

ROLLA WASTEWATER TREATMENT PLANT CONDITION ASSESSMENT

FINAL - 2020-10-26

ASSESSMENT REPORT

CONFIDENTIAL



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ASSESSMENT REPORT

ROLLA WASTEWATER TREATMENT PLANT CONDITION ASSESSMENT

PEACE RIVER REGIONAL DISTRICT
CONFIDENTIAL
PROJECT NO. 201-07251-00
AUGUST 2020

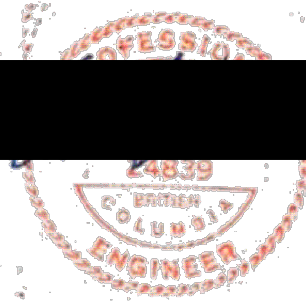
SIGNATURES

PREPARED BY



2020/10/26

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Project Manager



2020/10/26

APPROVED¹ BY



Doug Randell, Eng.L, PMP
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October 26, 2020

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Peace River Regional District
1981 Alaska Avenue
Dawson Creek BC V1G 4H8

Attention: Kari Bondaroff

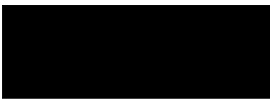
Subject: Rolla Wastewater Treatment Plant - Condition Assessment

We are pleased to present the following condition assessment for the Rolla Wastewater Treatment Plant. The assessment is based on the walk-through in July 2020 and subsequent analysis reports.

We trust the document provides what you need for long-term planning at this site.

If you have any questions, please give me a call.

Sincerely,

A black rectangular redaction box covering the signature of Kevin Wiens.

2020/10/26

Kevin Wiens, P.Eng.

Project Manager

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WSP Canada Inc

#420, 301 Victoria St

Kamloops, BC

1 INTRODUCTION

WSP Canada Inc. (WSP) was engaged by Peace River Regional District in June of 2020 to perform a condition assessment on the existing Hamlet of Rolla wastewater treatment plant and to determine any deficiencies, remaining life, and a cost estimate for repair or replacement.

Our field observer was Kevin Wiens, P.Eng. and he was on site July 28, 2020 to perform a visual inspection. He met with operations Kari Bondaroff, Paulo Eichelberger, and Travis Nelson to walk through the site and answer questions.

The original treatment and collection systems were constructed in 1977 and consisted of a gravity collection and conveyance system, a lift station, forcemain, aerobic stabilization pond, and an effluent outfall. In 2002, a second lagoon was added including a fine bubble diffuser aeration system in the original lagoon.

This report outlines the results from our site review of the wastewater treatment plant in Rolla, BC. Assets reviewed include the lift station, overflow & drain structure, lagoon berms, aeration system, blower building, piping, outfall, and overall site conditions.

1.1 REPORT LIMITATIONS

The purpose of this report is to provide a general indication of the present physical condition of the infrastructure with respect to easily visible portions of the wastewater treatment infrastructure. We were to record deficiencies or conditions noted during a single visual walk-through review that in our opinion, will likely require Capital expenditures by the Owner over the next 10 years. Capital expenditures are defined as expenditures that are expected to exceed an annual threshold of \$5,000 and are not normally associated with routine maintenance.

Our opinion of costs assumes a prudent level of ongoing maintenance. It is not within our mandate to check the adequacy of existing maintenance practices or confirm that all mandatory system tests and inspections have been completed. In the course of our review, we may identify some maintenance-type issues, but this should not be seen to indicate that a maintenance audit has been completed.

Timeframes given for undertaking work represent our opinion of when to budget for the work. Failure of the item, or the optimum repair / replacement process, may vary from our estimate.

The budget figures are our opinion of a probable current dollar value of the works and are provided for approximate budget purposes only. Accurate figures can only be obtained by establishing a scope of work and receiving quotes from suitable contractors.

2 SYSTEM OVERVIEW

The Hamlet of Rolla is located 20km north of Dawson Creek, BC. It has a reported population of 103 as per the 2016 census.

The Rolla wastewater system consists of a gravity collection system within the Hamlet of Rolla community, a lift station immediately upstream of the lagoons, a 1.0 hectare aerated lagoon and blower system, a 1.0 hectare storage lagoon, and an outfall to Rolla Creek. The system operates automatically except for the annual discharge to Rolla Creek which must be manually operated by staff over the course of a day or two, typically in the early spring.

The original collection system, lift station, lagoon and discharge were constructed in 1977. In 2002, aeration was added to the lagoon, and a second lagoon constructed as a storage lagoon. In 2016, the blower building and equipment for the aeration system was replaced.

As per the Operating Permit from March 1995, the maximum authorized discharge rate is 5000 m³/year. Dilution of effluent in Rolla Creek is authorized at 50:1 or greater (Paragraph 1.1.1). The operating / discharge permit for the system is attached in Appendix C.



Figure 1 - System Overview



Figure 2 - Wastewater Treatment Plant - Layout

3 ASSESSMENT RESULTS

The scope of this assessment includes the whole treatment and disposal system but not including the collection system and trunk main to the lift station. Results of the assessment are summarized in the following section. Detailed assessment observations are included in Appendix A.

3.1 SITE CONDITIONS

3.1.1 ACCESS ROAD

The treatment plant site is accessed off Sweetwater Road, 0.5km east of Rolla Road. The narrow gravel road is 1600m long and is maintained by the local farmer and gas company. It is passable during dry conditions for high clearance vehicles. The access road for the treatment plant is 400m long and is maintained by PRRD.

The portion maintained by PRRD should be improved for better access for lower clearance vehicles and all-weather travel. An estimated volume of gravel to supplement the access road and parking area was determined to be 200m long by 4m wide, by 100mm thick, or 80 m³.



Figure 3: Access Road Photo from Assessment Site Visit (2020-07-28)

3.1.2 SITE SECURITY

The treatment plant site is surrounded by a barbed wire fence and locked steel gate. As per the Operating Permit section 2.5, the purpose of security is to prevent “accidental trespass”. These appear to be in acceptable condition given the remoteness of the site. (Refer to Operating Permit Section 2.5)

One portion of the property not surrounded by fence is the outfall piping. Access to the valves and discharge piping during annual discharge is through cultivated fields. This area should be surrounded by fence with a road access to the discharge piping manholes. Encompassing the entire property would require 1200m of barbed wire fence.



Figure 4 - Proposed New Fence

3.1.3 SAFETY SIGNAGE

Safety signage was noted to be deficient in some areas as there is a lack of signage near several safety hazards. For example, “No Unauthorized Access”, “Confined Space Entry”, and “Dangerous Open Water” signs should be installed at the entrance to the site. The lift station should also have safety signage indicating the danger of opening the hatches. We would suggest up to five new metal signs may be appropriate. (Refer to Operating Permit Section 2.6)

	Site Conditions	Repairs	Priority	Probable Cost
SC 1	Access Road	4m wide Gravel topping - 400m x 4m x 100mm deep (access road) + access to discharge manhole (150m x 4m x 300mm) = 360 m ³	1-3 years	\$ 68,200
SC 2	Fencing	New Perimeter Barbed Wire Fence - 1200m * \$70 / m	1-3 years	\$ 84,000
SC 5	Safety Signage	Safety signs x 5	<1 year	\$ 2,000
				\$ 154,200

3.2 LIFT STATION

The lift station is a duplex pump system with alternating submersible pumps controlled by an ultrasonic level transmitter. Recent upgrades have included a power plug installed to facilitate a portable backup generator in case of power loss. Another recent upgrade is a strainer to collect garbage before entering the lift station. The strainer is operating effectively, however it needs to be emptied manually on a regular basis.

The lift station was found to be generally in good condition with several urgent repairs to be made.



Figure 5: Lift Station Manhole Photo from Assessment Site Visit (2020-07-28)

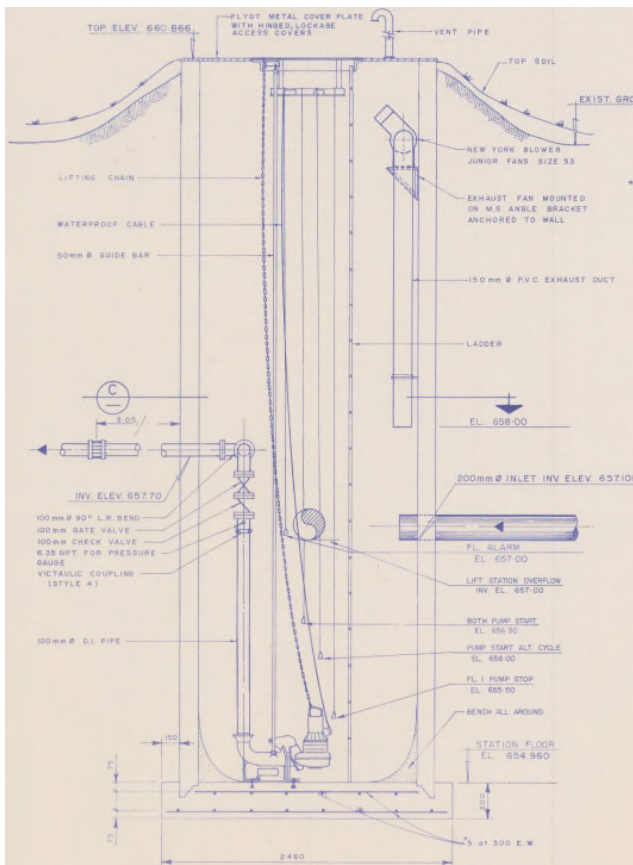


Figure 6: Lift Station Drawing (from Underwood McLellan Drawing Set)

3.2.1 PUMPS

Pumps are approximately 10 years old and are in good condition and pump sufficiently. There are 2 duty pumps and 1 spare on site. Based on their age, these are expected to need replacement in the next 3-10 years, however, pumps operating in severe conditions such as this can fail prematurely or unexpectedly.

Annual maintenance consists of taking one pump offline at a time, sending it to a subcontractor for inspection and maintenance. Recent repairs have involved resolving a plugging issue in one of the pumps and replacing the other one.

3.2.2 ACCESS LADDER

It is currently not possible to enter the lift station without a portable man-rescue tripod system. In addition, several rungs are missing from the ladder which should be replaced, to facilitate entry, even with a man-rescue tripod system. The existing ladder rungs should be removed so that personnel are not tempted to use them. Portable ladders should be used.

3.2.3 HANDRAILS

There are no handrails or safety netting to protect an operator from falling when the lift station hatch is open. Hatch safety netting or handrails should be installed.

3.2.4 HATCH LOCK

There are no locks or property latches on the lift station hatches. Install latches and locks for security and safety.

3.2.5 VALVES

The check valves downstream of the pumps were recently replaced with swing check valves. During the recent removal of pumps for maintenance, the two isolation valves were exercised. All check valves and isolation valves are in good working order, operate smoothly, and have with no leaks.

3.2.6 PUMP CHAMBER

The pump chamber appears to be structurally sound. This structure can be expected to serve the system for many more years.

3.2.7 DRAINAGE AROUND LIFT STATION

Site grading in the vicinity of the lift station allows some snowmelt and rainfall to drain toward the lift station and enter through the lid. Site grading away from the lift station would be difficult since the lid is so low. We recommend the top of the lift station be raised by 0.6m with another concrete ring. Soil can then be brought in to be placed around the lift station and shaped to ensure positive drainage away from the lid and toward the site drainage ditches.

Raising the lift station would involve removing the lid, lengthening the pump rails, placing a new concrete ring. The joint should be sealed either with a rubber ring, or with grout to keep out any groundwater.

Based on some water seepage marks on the inside of the lift station, it appears there is some groundwater infiltration. If groundwater becomes a concern, the joints between the concrete barrels could be grouted from the inside.

	Lift Station	Repairs	Priority	Probable Cost
LS 1	Pump Operation	Replace pumps as required	3-10 years	\$ 40,000
LS 4	Ladder	Remove ladder rungs. Only use portable man-rescue system for entry with portable ladder.	<1 year	\$ 1,000
LS 5	Handrails & Safety Netting	Install hatch safety netting, handrails	<1 year	\$ 10,000
LS 6	Hatch Lock	Install latches and locks on hatches	<1 year	\$ 1,000
LS 8	Pressure gauge works	Install Pump Pressure Gauges	<1 year	\$ 1,000
LS 16	Lights & electrical	Install lights in lift station	1-3 years	\$ 1,000
LS 17	Drainage around Lift Station	Add concrete ring to raise lift station lid by 0.6m. Seal concrete ring joints with grout to 3m below grade.	1-3 years	\$ 15,000
				\$ 69,000

A budget estimate for replacement of the entire lift station is in the order of \$300,000 for a duplex station built out of fibreglass.

3.3 AERATED LAGOON

The original treatment plant lagoon was outfitted with an aeration system in 2002 in an effort to add additional treatment to the system. The aeration system consists of rows of piping with fine bubble diffusers at the bottom of the lagoon. The air bubbles float to the surface, treating the water as they rise. The lagoon aeration piping is fed from distribution headers at each side of the lagoon. A building at the head of the lagoon includes two blowers (air pumps) that feed the distribution heads.

The treated effluent from the aerated lagoon flows to the storage lagoon, from which it is discharged annually.

All the original aeration piping is still in place. Some spot repairs to holes in the exposed pipes have been made over the years. No repairs have been done to underwater piping.

The blower building and equipment burned down several years ago and was quickly replaced. This building and equipment are fairly new and therefore no upgrades are required.

Below are the identified opportunities for upgrades. All other inspection items were deemed to be satisfactory, as shown in Appendix A.



Figure 7: Aeration Lagoon Aerial Photo from Assessment Site Visit (2020-07-28)

3.3.1 BERMS

The size of the lagoons and height of the berms were originally designed based on expected annual flows. The population of Rolla is not growing, however, wet weather can cause increased infiltration into the system. Anecdotally from the operators, consecutive wet years can cause water levels to be very high. However, to the operators' knowledge, no overflows have occurred. Weekly inspections by operators include monitoring the lagoon levels.

Operating Permit section 2.7 indicates a minimum freeboard of 0.5m is required at all times. This is automatically maintained with emergency overflow piping.

Otherwise, the berms for both lagoons appear to be in satisfactory condition. There are no shrubs or trees growing in the berms. No evidence of burrowing animals. No evidence the lagoons have ever topped, or any erosion on the banks.

We would recommend that the Cell #2 lagoon level gauge is calibrated with the lagoon overflow level. This could be done with a survey of the overflow level from Cell #1 and transposing that level to the Cell #2 level gauge.

3.3.2 SPREAD OF AIR DIFFUSION

As seen on the aerial photo, the bubbles from the air diffusers identify where the aeration piping is. Along these aeration lines, there are many locations where the holes in the piping is blocked as indicated by the lack of air bubbles. Other locations show more bubbles than normal indicating a possible break in the pipe.

We have made initial contact with the supplier of the original aeration system to determine possible repair or replacement methods. Further discussions and proposals from various suppliers are recommended.

The methodology of repair as recommended by Nexom (see attached proposal) might involve:

- Remove underwater piping and diffusers using boats and divers

- De-sludge lagoon
- Replace piping and diffusers
- Leave header piping and blowers in place

Further details will have to be worked out with suppliers.

	Aeration System	Repairs	Priority	Probable Cost
AS 1	Spread of air diffusion	Repair or replace underwater aeration piping, incl desludging. Refer to proposal from Nexom (2020-10)	1-3 years	\$ 200,000
AS 2	Aeration Piping (exposed along berms)	Check annually and repair pipes as necessary	1-3 years	\$ 2,000
				\$ 202,000

3.3.3 AERATION HEADER PIPING

We identified two locations of air leaking out of pinholes in the ¾" HDPE distribution lines along the west header. Careful inspection may find more locations. This loss of air and pressure reduces the effectiveness of the aeration system. This should be checked annually, and pipes should be repaired as leaks are found.

We did not do a physical inspection of any piping below the water level.

3.3.4 SLUDGE BUILDUP

Sludge has reportedly never been removed from the lagoons. We recommend the PRRD use a "sludge judge" from a boat to gauge how much build up there is in the aerated lagoon and to implement a pumping and removal program. This can be done without removing the diffusers and aeration piping.

	Lagoons	Repairs	Priority	Probable Cost
LA 6	Sludge Build Up	Conduct sludge depth test with "sludge judge" and boat	1-3 years	\$ 10,000
				\$ 10,000

3.4 STORAGE LAGOON

The storage lagoon was constructed in 2002. This asset is generally in good condition with the opportunity for future upgrades if necessary.

There are no shrubs or trees growing in the berms. No evidence of burrowing animals. No evidence the lagoon has ever topped, or any erosion on the banks.



Figure 8: Storage Lagoon Aerial Photo from Assessment Site Visit (2020-07-28)

3.5 PIPING, VALVES & MANHOLES

The pipe, valve and manhole system throughout the site was visually inspected in August 2020. All pipe was inspected using CCTV with submersible pipe cameras by CL Video Inspections. Detailed results of this analysis are shown in Appendix B.

The majority of the site piping is 200mm diameter PVC. The outfall down the hill to the creek is 300mm diameter corrugated steel (CSP). The piping from the lift station to the aerated lagoon is 100mm diameter steel.

3.5.1 CCTV PIPE INSPECTION

Following is a summary of the deficiencies as outlined in the detailed CCTV report in Appendix B.

- Aerated Lagoon to Overflow
 - o Compacted deposits settled in first 65m of overflow pipe. Flushing did not remove the deposits.
 - o Structural spiral fracture – one pipe length affected – 30m south of SMH 7SE toward SMH 7SE B
 - o Structural longitudinal fracture - one pipe length affected – 51m south of SMH 7SE toward SMH 7SE B
 - o Evidence of joint infiltration – one joint - at 76m south of SMH 7 SE toward SMH 7SE B
 - o 8.5m long sag in pipe starting at SMH 7SE B toward SMH 9S
 - o Pipe Deformed (minor denting) 2 locations – 44m and 65m from SMH 7 SE B toward SMH 9S
- Aerated Lagoon to Storage Lagoon
 - o Corroded valve – at SMH Rolla 4
- Outfall Pipe
 - o Severe Metal Pipe Surface corrosion – entire length – SMH 9 to outlet

- Corrosion hole on side of pipe – 14m from SMH 9S toward outfall
- Stick stuck in pipe - 15m from SMH 9S toward Outlet
- Roots protruding at joint – 17.7m from SMH 9S toward outfall
- Hole in pipe at 26m from SMH 9S toward outfall
- Deformed (dented) pipe at 40m from SMH 9S toward outlet
- Protrusions through pipe wall at 70m from SMH 9S
- Gravel debris just inside outfall end





Figure 9 - Longitudinal Fracture in Overflow Pipe



Figure 10 - Spiral Fracture in Overflow Pipe

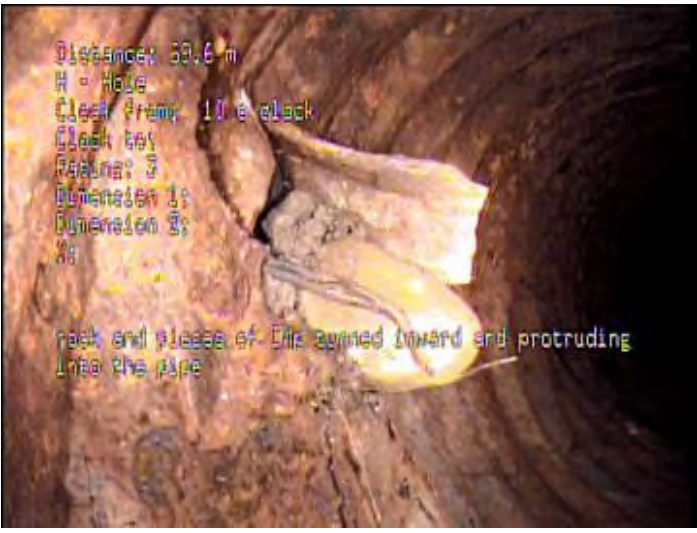


Figure 11 - Protrusion in Steel Outfall Pipe



Figure 12 - Severe Corrosion in Valve Between Lagoons

3.5.2 MANHOLES

The manhole bases and barrels appear to be in satisfactory condition. However, the lids were rusted and not secure. Recommendation to replace six manhole lids with more common cast iron frame and cover.



3.5.3 OVERFLOW PIPING

As can be seen from the CCTV reports, there are several deficiencies in the overflow piping. One section has a sag, there are several sections of “bent” pipe, and a couple structural failures in the PVC pipe.

This overflow pipe from the aerated lagoon to the manhole on the outfall pipe is for emergency purposes only if the lagoons happen to overflow in a given year. It is not critical that the pipe be kept in perfect condition due to the unlikelihood that it would ever be used. The deficiencies that have been noted will not affect the flow capacity. However, over time, the structural deficiencies will get worse and eventually the pipe may collapse.

The pipe will likely serve its purpose for many years however, it may suddenly collapse without anyone knowing it. It is important to repair the structural failures. We would recommend spot repairs instead of full pipe replacement.

3.5.4 OUTFALL PIPE

The outfall pipe from the top of the hill by the storage lagoon to the creek is a corrugated steel pipe that is significantly deteriorated. The inside is severely corroded, there are leaks in a few locations, and there is a piece of metal protruding into the pipe in one location. There is a risk of the pipe joints separating, causing environmental damage during discharges.

This pipe should be replaced, however the constructability challenges with installing a new pipe down the steep bank make this a complex replacement.

One option for replacement would be to use a flexible hose from the top that is rolled out each time the discharge is initiated. The 8" or 10" diameter hose would extend down to the existing splashpad at the bottom. It would be tied at the top to existing discharge pipe near the last manhole at the edge of the slope. An operator would still need to go down to the creek to extend the hose and monitor the discharge. However, this hose would be a much less expensive than replacing the outfall pipe with a buried pipe.

A similar solution would be to install the HDPE pipe above ground with anchors.

A more permanent solution would be to feed fused HDPE pipe through the culvert from the top. This smooth walled pipe would provide sufficient flows through the smaller diameter, and would hold together much more solidly on the potentially unsteady slope. Infiltration / exfiltration would not be an issue with this solution.

3.5.5 OUTFALL SPLASHPAD

The outfall was constructed with the original construction in 1977. It consists of a corrugated steel pipe that discharges directly onto a concrete pad immediately adjacent the stream. No known repairs have been made to it since its installation.

The splashpad has evidently settled and moved somewhat over the years. The splashpad should be replaced or shored up, and protect with riprap to prevent it moving again.



Figure 13: Outfall Structure Photo from Assessment Site Visit (2020-07-28)

3.5.6 WATER QUALITY TESTING

The operating permit requires that the effluent be tested prior to discharge. This is typically done in the early spring while there is still ice on the storage lagoon. The ice needs to be broken and the sample taken from a location away from the edge. This dangerous procedure with thin ice could be improved.

One method would be to install a new isolation valve in the downstream discharge piping near SMH 9S. Effluent can be run to manhole SMH 9S and stopped with a new valve. Sampling can then occur in SMH 8S. If the effluent passes, then the new valve can be opened to facilitate discharge.

Water quality prior to discharge must meet the following requirements (Operating Permit 1.1.2)

- 5 day Biochemical Oxygen Demand – 30 mg/L
- Total Suspended Solids – 40 mg/L

Historic records indicate that water quality in the storage lagoon has met these requirements prior to discharge.

3.5.7 DISCHARGE FLOW MONITORING

The manual annual discharge operation is a complex operation which should be simplified.

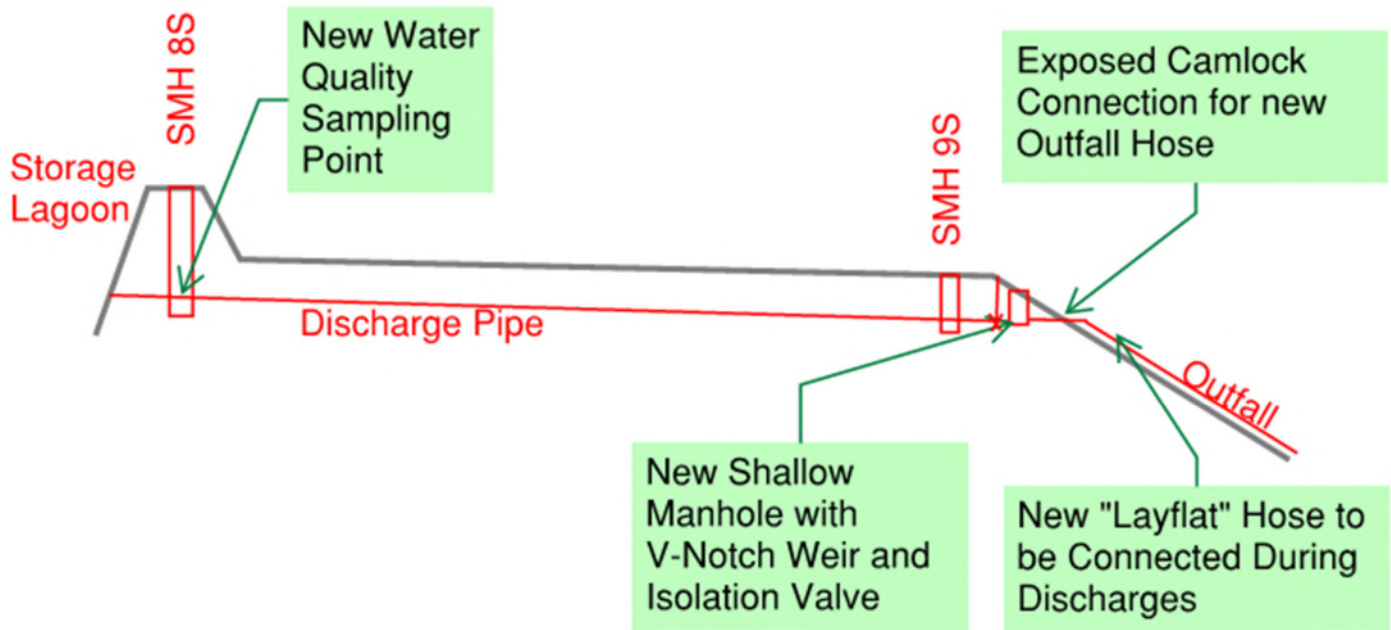
Annual discharge from the storage lagoon is regulated by the operating permit to be a certain dilution ratio compared to the receiving waters of Rolla Creek. The creek flows are monitored several hundred meters upstream where the creek crosses the highway. This is done by monitoring the flow through the culvert.

The flow out of the storage lagoon can only be measured by observing the rate of level drop in the lagoon. Due to the difficulty in getting precise measurements of the lagoon level, this flow can only be estimated, but is sufficient for the batch discharge methodology that is being employed.

A more precise discharge flow measurement device could be installed. This could be a V-notch weir installed in a concrete chamber downstream of the lagoon discharge valve. The operator could watch the level in the weir and accurately turn the discharge valve to regulate the flow out of the lagoon, based on the flow in the creek.



Figure 14 - Example of V-Notch Weir



	Piping	Repairs	Priority	Probable Cost
P2	Interlagoon Piping & Valves	Replace valve	<1 year	\$ 8,000
P 4	Overflow Pipe Condition	Spot repairs req'd in 6 locations - 6 x \$3,000	1-3 years	\$ 18,000
P 8	Manhole Lids	Replace manhole frames and covers (x6)	1-3 years	\$ 9,000
				\$ 35,000

The above costs for the overflow pipe repairs include spots repairs only. Since there are a number of them, the PRRD may consider replacing the entire pipe. At 330m long at approximately \$400 / m, replacement cost would be in the order of \$130,000.

	Outfall	Repairs	Priority	Probable Cost
O 1	Pipe integrity	Replace steep portion of pipe with temp hose, HDPE on surface, or HDPE fed through ex. Pipe - 90m	1-3 years	\$ 150,000
O 2	Concrete structure at outfall	Replace Splashpad or Protect with Riprap to Prevent	<1 year	\$ 5,000
O 4	Creek flow monitoring device	Culvert flow remote monitoring device	3-10 years	\$ 15,000
O 5	Discharge Flow Monitoring	Install new conc chamber with V-notch weir to monitor discharge flow rates	1-3 years	\$ 20,000
O 7	Water Quality Testing Point	New isolation valve and sampling point in existing downstream pipe	1-3 years	\$ 10,000
				\$ 200,000

3.6 OVERALL TREATMENT EFFECTIVENESS

We did not do a comprehensive review of treatment effectiveness. However, based on visual observations, the reported effluent quality meeting the discharge requirements, the consistency of the aeration system, and integrity of the berms, we believe the system is operating effectively and efficiently. The permitted discharge limits are being met.

4 ESTIMATED REMAINING LIFE

The following table shows the estimated remaining life of the components reviewed. This is based on experience of other systems and when replacements are typically anticipated.

Table 1: Estimated Remaining Life of Components

Asset	Estimated Remaining Life	Replacement Cost
Lift Station Equipment	5-10 years	\$300,000 (fibreglass duplex – no building or generator)
Lagoons	30-40 years	Unknown
Outfall Piping	0-2 years	\$150,000 (90m)
Inter Lagoon Piping	10-20 years	\$220,000 (550m * \$400 / m)
Aeration Piping	2-5 years	\$200,000
Blowers	5-10 years	Unknown
Blower Building	30 years	\$150,000 (5m x 10m @ \$3000 / m2)

5 RECOMMENDATIONS

The following shows the location and probable costs of the recommended repairs. We have also prepared digital file for insertion into the PRRD GIS system.

Details of the recommended repairs and their associated costs can be found in Appendix A.

The probable cost was estimated from similar projects in the area in recent years. It does not include escalation costs for work done in the future. This is considered a Class 'D' estimate. Detailed design should be completed prior to budgeting for any specific item.



Figure 15 - Pipe Repairs



Figure 16 - Repairs (Non-Pipe)

Table 2: Opinion of Probable Costs Summary

	Priority			Probable Cost
	High (<1 year)	Medium (1-3 years)	Low (3-10 years)	
Site Conditions	\$ 2,000.00	\$ 152,200.00	\$ -	\$ 154,200.00
Lift Station	\$ 13,000.00	\$ 16,000.00	\$ 40,000.00	\$ 69,000.00
Lagoons	\$ -	\$ 10,000.00	\$ -	\$ 10,000.00
Aeration System	\$ -	\$ 202,000.00	\$ -	\$ 202,000.00
Piping	\$ 8,000.00	\$ 27,000.00	\$ -	\$ 35,000.00
Outfall	\$ 5,000.00	\$ 180,000.00	\$ 15,000.00	\$ 200,000.00
Priority Total	\$ 28,000.00	\$ 587,200.00	\$ 55,000.00	\$ 670,200.00

A

ASSESSMENT OBSERVATIONS

Item	Condition	Comments	Repairs	Priority	Probable Cost
Site Conditions					
SC 1	Access Road <input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Access Road passable. Could use more gravel for all-weather travel. Road access to discharge manhole required	4m wide Gravel topping - 400m x 4m x 100mm deep (access road) + access to discharge manhole (150m x 4m x 300mm) = 360 m ³	1-3 years	\$ 68,200.00
SC 2	Fencing <input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Fencing in good condition. Regular maintenance required. Does not encompass entire property	New Perimeter Barbed Wire Fence - 1200m * \$70 / m	1-3 years	\$ 84,000.00
SC 3	Gate <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Gate in good condition. Secure against vehicles. Not secure against pedestrians.			
SC 4	Grass Cutting <input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Grass around lagoons maintained. Grass along perimeter not cut. Regular maintenance required.			
SC 5	Safety Signage <input checked="" type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	More safety signage needed throughout site. "No unauthorized access", "Dangerous Open Water"	Safety signs x 5	<1 year	\$ 2,000.00
SC 6	Drainage <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Wet area between lagoons, but it still drains. No other drainage issues.			





Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
Lift Station					
LS 1	Pump Operation <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	2 Duty pumps. 1 spare pump. Approx 10 years old. Pumps in good condition and pump sufficiently. No flow test done.	Replace pumps as required	3-10 years	\$ 40,000.00
LS 2	Controls <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Ultrasonic level transducer works well. Couple years old.			
LS 3	Alarms <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Flashing light can be seen from road. Remote alarm to operator works well			
LS 4	Ladder <input checked="" type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	Several ladder rungs missing. Do not enter LS without man rescue system.	Remove ladder rungs. Only use portable man-rescue system for entry with portable ladder.	<1 year	\$ 1,000.00
LS 5	Handrails & Safety Netting <input checked="" type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	Handrails and safety bars inadequate when hatches open. Need hatch safety netting	Install hatch safety netting, handrails	<1 year	\$ 10,000.00
LS 6	Hatch Lock <input checked="" type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	No lock on LS hatches. Repair required	Install latches and locks on hatches	<1 year	\$ 1,000.00
LS 7	Exhaust fan & ducting <input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Exhaust fan inoperable. Portable fan needed when LS entry required.	No upgrade required if portable fan is available		
LS 8	Pressure gauge works <input checked="" type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	No pressure gauges observed. Pump efficiencies is not possible to judge without pressure gauges	Install Pump Pressure Gauges	<1 year	\$ 1,000.00
LS 9	Valves <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Check valves recently replaced. Isolation valves have been exercised.			
LS 10	Grit Screen <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Grit screen recently installed. Needs cleaning every couple weeks. Working well			
LS 11	Overflow pipe <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Overflow pipe works - Not obstructed			
LS 12	Pumps lift out and re-seat correctly <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Pumps removed recently. Appear to have sealed.			
LS 13	Evidence of critters <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No evidence of critters in or near LS			

	Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
LS 14	Pump Hours	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	Not checked. Verbal assurance that pumps are checked and maintained regularly			
LS 15	Backup Generator	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No backup generator. New plug for portable backup generator. Has been used recently and works well			
LS 16	Lights & electrical	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	No lights in LS	Install lights in lift station	1-3 years	\$ 1,000.00
LS 17	Drainage around Lift Station	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Snow melt and rainfall can enter lift station. LS lid should be raised by 0.6m with another concrete ring.	Add concrete ring to raise lift station lid by 0.6m. Seal concrete ring joints with grout to 3m below grade.	1-3 years	\$ 15,000.00



Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
Lagoons					
LA 1	Roots in berm <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No trees or shrubs in berms.			
LA 2	Berm sloughing <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No berm sloughing noted. Refer to drone photos			
LA 3	Evidence of leakage <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No evidence of berm leakage. One wet area between lagoons. Unlikely to be leakage			
LA 4	Evidence of burrowing animals <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No evidence of burrowing animals			
LA 5	Any visible tears in liner <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	No liner. Bottom of lagoons not visible.			
LA 6	Sludge Build Up <input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	No sludge accumulation test done.	Conduct sludge depth test with "sludge judge" and boat	1-3 years	\$ 10,000.00
LA 7	Berm Elevations <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Overflow is working well, but if it is used regularly, the berm elevations should be raised.			



	Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
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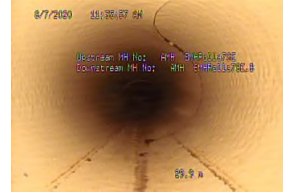
Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
Aeration System					
AS 1	Spread of air diffusion <input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Air diffusers appear to be blocked and broken in some areas	Repair or replace underwater aeration piping, incl desludging. Refer to proposal from Nexom (2020-10)	1-3 years	\$ 200,000.00
AS 2	Aeration Piping (exposed along berms) <input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Two locations of air leaking in 3/4" distribution lines. Locations noted for repair	Check annually and repair pipes as necessary	1-3 years	\$ 2,000.00
AS 3	Blowers <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Blowers are a couple years old. Working well			
AS 4	Alarms <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Alarms working well. No concerns from maintenance personnel			
AS 5	Blower hours <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Blowers are a couple years old. Working well. Hours not checked			
AS 6	Safety <input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No safety issues noted			





	Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
Piping						
P 1	Outfall Discharge Valve	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Discharge valve out of Settling Lagoon turned every year. Working well. Seals well			
P2	Interlagoon Piping & Valves	<input checked="" type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	Isolation Valve between lagoons is rusted and doesn't seal well	Replace valve	<1 year	\$ 8,000.00
P 3	Lagoon Downstream Valves	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Valves need to be exercised annually.			
P 4	Overflow Pipe Condition	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Refer to video report. Pipe in fair condition. Spot repairs required	Spot repairs req'd in 6 locations - 6 x \$3,000	1-3 years	\$ 18,000.00
P 5	Accumulation in overflow pipes?	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Refer to video report. 65m of minor accumulation. Doesn't affect flows.			
P 6	Manhole benching	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Manhole benching appears adequate			
P 7	Buildup in manholes	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Refer to video report. No buildup noted			
P 8	Manhole Lids	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Manhole lids rusted and not secure.	Replace manhole frames and covers (x6)	1-3 years	\$ 9,000.00

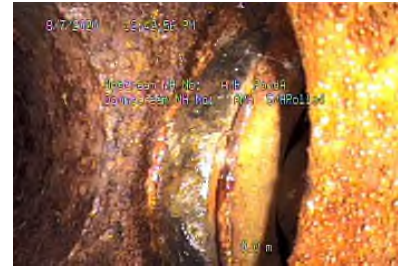
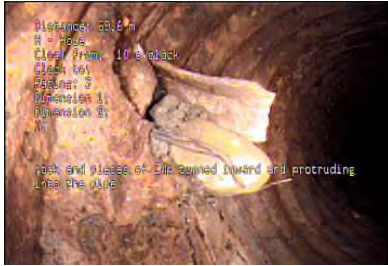
Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
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	Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
Outfall						
O 1	Pipe integrity	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Evidence of infiltration / exfiltration. CSP is severely corroded. Risk of pipe pulling apart. Still functioning well. Refer to video report	Replace steep portion of pipe with temp hose, HDPE on surface, or HDPE fed through ex. Pipe - 90m	1-3 years	\$ 150,000.00
O 2	Concrete structure at outfall	<input checked="" type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input type="checkbox"/> Good	Concrete splashpad broken apart. Needs replacing and reinforcing	Replace Splashpad or Protect with Riprap to Prevent Movement	<1 year	\$ 5,000.00
O 3	Slope stability	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Slope appears stable. Refer to drone photos			
O 4	Creek flow monitoring device	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	Creek level monitoring stake needs to be replaced with creek flow monitoring system at upstream culvert.	Culvert flow remote monitoring device	3-10 years	\$ 15,000.00
O 5	Discharge Flow Monitoring	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Outfall flow measuring device does not exist. Need to install V-notch weir or similar in concrete chamber.	Install new conc chamber with V-notch weir to monitor discharge flow rates	1-3 years	\$ 20,000.00
O 6	Water Quality during discharge	<input type="checkbox"/> Immediate Action Req'd <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Good	No challenges achieving water quality / dilution ratios during discharge.			
O 7	Water Quality Testing Point	<input type="checkbox"/> Immediate Action Req'd <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Good	Safety issues collecting samples with ice on Settling Lagoon. Should construct new testing point	New isolation valve and sampling point in existing downstream pipe	1-3 years	\$ 10,000.00



Inspection Item	Condition	Comments	Repairs	Priority	Probable Cost
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Summary			
	High Priority Repairs (< 1 year)		\$ 28,000.00
	Medium Term Repairs (1-3 years)		\$ 587,200.00
	Long Term Repairs (3-10 years)		\$ 55,000.00
	All Repairs		\$ 670,200.00

Probable Cost determined from similar projects in the area in recent years.
 Does not include escalation if work is to be done in the future
 Class 'D' estimate

Check? \$ 670,200.00



ROLLA- PEACE RIVER REGIONAL DISTRICT, BC

Preliminary Proposal for Design,
Supply and Installation of the
Wastewater Treatment System
Upgraded with
optAER

October 23, 2020

technologies for cleaner water

5 Burks Way · Winnipeg MB · R2J 3R8
888-426-8180 • www.nexom.com

Project Overview

Nexom is pleased to propose an optAER lagoon aeration-based wastewater treatment system upgrade for the Rolla, in the Peace River District, BC.

The proposed system is designed as an upgrade and would consist of the following processes and technologies:

- Retain existing primary lagoon cell for BOD and TSS removal (condition and suitability to be determined by others).
- Remove existing aeration
- Implement optAER® fine bubble partial mix aeration with floating laterals in cells 1
- Implement partial settling in cell 1.

System Design Parameters

Preliminary design loads, flows, and effluent objectives are presented in these tables:

		Influent	Effluent Requirements
Design Flow (ADF)	m ³	27.4	
cBOD ₅	mg/l	700	<45
TSS	mg/L		<45

Aeration design parameters are presented in the following table:

	Cell 1 (PM)	Totals
Alpha	0.60	
Beta	0.95	
Theta	1.024	
Site elevation (m)	661	
Water Depth (m)	1.6	
Water Volume (m)	10,676	
Retention time (days)	389.6	389.6
Min. Dissolved Oxygen (mg/l)	2.0	
# HT25 diffusers (Fine Bubble)	8	8
SCFM per diffuser	10.0	
Total SCFM	80	80

Lagoon Treatment Processes

The primary purpose of the aerated ponds is to provide oxygen and residence and contact time to natural bacteria, which ultimately convert the wastewater contaminants (BOD₅, ammonia, and TSS) to carbon dioxide, water, and inert ash and nitrates. Aerated ponds effectively control odours and provide internal sludge digestion.

PARTIAL MIX (PM) CELL

With aerated partial mix cells, the diffuser density is based upon oxygen demand. The optAER system does not rely on algae or natural surface aeration for providing oxygen to the wastewater.

The diffusers are suspended near the bottom of the cells. Through the rise of the bubbles and subsequent mixing, convection cells are created between the diffusers. Not only does the water rise with the bubbles, the solids settle out through the downward motion of the water between the diffusers where the circulation loop is completed. This combined with the slow rate of bubble rise contributes to the overall efficiency of the system. Because of low sludge production in the system, retention time is retained for long term BOD₅ removal.

When the solids reach the bottom of the lagoon, additional oxygen for biodegradation is provided through the diffusers near the cell bottom. This process results in minimal organic bottom sludge accumulation. Aerobic digestion takes place within the aerated cells at the sludge water interface.

HT25 FINE BUBBLE MEMBRANE DIFFUSERS



An HT25 diffuser

HT25 fine bubble diffusers are used to provide oxygen to the wastewater. The diffusers consist of an HDPE air distribution body with individual tubular EPDM membranes extending outwards in a horizontal plane. This design prevents bubbles from coalescing, and results in an excellent oxygen transfer rate with minimal head loss.

The diffusers are suspended with a marine grade rope directly under the lateral, at a uniform depth. The rope is attached to the floating header for ease of diffuser retrieval. Each diffuser is attached to a small concrete weight, encased in HDPE pipe. Diffuser assemblies can be retrieved from a boat with no special equipment.

OPTAER® HEADER SYSTEM (AERATED CELL)

A metal manifold and discharge piping are used to dissipate the heat produced by the blowers. Shallow buried HDPE header piping connects to the galvanized steel manifold, and supplies air to the floating laterals. The header has flanged connections for each lateral as shown on the drawings. Each lateral is individually valved for ease of maintenance.

All header, lateral, and feeder piping is designed to accommodate increased airflow for high pressure and volume cleaning without increasing header friction losses by more than 1 psi. This allows for management of additional organic load, improved diffuser maintenance and additional odor control.

AIR DISTRIBUTION SYSTEM: FLOATING LATERALS (PM)

Laterals connect to the shallow buried header with flanged connections (by others), and float on the water surface. Each lateral is individually valved for ease of maintenance. With floating laterals, there are no concrete weights required to be in contact with the bottom of the basin. Laterals are secured against wind action with a stainless-steel cable system. The cables are fastened to anchors in the berm using a self-adjusting lateral tensioning assembly.

All header and lateral piping, joints, and fittings are thermally fused HDPE. With floating laterals, the cells do not have to be dewatered or taken out of service for system installation or maintenance. All maintenance can be performed from a boat with a 2-person crew.

Positive Displacement Blowers

Positive displacement blowers are required to provide air supply for the treatment system. Blowers should be designed to provide the required airflow at normal system operating pressure and have the capability of operating at the maximum required pressure intermittently for diffuser purging.

Blower requirements are summarized in the following table:

		Blowers
Design airflow per blower	SCFM	80
Normal operating pressure	psi	4.0
Maximum Required Pressure	psi	5.2



Budgetary Capital Cost

INCLUDED IN THE WASTEWATER TREATMENT SYSTEM CAPITAL COST ARE:

GENERAL

- Nexom System Process Design
 - CAD Drawings and specifications
- ***Equipment installation /start-up/commissioning/training***
- Operation and maintenance manuals
- Project Record Drawings

optAER[®] Lagoon Aeration System:

- Shallow-buried HDPE Main air supply header including excavation and backfill.
- Floating lateral aeration piping, feeder piping, fittings and lateral valves as required
- HT25 Diffuser assemblies complete with EPDM Membranes and pre-cast diffuser weights.
- Self-tensioning lateral assemblies and anchor posts.
- Decommissioning of existing in water aeration equipment.

BUDGETARY COST FOR THE OPTAER SCOPE:

\$107,500 CAD (Shipping allowed to jobsite, plus applicable taxes)

All prices are subject to final design review.

Items Specifically Not Included:

- Material offloading and secure on-site storage
- Civil works including Lagoon Cells basin design and construction, liner, transport piping, inter-cell piping, discharge piping, manholes, valves, access roads to site, site roads and landscaping, lagoon desludging etc. if required
- Disposal of existing aeration
- Air supply (re-use existing blowers)
- Building or upgrades to building
- Electrical hookup or electrical work
- Site Preparation and Restoration



Questions or Comments?

The

Any questions or comments can be directed to:

Greg Roppelt

Regional Sales Manager

greg.roppelt@wastewater.com

239-565-8873



Nexom

Info@nexom.com

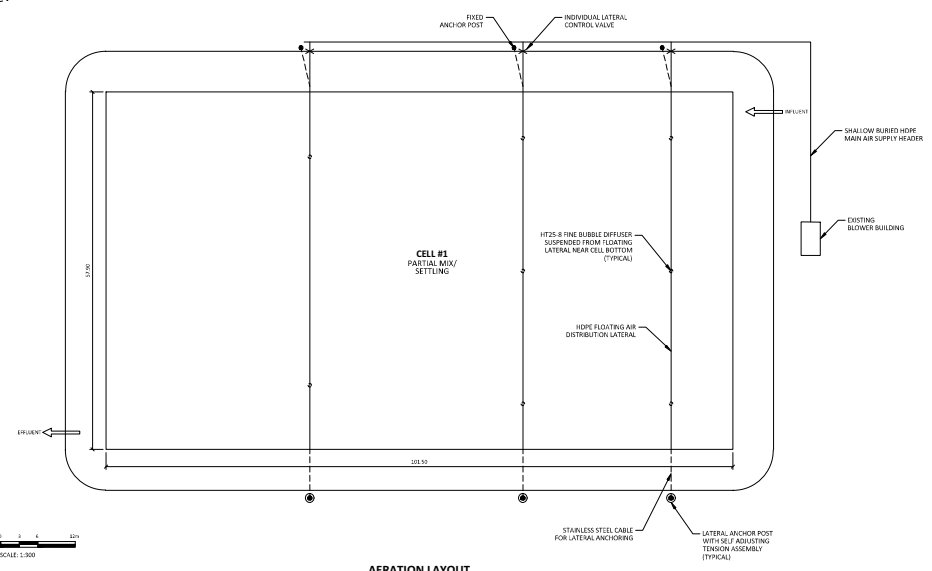
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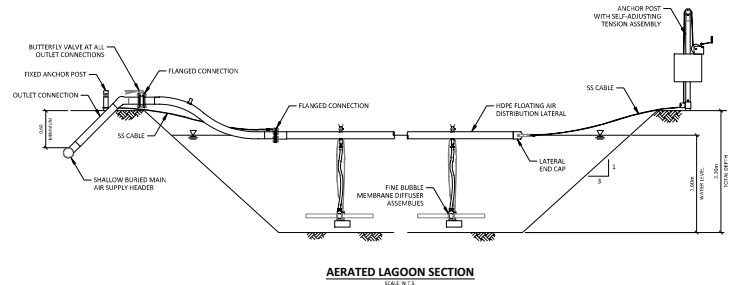
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REDUCED SIZE PLOT - DO NOT SCALE

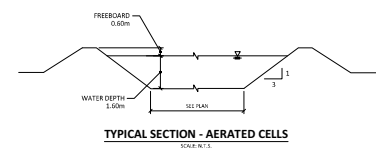


LOCATION PLAN
SCALE 1:200

AERATION LAYOUT
SCALE 1:300



AERATED LAGOON SECTION
SCALE 1:10



TYPICAL SECTION - AERATED CELLS
SCALE 1:10



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Navin, Manitoba
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PROJECT		PEACE RIVER, BC PROPOSED WASTEWATER TREATMENT SYSTEM			
OWNER		OPTAER SYSTEM			
DRAWING NO.		AERATION LAYOUT, TYPICAL SECTION, LOCATION PLAN			
DESIGNED BY	MR	CHECKED BY	DK	SCALE	AS NOTED
DATE	2020/10/23	PROJECT NO.	18-1	CD5028.01	
					REV. 1
					REV. 1
					REV. 0



B

PIPE VIDEO
INSPECTION
REPORTS





CL Video Inspection Service Ltd.
 250-261-1233
 tdfrancoeur@gmail.com
 Charlie Lake B.C.
 Box 654 VOC1H0

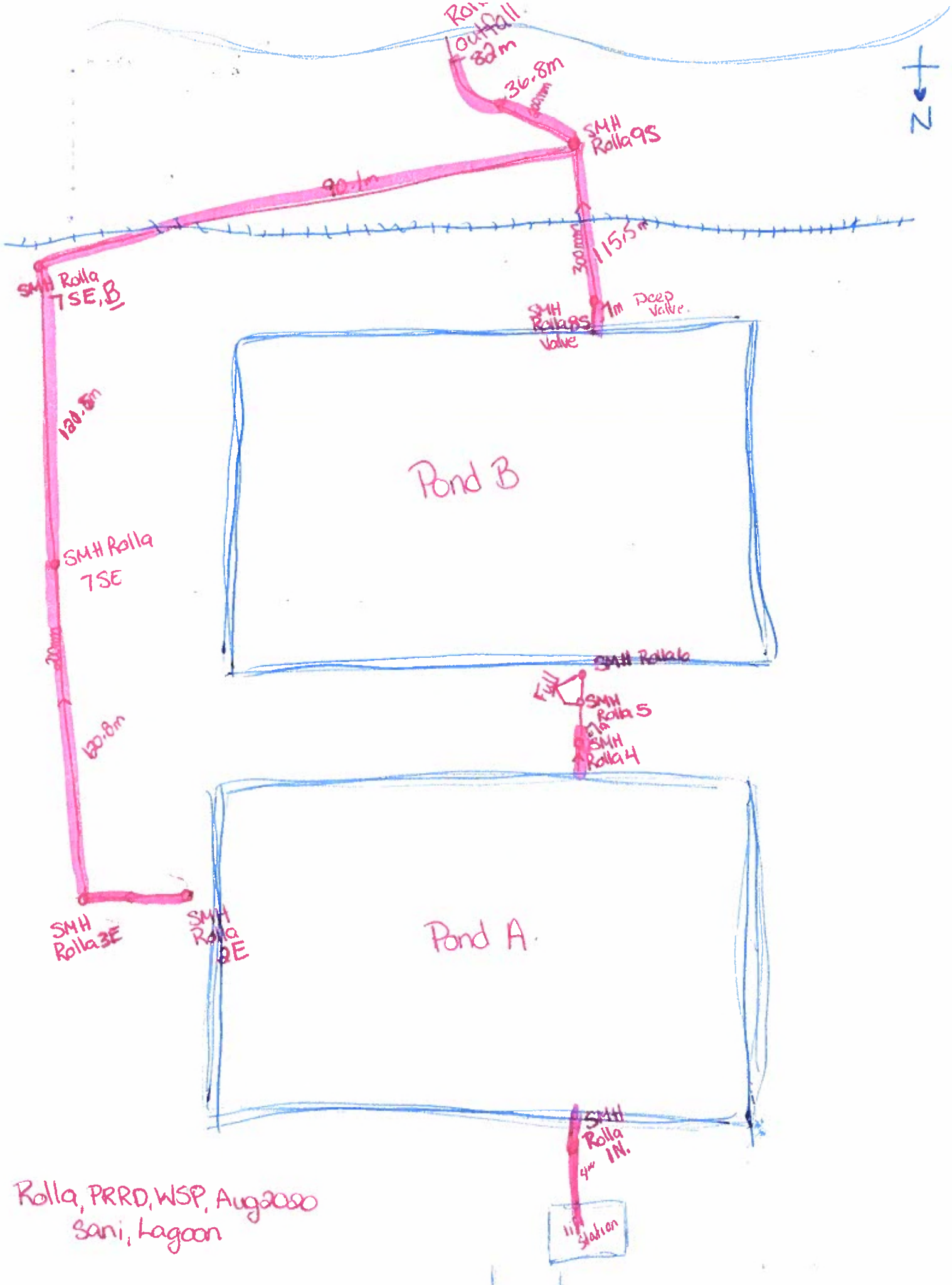
Main Inspections Summary

RollaSaniLagoons, PRRD, WSP, Aug2020

Mainline ID	End date/time	Surveyed by	Start MH	Finish MH	Material	Height	Total length	Length
SegSMHRolla3E-SMHRolla7SE	8/7/2020 11:21 AM	Bryana	SMHRolla3E	SMHRolla7SE	PVC	200 mm	120.9 m	120.9 m
SegSMRolla7SE-SMRolla7SEB	8/7/2020 11:55 AM	Bryana	SMHRolla7SE	SMHRolla7SE, B	PVC	200 mm	121.6 m	121.6 m
SegSMHRolla2E PM-SMHRolla3E	8/7/2020 12:16	Bryana	SMHRolla3E	SMHRolla2E	PVC	200 mm	1.7 m	1.7 m
SegPondA to SMHRolla4	8/7/2020 12:44 PM	Bryana	SMHRolla4	PondA	CAS	200 mm	0.5 m	0.5 m

Mainline ID	End date/time	Surveyed by	Start MH	Finish MH	Material	Height	Total length	Length
SMHRolla9S - RollaOutfall	8/13/2020 11:31 AM	Bryana	SMHRolla9S	RollaOutfall	CMP	200 mm	36.9 m	36.9 m
SMHRolla9S - RollaOutfall.	8/13/2020 12:01 PM	Bryana	SMHRolla9S.	RollaOutfall.	CMP	200 mm	82.7 m	82.7 m
SMHRolla8S Valv- SMHRolla9S	8/13/2020 12:36 PM	Bryana	SMHRolla8Valve	SMHRolla9S	PVC	300 mm	115.6 m	115.6 m
SMHRolla7S E, B- SMHRolla9S	8/13/2020 1:18 PM	Bryana	SMHRolla7SE, B	SMHRolla9S	PVC	200 mm	90.2 m	90.2 m
PondB- SMHRolla8S Valve	8/13/2020 1:39 PM	Bryana	SMHRolla8SValve	Pond B	PVC	300 mm	0.8 m	0.8 m
SMHRolla4- SMHRolla5	8/13/2020 1:58 PM	Bryana	SMHRolla4	SMHRolla5	CAS	200 mm	0.8 m	0.8 m
LiftStation- SMHRolla1 N	8/13/2020 3:10 PM	Bryana	SMHRolla1N	LiftStation	CAS	100 mm	5.9 m	5.9 m
SMHRolla2E - SMHRolla3E	8/13/2020 3:34 PM	Bryana	SMHRolla3E	SMHRolla2E.	PVC	200 mm	8.7 m	8.7 m

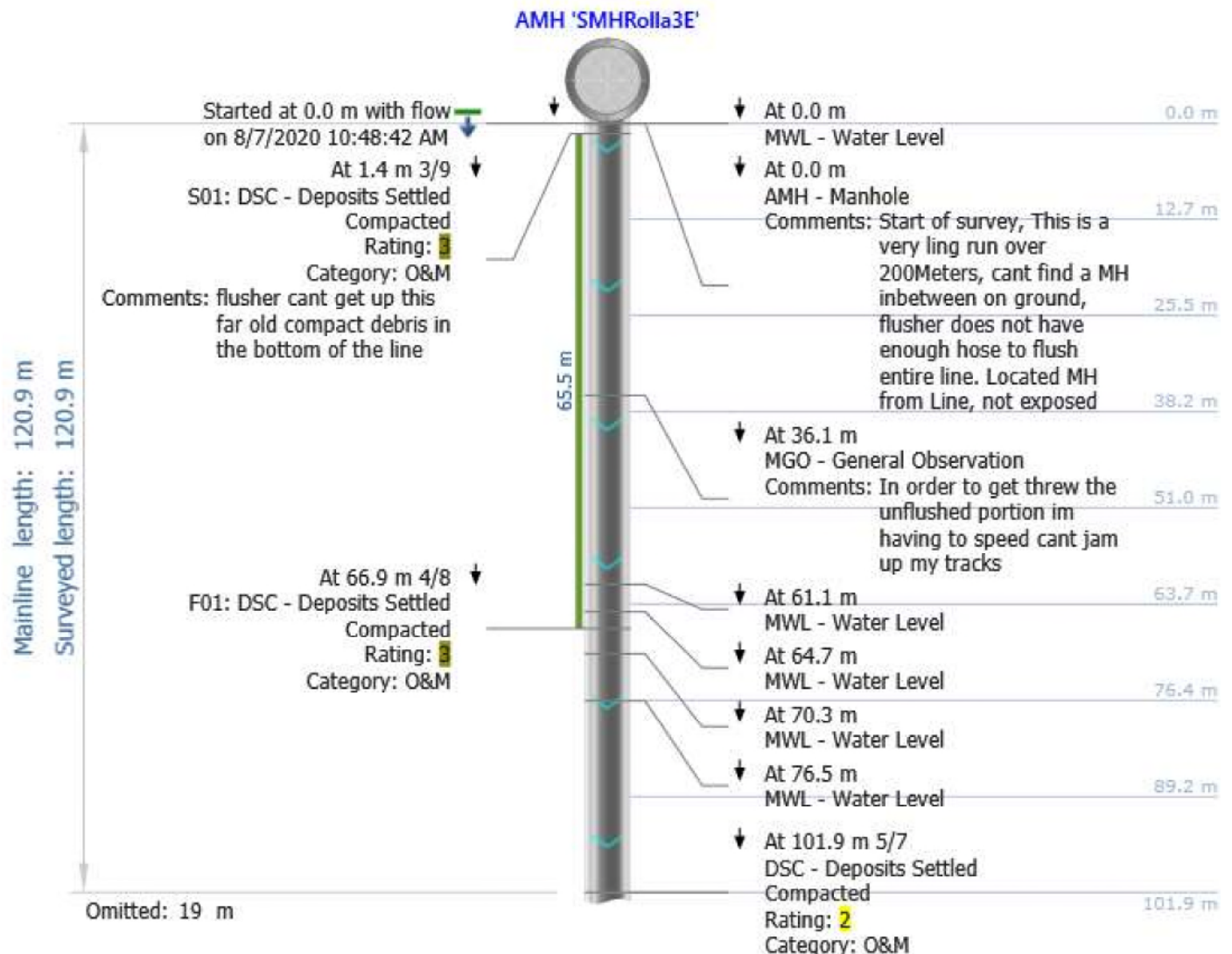
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Lift Station-SMHRolla1N.	8/13/2020 4:10 PM	Bryana	SMHRolla1N,	Lift Station.	PVC	100 mm	13.1 m	13.1 m
SMHRolla1N-PondA	8/13/2020 4:18 PM	Bryana	PondA.	SMHRolla1N	PVC	150 mm	2.0 m	2.0 m
					Sub-Total		601.4 m	601.4 m
					Total		601.4 m	601.4 m



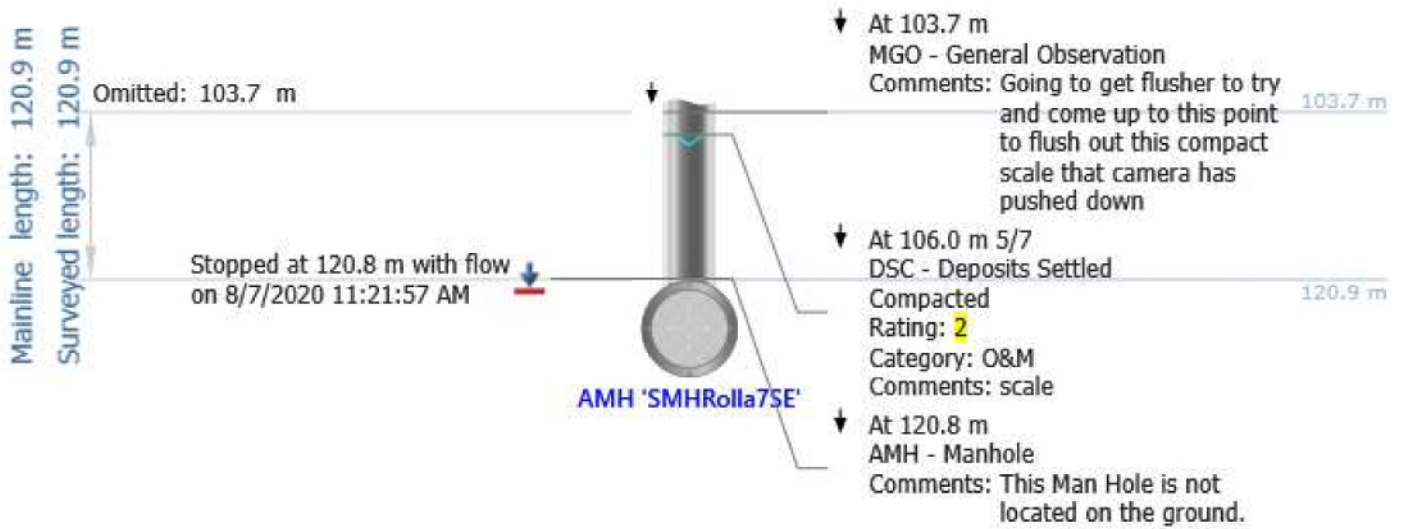
Rolla, PRRD, WSP, Aug 2000
Sani, Lagoon

Main Inspections Pipe Run

Project name:	Mainline ID:	City:	Street:
RollaSaniLagoons,PRRD, WSP, Aug2020	SegSMHRolla3E-SMHRolla7SE	Rolla	Along the fens East side of the Lagoons
Start date/time:	Direction:	Weather:	Location code:
8/7/2020 10:48 AM	D		
Shape:	Material:	Height:	Width:
C	PVC	200 mm	

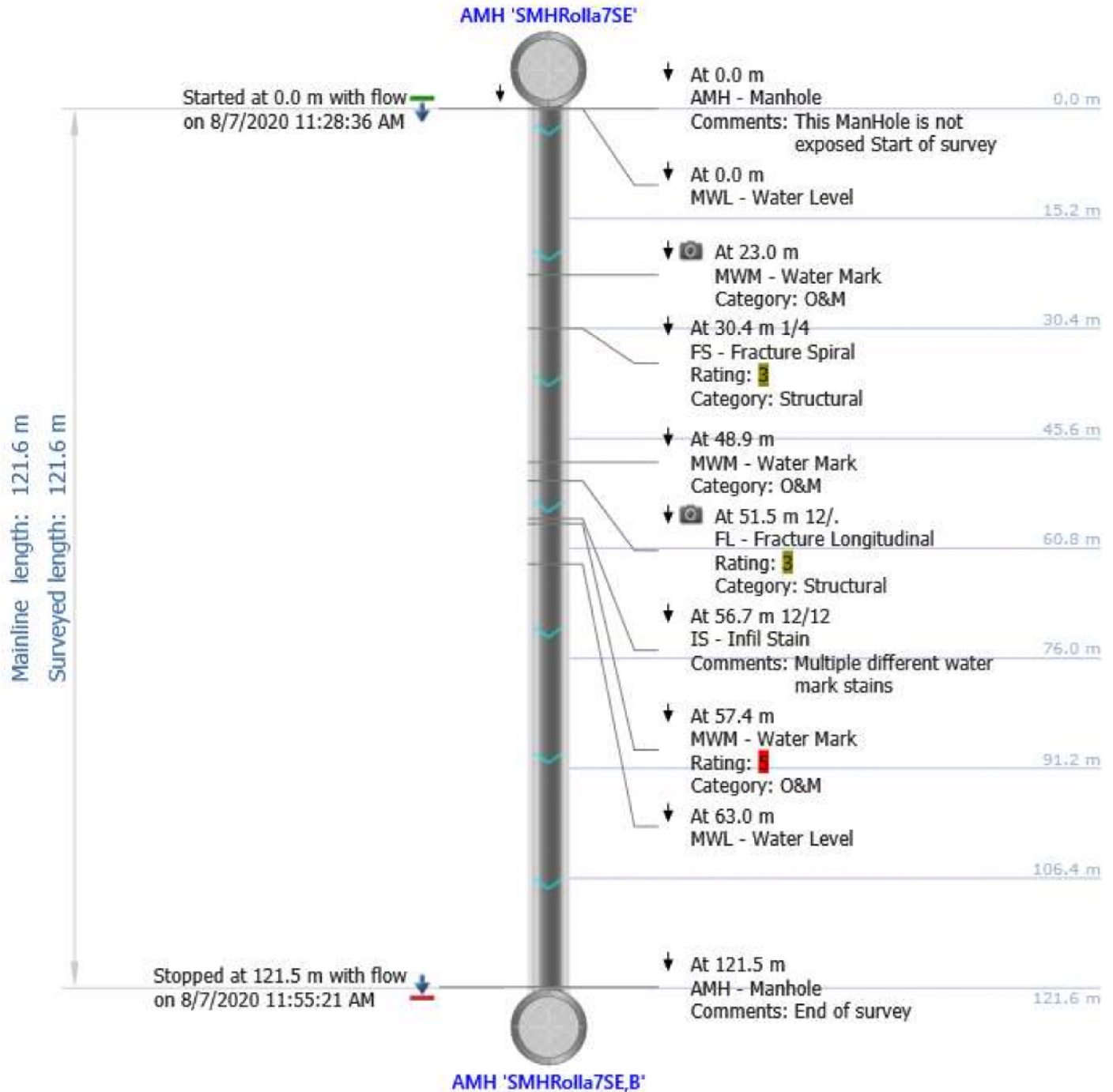


Weather:



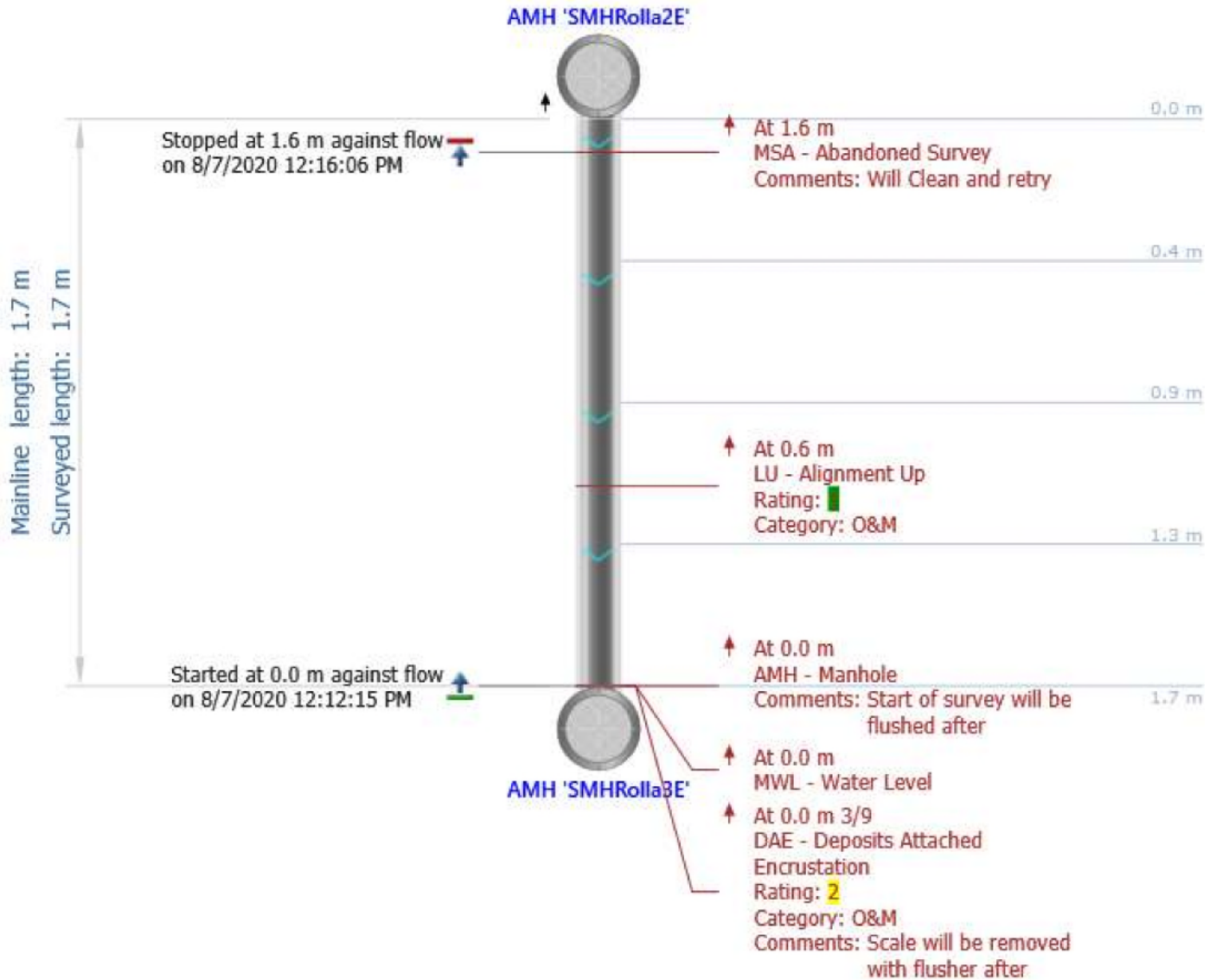
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: SegSMRolla7SE- SMRolla7SEB	City: Rolla	Street: Along Fence East side of the lagoon
Start date/time: 8/7/2020 11:28 AM	Direction: D	Weather:	Location code:
Shape: C	Material: PVC	Height: 200 mm	Width:



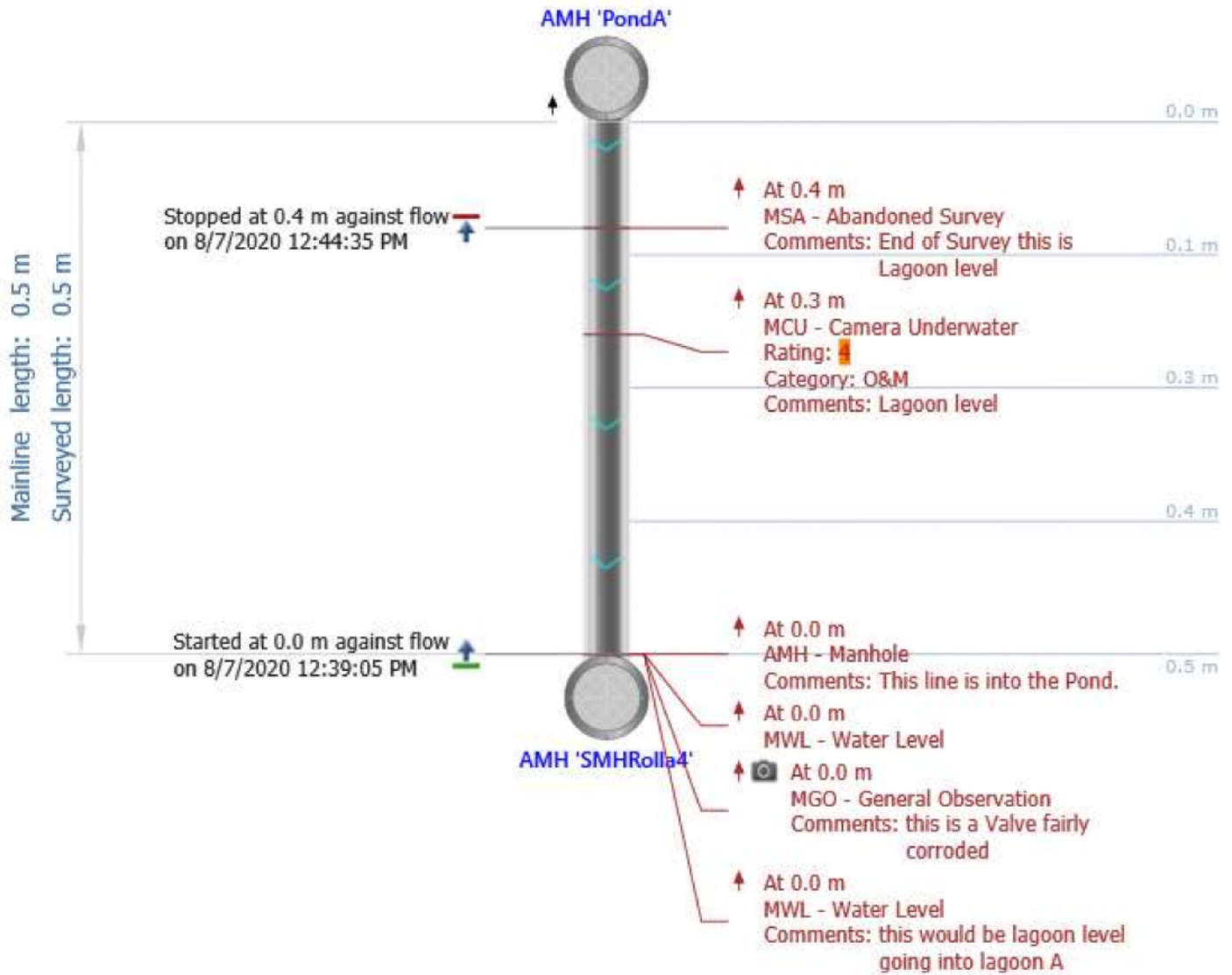
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: Seg SMHRolla2E-SMHRolla3E	City: Rolla	Street: East Side of PondA
Start date/time: 8/7/2020 12:12 PM	Direction: U	Weather:	Location code:
Shape: C	Material: PVC	Height: 200 mm	Width:



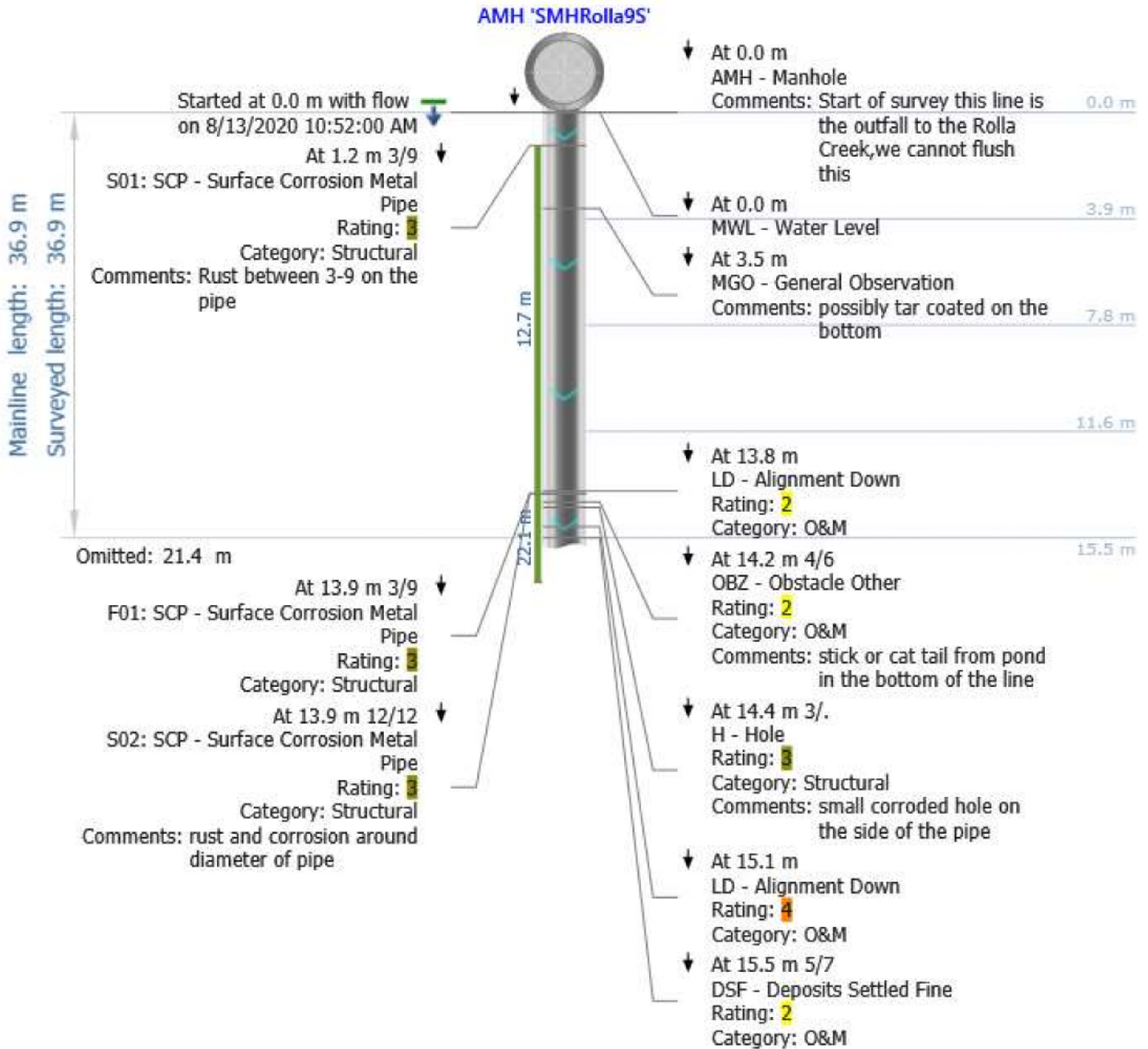
Main Inspections Pipe Run

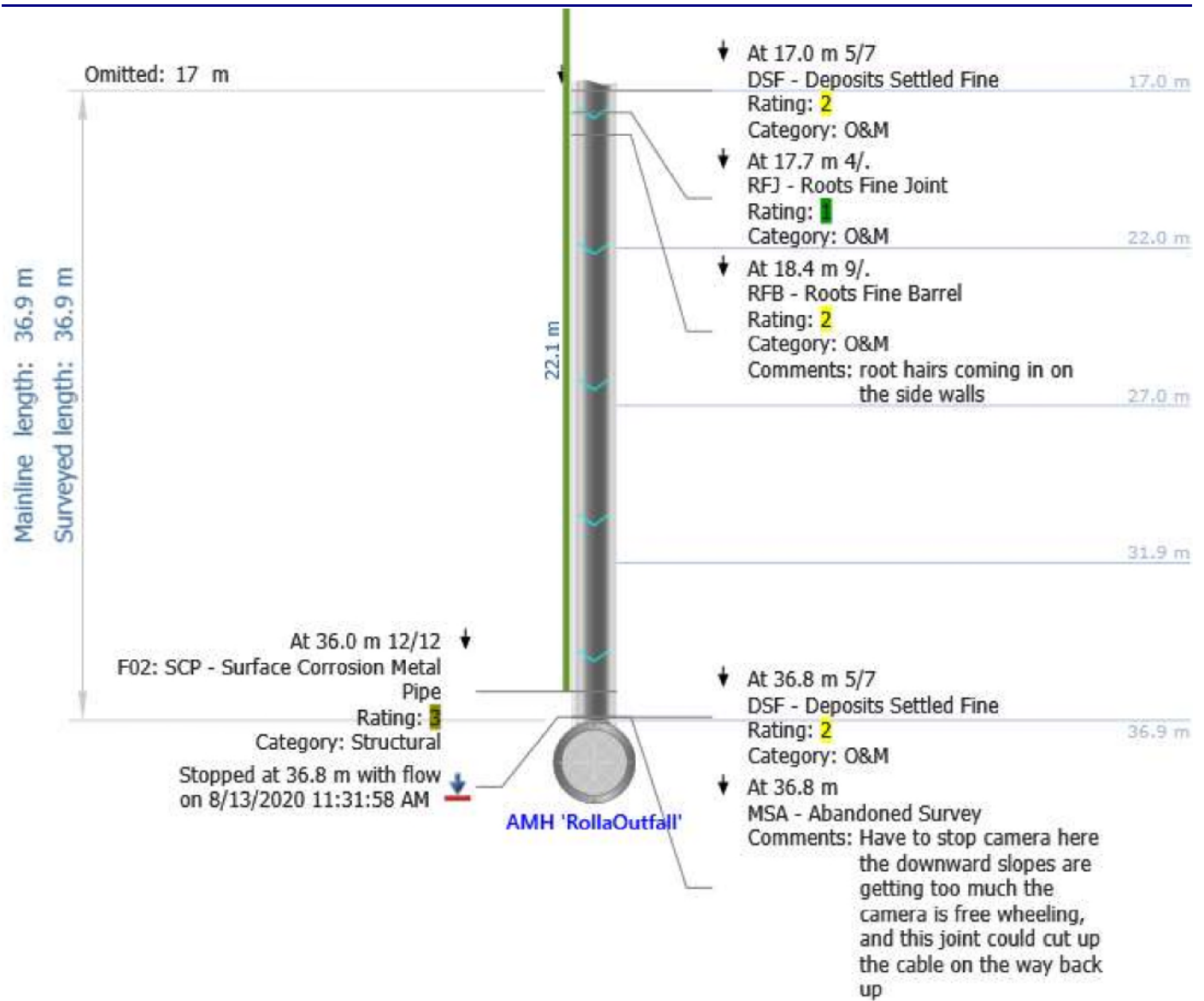
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: SegPondA to SMHRolla4	City: Rolla	Street: Between PondA and B in the middle, first MH out of Pond A
Start date/time: 8/7/2020 12:39 PM	Direction: U	Weather:	Location code:
Shape: C	Material: CAS	Height: 200 mm	Width:



Main Inspections Pipe Run

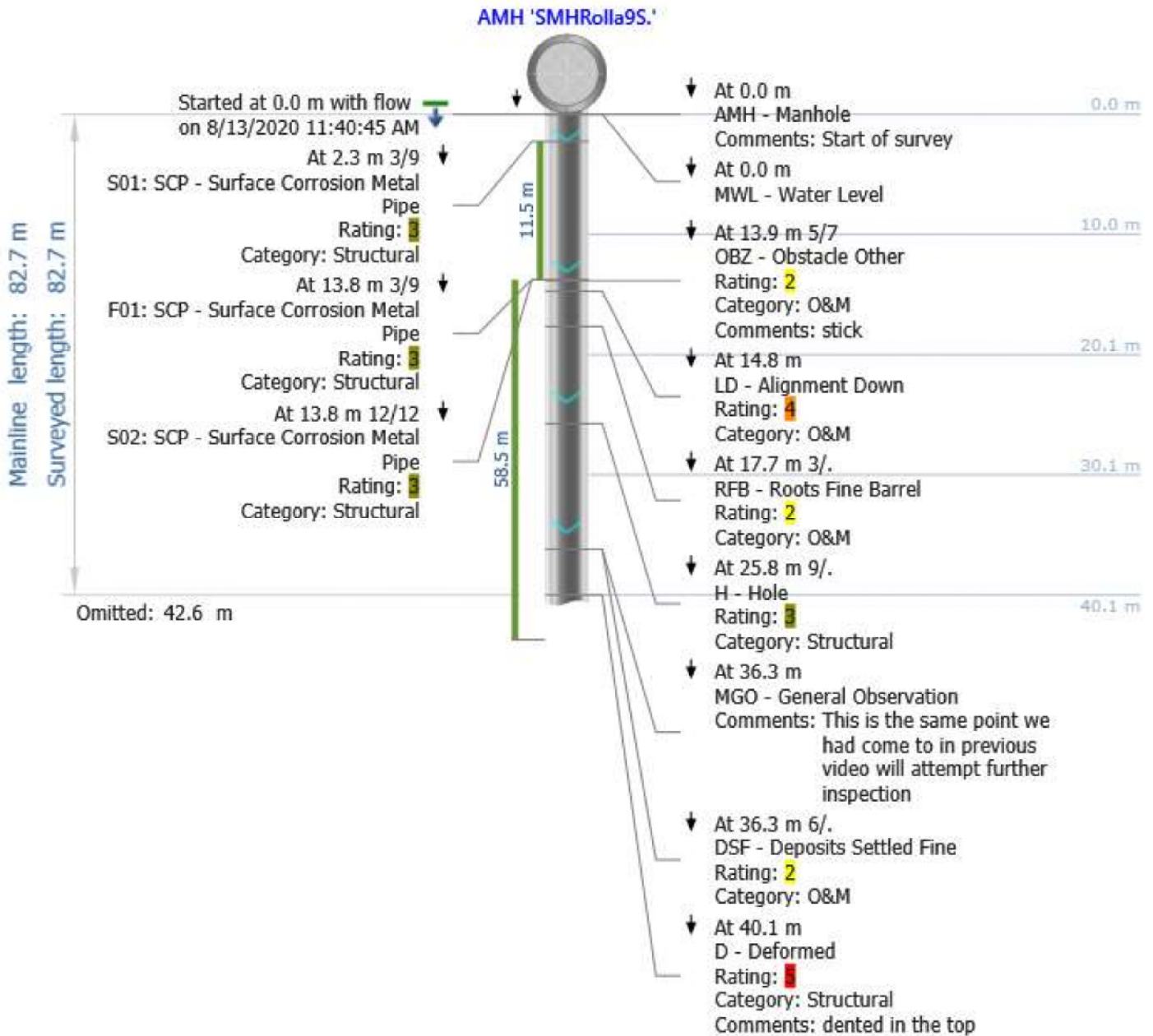
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: SMHRolla9S-RollaOutfall	City: Rolla	Street: Far end of both ponds on bank before outfall
Start date/time: 8/13/2020 10:51 AM	Direction: D	Weather:	Location code:
Shape: C	Material: CMP	Height: 200 mm	Width:

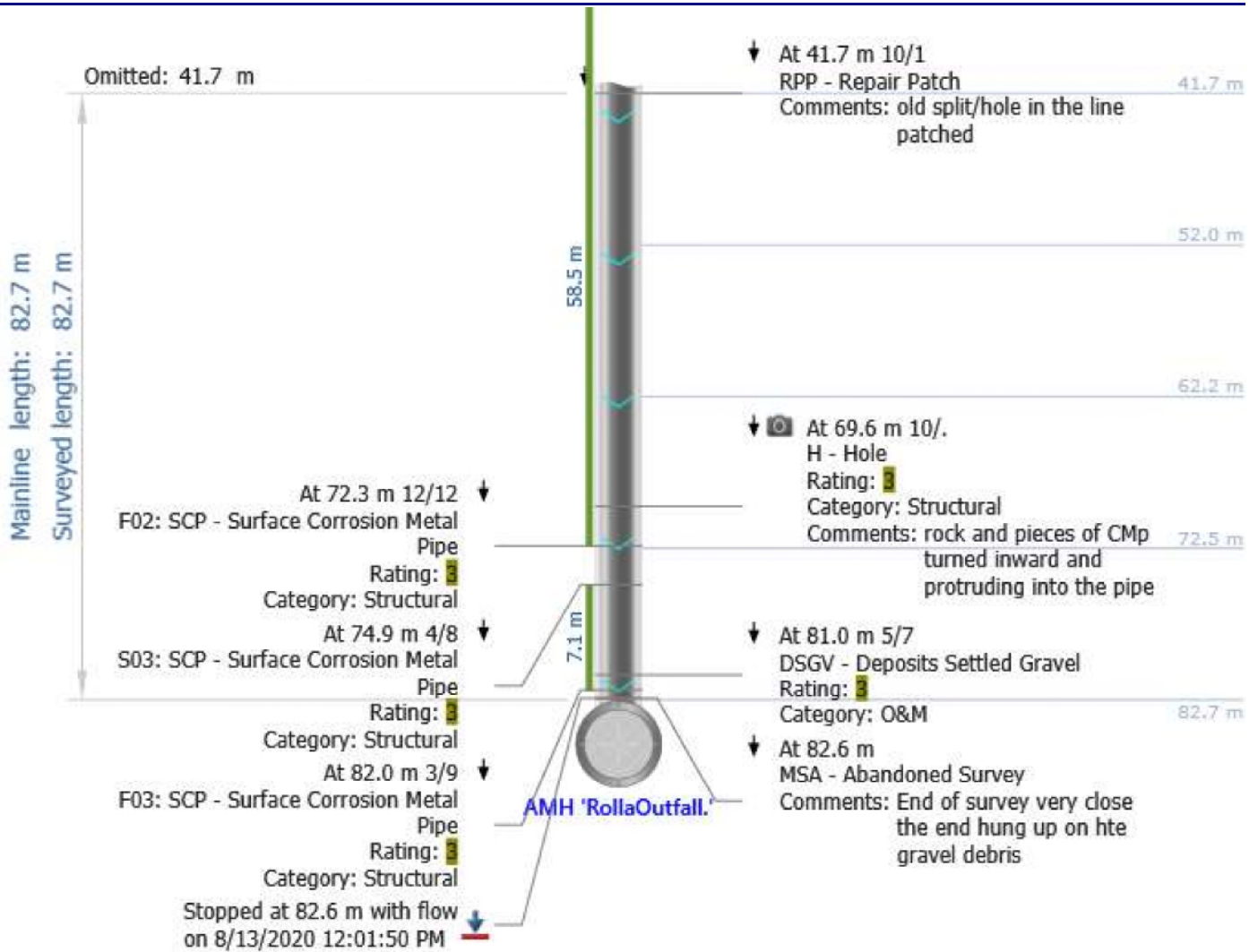




Main Inspections Pipe Run

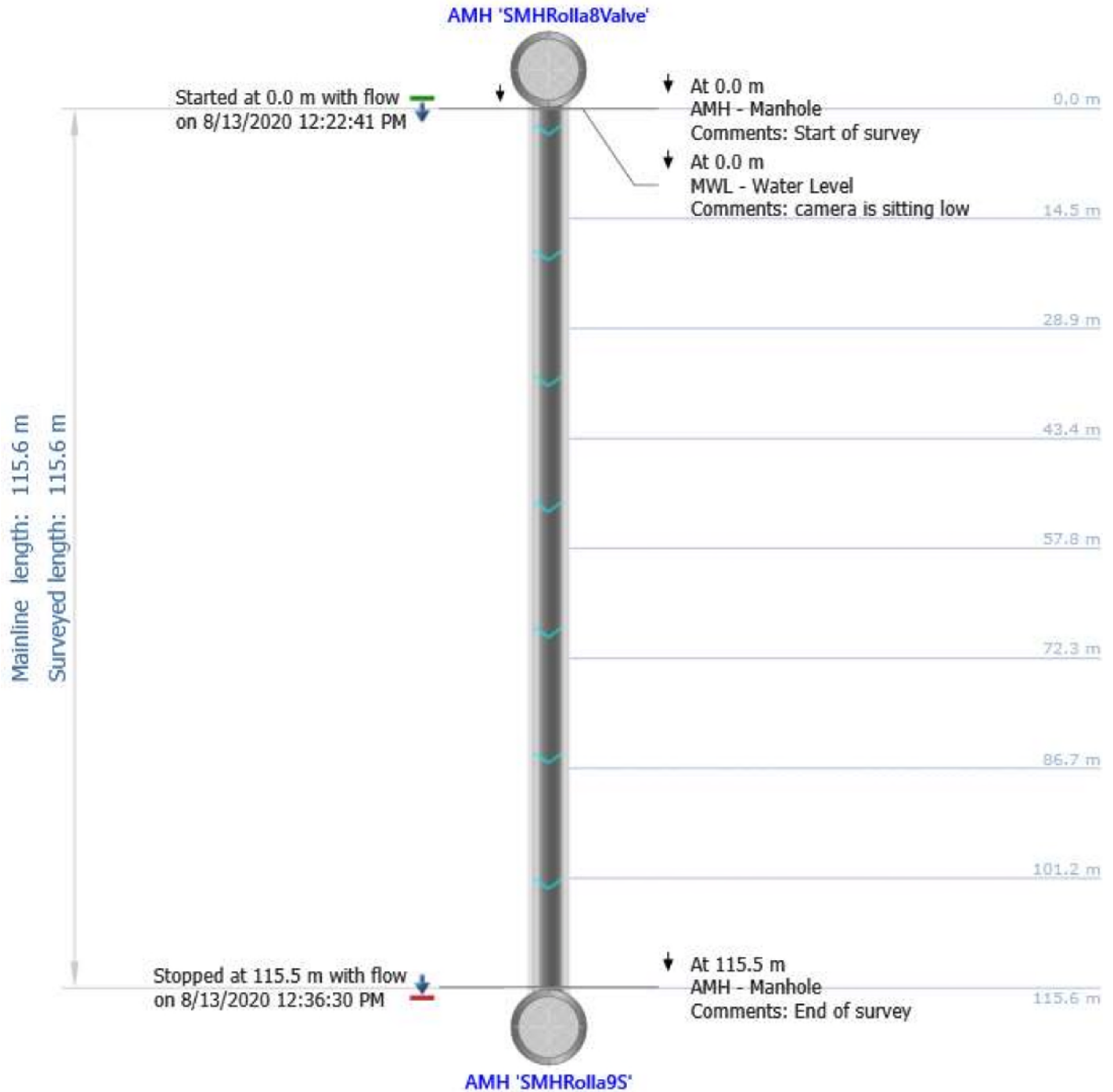
Project name: RollaSaniLagoons,PRRD, WSP, Aug2020	Mainline ID: SMHRolla9S-RollaOutfall.	City: Rolla	Street: Far South end of the Lagoon going towards the Creek
Start date/time: 8/13/2020 11:40 AM	Direction: D	Weather:	Location code:
Shape: C	Material: CMP	Height: 200 mm	Width:





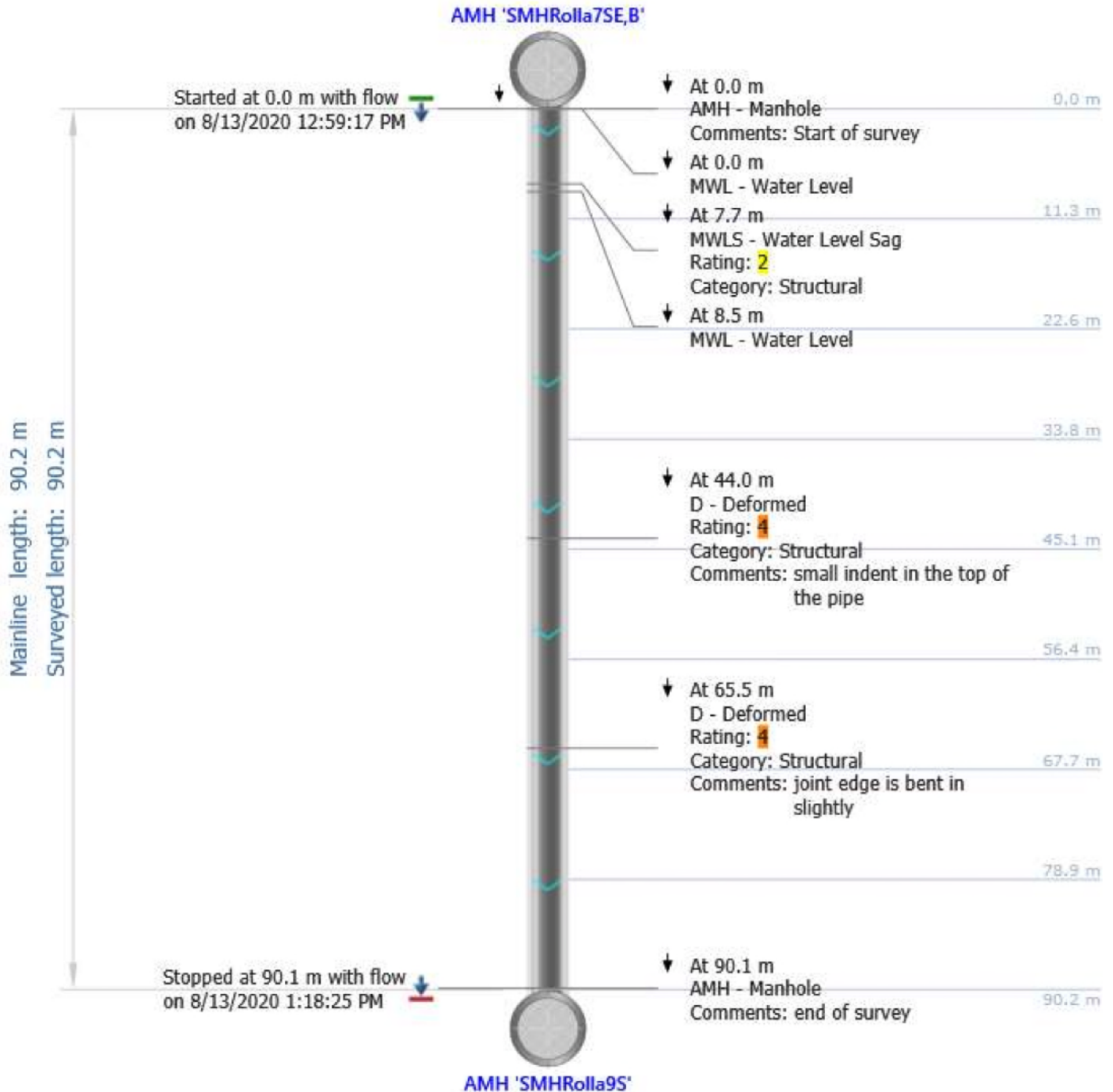
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: SMHRolla8Valv- SMHRolla9S	City: Rolla	Street: Coming out of Pond B South
Start date/time: 8/13/2020 12:22 PM	Direction: D	Weather:	Location code:
Shape: C	Material: PVC	Height: 300 mm	Width:



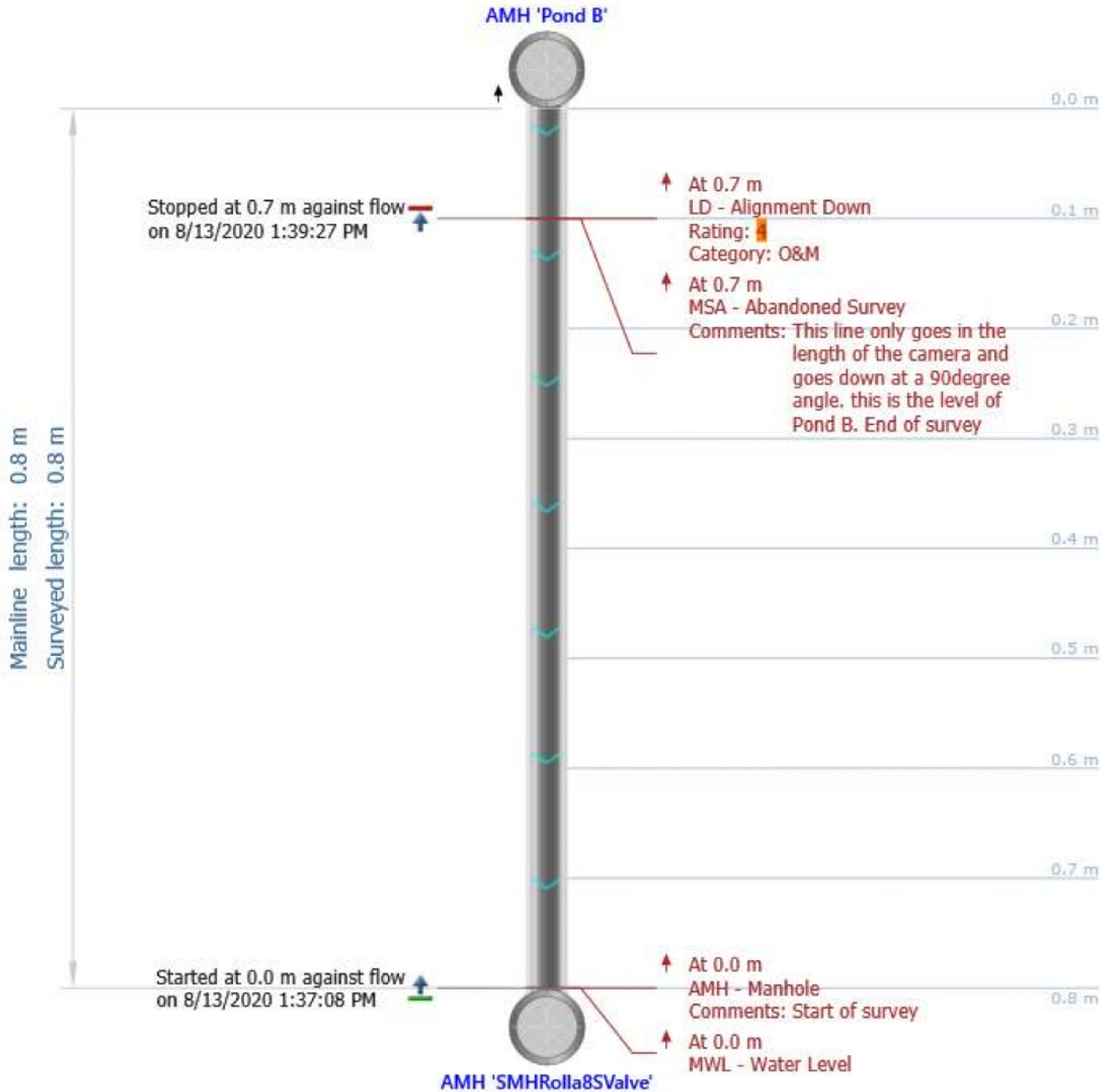
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: SMHRolla7SE, B-SMHRolla9S	City: Rolla	Street: Far South East corner along fence
Start date/time: 8/13/2020 12:59 PM	Direction: D	Weather:	Location code:
Shape: C	Material: PVC	Height: 200 mm	Width:



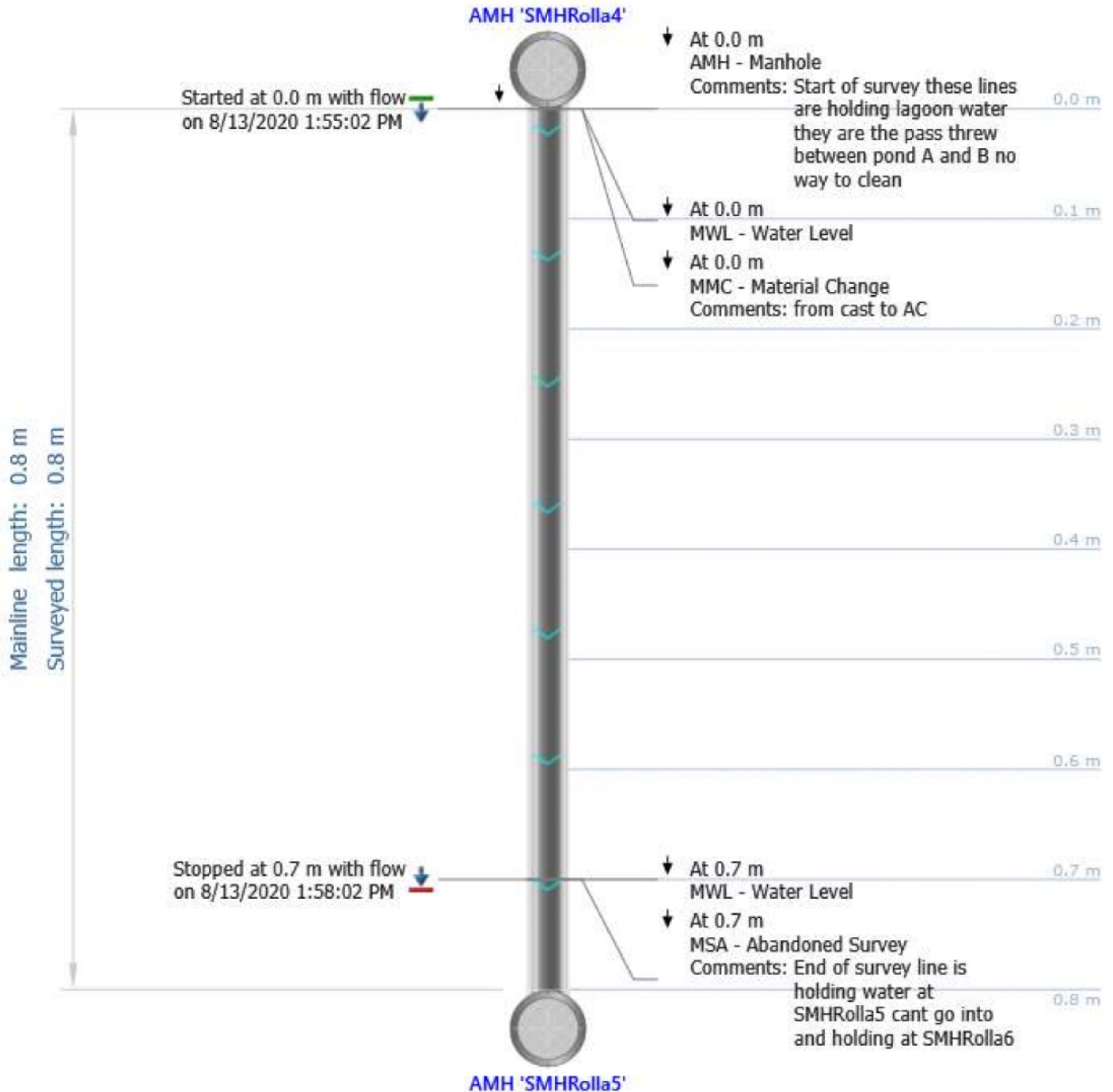
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: PondB-SMHRolla8SValve	City: Rolla	Street: Going into PondB
Start date/time: 8/13/2020 1:37 PM	Direction: U	Weather:	Location code:
Shape: C	Material: PVC	Height: 300 mm	Width:



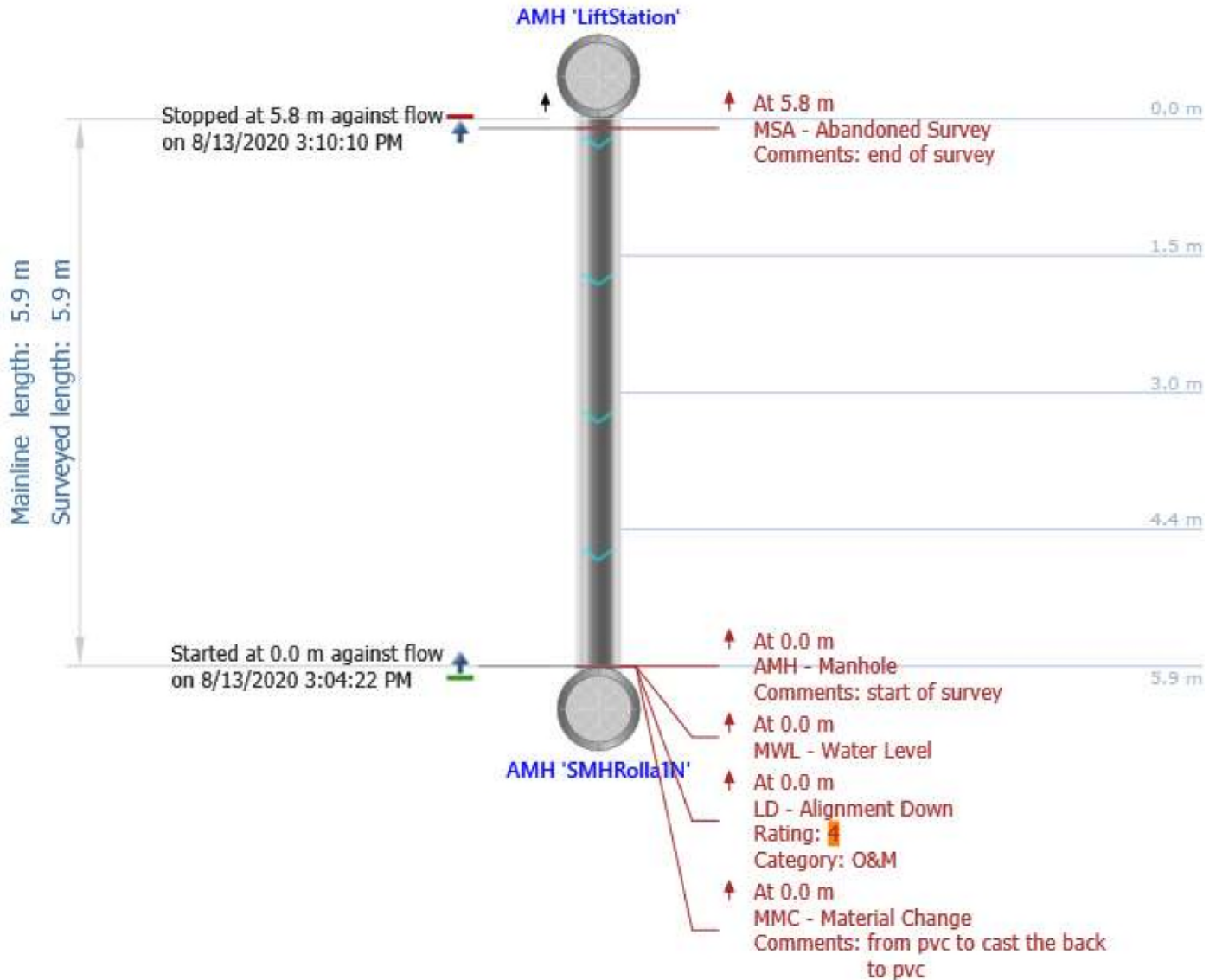
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP, Aug2020	Mainline ID: SMHRolla4-SMHRolla5	City: Rolla	Street: Middle between Pond A and B
Start date/time: 8/13/2020 1:55 PM	Direction: D	Weather:	Location code:
Shape: C	Material: CAS	Height: 200 mm	Width:



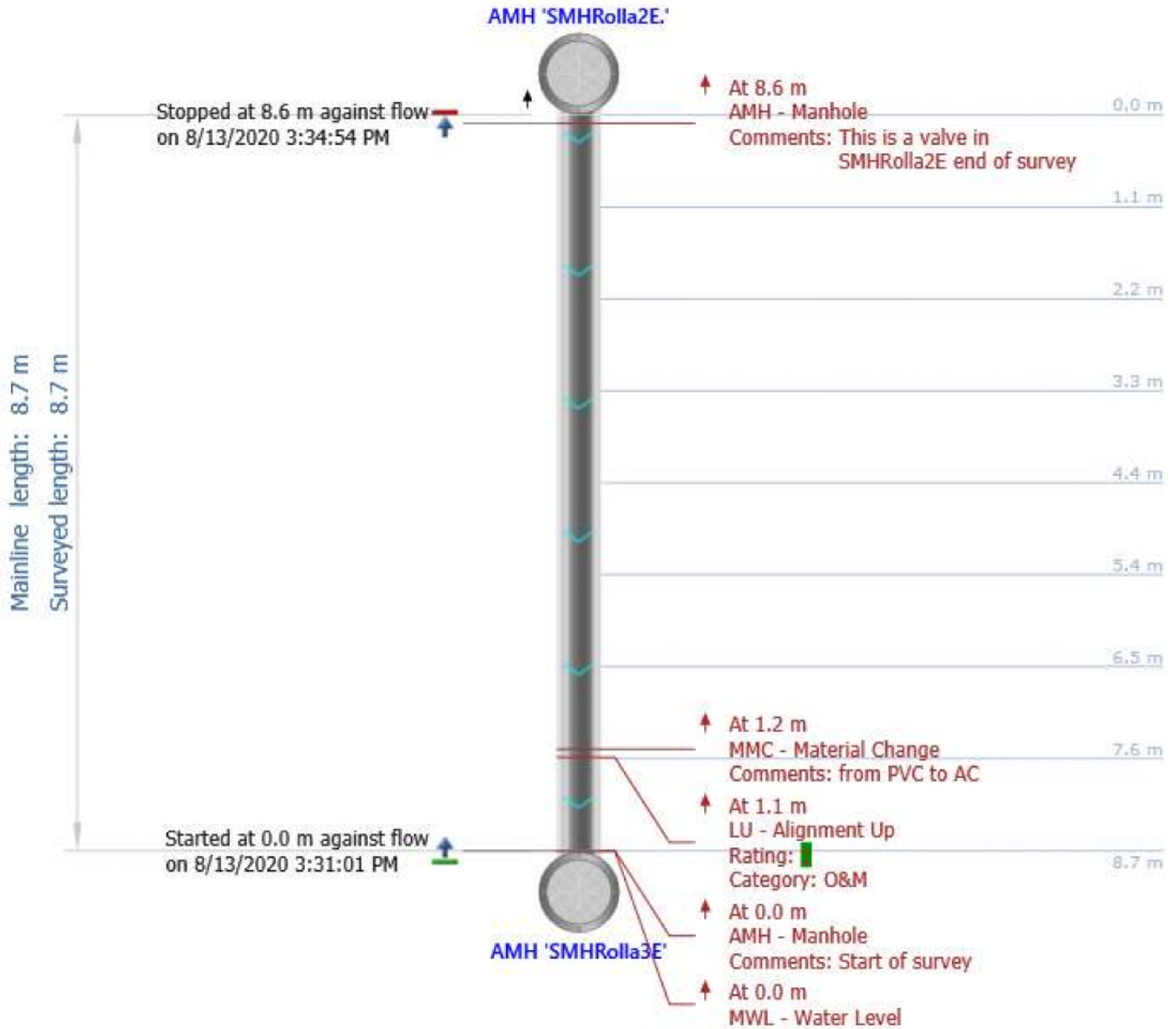
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: LiftStation-SMHRolla1N	City: Rolla	Street: Front entrance
Start date/time: 8/13/2020 3:04 PM	Direction: U	Weather:	Location code:
Shape: C	Material: CAS	Height: 100 mm	Width:



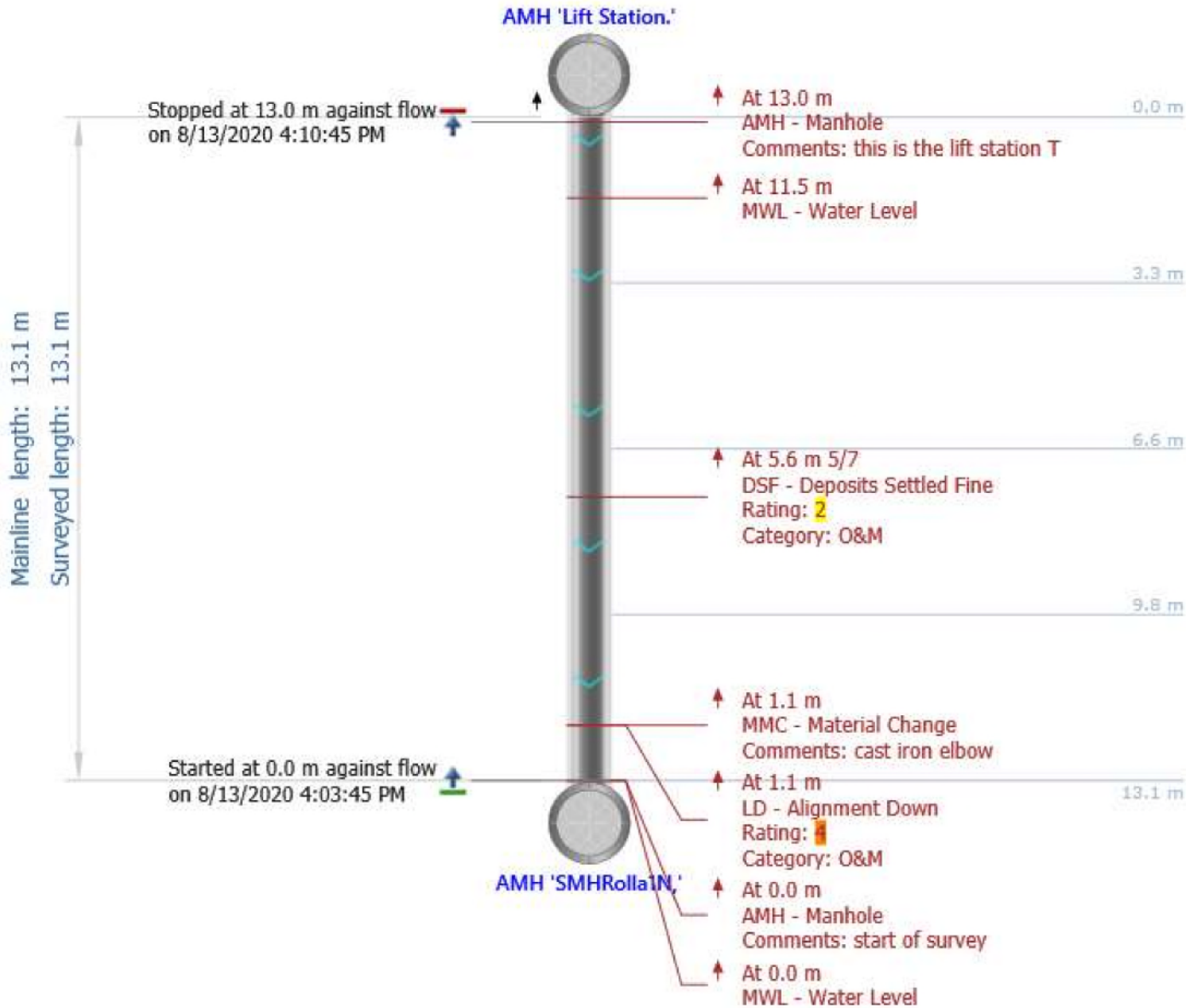
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: SMHRolla2E-SMHRolla3E	City: Rolla	Street: East side of Pond A
Start date/time: 8/13/2020 3:31 PM	Direction: U	Weather:	Location code:
Shape: C	Material: PVC	Height: 200 mm	Width:



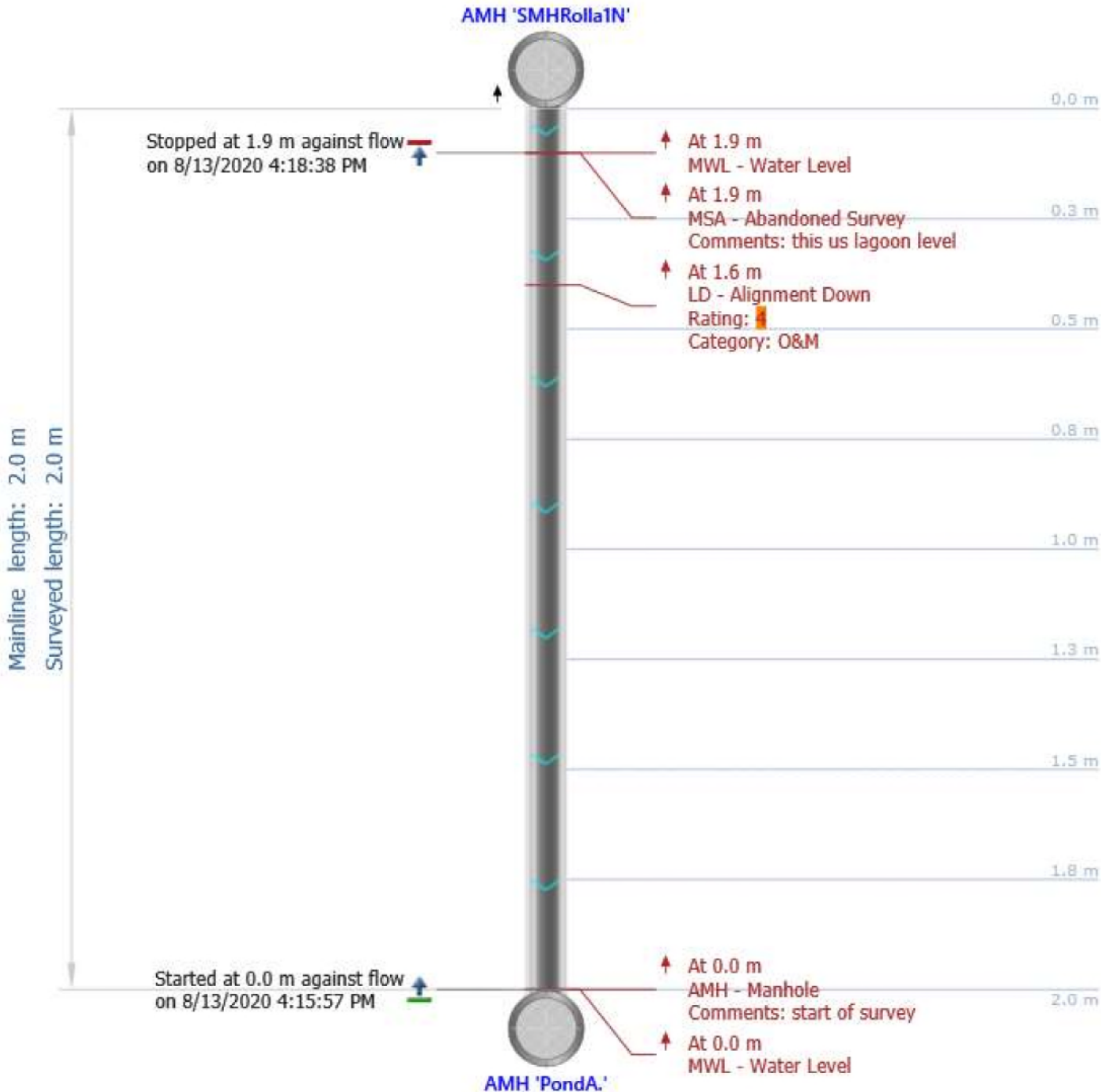
Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP, Aug2020	Mainline ID: Lift Station-SMHRolla1N.	City: Rolla	Street: Front entrance to laggons
Start date/time: 8/13/2020 4:03 PM	Direction: U	Weather:	Location code:
Shape: C	Material: PVC	Height: 100 mm	Width:



Main Inspections Pipe Run

Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Mainline ID: SMHRolla1N-PondA	City: Rolla	Street: Front entrance Pond A
Start date/time: 8/13/2020 4:15 PM	Direction: U	Weather:	Location code:
Shape: C	Material: PVC	Height: 150 mm	Width:



PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SegSMHRolla3E-SMHRolla7SE		Start date/time: 20200807 10:48	Street: Along the fens East side of the Lagoons		City: Rolla	
Location details:		Upstream MH No: SMHRolla3E	Rim to invert:		Grade to invert:	Rim to grade:
Sewer use:	Direction: D	Flow control:	Downstream MH No: SMHRolla7SE	Rim to invert:	Grade to invert:	Rim to grade:
Height: 200 mm	Width:	Shape: C	Material: PVC	Lining method:	Pipe joint length:	Total length: 120.9 m
Length surveyed: 120.9 m	Year laid:	Year renewed:	Media label:	Purpose:	Sewer category:	Pre-cleaning: J
Date cleaned:	Work order no.:	Weather:	Location code:	Pressure value:	Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	
Additional info:						

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	133	3G22	2.96	133	2.96
2	0	0				2	4					
3	0	0				43	129					
4	0	0				0	0					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:50	MWL					5	<input type="checkbox"/>		/			
0.0 m	00:00:03	AMH						<input type="checkbox"/>		/			Start of survey, This is a very long run over 200Meters, cant find a MH inbetween on ground, flusher does not have enough hose to flush entire line. Located MH from Line, not exposed
1.4 m	00:02:43	DSC	S01				20	<input type="checkbox"/>		3 / 9	3		flusher cant get up this far old compact debris in the bottom of the line
36.1 m	00:06:10	MGO						<input type="checkbox"/>		/			In order to get threw the unflushed portion im having to speed cant jam up my tracks
61.1 m	00:09:18	MWL					40	<input type="checkbox"/>		/			
64.7 m	00:09:46	MWL					5	<input type="checkbox"/>		/			
66.9 m	00:09:57	DSC	F01				20	<input type="checkbox"/>		4 / 8	3		
70.3 m	00:10:14	MWL					40	<input type="checkbox"/>		/			
76.5 m	00:10:48	MWL					5	<input type="checkbox"/>		/			
101.9 m	00:15:36	DSC					10	<input type="checkbox"/>		5 / 7	2		
103.7 m	00:20:59	MGO						<input type="checkbox"/>		/			Going to get flusher to try and come up to this point to flush out this compact scale that camera has pushed down
106.0 m	00:18:16	DSC					10	<input type="checkbox"/>		5 / 7	2		scale
120.8 m	00:25:29	AMH						<input type="checkbox"/>		/			This Man Hole is not located on the ground.

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SegSMRolla7SE-SMRolla7SEB	Start date/time: 20200807 11:28	Street: Along Fence East side of the lagoon	City: Rolla	Location details:		
Sewer use: Direction: Flow control:		Upstream MH No: SMHRolla7SE	Rim to invert:	Grade to invert:	Rim to grade:	
Height: Width: Shape:	Material: Lining method: Pipe joint length: Total length: Length surveyed:	Downstream MH No: SMHRolla7SE,B	Rim to invert:	Grade to invert:	Rim to grade:	
200 mm C	PVC 121.6 m 121.6 m	Year laid: Year renewed:	Media label: Purpose: Sewer category: Pre-cleaning: Date cleaned: Work order no.: Weather: Location code: Pressure value:			
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020		Additional info:				

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	6	3200	3.00	0	0	5	5100	5.00	11	3.67
2	0	0				0	0					
3	2	6				0	0					
4	0	0				0	0					
5	0	0				1	5					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:02	AMH						<input type="checkbox"/>	/				This ManHole is not exposed Start of survey
0.0 m	00:26:27	MWL					5	<input type="checkbox"/>	/				
23.0 m	00:06:05	MWM					40	<input type="checkbox"/>	/			RollaSaniLagoons_P RRD_WSP_Aug2020-AMH 'SMHRolla7SE'-AMH 'SMHRolla7SE_B'-MWM at 23.0 m.JPG	
30.4 m	00:07:59	FS						<input type="checkbox"/>	1 / 4		3		
48.9 m	00:11:49	MWM					10	<input type="checkbox"/>	/				
51.5 m	00:12:40	FL						<input type="checkbox"/>	12 /		3	RollaSaniLagoons_P RRD_WSP_Aug2020-AMH 'SMHRolla7SE'-AMH 'SMHRolla7SE_B'-FL at 51.5 m.JPG	
56.7 m	00:14:17	IS						<input type="checkbox"/>	12 / 12				Multiple different water mark stains
57.4 m	00:15:15	MWM					100	<input type="checkbox"/>	/		5		
63.0 m	00:16:20	MWL					5	<input type="checkbox"/>	/				
121.5 m	00:25:21	AMH						<input type="checkbox"/>	/				End of survey

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: Seg SMHRolla2E-SMHRolla3E	Start date/time: 20200807 12:12	Street: East Side of PondA	City: Rolla	Location details:		
Sewer use:	Direction: U	Flow control:	Upstream MH No: SMHRolla2E	Rim to invert:	Grade to invert:	Rim to grade:
Height: 200 mm	Width:	Shape: C	Material: PVC	Lining method:	Pipe joint length:	Total length: 1.7 m
Media label:	Purpose:	Sewer category:	Pre-cleaning: N	Date cleaned:	Work order no.:	Weather:
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	1	1	3	2111	1.50	3	1.50
2	0	0				1	2					
3	0	0				0	0					
4	0	0				0	0					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:03	AMH						<input type="checkbox"/>	/				Start of survey will be flushed after
0.0 m	00:00:33	MWL				5		<input type="checkbox"/>	/				
0.0 m	00:00:57	DAE				5		<input type="checkbox"/>	3 / 9		2		Scale will be removed with flusher after
0.6 m	00:02:06	LU				10		<input type="checkbox"/>	/		1		
1.6 m	00:03:26	MSA						<input type="checkbox"/>	/				Will Clean and retry

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SegPondA to SMHRolla4	Start date/time: 20200807 12:39	Street: Between PondA and B in the middle, first MH out of Pond A	City: Rolla			
Location details:		Upstream MH No: PondA	Rim to invert:	Grade to invert:	Rim to grade:	
Sewer use:	Direction: U	Flow control:	Downstream MH No: SMHRolla4	Rim to invert:	Grade to invert:	Rim to grade:
Height: 200 mm	Width:	Shape: C	Material: CAS	Lining method:	Pipe joint length:	Total length: 0.5 m
Length surveyed: 0.5 m	Year laid:	Year renewed:	Media label:	Purpose:	Sewer category:	Pre-cleaning: N
Date cleaned:	Work order no.:	Weather:	Location code:	Pressure value:	Additional info:	
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020						

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	4	4100	4.00	4	4.00
2	0	0				0	0					
3	0	0				0	0					
4	0	0				1	4					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:08	AMH						<input type="checkbox"/>	/				This line is into the Pond.
0.0 m	00:00:27	MWL					5	<input type="checkbox"/>	/				
0.0 m	00:02:05	MGO						<input type="checkbox"/>	/		RollaSaniLagoons_P RRD_WSP_Aug2020- AMH 'PondA'-AMH 'SMHRolla4'-MGO at 0.0 m.JPG		this is a Valve fairly corroded
0.0 m	00:04:04	MWL					100	<input type="checkbox"/>	/				this would be lagoon level going into lagoon A
0.3 m	00:04:40	MCU						<input type="checkbox"/>	/		4		Lagoon level
0.4 m	00:04:54	MSA						<input type="checkbox"/>	/				End of Survey this is Lagoon level

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SMHRolla9S-RollaOutfall	Start date/time: 20200813 10:51	Street: Far end of both ponds on bank before outfall	City: Rolla			
Location details:	Upstream MH No: SMHRolla9S	Rim to invert:	Grade to invert:	Rim to grade:		
Sewer use: Direction: Flow control:	Downstream MH No: RollaOutfall	Rim to invert:	Grade to invert:	Rim to grade:		
Height: Width: Shape:	Material: Lining method: Pipe joint length: Total length: Length surveyed:	Year laid:	Year renewed:			
200 mm C	CMP 36.9 m 36.9 m					
Media label: Purpose:	Sewer category: Pre-cleaning: Date cleaned: Work order no.: Weather:	Location code:	Pressure value:			
	N					
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	69	3C00	3.00	1	1	17	4126	2.13	86	2.77
2	0	0				6	12					
3	23	69				0	0					
4	0	0				1	4					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:09	AMH						<input type="checkbox"/>	/				Start of survey this line is the outfall to the Rolla Creek, we cannot flush this
0.0 m	00:00:48	MWL					5	<input type="checkbox"/>	/				
1.2 m	00:02:02	SCP	S01					<input type="checkbox"/>	3 / 9		3		Rust between 3-9 on the pipe
3.5 m	00:04:37	MGO						<input type="checkbox"/>	/				possibly tar coated on the bottom
13.8 m	00:10:23	LD					15	<input type="checkbox"/>	/		2		
13.9 m	00:13:42	SCP	F01					<input type="checkbox"/>	3 / 9		3		
13.9 m	00:13:50	SCP	S02					<input type="checkbox"/>	12 / 12		3		rust and corrosion around diameter of pipe
14.2 m	00:11:10	OBZ					10	<input type="checkbox"/>	4 / 6		2		stick or cat tail from pond in the bottom of the line
14.4 m	00:15:21	H						<input type="checkbox"/>	3 /		3		small corroded hole on the side of the pipe
15.1 m	00:17:28	LD					30	<input type="checkbox"/>	/		4		
15.5 m	00:20:24	DSF					5	<input type="checkbox"/>	5 / 7		2		
17.0 m	00:23:05	DSF					10	<input type="checkbox"/>	5 / 7		2		
17.7 m	00:24:35	RFJ						<input checked="" type="checkbox"/>	4 /		1		
18.4 m	00:25:06	RFB						<input type="checkbox"/>	9 /		2		root hairs coming in on the side walls
36.0 m	00:33:10	SCP	F02					<input type="checkbox"/>	12 / 12		3		
36.8 m	00:30:11	DSF					5	<input type="checkbox"/>	5 / 7		2		

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
36.8 m	00:31:06	MSA						<input type="checkbox"/>	/				Have to stop camera here the downward slopes are getting too much the camera is free wheeling, and this joint could cut up the cable on the way back up

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SMHRolla9S-RollaOutfall.	Start date/time: 20200813 11:40	Street: Far South end of the Lagoon going towards the Creek	City: Rolla			
Location details:	Upstream MH No: SMHRolla9S.	Rim to invert:	Grade to invert:	Rim to grade:		
Sewer use: Direction: Flow control:	Downstream MH No: RollaOutfall.	Rim to invert:	Grade to invert:	Rim to grade:		
Height: Width: Shape:	Material: Lining method: Pipe joint length: Total length: Length surveyed:	Year laid:	Year renewed:			
200 mm C	CMP 82.7 m 82.7 m					
Media label: Purpose:	Sewer category: Pre-cleaning: Date cleaned: Work order no.: Weather:	Location code:	Pressure value:			
	J					
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	164	5131	3.04	0	0	13	4131	2.60	177	3.00
2	0	0				3	6					
3	53	159				1	3					
4	0	0				1	4					
5	1	5				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
				1st	2nd			At/From	To			
0.0 m	00:00:02	AMH					<input type="checkbox"/>	/				Start of survey
0.0 m	00:00:11	MWL				5	<input type="checkbox"/>	/				
2.3 m	00:00:51	SCP	S01				<input type="checkbox"/>	3 / 9		3		
13.8 m	00:02:05	SCP	F01				<input type="checkbox"/>	3 / 9		3		
13.8 m	00:02:13	SCP	S02				<input type="checkbox"/>	12 / 12		3		
13.9 m	00:02:28	OBZ				5	<input type="checkbox"/>	5 / 7		2		stick
14.8 m	00:02:59	LD				30	<input type="checkbox"/>	/		4		
17.7 m	00:03:30	RFB					<input type="checkbox"/>	3 /		2		
25.8 m	00:04:39	H					<input type="checkbox"/>	9 /		3		
36.3 m	00:06:04	MGO					<input type="checkbox"/>	/				This is the same point we had come to in previous video will attempt further inspection
36.3 m	00:06:49	DSF				5	<input type="checkbox"/>	6 /		2		
40.1 m	00:08:09	D				15	<input type="checkbox"/>	/		5		dented in the top
41.7 m	00:09:17	RPP					<input type="checkbox"/>	10 / 1				old split/hole in the line patched
69.6 m	00:14:54	H					<input type="checkbox"/>	10 /		3	RollaSanilagoons_P RRD_WSP_Aug2020-AMH 'SMHRolla9S.-AMH 'RollaOutfall.'-H at 69.6 m.JPG	rock and pieces of CMP turned inward and protruding into the pipe
72.3 m	00:16:23	SCP	F02				<input type="checkbox"/>	12 / 12		3		
74.9 m	00:16:52	SCP	S03				<input type="checkbox"/>	4 / 8		3		
81.0 m	00:18:22	DSGV				15	<input type="checkbox"/>	5 / 7		3		
82.0 m	00:20:47	SCP	F03				<input type="checkbox"/>	3 / 9		3		
82.6 m	00:20:08	MSA					<input type="checkbox"/>	/				End of survey very close the end hung up on hte gravel debris

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SMHRolla8SValv-SMHRolla9S	Start date/time: 20200813 12:22	Street: Coming out of Pond B South	City: Rolla			
Location details:	Upstream MH No: SMHRolla8Valve	Rim to invert:	Grade to invert:	Rim to grade:		
Sewer use:	Direction: D	Flow control:	Downstream MH No: SMHRolla9S	Rim to invert:	Grade to invert:	Rim to grade:
Height: 300 mm	Width:	Shape: C	Material: PVC	Lining method:	Pipe joint length:	Total length: 115.6 m
Media label:	Purpose:	Sewer category:	Pre-cleaning: J	Date cleaned:	Work order no.:	Weather:
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	0	0000	0.00	0	0.00
2	0	0				0	0					
3	0	0				0	0					
4	0	0				0	0					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:03	AMH						<input type="checkbox"/>	/				Start of survey
0.0 m	00:00:16	MWL					5	<input type="checkbox"/>	/				camera is sitting low
115.5 m	00:13:35	AMH						<input type="checkbox"/>	/				End of survey

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SMHRolla7SE,B-SMHRolla9S	Start date/time: 20200813 12:59	Street: Far South East corner along fence	City: Rolla			
Location details:	Upstream MH No: SMHRolla7SE,B	Rim to invert:	Grade to invert:	Rim to grade:		
Sewer use:	Direction: D	Flow control:	Downstream MH No: SMHRolla9S	Rim to invert:	Grade to invert:	Rim to grade:
Height: 200 mm	Width:	Shape: C	Material: PVC	Lining method:	Pipe joint length:	Total length: 90.2 m
Media label:	Purpose:	Sewer category:	Pre-cleaning: J	Date cleaned:	Work order no.:	Weather:
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:					O&M:					Overall:	
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	10	4221	3.33	0	0	0	0000	0.00	10	3.33
2	1	2				0	0					
3	0	0				0	0					
4	2	8				0	0					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:02	AMH						<input type="checkbox"/>	/				Start of survey
0.0 m	00:00:15	MWL					5	<input type="checkbox"/>	/				
7.7 m	00:02:13	MWLS					10	<input type="checkbox"/>	/		2		
8.5 m	00:02:28	MWL					5	<input type="checkbox"/>	/				
44.0 m	00:09:55	D					5	<input type="checkbox"/>	/		4		small indent in the top of the pipe
65.5 m	00:13:18	D					5	<input type="checkbox"/>	/		4		joint edge is bent in slightly
90.1 m	00:17:53	AMH						<input type="checkbox"/>	/				end of survey

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: PondB-SMHRolla8SValve	Start date/time: 20200813 13:37	Street: Going into PondB	City: Rolla	Location details:		
Sewer use:	Direction: U	Flow control:	Upstream MH No: Pond B	Rim to invert:	Grade to invert:	Rim to grade:
Height: 300 mm	Width:	Shape: C	Material: PVC	Lining method:	Pipe joint length:	Total length: 0.8 m
Media label:	Purpose:	Sewer category:	Pre-cleaning: N	Date cleaned:	Work order no.:	Weather:
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:			O&M:			Overall:					
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	4	4100	4.00	4	4.00
2	0	0				0	0					
3	0	0				0	0					
4	0	0				1	4					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:02	AMH						<input type="checkbox"/>	/				Start of survey
0.0 m	00:00:20	MWL					5	<input type="checkbox"/>	/				
0.7 m	00:01:01	LD					90	<input type="checkbox"/>	/		4		
0.7 m	00:01:08	MSA						<input type="checkbox"/>	/				This line only goes in the length of the camera and goes down at a 90degree angle. this is the level of Pond B. End of survey

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SMHRolla4-SMHRolla5	Start date/time: 20200813 13:55	Street: Middle between Pond A and B	City: Rolla	Location details:		
Sewer use:	Direction: D	Flow control:	Upstream MH No: SMHRolla4	Rim to invert:	Grade to invert:	Rim to grade:
Height: 200 mm	Width:	Shape: C	Material: CAS	Lining method:	Pipe joint length:	Total length: 0.8 m
Media label:	Purpose:	Sewer category:	Pre-cleaning: N	Date cleaned:	Work order no.:	Weather:
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:			O&M:			Overall:					
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	0	0000	0.00	0	0.00
2	0	0				0	0					
3	0	0				0	0					
4	0	0				0	0					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:02	AMH						<input type="checkbox"/>	/				Start of survey these lines are holding lagoon water they are the pass threw between pond A and B no way to clean
0.0 m	00:00:45	MWL				5		<input type="checkbox"/>	/				
0.0 m	00:01:32	MMC						<input type="checkbox"/>	/				from cast to AC
0.7 m	00:01:59	MWL				100		<input type="checkbox"/>	/				
0.7 m	00:02:05	MSA						<input type="checkbox"/>	/				End of survey line is holding water at SMHRolla5 cant go into and holding at SMHRolla6

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: LiftStation-SMHRolla1N	Start date/time: 20200813 15:04	Street: Front entrance	City: Rolla		Location details:	
Sewer use: Direction: Flow control:		Upstream MH No: LiftStation	Rim to invert:	Grade to invert:	Rim to grade:	
Height: Width: Shape:		Downstream MH No: SMHRolla1N	Rim to invert:	Grade to invert:	Rim to grade:	
100 mm	C	Material: Lining method: Pipe joint length: Total length: Length surveyed:	5.9 m	5.9 m	Year laid:	Year renewed:
Media label:	Purpose:	Sewer category: Pre-cleaning: Date cleaned: Work order no.: Weather:	J	Location code:	Pressure value:	
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020		Additional info:				

Grade	Structural:			O&M:			Overall:					
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	4	4100	4.00	4	4.00
2	0	0				0	0					
3	0	0				0	0					
4	0	0				1	4					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:07	AMH						<input type="checkbox"/>	/				start of survey
0.0 m	00:00:24	MWL					5	<input type="checkbox"/>	/				
0.0 m	00:01:29	LD					45	<input type="checkbox"/>	/		4		
0.0 m	00:01:38	MMC						<input type="checkbox"/>	/				from pvc to cast the back to pvc
5.8 m	00:05:30	MSA						<input type="checkbox"/>	/				end of survey

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SMHRolla2E-SMHRolla3E	Start date/time: 20200813 15:31	Street: East side of Pond A	City: Rolla			
Location details:	Upstream MH No: SMHRolla2E.	Rim to invert:	Grade to invert:	Rim to grade:		
Sewer use:	Direction: U	Flow control:	Downstream MH No: SMHRolla3E	Rim to invert:	Grade to invert:	Rim to grade:
Height: 200 mm	Width:	Shape: C	Material: PVC	Lining method:	Pipe joint length:	Total length: 8.7 m
Media label:	Purpose:	Sewer category:	Pre-cleaning: J	Date cleaned:	Work order no.:	Weather:
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:					

Grade	Structural:			O&M:			Overall:					
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	1	1	1	1100	1.00	1	1.00
2	0	0				0	0					
3	0	0				0	0					
4	0	0				0	0					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:04	AMH						<input type="checkbox"/>	/				Start of survey
0.0 m	00:00:17	MWL					5	<input type="checkbox"/>	/				
1.1 m	00:01:07	LU					10	<input type="checkbox"/>	/		1		
1.2 m	00:01:12	MMC						<input type="checkbox"/>	/				from PVC to AC
8.6 m	00:03:01	AMH						<input type="checkbox"/>	/				This is a valve in SMHRolla2E end of survey

PACP Inspection and Scoring

Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: Lift Station-SMHRolla1N.	Start date/time: 20200813 16:03	Street: Front entrance to laggons	City: Rolla	Location details:		
Sewer use:	Direction: U	Flow control:	Upstream MH No: Lift Station.	Rim to invert:	Grade to invert:	Rim to grade:
Height: 100 mm	Width:	Shape: C	Material: PVC	Lining method:	Downstream MH No: SMHRolla1N,	Rim to invert:
Media label:	Purpose:	Sewer category:	Pre-cleaning: J	Pipe joint length:	Date cleaned:	Work order no.:
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020	Additional info:	Total length: 13.1 m	Length surveyed: 13.1 m	Year laid:	Year renewed:	Location code:
		Weather:	Pressure value:			

Grade	Structural:			O&M:			Overall:					
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	6	4121	3.00	6	3.00
2	0	0				1	2					
3	0	0				0	0					
4	0	0				1	4					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:06	AMH						<input type="checkbox"/>	/				start of survey
0.0 m	00:00:28	MWL					5	<input type="checkbox"/>	/				
1.1 m	00:01:16	MMC						<input type="checkbox"/>	/				cast iron elbow
1.1 m	00:01:07	LD					45	<input type="checkbox"/>	/		4		
5.6 m	00:03:39	DSF					5	<input type="checkbox"/>	5 / 7		2		
11.5 m	00:05:33	MWL					10	<input type="checkbox"/>	/				
13.0 m	00:06:40	AMH						<input type="checkbox"/>	/				this is the lift station T

PACP Inspection and Scoring

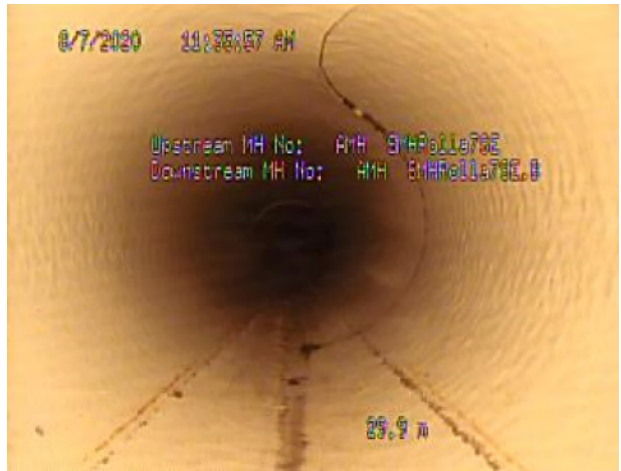
Surveyed by: Bryana	Certificate number: U-0417-07004461	Owner: CL Video Inspection Service Ld	Customer:	Drainage area:	P/O number:	Sheet number:
Pipe segment ref.: SMHRolla1N-PondA	Start date/time: 20200813 16:15	Street: Front entrance Pond A	City: Rolla		Location details:	
Sewer use: Direction: Flow control:		Upstream MH No: SMHRolla1N	Rim to invert:	Grade to invert:	Rim to grade:	
Height: Width: Shape:		Downstream MH No: PondA.	Rim to invert:	Grade to invert:	Rim to grade:	
150 mm	C	Material: Lining method: Pipe joint length: Total length: Length surveyed:	2.0 m	2.0 m	Year laid:	Year renewed:
Media label:	Purpose:	Sewer category: Pre-cleaning: Date cleaned: Work order no.: Weather:	N	Location code:	Pressure value:	
Project name: RollaSaniLagoons,PRRD, WSP,Aug2020		Additional info:				

Grade	Structural:			O&M:			Overall:					
	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Amount of Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0	0	0000	0.00	0	0	4	4100	4.00	4	4.00
2	0	0				0	0					
3	0	0				0	0					
4	0	0				1	4					
5	0	0				0	0					

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Rating	Image Ref.	Remarks
					1st	2nd			At/From	To			
0.0 m	00:00:16	AMH						<input type="checkbox"/>	/				start of survey
0.0 m	00:00:33	MWL					5	<input type="checkbox"/>	/				
1.6 m	00:01:03	LD					45	<input type="checkbox"/>	/		4		
1.9 m	00:01:39	MWL					100	<input type="checkbox"/>	/				
1.9 m	00:02:04	MSA						<input type="checkbox"/>	/				this us lagoon level

Pipe Cracking Deficiencies in Inter-lagoon Piping



Internal Corrosion in Outfall Pipe



C

OPERATING
PERMIT





Province of
British Columbia

BC
Environment

MINISTRY OF
ENVIRONMENT,
LANDS AND PARKS

Environmental Protection
1011 4th Avenue
Prince George, British Columbia
V2L 3H9
Telephone: (604) 565-6155
Fax: (604) 565-6629

REGISTERED MAIL

Date: MAR 15 1995

File: PE-05465

Peace River Regional District
1891 Alaska Highway,
Box 810,
Dawson Creek, B.C.
V1G 4H7



Attention: A. Jorgensen

Dear Permittee:

Enclosed is an amended copy of Permit No. PE-05465 issued under the provisions of the Waste Management Act. Your attention is respectfully directed to the terms and conditions outlined in the Permit.

The Ministry has concerns regarding the ability of Rolla Creek to provide adequate dilution over the long-term. At present, the Ministry is preparing new *Municipal Effluent Discharge Criteria*, which are currently in *draft* form and may become regulations. These *draft* Criteria generally prohibit discharge of secondary treated sewage effluent to streams where dilution is less than 100:1 unless an environmental assessment study is completed and shows that the discharge is acceptable.

Due to low and intermittent flows in the creek and characteristics of the clay soils in the area, it appears that the options for sewage disposal at this site may be limited. At this time, it is recommended that the Permittee begin investigating the opportunity for spray irrigation of effluent at the site, thereby eliminating the need for discharge to the creek. At the present permitted discharge volume of 5,000 m³/year, a minimum land area of 1.6 hectares (4 acres) is required for spray irrigation of effluent.

This Permit does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority shall rest with the Permittee.

The Permittee shall ensure that any discharge under this Permit meets the requirements of other regulatory agencies including, but not restricted to, Environment Canada and the Department of Fisheries and Oceans (Canada).

An annual permit fee will be determined according to the Waste Management Permit Fees Regulation.

The administration of this Permit will be carried out by staff from our Regional Office located in Prince George (telephone 565-6155). **Plans, data and reports pertinent to the Permit are to be submitted to the Environmental Protection office, 3rd Floor, 1011 Fourth Avenue, Prince George, British Columbia, V2L 3H9 and a copy of all plans, data and reports is to be submitted to the sub-Regional office at Room #200, 10003 - 110th Avenue, Fort St. John, British Columbia, V1J 6M7 (telephone 787-3391).**

This decision may be appealed in accordance with Section 27 of the Waste Management Act by giving written notice to me within 21 days of this notification.

Yours truly,



B.W.Medlar
Assistant Regional Waste Manager
Omineca-Peace Region

enclosure



MINISTRY OF ENVIRONMENT,
LANDS AND PARKS

PERMIT
PE-05465

Under the Provisions of the Waste Management Act

Peace River Regional District
1891 Alaska Avenue
Box 810
Dawson Creek, British Columbia
V1G 4H7

is authorized to discharge treated domestic effluent to Rolla Creek from a wastewater treatment lagoon located at **Rolla**, British Columbia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

This permit revokes and replaces all previously issued permits under the number PE-5465 issued under Part 2, Section 8 of the Waste Management Act.

1. AUTHORIZED DISCHARGES

1.1 This subsection applies to the discharge of effluent from a wastewater treatment lagoon. The site reference number for this discharge is E209664.

1.1.1 The maximum authorized rate of discharge is 5,000 m³/year. Discharge of effluent is authorized only when a dilution of equal to or greater than 50:1 can be maintained in the creek.

1.1.2 The characteristics of the discharge shall not exceed:

- | | | |
|----|---------------------------------|---------|
| a) | 5-Day Biochemical Oxygen Demand | 30 mg/L |
| b) | Total Suspended Solids | 40 mg/L |

1.1.3 The authorized works are a 1.0 hectare stabilization lagoon with an outfall to Rolla Creek and related appurtenances approximately located as shown on attached Site Plan A.

Date issued: June 7, 1979

Date Amended:
(most recent)

MAR 15 1995

Page: 1 of 5


B.W. Medlar
Assistant Regional Waste Manager

PERMIT : PE-05465

1.1.4 The location of the point of discharge and the facilities from which the discharge originates is the southwest 1/4 of Section 33, Township 79, Range 14, W6M, Peace River District.

2. GENERAL REQUIREMENTS

2.1 Maintenance of Works and Emergency Procedures

The Permittee shall inspect the authorized works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the Permittee which prevents continuing operation of the authorized works, the Permittee shall immediately notify the Regional Waste Manager and take appropriate remedial action.

2.2 Bypasses

The discharge of effluent which has bypassed the authorized works is prohibited unless the consent of the Regional Waste Manager is obtained and confirmed in writing.

2.3 Modifications to Processes and/or Authorized Works

The Permittee shall notify the Regional Waste Manager in writing prior to implementing changes to any process and/or authorized works that may negatively affect the quality of the discharge and/or increase the quantity of the discharge.

2.4 Upgrading of Authorized Works

The Regional Waste Manager may require upgrading of the authorized works if, based on data and information received, it becomes apparent that such improvements are necessary to protect the environment.

2.5 Fencing

The lagoons shall be fenced to the satisfaction of the Regional Waste Manager to prevent accidental trespass.

2.6 Posting of Cautionary Signs

The Permittee shall erect signs along the perimeter of the lagoons and along the alignment of the outfall above high water mark. The signs shall identify the nature of the works. The wording and size of the signs requires the consent of the Regional Waste Manager.

2.7 Lagoon Freeboard

A minimum level of 0.5 metre(s) of freeboard shall be maintained in lagoons to prevent overflow from the treatment works to the receiving environment. Freeboard is defined as the difference in elevation between the contained liquid level and the top of the berm structure at its lowest point.

2.8 Sludge Wasting and Disposal

Sludge wasted from the treatment works shall be disposed of to a site and in a manner authorized by the Regional Waste Manager.

2.9 Disinfection

Although disinfection of the effluent is not required at this time, suitable provisions should be made to include disinfection facilities in the future. If disinfection is by chlorination, dechlorination facilities may also be required. The Regional Manager may issue a direction to commence disinfection of the effluent at his/her discretion.

2.10 Facility Classification and Operator Certification

Facility classification shall be maintained with the *British Columbia Water and Wastewater Operators Certification Program Society (BCWWOCPS)*.

The wastewater treatment system authorized in Section 1.1 has been classified as Level I by the BCWWOCPS. The classification certificate shall be renewed annually and a re-classification review of each facility shall be conducted at least once every five (5) years.

Certification of operators is not required for facilities classified as Level I.

2.11 Notification of Intent to Discharge

The Permittee shall notify the Regional Environmental Protection office a minimum of 24 hours prior to commencing the discharge from the lagoon.

Results of pre-discharge sampling and creek flow measurements shall be reported at this time.

3. MONITORING AND REPORTING REQUIREMENTS

3.1 Discharge Monitoring

3.1.1 Discharge Flow Measurement

The Permittee shall provide and maintain a suitable flow measuring device and record daily the effluent volume discharged over a 24-hour period.

3.1.2 Grab Sampling

The Permittee shall install a suitable sampling facility and obtain a representative grab sample of the effluent to be discharged once prior to commencing each discharge period and once each month during the discharge period. The first sample shall be collected within two (2) weeks prior to commencing each discharge period.

3.1.3 Analyses

Samples shall be analyzed for the following:

- a) 5-day Biochemical Oxygen Demand mg/L
- b) Total Suspended Solids mg/L
- c) Faecal Coliform Organisms FC-CFU/100 mL or
MPN/100 mL

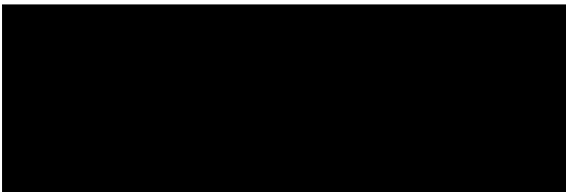
3.2 Receiving Environment Monitoring

3.2.1 Creek Flow Measurement

The Permittee shall provide some means, satisfactory to the Regional Waste Manager, for measuring or estimating the flow in Rolla Creek over a 24-hour period. Creek flow measurements shall be recorded daily during the discharge period.

3.3 Quality Assurance Program

The Permittee shall conduct an ongoing data quality program which is acceptable to the Regional Waste Manager. The Quality Assurance Program will determine the acceptability of data required by the Permit and will replace the split sampling program.



3.4 Monitoring Procedures

Copies of the manuals mentioned below are available for viewing at all Environmental Protection offices, or may be obtained from the Environmental Protection Division, Ministry of Environment, Lands and Parks, 777 Broughton Street, Victoria, British Columbia, V8V 1X5.

3.4.1 Sampling

Proper care should be taken in sampling, storing, and transporting the samples to adequately control temperature and avoid contamination, breakage, etc. Sampling of effluent is to be carried out in accordance with procedures described in the most current edition of "*Field Criteria for Sampling Effluent and Receiving Water*" (April 1989, or most recent update), or by suitable alternative procedures as authorized by the Regional Waste Manager.

3.4.2 Analyses

Analyses are to be carried out in accordance with procedures described in the most current edition of "*British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials*" (1994 Edition, or most recent update) or by suitable alternative procedures as authorized by the Regional Waste Manager.

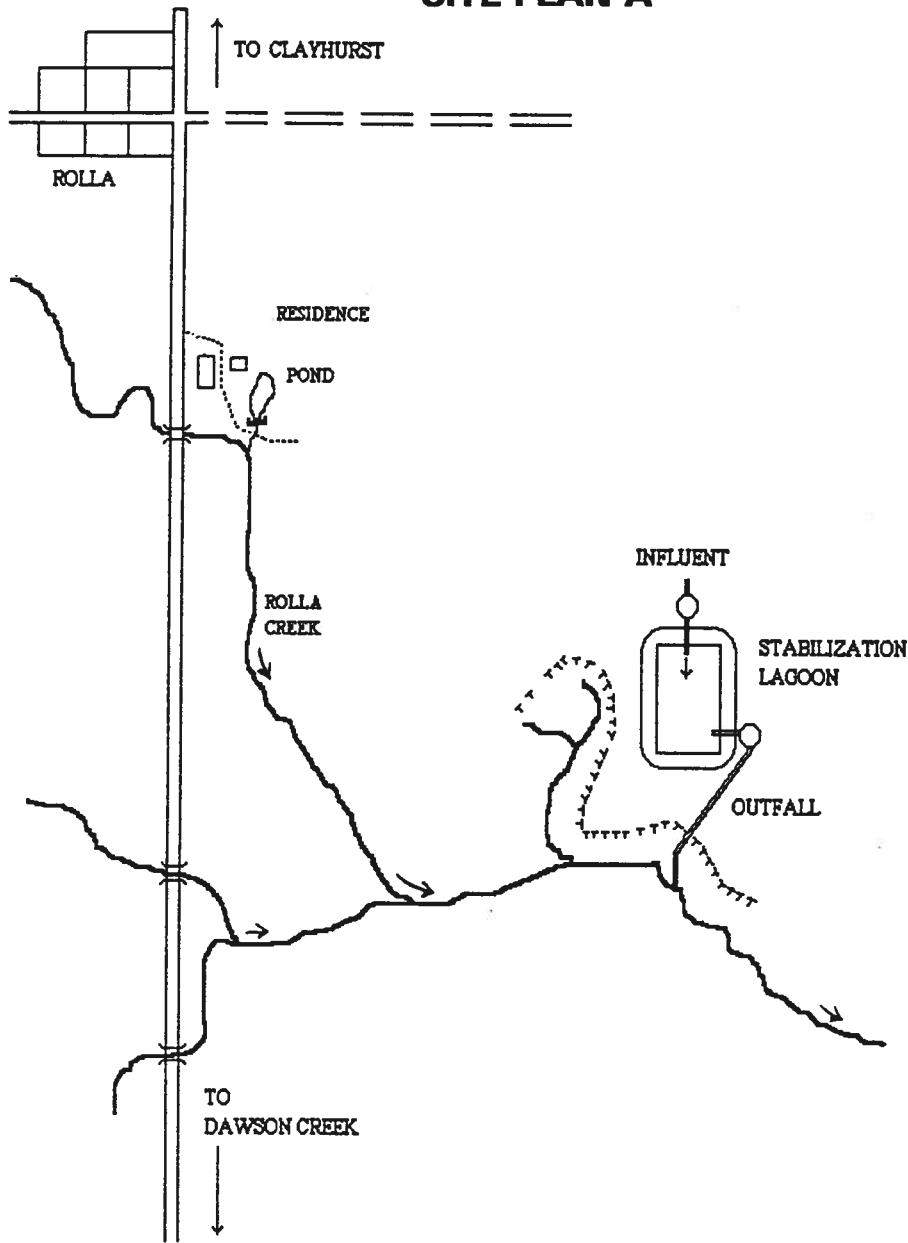
3.5 Reporting

Data of analyses and flow measurements shall be maintained for inspection and submitted to the Regional Environmental Protection office. All sample analyses shall be submitted within 30 days of the month end during which the monitoring was carried out. Daily discharge flow and creek flow measurements shall be submitted within 30 days of the end of each discharge period.

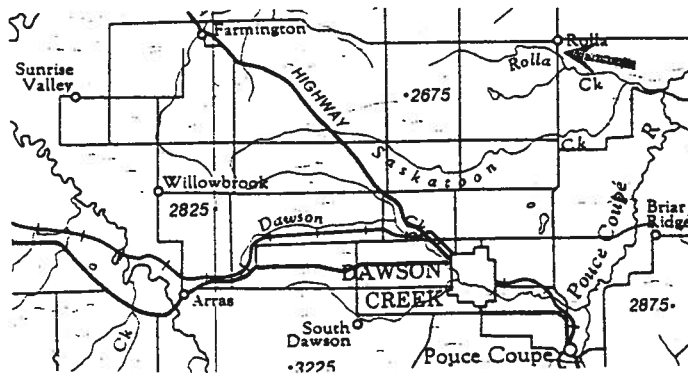
The need for subsequent increased or decreased monitoring will be assessed on the basis of the monitoring data submitted and any other data gathered by Environmental Protection in connection with this discharge.

MAR 15 1995

SITE PLAN A



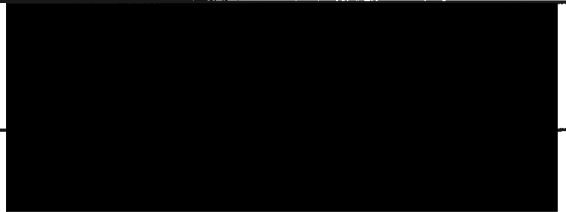
Location Map



not to scale

Permit: PE-05465

Date: MAR 15 1995



D

**RECORD
DRAWINGS**

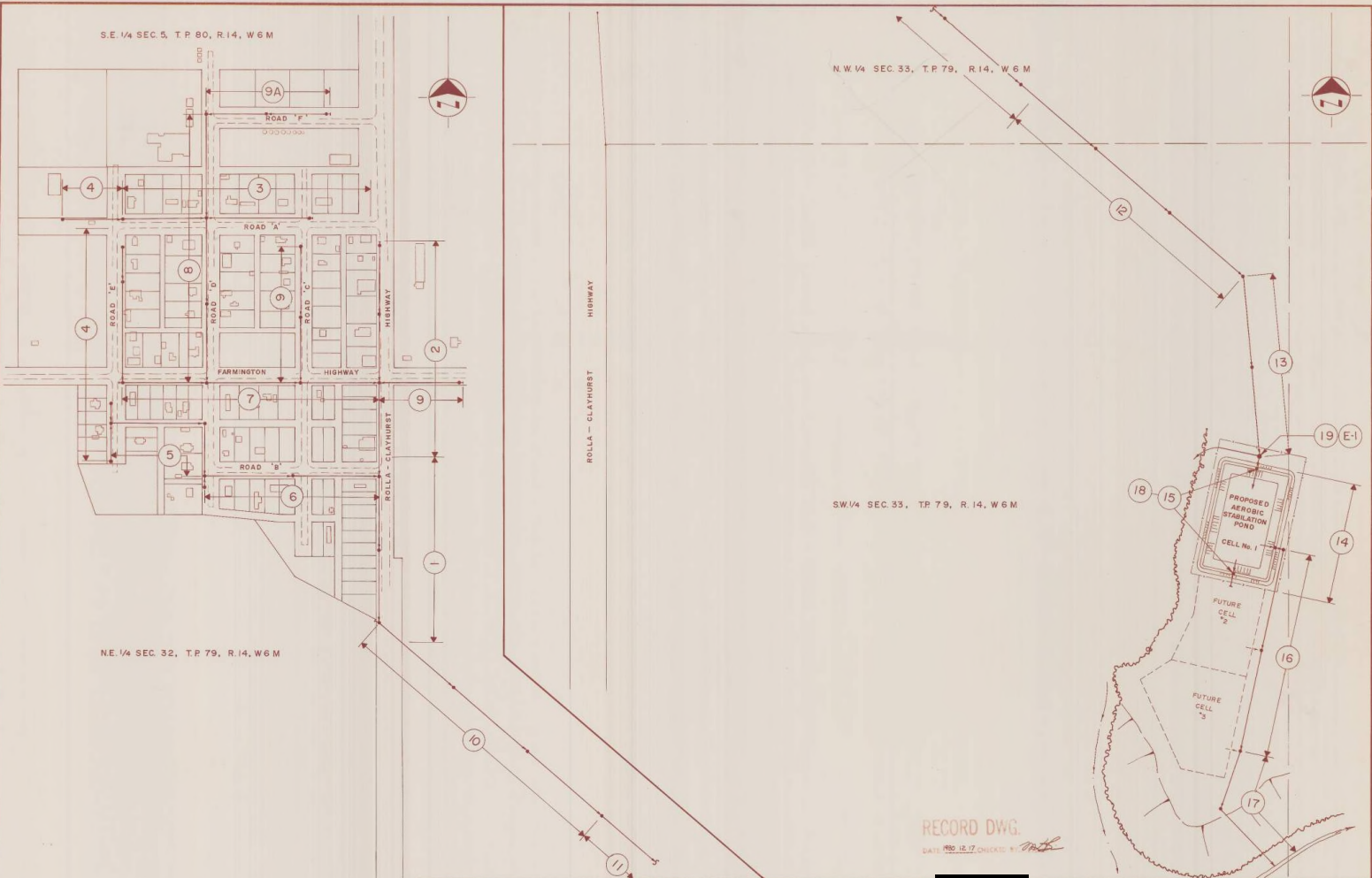


S.E. 1/4 SEC. 5, T.P. 80, R. 14, W. 6 M

N.W. 1/4 SEC. 33, T.P. 79, R. 14, W. 6 M

N.E. 1/4 SEC. 32, T.P. 79, R. 14, W. 6 M

SW. 1/4 SEC. 33, T.P. 79, R. 14, W. 6 M



RECORD DWG.
DATE: FEB. 12, 77 CHECKED: [Signature]

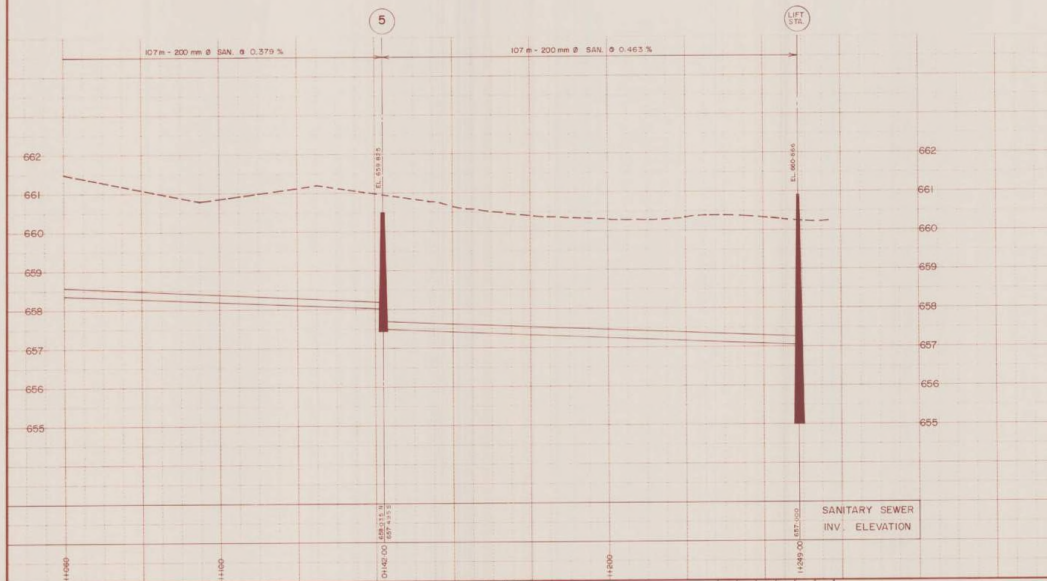
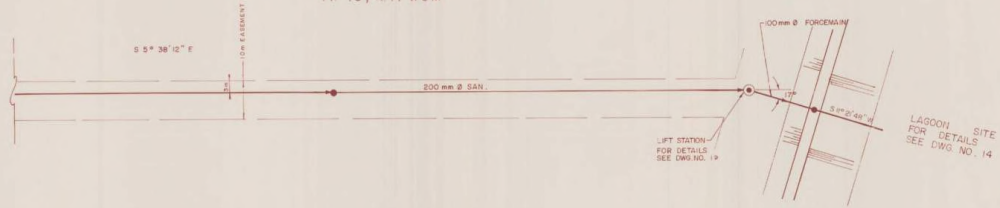
3	80	08	20	FOR RECORD					
2	79	09	10	FOR CONSTRUCTION					
1	79	09	04	FOR TENDER					
0	79	08	31	FDR APPROVAL	G.D.J.	G.D.J.	M.L.B.		
REV	Y	M	D	REVISION DESCRIPTION	DRN	SUPP	DES	CHK	ENG

Underwood McLellan (1977) Ltd.
 Consulting Engineers and Planners
 British Columbia Alberta Saskatchewan
 Manitoba Ontario
 Yukon Territory Northwest Territories

PEACE RIVER LIARD REGIONAL DISTRICT ROLLA SANITARY SEWER SYSTEM SITE PLAN		THE GRAB	SCALE:	DRAWING	BY
			1 : 2000	2947 - 001	SI 3



S.W. 1/4 SEC. 33
T.P. 79, R. 14 W. 6 M



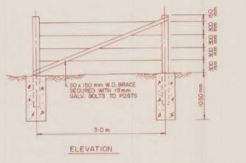
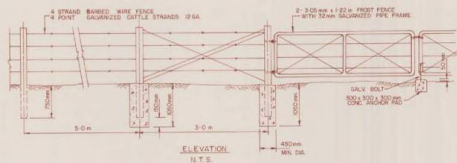
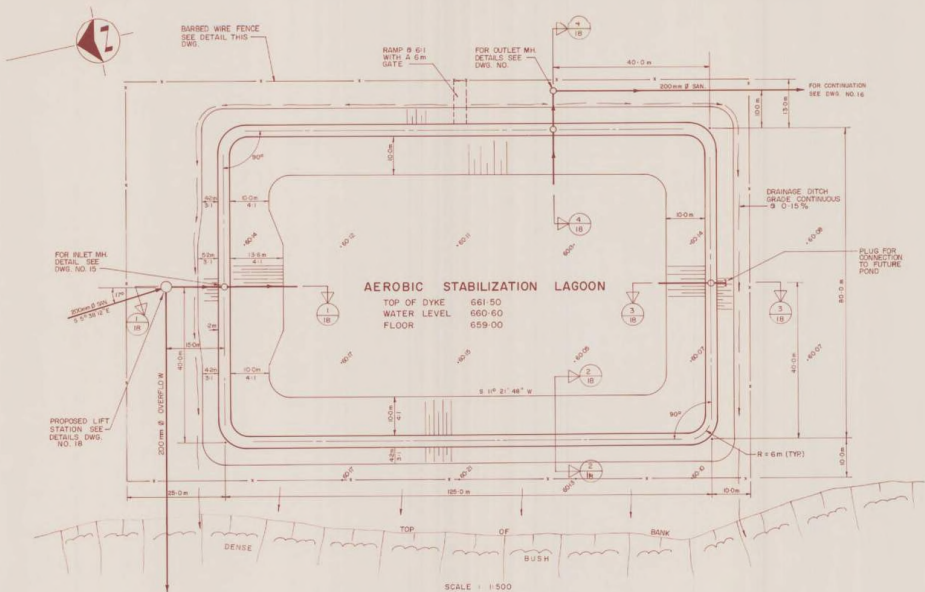
RECORD DWG
DATE 7-2-77 CHECKED BY

Underwood McLellan (1977) Ltd.
Consulting Engineers and Planners
Edmonton, Alberta, Saskatchewan
Manitoba, Ontario
Yukon, Northwest Territories

PEACE RIVER-LIARD REGION
ROLLA SANITARY SEWER COLLECTOR
SEWER MAIN TRUNK
STATION 1+060 TO STATION 1+080

REV.	NO.	DATE	REVISION	DESCRIPTION	DES.	SUP.	CHK.	ENG.
3	80	08	20	FOR RECORD				
2	79	09	10	FOR CONSTRUCTION				
1	79	09	04	FOR TENDER	K.S.J.			MLR
0	79	08	31	FOR APPROVAL	K.S.J.	MLB		MLB

SCALE
HOR. 1:500
VERT. 1:50
2947-



FENCE DETAIL
N.T.S.

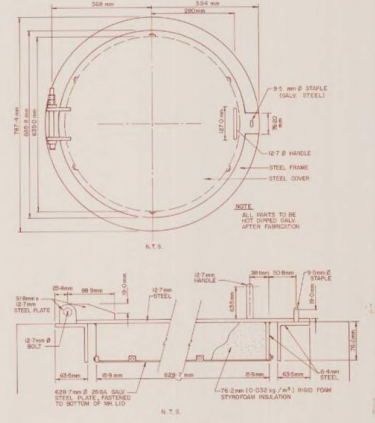
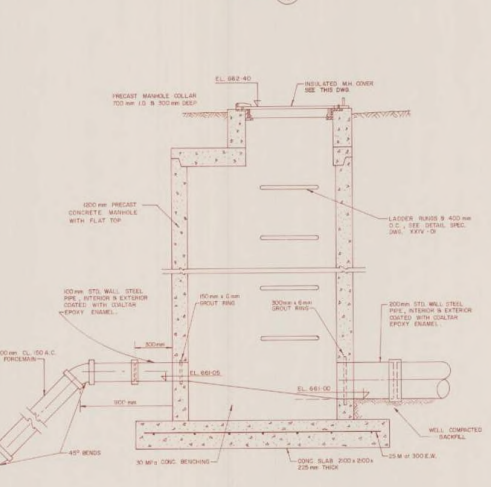
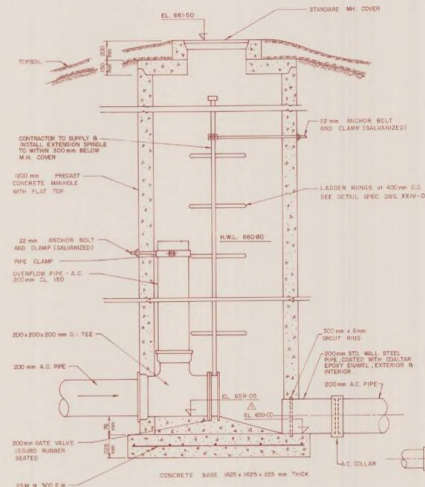
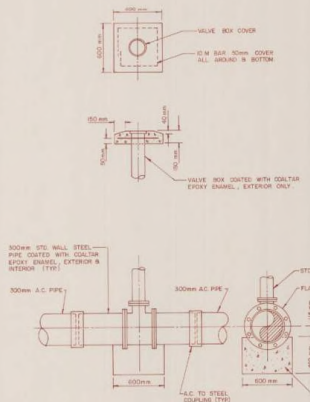
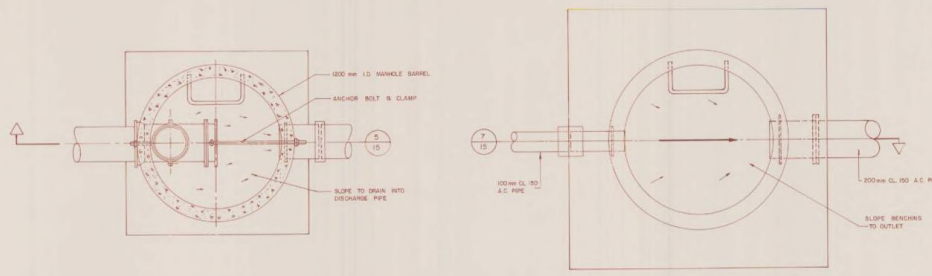
RECORD DWG
1900-12-17
MLB

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Consulting Engineers and Planners
British Columbia Alberta Saskatchewan
Manitoba Ontario
Yukon Territory Northwest Territories

PEACE RIVER LIARD REGIONAL DISTRICT
ROLLA SEWAGE DISPOSAL SYSTEM
LAGOON LAYOUT PLAN

REV	DATE	BY	CHK	DESCRIPTION
3	80 09 02			FOR RECORD
2	79 09 10			FOR CONSTRUCTION
1	79 09 04			FOR TENDER
0	79 08 31			FOR APPROVAL

BY UML JMK	SCALE AS SHOWN	DRAWING 2947-001	REV 14	REV 3
-------------------------	-------------------	---------------------	-----------	----------



REV	NO	DATE	REVISION DESCRIPTION	DESIGN	SUPV	CHECK	END
4	80	09	02	FOR RECORD			
3	79	09	10	FOR CONSTRUCTION			
2	80	09	22	REVISED ELEVATIONS	SLJ	MLB	
1	79	09	04	FOR TENDER	SLJ	MLB	
0	79	08	31	FOR APPROVAL	K.C.J.	MLB	

Underwood McLellan (1977) Ltd.
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 British Columbia Alberta Saskatchewan
 Manitoba Ontario
 Yukon Territory Northwest Territories

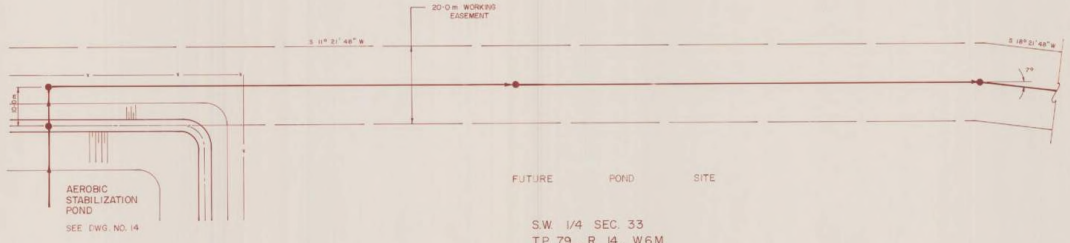
MANHOLE COVER DETAIL

PEACE RIVER LIARD REGIONAL
 ROLLA SEWAGE DISPOSAL
 LAGOON MANHOLE DETAIL

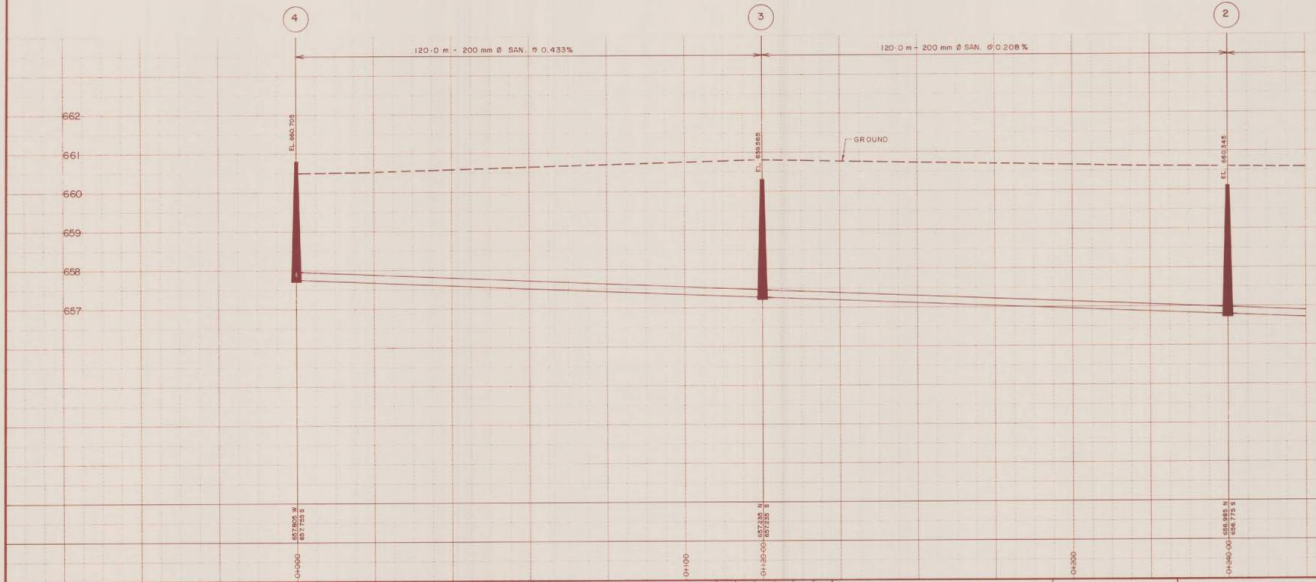
ENGINEER: [Redacted]
 SCALE: AS SHOWN
 2947



FIELD UNDER CULTIVATION



S.W. 1/4 SEC. 33
T.P. 79, R. 14, W.6M

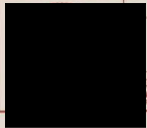


RECORD
DATE 1980-12-17

SANTA
INV. E

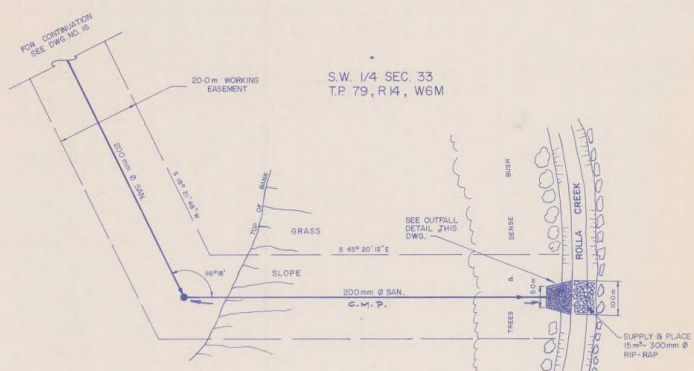
3	80	08	29	FOR RECORD			
2	79	09	10	FOR CONSTRUCTION			
1	79	08	04	FOR TENDER			
0	79	08	31	FOR APPROVAL			
REV				REVISION DESCRIPTION	DES	SUPV	CHK

Underwood McLellan (1977) Ltd.
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 British Columbia Alberta Saskatchewan
 Manitoba Ontario
 Yukon Territory Northwest Territories

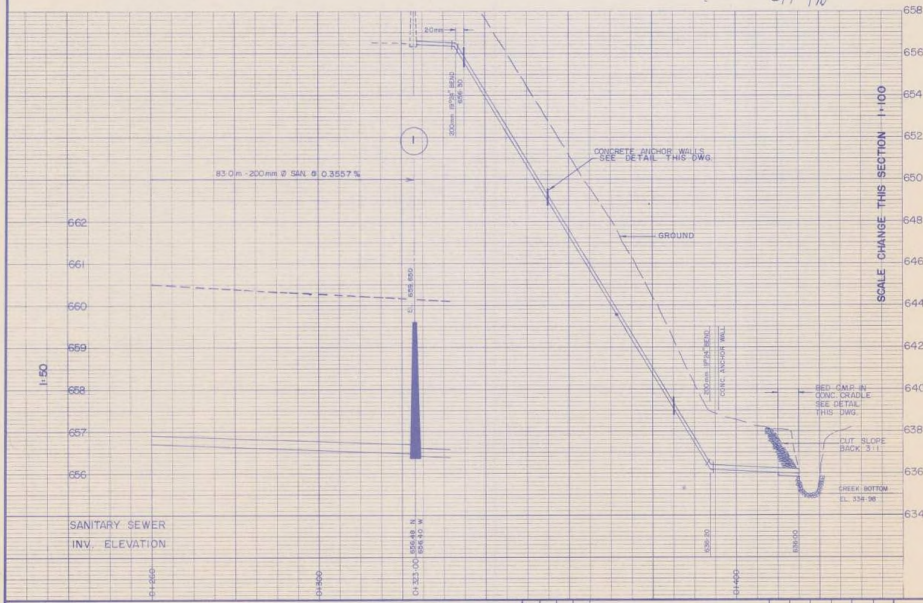
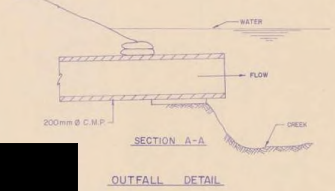
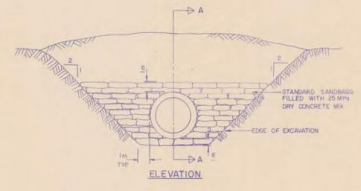
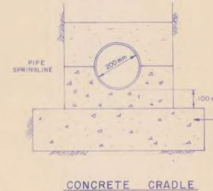
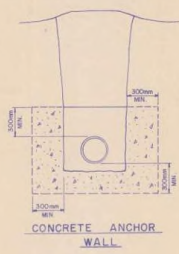


PEACE RIVER-LIARD REGIONAL
 ROLLA SEWAGE DISPOSAL
 SEWER OUTFALL
 STATION 0+000 TO STATION 0+400

SCALE
 HOR. 1:500
 VERT. 1:50
 2947-



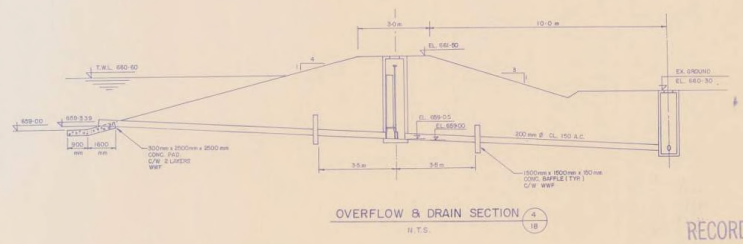
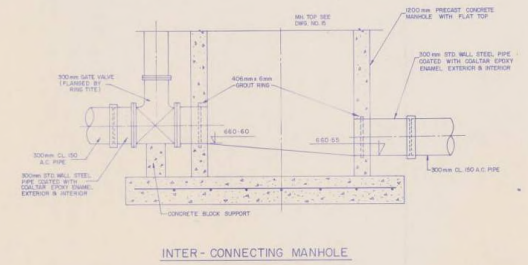
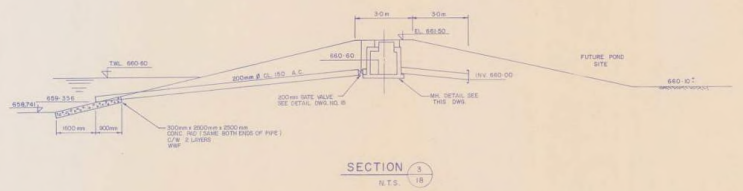
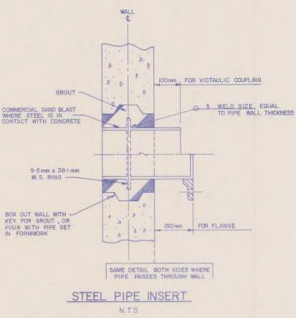
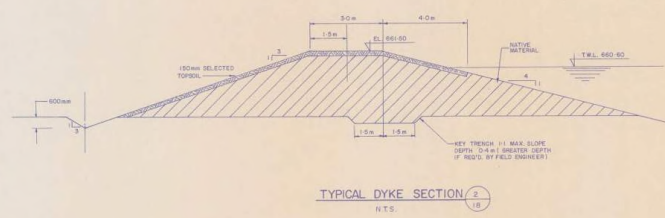
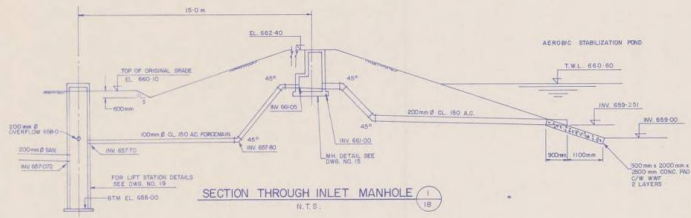
- NOTE**
1. WALL SHALL BE MIN. 300mm THICK.
 2. ANCHOR WALL SHALL BE HAND EXCAVATED A MIN. OF 100mm ON ALL SIDES OF TRENCH INTO UNDISTURBED SOIL.
 3. COMPRESSIVE STRENGTH OF CONCRETE IS 25 MPa. SHALL BE A MIN. OF 25 MPa.



3	80	08	28	FOR RECORD
2	79	08	10	FOR CONSTRUCTION
1	78	08	01	FOR RECORD

Underwood McLellan (19
 Consulting Engineers and
 British Columbia Alberta Saskat
 Manitoba Ontario

PEACE RIVER-LIARD REGIONAL D
ROLLA SEWAGE DISPOSAL SYSTEM
OUTFALL SEWER
& DETAILS



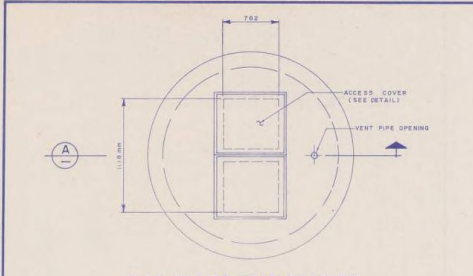
3	80	18	29	FOR RECORD	SDJ	MLB
2	79	18	10	FOR CONSTRUCTION	MLB	MLB
1	79	08	04	FOR TENDER	MLB	MLB

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 Yukon Territory Northwest Territories

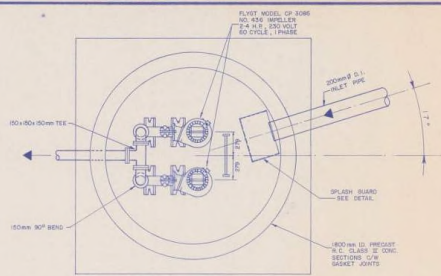
PEACE RIVER LIARD REGIONAL
 ROLLA SEWAGE DISPOSAL SYSTEM
 DETAILS & LAGOON SECTION

RECORD D
 DATE 1980-12-17 CHOC

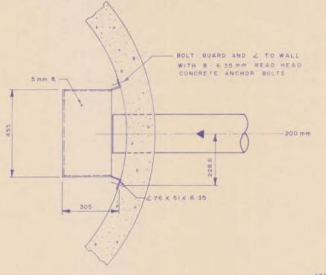
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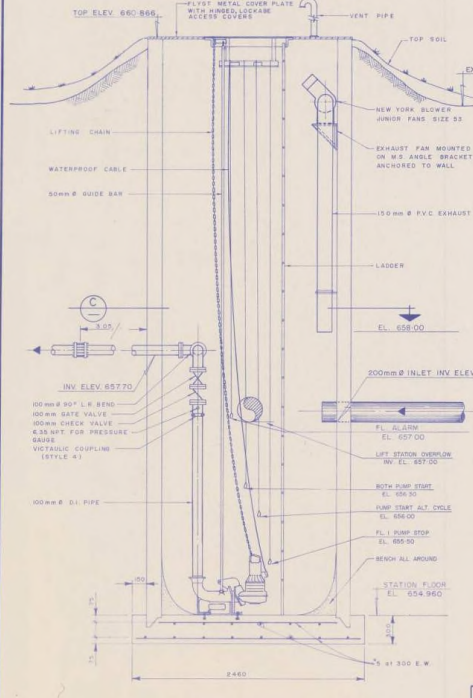
PLAN OF LIFT STATION COVER



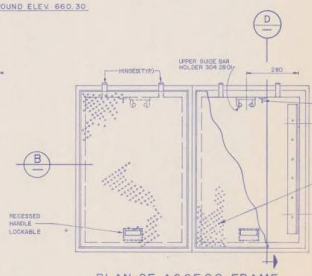
SECTION C
N.T.S.



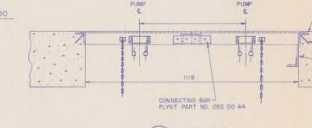
SPLASH GUARD PLAN
N.T.S.



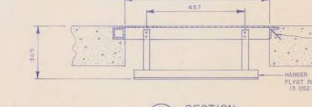
SECTION A
N.T.S.



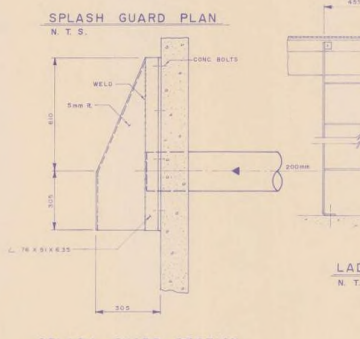
PLAN OF ACCESS FRAME



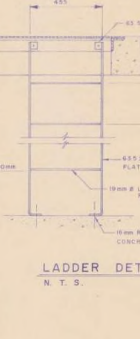
SECTION B
N.T.S.



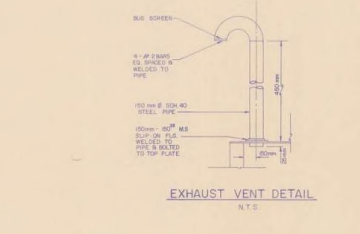
SECTION D
N.T.S.



SPLASH GUARD SECTION
N.T.S.



LADDER DETAIL
N.T.S.



EXHAUST VENT DETAIL
N.T.S.

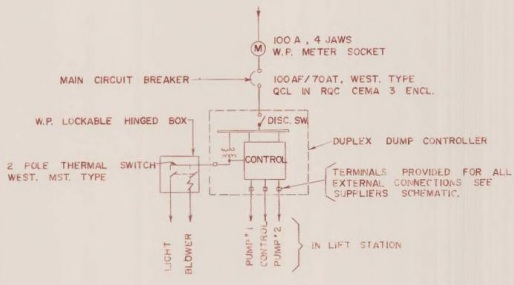
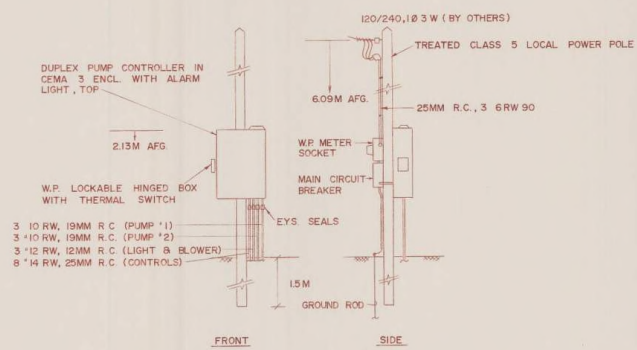
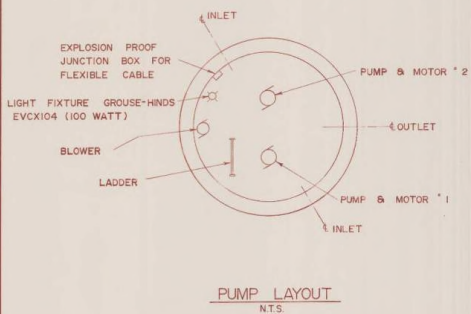
3	80	09	02	FOR RECORD		
2	78	05	10	FOR CONSTRUCTION		
1	79	09	04	FOR TENDER	(K.S.)	(M.B.)

Underwood McLellan (1977) Ltd.
Consulting Engineers and Planners
British Columbia, Alberta, Saskatchewan,
Manitoba, Ontario,
Yukon Territory, Northwest Territories

PEACE RIVER LIARD REGIONAL
ROLLA SEWAGE DISPOSAL SY
LIFT STATION DETAILS

DATE: 1980-12-18

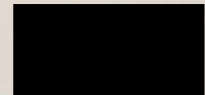
EN SCALE DRAWING



LOAD CALCULATION

PUMP 1 - 2.4 H.P., 220 VOLT, 1 Ø = 17.0 A
 PUMP 2 - 2.4 H.P., 220 VOLT, 1 Ø = 17.0 A
 LIGHT - 100W (MAX.), 120 VOLT = 1.0 A
 BLOWER - 1/4 H.P., 120 VOLT = 5.8 A

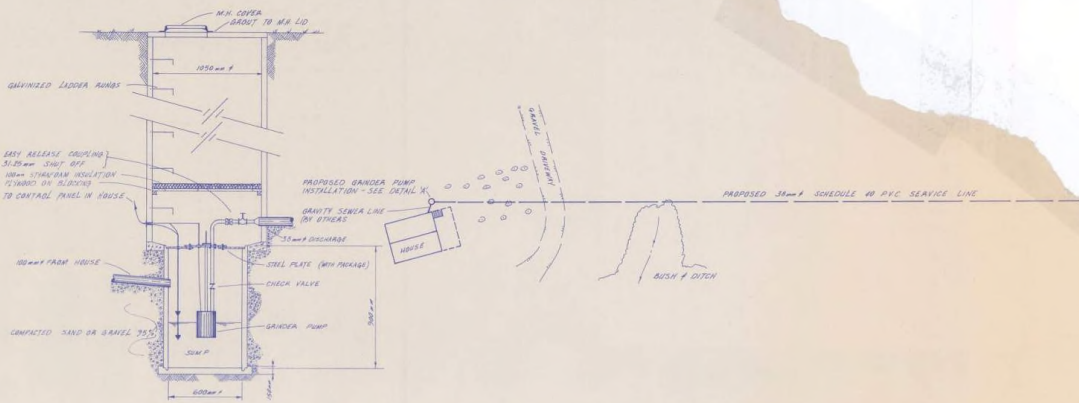
FEEDER = 45.0 A (1.6 COND.)
 MAIN CB = 63.8 A (100 AF, 70 AT)



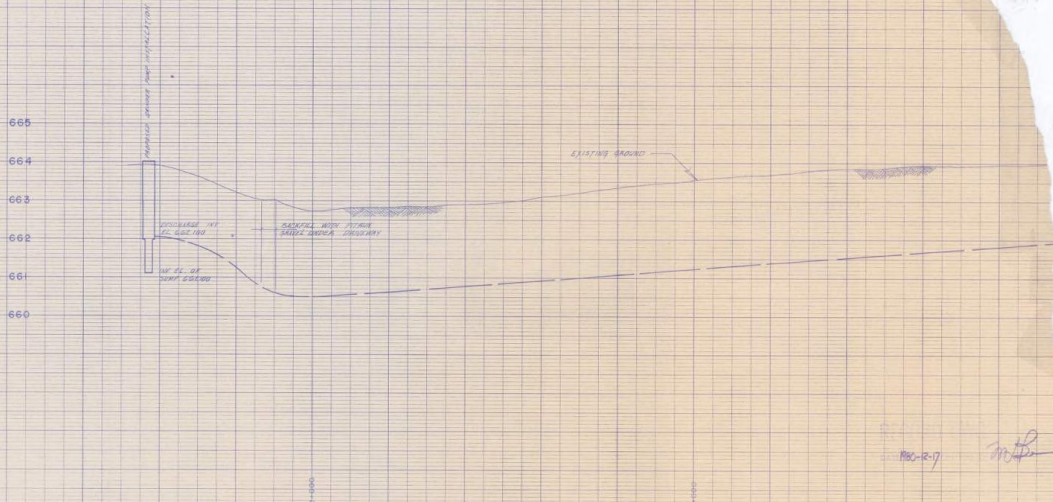
				Underwood McLellan (1977) Ltd. Consulting Engineers and Planners British Columbia Alberta Saskatchewan Manitoba Ontario Yukon Territory Northwest Territories				PEACE RIVER LIARD REGIONAL DISTRICT ROLLA SANITARY SEWER SYSTEM LIFT STATION ELECTRICAL DETAIL					
3	80	09	02	FOR RECORD									
2	79	09	10	FOR CONSTRUCTION									
1	79	03	04	FOR TENDER									
0	77	08	31	FOR APPROVAL									
REV	Y	M	D	REVISION DESCRIPTION	DES	SUPV	DES	CHK	ENG.				

Peace River
 11/20/77

TO Uma GOOD	SCALE AS SHOWN	DRAWING 2947-001	REV E-1 3
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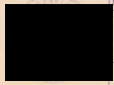
DETAIL A
NOT 3



180-12-77
MLB

REV	NO	DATE	DESCRIPTION	BY	CHECKED	APP'D
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0	80	3	10	FOR CONSTRUCTION	SDJ	RWH
						MLB

Underwood McLellan (1977) Ltd.
Consulting Engineers and Planners
British Columbia Alberta Saskatchewan
Manitoba Ontario
Yukon Territory Northwest Territories



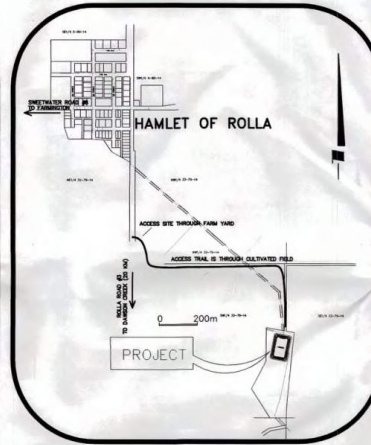
PEACE RIVER - LIARD REGIONAL
ROLLA SANITARY SEWER COLLECTION
MILLER FARMHOUSE

SCALE: HORIZ. 1" = 100'
VERT. 1" = 10'

PEACE RIVER REGIONAL DISTRICT ROLLA LAGOON EXPANSION



LOCATION PLAN
NOT TO SCALE



SITE PLAN

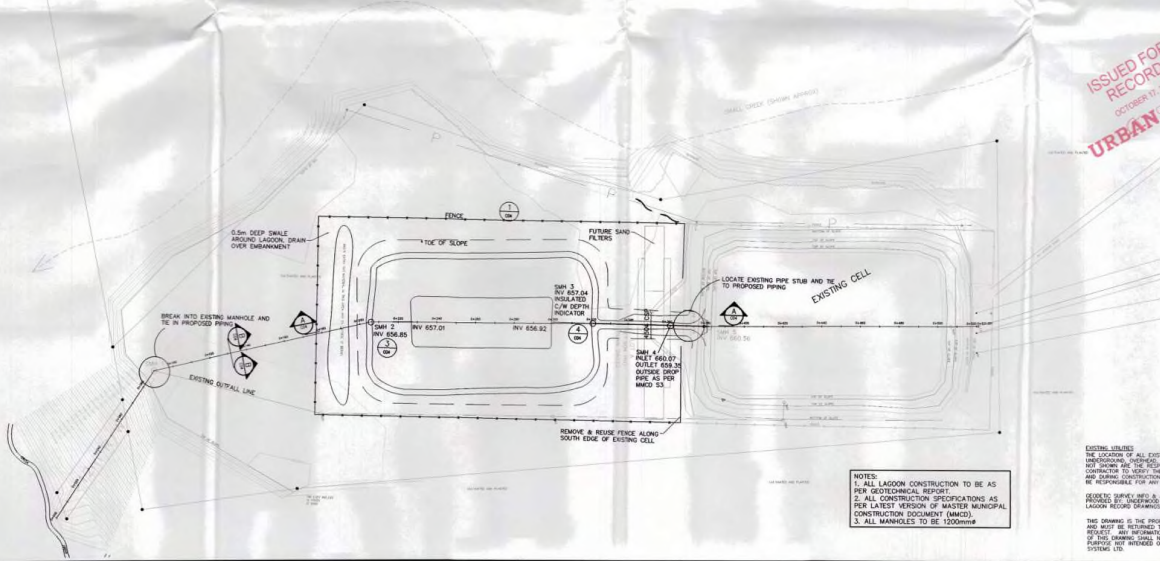
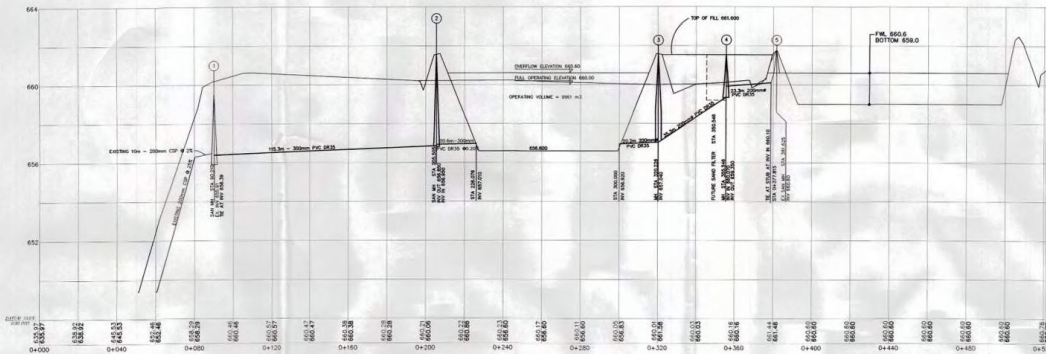
ISSUED FOR RECORD

ISSUED FOR
RECORD
OCTOBER 17, 2002
URBANSYSTEMS



URBANSYSTEMS
9807 - 100th AVENUE
FORT ST. JOHN, BC V1J 1Y4
T:250-785-9697 F:250-785-9691

JULY 2002
JOB No. 8060119.3



ISSUED FOR RECORD
OCTOBER 17, 2002
URBANSYSTEMS

NOTES:
1. ALL LAGOON CONSTRUCTION TO BE AS PER GEOTECHNICAL REPORT.
2. ALL CONSTRUCTION SPECIFICATIONS AS PER LATEST VERSION OF MASTER MUNICIPAL CONSTRUCTION DOCUMENT (MCMC).
3. ALL MANHOLES TO BE 1200mm Ø.

EXISTING UTILITIES
THE LOCATION OF ALL EXISTING UTILITIES INCLUDING UNDERGROUND, PIPES, CONDUITS AND CABLES IS SHOWN ON THIS DRAWING. THE LOCATION OF ALL UTILITIES IS TO BE VERIFIED BY THE CONTRACTOR TO VERIFY THEIR LOCATION FROM THE SHOWN LOCATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES OCCURRING.
DESIGNED, DRAWN, AND A SEVERAL TIMES CHECKED BY: [Signature]
LAGOON RECORD DRAWING: 0202

ISSUES		
NO.	DESCRIPTION	DATE
1	FOR APPROVAL	02/07/03
2	FOR TENDER	02/07/03
3	FOR CONSTRUCTION	02/08/03
4	AS CONSTRUCTED	02/08/03
5	FOR ARCHIVE	02/08/03

LEGEND	
EXISTING	PROPOSED
PAVEMENT EDGE & SHOULDER EDGE	PAVEMENT EDGE & SHOULDER EDGE
ASPHALT CURB	ASPHALT CURB
OPEN	CLEAR CUT
CURB & SIDEWALK	CURB & SIDEWALK
WATERMAIN	WATERMAIN
VALVE	VALVE
FIRE HYDRANT	FIRE HYDRANT
STANDPIPE	STANDPIPE
WATER SERVICE	WATER SERVICE
CAP - REDUCER	CAP - REDUCER
SANITARY DUCT	SANITARY DUCT
SANITARY MANHOLE	SANITARY MANHOLE
CLEANOUT	CLEANOUT
LIFT STATION	LIFT STATION
SEWER SERVICE	SEWER SERVICE
STORM SEWER	STORM SEWER
STORM MANHOLE	STORM MANHOLE
CATCH BASIN	CATCH BASIN
STORM SERVICE	STORM SERVICE
1/2" POWER, TEL	1/2" POWER, TEL
1/2" CONDUIT	1/2" CONDUIT
1/2" GAS LINE	1/2" GAS LINE
UTILITY POLE	UTILITY POLE
SWP	SWP
STREET LIGHT	STREET LIGHT
POWER BASE	POWER BASE

H		
G		
F		
E		
D		
C		
B	REV AS CONSTRUCTED	JL KM
A	REV ADDENDUMS	JL KM
REV	DESCRIPTION	BY PPS

SCALE: 1:1000

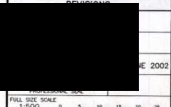
URBANSYSTEMS.
PEACE RIVER REGIONAL DISTRICT
ROLLA LAGOON EXPANSION
SITE PLAN

PROJECT No: 8060119.3
SHEET 1 OF 4
DRAWING No: 060119-C01 REV B

ISSUES		
NO	DESCRIPTION	DATE
1	FOR APPROVAL	02/09/2022
2	FOR TENDER	02/09/22
3	FOR CONSTRUCTION	02/09/22
4	AS CONSTRUCTED	02/09/22
5	FOR ARCHIVE	02/09/22

LEGEND		
EXISTING	DESCRIPTION	PROPOSED
	PROPOSED EDGE & SHOULDER	
	PROPOSED KERB	
	PROPOSED DITCH	
	PROPOSED CULVERT	
	PROPOSED CURB & SIDEWALK	
	WATERMAN VALVE	
	FIRE HYDRANT STANDOFF	
	WATER SERVICE	
	CAP - RECEIVER	
	SANITARY SEWER	
	SANITARY MANHOLE	
	STORM SEWER	
	STORM MANHOLE	
	STORM BASIN	
	STORM SERVICE	
	U/S POWER, TEL, U/S CONDUIT	
	U/S GAS LINE	
	UTILITY POLE	
	GUY	
	STREET LIGHT	
	POWER BASE	

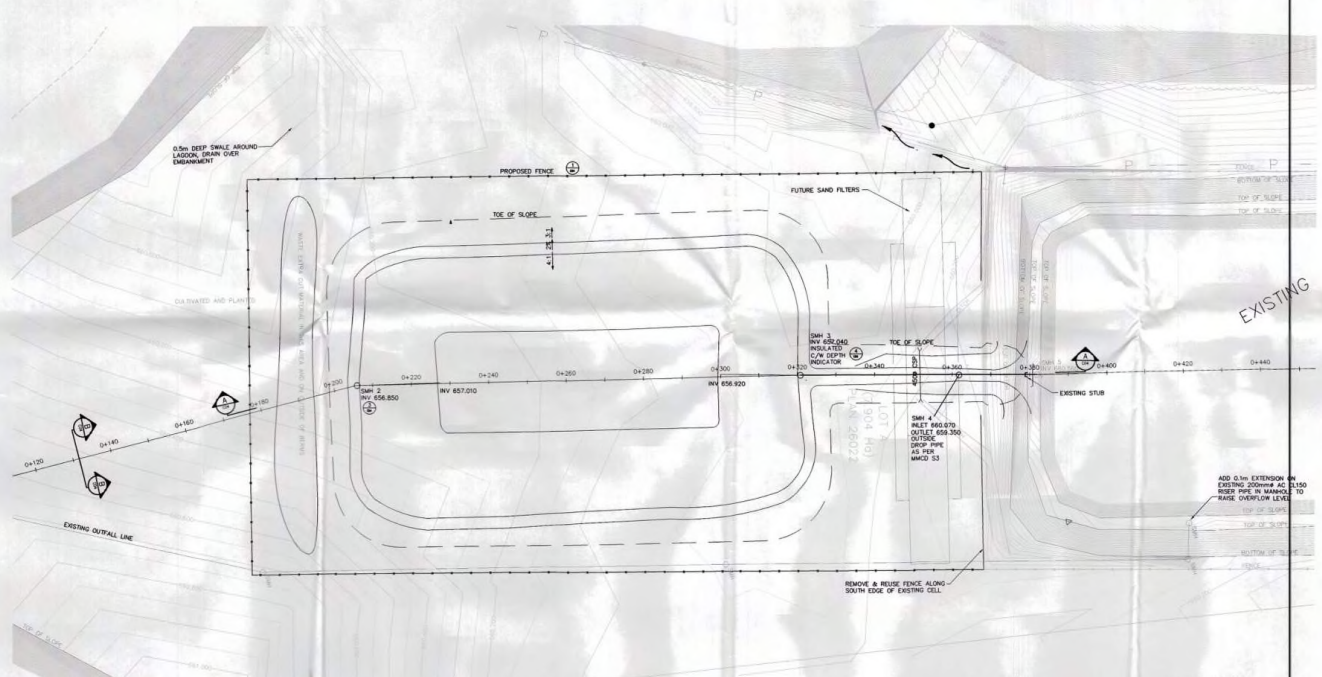
NO	DESCRIPTION	DATE
1	AS CONSTRUCTED	JL, JM
2	ADDENDUMS	JL, JM
3	REVISIONS	BY: [Redacted]



URBANSYSTEMS
PEACE RIVER REGIONAL DISTRICT
ROLLA LAGOON EXPANSION
LAGOON PLAN

PROJECT No. 8060119.3
 SHEET 2 OF 4
 DRAWING No. 060119-C02 REV B

VOLUMES (JULY 16, 2022)
 FTO STONE SURFACE - 0.5m DEEP
 OUT: 1056.27m²
 FILL: 7248.84m³
 NET: 2817.43m³



NOTES:
 1. ALL LAGOON CONSTRUCTION TO BE AS SHOWN SECTIONAL VIEWS.
 2. ALL CONSTRUCTION SPECIFICATIONS AS PER LATEST EDITION OF MASTER MUNICIPAL ENGINEERING DOCUMENTS.
 3. ALL MANHOLES TO BE 1000mm.

ISSUED FOR RECORD
 OCTOBER 17, 2022
URBANSYSTEMS

EXISTING UTILITIES
 THE LOCATION OF ALL EXISTING UTILITIES INCLUDING SANITARY SEWERS, WATER MAINS AND GAS LINES HAS BEEN OBTAINED FROM THE PEACE RIVER REGIONAL DISTRICT. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION. THE USER SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE OCCURRING TO EXISTING UTILITIES AS A RESULT OF CONSTRUCTION.
 THIS DRAWING IS THE PROPERTY OF URBAN SYSTEMS LTD. AND MUST BE RETURNED TO URBAN SYSTEMS LTD. UPON COMPLETION OF CONSTRUCTION. NO PART OF THIS DRAWING SHALL BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT THE WRITTEN PERMISSION OF URBAN SYSTEMS LTD.

URBANSYSTEMS LTD. 11555555 5555 5555

