January 3, 2020

Mr. Clece Aurelus, PE
Engineering Manager
City of Hollywood
1621 N 14th Avenue
Hollywood, FL 33022

Subject: **City of Hollywood 30- and 48-inch DIP Force Main Condition Assessment**

Dear Mr. Aurelus,

Pure Technologies U.S. Inc. (Pure Technologies) is pleased to offer our services to the City of Hollywood for condition assessment coupled with air pocket detection. The purpose of this project is to perform an inspection and condition assessment of approximately 1.8 miles of 30-inch diameter and 3.6 miles of 48-inch diameter Ductile Iron Pipe (DIP) force main.

OVERVIEW

While there are several mechanisms for the failure of sewer pressure pipe, research conducted as part of the Water Environment Research Foundation: 2010 Guidelines for the Inspection of Wastewater Force Mains, shows that the most common failure mode is internal hydrogen sulfide corrosion. This form of corrosion starts by a gas pocket forming in the pipeline, which develops the environmental conditions necessary to corrode the pipe wall, eventually leading to a failure. Collapse due to vacuum has a higher risk of occurrence at gas pocket locations should a transient pressure wave traverse the pipeline. With the exception of deflection and fatigue, these potential failure modes can be evaluated using inline leak and gas pocket detection tools.

Gas pockets can also impact the operation of a pump station system by reducing capacity of the pipeline. Pure Technologies has performed an analysis of force mains inspected using acoustic based technologies in order to better characterize the frequency and location of gas pockets. Based on the analysis, it was found that 72% of gas pockets were not at known high points or air release valves.

Pipeline leaks are of concern for all pipe materials as they are often found to be the precursor of major failures. A pipeline failure can begin with weakening of the joint or barrel that may include a small leak. As constant use of the pipeline continues and pressure surges occur, the leak may grow possibly leading to a catastrophic failure or undermining the support of the pipeline. Therefore, identification of both gas pockets and leaks may eliminate these potential failures.

DIP ordinarily does not undergo mechanical failures such as circumferential or longitudinal cracks that have been observed in CIP. The more common mode of failure is a leak or burst due to corrosion. For sewer force mains, approximately 27% of reported failures are attributed to internal corrosion, while 19% stem from external corrosion (Thomson et al., 2010). Third party damage and leaking joints account for other causes of failures in DIP. In force mains, the cause of corrosion is from the bacterial creation of dilute sulfuric acid at hydrogen sulfide (H_2S) gas pockets in the line. The acid will destroy the cement mortar lining and eat away at the DIP itself.

Understanding the condition of the pipe wall and identifying problematic areas enables utilities to take proactive action to safely manage the pipeline by making immediate repairs where necessary and can also inform remaining useful life estimations.

SCOPE OF SERVICES

The focus of the study is the 30/48-inch DIP force main that runs from the meter located on Taft Street west of N 72nd Avenue and discharges into the manhole on Taft Street and N 23rd Avenue. This run is approximately 5.4 miles in length. The overall scope of work is to provide condition assessment in addition to leak and air pocket detection services utilizing the SmartBall and PipeDiver platforms. The following sections describe the technologies, inspection plans and project deliverables.

SmartBall® Technology Description

Figure 1: SmartBall Instrument and SmartBall Receiver (SBR)

The SmartBall platform is an internal free-swimming acoustic air pocket and leak detection tool well suited for larger diameter pipelines. The SmartBall device is composed of a water-tight, aluminum core that contains the power source, electronic components and instrumentation (including an acoustic sensor, accelerometer, magnetometer, GPS synchronized ultrasonic transmitter, and temperature sensor). The core is encapsulated inside a protective outer foam shell or sphere. The outer foam shell provides additional surface area to propel the device and it also eliminates any noise the device might generate while traversing the pipeline. The SmartBall device is inserted into the flow of a pipeline and it simply travels the pipeline – propelled by the hydraulic flow - and is captured at a point downstream. The device records acoustic activity and positional data as it traverses the pipeline, which is evaluated to report the presence, approximate size, and location of leaks and air pockets.

The SmartBall instrument contains sensors needed to produce reliable, reproducible data in normal pipeline operating conditions. Pure Technologies has also developed appropriate analysis software and can generate reports that allow accurate determination of the locations of anomalies. Given the battery life of the SmartBall tool, many miles of pipeline can be tested during a single deployment. Pure Technologies utilizes a proprietary SmartBall Acoustic Receiver (SBR) to track the location of the device as it traverses the pipeline.

PipeDiver® Technology Description

PipeDiver is a free-swimming platform that uses electromagnetics to identifying localized areas of wall loss in metallic pipes. The tool creates an electromagnetic field that interacts with the pipe wall as it moves through the pipeline. Where wall loss exists, the electromagnetic field is changed. This field data is recorded by the detectors and stored on board of the tool. Post-inspection, analysts identify, quantify and locate areas of wall thickness concerns.

The tool can be inserted into the pipeline in a number of ways including under pressure, but more commonly through a depressurized appurtenance. Extraction options also vary and include nets or grates to stop the tools and extract through a depressurized appurtenance, retrieval at reservoirs, chambers or tanks. As the PipeDiver travels through the pipeline, field crews track the tool from above ground at regular intervals using tracking units. The system is neutrally buoyant and has flexible petals that are used to center the tool within the pipe and provide propulsion. Its flexible design allows the PipeDiver platform to navigate valves and bends in the pipeline, while travelling long distances.

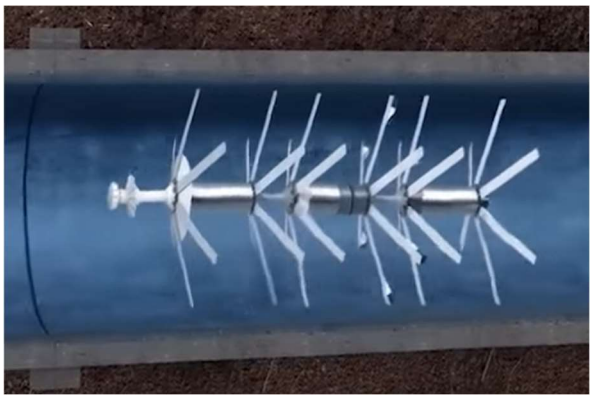

Figure 2: PipeDiver® Electromagnetic Inspection Platform

PipeDiver has been successfully used to inspect and manage over 1,000 miles of pipelines around the world. Through this experience we have identified key factors for success for free-swimming inspections to minimize risk and disruption of operations of the pipeline.

Extensive planning is required when preparing for a condition assessment inspection using a free-swimming tool. Pure's team of highly trained and experienced technicians will work closely with operations personnel to understand and mitigate risks. The PipeDiver tool is designed to follow the flow and, as such, it is important to identify risk points along an inspection route such as the type and position of in-line butterfly valves, large off-takes, the configuration of tee's, wye's or manifolds.

After the inspection is complete and the PipeDiver tool has been removed from the system, the data is downloaded and analyzed. Analysts can identify areas of wall loss and locate them both circumferentially and longitudinally on the pipe. The resolution of the PipeDiver tool is defined by the minimum detectable defect size; the size of detect that, under normal operating conditions, will be detected during an inspection. Internally, defects 4-inch by 4-inch by 40% loss will be detected.

The tool's ability to collect quality data is dependent on consistent flow. Buildup and turbulence in the flow can cause sensors to drag and may introduce noise into the data. Quantification of electromagnetics results depends on a number of variables including; accuracy of pipeline specifications, calibration data, repairs (cylinder or welds), presence of nearby electromagnetic fields, and the number and complexity of corrosion regions. Location of the damaged pipe section relies on the accuracy of correlation between the collected data and the pipeline, which relies on the accuracy and completeness of pipeline drawings and the number of tracking points available.

Preliminary Inspection Plan

The inspection will consist of utilizing the SmartBall platform from the repump station to the discharge manhole to identify gas pockets and the PipeDiver platform to evaluate structural integrity of the pipeline.

Pure Technologies will meet with the City of Hollywood staff and perform a site visit. The field visit will allow Pure Technologies to verify and inspect access locations and potential challenges in order to develop the Project Planning Document. This proposal is developed recognizing that deployment will need to be coordinated with the City of Hollywood staff due to insertion/extraction points and flow control required to maintain minimum/maximum flows which optimize efficiency during the inspections. *To mitigate project costs, it is our understanding that City will facilitate all civil activity for pipeline access, tool insertion/extraction and SBR installations, including, but not*

limited to, pipeline fitting modification, excavation, tapping, shoring and other activities necessary to access valves and appurtenances identified as being critical to the performance of the assessment, as required.

Insertion/Extraction Locations

A 4-inch or greater diameter full access port is required for insertion and extraction of the SmartBall tool. A minimum 16-inch access tap is necessary to insert and extract the PipeDiver tool. Both the SmartBall and PipeDiver inspections can be performed while the pipelines are in service. Pipeline access needs are outlined below and will be detailed in the Project Planning Document following a site visit. As noted above, the City will facilitate access to the pipeline as outlined below. A detailed planning document will be developed upon completion of the site visit.

Inspection Platform	Insertion	Extraction
SmartBall	Min 4-inch access required. Insertion TBD, but anticipated to be through a check valve in the meter pit located west of N 72nd Avenue, pending site visit confirmation	At the discharge manhole located on Taft Street and N 23rd Avenue
PipeDiver	Min. 16-inch access required. Insertion TBD, but anticipated to be through piping at the meter pit located west of N 72nd Avenue. Alternate insertion will be via a new tap installed by the City on the line.	At the discharge manhole located on Taft Street and N 23rd Avenue

Installation of SBRs

Prior to the inspection, SmartBall Acoustic Receivers (SBRs) will be installed directly onto the force main to track the position of the SmartBall and PipeDiver tools. The SBRs perform best when attached directly to the metal surfaces of pipeline appurtenances, such as existing air release valves, valves or any other contact points on the pipe. At these locations, Pure Technologies staff will adhere the requisite number of acoustic sensors on the pipe for the duration of the survey. Details for installing SBRs will be included in the Project Planning Document prior to the inspection.

Minimum Flow Requirements

Both the SmartBall and PipeDiver inspection tools require a pipeline liquid average velocity. SmartBall requires 1 to 4 feet per second for propulsion through the force main; PipeDiver requires 1 to 1.5 feet per second. Pure Technologies will request that City of Hollywood staff control flow or augment flow to meet the requisite velocity during tool deployments.

ENGINEERING ANALYSIS

The inspection technologies described above will provide data regarding the condition of the pipeline. The engineering analysis will analyze the pipeline condition data and yield actionable results, including recommendations on individual pipe repairs.

Transient Pressure Monitoring

One of the initial phases of any condition assessment project should include monitoring for short duration pressure transients. Traditional pressure monitors collect data in intervals of minutes while transients or events of specific interest may occur in fractions of a second. A transient pressure monitor addresses the sampling frequency issue by continuously monitoring pressure while under normal operating conditions and recording normal operating data every few minutes (based on user-defined time intervals). However, when a transient event occurs in a pipeline, the monitor detects the sudden change in pressure and records data at a higher sampling rate (typically in intervals of 50 milliseconds). Collection of the transient data is critical for the hydraulic evaluation of the force main and ultimately the condition assessment of the pipeline. If a pipeline owner or operator relies solely on traditional pressure monitoring data, the actual pressures that influence a pipeline may not be documented, limiting an accurate condition assessment of the pipeline.

One self-contained pressure-monitoring device will be placed along the force main to record transient events for up to 30 days. Pure Technologies will then remove the temporary monitor and incorporate the results in the final report. Transient monitoring will be performed concurrently with project planning and implementation to maintain project schedule.

Field Verifications/Wall Thickness Validations and Statistical Analysis

Wall thickness data for metallic pipes can be statistically analyzed to evaluate the failure probability for pipelines. A Monte Carlo simulation is used to estimate remaining wall thickness and rate of loss based on the results of the PipeDiver EM surveys, actual wall thickness measurements obtained during field verifications and the structural evaluation.

Using this simulation, pipe management strategies can be developed that address the short-term management and long-term renewal strategies for the force main. *It should be noted that a statistical evaluation and remaining useful life calculations are contingent upon performing test pits to obtain wall thickness measurements.* The preferred means to accomplish the remaining useful life calculations is via test pits that are chosen at statistically significant locations. Additional ultrasonic thickness measurements can be taken at existing ARV locations or where leaks or pockets of trapped gas are being externally repaired.

A summary of the typical field verification protocols is summarized below:

- Prior to external testing, pipe diameter and length will be measured by Pure. The pipe's identification, station location, or length to known reference point will be boldly marked or painted on the pipe so as to be clearly seen in photographs. Photographs will be taken of the in-situ pipe from various angles.
- Soil and groundwater (where applicable) samples may be collected at the discretion of Pure Technologies.
- Burial depth will be measured as well as notation made on potential live loading.
- GPS points will be captured using Trimble 7-Series GPS equipment or better of pipe and excavation including elevations and multiple photographs.
- External testing will be performed to determine wall thickness and areas of internal and external corrosion. This will be done using one or more of the following techniques: pulsed-eddy current, ultrasonic thickness testing, magnetic particle testing or dye penetrant testing.

Pure Technologies will coordinate verification/validation test pit location site preparation with the City prior to mobilizing to the project site. For the purpose of estimating this project cost, a minimum of number of test pit locations are identified for alternative technologies.

Evaluation of Risk of Failure and Structural Modeling

As part of any ductile iron pipe evaluation, a condition-based pipeline management model should be developed to determine the significance of any pipe wall deterioration identified. Because of the nature of ductile iron pipe design and failure modes, a more simplistic structural model may be used for determining condition. This model incorporates any hydraulic information (operating and transient pressures) as well as the specified and industry design standard for the pipeline (AWWA C150), ultimately delivering a comprehensive decision-making tool for the management of the pipeline.

Pure Technologies will provide this structural model in a pipeline condition curve, allowing for both the localized and systemic condition evaluation of the pipeline. The yellow curve in Figure 3 to the right represents the Yield Strength Limit of the pipeline along its length, which identifies the specific wall thickness required to remain in the elastic zone. This is used to determine the safety of the pipeline. Any wall thickness measurements less than this curve should be considered for repair or rehabilitation in the near future. The red curve represents the Ultimate Strength Limit of the pipeline where, by all technical definitions, the pipe has failed but may not have ruptured. Any pipe sections with wall thickness measurements less than the Ultimate Strength Limit should be repaired immediately.

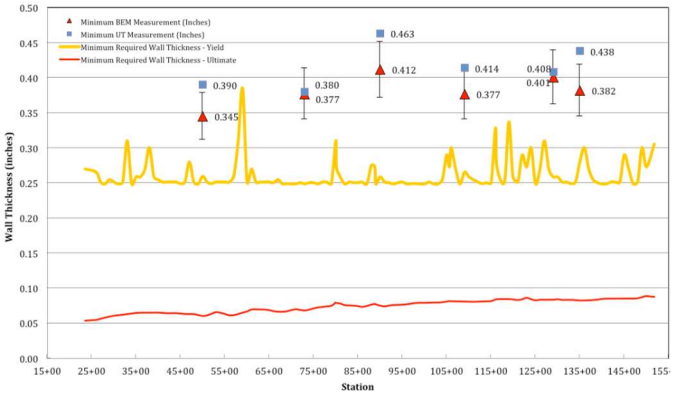

Figure 1: Structural Model for Ductile Iron Pipe with Wall Thickness Measurements

Remaining Service Life Analysis

By combining the structural analysis with condition data, estimates of when the pipeline should next be inspected along with a remaining service life of the asset can be completed. To do this, Pure Technologies has developed a statistical simulation that utilizes multiple asset attributes such as failure history, inspection data, and structural analysis.

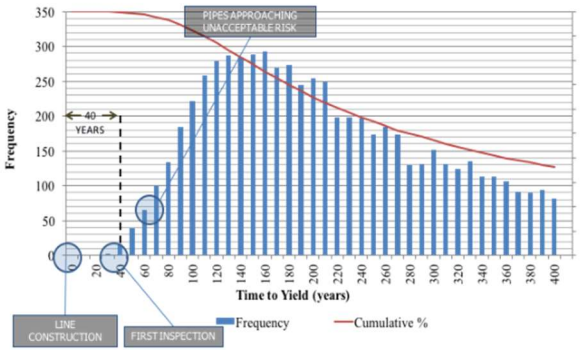

Figure 4: Remaining Useful Life Output

An example of the output of this model is shown in Figure 3 which shows the number of failures predicted (y-axis) by year into the future (x-axis). The simulation data indicates that based on the data collected, several areas within the force main are expected to corrode to the point of requiring intervention within the next 10 years. Pure Technologies recommends that remaining useful life estimates be used as guidance for re-inspection interval planning as collection of subsequent condition data can be used to better refine the asset life estimates. Once another inspection is completed, the data collected in that inspection should be analyzed in conjunction with the data presented in the initial inspection report to provide a more accurate and robust remaining useful life evaluation.

DELIVERABLES

1. A detailed Project Plan will be submitted to the City of Hollywood prior to the inspection in electronic PDF format. The project plan will be provided approximately two weeks prior to the inspection, dependent on the receipt of project data.
2. A Draft Report (electronic PDF) will be generated and delivered to the client within eight weeks of completion of the inspections. The report will include the following information:
   - SmartBall® – Identification and location of any air pockets in the pipeline as well as ARV installation recommendations.
   - PureEM® – Pipe list detailing pipe sections in the area of any wall loss indicated and detailed location and quantity of corrosion wall loss within each pipe section inspected via PipeDiver. If needed, and at no additional cost, Pure Technologies can mobilize to the site to externally verify pipe segments recommended for repair/replacement.
   - Pure Technologies will also provide engineering and structural evaluation of the pipeline in support of recommendations to safely manage the force main. Pure Technologies typically provides a presentation summarizing draft results to stakeholders to facilitate review of the draft report.
3. A Final Report will be submitted within two weeks of the receipt of comments from the client summarizing the findings based on the proposed inspection. The Final Report shall be delivered in electronic format (PDF format).

SCHEDULE

The proposed schedule for the SmartBall and PipeDiver condition assessment is outlined below. It should be noted that the inspection schedule is dependent upon tapping services.

- Confirmation Site Visit — 1 week after NTP
- Project Planning Document — 4 weeks after NTP
- SmartBall/PipeDiver Inspection — 4-5 weeks after NTP

- Data Analysis and Draft Repot 18 weeks after NTP
- Final Report 20 weeks from NTP

PROPOSED FEE AND PAYMENT SCHEDULE

Pure Technologies will deliver leak and air pocket detection on the SmartBall platform and PureEM electromagnetic inspection on the PipeDiver platform. The estimated cost for this project based on the information provided at this time is detailed in the tables below.

Item	Description	Unit	Unit Price	Quantity	Total Price
1	Project Planning and Mobilization for SmartBall and PipeDiver Inspections	EA	$ 78,750.00	1	$ 78,750.00
2	Smartball Leak and Gas Pocket Detection, Inspection and Analysis	MI	$ 16,538.00	5.4	No Charge
3	PipeDiver Inspection and Analysis	MI	$ 60,000.00	5.4	$ 324,000.00
4	Transient Pressure Monitoring	EA	$ 5,513.00	1	$ 5,513.00
5	Project Reporting	LS	$ 25,500.00	1	$ 25,500.00
6	AWWA C150 Structural Design Check (two pipe diameters)	LS	$ 5,000.00	1	$ 5,000.00
	Estimated Project Cost Without Additional Services				***$438,763.00***
Additional Services					
7	Field Verifications/Wall Thickness Validations *(minimum of 4 test pits)*	EA	$ 7,000.00	8	$ 56,000.00
8	Structural Analysis (per pipe diameter/class)	EA	$ 12,975.00	1	$ 12,975.00
9	RUL Analysis	EA	$ 9,975.00	1	$ 9,975.00
	Estimated Project Cost With Additional Services				***$517,713.00***

All travel, shipping and related expenses are included in the mobilization and field data collection/inspection costs. Payment of services rendered by Pure Technologies will be invoiced accordingly:

Payment Schedule

Service	Fee	Invoicing Period
Project Planning and Mobilization	$ 78,750.00	Upon submittal of the Project Planning Document
Smartball Leak and Gas Pocket Detection, Inspection and Analysis	No Charge	N/A
PipeDiver Inspection and Analysis	$ 324,000.00	Upon completion of the Inspection
Transient Pressure Monitoring	$ 5,513.00	Upon submittal of the Draft Report
Draft Report	$ 12,750.00	Upon submittal of the Draft Report
Final Report	$ 12,750.00	Upon submittal of the Final Report
Field Verifications/Wall Thickness Validations	$ 7,000.00/ea	Incurred, upon completion of Field Verifications

Structural Modeling/Analysis	$ 12,975.00	Upon submittal of the Final Report
Remaining Useful Life Analysis	$ 9,975.00	Upon submittal of the Final Report

ADDITIONAL NOTES & ASSUMPTIONS

Standby charges:

For standby time of the on-site inspection team once the field team mobilizes to the site. This item will be invoiced upon the completion of the field work: Additional cost is $15,000.00/day. Pure Technologies schedules our resources based on Client availability. If the City of Hollywood's schedule changes, we request at least two weeks' notice. If we have already mobilized, a standby charge may apply.

Conditions of Engagement:

This proposal is subject to the attached Conditions of Engagement unless amended by a mutually agreed upon binding contract.

Support Services:

The cost of support services such as excavation, tapping services, traffic control, removal of flanges, and valve operation are not included in this proposal and are to be conducted by others.

Regarding the Planning Process:

The planning process is an integral part of the work. It allows the team to identify features of the site or the pipe that could prevent a successful inspection. Steps are then put into place to mitigate the potential risk. As much information as possible on the pipeline will be requested during the planning process. Based on this information and the preliminary site visit, a detailed Project Plan will be submitted prior to commencing the work and, absent any feedback from the City of Hollywood on the Project Plan, agreement with it will be assumed.

Any changes to the scope that arise in the planning process which impact the pricing in this proposal will be discussed with the City of Hollywood and mutually agreed upon before proceeding.

Live pipeline inspection:

Despite meticulous planning and preparation, live pipeline inspection involves an inherent risk that cannot be avoided. There is always a possibility that the inspection platform could encounter problems during the inspection run that could lead to loss of data, requiring a re-inspection or, at worst, the tool getting stuck in the pipeline due to unforeseen or unknown obstructions. The team will work closely with the City to identify and mitigate any potential risks.

Mobilization Fee Summary:

The following is a summary of basic items covered under the mobilization line item included in this proposal:

- Project document review;
- Preliminary site visit and review (including travel costs);
- Pre-inspection coordination/meetings;

- Planning document development;
- Equipment and staffing logistics to and from the project sites;
- Tool calibration; and,
- Pre-inspection activities required in advance of the scheduled inspection date.

Local Assistance:

During the inspection planning process, the following information will be requested of the City of Hollywood for the preparation and execution of the inspection.

- Information about the pipeline, prior to inspection, including, but not limited to, GIS, plan and profile drawings, lay sheets, shop drawings, manufacturing details, and details of access structures, air valves, blow-offs, and main line valves – if available;
- Provision of any required legal right-of-entry on the property for insertion and extraction; including environmentally sensitive areas;
- Provide support personnel during the inspection for access to system features typically restricted to client personnel;
- Provide opportunity to verify flow velocities recommended in this document prior to performance of the inspection;
- Modify existing pipeline fittings and structures for insertion and extraction of the inspection tools, as necessary;
- Authorize or assist in the operation of valves for insertion and extraction of the tools;
- Provide and maintain safe and reasonable access to all insertion sites throughout the inspections, as required; and,
- Render confined space areas safe for the services, including locking and tagging pumps, valves, and motors, if required.

Pure Technologies is excited for the opportunity to perform the proposed scope of work. We are committed to providing you with a successful project. If you have any questions or comments, please do not hesitate to contact me.

Best regards,

Jennifer Leone, P.E.

Business Development Manager

jennifer.leone@xyleminc.com

Attachments - CONDITIONS OF ENGAGEMENT FOR THE PROVISION OF SERVICES

CONDITIONS OF ENGAGEMENT FOR THE PROVISION OF SERVICES

(North America)

The Proposal is issued upon and is subject to these Conditions of Engagement. If the Proposal is accepted by the Client, these Conditions of Engagement and the Proposal will be deemed to form part of the Contract between the Client and Pure.

1. DEFINITIONS

In these Conditions of Engagement the following definitions apply:

Client	means any person or persons, firm or company engaging Pure to provide the Services.
Contract	means the agreement awarded to Pure as a result of the Proposal.
Pure	means Pure Technologies Ltd., Pure Technologies U.S. Inc., Pure Engineering Services Inc., or any of their affiliates, as the case may be, which submitted the Proposal and is a party to the Contract.
Proposal	means Pure's offer to carry out the Services and includes all related correspondence plus agreed written variations or amendments thereto.
Services	mean those services of whatever nature to be supplied by Pure under the Contract.
Site	means the facility, land, installation or premises to which Pure is granted access for the purposes of the Contract and may include any combination of the foregoing.

2. PURE'S OBLIGATIONS

2.1 Pure will perform the Services in accordance with the procedures described in the Proposal, using reasonable skill, care and diligence and consistent with industry standards.

2.2 Pure will ensure that the equipment used in performing the Services is in a good and functional state.

3. CLIENT'S OBLIGATIONS

3.1 The Client will provide to Pure full, good faith co-operation to assist Pure in providing the Services. Unless otherwise specified in the Proposal and without limiting the generality of the foregoing, the Client will at its own expense:

(i) ensure, if required, access to private land will be given to Pure and that any official permits or permissions required for Pure to have access to the Site or carry out the Services are obtained and are in force for the duration of the Services;

(ii) inform Pure in writing of any special circumstances or danger which the execution of the Services may entail or which are inherent in the Site, including the existence and identity of any known hazardous substance or material;

(iii) perform such additional duties and responsibilities and provide such information and resources as are described in the Proposal.

3.2 The description of the Services and related compensation amount set out in the Proposal will be based upon information that the Client shall have provided to Pure, and assumptions that Pure shall have identified in the Proposal. The Client acknowledges that if any such information provided by Client is materially incomplete or inaccurate, or if the assumptions identified by Pure are not correct, then the parties will modify the Proposal to reflect the actual information, assumptions, and Services required, and the compensation to Pure will be adjusted accordingly using the change order process set out in the Contract, or if there is no such process, on an equitable basis.

4. PROPRIETARY AND CONFIDENTIAL INFORMATION

4.1 All reports generated in the performance of the Services and delivered by Pure to the Client will become the property of the Client.

4.2 Pure's equipment which is made available to the Client in connection with the Contract and the raw data generated in the performance of the Services will remain the sole and exclusive property of Pure. The Client will not acquire any proprietary rights in Pure's equipment, systems, software, technology, inventions (whether or not patentable), patents, patent applications, documentation, specifications, designs, data, databases, methods, processes or know-how ("Pure's Proprietary Technology"). Any modifications or improvements to the Pure's Proprietary Technology made during the performance of the Services will be the sole and exclusive property of Pure.

4.3 Both parties agree to keep confidential all documentation and information provided by the other during the performance of the Contract. The obligations set out in this clause 4.3 will remain in full force and effect after any termination or expiry, as the case may be, of the Contract.

5. LIABILITY AND WARRANTIES

5.1 Pure will indemnify the Client against any expense, demand, liability, loss, claim or proceeding whatsoever in respect of personal injury to or the death of any person, or any loss, destruction or damage to any tangible property and arising directly or indirectly from the negligence of Pure, its employees, servants or agents except to the extent caused by the negligence of the Client or any person for whom the Client is responsible. The Client will similarly indemnify Pure.

5.2 Pure will not be liable for any loss of production, loss of use of property, loss of revenue or profit, equipment downtime, business interruption, loss of goodwill, loss of anticipated savings, cost of procurement of substitute goods or services, or for any consequential, indirect, incidental, or special loss or damage suffered by the Client or any third party, or for any punitive damages, even if advised of the possibility thereof and notwithstanding the failure of essential purpose of any remedy.

5.3 Pure's cumulative liability under the Contract, whether in contract, tort (including negligence), or otherwise, will in no event exceed the aggregate consideration paid by the Client to Pure for the portion of the Services that gave rise to the liability, provided, however, that this clause 5.3 shall not limit Pure's indemnification obligations under these Conditions of Engagement.

5.4 The report(s) and any other recommendations or advice made by Pure relating to the pipeline or the Services will be made in accordance with the procedures described in the Proposal, using reasonable skill, care and diligence consistent with industry standards, but do not and will not constitute a warranty of the pipeline's quality, capacity, safety or fitness for purpose. Pure will not be liable to the Client for any liability or damages that arise from the Client's reliance upon or application or use of such final report or recommendations or advice made by Pure in relation to the pipeline or

Services, and the Client will indemnify Pure against any liability to third parties resulting therefrom.

5.5 Pure's warranties for the Services will be set out in the Contract. Pure disclaims all implied or statutory warranties or conditions, including of merchantability, merchantable quality, durability, or fitness for particular purpose to the extent allowed by applicable law. This means Pure's warranty obligations will be limited to what is expressly set out in the Contract.