

OPERATING PLAN

Onsite Effluent Dispersal – Ground Disposal System

Parcel B, Plan KAP68151, Sec. 5, Twp. 20, Range 9, W6M, K.D.Y.D.

Total Discharge 38.1 m³/day

Business Services

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A. Collection System

Plant septage influent is gravity fed to 2 – 3,500 IG partitioned Grease Interceptor tanks, located in the south east corner of the property. The effluent coming out of the grease interceptor tanks is then transferred (pumped) to a 30,000 IG retention/flow equalization tank. Then the septage is metered (time dosed) out and pumped into the 3,500 IG coarse or pre-aeration tank. The out flow is gravity fed to a 2,500 IG settling tank. The out flow from the employee washrooms also enters the treatment system at the settling tank.

The partially treated septage (due to retention time and pre-aeration) with an approximate BOD₅ @ 250 to 300 mg/L, is now gravity fed from the settling tank to the MicroFAST 9.0 FAST® unit, which process the effluent using a fixed activated sludge treatment system. As indicated earlier, the Inlet flow to the MicroFAST 9.0FAST® is controlled by the timed pump control system at the outlet of the 30,000 IG, providing flow equalization.

Initial design of this system was to support killing of 100 hogs per day and installed accordingly. Within 2 years the maximum capability of the facility was attained, namely 225 hogs per day and 28 staff on site. Consequently, adjustments to the treatment system were required. At 225 hogs per day 41.5 m³/day of septage was produced. And the MicroFAST 9.0 FAST® has the capacity of treating 34.02 m³/day, which is short by 7.48 m³/day.

In order to meet the required treatment of septage, a 30,000 IG holding tank was installed with a time controlled pump system to control the dosing to the MicroFAST 9.0 treatment unit. MicroFAST 9.0 requires a minimum of 5 minutes between input doses. The control system is programmed so that there is a 28 minute 10 seconds rest time between doses to the coarse aeration tank and settling tank, which feeds the MicroFAST 9.0 unit.

Hog waste septage being produced during 5 days of killing is a total of $(5 \times 41.5) = 207.5 \text{ m}^3$. The MicroFAST 9.0 operates for 7 days each week and therefore can process $(7 \times 34.02) = 238.14 \text{ m}^3$, leaving a 13 % excess capacity, which is a good safety margin.

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B. Treatment System

The treatment system is a Bio-Microbics MicroFAST 9.0®, which uses a fixed attached suspended activated sludge treatment process for treating the influent wastewater. In this process wastewater influent and the recycled activated sludge are mixed by the diffused air which is supplied by an air drop mounted in the centre of the treatment tank. Air, at a volume of 155 to 200 cfm, is introduced, under pressure, for the diffusing process. The air injected at the bottom of the fixed media serves to provide good mixing and as globs attach to the media and accumulate some mass, they slough off of the media and descend to the bottom where by turbulence and are again mixed for further treatment.

At the top of the media there is a splash plate and partial pipe which collects some of the treated effluent and feeds it to the field system. The Volumetric or Hydraulic (Organic) Loading rate capacity for the particular unit being used for this system is 22.52 BOD₅ lbs/day. Thus, the Treatment Capacity of the unit is 9,000 US Gallons per day. Sampling is done from the pump/dosing Chamber.

C. Control of the System

There are no moving parts in the Treatment Unit. There is an air blower separately located and mounted, to supply 172 to 228 CFM to the treatment unit. The air blower unit is alarmed, both audibly and visually. The air blower is mounted with in the required distance as specified for remote units.

D. Cold Weather Considerations

Insulation is attached to the bottom of the system lids (1 inch thick R-5). The treatment process is exothermic and so it generates a considerable amount of warmth, typical effluent exit temperatures range from 15 to 19 ° C , usually there will be no snow on the treatment unit lids. Other cold considerations include standard practices used with most onsite systems, such as insulating tank lids and backfilling risers with pea gravel, if there is potential for frost heave.

E. Ground Discharge

Design Discharge (max. or peak loading to ground) at the site will be 38.1 m³/day. The dispersal system is a Pressure Distribution System with duplex pumps located in the pump/dosing chamber. The dispersal field is divided into 14 Zones, Each dosed 10 times per 24 hour period.

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Pump controls include non-resettable elapsed run time meters and cycle counters. This information is transmitted via telephone to the Orenco's Vericom Panel Data-Base control system. This allows monitoring of the site via the internet and using specific password control. The data base for the specific system is updated once per month, with the option of purchasing more frequent update frequency, should it be desired. This panel and facility is also use to track and monitor Flow Meter readings. The control panel controls 14 Zones for pressure distribution by using 4 Distribution Valves as shown on the design drawings. The controller also provides malfunction alarms, both audible and visual. This malfunction alarm alert will also be transmitted through the remote monitoring system to the EOCP – designated system operator – who then can initiate the appropriate action.

The trench layout is consistent with the respective schedules of the MWR.

Cold weather considerations are incorporated in the design using pea size Styrofoam balls in each of the Distribution Valve Containers and the irrigation valve covers at the end of each lateral.

F. Typical Maintenance, Monitoring and Sampling Schedule

1. Treatment system maintenance typically consists of removing the cover and observing the operation of the system to ensure it is what is perceived as normal, since there are no moving parts in the treatment system other than bubbling of air – verify that it looks normal, based on a semi-annual observation.
2. **Dispersal Field Area**
 - a. Observe general condition of the field area – semi-annually.
 - b. Flush Laterals after 6 months of start-up use and then Bi-Annually.
 - c. Conduct groundwater monitoring near dispersal field in accordance with the EIS.
 - d. Take readings – quarterly – record cycle counter value and flow meter value to determine the number of cubic meters that have been pumped to the field during a specific day.
 - e. Test high level alarms of the system – visual and audible – semi-annually.

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3. Grab Sample – MWR (Division 4, Section 86, Table 6)

- a. BOD₅ and TSS – quarterly.

Sampling Procedure (Grab)

Exercise all necessary measure to ensure personal safety while conducting the sampling procedure. Proper eye protection and disposal gloves should be used while conducting sampling. Always wash your hands or use alcohol gel for disinfection after samples have been collected or after handling sample bottles.

1. Always use adequately sized sampling containers. Sampling containers must be prepared and sterilized prior to collection and sampling at the site.
2. Locate effluent pipe closest to the point of discharge to the dispersal field, in this system the pump/dosing chamber is the best location.
3. Carefully place the mouth of the sampling bottle into the free falling stream of effluent, if that can be done. If not, collect a sample with a pole dip container device, from the effluent below the inlet pipe.
4. Fill sample bottles to 95% level, leaving room for expansion during transport.
5. Take extreme care while handling the open sample bottle, do not let any dust, debris, or foreign material enter the sample. Do not touch interior of the sample bottle lid. If sample becomes contaminated, a new sample bottle must be used to collect a fresh sample.
6. Cap and label sample.
7. Samples must be stored in a cooler with ice during transport.
8. Make sure all records and labels are correct before turning sample over to, or sending to the laboratory.
9. Sample must be shipped to arrive at the testing lab within 48 hours.

G. System Operator

The System Operator is required to be an Environmental Operator Certified Professional (EOCP). The EOCP is responsible for recording, calculating and reporting flow readings, sampling and maintenance. Remote telemetric and internet monitoring equipment will be installed and accessible to the EOCP.

H. Dispersal Field

Dispersal Field Area to be properly seeded and maintained, this includes weed and pest control.

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I. Electrical Power Outage

Plant Operations stops as power is mandatory for the slaughter operation to continue.

This Operating Plan and Maintenance Requirement Schedule is adequate for the Onsite Sewerage System installed.



Dick Bartel, P.Eng. P.E.

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SAMPLE ANALYTICAL DATA

REPORTED TO PROJECT Horton Contracting
Inland Meats

WORK ORDER 5072167
REPORTED Aug-10-15

Analyte	Result / Recovery	MRL / Units Limits	Prepared	Analyzed	Notes
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Sample ID: Inland Meats (5072167-01) [Water] Sampled: Jul-30-15 14:00

General Parameters

BOD, 5-day	29	2 mg/L	Aug-01-15	Aug-06-15	
pH	7.52	0.01 pH units	N/A	Aug-01-15	HT2
Solids, Total Suspended	16	2 mg/L	Aug-04-15	Aug-06-15	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

SAMPLE ANALYTICAL DATA

REPORTED TO PROJECT Horton Contracting
Inland Meats

WORK ORDER 5081473
REPORTED Aug-31-15

Analyte	Result / Recovery	MRL / Units Limits	Prepared	Analyzed	Notes
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Sample ID: Inland Meats (5081473-01) [Water] Sampled: Aug-21-15 12:00

General Parameters

BOD, 5-day	11	2 mg/L	Aug-24-15	Aug-29-15	
pH	7.66	0.01 pH units	N/A	Aug-27-15	HT2
Solids, Total Suspended	4	2 mg/L	N/A	Aug-24-15	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

SAMPLE ANALYTICAL DATA

REPORTED TO PROJECT Horton Contracting
RoCana

WORK ORDER REPORTED 5090516
Sep-15-15

Analyte	Result / Recovery	MRL / Units Limits	Prepared	Analyzed	Notes
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Sample ID: RoCANA (5090516-01) [Water] Sampled: Sep-07-15 14:30

General Parameters

BOD, 5-day	< 10	2 mg/L	Sep-09-15	Sep-14-15	
pH	6.42	0.01 pH units	N/A	Sep-10-15	HT2
Solids, Total Suspended	6	2 mg/L	N/A	Sep-11-15	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

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TRACK# 342949
AWh# 108093

Mr. s.22 Timson Huang - Executive Director
1009392 BC Ltd.
4141 54th Street SE
Salmon Arm, BC

December 14, 2014

Re: Groundwater Monitoring Program and BC Code of Good Practice Compliance Assessment,
Inland Meat Packers Facility, Salmon Arm, BC

Dear Mr.s.22 Huang :

1.0 INTRODUCTION

In accordance with your request, Watterson Geoscience Inc. (WGI) is pleased to submit this letter report which documents the findings from a hydrogeological investigation and an environmental assessment conducted at the Inland Meat Packers facility (IMP) located at 4141 54th Street SE, Salmon Arm, BC (Figure 1). The purpose of this investigation is to support the application for the facility operating permit.

The hydrogeological investigation and environmental assessment work were conducted to develop a thorough understanding of site conditions, facility waste water treatment system effectiveness and the environmental effects from long-term effluent disposal into the ground. The primary consideration for the treatment system design and operation is to ensure that no health hazard or other impacts on local groundwater or adjacent properties result from system operation and waste water disposal.

The investigation work was conducted in accordance with requirements stipulated in the BC *Environmental Management Act* Code of Practice for the Slaughter and Poultry Processing Facilities Part 3 Sections 6 and 7 (2010) (the Code). Section 6 (a) requires that waste water must not be discharged "directly into groundwater", while Section 7 requires (among other design, inspection and operating criteria) that "wastewater discharged into the subsurface of the ground from a category B facility must not surface and must not cause the groundwater table to be raised to the surface".

Additionally, the hydrogeological investigation findings were used to develop recommendations for a groundwater quality monitoring plan. This plan will provide long-term information regarding the treatment system effectiveness and will identify whether off-site groundwater quality may be affected by effluent disposal to ground.

2.0 TREATMENT AND DISPOSAL SYSTEM DESCRIPTION

The site is located at the southwest corner of the intersection of 54th Street SE and 40 Avenue SE in the Salmon Arm Industrial Park. The legal property description is Block B, Plan KAP68151, Sec 5, Twp 20, Rge, 9 KDYD. The site is situated at a mean elevation of approximately 530 m above sea level (ASL) and a site location diagram is provided as Figure 1. The surrounding property use is as follows:

- North – 40th Avenue SE with undeveloped land and Salmon Arm Golf Course further to the north;
- East – 54th Street with commercial development further to the east;

- South – undeveloped land used to store concrete structures with Auto Road SE further to the south;
- West – undeveloped land

The subject property is occupied by a processing building, paved areas and the treatment system and disposal area. IMP owns the vacant property to the west and a site layout diagram is provided as Figure 2.

Wastewater treatment and disposal system design services were provided by Point One Engineering Ltd. (Point One), and treatment system installation services were provided by Horton Contracting Ltd., both of Vernon, BC.

Based on information provided by IMP and Mr. Dick Bartel, P.Eng. with Point One, WGI understands the following:

- The planned hog production is 225 hogs/day or about 1,125 hogs/week. The facility will also include 28 staff. Hog production may increase in the future;
- The facility waste water will be treated using a Microfast 9.0 Fixed Activated Sludge Treatment system constructed by Biomicribics Inc.;
- The treatment system will produce Class C effluent or better, with total suspended solids (TSS) and 5-day biological oxygen demand (BOD₅) concentrations at 45 mg/L or less;
- The daily design flow for the system is 38.1 m³/day (8,392 IGPD), comprised of about 36.7 m³/day waste water from the abattoir and about 1.3 m³/day of domestic waste water;
- The collected waste water will be routed through two 3,500 IG grease interceptor tanks to prevent fats, oils and grease to enter the treatment system;
- The treated waste water will be disposed to ground using a pressurized distribution system into two infiltration areas totalling approximate 1,143 m² at a hydraulic loading rate of 100 L/m/day (Figure 2);
- A standby area equal to the active infiltration area is available at the site;
- Stormwater runoff from the facility roof and paved areas will be routed to five drywells located north and away from the from the treatment system and infiltration areas.

3.0 SITE CHARACTERISTICS

The facility is located within a southeast trending glacial meltwater channel which historically drained Shuswap Lake into the Enderby Valley. Surface topography in the facility and Industrial Park area is generally flat with a slight slope to the east-southeast.

Geologic maps for the area obtained from BC Ministry of Environment (MoE) online Water Resource Atlas (WRA) show surficial geology consists of undifferentiated fluvial, lacustrine and glacially derived sediments. These commonly include complexly interbedded clay, silt, sand and gravel deposits.

Aquifer mapping provided by the MoE WRA indicates the project area is underlain by Aquifer 0108 and underlying Aquifer 0109. Aquifer 0108 is a sand and gravel aquifer that is classified as IIIA with low demand and moderate productivity and high vulnerability. Aquifer 0109 also consists of sand and gravel deposits and is classified as a IIIC aquifer with low demand, moderate productivity and low vulnerability. Groundwater flow direction in the Salmon Industrial Park area is expected to follow surface topography, with flow generally to the southeast (Figure 3).

Based on information provided in the MoE WRA, several water wells are located southeast and downgradient of the facility, with three situated within about 1/2 km of the disposal area (Figure 3). Well 23814, located approximately 350 m to the southeast, was drilled in 1970 and extends to 27.4 m below ground surface (bgs). This well encountered sand and clay to 26.5 m bgs, with bedrock to the total well depth. The static water level in this well was reported 19.5 m bgs and the well produced about 0.16 L/sec (3 US gpm).

Well 30524 is located approximately 460 m southeast of the facility and was drilled in 1974. The well extends to about 35 m bgs and encountered interbedded silty sand and clay to the well's total depth. This well produced about 0.5 L/sec (8 US gpm) with a static water level at 17.7 m bgs.

Further to the southeast, Well 51722 was drilled in 1983. This well is situated approximately 570 m from the facility and extends to 52.1 m bgs. Sediments encountered in Well 51722 consisted of soft brown sand overlying hard brown sand with blue sand and clay. The static water level in this well was measured at 26.2 m bgs with an estimated production rate of 0.38 L/sec (6 US gpm).

The facility and surrounding industrial park obtains potable water from the City of Salmon Arm. As such it is unlikely that nearby private water wells are used for potable supply.

Two surface water bodies, where shallow groundwater may discharge, are situated further southeast and downslope across Highway 97B. An unnamed slough is situated approximately 700 m downslope of the facility and an unnamed creek is situated approximately 900 m further to the southeast (Figure 3).

4.0 FIELD WORK AND FINDINGS

4.1 *Drilling and Monitoring Well Installation*

Two groundwater monitoring wells were installed at the property to confirm sediment characteristics beneath the proposed wastewater infiltration area, obtain sediment samples for sieve analyses, collect groundwater elevation data, and to obtain groundwater samples to establish baseline groundwater quality. The wells were drilled and installed using an hollow-stem auger drill rig operated by KEL Drilling out of Monte Creek, BC. Onsite supervision and geologic logging services were provided by Daniel Watterson, P.Geo. with WGI.

Both wells were drilled using 152 mm (8-inch) boreholes to 22.86 m (74 ft) bgs. Undisturbed sediment samples were collected at 3 m (10 ft) intervals using a split-spoon sampler. Based on field observations both holes were drilled at least 3.0 m into saturated sediments. Well locations are provided in Figure 2.

Each monitoring well was constructed of 52 mm (2 inch)PVC casing with 0.010-in slot screen set across the apparent water table. Sand filter pack was installed around each well screen and the annulus between the filter pack and ground surface was filled with native backfill and hydrated bentonite chips. Both wells were completed with stand-up steel monuments. Geologic logs and well construction diagrams are provided in Attachment A.

Each well was developed by surging with Waterra™ tubing and a foot valve until the produced water was relatively sand free. However, due to silt and clay in the sediments and limited water inflow, turbidity in the produced water was not fully reduced by well development.

As noted in the geologic logs, sediments beneath the proposed treatment and disposal facility consist of silty sand and very fine sand grading to sand and gravelly sand with depth. Scattered thin gravel, silt and clay layers were also observed. These sediments are consistent with those encountered in the downgradient water wells and with published geologic mapping for the area.

Groundwater was encountered at about 18 m bgs in both wells. This depth is also consistent with static water levels measured in other wells in the area.

4.2 Grain Size (Sieve) Analysis

Three (3) soil samples were collected from soil boring MW-2 and submitted to Fletcher-Paine Associates Ltd. in Vernon, BC for grain size analysis. The samples were collected from approximately 3, 9 and 18 m bgs to support estimates of sediment hydraulic conductivity which span the entire vadose zone. The analysis reports are provided in Attachment B.

Sediment hydraulic conductivity (K) values based on the sieve analysis data were estimated using a computer DOS-based analytical program called MVSKF developed by Vukovic and Soro (1992). Numerous analyses are provided which apply to differing sediment characteristics. The analysis methods most applicable to the fine sediments found in the proposed infiltration area are the Beyer, Sauerbrei and Zunker methods. The calculation results are provided in Attachment B and the analysis results are summarized as follows:

<u>Sample Depth</u>	<u>Conductivity Range</u>	<u>Average Conductivity</u>
3 m	2 to 6 m/day	4 m/day
6 m	2 to 4 m/day	3 m/day
18 m	19 to 22 m/day	21 m/day

The estimated sediment conductivities generally correspond with field observations of decreasing fines content with depth. The overall estimated average conductivity for the infiltration area sediments is about 9 m/day, which compares favorably with published values for these type of sediments (Driscoll, 1986).

4.3 Baseline Groundwater Sampling

Groundwater samples were collected from both monitoring wells to establish baseline groundwater quality up- and cross-gradient (MW-1) and downgradient (MW-2) of the proposed disposal areas (Figure

2). The groundwater samples were collected immediately following well development or after a minimum of three well volumes were purged from each well. The samples were collected directly into laboratory-supplied containers and shipped with ice to Caro Analytical Laboratory in Kelowna, BC under chain-of-custody. The samples were analyzed for

- Physical characteristics, including total dissolved and suspended solids, and pH,
- Anions and cations, including chloride, sulfate, nitrate and nitrite nitrogen, and cyanide,
- 5-Day biological oxygen demand and total organic carbon,
- Total phosphorus, and
- Total oil and grease.

Water quality analyses results are summarized in Table 1 and laboratory analytical reports are provided as Attachment C.

TABLE 1: ANALYTICAL RESULTS SUMMARY					
	Well	MW-1	MW-2	Guidelines for Canadian Drinking Water Quality ¹	
	Caro Report Date	12-Nov-14	12-Nov-14	Upper Limit	
	Sampling Date	29-Oct-14	30-Oct-14		
	Sampled by:	DW	DW	MAC ²	AO ³
	Units				
General Parameters					
Total Dissolved Solids (TDS)	mg/L	414	652		500
Total Suspended Solid (TSS)	mg/L	1040	1270	NS ⁴	
pH (lab)	pH units	7.65	7.48		6.5-8.5
5-Day Biological Oxygen Demand (BOD ₅)	mg/L	<10	<10	NS	
Total Organic Carbon (TOC)	mg/L	8.8	6.8	NS	
Total Oil and Grease (TOG)	mg/L	<2	3	NS	
Anions and Nutrients					
Chloride	mg/L	61.8	188		250
Sulfate	mg/L	20.6	36		500
Total Kjeldahl Phosphorus	mg/L	2.76	2.29	NS	
Nitrate Nitrogen	mg/L	3	2.41	10	
Nitrite Nitrogen	mg/L	<0.010	<0.010	1	

Notes:

- 1) Guidelines for Canadian Drinking Water Quality, updated October 2014.
 - 2) MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
 - 3) AO refers to the Aesthetic Objective according to the GCDWQ criteria.
 - 4) "NS" indicated no applicable standard.
- Shaded cell means above applicable guideline value

In general, the analytical results indicate that shallow groundwater quality in the proposed disposal areas is good with pH, anions and nutrients all within or below applicable guidelines. The elevated TDS and TSS likely result from the elevated turbidity in the samples. The concentrations of organic constituents (TOC and TOG) are also low and indicate little if any influence on local groundwater quality from upgradient anthropogenic sources has occurred.

5.0 IMPACT ANALYSIS

The potential environmental impacts from infiltration of treated waste water will be governed by effluent quality and volume, soil mineralogical and biological characteristics in the infiltration area, the depth to groundwater, the size and characteristics of the receiving aquifer, the nature and distance to potential downgradient receptors and local climate factors. Each of these are discussed below.

Compliance with the Code stipulates that treated effluent should not be discharged directly to site groundwater and the effluent discharge should not cause the water table to be raised to the surface. As noted above, the depth to groundwater beneath the infiltration area is about 18 m bgs and so it is highly unlikely that waste water infiltration will result in sufficient groundwater mounding effluent to cause direct contact between infiltrated effluent and the underlying water table, and for effluent to daylight to the surface.

However, this finding can be confirmed by estimating potential groundwater mounding beneath the infiltration area using available information and conservative assumptions. The potential groundwater mound height was estimated using a simplified Hantush calculation (Finnemore, 1983) where:

- Sediment permeability (K) = 9 m/day
- Sediment porosity = 0.30
- Initial saturated sediment thickness = 3 m (amount of saturated sediment in the monitoring wells)
- Infiltration area width = 25 m
- Infiltration area length = 45 m
- Average effluent discharge rate = $0.033 \text{ m}^3/\text{m}^2/\text{day}$ (i.e. $38 \text{ m}^3/\text{day}$ into the $1,143 \text{ m}^2$ infiltration area)
- Discharge duration = 3,650 days (10 years)

Based on the above parameters, the groundwater elevation beneath the center of the infiltration area is estimated to increase by a maximum of approximately 0.8 m after 10 years of continuous discharge. This value is conservative because the actual thickness of saturated sediments beneath the infiltration area is almost certainly much greater than this value, and thicker saturated sediments results in less mounding.

The potential environmental impacts from infiltrated effluent on receiving groundwater quality and on downgradient receptors must also be considered. The main factors which govern the degree of impact are the effluent volume and quality, the amount of additional treatment that occurs in soil beneath the infiltration area, and the travel time to potential receptors.

The Class C effluent produced by the treatment system will be of high quality with BOD₅ (5-day biological oxygen demand) and TSS (total suspended solids) concentrations at 45 mg/L or better. Coliforms contained in the effluent will commonly bind to soil particles, fine-grained materials and organic matter within the first meter or two from the surface (Brown, et al 1979). Further, numerous studies have shown that coliforms do not survive longer than a few weeks in groundwater (Health Canada, 2006).

Typical effluent also contains nitrates and phosphorous along with small concentrations of biological and other constituents. Nitrogen can undergo several transformations in and below a waste water infiltration area, including adsorption, volatilization, mineralization, nitrification, and denitrification. Nitrification, the conversion of ammonium nitrogen to nitrite and then nitrate by bacteria under aerobic conditions, is the predominant transformation that occurs immediately below the infiltration zone. Denitrification is the further reduction of nitrates or nitrites commonly by bacteria that usually results in the escape of nitrogen into the air. Factors found to favor denitrification are fine-grained soils (silts and clays) and layered soils (alternating fine-grained and coarser-grained soils with distinct boundaries between the texturally different layers) (U.S EPA, 2002). As discussed above, these sediments and characteristics are present beneath the proposed infiltration area.

Most phosphorus is retained in activated waste sludge and is effectively removed by settling and subsequent tank pumping. Phosphorus that is discharged to the environment is precipitated or adsorbed in soil, such that most to almost all discharged phosphorus is eliminated from effluent no more than a few meters from the infiltration area, even after years of effluent disposal (Scope, 2006). Concentrations of other waste water constituents commonly decline due to aerobic and anaerobic biodegradation and by adsorption onto mineral surfaces in the unsaturated zone and in groundwater.

The proposed treatment system tanks will be constructed without seams joining the tank's sides and floor. This construction method will significantly minimize the potential for leakage. The only potential pathway for leaks would be from cracks through the tank wall or from piping connections, which are highly unlikely to occur under normal operating conditions. In the unlikely event that effluent leakage occurs, the aerated loamy sand soil and deep depth to groundwater will limit any negative effects on underlying water quality.

Another important consideration when estimating potential environmental effects on underlying groundwater from waste water infiltration is that the proposed IMP facility is situated in an area where a net deficit of precipitation compared to evaporation and evapotranspiration (ET) is present. Evaporation is the direct transfer of water from the soil into the atmosphere while ET is the sum of evaporation and transpiration, which is water transferred to the atmosphere by plants.

Precipitation and ET information for the Salmon Arm area are available from an on-line calculator provided by the Pacific Field Corn Association (www.farmwest.com). The average total annual precipitation for this area is about 434 mm/year while the estimated ET for this area is about 934 mm/year, leaving a net precipitation deficit of about 500 mm/year. This suggests that under normal circumstances, much of the infiltrated effluent can be expected to evaporate during the summer months and not migrate downward to the underlying water table.

A further key factor to understand the environmental effects of effluent infiltration is the time required for treated effluent to migrate vertically downward to the water table and then laterally to the property boundary. Vertical effluent velocity can be estimated using the relationship

$$V = K / n$$

Where

V = Velocity

K = Sediment permeability (9 m/day)

n = soil porosity (0.3)

Based on this relationship and sediment characteristics, the downward effluent velocity beneath the proposed discharge area to the water table is estimated at approximately 30 m/day.

Lateral groundwater velocity from beneath the infiltration area to the property boundary can be estimated using a related relationship

$$V = KI / n$$

Where

V = Velocity

K = Sediment permeability (9 m/day)

I = Water table gradient (0.002 m/m, based to topographic slope in the facility area)

n = soil porosity (0.3)

Thus, lateral effluent velocity towards the property boundary and downgradient receptors is estimated at about 0.06 m/day.

The estimated travel time to the property boundary and downgradient receptors can be estimated as follows:

$$TT = \text{distance} / \text{velocity}$$

Because of the low hydraulic gradient, the travel time for effluent to reach the property boundary is estimated at over 50 days, while the travel time to the nearest potential receptors (Figure 3) is estimated at

Well 23814 (+/- 350 m)	approximately 16 years
Well 30524 (+/- 460 m)	approximately 21 years
Well 51722 (+/- 570 m)	approximately 26 years
Slough (+/- 690 m)	approximately 31 years
Unnamed Creek (+/- 910 m)	approximately 41 years

Finally, because of these long travel times, effluent that reaches the water table can be expected to be significantly diluted by seasonal precipitation and dispersed into the underlying groundwater long before it reaches a potential receptor. This dilution and dispersion cannot be quantified as the aquifer

depth, groundwater flow volume and recharge rate in the facility area are unknown, but as the aquifer is unconfined and aerially extensive, substantial volumes of groundwater likely flow downgradient beneath the property (Figure 3).

6.0 MONITORING PLAN

As noted above, the main objective for this hydrogeological investigation and impact assessment is to characterize subsurface hydrogeological conditions, identify potential off-site and downgradient receptors and provide a baseline of current groundwater quality. Although groundwater monitoring is not discussed or required under the Code, IMP desires to be proactive towards this issue and will implement a long-term groundwater quality monitoring program.

The water quality data discussed in Section 4.3 illustrate current and pre-waste water disposal conditions in local groundwater. As groundwater beneath the facility is expected to flow generally southeasterly, up- to cross-gradient monitoring well MW-1 is situated to provide water quality data that is unaffected by facility operations. Similarly, monitoring well MW-2 is situated below and downgradient of the main infiltration area. Samples collected from this well will provide good information regarding the treatment system effectiveness and will provide early warning of potential off-property impacts.

Water quality samples from the monitoring wells are proposed to be collected semi-annually (every six months) after facility operations begin and treated waste water is disposed to ground. Semi-annual sampling will be conducted for at least two years; after which, should no environmental impacts be observed, monitoring will be conducted annually for an additional three years. If no further impacts are detected, then samples will be collected every three years.

The proposed water quality parameters are those completed for the baseline sampling and include:

- Total Dissolved Solids (TDS)
- Total Suspended Solids (TSS)
- pH
- 5-Day Biological Demand (BOD₅)
- Total Organic Carbon (TOC)
- Total Oil and Grease (TOG)
- Chloride
- Sulfate
- Total Kjeldahl Phosphorus
- Nitrate and Nitrite Nitrogen

The water quality data will be tabulated and compared to previous monitoring events and applicable water quality guidelines to identify whether groundwater quality has been negatively affected by treatment system operation.

Elevated constituent concentrations in downgradient groundwater may indicate potential issues with the waste water treatment system. If these are observed, the first action will be to resample the wells

and confirm the elevated concentrations. If confirmed, then in consultation with IMP one or more of the following actions may be implemented to improve effluent quality:

- Ensure the treatment system is operating properly;
- Add on-site storage to increase sewage retention time;
- Add additional secondary treatment capacity consisting of another MicroFAST 4.5 unit which will provide 1/2 again as much treatment capacity as currently installed; and /or
- Add ultraviolet disinfection to the treated wastewater to remove biological constituents.

The specific actions implemented to improve infiltrated effluent quality will be based on the type and concentration of elevated parameters observed in downgradient groundwater. Actions implemented to rectify the situation will be documented and submitted to the MoE by IMP.

7.0 ASSESSMENT SUMMARY

A hydrogeological assessment was completed to assess the potential for environmental impacts resulting from long term disposal by infiltration of treated waste water at the proposed Inland Meat Packers facility. The proposed facility operations, waste water treatment and disposal plans and assessment findings are summarized below.

- The waste water treatment and disposal system is designed to accommodate processing of 225 hogs /day and produce Class C or better effluent at a daily design flow of 38.1 m³/day.
- Sediments and groundwater conditions at the facility are suitable for waste water disposal via infiltration to ground. Sediments generally consist of silty fine sand grading to clean fine sand with depth and groundwater is present at about 18 m bgs. The property is underlain by two sand and gravel aquifers and groundwater flow is expected to follow surface topography with flow towards the southeast.
- Baseline groundwater quality in the proposed disposal area is good with pH, anions and nutrients all within or below applicable guidelines. Little or no evidence of anthropogenic impacts on groundwater quality are present.
- The deep depth to groundwater and fine grained sediments will provide further reduction of nutrients that are commonly present in treated waste water.
- Available climate data suggests the area experiences net precipitation deficits, with annual evapotranspiration rates exceeding annual precipitation rates. This net deficit should result in reduced volumes of infiltrated effluent to reach underlying groundwater, at least during summer months.
- Long-term infiltration of treated waste water will meet Code requirements and is not expected to cause groundwater to rise sufficiently to cause direct effluent discharge into the aquifer.
- Groundwater travel time to the property boundary is expected at over 50 days with travel time to the nearest known downgradient receptor (Well 23814) is well over a decade.

- The proposed monitoring wells are situated upgradient and downgradient of the main infiltration area, and are appropriately located to provide good information regarding background and downgradient groundwater quality during facility operations.
- The proposed water quality monitoring parameters and sampling plan (samples collected semi-annual for two years, followed by annual sampling for three years, followed by samples collected every three years), should prove protective of the environment and will support early detection of impacted groundwater quality.
- In the unlikely event underlying groundwater quality is affected by long-term waste water infiltration, several engineering options have been developed to improve effluent quality and minimize the impacts.

Based on this assessment, the local and downgradient soil and hydrogeological characteristics, the deep depth to groundwater, the long travel time to the property boundary and downgradient receptors, climate factors, and proposed effluent quality support year-round infiltration of treated waste water by infiltration. No negative impacts on underlying groundwater quality, offsite groundwater quality, or the receiving environment are expected from long-term disposal of facility waste water to ground. As such, operation of the proposed treatment facility is expected to be fully compliant with the BC Code of Practice for the Slaughter and Poultry Processing Facilities.

8.0 CLOSURE

This report is intended for the exclusive use of BC 1009392 and their authorized parties for specific application to the subject site and subject project. Please be advised that I am a member in good standing in the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) and I am acting within my area of expertise. In preparing this analysis I have relied in good faith on information provided by others, the accuracy of which I cannot attest.

WGI trusts that this report satisfies your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully submitted,

Watterson Geoscience Inc.



Daniel Watterson, P.Geo., LHG
Principal Hydrogeologist

Attachments:

Figure 1: Site Location

Figure 2: Site Layout

Figure 3: Regional Groundwater Wells and Aquifers

Attachment A: Geologic Logs and Well Construction Diagrams

Attachment B: Grain Size Analyses and Conductivity Estimates

Attachment C: Analytical Laboratory Reports

References:

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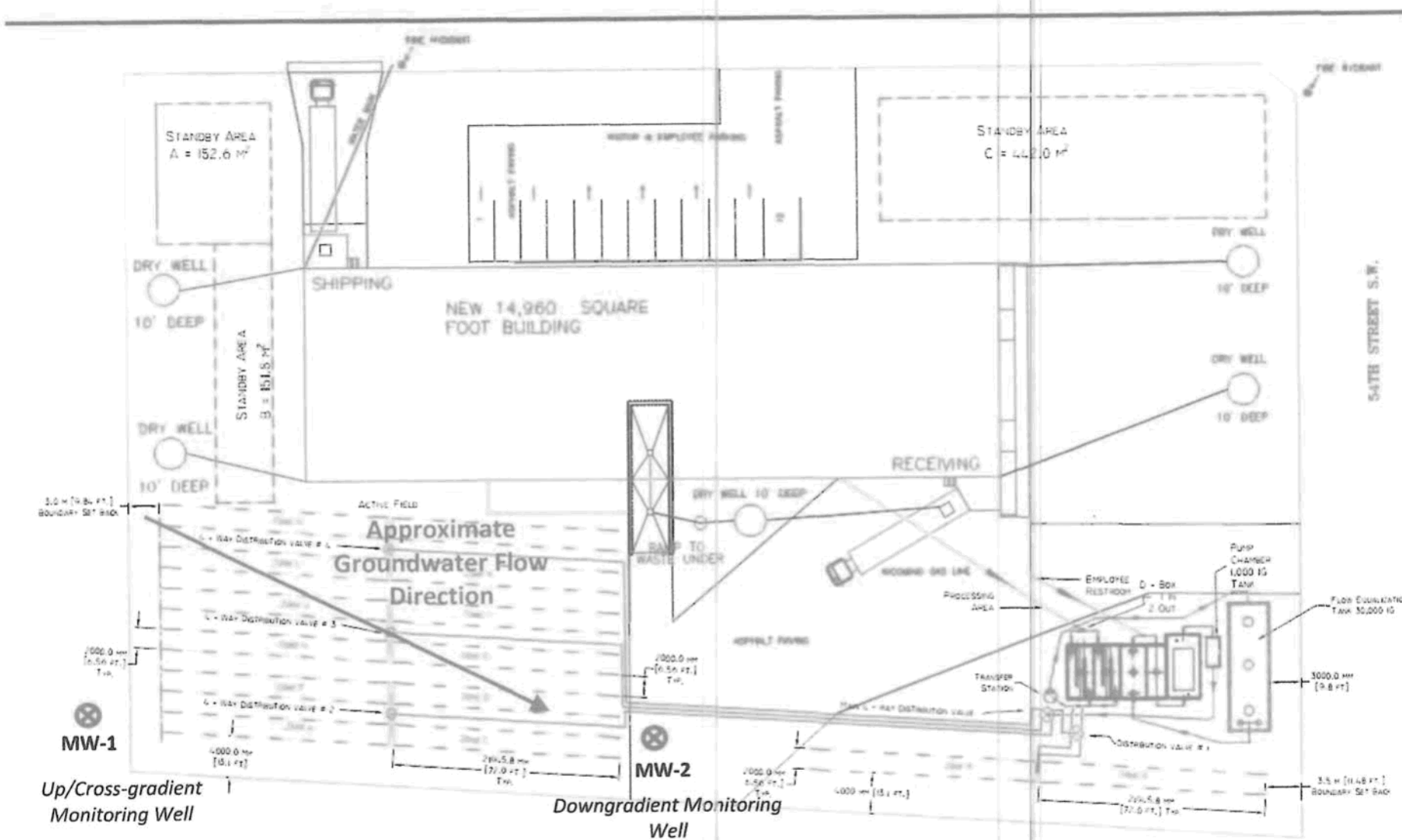
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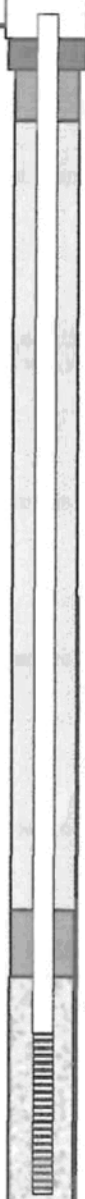
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<i>Watterson Geoscience Inc.</i> Groundwater Consulting Services	Hydrogeological Evaluation and Groundwater Monitoring Program	Inland Meat Packers Site Location
		Project No. 15-007
Source: Google Earth™	Client: 1009392 BC Ltd.	Figure 1



Watterson Geoscience Inc. Groundwater Consulting Services	Hydrogeological Evaluation and Groundwater Monitoring Program	Inland Meat Packers Facility Site Layout
		Project No. 15-007 Figure 2
Source: Point One Engineering Drawing No. 2014-47-05	Client: 1009392 BC Ltd.	

ATTACHMENT A

Project: Inland Packers			Location: Refer to site plan		Borehole Number: MW-1	
Client: Dave DeBoer			Driller: KEL Drilling Ltd.		Project No. 15-007	
Project Geologist: DW			Drill Method: HSA		Elevation: +/- 536 m amsl	
Depth (ft)	Depth (m)	S. S. Sample	Soil Description	Well Design	Comments	
0	0		SANDY SILT; tan to brown, loose, dry to v. sli damp		Well Monument Stickup 0.9 m	
10	3.05		SILTY SAND; gray brown, sd vfn grained, mod dense, damp, minor red-brown mottling Sample submitted for sieve analysis		Cement Hydrated Bentonite Chips 51 mm in ID Sch 20 PVC Casing	
20	6.1		SILTY SAND; As above, minor silt/clay laminations		Native Sediment Backfill	
30	9.14		SAND; gray, very fine, soft, damp to moist, thin black lam, 20 cm sandy silt layer Sample submitted for sieve analysis			
40	12.2		SILT / SANDY SILT; olive brown, mod firm SAND; gray, fine, coarser than above, well sorted, damp to moist, increase density with depth, no lam			
50	15.24		SAND; as above			
60	18.29		SAND; gray, fine grained, wet to saturated, as above Sample submitted for sieve analysis		Hydrated Bentonite Chips ▽ Groundwater at 19.67 m btoc*	
70	21.34		Hole Total Depth 22.86 m		10-20 Silica Sand Filter Pack Screen 0.010-in Slot PVC End Cap	
80	24.38				btoc - below top of casing	

Watterson Geoscience Inc. Groundwater Consulting Services	Logged by: DW	Completion Depth: 22.86 m
	Reviewed by: DW	Completed: Oct 27, 2014
	Figure B1	Page: 1 of 1

Project: Inland Packers			Location: Refer to site plan		Borehole Number: MW-2	
Client: Dave DeBoer			Driller: KEL Drilling Ltd.		Project No. 15-007	
Project Geologist: DW			Drill Method: HSA		Elevation: +/- 535 m amsl	
Depth (ft)	Depth (m)	S. S. Sample	Soil Description	Well Design	Comments	
0	0				Well Monument Stickup 0.66 m	
					Cement	
					Hydrated Bentonite Chips	
10	3.05		SILTY SAND; brown, loose, damp, sand v fn,		51 mm in ID Sch 20 PVC Casing	
20	6.1		GRAVELLY SAND; gray, sd med grained, scat large gravel, mod dense, damp, minor red-brown mottling, 25 mm silt layer			
					Native Sediment Backfill	
30	9.14		SAND; olive brown, med to fine, loose to mod dense, damp to moist, well sorted			
40	12.2		SAND; gray, med to fine, well sorted, damp to moist, mod dense			
50	15.24		SAND; as above, wet to saturated			
					Hydrated Bentonite Chips	
60	18.29		SAND; gray, fine grained, as above, wet to saturated		Groundwater at 19.40 m btoc*	
					10-20 Silica Sand Filter Pack	
70	21.34				Screen 0.010-in Slot	
			Hole Total Depth 22.86 m		PVC End Cap	
80	24.38				btoc - below top of casing	
Waterson Geoscience Inc. Groundwater Consulting Services				Logged by: DW	Completion Depth: 22.86 m	
				Reviewed by: DW	Completed: Oct 28, 2014	
				Figure B2	Page: 1 of 1	

ATTACHMENT B

PROJECT: Watterson Geoscience Inc. Materials Testing

CLIENT: Watterson Geoscience Inc.

SOURCE: Unknown

RECEIVED IN LAB:

29-Oct-14

LOCATION: Vernon, BC


MATERIAL: Sample 60' - 62'

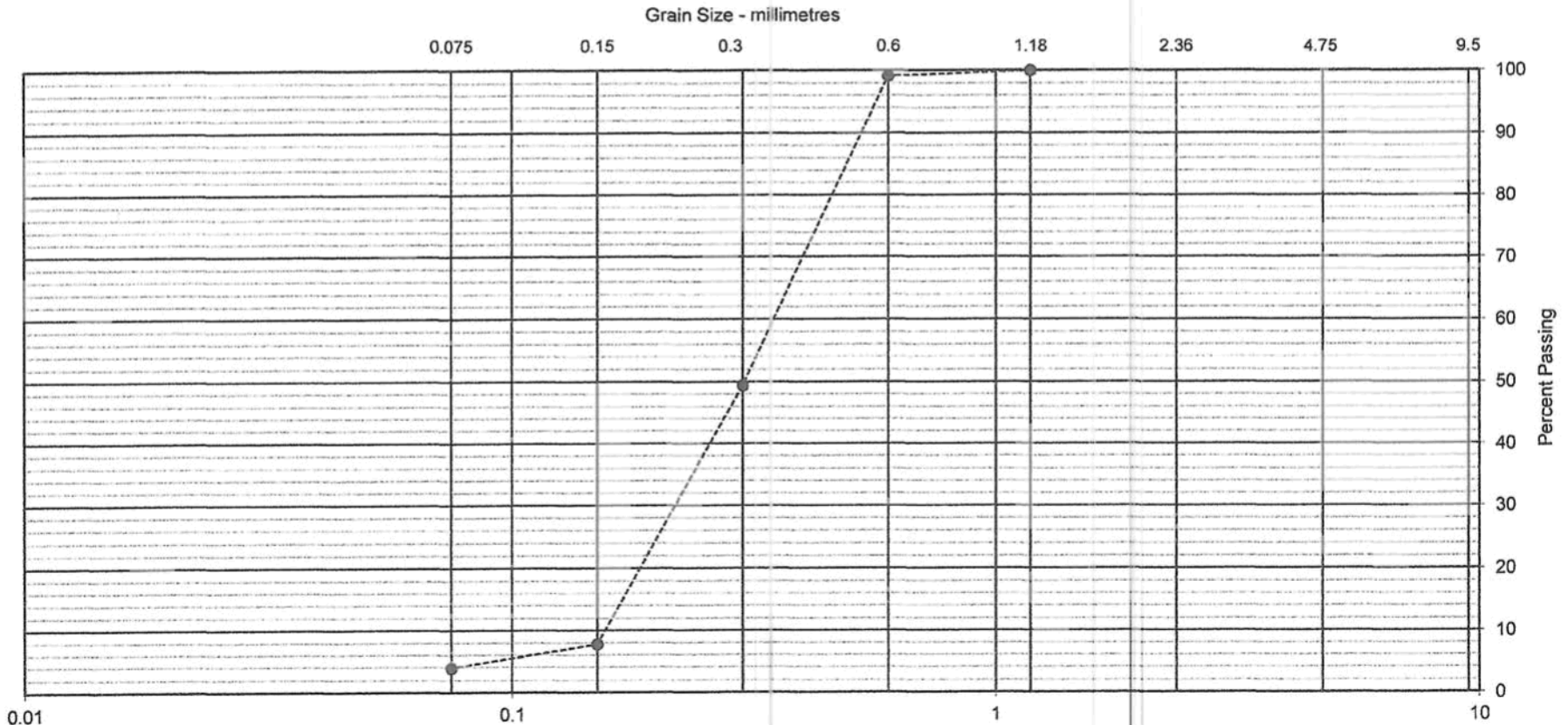
SAMPLED BY: Client Representative

Project No: 5000-T163

GRADATION SPECIFICATIONS:

No Specification

WASH ANALYSIS		LIMITS		WASH ANALYSIS		LIMITS		REMARKS:
SIEVE (mm)	% Passing	MIN. %	MAX. %	SIEVE (mm)	% Passing	MIN. %	MAX. %	
150				9.50				<div style="border: 1px solid black; padding: 5px; float: right;"> <small>CERTIFIED BY</small>  </div> <p>- Sample labelled as MW-2 60'-62' by client rep.</p> <p>- Received in lab on Oct 29, 2014. Date of sampling is unknown</p>
100				4.75				
75				2.36				
50				1.18	100			
38.0				0.600	99.1			
25.0				0.300	49.4			
19.0				0.150	7.7			
12.5				0.075	3.9			



Reporting of this test result constitutes testing services only. Engineering interpretation or evaluation of the test result is provided only upon written request. Data presented in this report is for the exclusive use of the Client listed above. F.P.A. will not take any responsibility for any unauthorized use.

Fletcher Paine Associates Ltd.

Consulting Geotechnical and Materials Engineers

SIEVE ANALYSIS

ASTM C136 & C117

2250 -11th Avenue - Vernon, B.C. V1T 7X8

Tel: (250) 542-0377 / Fax: (250) 542-1220

PROJECT: Watterson Geoscience Inc. Materials Testing

CLIENT: Watterson Geoscience Inc.

SOURCE: Unknown

RECEIVED IN LAB:

29-Oct-14

LOCATION: Vernon, BC


MATERIAL: Sample 30' - 32'

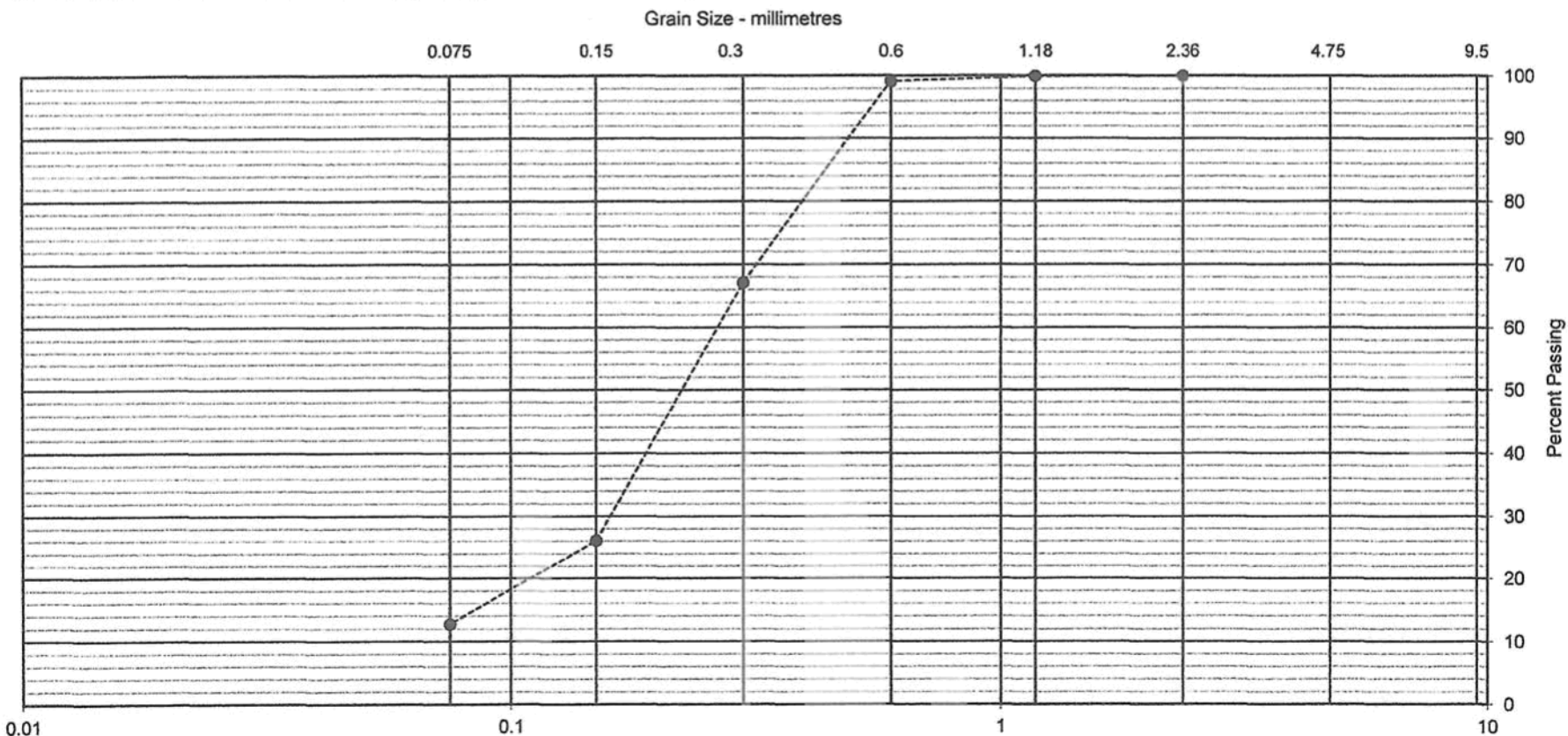
SAMPLED BY: Client Representative

Project No: 5000-T163

GRADATION SPECIFICATIONS:

No Specification

WASH ANALYSIS		LIMITS		WASH ANALYSIS		LIMITS		REMARKS:
SIEVE (mm)	% Passing	MIN. %	MAX. %	SIEVE (mm)	% Passing	MIN. %	MAX. %	
150				9.50				<div style="text-align: right;">  </div> <p>- Sample labelled as MW-2 30'-32' by client rep.</p> <p>- Received in lab on Oct 29, 2014. Date of sampling is unknown.</p>
100				4.75				
75				2.36	100			
50				1.18	99.9			
38.0				0.600	99.1			
25.0				0.300	67.1			
19.0				0.150	26.1			
12.5				0.075	12.7			



Reporting of this test result constitutes testing services only. Engineering interpretation or evaluation of the test result is provided only upon written request. Data presented in this report is for the exclusive use of the Client listed above. F.P.A. will not take any responsibility for any unauthorized use.

Fletcher Paine Associates Ltd.

Consulting Geotechnical and Materials Engineers

SIEVE ANALYSIS

ASTM C136 & C117

2250 -11th Avenue - Vernon, B.C. V1T 7X8

Tel: (250) 542-0377 / Fax: (250) 542-1220

PROJECT: Watterson Geoscience Inc. Materials Testing

CLIENT: Watterson Geoscience Inc.

SOURCE: Unknown

RECEIVED IN LAB:

29-Oct-14


LOCATION: Vernon, BC

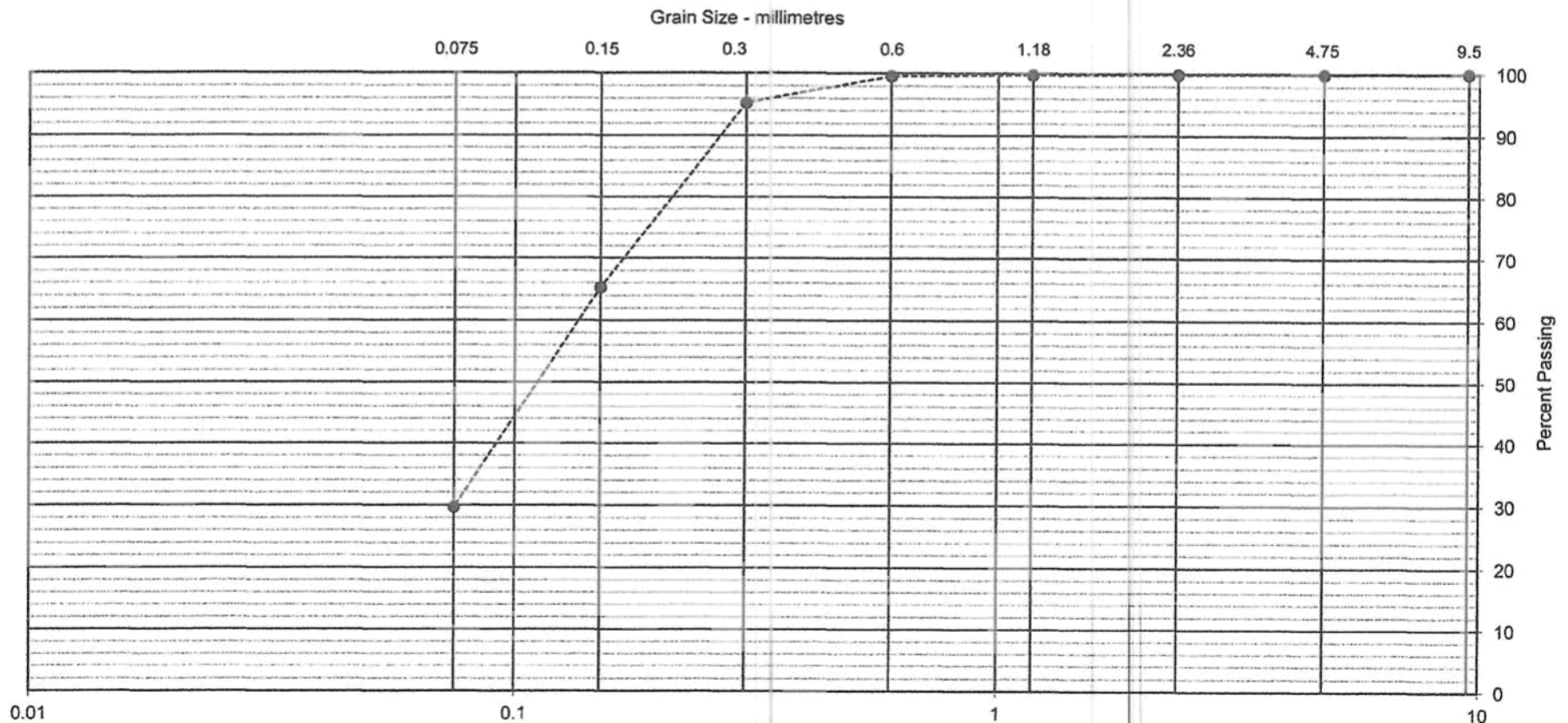
MATERIAL: Sample 10' - 12'

SAMPLED BY: Client Representative

Project No: 5000-T163

GRADATION SPECIFICATIONS: No Specification

WASH ANALYSIS		LIMITS			WASH ANALYSIS		LIMITS		REMARKS:
SIEVE (mm)	% Passing	MIN. %	MAX. %		SIEVE (mm)	% Passing	MIN. %	MAX. %	
150					9.50	100			 - Sample labelled as MW-2 10'-12' by client rep. - Received in lab on Oct 29, 2014. Date of sampling is unknown.
100					4.75	99.9			
75					2.36	99.9			
50					1.18	99.8			
38.0					0.600	99.5			
25.0					0.300	95.2			
19.0					0.150	65.3			
12.5					0.075	29.7			



Reporting of this test result constitutes testing services only. Engineering interpretation or evaluation of the test result is provided only upon written request. Data presented in this report is for the exclusive use of the Client listed above. F.P.A. will not take any responsibility for any unauthorized use.

Sample 10 -12 results

Inland Packers Sample 10-12
Silty Sand

Number of Data Points: 9

Calculated Porosity: 41.9

Coefficient of Uniformity(D60/D10): 2.4

EFFECTIVE GRAIN DIAMETERS

D10 = 0.0573 (mm) D17 = 0.0631 (mm)
D20 = 0.0657 (mm) D60 = 0.1353 (mm)
Krueger = 0.1070 (mm) Kozeny = 0.0988 (mm)
Zunker = 0.1015 (mm) Zamarin = 0.1042 (mm)

HYDRAULIC CONDUCTIVITY (m/s)

Hazen: 4.40e-05 Slichter: 1.62e-05
Terzaghi: 2.85e-05 Beyer: 3.42e-05
Sauerbrei: 2.80e-05 Krueger: 6.19e-05
Kozeny: 1.52e-04 Zunker: 7.16e-05
Zamarinu: 7.38e-05 USBR: 6.89e-06

Maximum: 1.52e-04 Minimum: 6.89e-06
Arithmetic Mean: 5.18e-05 Geometric Mean: 3.83e-05

Sample 30-32 results

Inland Packers Sample #30-32

Silty Sand

Number of Data Points: 7

Calculated Porosity: 34.7

Coefficient of Uniformity(D60/D10): 5.4

EFFECTIVE GRAIN DIAMETERS

D10 = 0.0489 (mm) D17 = 0.0937 (mm)

D20 = 0.1094 (mm) D60 = 0.2661 (mm)

Krueger = 0.1488 (mm) Kozeny = 0.0877 (mm)

Zunker = 0.1052 (mm) Zamarin = 0.1279 (mm)

HYDRAULIC CONDUCTIVITY (m/s)

Hazen: 2.31e-05 Slichter: 6.36e-06

Terzaghi: 1.09e-05 Beyer: 2.10e-05

Sauerbrei: 2.79e-05 Krueger: 7.85e-05

Kozeny: 5.42e-05 Zunker: 4.19e-05

Zamarinu: 6.82e-05 USBR: 2.23e-05

Maximum: 7.85e-05 Minimum: 6.36e-06

Arithmetic Mean: 3.54e-05 Geometric Mean: 2.76e-05

Sample 60-62 results

Inland Packers Sample #60-62

Silty Sand

Number of Data Points: 6

Calculated Porosity: 42.3

Coefficient of Uniformity(D60/D10): 2.2

EFFECTIVE GRAIN DIAMETERS

D10 = 0.1558 (mm) D17 = 0.1751 (mm)
D20 = 0.1840 (mm) D60 = 0.3478 (mm)
Krueger = 0.2368 (mm) Kozeny = 0.1687 (mm)
Zunker = 0.1903 (mm) Zamarin = 0.2152 (mm)

HYDRAULIC CONDUCTIVITY (m/s)

Hazen: 3.30e-04 Slichter: 1.24e-04
Terzaghi: 2.18e-04 Beyer: 2.55e-04
Sauerbrei: 2.25e-04 Krueger: 3.10e-04
Kozeny: 4.63e-04 Zunker: 2.60e-04
Zamarinu: 3.22e-04 USBR: 7.37e-05

Maximum: 4.63e-04 Minimum: 7.37e-05
Arithmetic Mean: 2.58e-04 Geometric Mean: 2.32e-04

ATTACHMENT C

REPORTED TO Watterson Geoscience
685 Pheasant Rd.
Vernon, BC V1B 3B1

TEL (250) 550-8560
FAX (250) 549-3027

ATTENTION Dan Watterson

WORK ORDER 4101824

PO NUMBER

RECEIVED / TEMP Oct-29-14 12:40 / 9°C

PROJECT Inland Packers

REPORTED Nov-12-14

PROJECT INFO

COC NUMBER B 15794

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Issued By:


Karin Miyazaki For Jennifer Shanko, ASCT
Administration Coordinator

Please contact CARO if more information is needed or to provide feedback on our services.

Locations:

#110 4011 Viking Way
Richmond, BC V6V 2K9
Tel: 604-279-1499 Fax: 604-279-1599

#102 3677 Highway 97N
Kelowna, BC V1X 5C3
Tel: 250-765-9646 Fax: 250-765-3893

17225 109 Avenue
Edmonton, AB T5S 1H7
Tel: 780-489-9100 Fax: 780-489-9700

www.caro.ca

REPORTED TO PROJECT Watterson Geoscience
Inland Packers

WORK ORDER REPORTED 4101824
Nov-12-14

Analysis Description	Method Reference	Technique	Location
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
BOD (5-day)	APHA 5210 B	Dissolved Oxygen Meter	Kelowna
Carbon, Total Organic	SM 5310 B	Combustion	Sublet
Oil and Grease, Total	EPA 1664A *	Liquid-Liquid Extraction with Hexane	Richmond
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Total Dissolved Solids (Gravimetric)	APHA 2540 C	Gravimetry (Dried at 103-105C)	Kelowna
Total Phosphorus in Water (Kjeldahl)	EPA 365.4 *	Sulfuric Acid Digestion, Automated Colorimetry	Kelowna
Total Suspended Solids	APHA 2540 D	Gravimetry (Dried at 103-105C)	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Method Reference Descriptions:

APHA Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation
EPA United States Environmental Protection Agency Test Methods

Glossary of Terms:

MRL Method Reporting Limit
< Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
mg/L Milligrams per litre
pH units pH < 7 = acidic, pH > 7 = basic

REPORTED TO PROJECT Watterson Geoscience
Inland Packers

WORK ORDER REPORTED 4101824
Nov-12-14

Analyte	Result / Recovery	MRL / Limits	Units	Prepared	Analyzed	Notes
---------	-------------------	--------------	-------	----------	----------	-------

Sample ID: MW-1 (4101824-01) [Water] Sampled: Oct-29-14 09:00

Anions

Chloride	61.8	0.10	mg/L	N/A	Oct-30-14	
Nitrogen, Nitrate as N	3.00	0.010	mg/L	N/A	Oct-30-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Oct-30-14	
Sulfate	20.6	1.0	mg/L	N/A	Oct-30-14	

General Parameters

BOD, 5-day	< 10	10	mg/L	Oct-30-14	Nov-04-14	
Carbon, Total Organic	8.8	0.5	mg/L	N/A	Nov-06-14	
Oil & Grease, Total	< 2	2	mg/L	N/A	Nov-04-14	
pH	7.65	0.01	pH units	Oct-30-14	Oct-30-14	
Phosphorus, Total Kjeldahl	2.76	0.01	mg/L	Oct-31-14	Nov-04-14	
Solids, Total Dissolved	414	10	mg/L	N/A	Oct-31-14	
Solids, Total Suspended	1040	1	mg/L	N/A	Oct-30-14	

Sample ID: MW-2 (4101824-02) [Water] Sampled: Oct-29-14 11:00

Anions

Chloride	188	0.10	mg/L	N/A	Oct-30-14	
Nitrogen, Nitrate as N	2.41	0.010	mg/L	N/A	Oct-30-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Oct-30-14	
Sulfate	36.0	1.0	mg/L	N/A	Oct-30-14	

General Parameters

BOD, 5-day	< 10	10	mg/L	Oct-30-14	Nov-04-14	
Carbon, Total Organic	6.8	0.5	mg/L	N/A	Nov-06-14	
Oil & Grease, Total	3	2	mg/L	N/A	Nov-04-14	
pH	7.48	0.01	pH units	Oct-30-14	Oct-30-14	
Phosphorus, Total Kjeldahl	2.29	0.01	mg/L	Oct-31-14	Nov-04-14	
Solids, Total Dissolved	652	10	mg/L	N/A	Oct-31-14	
Solids, Total Suspended	1270	1	mg/L	N/A	Oct-30-14	

REPORTED TO Watterson Geoscience
PROJECT Inland Packers

WORK ORDER 4101824
REPORTED Nov-12-14

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup):** Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS):** A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM):** A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
---------	--------	-----------	-------------	---------------	-------	-----------	-----	-----------	-------

Anions, Batch B4J1379

Blank (B4J1379-BLK1)

Prepared: Oct-29-14, Analyzed: Oct-29-14

Chloride	< 0.10	0.10 mg/L
Nitrogen, Nitrate as N	< 0.010	0.010 mg/L
Nitrogen, Nitrite as N	< 0.010	0.010 mg/L
Sulfate	< 1.0	1.0 mg/L

Blank (B4J1379-BLK2)

Prepared: Oct-30-14, Analyzed: Oct-30-14

Chloride	< 0.10	0.10 mg/L
Nitrogen, Nitrate as N	< 0.010	0.010 mg/L
Nitrogen, Nitrite as N	< 0.010	0.010 mg/L
Sulfate	< 1.0	1.0 mg/L

LCS (B4J1379-BS1)

Prepared: Oct-29-14, Analyzed: Oct-29-14

Chloride	16.2	0.10 mg/L	16.0	101	85-115
Nitrogen, Nitrate as N	4.06	0.010 mg/L	4.00	101	85-115
Nitrogen, Nitrite as N	1.93	0.010 mg/L	2.00	97	85-115
Sulfate	16.1	1.0 mg/L	16.0	101	85-115

LCS (B4J1379-BS2)

Prepared: Oct-30-14, Analyzed: Oct-30-14

Chloride	16.0	0.10 mg/L	16.0	100	85-115
Nitrogen, Nitrate as N	4.05	0.010 mg/L	4.00	101	85-115
Nitrogen, Nitrite as N	1.96	0.010 mg/L	2.00	98	85-115
Sulfate	16.1	1.0 mg/L	16.0	101	85-115

General Parameters, Batch B4J1395

Blank (B4J1395-BLK1)

Prepared: Oct-30-14, Analyzed: Oct-30-14

Solids, Total Suspended	< 1	1 mg/L
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Blank (B4J1395-BLK2)

Prepared: Oct-30-14, Analyzed: Oct-30-14

Solids, Total Suspended	< 1	1 mg/L
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QUALITY CONTROL DATA

REPORTED TO PROJECT Watterson Geoscience
Inland Packers

WORK ORDER REPORTED 4101824
Nov-12-14

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
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General Parameters, Batch B4J1395, Continued

Reference (B4J1395-SRM1)			Prepared: Oct-30-14, Analyzed: Oct-30-14						
Solids, Total Suspended	174	1 mg/L	159		109	80-120			
Reference (B4J1395-SRM2)			Prepared: Oct-30-14, Analyzed: Oct-30-14						
Solids, Total Suspended	148	1 mg/L	159		93	80-120			

General Parameters, Batch B4J1426

Blank (B4J1426-BLK1)			Prepared: Nov-04-14, Analyzed: Nov-04-14						
Oil & Grease, Total	< 2	2 mg/L							
LCS (B4J1426-BS1)			Prepared: Nov-04-14, Analyzed: Nov-04-14						
Oil & Grease, Total	36	2 mg/L	40.2		91	66-107			
LCS Dup (B4J1426-BSD1)			Prepared: Nov-04-14, Analyzed: Nov-04-14						
Oil & Grease, Total	37	2 mg/L	40.2		93	66-107	3	20	

General Parameters, Batch B4J1427

Blank (B4J1427-BLK1)			Prepared: Oct-30-14, Analyzed: Nov-04-14						
BOD, 5-day	< 10	10 mg/L							
LCS (B4J1427-BS1)			Prepared: Oct-30-14, Analyzed: Nov-04-14						
BOD, 5-day	197	10 mg/L	198		99	85-115			
Duplicate (B4J1427-DUP1)			Prepared: Oct-30-14, Analyzed: Nov-04-14						
BOD, 5-day	< 10	10 mg/L		< 10				20	

General Parameters, Batch B4J1442

Blank (B4J1442-BLK1)			Prepared: Oct-31-14, Analyzed: Oct-31-14						
Solids, Total Dissolved	< 10	10 mg/L							
Reference (B4J1442-SRM1)			Prepared: Oct-31-14, Analyzed: Oct-31-14						
Solids, Total Dissolved	247	10 mg/L	240		103	85-115			

General Parameters, Batch B4J1445

Reference (B4J1445-SRM1)			Prepared: Oct-30-14, Analyzed: Oct-30-14						
pH	6.99	0.01 pH units	7.00		100	98-102			
Reference (B4J1445-SRM2)			Prepared: Oct-30-14, Analyzed: Oct-30-14						
pH	6.99	0.01 pH units	7.00		100	98-102			

General Parameters, Batch B4K0005

Blank (B4K0005-BLK1)			Prepared: Oct-31-14, Analyzed: Nov-04-14						
Phosphorus, Total Kjeldahl	< 0.01	0.01 mg/L							
LCS (B4K0005-BS1)			Prepared: Oct-31-14, Analyzed: Nov-04-14						
Phosphorus, Total Kjeldahl	0.52	0.01 mg/L	0.500		104	75-120			



Report Date: October 11, 2017

File: 108093

Report Number: 061992

ROCANA MEATS LTD.
4141 54th St SE
Salmon Arm BC V1E 3P8

Dear ROCANA MEATS LTD.

Re: Non-compliance Advisory Letter, Code of Practice for Slaughter and Poultry Processing 108093, 4141 54th Street SE, Salmon Arm BC V1E 3P8, Effluent

On June 20, 2017, Ministry of Environment, Environmental Protection Division staff conducted an inspection of your facility, ROCANA MEATS LTD. located at 4141 54th Street SE, Salmon Arm BC V1E 3P8 with authorization number 108093 under the *Environmental Management Act*.

Failure to comply with the terms and conditions set out in your authorization is an offence under the *Environmental Management Act* (EMA).

A person who fails to comply with a provision of EMA may be found guilty of an offence and could be liable, on summary conviction, to a penalty. For your reference, EMA and all related and pertinent British Columbia Laws can be found at <http://www.bclaws.ca/>.

It should also be noted that, as an alternative to prosecution of the offence mentioned above, the Ministry may initiate action to impose an administrative penalty against ROCANA MEATS LTD.. The *Administrative Penalties Regulation (EMA)* (B.C. Reg. 133/2014) (APR) was brought into force in 2014. The APR describes the prescribed provisions of the *EMA* as well as that of specified regulations under which administrative penalties can be assigned.

This Advisory, the alleged violations and the circumstances to which it refers will form part of the compliance history of ROCANA MEATS LTD., and will be taken into account in the event of future non-compliance.

Please note that this authorization is considered to be out of compliance until such a time as it can be confirmed to meet the authorization requirements.

Inspection Details:

Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 2 (1)(a): Subject to subsection (2), a person must register under section 4 of the Waste Discharge Regulation for the purposes of an exemption under that section in relation to this code, and must include, with the other information required under section 4 (2) of that regulation, the following information: (a) the annual production, in tonnes of live weight killed per calendar year, of red meat and of poultry products by the person's facility;
Details/Findings:	The revised registration form accepted on 24 September 2015 stated that the annual production as 6277 tonnes of live weight killed per year.
Compliance:	In
Actions to be taken:	

Ministry of Environment

Compliance
Environmental
Protection Division

Mailing Address:
1259 Dalhousie Dr
Kamloops BC V2C 5Z5

Telephone: 250 371 6200
Facsimile: 250 371 6234
Website: www.gov.bc.ca/env

Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 2 (1)(b): Subject to subsection (2), a person must register under section 4 of the Waste Discharge Regulation for the purposes of an exemption under that section in relation to this code, and must include, with the other information required under section 4 (2) of that regulation, the following information: (b) the maximum amount of wastewater discharged from the person's facility, in cubic metres per day;
Details/Findings:	The revised registration form accepted on 24 September 2015 stated that the maximum wastewater discharge at 38.1 cubic metres per day.
Compliance:	In
Actions to be taken:	
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 6 (a): A person operating a category B facility (a) must comply with section 5, and
Details/Findings:	Section 5(a) states: "A person operating a category A facility (a) must not discharge wastewater directly into groundwater or into a watercourse". The wastewater discharge system was initially designed by a qualified professional. Compliance with this section cannot be determined without any sampling records.
Compliance:	Not Determined
Actions to be taken:	Design or update, and implement, a groundwater monitoring plan to establish compliance with this condition.
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 6 (a): A person operating a category B facility (a) must comply with section 5, and
Details/Findings:	Section 5(c)(i) states: "A person operating a category A facility (c) must keep records of the following information: (i) the amount of wastewater discharged, in cubic metres per day, from the category A facility for any period during which there is a discharge" Site data for daily wastewater flow was given as follows: - Approximately 6000- 7000 gallons per day when killing, slaughtering twice per week - The balance of the week is clean up water from further processing - In total approximately 35000 gallons per week This is compliant with the maximum discharge as provided in the registration documents.
Compliance:	In
Actions to be taken:	Please provide future measurements in cubic metres.
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 6 (a): A person operating a category B facility (a) must comply with section 5, and
Details/Findings:	Section 5(c)(ii) states: "A person operating a category A facility (c) must keep records of the following information: (ii) production volumes of red meat or poultry, in tonnes of live weight killed per year" The annual production for 2016 in tonnes of live weight killed, in monthly intervals, was requested as part of the inspection. The information provided was "approximately 50 tonne per week" which is under the value submitted on the registration forms.
Compliance:	In
Actions to be taken:	In future, please provide specific and accurate information as required.
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 6 (b): A person operating a category B facility (b) must ensure that a discharge of wastewater from the category B facility is carried out in accordance with either section 7 or 8, as applicable.

Details/Findings:	Wastewater from this facility is discharged into the (section 7) subsurface of the ground by a system designed by a qualified professional.
Compliance:	In
Actions to be taken:	
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 7 (1): Wastewater discharged into the subsurface of the ground from a category B facility must not surface and must not cause the groundwater table to be raised to the surface.
Details/Findings:	<p>Inspection, testing and monitoring results were requested to establish compliance under this section and related sections. None were provided. The company that was contracted to sample and report is no longer associated with Rocana Meats. According to Mr Deboer of Rocana, their records were not provided to Rocana on departure.</p> <p>While the parameters to be monitored for ground discharge are not specified in the Code of Practice For The Slaughter And Poultry Processing Industries, it is recommended that a Qualified Professional design a monitoring program to demonstrate that the discharge is not causing pollution of any groundwater.</p> <p>According to the onsite wastewater system plans and notes, designed by a qualified professional, monitoring of the facility is outlined as follows:</p> <p>8. Effluent samples shall be taken from the dosing chamber. Sample to be analyzed for bod, TSS, ammonia, ph 8. Fecal coliform. Samples to be taken and analyzed quarterly at least for the first two years. Results to be recorded on maintenance report.</p> <p>9. The aerated treatment system shall be under maintenance agreement 8. Serviced semi-annually. Elapsed timer and cycle counter readings to be recorded on maintenance report.</p>
Compliance:	Not Determined
Actions to be taken:	Design or update, and implement, a groundwater monitoring plan to establish compliance with this condition.
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 7 (2): A person discharging wastewater under subsection (1) must conduct inspections of the discharge site to ensure compliance with that subsection.
Details/Findings:	<p>Inspection, testing and monitoring results were requested to establish compliance under this section and related sections. None were provided.</p> <p>The aforementioned sampling plan results have not been provided.</p>
Compliance:	Out
Actions to be taken:	Design or update, and implement, a groundwater monitoring plan to establish compliance with this condition.
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 7 (3): The subsurface wastewater disposal system of a category B facility that discharges wastewater into the subsurface of the ground for the first time after September 30, 2007, must be designed by a qualified professional and installed according to that design.
Details/Findings:	The subsurface wastewater disposal system plans were provided to the Ministry. They are signed by a qualified professional and are dated 4 September 2015.
Compliance:	In
Actions to be taken:	

Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 7 (5)(a): A person operating either a category A facility or a category B facility may discharge wastewater containing domestic sewage into the subsurface of the ground if (a) the domestic sewage source is from the facility.
Details/Findings:	Discharge wastewater containing domestic sewage only sourced from the facility is released into the subsurface of the ground.
Compliance:	In
Actions to be taken:	
Requirement Description:	Environmental Management Act, Code Of Practice For The Slaughter And Poultry Processing Industries (246/2007) (EMA) 7 (5)(d): A person operating either a category A facility or a category B facility may discharge wastewater containing domestic sewage into the subsurface of the ground if (d) the subsurface wastewater disposal system is designed by a qualified professional and installed according to that design.
Details/Findings:	The subsurface wastewater disposal system plans were provided to the Ministry. They are signed by a qualified professional and are dated 4 September 2015. They specifically note Sanitary/Bathroom waste of volume 1380L/Day as an input.
Compliance:	In
Actions to be taken:	

Compliance History: This is the first electronic record for this file. The site inspection was triggered due to a complaint regarding wastewater surfacing via a portal.

The scope of the inspection was to assess Rocana Meats, Registration Number 108093, for compliance under the Code Of Practice For The Slaughter And Poultry Processing Industries.

Rocana Meats now owns the facility which was previously owned by Inland Meats. That facility operated on the site for a number of years.

While it is understood that the company hired to undertake the sampling program previously is no longer associated with Rocana, and did not provide their sampling results and reports before departure, this does not provide an adequate reason for the operator of the site to not have copies. It is understood that Rocana has hired new contractors for the upgrade to the wastewater system, including the DAF addition, as well as undertaking the monitoring program. For future reference, Rocana is responsible to retain copies of all data for ten years under this code.

Please provide all updated plans and sampling as noted above.

Please implement the necessary changes or modifications immediately to address issues and to bring it into compliance and notify this office by email or letter within 30 days of this letter, advising what corrective measures have been taken, and what else is being done, to bring this authorization into compliance.

Please be advised that this inspection report may be published on the provincial government website within 7 days.

Please submit all annual/quarterly/monthly reports and data submissions to the Ministry's Routine Environmental Reporting Submission Mailbox at EnvAuthorizationsReporting@gov.bc.ca. More information about the reporting requirements may be found at <http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/routine-environmental-reporting-submission-mailbox>

Below are attachments related to this inspection.

If you have any questions about this letter, please contact the undersigned.

Yours truly,

Ross Blake

Environmental Protection Officer

cc:

Attachments:

1) Photo Log 2017-06-20 Site inspection.pdf Photo Log 2017-06-20 Site inspection

Deliver via:

Email: ☒ Fax: ☐ Mail: ☐
Registered Mail: ☐ Hand Delivery: ☐

Ministry of Environment

Compliance
Environmental
Protection Division

Mailing Address:
1259 Dalhousie Dr
Kamloops BC V2C 5Z5

Telephone: 250 371 6200
Facsimile: 250 371 6234
Website: www.gov.bc.ca/env

DISCLAIMER:

Please note that sections of the permit, regulation or code of practice referenced in this inspection record are for guidance and are not the official version. Please refer to the original permit, regulation or code of practice.

To see the most up to date version of the regulations and codes of practices please visit
<http://www.bclaws.ca>

If you require a copy of the original permit, please contact the inspector noted on this inspection record or visit:
<http://www2.gov.bc.ca/gov/topic.page?id=DF89089126D042FD96DF5D8C1D8B1E41&title=Publically%20Viewable%20Authorizations>

It is also important to note that this inspection record does not necessarily reflect each requirement or condition of the authorization therefore compliance is noted only for the requirements or conditions listed in the inspection record.

NRIS Photo Record

Authorization: 108093	Rocana Meats Ltd
NRIS IR #: 61992	2017-06-20 Site Inspection Photos

Photo 1
Wastewater system
portals, facing SE



Photo 2
Wastewater system
meter, facing SW



NRIS Photo Record

Authorization: 108093	Rocana Meats Ltd
NRIS IR #: 61992	2017-06-20 Site Inspection Photos

Photo 3
Sampling well under
infiltration field, facing
W



Photo 4
Wastewater system
portals, facing NW





Category : Code 1

Incident Date Time : 2017-12-14 ONGOING

MCTS # :

Spiller :	ROCANA MEATS		
Location :	4141 54 ST SE		
Area :	SALMON ARM DISTRICT	EMBC Region :	CTL
		MOE Region :	Thompson Region
Material(s):	SLAUGHTERED LIVESTOCK WASTE		
Amount(s):	UNKNOWN		
Received From:			
Caller A :	CONFIDENTIAL (NAME & CONTACT INFO ON FILE IN ECC)	Caller B :	
Org :	s.15,s.22	Org :	
Phone :	Cellular CONFIDENTIAL	Phone :	
Alternate :		Alternate :	
Time :		Time :	
Received by EMBC Operations Officer :	DAWN	When Received :	2017-12-14 13:48
Affected Environment :	Ground	Other :	
Type of Spilling :	Unknown	Other Spill Type :	
Accidents:			
Sector:	PRIVATE		
Cause :			
s.15,s.22			
s.15,s.22			
s.15.s.22	Caller thinks this should be looked into.		
s.15,s.22			
Response :			
Jurisdiction :	Federal, Provincial		
Task # :	Amount : \$	Issued To :	
Notification :			
13:58	briefed MOE RO Rick Wagner - Fed/Prov 1		
14:03	briefed PDM/NEEC		
14:15	emailed MOE Kamloops		

From: Vergamini, Don ENV:EX
To: "wei liu"
Subject: RE: Inland Meat Packers
Date: March 20, 2014 9:10:00 AM
Attachments: Tai-Ni Food - Request for more information.pdf

Hi Wei

The wastewater treatment system located on site cannot be permitted immediately for operation. The system may only be operated after receiving an effective registration under the "Code of Practice for the Slaughter and Poultry Processing Industries".

In order to register this facility the following registration form must be submitted to the Ministry:

http://www2.gov.bc.ca/assets/gov/topic/C0188F632AEC266B044F8A2B756F055F/industrial_waste/slaughterregform.pdf

A copy of the Code of Practice may be found here: http://www.bclaws.ca/Recon/document/ID/freeside/18_246_2007

In addition to the requirements of the Code of Practice you will also be required to follow the requirements of other Ministries such as the Canadian Food Inspection Agency and possibly others.

As I indicated to you earlier, the Ministry has significant concerns that the wastewater treatment system located at the site will be unable to achieve effluent of an acceptable quality. The design drawing 2010-64-3 and a 3 page spreadsheet were reviewed on June 26, 2012 upon application the latest registration for this site under the Code of Practice. The submitted spreadsheet contained calculations that the 7500 imperial gallon MicroFAST wastewater treatment system would remove 22% of the BOD (Biological Oxygen Demand) and that the 3500 imperial gallon tank with simple aeration would remove 78% of the BOD. I believe there are significant errors in these calculations as an aeration tank, less than half the size of the treatment system, cannot possibly remove 78% of the BOD.

As a result of the earlier submitted registration and information, the Ministry responded with a letter dated June 26, 2012. I have attached a copy of this letter to this e-mail. It is likely, should you submit a Registration application for this discharge, that a similar letter will be issued to your company.

I have reviewed the letter you sent dated November 16, 2013 and have two significant concerns.

- The letter indicates that a drywell is being proposed. I assume the "truck well and receiving" noted in the letter is the location where the animals are unloaded and where significant volumes of liquid and solid excrement are present. I do not believe it is acceptable to discharge these liquids directly to a drywell and into the ground without treatment.
- The letter does not propose any changes to the treatment system. This system (without the newly added equalization tank) was only able to operate between October 2007 and March 2008 before the tile field became plugged and effluent was surfacing.

I would highly recommend a pre-registration with the Ministry should you consider submitting a registration for this site. You may also wish to obtain some of the historical information in the files.

If you have any questions, feel free to give me a call.

Don Vergamini, ASCT
Environmental Protection Officer
Ministry of Environment

1259 Dalhousie Drive, Kamloops BC V2C 5Z5
Phone: 250-371-6343 Fax 250-828-4000
e-mail: Don.Vergamini@gov.bc.ca
<http://www.env.gov.bc.ca/epd/regions/thompson>

From: wei liu [mailto:wei.liu@strongenterprises.com]
Sent: Wednesday, March 19, 2014 3:46 PM
To: Vergamini, Don ENV:EX
Subject: Fwd: Inland Meat Packers

Dear Mr Don Vergamini:

Our company intends to purchase a slaughterhouse named Inland Meat Packers, located at 4141 54 St SE, Salmon Arm. Its products used to be mainly for export, and partially for supplying the domestic market. We have signed a conditional purchase agreement as attached hereto. Because the business has been suspended for years, we'd like to inquire your office about the reason for that if pertaining to permitting of waste discharge and so on. If the establishment cannot be permitted immediately for operation after the purchase, is it possible to allow reopening the business after implementation of the attached change and upgrade plan? What else would be needed to get your approval? How long would it take by your estimate? What regulations and/or rules should we follow while in operation?

We would appreciate your response at your earliest convenience.

Yours sincerely,

Wei Liu
Secretary
Name of responsible person
Position with the company:
Strong Enterprises Limited
March 19, 2014



File: RE-106180
Xref: RE-100418

June 26, 2012

Tai-Ni Food Inc
3505 E 48th Avenue
Vancouver BC V5S 1H6

Dear Anderson Hsieh:

Re: Registration under the Code of Practice for the Slaughter and Poultry Processing Industries

The Ministry received your initial registration on May 14, 2012. The Ministry has also received the design drawings of the treatment and disposal works and a rational for the treatment system design.

The submitted Registration, design drawings and design rational for the treatment system have been reviewed. I have concerns that the treatment system as proposed will be unable to produce effluent of an acceptable quality. The designs project a BOD reduction of 78% in the aeration tank and a 22% BOD reduction in the MicroFAST 9.0 treatment system.

Therefore as per section 4(2) (l) of the Waste Discharge Regulation, I require the following to be submitted to complete your registration:

- A peer review of the wastewater treatment system design and rational. The peer review is to include:
 - Discussion of the assumed influent characteristics,
 - Should similarly facilities be used to validate the design, provide design details and supporting influent and effluent analytical data to verify system capability.
- A proposed environmental monitoring plan
- A commissioning plan. The commissioning plan will include:
 - Length of the proposed commissioning period,
 - Proposed sampling frequency, effluent parameters and sampling locations,
 - Contingency plans determining effluent quality that may be discharged to the tile field and disposal plans for effluent determined unfit for tile field disposal.
- An update of the environmental impact study by a qualified professional.
- An updated site plan showing lot description and location of the treatment and disposal works.

June 26, 2012

The submitted registration will be considered complete upon submission of the above and will become effective 45 days after submission.

Discharge cannot commence until such time as the registration is effective. The Director may reduce the 45 day period, and, it is my intention to expedite this Registration following receipt of the required information.

If you have any questions, feel free to contact Don Vergamini at (250) 371-6343.

Sincerely,

A handwritten signature in black ink, appearing to read 'Larry Gardner', with a large, sweeping loop at the end.

Larry Gardner, AScT, Eng. L
for Director, Environment Management Act
Thompson and Cariboo Regions

Cc: Dick Bartel, Point One Engineering, 8816 Michael Drive, Coldstream, BC V1B 2B9
Paul Blackett, Kala Groundwater, 1314 McGill Road, Kamloops, BC V2C 6N6

From: Vergamini, Don ENV:EX
To: "wei liu"
Cc: Danyluk, Carol ENV:EX
Subject: RE: Inland Meat Packers
Date: March 24, 2014 8:42:00 AM

I just realized a lot of the engineering firms we often deal with don't all come up with a Kamloops search....

For more you may also want to look at the Kelowna search, as many also do work in Salmon Arm.

<http://www.yellowpages.ca/search/si-alpha/2/Consulting+Engineers/kelowna+BC>

Don Vergamini, ASCT
Environmental Protection Officer
Ministry of Environment
1259 Dalhousie Drive, Kamloops BC V2C 5Z5
Phone: 250-371-6343 Fax 250-828-4000
e-mail: Don.Vergamini@gov.bc.ca
<http://www.env.gov.bc.ca/epd/regions/thompson>

From: Vergamini, Don ENV:EX
Sent: Monday, March 24, 2014 8:07 AM
To: 'wei liu'
Cc: Danyluk, Carol ENV:EX
Subject: RE: Inland Meat Packers

Hi Wei

I do not have a list of engineering companies. I would suggest the Yellow Pages:

<http://www.yellowpages.ca/search/si-alpha/1/Consulting+Engineers/kamloops+BC>

Any information that has been submitted to the Ministry is freely available (except for any complaints we may have received... a complainant's name is protected under the Freedom of Information and Protection of Privacy Act), though there are photocopying charges of \$0.25 per page if the request is greater than 25 pages. If there is anything in the file that could help, we can make you copies.

Yes, I am free on Wednesday if you would like to come in. If you could let me know approximately when, I will book a meeting room.

Don Vergamini, ASCT
Environmental Protection Officer
Ministry of Environment
1259 Dalhousie Drive, Kamloops BC V2C 5Z5
Phone: 250-371-6343 Fax 250-828-4000
e-mail: Don.Vergamini@gov.bc.ca
<http://www.env.gov.bc.ca/epd/regions/thompson>

From: wei liu [<mailto:vina8223@gmail.com>]

Sent: Friday, March 21, 2014 9:58 AM
To: Vergamini, Don ENV:EX
Subject: Re: Inland Meat Packers

Dear Don,

Thanks a lot for your prompt and very helpful response via email and telephone regarding Inland Meat Packers. We really wish to move forward by engaging a qualified and experienced engineering company so as to redesign and implement the waste treatment system, providing that your approval is granted. If you have a list of such companies, we will really appreciate to have that information and choose from them. On the other hand, you mentioned you could provide us the historical drawings, plans and reviews of the establishment, that will be of great help and we would be more than pleased to have those.

Moreover, are you available next Wednesday for a brief meeting with our chairman? He will be visiting the establishment in Salmon Arm, and would like to stop by your office if that's convenient for you too.

Wei Liu
Secretary
Name of responsible person
Position with the company:
Strong Enterprises Limited

2014-03-20 9:45 GMT-07:00 Vergamini, Don ENV:EX <Don.Vergamini@gov.bc.ca>:
Hi Wei

Just a quick follow-up...

I mentioned below that I would highly recommend a pre-Registration. What I meant to say was that I highly recommend a pre-registration meeting with the Ministry.

We encourage meetings prior to registration so that we can go over any proposals and try to insure there are no surprises for the owners.

Thanks

Don Vergamini, ASCT
Environmental Protection Officer
Ministry of Environment
1259 Dalhousie Drive, Kamloops BC V2C 5Z5
Phone: [250-371-6343](tel:250-371-6343) Fax [250-828-4000](tel:250-828-4000)
e-mail: Don.Vergamini@gov.bc.ca
<http://www.env.gov.bc.ca/epd/regions/thompson>

From: Vergamini, Don ENV:EX
Sent: Thursday, March 20, 2014 9:11 AM

To: 'wei liu'
Subject: RE: Inland Meat Packers

Hi Wei

The wastewater treatment system located on site cannot be permitted immediately for operation. The system may only be operated after receiving an effective registration under the "Code of Practice for the Slaughter and Poultry Processing Industries".

In order to register this facility the following registration form must be submitted to the Ministry:

http://www2.gov.bc.ca/assets/gov/topic/C0188F632AEC266B044F8A2B756F055F/industrial_waste/slaughterregform.pdf

A copy of the Code of Practice may be found here: http://www.bclaws.ca/Recon/document/ID/freeside/18_246_2007

In addition to the requirements of the Code of Practice you will also be required to follow the requirements of other Ministries such as the Canadian Food Inspection Agency and possibly others.

As I indicated to you earlier, the Ministry has significant concerns that the wastewater treatment system located at the site will be unable to achieve effluent of an acceptable quality. The design drawing 2010-64-3 and a 3 page spreadsheet were reviewed on June 26, 2012 upon application the latest registration for this site under the Code of Practice. The submitted spreadsheet contained calculations that the 7500 imperial gallon MicroFAST wastewater treatment system would remove 22% of the BOD (Biological Oxygen Demand) and that the 3500 imperial gallon tank with simple aeration would remove 78% of the BOD. I believe there are significant errors in these calculations as an aeration tank, less than half the size of the treatment system, cannot possibly remove 78% of the BOD.

As a result of the earlier submitted registration and information, the Ministry responded with a letter dated June 26, 2012. I have attached a copy of this letter to this e-mail. It is likely, should you submit a Registration application for this discharge, that a similar letter will be issued to your company.

I have reviewed the letter you sent dated November 16, 2013 and have two significant concerns.

- The letter indicates that a drywell is being proposed. I assume the "truck well and receiving" noted in the letter is the location where the animals are unloaded and where significant volumes of liquid and solid excrement are present. I do not believe it is acceptable to discharge these liquids directly to a drywell and into the ground without treatment.
- The letter does not propose any changes to the treatment system. This system (without the newly added equalization tank) was only able to operate between October 2007 and March 2008 before the tile field became plugged and effluent was surfacing.

I would highly recommend a pre-registration with the Ministry should you consider submitting a registration for this site. You may also wish to obtain some of the historical information in the files.

If you have any questions, feel free to give me a call.

Don Vergamini, ASCT
Environmental Protection Officer
Ministry of Environment
1259 Dalhousie Drive, Kamloops BC V2C 5Z5

Phone: 250-371-6343 Fax 250-828-4000
e-mail: Don.Vergamini@gov.bc.ca
http://www.env.gov.bc.ca/epd/regions/thompson

From: wei liu [<mailto:s.22>]
Sent: Wednesday, March 19, 2014 3:46 PM
To: Vergamini, Don ENV:EX
Subject: Fwd: Inland Meat Packers

Dear Mr Don Vergamini:

Our company intends to purchase a slaughterhouse named Inland Meat Packers, located at 4141 54 St SE, Salmon Arm. Its products used to be mainly for export, and partially for supplying the domestic market. We have signed a conditional purchase agreement as attached hereto. Because the business has been suspended for years, we'd like to inquire your office about the reason for that if pertaining to permitting of waste discharge and so on. If the establishment cannot be permitted immediately for operation after the purchase, is it possible to allow reopening the business after implementation of the attached change and upgrade plan? What else would be needed to get your approval? How long would it take by your estimate? What regulations and/or rules should we follow while in operation?

We would appreciate your response at your earliest convenience.

Yours sincerely,

Wei Liu
Secretary
Name of responsible person
Position with the company:
Strong Enterprises Limited
March 19, 2014

From: [Vergamini, Don ENV:EX](#)
To: [Barlas, Sajid A ENV:EX](#)
Cc: [Danyluk, Carol ENV:EX](#)
Subject: Former Inland Meat Packers Property
Date: March 26, 2014 4:23:00 PM

FYI

I had the meeting with the prospective purchasers of Inland Meat Packers.

I think it went quite well. I will create some notes for the file tomorrow morning.

They seemed quite interested and asked good questions which allowed me to show them why the submitted treatment calculation were wrong and why the treatment system would not operate properly. The discussion was slightly complicated as it was done through their interpreter, however I think they understood based on follow up questions.

I believe that their next step is to find an engineer to look at the current system or put in a new system, if they still decide to follow through with the purchase.

Don Vergamini, ASCT
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<http://www.env.gov.bc.ca/epd/regions/thompson>

From: [Vergamini, Don ENV:EX](#)
To: ["strong enterprise"](#)
Subject: RE: Inland Meat Packer
Date: April 2, 2014 8:00:00 AM

Your welcome.

Feel free to have the engineering firm you have hired contact me should they require any information about the site.

Don Vergamini, AScT

Environmental Protection Officer

Ministry of Environment

1259 Dalhousie Drive, Kamloops BC V2C 5Z5

Phone: 250-371-6343 Fax 250-828-4000

e-mail: Don.Vergamini@gov.bc.ca

<http://www.env.gov.bc.ca/epd/regions/thompson>

From: strong enterprise [mailto:strongenterpriseinc@gmail.com]
Sent: Wednesday, April 2, 2014 6:30 AM
To: Vergamini, Don ENV:EX
Subject: Inland Meat Packer

Good morning Mr. Vergamini,

This is Fan writing on behalf of Strong Enterprise Inc. from Vancouver regarding Inland Meat Packer.

Your email on March 27 regarding the kill numbers of Inland Meat Packer has been received.

We would like to thank you for taking the time to meet with us in your office. The thorough information you provided were rather helpful to our decision making. Also thank you for the Chinese speaking engineering firm that you mentioned. We will contact you if we need any other help in the future. Again, thank you and have a wonderful day.

Strong Enterprise Inc.