

Area	Population		Dwellings		
	Alpine-2016 Census	**2021 Census**			
Total for Sunshine Coast	29970	32170	17982	Total	
District of Sechelt WW System including Sechelt Indian Government District	7000	6189	3246		
Town of Gibsons	5000 (census 4605)	4758	2482		
SCRD WWT Systems	2000				
Greaves Road		13	6		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Woodcreek Park		153	73		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Sunnyside		23	11		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Jolly Roger		67	32		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Secret Cove		71	34		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Lee Bay		376	179		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Square Bay		195	93		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Langdale		84	40		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Canoe Road		21	10		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Merrill Crescent		29	14		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Currran Road		147	70		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Roberts Creek Co-Housing		65	31		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Lily Lake		59	28		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Painted Boat		71	34		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Sakinaw Ridge		61	29		2020 SCRD Board Report/Census reports average household size is 2.1 in SCRD
Rockwater Resort Four Star Resort with 40 rooms according to Expedia	Adjusted population & dwellings	60	30		Equivalent annual population based on 2 persons per unit & 75% capacity
Bayside Campground - Year Round-52 RV/Tent Sites-Some with water & sewer/Washrooms& showers	Adjusted population & dwellings	52	26		Equivalent annual population based on 2 persons per site & 50% capacity assuming some users are area residents
Big Maples - 27 lot residential subdivision		57	27		Census reports average household size is 2.1 in SCRD
Port Stalashen - Gated 44 unit townhouse Community		92	44		Census reports average household size is 2.1 in SCRD
	Total on Community Systems	**12644**	**6539**		
	Total Onsite Systems	**19526**	**11443**		

	Population	Dwellings
SCRD WWT Systems	1436	684
Other	261	127
	1698	811

Population split confirmed by client - Expect to change

Sechelt Census	10847
SIGD	765
Total	11612

1698 population on small WWT Plants

APPENDIX B
District of Sechelt Bylaw No. 112

BYLAW

Public Sewer Bylaw

No. 112, 1990

Consolidated for convenience only March 2019

This Consolidation includes the following Bylaw Amendments:

112-1, 1994	112-5, 2012
112-2, 1995	112-6, 2013
112-4, 2011	112-7, 2017

Note: 112-3, 1996 was not proceeded with.

DISCLAIMER

Unless an image, photograph or diagram is explicitly referred to in the text of the Bylaw as being part of a bylaw, any image, photographs or diagrams do not form part of the Bylaw and are provided as supplementary materials for convenience only.

AMENDMENTS

Number	Date	Amendment

DISTRICT OF SECHELT

BYLAW NO. 112, 1990

A bylaw for the administration and regulation of public sewers

WHEREAS the *Community Charter* provides for the establishment of public sewer systems and the operation thereof:

NOW THEREFORE, the Council of the Corporation of the District of Sechelt in open meeting assembled hereby enacts as follows:

TITLE

1. This bylaw may be cited as the "District of Sechelt Public Sewer Bylaw No. 112, 1990".

DEFINITIONS

2.(1) In this bylaw, the following terms and expressions shall have the meanings hereinafter assigned to them, that is to say:

(a) **B.O.D.** (denoting biochemical oxygen demand) means the quantity of oxygen utilized in the biochemical exodation of organic matter under standard laboratory procedure in five (5) days at 20^{o} Celsius, expressed in milligrams per litre;

(b) **BUILDING SANITARY SEWER** means the section of sewer piping from the sanitary sewer connection to the building it serves and is intended to receive only sanitary sewage;

(c) **BUILDING STORM SEWER** means the section of sewer piping from the storm sewer connection to the building it serves and is intended to receive only storm water;

(d) **COMBINED SEWER** means a sewer intended to receive both storm water and sewage;

(e) **ENGINEER** means the Director of Engineering and Public Works for the Municipality or duly authorized assistant or agent.

(f) **GARBAGE** means solid wastes from the domestic or commercial preparation, cooking and dispensing of food and from the handling, storage and sale of produce;

(g) **INDUSTRIAL WASTES** means the waste water from industrial business processes as distinct from sanitary sewage;

(h) **MAIN SEWER** see **PUBLIC SEWER**

(i) **MUNICIPALITY** means the District of Sechelt.

(j) **pH** means the logarithm of the reciprocal of the weight of hydrogen ions in grams per litre of solution;

(k) **PERMISSION** means permission given by the Engineer or his duly authorized assistant or agent.

(l) **PROPERLY COMMINUTED GARBAGE** means the wastes from the preparation, cooking and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than six millitres (6 mm.) in any dimension;

(m) **PUBLIC SEWER** means a sewer installed on Municipal property, highways or rights-of-way and shall include main sewers, lateral sewers, sewer extensions and sewer connections, and is controlled by the Municipality;

(n) **RIGHT-OF-WAY** means an acquired legal right for the specified use of land owned by others;

(o) **SANITARY SEWAGE** means any liquid or waste water containing animal or vegetable matter in suspension or solution and includes waste water from plumbing fixtures and appliances;

(p) **SEWAGE** means waste water from buildings, lands and industrial establishments, together with such storm water that is not intentionally admitted;

(q) **SEWAGE TREATMENT PLANT** means any arrangement of devices and structures used for treating sewage;

(r) **SEWER** means a pipe or conduit for carrying sewage or storm water;

(s) **"SEWER CONNECTION"** means that section of the public sewer connecting the main sewer, lateral sewer or sewer extension to the property it serves;

(t) **STORM SEWER** means a sewer which carries storm and surface waters and drainage, but excludes sewage and industrial wastes, other than unpolluted cooling water;

(u) **STORM WATER** means rainfall, ground water, subsurface water or unpolluted water from any source;

(v) **SUSPENDED SOLIDS** means solids that either float on the surface of, or are in suspension in water, sewage or other liquids, and which are removable by laboratory filtering;

(w) **UNPOLLUTED WATER** means water of quality equal or better than the effluent criteria in effect or water that would not cause a violation of receiving water quality standards and would not be benefitted by discharge to the sanitary sewers and sewage treatment facilities.

(x) **WATER COURSE** means a natural or artificial channel for the passage of water either continuously or intermittently.

REQUIREMENTS TO CONNECT SEWERS

3. (1) The owner of every parcel of land to which a sewer connection can be or has been made, and on which a building or other structure with a plumbing system is situate shall connect such plumbing system to the sewer connection.

(2) In the event of the owner failing to make the necessary connection to the sewer connection within thirty (30) days after being notified in writing by the Municipality to do so, or as required by Section 12 (1) of this bylaw, the Engineer, by his workmen or others, may have the work done at the expense of such owner, and the Municipality shall recover the expense thereof with costs in like manner as municipal taxes.

(3) Notwithstanding the foregoing, an owner failing to connect his building or structure to the sewer system within the aforesaid period of thirty (30) days shall be liable to the penalties provided by this Bylaw.

(4) Notice in writing required to be given by the Engineer pursuant to this Section shall be sufficiently given if sent by registered mail to the owner at the address shown on the last revised assessment roll of the Municipality.

(5) For clarity of Section (1) above:

a) where a sewer line extension is built as a response to a petition for the service, connection to abutting properties is mandatory;
b) where a sewer line extension is built as a Council initiative whereby the assent of the electors has been gained or an alternative approval process used, connection to abutting properties is mandatory;
c) where grant funds are used for a sewer capital project, connection to abutting properties is mandatory;

d) where Gas Tax grant money is to be used for a project that is in the District's five year capital forecast, connection to abutting properties is mandatory;

e) where a developer has provided the funds for a sewer line extension, the abutting properties will be required to connect to the sewer only under the following criteria:

i. change of ownership;
ii. improvement within the property that requires a building permit; and
iii. failure of the septic on the property.

(6) Property owners who appeal an obligation to connect based on physical lot characteristics or financial hardship be dealt with by Council on a case by case basis.

DESIGN AND INSTALLATION

4. (1) Pursuant to the provisions of this Bylaw, all drainage and sewerage works provided by persons other than the Municipality shall be constructed and installed strictly in accordance with the plans and specifications annexed to the Subdivision Control Bylaw of the Municipality and shall comply with the provisions of the British Columbia Plumbing code.

APPLICATION FOR SERVICE

5. (1) Each application for a sewer connection shall be made to the Municipality by the owner or his authorized agent in the form prescribed in Appendix "A" attached to and forming part of this Bylaw.

(2) Such owner shall, on making application, pay to the Municipality the applicable connection fee. If such connection is practicable, the Engineer shall, within ninety (90) days, weather permitting, provide and install a sewer connection to the applicant's property. If such connection is not practicable, the Engineer shall so notify the applicant within sixty (60) days and the Municipality shall refund the charges or fees paid by the applicant.

(3) Each property shall have its own sewer connection which shall be installed by the Municipality. Where two or more buildings exist on one parcel of land and where such parcel of land can be subdivided, each building or structure shall have a separate service connection.

(4) Where possible, the sewer connection will be located at the location requested by the applicant. In the event the applicant's preferred location is not practicable due to the existence of installed surface improvements or is in conflict with installed underground utilities the Engineer shall designate the location of each service connection to each parcel of land or premises.

FEES AND PERMITS

6. (1) To defray the District of Sechelt's cost to install sewer connection to land on which buildings or structures are to be served, all such costs are to be borne by the owner of said land pursuant to the cost estimate set out in Appendix A attached to and forming part of this bylaw.

INSTALLATION OF SEWERS

7. (1) The Engineer shall determine the location, size and depth of each sewer connection.

(2) Whenever possible, the sewer connection shall be brought to the property line at a gradient and elevation that will allow gravity flow of sewage from the building to the main sewer.

(3) When, in the opinion of the Engineer, problems may occur in any sewer connection because of the surcharging of the public sewer, the Engineer may refuse an application.

(4) The connecting of the building sanitary sewer or the building storm sewer into a public sewer shall conform to the requirements of the Building and Plumbing Codes or other applicable rules and regulations of the Municipality. All such connections shall be made gas-tight and water-tight and be verified by proper testing. Any deviation from the prescribed procedures and materials must be approved by the Engineer before installation.

(5) All excavations for sewer installations shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the Municipality.

(6) When determined as being necessary by the Engineer, the owner of any property served by a sewer discharging industrial wastes to a public sewer shall install a suitable structure, together with such necessary meters and other appurtenances, in the building sanitary sewer to facilitate observation, sampling and measurement of the wastes. Such structure, when required, shall be accessible and safely located and shall be constructed in accordance with the plans approved by the Engineer. The structure shall be maintained by the owner as to be safe and accessible at all times.

(7) The Engineer may require a user of sewer services to provide information needed to determine compliance with this Bylaw. These requirements may include:

(a) Sewage or storm water discharge peak rate and volume over a specified time period;
(b) Chemical analysis of sewage;
(c) Information on raw materials, processes and products affecting sewage volume and quality;
(d) Quantity and disposition of specific liquid, sludge, oil, solvent or other materials important to sewer use control;
(e) A plot plan of sewers on the user's property showing sewer and pre-treatment facility locations;
(f) Details of sewage pre-treatment facilities; and/or
(g) Details of systems to prevent and control the losses of materials through spills to the public sewer.

USE OF PUBLIC SEWERS

8. (1) If any sewage is discharged or is proposed to be discharged to the public sewers, which sewage contains the substances or possesses the characteristics, detailed in Section 10, and which, in the judgement of the Engineer, may have deleterious effect upon the sewage facilities, processes, or equipment or which may otherwise create a hazard to life or constitute a public nuisance, the Engineer may:

(a) Reject the sewage;
(b) Require pre-treatment to an acceptable condition prior to the discharge into the public sewers;
(c) Require control over the quantities and rates of discharge; and/or
(d) Require payment to cover the added cost of handling and treating the sewage not covered by existing taxes or sewer charges.

When considering the above alternatives, the Engineer shall give consideration to the economic impact of each alternative on the discharger. If the Engineer permits the pre-treatment or equalization of waste flows, the design and installation of the plans and equipment shall be subject to review and approval by the Engineer.

(2) Grease, oil and sand interceptors shall be provided when, in the opinion of the Engineer, they are necessary for the proper handling of sewage containing floatable grease in excessive amounts, as specified in Section 10(3)(c), or any flammable wastes, sand or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the Engineer, and shall be located as to be readily and easily accessible for cleaning and inspection. In the maintaining of these interceptors, the owner(s) shall be responsible for the proper removal and disposal by appropriate means of the captured materials and shall maintain records of the dates and means of disposal, which are subject to review by the Engineer. Any removal and hauling of the collected materials not performed by the owner's personnel must be performed by currently licenced waste disposal firms.

9. (1) No person shall discharge or cause or allow to be discharged into any pipe, main, conduit, manhole, catch basin, gutter or aperture of the sewer system, or to any sanitary or storm sewer:

(a) Any gasoline, benzene, naphtha, alcohols or other flammable or explosive liquid, solid or gas;

(b) Any solid or viscous substance capable of obstructing sewage flow or interfering with the operation of the sewage works or treatment facilities. These substances include, but are not limited to: ashes, cinders, sands, mud, straw, grass clippings, insoluble shavings, metal, glass, rags, feathers, tar, asphalt, creosote, plastics, wood, animal paunch contents, offal, blood, bones, meat trimmings and wastes, fish or fowl heads, shrimp, crab or clam shells, entrails, lard, tallow, baking dough, chemical residues, cannery waste bulk solids, hair and fleshings, spent grain and hops, whole or ground paper dishes and cups, whole or ground plastic dishes and cups, whole or ground food and beverage containers, unground garbage, paint residues;

(c) Any noxious or malodorous gas or substance which either singly or by interaction with other wastes is capable of creating a public nuisance or hazard to life or preventing entry into a sewer or pump station;

(d) Radioactive material, except within such limits as are permitted by the licence issued by the Atomic Energy Control Board of Canada; or

(e) Any material from a cesspool, holding tank or septic tank, except at authorized receiving stations.

RESTRICTED WASTES

10. (1) No person shall discharge into any sanitary sewer any storm water, unpolluted drainage or cooling water.

(2) No person shall discharge any water into a storm sewer except unpolluted drainage water and cooling water.

(3) No person shall discharge or cause or allow to be discharged into any sanitary sewer or combined sewer any of the following:

(a) Any garbage which has not been properly comminuted.
(b) Any liquid or vapour having a temperature higher than 65° Celsius.
(c) Any water or waste which contains grease (includes fats, waxes, oil or any other non-volatile material extracted by hexane from an acidified sample of the wastes), whether or not emulsified, whose all inclusive concentration is in excess of one hundred fifty (150) milligrams per litre of substances derived from petroleum sources, or which contains any substance which may solidify or become discernibly viscous at temperatures above 0° Celsius.
(d) Any water or waste having a suspended solids content of more than six hundred (600) milligrams per litre.
(e) Any soluble waste or waste water having a pH lower than 5.5 or higher than 9.5 or having any other corrosive property which reasonably could be hazardous to structures, equipment or personnel; such as, but not limited to battery or plating acid and wastes, copper sulphate, chromium salts and compounds or salt brine.
(f) Any water or waste containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process, to constitute a hazard to humans or animals, or to create any hazard to the receiving waters or storm water overflows, or to the effluent of the sewage treatment plant. Without limiting the generality of this Section, the concentration of the following toxic substances at the point of discharge to the public sewer shall not exceed:

Arsenic	one (1) milligram per litre
Cadmium	one (1) milligram per litre
Chromium (Total)	five (5) milligrams per litre
Copper	two (2) milligrams per litre
Cyanide	one (1) milligram per litre
Iron	ten (10) milligrams per litre
Lead	two (2) milligrams per litre
Nickel	three (3) milligrams per litre
Phenols & Cresols	one (1) milligram per litre
Zinc	four (4) milligrams per litre

(g) Any materials which exerts or causes:

(i) Unusual concentration of inert suspended solids; such as, but not limited to: Fuller's earth, lime slurries or lime residue;
(ii) Unusual concentrations of dissolved solids; such as, but not limited to: sodium chloride or sodium sulphate;
(iii) Excessive discolouration; such as, but not limited to: dye wastes or vegetable tanning solutions, or
(iv) Unusual biochemical oxidation demand;

(h) Any water or waste that will, by itself or with other water or wastes in the sewer system, release obnoxious gases; or develop colour of undesirable intensity; or form suspended solids in objectionable concentration; or create any other conditions deleterious to structures or treatment processes; or

(i) Water or wastes containing substances in such concentrations that they are not amenable to treatment or reduction by the sewage treatment processes employed, or are amenable to treatment only to such a degree that the sewage treatment plant effluent cannot meet the requirements of any other agency having jurisdiction over discharges to the receiving waters.

SAMPLING AND ANALYSIS

11. (1) All measurements, tests and analyses of the characteristics of waters and wastes to which reference is made shall be determined in accordance with the latest edition of "Standard Methods for the Examination of Water" published by the American Public Health Association. Sampling shall be carried out by customarily accepted methods to reflect the effects of constituents upon the sewage works and to determine the existence of hazards to life, health and property.

PRIVATE DISPOSAL

12. (1) Where a private sewage disposal system such as a septic tank, holding tank, cesspool, or leeching pit has been permitted on a property and a public sanitary sewer is later constructed or becomes available within a reasonable distance of any part of the property, the owner of the property shall make a direct connection to such public sanitary sewer within a two (2) year period of such availability or within 30 days of being notified by the Municipality to do so, whichever period is less. The previously permitted method of sewage disposal shall cease and be removed or cleaned of sludge and filled with a suitable material.

(2) No statement contained in this Section shall be construed to interfere with any additional requirements that may be imposed by the Health Act or Plumbing codes and Bylaws.

PROHIBITIONS

13. (1) It shall be unlawful for any person to place, deposit or permit to be deposited in any unsanitary manner on public or private property within the Municipality, or in any area under the jurisdiction of the said Municipality, any human or animal excrement, garbage or objectionable waste.

(2) Except where a sewer connection cannot be installed, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage.

(3) No person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is part of the sewer system.

(4) No person shall discharge or cause to be discharged any unpolluted waters such as storm water, ground water, roof runoff, subsurface drainage or colling water to any sanitary sewer; except that storm water runoff from limited areas, which storm water may be polluted at times, may be discharged to the sanitary sewer by permission of the Engineer.

(5) No person shall make any connection whatsoever to the sewer or sewer connection or in any way tamper with the sewer or sewer connection without first obtaining permission from the Engineer.

(6) No person shall connect any building sanitary sewer to any public storm sewer or to any storm sewer connection. No person shall connect any building storm sewer to any sanitary sewer connection.

(7) Where any public sewer is laid in private property in respect of which the Municipality holds a right-of-way for sewer purposes, no person shall connect to, or disturb, such sewer except by direction of, and with permission of, the Engineer.

(8) No person shall connect or attempt to connect or allow to be connected or allow to remain connected any real property to the sanitary sewer or storm sewer system otherwise than in accordance with the provisions of this Bylaw.

STORM WATER DISPOSAL

14. (1) Storm water and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers or to a natural outlet approved by the Engineer and other regulatory agencies. Unpolluted industrial cooling water or process waters may be discharged, on approval of the Engineer, to a storm sewer, combined sewer or natural outlet.

INSPECTION

15. (1) The Engineer may enter, at all reasonable times, upon any property subject to the provisions of this Bylaw, in order to ascertain whether such regulations are being obeyed.

ENFORCEMENT

16. (1) Should any person who is required by the provisions of this Bylaw to do any matter or thing be in default of it being done by that person, such matter or thing may be done at the expense of the person in default and the Council may recover the expense thereof, with costs in like manner as municipal taxes.

PENALTIES

17. (1) Any person who violates any of the provisions of this Bylaw or who suffers or permits any act or thing to be done in contravention of this Bylaw, or who neglects to do or refrains from doing any act or thing required to be done by the provisions of this Bylaw, shall be guilty of an offence and shall be liable, upon conviction, to a fine of not less than Fifty Dollars ($50.00), not more than Two Thousand Dollars ($2,000.00) or to a term of imprisonment not exceeding six (6) months or to both, for each offence; and each day during which any violation, contravention or breach shall continue shall be deemed a separate offence.

READ A FIRST TIME THIS 2nd DAY OF MAY, 1990.

READ A SECOND TIME THIS 16th DAY OF MAY, 1990.

READ A THIRD TIME THIS 16TH DAY OF MAY, 1990

RECONSIDERED AND FINALLY ADOPTED THIS 16TH DAY OF MAY, 1990.

"Nancy A. MacLarty"
MAYOR

"B. Sabine"
CLERK (Acting)

APPENDIX A

To: District of Sechelt **Date:** _____
Folio: _____

I request an estimate for the following services:

Sanitary Sewer:_____Size _____ Storm Sewer:_____Size _____

Driveway Access: _____ Width: _____ Culvert Required (Y/N):_____Size:_____

Other _____If other, description and on-site location of service requested

_____ _____
PROJECT ADDRESS APPLICANT

Applicant's address: _____
if different than project address

Telephone number: _____ Alternate telephone number: _____

ESTIMATE: See separate sheet attached _____

Prepared by: _____ Date: _____
Print Name

Approved By: _____ Date: _____
Director of Engineering Services

WORK ORDER: Please carry out the work described relative to:

Address: _____ Date: _____

Sanitary Sewer ____ Storm Sewer ____ Water Service ____ Driveway ____ Other _____

Plan attached: Yes _____ No _____ Engineering Receipt No.:_____

Land Owner's Name:_____

Land Owner's Signature:_____

Please return this document to the District of Sechelt

Folio: _____

WORK ORDER STATUS:

Completed: Date: _____ Signature:_____

Abandoned: Date: _____ Signature:_____

Plans Drawn: Yes: ____ No:____ By:_____

Details of Service Installed:

APPENDIX C
Laboratory Data

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23B0086**	Page	: 1 of 6
Client	: **District of Sechelt**	Laboratory	: Vancouver - Environmental
Contact	: Christine Miller	Account Manager	: Ian Chen
Address	: PO Box 129 2nd Floor, 5797 Cowrie St. Sechelt BC Canada V0N 3A0	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: 604-989-0580	Telephone	: +1 604 253 4188
Project	: DUSTY ROAD	Date Samples Received	: 09-May-2023 20:30
PO	: ----	Date Analysis Commenced	: 10-May-2023
C-O-C number	: 17-866194	Issue Date	: 23-May-2023 16:58
Sampler	: CM/RC		
Site	: new sampling		
Quote number	: VA23-DOSE100-001		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
µg/L	micrograms per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
BODF	*BOD analyzed from frozen (preserved) sample. Hold time for unpreserved samples was exceeded, but freezing can extend hold time to at least 1 month, according to ISO 5667-3 (2018).*
CNP	*Cyanide test sample appears to have been preserved, but pH was <10 at time of testing. Results may be biased low, particularly for Free CN species.*
DLA	*Detection Limit adjusted for required dilution.*
DLCI	*Detection Limit Raised: Chromatographic interference due to co-elution.*
DLIS	*Detection Limit Adjusted due to insufficient sample.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DLQ	*Detection Limit raised due to co-eluting interference. Mass Spectrometry qualifier ion ratio did not meet acceptance criteria.*
HTP	*Sample preparation or preservation hold time was exceeded.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	TRUCK R	LAGOON	CONTACT TANK	TRUCK A	----
					Client sampling date / time	09-May-2023 10:15	09-May-2023 10:45	09-May-2023 11:00	09-May-2023 10:30	----
						VA23B0086-001	VA23B0086-002	VA23B0086-003	VA23B0086-004	--------
						Result	Result	Result	Result	----
Physical Tests										
pH	----	E108/VA	0.10	pH units		6.18	7.16	8.30	7.03	----
Solids, fixed suspended [FSS]	----	E170/VA	3.0	mg/L		187	1710	5.3	349	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		1650	10400	34.6	3100	----
Solids, volatile suspended [VSS]	----	EC167/VA	3.0	mg/L		1460	8690	29.3	2750	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		146	15.0	119	477	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L		484	487	104	799	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/VA	0.0050	mg/L		<0.200 DLM, HTP	<0.200 DLM	<0.200 DLM	<0.200 CNP, DLM	----
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		11500	3120	69.6	2140	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		65.1	41.5	0.0938	12.7	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		0.0177	0.0148	0.00056	0.0101	----
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.0417	0.0576	0.00636	0.0444	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		3.36	2.56	0.00774	1.35	----
Beryllium, total	7440-41-7	E420/VA	0.000020	mg/L		0.00106	0.000709	<0.000020	0.000270	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		1.63	0.576	0.000809	0.0940	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		1.12	0.502	0.150	0.228	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		0.0562	0.0256	0.0000469	0.00854	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		431	209	53.2	109	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000922	0.00136	0.000093	0.000705	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		0.264	0.142	<0.00050	0.0446	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		0.0267	0.0182	0.00425	0.00799	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		5.18	3.75	0.0128	2.39	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		295	40.8	0.231	8.45	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.413	0.206	0.000499	0.0584	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.0288	0.0237	0.0134	0.0088	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		175	49.4	17.0	17.6	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	TRUCK R	LAGOON	CONTACT TANK	TRUCK A	----
					Client sampling date / time	09-May-2023 10:15	09-May-2023 10:45	09-May-2023 11:00	09-May-2023 10:30	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA23B0086-001	VA23B0086-002	VA23B0086-003	VA23B0086-004	--------
						Result	Result	Result	Result	----
Total Metals										
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		1.83	1.21	0.0611	0.544	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.104	0.0897	0.00302	0.0481	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		0.236	0.140	0.00638	0.0710	----
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		128	109	29.7	89.0	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		84.9	148	69.4	221	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.0422	0.117	0.0502	0.181	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		0.0453	0.0459	0.000914	0.0155	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		22.3	30.6	10.2	14.1	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		0.0819	0.0334	0.000049	0.00867	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		1110	287	110	253	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		2.03	0.678	0.123	0.258	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		332	124	8.13	89.0	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00200 DLA	<0.00100 DLA	<0.00020	<0.00040 DLA	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		0.00163	0.000562	<0.000010	0.000354	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		<0.00100 DLA	<0.00050 DLA	<0.00010	<0.00020 DLA	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		0.0578	0.0231	0.00110	0.00973	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		0.0975	0.175	0.00213	0.0487	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		0.00681	0.00884	0.00014	0.00230	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.00636	0.00693	0.000120	0.00168	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		0.146	0.113	0.00070	0.0558	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		36.7	12.3	0.0298	7.98	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		0.0248	0.00813	0.00021	0.00084	----
Aggregate Organics										
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L		2100 BODF	606 BODF	26.9 BODF	2920 BODF	----
Chemical oxygen demand [COD]	----	E559-L/VA	10	mg/L		36600	14900	292	11800	----
Oil & grease (gravimetric)	----	E567/VA	5.0	mg/L		908	211	6.2	325	----
Chlorinated Phenolics										
Chlorophenol, 2-	95-57-8	E651A/VA	0.050	µg/L		<1.50 DLCI	<0.230 DLCI	<0.050	<1.10 DLQ	----
Chlorophenol, 3-	108-43-0	E651A/VA	0.050	µg/L		<0.952 DLCI	<0.053 DLIS	<0.050	<0.600 DLQ	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	TRUCK R	LAGOON	CONTACT TANK	TRUCK A	----
					Client sampling date / time	09-May-2023 10:15	09-May-2023 10:45	09-May-2023 11:00	09-May-2023 10:30	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA23B0086-001	VA23B0086-002	VA23B0086-003	VA23B0086-004	--------
						Result	Result	Result	Result	----
Chlorinated Phenolics										
Chlorophenol, 4-	106-48-9	E651A/VA	0.050	µg/L		<0.952 DLCI	<0.053 DLIS	<0.050	<0.435 DLCI	----
Dichlorophenol, 2,3-	576-24-9	E651A/VA	0.050	µg/L		<0.952 DLCI	<0.053 DLIS	<0.050	<0.435 DLCI	----
Dichlorophenol, 2,4- + 2,5-	----	E651A/VA	0.050	µg/L		<0.952 DLCI	<0.070 DLQ	<0.050	<0.435 DLCI	----
Dichlorophenol, 2,6-	87-65-0	E651A/VA	0.050	µg/L		<0.952 DLCI	<0.053 DLIS	<0.050	<0.435 DLCI	----
Dichlorophenol, 3,4-	95-77-2	E651A/VA	0.050	µg/L		<0.952 DLCI	<0.053 DLIS	<0.050	<0.435 DLCI	----
Dichlorophenol, 3,5-	591-35-5	E651A/VA	0.050	µg/L		<0.952 DLCI	<0.053 DLIS	<0.050	<0.435 DLCI	----
Methylphenol, 4-chloro-3-	59-50-7	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Pentachlorophenol [PCP]	87-86-5	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Tetrachlorophenol, 2,3,4,5-	4901-51-3	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Tetrachlorophenol, 2,3,4,6-	58-90-2	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Tetrachlorophenol, 2,3,5,6-	935-95-5	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Trichlorophenol, 2,3,4-	15950-66-0	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Trichlorophenol, 2,3,5-	933-78-8	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Trichlorophenol, 2,3,6-	933-75-5	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Trichlorophenol, 2,4,5-	95-95-4	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Trichlorophenol, 2,4,6-	88-06-2	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Trichlorophenol, 3,4,5-	609-19-8	E651A/VA	0.10	µg/L		<0.95 DLCI	<0.10	<0.10	<0.43 DLCI	----
Non-Chlorinated Phenolics										
Dimethylphenol, 2,4-	105-67-9	E651A/VA	0.20	µg/L		<0.20	<0.20	<0.20	<0.43 DLCI	----
Methylphenol, 2-	95-48-7	E651A/VA	0.50	µg/L		<3.00 DLCI	<0.50	2.64	<6.00 DLQ	----
Methylphenol, 3-	108-39-4	E651A/VA	0.20	µg/L		<2.40 DLCI	<0.20	1.19	3.10	----
Methylphenol, 4-	106-44-5	E651A/VA	0.20	µg/L		2480	4.56	68.9	392	----
Phenol	108-95-2	E651A/VA	0.20	µg/L		17.8	0.46	3.73	461	----
Phenolics Surrogates										
Chlorophenol-d4, 2-	93951-73-6	E651A/VA	0.1	%		50.5	81.3	80.2	50.8	----
Dichlorophenol-d3, 2,4-	93951-74-7	E651A/VA	0.1	%		81.9	87.0	78.6	70.0	----
Tribromophenol, 2,4,6-	118-79-6	E651A/VA	0.1	%		56.9	78.0	90.7	71.5	----

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

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23B0086**	Page	: 1 of 15
Client	: **District of Sechelt**	Laboratory	: Vancouver - Environmental
Contact	: Christine Miller	Account Manager	: Ian Chen
Address	: PO Box 129 2nd Floor, 5797 Cowrie St. Sechelt BC Canada V0N 3A0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604-989-0580	Telephone	: +1 604 253 4188
Project	: DUSTY ROAD	Date Samples Received	: 09-May-2023 20:30
PO	: ----	Issue Date	: 23-May-2023 16:58
C-O-C number	: 17-866194		
Sampler	: CM/RC		
Site	: new sampling		
Quote number	: VA23-DOSE100-001		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Non-Chlorinated Phenolics	QC-940673-002	----	Methylphenol, 2-	95-48-7	E651A	22.2 % LCS-ND	50.0-130%	Recovery less than lower control limit

Result Qualifiers

Qualifier	Description
LCS-ND	*Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.*

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] CONTACT TANK	E555	09-May-2023	----	----	----		15-May-2023	3 days	6 days	× EHT
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] LAGOON	E555	09-May-2023	----	----	----		15-May-2023	3 days	6 days	× EHT
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] TRUCK A	E555	09-May-2023	----	----	----		15-May-2023	3 days	6 days	× EHT
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] TRUCK R	E555	09-May-2023	----	----	----		15-May-2023	3 days	6 days	× EHT
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) CONTACT TANK	E559-L	09-May-2023	----	----	----		16-May-2023	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) LAGOON	E559-L	09-May-2023	----	----	----		16-May-2023	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) TRUCK A	E559-L	09-May-2023	----	----	----		16-May-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) TRUCK R	E559-L	09-May-2023	----	----	----		16-May-2023	28 days	7 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass total (hydrochloric acid) CONTACT TANK	E567	09-May-2023	17-May-2023	28 days	8 days	✓	17-May-2023	40 days	0 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass total (hydrochloric acid) LAGOON	E567	09-May-2023	17-May-2023	28 days	8 days	✓	17-May-2023	40 days	0 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass total (hydrochloric acid) TRUCK A	E567	09-May-2023	17-May-2023	28 days	8 days	✓	17-May-2023	40 days	0 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass total (hydrochloric acid) TRUCK R	E567	09-May-2023	17-May-2023	28 days	8 days	✓	17-May-2023	40 days	0 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CONTACT TANK	E298	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) LAGOON	E298	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) TRUCK A	E298	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) TRUCK R	E298	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CONTACT TANK	E318	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) LAGOON	E318	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) TRUCK A	E318	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) TRUCK R	E318	09-May-2023	14-May-2023	----	----		16-May-2023	28 days	7 days	✓
Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) LAGOON	E651A	09-May-2023	19-May-2023	14 days	10 days	✓	21-May-2023	40 days	2 days	✓
Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) TRUCK R	E651A	09-May-2023	19-May-2023	14 days	10 days	✓	21-May-2023	40 days	2 days	✓
Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) CONTACT TANK	E651A	09-May-2023	16-May-2023	14 days	7 days	✓	17-May-2023	40 days	1 days	✓
Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) TRUCK A	E651A	09-May-2023	16-May-2023	14 days	7 days	✓	17-May-2023	40 days	1 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) CONTACT TANK	E333	09-May-2023	10-May-2023	----	----		10-May-2023	14 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) LAGOON	E333	09-May-2023	10-May-2023	----	----		10-May-2023	14 days	1 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) TRUCK A	E333	09-May-2023	10-May-2023	----	----		10-May-2023	14 days	1 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) TRUCK R	E333	09-May-2023	10-May-2023	----	----		10-May-2023	14 days	1 days	✓
Non-Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) LAGOON	E651A	09-May-2023	19-May-2023	14 days	10 days	✓	21-May-2023	40 days	2 days	✓
Non-Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) TRUCK R	E651A	09-May-2023	19-May-2023	14 days	10 days	✓	21-May-2023	40 days	2 days	✓
Non-Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) CONTACT TANK	E651A	09-May-2023	16-May-2023	14 days	7 days	✓	17-May-2023	40 days	1 days	✓
Non-Chlorinated Phenolics : Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) TRUCK A	E651A	09-May-2023	16-May-2023	14 days	7 days	✓	17-May-2023	40 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CONTACT TANK	E355-L	09-May-2023	14-May-2023	----	----		14-May-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) LAGOON	E355-L	09-May-2023	14-May-2023	----	----		14-May-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) TRUCK A	E355-L	09-May-2023	14-May-2023	----	----		14-May-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) TRUCK R	E355-L	09-May-2023	14-May-2023	----	----		14-May-2023	28 days	5 days	✓
Physical Tests : FSS by Gravimetry										
HDPE CONTACT TANK	E170	09-May-2023	----	----	----		18-May-2023	7 days	9 days	× EHT
Physical Tests : FSS by Gravimetry										
HDPE LAGOON	E170	09-May-2023	----	----	----		18-May-2023	7 days	9 days	× EHT
Physical Tests : FSS by Gravimetry										
HDPE TRUCK A	E170	09-May-2023	----	----	----		18-May-2023	7 days	9 days	× EHT
Physical Tests : FSS by Gravimetry										
HDPE TRUCK R	E170	09-May-2023	----	----	----		18-May-2023	7 days	9 days	× EHT
Physical Tests : pH by Meter										
HDPE CONTACT TANK	E108	09-May-2023	16-May-2023	----	----		16-May-2023	0.25 hrs	1.29 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE LAGOON	E108	09-May-2023	16-May-2023	----	----		16-May-2023	0.25 hrs	1.29 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TRUCK A	E108	09-May-2023	16-May-2023	----	----		16-May-2023	0.25 hrs	1.29 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE TRUCK R	E108	09-May-2023	16-May-2023	----	----		16-May-2023	0.25 hrs	1.29 hrs	✖ EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE CONTACT TANK	E160	09-May-2023	----	----	----		12-May-2023	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE LAGOON	E160	09-May-2023	----	----	----		12-May-2023	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE TRUCK A	E160	09-May-2023	----	----	----		12-May-2023	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE TRUCK R	E160	09-May-2023	----	----	----		12-May-2023	7 days	3 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CONTACT TANK	E420	09-May-2023	11-May-2023	----	----		14-May-2023	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) LAGOON	E420	09-May-2023	11-May-2023	----	----		14-May-2023	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) TRUCK A	E420	09-May-2023	11-May-2023	----	----		14-May-2023	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) TRUCK R	E420	09-May-2023	11-May-2023	----	----		14-May-2023	180 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

Evaluation: ✗ = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	937626	1	16	6.2	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	938446	1	9	11.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	940413	1	20	5.0	5.0	✓
FSS by Gravimetry	E170	944527	0	4	0.0	5.0	✗
pH by Meter	E108	940630	1	20	5.0	5.0	✓
Total Cyanide	E333	931018	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	937624	1	14	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	930928	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	937625	1	14	7.1	5.0	✓
TSS by Gravimetry	E160	935805	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	937626	1	16	6.2	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	938446	1	9	11.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	940413	1	20	5.0	5.0	✓
FSS by Gravimetry	E170	944527	1	4	25.0	5.0	✓
Oil & Grease by Gravimetry	E567	941640	1	9	11.1	5.0	✓
pH by Meter	E108	940630	1	20	5.0	5.0	✓
Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS	E651A	947135	2	13	15.3	5.0	✓
Total Cyanide	E333	931018	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	937624	1	14	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	930928	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	937625	1	14	7.1	5.0	✓
TSS by Gravimetry	E160	935805	1	18	5.5	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	937626	1	16	6.2	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	938446	1	9	11.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	940413	1	20	5.0	5.0	✓
FSS by Gravimetry	E170	944527	1	4	25.0	5.0	✓
Oil & Grease by Gravimetry	E567	941640	1	9	11.1	5.0	✓
Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS	E651A	947135	2	13	15.3	5.0	✓
Total Cyanide	E333	931018	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	937624	1	14	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	930928	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	937625	1	14	7.1	5.0	✓
TSS by Gravimetry	E160	935805	1	18	5.5	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	937626	1	16	6.2	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	940413	1	20	5.0	5.0	✓
Total Cyanide	E333	931018	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	937624	1	14	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	930928	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	937625	1	14	7.1	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
FSS by Gravimetry	E170 Vancouver - Environmental	Water	APHA 2540 E (mod)	Fixed Suspended Solids (FSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. This residue is ignited to constant weight at 550°C. The remaining solids represent the Fixed Suspended Solids (FSS), while the weight lost on ignition represents the Volatile Suspended Solids (VSS). Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Cyanide	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Oil & Grease by Gravimetry	E567 Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
Phenolics (Western Canada List, No Nitro-Phenols) by GC-MS	E651A Vancouver - Environmental	Water	EPA 8270E (mod)	Phenolics are analyzed by GC-MS.
VSS by Gravimetry	EC167 Vancouver - Environmental	Water	APHA 2540 E (mod)	Volatile Suspended Solids (VSS) are determined by filtering a well-mixed sample through a weighed standard glass-fiber filter and the residue retained on the filter is dried to a constant weight at 104 ± 1°C. This residue is ignited to constant weight at 550°C. The remaining solids represent the fixed suspended solids while the weight lost on ignition is the volatile suspended solids.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Oil & Grease Extraction for Gravimetry	EP567 Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
Phenolics Extraction	EP651 Vancouver - Environmental	Water	EPA 3511 (mod)	Phenolics are extracted from acidic aqueous sample using DCM liquid-liquid extraction.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **VA23B0086**	Page	: 1 of 14
Client	: District of Sechelt	Laboratory	: Vancouver - Environmental
Contact	: Christine Miller	Account Manager	: Ian Chen
Address	: PO Box 129 2nd Floor, 5797 Cowrie St. Sechelt BC Canada V0N 3A0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: DUSTY ROAD	Date Samples Received	: 09-May-2023 20:30
PO	: ----	Date Analysis Commenced	: 10-May-2023
C-O-C number	: 17-866194	Issue Date	: 23-May-2023 16:55
Sampler	: CM/RC 604-989-0580		
Site	: new sampling		
Quote number	: VA23-DOSE100-001		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
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General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 935805)											
VA23B0052-002	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	303	304	0.462%	20%	----
Physical Tests (QC Lot: 940630)											
VA23B0208-008	Anonymous	pH	----	E108	0.10	pH units	5.44	5.43	0.184%	4%	----
Anions and Nutrients (QC Lot: 937624)											
VA23B0086-001	TRUCK R	Kjeldahl nitrogen, total [TKN]	----	E318	20.0	mg/L	484	536	10.1%	20%	----
Anions and Nutrients (QC Lot: 937626)											
VA23B0086-001	TRUCK R	Ammonia, total (as N)	7664-41-7	E298	5.00	mg/L	146	162	10.5%	20%	----
Cyanides (QC Lot: 931018)											
WR2300335-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 937625)											
VA23B0086-001	TRUCK R	Carbon, total organic [TOC]	----	E355-L	100	mg/L	11500	12700	9.56%	20%	----
Total Metals (QC Lot: 930928)											
FJ2301031-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0935	0.102	8.73%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00029	0.00030	0.000006	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00019	0.00021	0.00002	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0514	0.0520	1.33%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	0.012	0.012	0.0003	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000671	0.0000593	12.3%	20%	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	71.9	74.3	3.35%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000038	0.000045	0.000006	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00026	0.00026	0.000003	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.00078	0.00078	0.000002	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.105	0.120	13.8%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000123	0.000131	0.000008	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0080	0.0081	0.00010	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	38.5	38.2	0.693%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0143	0.0147	2.60%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 930928) - continued											
FJ2301031-001	Anonymous	Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00157	0.00156	0.428%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00348	0.00342	0.00006	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	1.63	1.65	1.31%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00126	0.00126	0.0000004	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.0231	0.0227	2.02%	20%	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	1.04	1.03	0.393%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	3.49	3.70	5.77%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.119	0.118	0.609%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	80.8	80.5	0.418%	20%	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	0.000010	0.000010	0.00000002	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00155	0.00165	0.00010	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.00238	0.00238	0.235%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00051	0.00056	0.00005	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0046	0.0047	0.00010	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 938446)											
WR2300341-003	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	4.0	mg/L	<4.0	<4.0	0.0%	30%	----
Aggregate Organics (QC Lot: 940413)											
VA23B0055-001	Anonymous	Chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----

Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 935805)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 944527)						
Solids, fixed suspended [FSS]	----	E170	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 937624)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 937626)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Cyanides (QCLot: 931018)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 937625)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 930928)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 930928) - continued						
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Aggregate Organics (QCLot: 938446)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 940413)						
Chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 941640)						
Oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Chlorinated Phenolics (QCLot: 940673)						
Chlorophenol, 2-	95-57-8	E651A	0.05	µg/L	<0.050	----
Chlorophenol, 3-	108-43-0	E651A	0.05	µg/L	<0.050	----
Chlorophenol, 4-	106-48-9	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 2,3-	576-24-9	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 2,4- + 2,5-	----	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 2,6-	87-65-0	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 3,4-	95-77-2	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 3,5-	591-35-5	E651A	0.05	µg/L	<0.050	----
Methylphenol, 4-chloro-3-	59-50-7	E651A	0.1	µg/L	<0.10	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Chlorinated Phenolics (QCLot: 940673) - continued						
Pentachlorophenol [PCP]	87-86-5	E651A	0.1	µg/L	<0.10	----
Tetrachlorophenol, 2,3,4,5-	4901-51-3	E651A	0.1	µg/L	<0.10	----
Tetrachlorophenol, 2,3,4,6-	58-90-2	E651A	0.1	µg/L	<0.10	----
Tetrachlorophenol, 2,3,5,6-	935-95-5	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,3,4-	15950-66-0	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,3,5-	933-78-8	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,3,6-	933-75-5	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,4,5-	95-95-4	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,4,6-	88-06-2	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 3,4,5-	609-19-8	E651A	0.1	µg/L	<0.10	----
Chlorinated Phenolics (QCLot: 947135)						
Chlorophenol, 2-	95-57-8	E651A	0.05	µg/L	<0.050	----
Chlorophenol, 3-	108-43-0	E651A	0.05	µg/L	<0.050	----
Chlorophenol, 4-	106-48-9	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 2,3-	576-24-9	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 2,4- + 2,5-	----	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 2,6-	87-65-0	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 3,4-	95-77-2	E651A	0.05	µg/L	<0.050	----
Dichlorophenol, 3,5-	591-35-5	E651A	0.05	µg/L	<0.050	----
Methylphenol, 4-chloro-3-	59-50-7	E651A	0.1	µg/L	<0.10	----
Pentachlorophenol [PCP]	87-86-5	E651A	0.1	µg/L	<0.10	----
Tetrachlorophenol, 2,3,4,5-	4901-51-3	E651A	0.1	µg/L	<0.10	----
Tetrachlorophenol, 2,3,4,6-	58-90-2	E651A	0.1	µg/L	<0.10	----
Tetrachlorophenol, 2,3,5,6-	935-95-5	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,3,4-	15950-66-0	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,3,5-	933-78-8	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,3,6-	933-75-5	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,4,5-	95-95-4	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 2,4,6-	88-06-2	E651A	0.1	µg/L	<0.10	----
Trichlorophenol, 3,4,5-	609-19-8	E651A	0.1	µg/L	<0.10	----
Non-Chlorinated Phenolics (QCLot: 940673)						
Dimethylphenol, 2,4-	105-67-9	E651A	0.2	µg/L	<0.20	----
Methylphenol, 2-	95-48-7	E651A	0.5	µg/L	<0.50	----
Methylphenol, 3-	108-39-4	E651A	0.2	µg/L	<0.20	----
Methylphenol, 4-	106-44-5	E651A	0.2	µg/L	<0.20	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Non-Chlorinated Phenolics (QCLot: 940673) - continued						
Phenol	108-95-2	E651A	0.2	µg/L	<0.20	----
Non-Chlorinated Phenolics (QCLot: 947135)						
Dimethylphenol, 2,4-	105-67-9	E651A	0.2	µg/L	<0.20	----
Methylphenol, 2-	95-48-7	E651A	0.5	µg/L	<0.50	----
Methylphenol, 3-	108-39-4	E651A	0.2	µg/L	<0.20	----
Methylphenol, 4-	106-44-5	E651A	0.2	µg/L	<0.20	----
Phenol	108-95-2	E651A	0.2	µg/L	<0.20	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 935805)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	110	85.0	115	----
Physical Tests (QCLot: 940630)									
pH	----	E108	----	pH units	7 pH units	99.7	98.0	102	----
Physical Tests (QCLot: 944527)									
Solids, fixed suspended [FSS]	----	E170	3	mg/L	150 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 937624)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	87.9	75.0	125	----
Anions and Nutrients (QCLot: 937626)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	111	85.0	115	----
Cyanides (QCLot: 931018)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	96.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 937625)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Total Metals (QCLot: 930928)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	100	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	107	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	100	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	96.4	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	97.7	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	87.9	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	100	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	93.3	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	99.4	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	99.8	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	97.9	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.0	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	107	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	97.0	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 930928) - continued									
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	89.3	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	98.4	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	99.8	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	111	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	97.0	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	95.0	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	106	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	95.6	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	101	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	94.6	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	96.5	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	98.0	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	97.4	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	96.6	80.0	120	----
Aggregate Organics (QCLot: 938446)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	106	85.0	115	----
Aggregate Organics (QCLot: 940413)									
Chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	108	85.0	115	----
Aggregate Organics (QCLot: 941640)									
Oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	102	70.0	130	----
Chlorinated Phenolics (QCLot: 940673)									
Chlorophenol, 2-	95-57-8	E651A	0.05	µg/L	2 µg/L	95.5	50.0	130	----
Chlorophenol, 3-	108-43-0	E651A	0.05	µg/L	2 µg/L	114	50.0	130	----
Chlorophenol, 4-	106-48-9	E651A	0.05	µg/L	2 µg/L	104	50.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Chlorinated Phenolics (QCLot: 940673) - continued									
Dichlorophenol, 2,3-	576-24-9	E651A	0.05	µg/L	2 µg/L	105	50.0	130	----
Dichlorophenol, 2,4- + 2,5-	----	E651A	0.05	µg/L	4 µg/L	103	50.0	130	----
Dichlorophenol, 2,6-	87-65-0	E651A	0.05	µg/L	2 µg/L	100	50.0	130	----
Dichlorophenol, 3,4-	95-77-2	E651A	0.05	µg/L	2 µg/L	110	50.0	130	----
Dichlorophenol, 3,5-	591-35-5	E651A	0.05	µg/L	2 µg/L	112	50.0	130	----
Methylphenol, 4-chloro-3-	59-50-7	E651A	0.1	µg/L	2 µg/L	103	60.0	130	----
Pentachlorophenol [PCP]	87-86-5	E651A	0.1	µg/L	2 µg/L	116	60.0	130	----
Tetrachlorophenol, 2,3,4,5-	4901-51-3	E651A	0.1	µg/L	2 µg/L	106	60.0	130	----
Tetrachlorophenol, 2,3,4,6-	58-90-2	E651A	0.1	µg/L	2 µg/L	107	60.0	130	----
Tetrachlorophenol, 2,3,5,6-	935-95-5	E651A	0.1	µg/L	2 µg/L	106	60.0	130	----
Trichlorophenol, 2,3,4-	15950-66-0	E651A	0.1	µg/L	2 µg/L	124	50.0	130	----
Trichlorophenol, 2,3,5-	933-78-8	E651A	0.1	µg/L	2 µg/L	108	50.0	130	----
Trichlorophenol, 2,3,6-	933-75-5	E651A	0.1	µg/L	2 µg/L	106	50.0	130	----
Trichlorophenol, 2,4,5-	95-95-4	E651A	0.1	µg/L	2 µg/L	109	50.0	130	----
Trichlorophenol, 2,4,6-	88-06-2	E651A	0.1	µg/L	2 µg/L	106	50.0	130	----
Trichlorophenol, 3,4,5-	609-19-8	E651A	0.1	µg/L	2 µg/L	110	50.0	130	----
Chlorinated Phenolics (QCLot: 947135)									
Chlorophenol, 2-	95-57-8	E651A	0.05	µg/L	2 µg/L	68.9	50.0	130	----
Chlorophenol, 3-	108-43-0	E651A	0.05	µg/L	2 µg/L	71.1	50.0	130	----
Chlorophenol, 4-	106-48-9	E651A	0.05	µg/L	2 µg/L	70.7	50.0	130	----
Dichlorophenol, 2,3-	576-24-9	E651A	0.05	µg/L	2 µg/L	71.4	50.0	130	----
Dichlorophenol, 2,4- + 2,5-	----	E651A	0.05	µg/L	4 µg/L	70.9	50.0	130	----
Dichlorophenol, 2,6-	87-65-0	E651A	0.05	µg/L	2 µg/L	70.7	50.0	130	----
Dichlorophenol, 3,4-	95-77-2	E651A	0.05	µg/L	2 µg/L	74.8	50.0	130	----
Dichlorophenol, 3,5-	591-35-5	E651A	0.05	µg/L	2 µg/L	72.2	50.0	130	----
Methylphenol, 4-chloro-3-	59-50-7	E651A	0.1	µg/L	2 µg/L	74.3	60.0	130	----
Pentachlorophenol [PCP]	87-86-5	E651A	0.1	µg/L	2 µg/L	60.8	60.0	130	----
Tetrachlorophenol, 2,3,4,5-	4901-51-3	E651A	0.1	µg/L	2 µg/L	71.4	60.0	130	----
Tetrachlorophenol, 2,3,4,6-	58-90-2	E651A	0.1	µg/L	2 µg/L	75.3	60.0	130	----
Tetrachlorophenol, 2,3,5,6-	935-95-5	E651A	0.1	µg/L	2 µg/L	74.6	60.0	130	----
Trichlorophenol, 2,3,4-	15950-66-0	E651A	0.1	µg/L	2 µg/L	72.4	50.0	130	----
Trichlorophenol, 2,3,5-	933-78-8	E651A	0.1	µg/L	2 µg/L	66.6	50.0	130	----
Trichlorophenol, 2,3,6-	933-75-5	E651A	0.1	µg/L	2 µg/L	72.3	50.0	130	----
Trichlorophenol, 2,4,5-	95-95-4	E651A	0.1	µg/L	2 µg/L	71.9	50.0	130	----
Trichlorophenol, 2,4,6-	88-06-2	E651A	0.1	µg/L	2 µg/L	74.9	50.0	130	----
Trichlorophenol, 3,4,5-	609-19-8	E651A	0.1	µg/L	2 µg/L	74.1	50.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Non-Chlorinated Phenolics (QCLot: 940673)									
Dimethylphenol, 2,4-	105-67-9	E651A	0.2	µg/L	2 µg/L	114	50.0	130	----
Methylphenol, 2-	95-48-7	E651A	0.5	µg/L	2 µg/L	# 22.2	50.0	130	LCS-ND
Methylphenol, 3-	108-39-4	E651A	0.2	µg/L	2 µg/L	94.9	50.0	130	----
Methylphenol, 4-	106-44-5	E651A	0.2	µg/L	2 µg/L	93.3	50.0	130	----
Phenol	108-95-2	E651A	0.2	µg/L	2 µg/L	128	50.0	130	----
Non-Chlorinated Phenolics (QCLot: 947135)									
Dimethylphenol, 2,4-	105-67-9	E651A	0.2	µg/L	2 µg/L	106	50.0	130	----
Methylphenol, 2-	95-48-7	E651A	0.5	µg/L	2 µg/L	74.2	50.0	130	----
Methylphenol, 3-	108-39-4	E651A	0.2	µg/L	2 µg/L	70.6	50.0	130	----
Methylphenol, 4-	106-44-5	E651A	0.2	µg/L	2 µg/L	73.7	50.0	130	----
Phenol	108-95-2	E651A	0.2	µg/L	2 µg/L	112	50.0	130	----

Qualifiers

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.

Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 937624)										
VA23B0086-002	LAGOON	Kjeldahl nitrogen, total [TKN]	----	E318	966 mg/L	2.5 mg/L	96.6	70.0	130	----
Anions and Nutrients (QCLot: 937626)										
VA23B0086-002	LAGOON	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Cyanides (QCLot: 931018)										
WR2300335-002	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.241 mg/L	0.25 mg/L	96.6	75.0	125	----
Organic / Inorganic Carbon (QCLot: 937625)										
VA23B0086-002	LAGOON	Carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 930928)										
FJ2301031-002	Anonymous	Aluminum, total	7429-90-5	E420	0.201 mg/L	0.2 mg/L	101	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00857 mg/L	0.01 mg/L	85.7	70.0	130	----
		Boron, total	7440-42-8	E420	0.092 mg/L	0.1 mg/L	92.6	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00400 mg/L	0.004 mg/L	100.0	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00950 mg/L	0.01 mg/L	95.0	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130	----
		Copper, total	7440-50-8	E420	0.0188 mg/L	0.02 mg/L	93.8	70.0	130	----
		Iron, total	7439-89-6	E420	1.95 mg/L	2 mg/L	97.6	70.0	130	----
		Lead, total	7439-92-1	E420	0.0177 mg/L	0.02 mg/L	88.5	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0865 mg/L	0.1 mg/L	86.5	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0196 mg/L	0.02 mg/L	97.9	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0377 mg/L	0.04 mg/L	94.4	70.0	130	----
		Phosphorus, total	7723-14-0	E420	9.65 mg/L	10 mg/L	96.5	70.0	130	----
		Potassium, total	7440-09-7	E420	4.03 mg/L	4 mg/L	101	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 930928) - continued										
FJ2301031-002	Anonymous	Rubidium, total	7440-17-7	E420	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		Silicon, total	7440-21-3	E420	9.70 mg/L	10 mg/L	97.0	70.0	130	----
		Silver, total	7440-22-4	E420	0.00383 mg/L	0.004 mg/L	95.7	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0394 mg/L	0.04 mg/L	98.6	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00351 mg/L	0.004 mg/L	87.7	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		Tin, total	7440-31-5	E420	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0378 mg/L	0.04 mg/L	94.6	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0185 mg/L	0.02 mg/L	92.6	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00369 mg/L	0.004 mg/L	92.2	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		Zinc, total	7440-66-6	E420	0.373 mg/L	0.4 mg/L	93.2	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
Aggregate Organics (QCLot: 940413)										
VA23B0163-001	Anonymous	Chemical oxygen demand [COD]	----	E559-L	110 mg/L	100 mg/L	110	75.0	125	----

Qualifiers

Qualifier	Description
MS-B	*Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.*

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 - 866194

Page 1 of 3

Report To	Contact and company name below will appear on the final report
Company:	DISTRICT OF SECHELT
Contact:	CHRISTINE MILLER
Phone:	604 741 5171
	Company address below will appear on the final report
Street:	5797 COWRIE ST PO BOX 129
City/Province:	SECHELT BC
Postal Code:	V0N 3A0
Invoice To	Same as Report To: YES NO
	Copy of Invoice with Report: YES NO
Company:	DISTRICT OF SECHELT
Contact:	FINANCE

Report Format / Distribution

Select Report Format: PDF EXCEL EDD (DIGITAL)
Quality Control (QC) Report with Report: YES NO
Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: EMAIL MAIL FAX
Email 1 or Fax: cmiller@sechelt.ca
Email 2: kwalkey@sechelt.ca
Email 3:

Invoice Distribution

Select Invoice Distribution: EMAIL MAIL FAX
Email 1 or Fax: Finance@sechelt.ca
Email 2: cmiller@sechelt.ca

Project Information

ALS Account # / Quote #: VA23-DOSE100-001
Job #: DUSTY ROAD
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (lab use only): B0086
ALS Contact: THOMAS Sampler: CM / RC

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] 3 day [P3-25%] 2 day [P2-50%]
EMERGENCY: 1 Business day [E - 100%] Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	PHENOLS (CRESOLS)	OIL + GREASE	TSS OR TS AND CORRESPONDING VOLATILES	cBOD + pH	COD | TKN | TOC | NH3	TOTAL METALS - Notify	CYANIDE
	TRUCK R 500ml	MAY 9	10:15	WATER	2	✓						
	TRUCK R 250ml	MAY 9	10:15	WATER	2		✓					
	TRUCK R 500ml	MAY 9	10:15	WATER	1			✓				
	TRUCK R 250ml	MAY 9	10:15	WATER	2				✓			
	TRUCK R 100ml	MAY 9	10:15	WATER	1					✓		
	TRUCK R 100ml	MAY 9	10:15	WATER	1						✓	
	TRUCK R 60ml	MAY 9	10:15	WATER	1							✓

Environmental Division Vancouver
Work Order Reference
VA23B0086

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? YES NO
Are samples for human consumption/ use? YES NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen SIF Observations Yes No
Ice Packs Ice Cubes Custody seal intact Yes No
Cooling Initiated

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				7			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date: May 9	Time: 8:30 pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUN 2016 FRONT

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 - 866193

Page 2 of 3

Report To	Contact and company name below will appear on the final report
Company:	DISTRICT OF SECHELT
Contact:	CHRISTINE MILLER
Phone:	604 741 5171
	Company address below will appear on the final report
Street:	5797 CONRIE ST POBOX 129
City/Province:	SECHELT BC
Postal Code:	V0N 3A0

Report Format / Distribution	
Select Report Format:	PDF EXCEL EDD (DIGITAL)
Quality Control (QC) Report with Report	YES NO
Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	EMAIL MAIL FAX
Email 1 or Fax	cmiller@sechelt.ca
Email 2	kwalkey@sechelt.ca
Email 3	

Invoice To		
	Same as Report To	YES NO
	Copy of Invoice with Report	YES NO
Company:	DISTRICT OF SECHELT	
Contact:	FINANCE	

Invoice Distribution	
Select Invoice Distribution:	EMAIL MAIL FAX
Email 1 or Fax	finance@sechelt.ca
Email 2	cmiller@sechelt.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: THOMAS Sampler: CM / RC

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] 3 day [P3-25%] 2 day [P2-50%]

EMERGENCY: 1 Business day [E - 100%] Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

NUMBER OF CONTAINERS | PHENOLS + CREOSOTE | OIL + GREASE | TSS OR TS AND COR-RESPONDING VOLATILES | CHLORIDE + PH | COD | TKN | TOC | NH3 | TOTAL METALS - MOLY | CYANIDE | SAMPLES ON HOLD | SUSPECTED HAZARD (see Special Instructions)

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	PHENOLS + CREOSOTE	OIL + GREASE	TSS OR TS AND COR-RESPONDING VOLATILES	CHLORIDE + PH	COD	TKN	TOC	NH3	TOTAL METALS - MOLY	CYANIDE	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	LAGOON 500ml	MAY 9	10:45	WATER	2	✓											
	LAGOON 250ml	MAY 9	10:45	WATER	2		✓										
	LAGOON 500ml	MAY 9	10:45	WATER	1			✓									
	LAGOON 250ml	MAY 9	10:45	WATER	2				✓								
	LAGOON 100ml	MAY 9	10:45	WATER	1					✓							
	LAGOON 100ml	MAY 9	10:45	WATER	1						✓						
	LAGOON 60ml	MAY 9	10:45	WATER	1									✓			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? YES NO

Are samples for human consumption/ use? YES NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen SIF Observations Yes No

Ice Packs Ice Cubes Custody seal intact Yes No

Cooling Initiated

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				3			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: DJ	Date: May 9	Time: 8:34 pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2008 FRONT

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 - 866192

Page 3 of 4

Report To	Contact and company name below will appear on the final report
Company:	DISTRICT OF SECHELT
Contact:	CHRISTINE MILLER
Phone:	604 741 5171
	Company address below will appear on the final report
Street:	5797 COWRIE ST PO Box 129
City/Province:	SECHELT BC
Postal Code:	V0N 3A0

Report Format / Distribution	
Select Report Format:	[x] PDF [x] EXCEL | EDD (DIGITAL)
Quality Control (QC) Report with Report	[x] YES [ ] NO
[ ] Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	[x] EMAIL | MAIL [ ] FAX
Email 1 or Fax	cmiller@sechelt.ca
Email 2	kwalkey@sechelt.ca
Email 3	

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)	
Regular [R]	[ ] Standard TAT if received by 3 pm - business days - no surcharges apply
PRIORITY (Business Days) 4 day [P4-20%]	[ ]
PRIORITY (Business Days) 3 day [P3-25%]	[ ]
PRIORITY (Business Days) 2 day [P2-50%]	[ ]
EMERGENCY 1 Business day [E - 100%]	[ ]
EMERGENCY Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]	[ ]
Date and Time Required for all E&P TATs:	dd-mmm-yy hh:mm
For tests that can not be performed according to the service level selected, you will be contacted.	

Invoice To		
	Same as Report To	[x] YES [ ] NO
	Copy of Invoice with Report	[ ] YES [ ] NO
Company:	DISTRICT OF SECHELT	
Contact:	FINANCE	

Invoice Distribution	
Select Invoice Distribution:	[x] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	finance@sechelt.ca
Email 2	cmiller@sechelt.ca

Project Information	
ALS Account # / Quote #:	VA23-DOSE100-001
Job #:	DUSTY ROAD
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)		
AFE/Cost Center:		PO#
Major/Minor Code:		Routing Code:
Requisitioner:		
Location:		

ALS Lab Work Order # (lab use only):

ALS Contact: THOMAS

Sampler: OM / RC

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	PHENOLS+CRESOLS	OIL + GREASE	TSS OR TS AND CORRESPONDING VOLATILES	CBOD + DIT	COD | TKN | TOC | NH3	TOTAL METALS - Hg	CYANIDE	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	CONTACT TANK	500ml	MAY 9	11:00	WATER	2	✓								
	CONTACT TANK	250ml	MAY 9	11:00	WATER	2		✓							
	CONTACT TANK	500ml	MAY 9	11:00	WATER	1			✓						
	CONTACT TANK	250ml	MAY 9	11:00	WATER	2				✓					
	CONTACT TANK	100ml	MAY 9	11:00	WATER	1					✓				
	CONTACT TANK	100ml	MAY 9	11:00	WATER	1						✓			
	CONTACT TANK	60ml	MAY 9	11:00	WATER	1							✓		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? [ ] YES [x] NO	
Are samples for human consumption/use? [ ] YES [x] NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	[ ]	SIF Observations	Yes [ ]	No	[ ]
Ice Packs [ ] Ice Cubes [ ]		Custody seal intact	Yes [ ]	No	[ ]
Cooling Initiated	[ ]				

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				7			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date: May 9	Time: 9:32 pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 - 866190

Page 4 of 4

Report To	Contact and company name below will appear on the final report
Company:	DISTRICT OF SECHELT
Contact:	CHRISTINE MILLER
Phone:	604 741 5171
	Company address below will appear on the final report
Street:	5797 COWRIE ST POBOX 129
City/Province:	SECHELT BC
Postal Code:	V0N 3A0
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	DISTRICT OF SECHELT
Contact:	FINANCE

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	cmiller@sechelt.ca
Email 2	kwalkey@sechelt.ca
Email 3	
Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	finance@sechelt.ca
Email 2	cmiller@sechelt.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact: THOMAS	Sampler: CM/RC

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	PHENOLS+CRESOLS	OIL+GREASE	TSS & TS AND CONDUCTIVITY	c BOD + DH	COD/TKN/TOC/NH3	TOTAL METALS - NOTED	CYANIDE	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	TRUCK A	500ml	MAY 9	10:30	WATER	2	✓								
	TRUCK A	250ml	MAY 9	10:30	WATER	2		✓							
	TRUCK A	500ml	MAY 9	10:30	WATER	1			✓						
	TRUCK A	250ml	MAY 9	10:30	WATER	2				✓					
	TRUCK A	100ml	MAY 9	10:30	WATER	1					✓				
	TRUCK A	100ml	MAY 9	10:30	WATER	1						✓			
	TRUCK A	60ml	MAY 9	10:30	WATER	1							✓		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C			
			7			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: NOV	Date: May 9	Time: 8:30 pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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