PHASE 2 INITIAL BOREHOLE DRILLING AND TESTING AT IG_BH04/05/06, IGNACE AREA

WP09 Data Report - Westbay Monitoring System Installation for IG_BH05

APM-REP-01332-0364 **November 2023**

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REPORT

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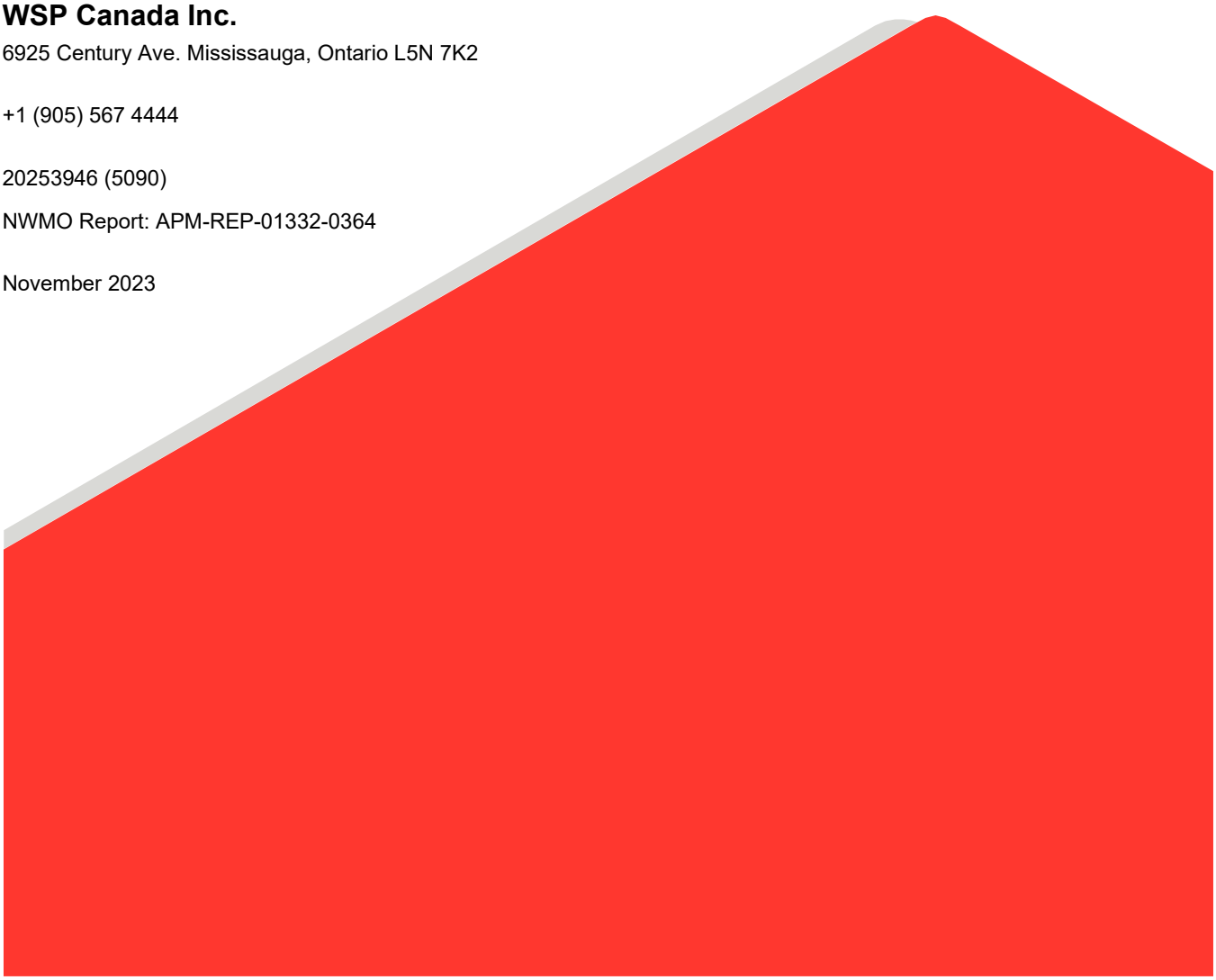
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20253946 (5090)

NWMO Report: APM-REP-01332-0364

November 2023



Distribution List

eCopy - NWMO

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WP09 DATA REPORT
WESTBAY MONITORING SYSTEM INSTALLATION FOR IG_BH05

CLIENT INFORMATION

Project Name:	Phase 2 Initial Borehole Drilling and Testing at IG_BH04/05/06, Ignace Area
Project Number:	20253946
Client PO Number:	2001102
Document Name:	20253946 (5090) IG_BH05 WP09 Report 21Nov2023 R4a

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ISSUE/REVISION INDEX

Issue Code	Revision					Revision Details
	No.	By	Revd.	App.	Date	
RR	0	GWS	MB	JLC	Aug. 22, 2022	Initial draft for review and comment
RI	1	MB	GWS	JLC	Oct. 21, 2022	Final Report
RI	2	MB	GWS	JLC	Jul. 20, 2023	Final Report – revised Appendix B
RI	3	MB	GWS	JLC	Oct. 6, 2023	Final Report – revised for NWMO comments
RI	4	GWS	MB	JLC	Nov. 21, 2023	Final Report – revised for NWMO comments

Issue Codes: RR = Released for Review and Comments, RI = Released for Information

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1.0 INTRODUCTION

The Initial Borehole Drilling and Testing project in the Wabigoon Lake Ojibway Nation (WLON) – Ignace Area, Ontario is part of Phase 2 Geoscientific Preliminary Field Investigations of the Nuclear Waste Management Organization's (NWMO) Adaptive Phased Management Site Selection Phase. This project includes the drilling and testing of six deep boreholes at the Revell site, as well as additional on-going studies, located within the northern portion of the Revell batholith.

This project involves testing of deep borehole IG_BH04 and the drilling and testing of deep boreholes IG_BH05 and IG_BH06 in the Revell site within the identified Potential Repository Area (PRA) as shown on Figure 1. The work comprises a total of eleven work packages and was carried out by a team led by WSP Canada Inc. (WSP) on behalf of the NWMO. The IG_BH05 program is described in a Borehole Characterization Plan (BCP) for IG_BH05.

This data report describes the methodology, activities, and results for Work Package 9 (WP09): Westbay Monitoring System Installation For IG_BH05.

2.0 BACKGROUND INFORMATION

2.1 Geological Setting

The approximately 2.7 billion year old Revell batholith is located in the western part of the Wabigoon Subprovince of the Archean Superior Province. The batholith is roughly elliptical in shape trending northwest, is approximately 40 km in length, 15 km in width, and covers an area of approximately 455 km^2. Based on geophysical modelling, the batholith is approximately 2 km to 3 km thick through the center of the northern portion (SGL 2015). The batholith is surrounded by supracrustal rocks of the Raleigh Lake (to the north and east) and Bending Lake (to the southwest) greenstone belts (Figure 2).

IG_BH05 is located within an investigation area of approximately 19 km^2 in size, situated in the northern portion of the Revell batholith. Bedrock exposure in the area is generally very good due to minimal overburden, few water bodies, and relatively recent logging activities. Ground elevations generally range from 400 to 450 m above sea level. The ground surface broadly slopes towards the northwest as indicated by the flow direction of the main rivers in the area. Local water courses tend to flow to the southwest towards Mennin Lake (Figure 1).

Four main rock units are identified in the supracrustal rock group: mafic metavolcanic rocks, intermediate to felsic metavolcanic rocks, metasedimentary rocks, and mafic intrusive rocks (Figure 2). Sedimentation within the supracrustal rock assemblage was largely synvolcanic, although sediment deposition in the Bending Lake area may have continued past the volcanic period (Stone 2009; Stone 2010a; Stone 2010b). All supracrustal rocks are affected, to varying degrees, by penetrative brittle-ductile to ductile deformation under greenschist- to amphibolite-facies metamorphic conditions (Blackburn and Hinz 1996; Stone et al. 1998). In some locations, primary features, such as pillow basalt or bedding in sedimentary rocks are preserved, in other locations, primary relationships are completely masked by penetrative deformation. Uranium-lead (U-Pb) geochronological analysis of the supracrustal rocks produced ages that range between 2734.6 +/-1.1 Ma and 2725 +/-5 Ma (Stone et al. 2010).

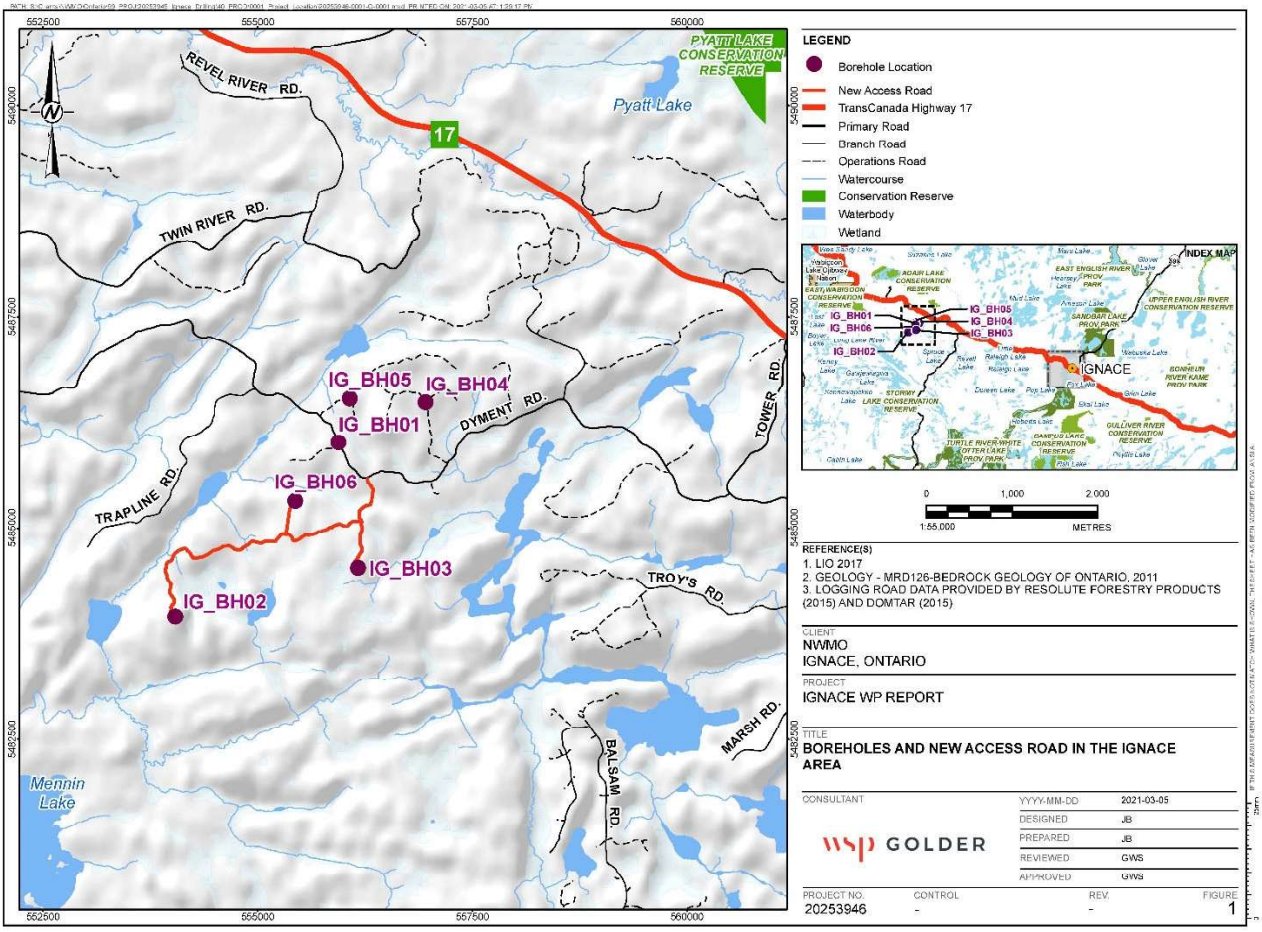


Figure 1: Location of IG_BH05 in relation to the Revell site

Three main suites of plutonic rock are recognized in the Revell batholith, including, from oldest to youngest: a Biotite Tonalite to Granodiorite suite, a Hornblende Tonalite to Granodiorite suite, and a Biotite Granite to Granodiorite suite (Figure 2). Plutonic rocks of the Biotite Tonalite to Granodiorite suite occur along the southwestern and northeastern margins of the Revell batholith. The principal type of rock within this suite is a white to grey, medium-grained, variably massive to foliated or weakly gneissic, biotite tonalite to granodiorite. One sample of foliated and medium-grained biotite tonalite produced a U-Pb age of 2734.2+/-0.8 Ma (Stone et al. 2010). The Hornblende Tonalite to Granodiorite suite occurs in two irregularly-shaped zones surrounding the central core of the Revell batholith. Rocks of the Hornblende Tonalite to Granodiorite suite range compositionally from tonalite through granodiorite to granite and also include significant proportions of quartz diorite and quartz monzodiorite. One sample of coarse-grained grey mesocratic hornblende tonalite produced a U-Pb age of 2732.3+/-0.8 Ma (Stone et al. 2010). Rocks of the Biotite Granite to Granodiorite suite underlie most of the northern, central and southern portions of the Revell batholith. Rocks of this suite are typically coarse-grained, massive to weakly foliated, and white to pink in colour. The Biotite Granite to Granodiorite suite ranges compositionally from granite through granodiorite to tonalite. A distinct potassium (K)-Feldspar Megacrystic Granite phase of the Biotite Granite to Granodiorite suite occurs as an oval-shaped body in the central portion of

the Revell batholith (Figure 2). One sample of coarse-grained, pink, massive K-feldspar megacrystic biotite granite produced a U-Pb age of 2694.0+/-0.9 Ma (Stone et al. 2010).

The bedrock surrounding IG_BH05 is composed mainly of massive to weakly foliated felsic intrusive rocks that vary in composition between granodiorite and tonalite, and together form a relatively homogeneous intrusive complex. Bedrock identified as tonalite transitions gradationally into granodiorite and no distinct contact relationships between these two rock types are typically observed (SRK and Golder 2015; Golder and PGW 2017). Massive to weakly foliated granite is identified at the ground surface to the northwest of the feldspar-megacrystic granite. The granite is observed to intrude into the granodiorite-tonalite bedrock, indicating it is distinct from, and younger than, the intrusive complex (Golder and PGW 2017).

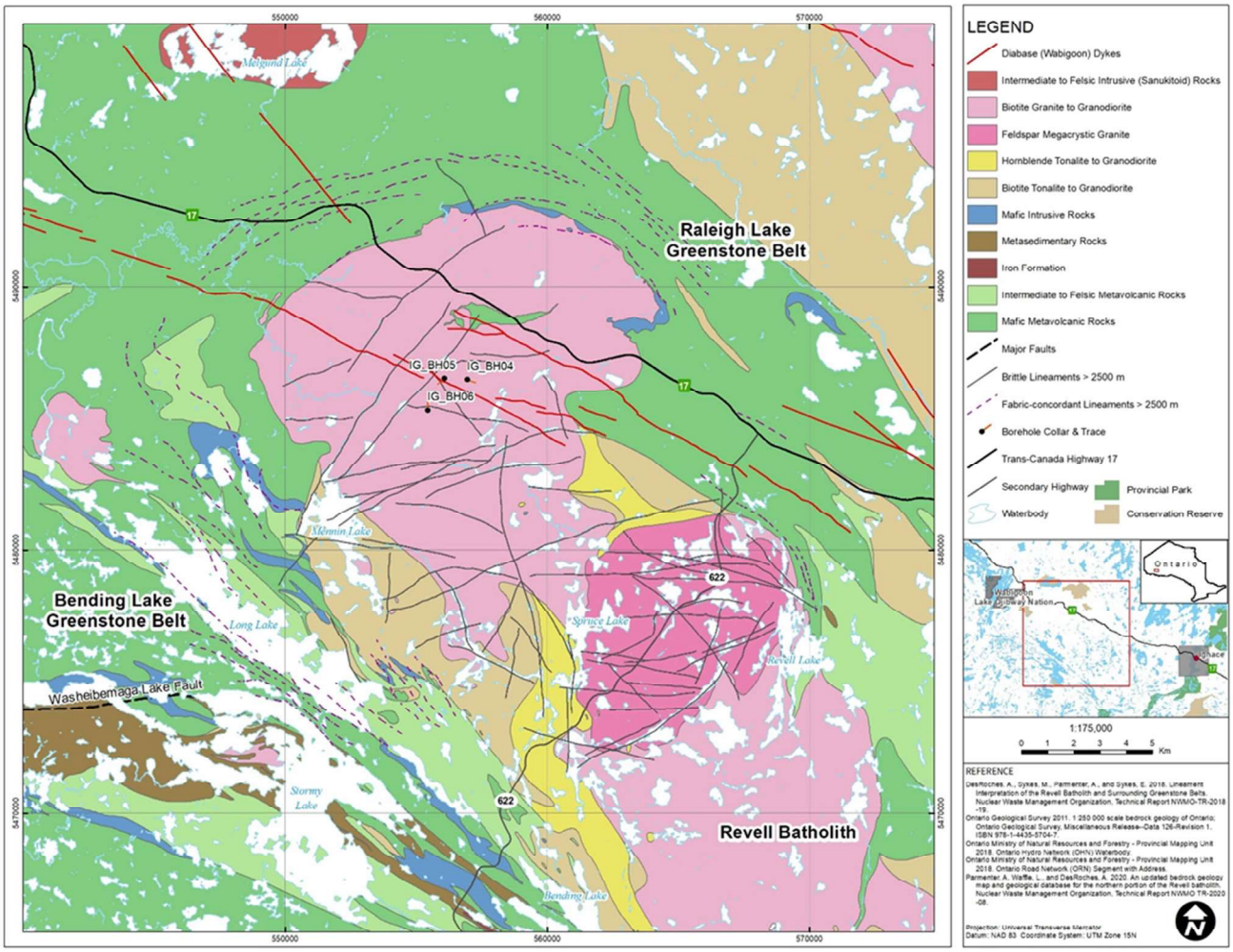


Figure 2: Geological setting and location of boreholes IG_BH04, IG_BH05 and IG_BH06 in the northern portion of the Revell batholith

West-northwest trending mafic dykes interpreted from aeromagnetic data extend across the northern portion of the Revell batholith and into the surrounding greenstone belts. One mafic dyke occurrence, located to the southwest of IG_BH05, is approximately 15-20 m wide (Figure 2). All of these mafic dykes have a similar character and are interpreted to be part of the Wabigoon dyke swarm. One sample from the same Wabigoon

swarm produced a U-Pb age of 1887+/-13 Ma (Stone et al. 2010), indicating that these mafic dykes are Proterozoic in age. It is assumed based on surface measurements that these mafic dykes are sub-vertical (Golder and PGW 2017).

Long, narrow valleys are located along the western and southern limits of the investigation area (Figure 1). These local valleys host creeks and small lakes that drain to the southwest and may represent the surface expression of structural features that extend into the bedrock. A broad valley is located along the eastern limits of the investigation area and hosts a more continuous, un-named water body that flows to the south. The linear and segmented nature of this waterbody's shorelines may also represent the surface expression of structural features that extend into the bedrock.

Regional observations from mapping have indicated that structural features are widely spaced (typical 30 to 500 cm spacing range) and dominantly comprised of sub-vertical joints with two dominant orientations, northeast and northwest trending (Golder and PGW 2017). Interpreted bedrock lineaments generally follow these same dominant orientations in the northern portion of the Revell batholith (Figure 2; DesRoches et al. 2018). Minor sub-horizontal joints have been observed with minimal alteration, suggesting they are younger and perhaps related to glacial unloading. One mapped regional-scale fault, the Washeibemaga Lake fault, trends east and is located to the west of the Revell batholith (Figure 2). Ductile lineaments, also shown on Figure 2, follow the trend of foliation mapped in the surrounding greenstone belts. Additional details of the lithological units and structures found at surface within the investigation area are reported in Golder and PGW (2017).

2.2 Technical Objectives

The Westbay MP38 system is designed to isolate specific depth intervals within the inclined IG_BH05 borehole and includes 25 monitoring zones to a depth of 931.9 metres below ground surface (mBGS) or 1000.6 m downhole. The Westbay system can be used for measurement of hydraulic pressures and collection of groundwater samples. The MP38 system can also be used to perform hydraulic tests in the isolated zones.

3.0 DESCRIPTION OF ACTIVITIES

Permission to drill was obtained from the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) on September 24, 2019 and formal notification given to Golder from the NWMO on February 11, 2021 with the understanding that the drilling would begin in May 2021. Drilling of IG_BH05 commenced immediately following completion of WP01 (site infrastructure setup) activities at IG_BH05. The borehole was drilled at a nominal diameter of 98 mm (HQ size) by diamond coring methods at an initial (surveyed) azimuth and dip of approximately 220˚/-70˚with no corrections made for deviation as the drilling progressed. Drilling of IG_BH05 commenced on May 10, 2021 and was completed on August 6, 2021.

Borehole flushing was carried out on IG_BH05 with 100 ppb fluorescein traced fresh water from the Town of Ignace Municipal supply on three occasions. The first flush was conducted on May 21, 2021, prior to installing the surface casing. Approximately 6,800 litres of traced water were flushed through the borehole, which at that point had been advanced to approximately 100.57 m downhole. Following flushing, optical and acoustic televiewer surveys were completed within the upper 100 m of the borehole to identify features which should be cased and cemented to seal them from the rest of the borehole. A PQ sized surface casing was advanced to a depth of 68.3 m downhole and cemented in place.

Once the PQ sized surface casing was cemented in place, the borehole was cored to its final depth of 931.9 mBGS, or 1000.63 m downhole. A second flush was carried out at the completion of drilling from August 7 to 8,

2021. Approximately 27,300 litres of traced water were flushed through the borehole, equivalent to just over 3.5 borehole volumes. Geophysical logging, hydraulic testing and vertical seismic profiling (VSP) was then completed in the borehole. Additional flushing of IG_BH05 was carried out on November 1, 2021 prior to the installation of the Westbay system, when approximately 22,100 litres of traced water was flushed through the borehole.

Installation of Westbay MP38 multilevel monitoring casing was carried out from November 3 to 14, 2021 by staff of Westbay Instruments with support provided by Golder and Rodren Drilling Ltd. (Rodren), in accordance with planned installation procedures. Installation of the MP38 casing involved the following activities:

- Preparation and review of a Westbay MP38 system design.
- Layout, numbering and visual inspection of all MP38 casing components at an off-site location and at the well head, including measurement of the length of each Westbay casing section.
- Installation of an HQ guide tube downhole to protect the casing string during installation.
- Lowering and testing of MP38 casing components into the borehole in the sequence indicated on the approved Westbay Completion Log.
- Pre-inflation pressure profiling.
- Packer inflation and guide tube removal.
- Wellhead completion and post-installation pressure profiling.

These activities are described in greater detail in the following subsections.

3.1 Westbay System Components

The Westbay system consists of modular casing, packers, couplings, abrasion protectors, measurement ports, hydraulic pumping ports and magnetic location collars. Fluid samples and in-situ fluid pressures are obtained using an electronic probe that is lowered inside the casing to access the valved ports. Westbay system components are illustrated on Figure 3.



Figure 3: Westbay MP38 System Components
1 - MP38 Casing; **2 -** MP38 Packer – 74 mm (1.5 m); **3 -** MP38 Measurement Port; **4** - MP38 Hydraulic Pumping Port; **5** - MP38 Regular Coupling; **6** - Magnetic Location Collar; **7 -** MP38 End Cap; **8 -** MP38 Monopod Attachment Bracket; **9 –** MP38 Abrasion Protector.

3.2 Preparation of the Monitoring Well Design

Test intervals within the Westbay MP38 system were selected to either target specific zones in the borehole where increased frequency of structures or hydraulic flows were observed, or to broadly monitor the evolution of hydraulic pressures and groundwater chemistry in regularly spaced intervals of the rock mass with increasing depth in the borehole. The length of a test interval is defined as the distance between the bottom of the upper packer and the top of the lower packer. The selected interval lengths were a function of the characteristics of specific zones and the purpose of the planned testing for that interval. Compared to previous Westbay installations at the Ignace PRA, a number of additional test intervals were created in IG_BH05 that were minimized in length. These shorter test intervals have reduced interval volumes which facilitate targeted groundwater sample collection activities.

Generally, a measurement port was placed a uniform distance below each packer to allow for pressure measurements and to permit squeeze relief venting during packer inflation. Magnetic locating collars were placed 0.6 m below measurement ports in key intervals. Pumping ports were located within intervals where hydrogeologic conditions suggested the collection of groundwater samples was possible. These intervals typically corresponded to observed inflows during flow logging. Abrasion protectors were used to centralize the installation in the inclined borehole and to prevent abrasion of system components against the sides of the borehole during installation. The abrasion protectors were clamped to the outside of the Westbay casing near the following components:

- One abrasion protector above and below each MP38 Packer;
- One abrasion protector above each MP38 Pumping Port;
- Two abrasion protectors at the bottom of the Westbay casing assembly.

In addition to the use of two abrasion protectors at the bottom of the Westbay casing assembly, a special tapered end plug was attached to the bottom of the assembly.

The results of drilling (WP02), core logging (WP03), geophysical logging (WP05) and hydraulic testing (WP06) were used to finalize test interval selection. A summary of the installed test intervals with their associated selection rationale is provided in Table 1 below.

Table 1: Westbay MP38 Test Intervals and Selection Rationale

Interval No.	Depth Interval (bottom of upper packer to top of lower packer)				Test Interval Selection Rationale
	Top (m down hole)	Bottom (m down hole)	Top (mBGS)	Bottom (mBGS)	
IG_BH05_INT_025	67.9	87.2	63.6	81.6	Span upper BH and seal bottom of casing
IG_BH05_INT_024	88.1	96.2	82.5	90.0	Isolate high flow zone
IG_BH05_INT_023	97.1	152.2	90.9	142.4	Span intact zone
IG_BH05_INT_022	153.1	176.6	143.2	165.2	Align with WP06, isolate high flow zone, aplite dykes
IG_BH05_INT_021	177.5	222.2	166.0	207.8	Align with WP06, span intact zone

Interval No.	Depth Interval (bottom of upper packer to top of lower packer)				Test Interval Selection Rationale
	Top (m down hole)	Bottom (m down hole)	Top (mBGS)	Bottom (mBGS)	
IG_BH05_INT_020	223.1	260.3	208.6	243.3	Align with WP06, span intact zone
IG_BH05_INT_019	261.2	309.0	244.2	288.8	Align with WP06, upper part of large dyke, high structure concentration
IG_BH05_INT_018	309.9	322.7	289.6	301.6	Isolate flow zone
IG_BH05_INT_017	323.6	368.9	302.4	344.6	Align with WP06, lower part of large dyke, mod flow zone
IG_BH05_INT_016	369.8	423.7	345.5	395.7	Align with WP06, several dykes, mod flow zone
IG_BH05_INT_015	424.6	483.1	396.6	451.1	Align with WP06, span intact/low flow section
IG_BH05_INT_014	484.0	537.9	452.0	502.2	Align with WP06, span intact/low flow BH section
IG_BH05_INT_013	538.8	583.6	503.0	544.7	Align with WP06, span intact/low flow BH section
IG_BH05_INT_012	584.5	623.1	545.5	581.4	Align with WP06, span intact/low flow BH section
IG_BH05_INT_011	624.0	630.8	582.3	588.6	Isolate fracture/flow zone
IG_BH05_INT_010	631.7	675.6	589.4	630.2	Align with WP06, span interval between flow zones
IG_BH05_INT_009	676.5	732.0	631.0	682.5	Align with WP06, span interval between flow zones
IG_BH05_INT_008	732.9	783.8	683.4	730.6	Align with WP06, span interval between flow zones
IG_BH05_INT_007	784.7	796.7	731.5	742.6	Top of dykes, fractures, flow zone
IG_BH05_INT_006	797.6	853.1	743.5	795.0	Bottom of dykes, fractures, flow zone
IG_BH05_INT_005	854.0	861.4	795.8	802.7	Top of felsic dyke, fracture, flow zone
IG_BH05_INT_004	862.3	924.4	803.5	861.2	Bottom of felsic dyke, fracture, flow zone
IG_BH05_INT_003	925.3	970.2	862.0	903.7	Align with WP06, span flow zones gap
IG_BH05_INT_002	971.1	987.0	904.5	919.3	Isolate dyke, fracture, mod flow zone
IG_BH05_INT_001	987.9	1000.6	920.1	931.9	Align with WP06, isolate lower BH, dyke, fractures, alteration zones

Following test interval selection, the depth of packer placement was refined using data from downhole caliper logs, core logs, and televiewers to ensure packers were located in sections of borehole having a sparse fracture frequency and consistent diameter. In addition to the primary function of creating a borehole annular seal between adjacent monitoring intervals, the Westbay packers also support the weight of the Westbay completion, and loads imposed by long-term or short-term hydraulic gradients across packers. The maximum distance between packers should be less than 100 m for load-sharing reasons.

The well design is comprised of the test interval selection and packer placement, and was used to prepare a Westbay Completion Log, which specifies the installation details of the Westbay System components in the well including serial numbers for each packer, pumping port and measurement port coupling. A copy of the Westbay Completion Log is included in the Westbay Completion Report provided in Appendix A.

3.3 Layout of Westbay Casing Components

A pre-installation layout of Westbay casing components was carried out at an offsite warehouse in Ignace, Ontario. The required MP38 components (casing, couplings, magnetic location collars, etc.) were laid out on a raised rack. Each component was numbered and measured, beginning with the lowermost, as an aid to confirming the proper sequence of components. The appropriate Westbay System couplings were attached to each casing section according to the Westbay Completion Log, and magnetic location collars were attached 0.6 m below the top of the measurement port couplings in the monitoring intervals. To prevent damage to the equipment during assembly into the inclined borehole, two abrasion protectors were installed at the bottom of the Westbay casing assembly, and single abrasion protectors were also added above and below each packer, and above each pumping port (see Figure 4). The serial numbers for each packer, pumping port and measurement port coupling were recorded on the Westbay Completion Log.

Following pre-installation layout, the components were re-sealed in their respective plastic bags, labelled, and re-packaged for transportation to the drill site.



Figure 4: Photo of packer assembly on left, and abrasion protector on right. Abrasion protectors were installed directly above and below each packer, to prevent damages during assembly.

3.4 Lowering of Westbay Casing Components

Upon delivery to the IG_BH05 drill site, the MP38 System components were arranged in sequence on layout racks located within the core logging trailer and checked against the Westbay Completion Log. A temporary guide tube of steel HQ drill rods was lowered into the borehole to a depth of 840.42 m downhole to protect the Westbay components from materials that could dislodge from the borehole wall during installation. The inside of each guide tube length was checked during installation to confirm that it was free of obstructions and smooth.

Each section of Westbay casing was visually inspected to confirm that the inside was clear and that the joint anchor wires were properly installed before attachment of a section of Westbay casing to the downhole casing string. The Westbay casing weight, differential pressure (both inside to outside, and outside to inside) and the buoyancy force on the casing bottom were maintained within operating limits through the regular addition of fluorescein-traced water (100 ppb) to the inside of the Westbay casing.

Each connection in the Westbay casing was pressure tested using the MP38 Joint Test Tool and the test results recorded on the Westbay Completion Log. A photo of the Joint Test Tools is provided on Figure 5. A minimum test pressure of 690 kPa and a minimum test duration of 1 minute was used for the joint testing with the test pass criteria of no observable water leakage. A record of each successful joint test and the placement of each component was noted on the Westbay Completion Log.



Figure 5: Photograph of joint testing and packer inflation tool

After the Westbay System string was lowered into the borehole, the water level inside the Westbay casing was monitored under a negative gradient (approximately 102 m) for 30 minutes, which confirmed the hydraulic integrity of the completion. Hydraulic integrity measurements are available in Appendix A.

3.5 Pre-inflation Pressure Profile

Prior to inflating the packers, a pre-inflation pressure profile was carried out on November 7, 2021 to confirm the operation of all pressure measurement ports downhole and to establish the open hole pressure profile. These measurements were carried out using the MOSDAX pressure profile tool and are provided in Appendix B.

Figure 6 illustrates the pre-inflation pressure profile and estimated piezometric levels in formations outside measurement ports for IG_BH05 assuming fresh water. As shown, the head increases linearly with depth over the entire length of the installation. This linear increase would be expected considering that the packers had not yet been inflated, and that the water within the borehole annulus was introduced during the drilling process and is not expected to contain density variations that would be observed with the native groundwaters.

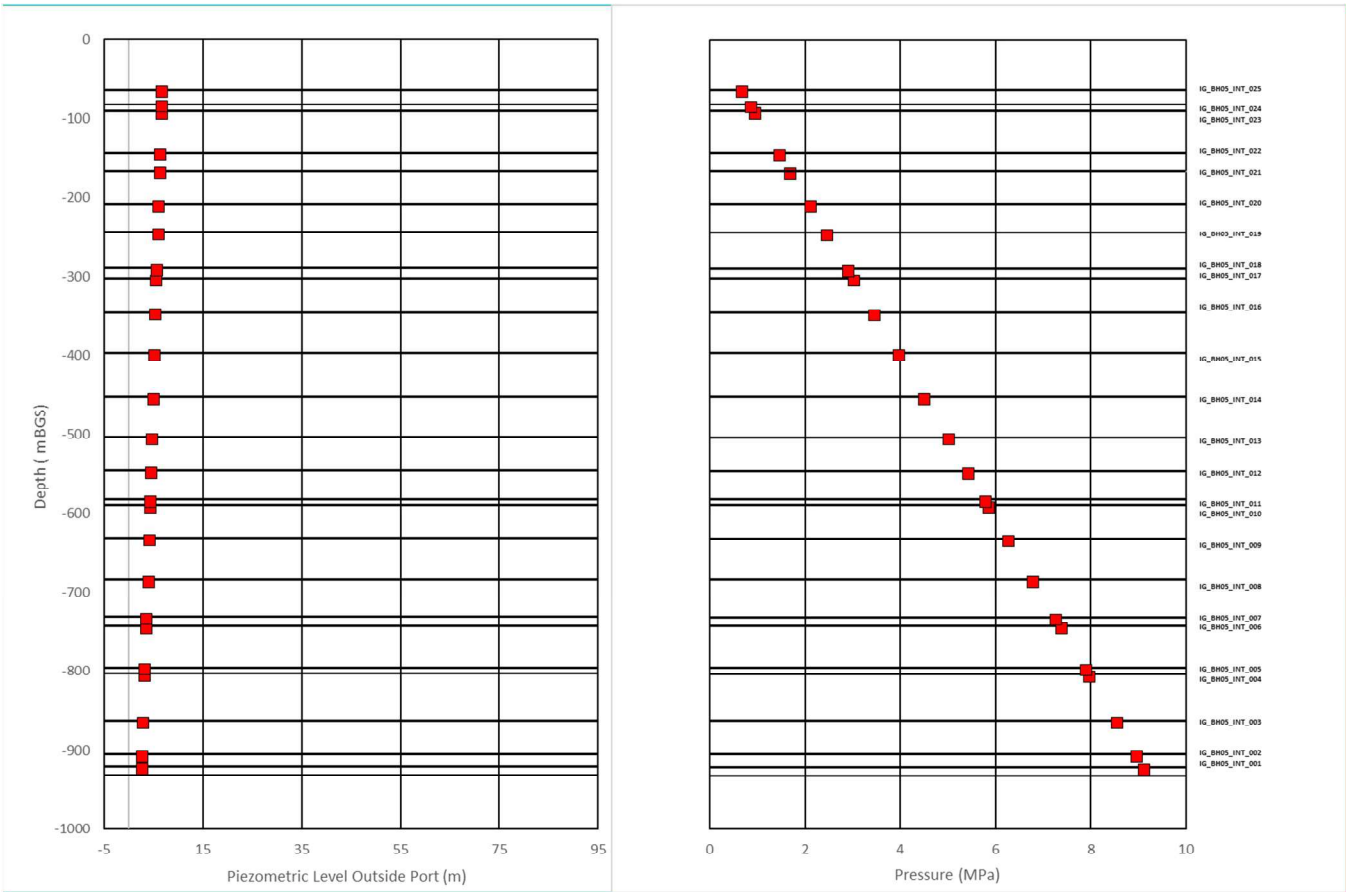


Figure 6: IG_BH05 Pre-Inflation Pressure Profile

Temperature profile measurements were made concurrently during the pre-inflation pressure profiling. With the exception of the first two (deepest) temperature readings, the temperature profile data (Figure 7) showed a linear increase in temperature with depth from approximately 5.7 ^{0}C at 66 mbgs to 13.1 ^{0}C at 865 mbgs.

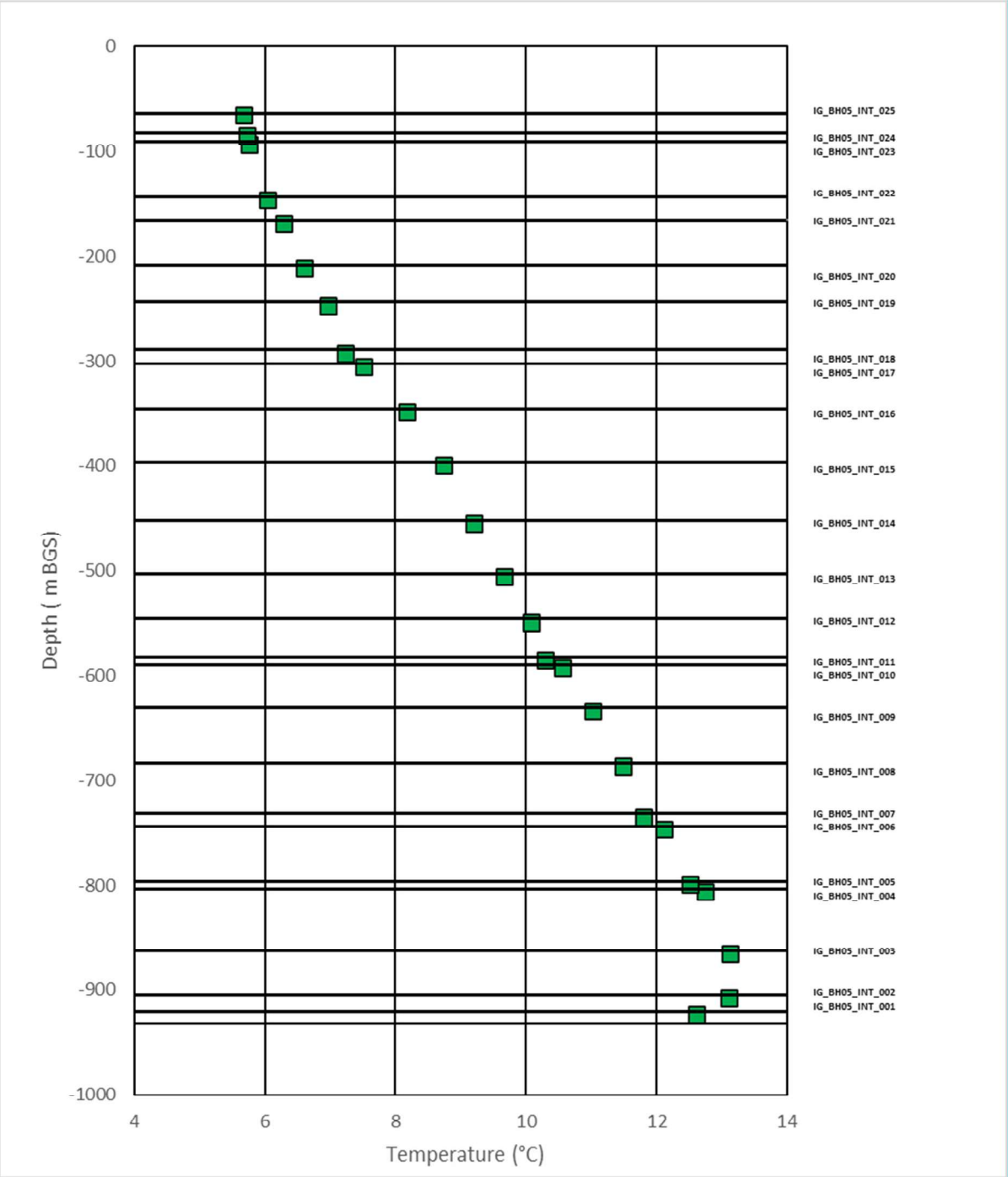


Figure 7: IG_BH05 Pre-Inflation Temperature Profile

3.6 Packer Inflation

Packers were inflated with fluorescein-traced water using the Westbay Model No. 6055 vented inflation tool, previously shown on Figure 5. The packer inflation took place from November 8 to 14, 2021 in six stages as summarized in Table 2, and was coordinated with the progressive removal of the guide tube, which was initially installed to a depth of 840.42 m downhole, which left the lowermost five packers initially exposed for inflation.

Table 2: Summary of Packer Inflation Steps

Inflation Step	Inflation Date	Guide Tube Depth (m downhole)	Packers Inflated
1	Nov. 8 2021	840.42	1 to 5 (5)
2	Nov. 9 2021	720.42	6 to 8 (3)
3	Nov. 10 2021	579.42	9 to 12 (4)
4	Nov. 10-11 2021	300.42	13 to 18 (6)
5	Nov. 13 2021	171.42	19 to 21 (3)
6	Nov. 13-14 2021	Fully retrieved	22 to 25 (4)

The five packers exposed below the base of the guide tube at Stage 1 were inflated in sequence beginning with the lowest. Injection pressure (packer element pressure) and pumped volume were measured at intervals (typically one reading for each 0.5 litres pumped) and manually recorded in the Packer Inflation Field Records provided in Appendix C. Subsequent inflation stages followed using the same procedure after each time the guide tube was raised.

3.7 Final Testing / Post-emplacement Profiling

Following the packer inflation and final measurements of the Westbay MP38 component string, a post-emplacement pressure profile was performed on November 14, 2021. The Westbay MOSDAX pressure probe was used to measure formation pressures in the packer-isolated borehole intervals outside the Westbay casing. Pressures measured by this equipment are total, or absolute pressures, which include groundwater pressure and atmospheric pressure. The atmospheric pressure component is removed from the formation pressure by measuring the atmospheric pressure with the probe at ground level and subtracting the atmospheric pressure (at the time of measurement) from the formation pressure. These pressure measurements are reported in Appendix B while a graphical presentation of the results is shown on Figure 8.

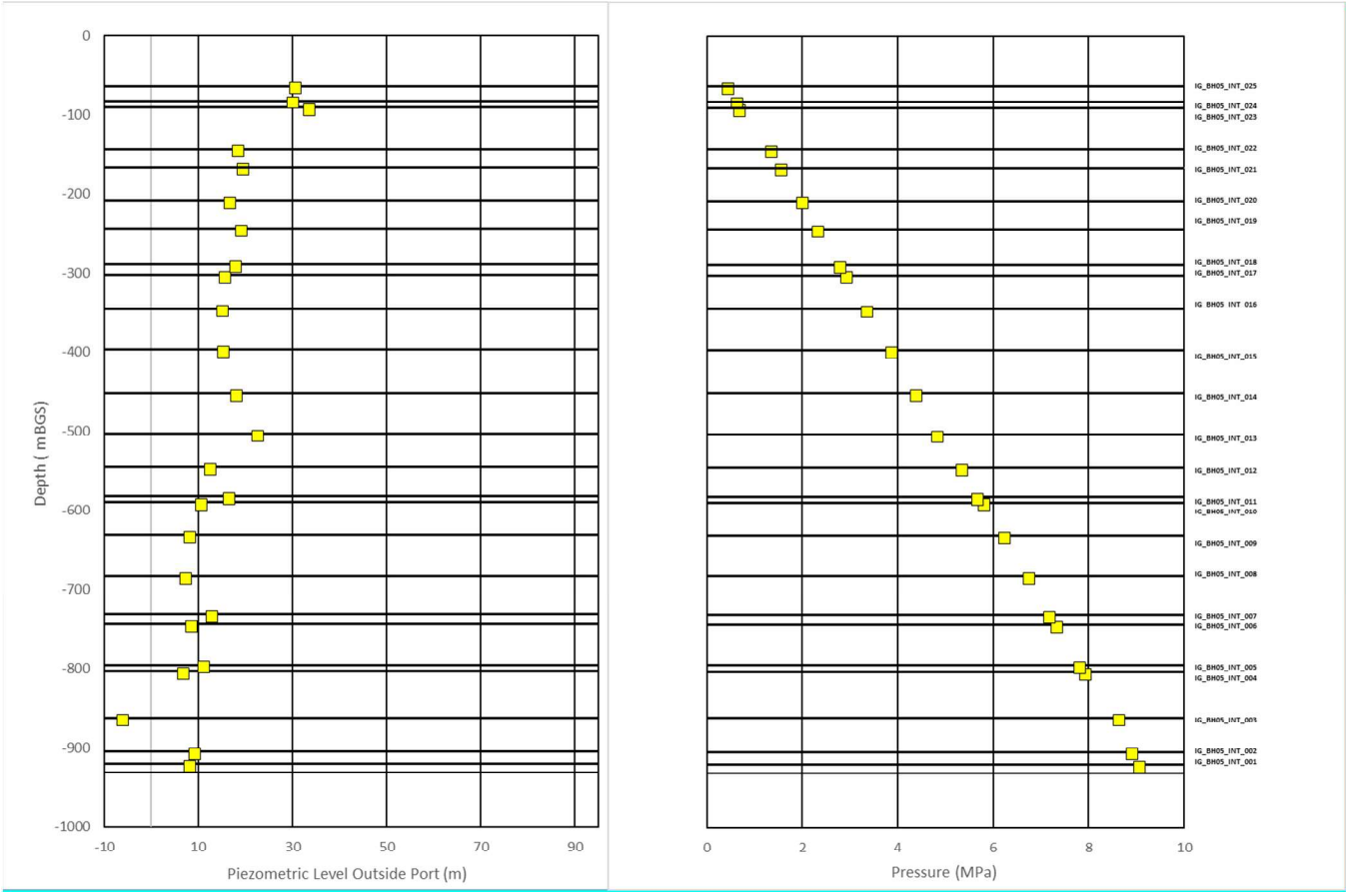


Figure 8: IG_BH05 Post-Inflation Pressure Profile from November 14, 2021

The post-inflation pressures shown above shows changes from open-hole pressures previously shown in Figure 6. These pressures were likely affected by testing and installation procedures and are not considered to be representative of equilibrium conditions. Long-term formation pressure conditions will develop over time as packer-isolated test intervals re-equilibrate from drilling and testing disturbances. Subsequent post-emplacement pressure profile measurements were collected on November 21, 2021. A plot showing the measured interval pressures over time is provided on Figure 9, and the measurements are reported in Appendix B.

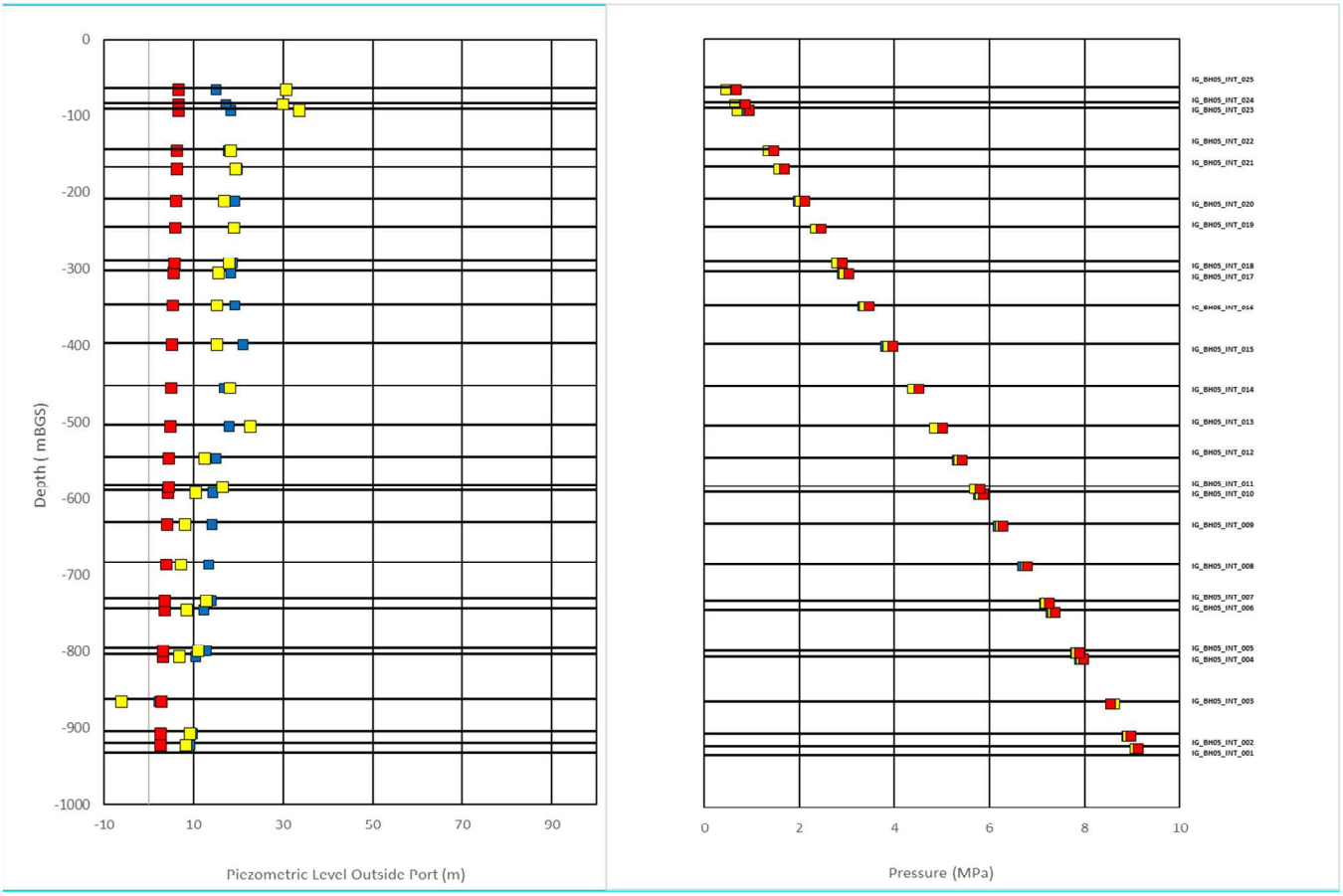


Figure 9: Changes in Pressures at IG_BH05, Pre and Post Packer Inflations, November 2021

Pressures measured on: November 7, 2021 (Prior to packer inflation) November 14, 2021 (Post Packer Inflation); November 25, 2021 (1-1/2 weeks Post Packer inflation).

The thermal gradients from the pre- and post-emplacement are shown on Figure 10 below and generally showed a slight decrease in temperature over time, with the exception of the lowermost two intervals where the temperature increased as the intervals approached the overall linear trend of increasing temperature with depth.

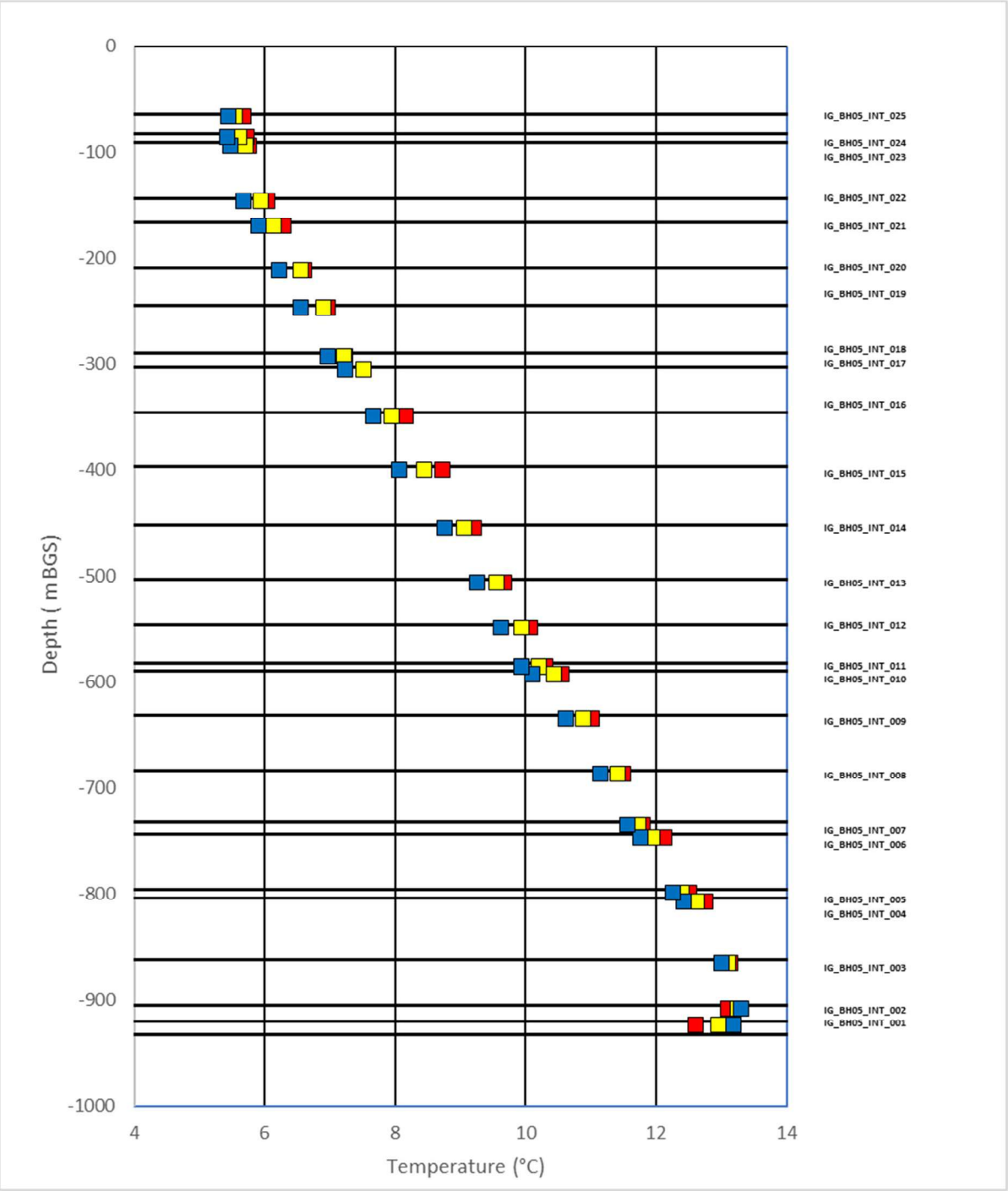


Figure 10: Changes in Temperatures at IG_BH05, Pre and Post Packer Inflations in November 2021

Temperatures measured on: November 7, 2021 (Prior to packer inflation) November 14, 2021 (Post Packer Inflation) November 25, 2021 (1-1/2 weeks Post Packer inflation).

3.8 Wellhead Completion

Following the MP38 installation and initial post-inflation pressure profile on November 14, 2021, the wellhead was completed by extending the Westbay MP38 riser pipe by 0.167 m, adding a Westbay MP38 cap, and threading on a steel HWT surface casing extension (0.658 m long) with a locking cap and monopod bracket (Figure 11). The final post-inflation pressure profile was collected on November 25, 2021 with these wellhead modifications in place.



Figure 11: IG_BH05 Wellhead with protective casing and monopod bracket installed – post site grading – November 20, 2021.

The as-built borehole installation was then surveyed on December 2, 2021 by Rugged Geomatics Inc., and the as-built coordinates of IG_BH05 with the surface casing extension in place (high side) are presented in Table 3. The survey data was used to calculate the “ground surface” reference elevation (Point D) used during drilling and installation of the Westbay MP38 based on the surveyed elevation “Point C” of the top of the original HWT surface casing, the original Westbay stick-up of 1.24 m, and the measured orientation of the borehole at surface. The reference points are illustrated on Figure 12 below.

Table 3: IG_BH05 Final Surveyed Collar and Casing Coordinates

Point	Easting (m)	Northing (m)	Elevation (masl)	Comment
A - Top of HWT surface casing with casing extension added	556069.38	5486536.26	433.67	As surveyed
B - Top of Westbay casing with riser pipe extension added	556069.39	5486536.28	433.60	As surveyed
C - Top of original HWT surface casing (prior to extension added)	556069.23	5486536.07	433.05	As surveyed
D - “Ground Surface” reference elevation datum used during drilling and Westbay installation	556069.05	5486535.85	432.29	Calculated

Note: Elevations are Geodetic and referred to the CGVD2013 Datum and coordinates are referred to UTM Zone 15, NAD 83 (CSRS).

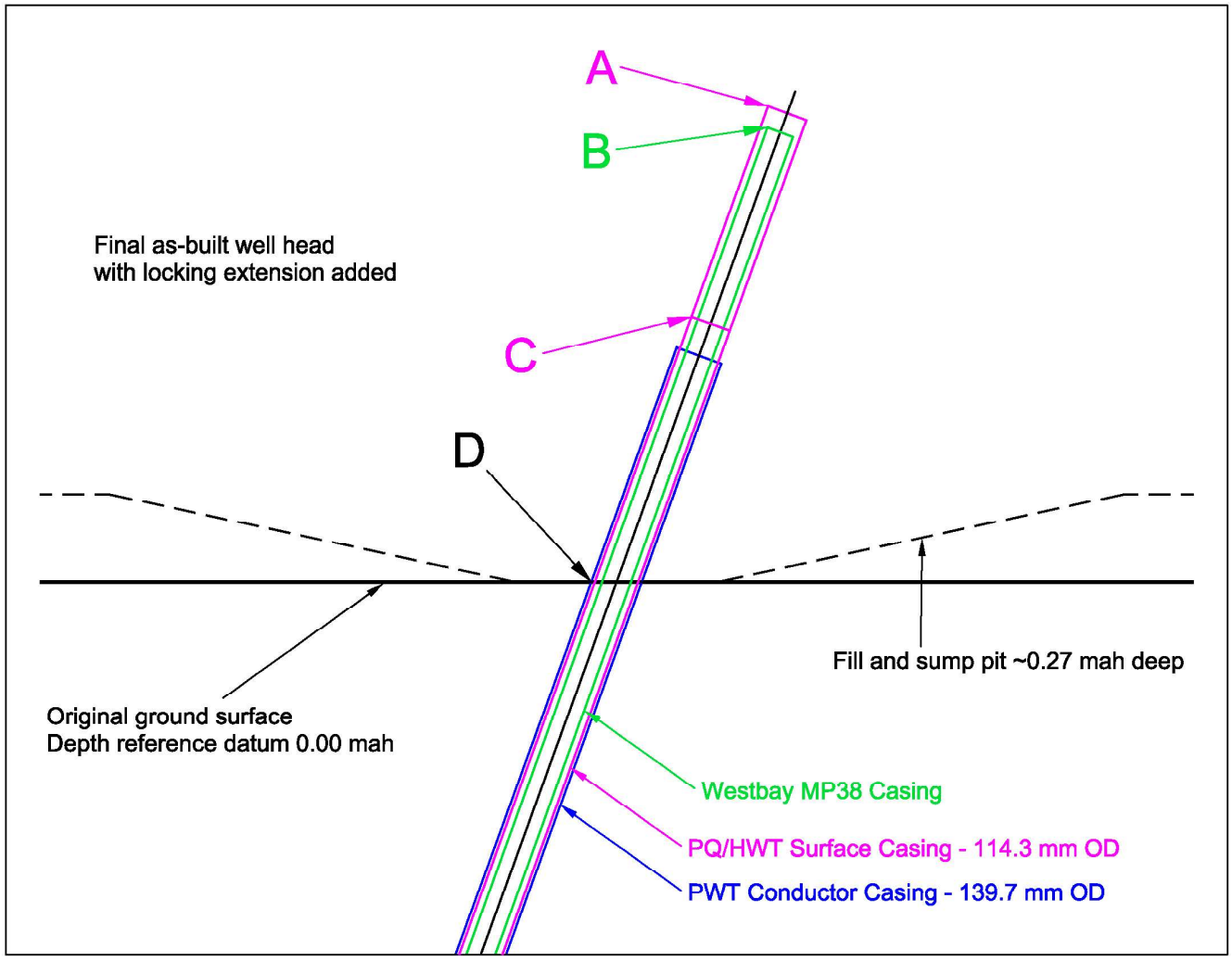


Figure 12: Survey Reference Points for IG_BH05

4.0 DATA QUALITY AND USE

Data presented in this report describe the installation and completion of Westbay MP38 multilevel monitoring casings in borehole IG_BH05 as well as the rationale for selection of multilevel monitoring intervals. Initial post-inflation pressure data obtained from these completions support the conclusion that the MP38 casing systems are operating as intended.

5.0 REFERENCES

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MB/GWS/JLC/

APPENDIX A

Westbay MP38 Completion Report

Completion Report

Well Name: IG_BH05



August 24, 2022

Completion Report

Well Name: IG_BH6

Project Number: WB981

Prepared for:

Golder Associates Ltd.

Prepared by:

Westbay Instruments
A Division of Nova Metrix Ground Monitoring (Canada) Limited.
8610 Glenlyon Parkway
Unit 134
Burnaby, BC
V5J 0B6

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C	Summary Completion Log
D	Tubing Summary (field copy)
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1. Introduction

This report and the attached Appendices document the technical services carried out by Westbay Instruments (Westbay) under Golder Associates Ltd. (Golder) W.O. 20253946-023 dated September 13, 2021. A Westbay System completion was installed in borehole IG_BH 05 at a site near Ignace, ON, Canada.

Westbay technical services representatives Mr. Mark Lessard and Mr. Tony Kim were on site for installation of the Westbay System from October 25 to November 15, 2021. Golder representative Mr. Matthew Bowman was on-site to supervise the installation of the Westbay System.

This report documents the installation tasks and related Quality Assurance (QA) checks.

2. Pre-Installation Activities

The borehole was drilled/cored at a nominal diameter of 96 mm (HQ-size) at an azimuth of about 220 degrees by wireline coring methods. The borehole was drilled about 70 degrees inclined from horizontal. Water labeled with 100 ppb fluorescein was used as a lubricant during coring. An HWT surface casing (nominal 114.3 mm OD) was advanced to 69 meters in the borehole.

Borehole logging, packer testing, flow logging and vertical seismic profiling were performed prior to the installation of the Westbay System. The borehole logging included Static Fluid Temperature / Resistivity, Flowing Fluid Electrical Conductivity, Mechanical Caliper, Optical Televiewer, Acoustic Televiewer, Natural Gamma, Electromagnetic Induction (Apparent Conductivity), Magnetic Susceptibility, Neutron, Gamma-Gamma, Full Waveform Sonic, Normal Resistivity, Spontaneous Potential and Single Point Resistance, Heat-Pulse Flowmeter, Spectral Gamma, and Borehole Deviation. Flow logging was carried out using the Posiva Flow Log - Difference flow method which records fluid flow, electrical conductivity and temperature, hydraulic head, and rock resistivity. For the packer testing, slug and pulse tests were performed. High-resolution vertical seismic profiling was carried out using multiple downhole receivers and multi-offset/multi-azimuth swept impact source locations.

(Note: all depths discussed in this report are with respect to ground surface measured along the inclined borehole. The ground level reference elevation is 432.29 masl.).

3. Installation

Westbay Instruments technical services representatives Mr. Lessard and Mr. Kim, and Mr. Bowman of Golder were on site to install the Westbay System in IG_BH05 as indicated below in Table 1.

(Note: Monitoring well reference elevation was not available at the time of writing).

Table 1: Summary of Westbay System Installation

Well Name.	Field Installation Dates	Total Depth (m)	MP38 Tubing Length (m)	No. Monitoring Zones
IG_BH05	November 3 to 14, 2021	1000.63	994.5	25

The Westbay System in IG_BH05 was installed according to the procedure described below. A summary of the QA checks conducted during the installation, including the dates for each task is documented on the Westbay Field QA Summary Form in Appendix A.

3.1 Preparation of Westbay System Design

Packer depths for the borehole were provided to Westbay by Golder. A well design was created based on these depths. The well design was used to prepare a Westbay Completion Log, which specifies the location of the Westbay System components in the well. This log was reviewed and approved in the field by Golder prior to installation of the Westbay System. The Westbay Completion Log as approved was used as an installation guide in the field. A field copy of the log is in Appendix B.

A measurement port coupling was included in 25 monitoring zones to measure groundwater formation pressures and collect groundwater formation samples. A Model 0206 hydraulic pumping port coupling was included in 6 selected zones to provide purging and hydraulic conductivity testing capabilities. Golder requested that optional geotextile filters (made of Polyethylene Terephthalate [PET] fabric) were to be installed over the measurement port couplings.

A summary of the installed Westbay System components is shown on Table 2 below. (also in the Summary Completion Log Legend in Appendix C).

Table 2: Summary of Installed Westbay System Components

Well Name	Packers (0238)	Measurement Ports (0205)	Pumping Ports (0206)
IG_BH05	25	25	6

3.2 Layout of Westbay System Tubing Components

Prior to the installation, the Westbay System components were set out in a heated warehouse according to the sequence indicated on the Westbay Completion Log. Data collected during the layout were recorded on the Tubing Summary (field copy) in Appendix D and the Summary Completion Log (field copy) in Appendix E. Each tubing length was numbered and measured beginning with the lowermost as an aid to confirming the proper sequence of components. The appropriate Westbay System couplings were attached to each casing section. Magnetic location collars were attached 0.6 meter below the top of the measurement port couplings in the monitoring intervals.

Since the borehole is inclined at 70 degrees from horizontal, abrasion protectors were used to protect the packers and pumping ports from damage during deployment inside the guide tube and lower section of open borehole. The abrasion protectors are clamped to the outside of the Westbay tubing at specified positions. There are 2 abrasion protectors per packer, 1 abrasion protector per pumping port, and 2 abrasion protectors for the bottom section of Westbay tubing. Some sections of the completion have a shared abrasion protector between the packer and pumping port. In addition, a special tapered end plug is attached to the bottom of the Westbay tubing.

The components were re-sealed in their plastic protective covers and re-boxed for transport to site. Once on site, the components were arranged on racks in a heated trailer.

Each component was visually inspected. Serial numbers for each packer, pumping port and measurement port coupling were recorded on the Westbay Completion Log (field copy) in Appendix B and Summary Completion Log (Field Copy) in Appendix E. The component layout was confirmed with the log before the components were lowered into the borehole.

3.3 Lowering of Westbay System Components

Steel HQ drill rods (guide tube) were lowered into the borehole to a depth of 840.42 meters to provide temporary protection from materials dislodged from the borehole wall during installation of the Westbay tubing string. The Westbay System components were lowered into the guide tube by hand and with a hoist on the rig. The lowering of components started on November 3 and completed on November 6, 2021. Each joint was tested with a minimum internal hydraulic pressure of 150-psi for one minute to confirm hydraulic seals. A record of each successful joint test and the placement of each component are noted by check marks on the Westbay Completion Log. Fluoroscein-traced drill water supplied by Golder was added to the Westbay System when necessary to counter buoyancy effects while components were lowered into the borehole and was used foras a secondary test of joint seals during lowering.

3.4 Hydraulic Integrity Testing

On November 6, 2021, after the Westbay System string was lowered into the borehole, the water level inside the Westbay System completion was monitored at a depth different from the open borehole water level for a minimum period of thirty minutes to confirm hydraulic integrity of the completion. The data from the hydraulic integrity test are shown on the third page of the Westbay Completion Log (field copy) in Appendix B and in Table 3 below.

Table 3: Hydraulic Integrity Test

Well Name	November 6, 2021	Fluid Levels	
	Time	Inside Tubing	Outside Tubing
IG_BH05	17:13	124.522m	*22.27m
	17:15	124.517m	*Measurement was taken on
	17:20	124.505m	November 3, 2021, just prior to
	17:35	124.502m	lowering Westbay System.
	17:45	124.501m	
	17:55	124.501m	
	18:05	124.501m	

3.5 Positioning of Westbay System Completion

After the completion of hydraulic integrity testing, the Westbay System was positioned as illustrated on the Westbay Completion Log (field copy) in Appendix B. The Westbay System was supported in this position from the surface with mechanical grips while the packers were inflated. The positioning of the Westbay System components is based on the "nominal" lengths of Westbay System components. The positioning calculations do not include allowances for borehole temperature or deviation effects.

Figure 1, entitled "MOSDAX Transducer Position" illustrates how the position of the MOSDAX transducer position is correlated to the reference position at the top of a measurement port. Figure 2, titled "Dimensions of Packer Seals and Monitoring Zones" outlines the calculations used to determine the packer depths and length of each monitoring zone.

3.6 Pre-inflation Profile

On November 7, 2021, a pre-inflation pressure profile was performed prior to inflating the packers, in order to confirm the proper position and operation of measurement ports and magnetic collars. All measurement ports and magnetic collars were confirmed to be operating properly and correctly positioned within the borehole. A plot of the Pre-inflation Piezometric levels in all zones is shown on Figure 3. Note that the plot includes a reference to 'equivalent depth to water' which is the calculated piezometric level as defined on the Westbay Piezometric Pressures/Levels Field Data and Calculation Sheet completed for each pressure profile. The apparent port depths are based on distance along the borehole from ground surface, and are not corrected for borehole angle. The field data calculation sheets for the pre-inflation pressure profile are provided in Appendix F.

3.7 Inflation of Westbay System Packers

The Westbay System packers were inflated sequentially beginning at the bottom of the well using fluorescein-traced drill water provided by Golder.

The packer inflation was coordinated with removal of the temporary guide tube as shown in Table 4.

Table 4: Summary of Packer Inflation Steps

Step No.	Date (2021)	Guide Tube Depth (m)	Number of Packers Inflated
1	Nov. 8	840.42	5
2	Nov. 9	720.42	3
3	Nov. 10	579.42	4
4	Nov. 10-11	300.42	6
5	Nov. 13	171.42	3
6	Nov. 13-14	All retrieved	4

The guide tube was initially positioned to at a depth of 840.42 meters below ground level, allowing the lower five packers to be exposed in the open borehole. Two 2-ft tubing and two 1-ft tubing (component number 368, 369, 370 and 371) were added temporarily to gain an access to the Westbay completion. These four components were removed after the packer inflation.

The Westbay Model No. 6055 vented inflation tool was used for packer inflation. All the packers appear to have inflated properly. The data for inflation of each packer are provided on the Westbay Packer Inflation Records included in Appendix G.

3.8 De-Stressing of Westbay System

Westbay's procedure for de-stressing the Westbay tubing was used to reduce the long-term load on the upper components. In this procedure the initial hanging weight of the Westbay string is applied in increments to selected packers after they have been inflated. In this process the top of the Westbay completion is lowered, and the positions of the shallower ports and packers are affected. Thus, after all packers have been inflated, the weight of the Westbay completion is distributed among the packers. The final clamp-off weight is supported at the well top. The depths of ports and packers are adjusted to account for the cumulative effect of the lowering. A summary of the de-stressing results is provided in Table 5. The final positions of the Westbay casing components (ports and packers) are shown on the Summary Completion Log (Appendix C) and Tables 6 and 7 (Appendix H). All positions (depths) are measured in distance along the borehole from ground level and are not corrected for borehole angle.

Table 5: Summary of De-Stressing Results

Well Name	Weight after inflating 5 packers (lb)	Final Clamp-off Weight	Total Vertical Movement at surface (m)	Beginning stick-up (m)	End stick-up (m)
IG_BH05	700	100	0.72	2.85	2.13

*Measurements of distance and weight taken from the temporary stick-up above datum before wellhead completion was built. The weight scale output is in pounds (lb).

4. Formation Pressure Measurements

On November 14, 2021, after the completion of packer inflation, formation pressures were measured at each of the 25 measurement ports. At that time, the formation pressures may not have recovered from the pre-installation activities. Effects on formation pressures are more likely to occur in monitoring zones located in low-permeability geological formations, and longer-term monitoring may be required to establish representative fluid pressures.

A plot of the post-inflation piezometric pressure and groundwater levels is provided in Figure 4. Note that the plot includes a reference to 'equivalent depth to water' which is the calculated piezometric level as defined on the Westbay Piezometric Pressures/Levels Field Data and Calculation Sheet completed for each pressure profile. The port depths used in these calculations are not corrected for borehole angle. The field data calculation sheets for the post-inflation pressure profile are provided in Appendix I.

The post-inflation data were examined to confirm proper operation of the measurement ports and to confirm the proper operation of packer seals between monitoring zones.

Future pressure profile measurements: It should be noted that for QA purposes, the post-inflation formation pressure measurements used the same port depths as the pre-inflation pressure measurements. These do not include adjustments for the effect of the de-stressing procedure whereby the as-built depths of shallower ports are slightly deeper than the pre-inflation depths. Future pressure profile measurements and calculations should use the adjusted port depths documented in Tables 6 and 7 in Appendix H.

In conclusion, the subject Westbay System completion was installed successfully as documented in this report.

Figure 1:

MOSDAX Transducer Position

In a Westbay MP38 System Measurement Port Coupling P/N 0205

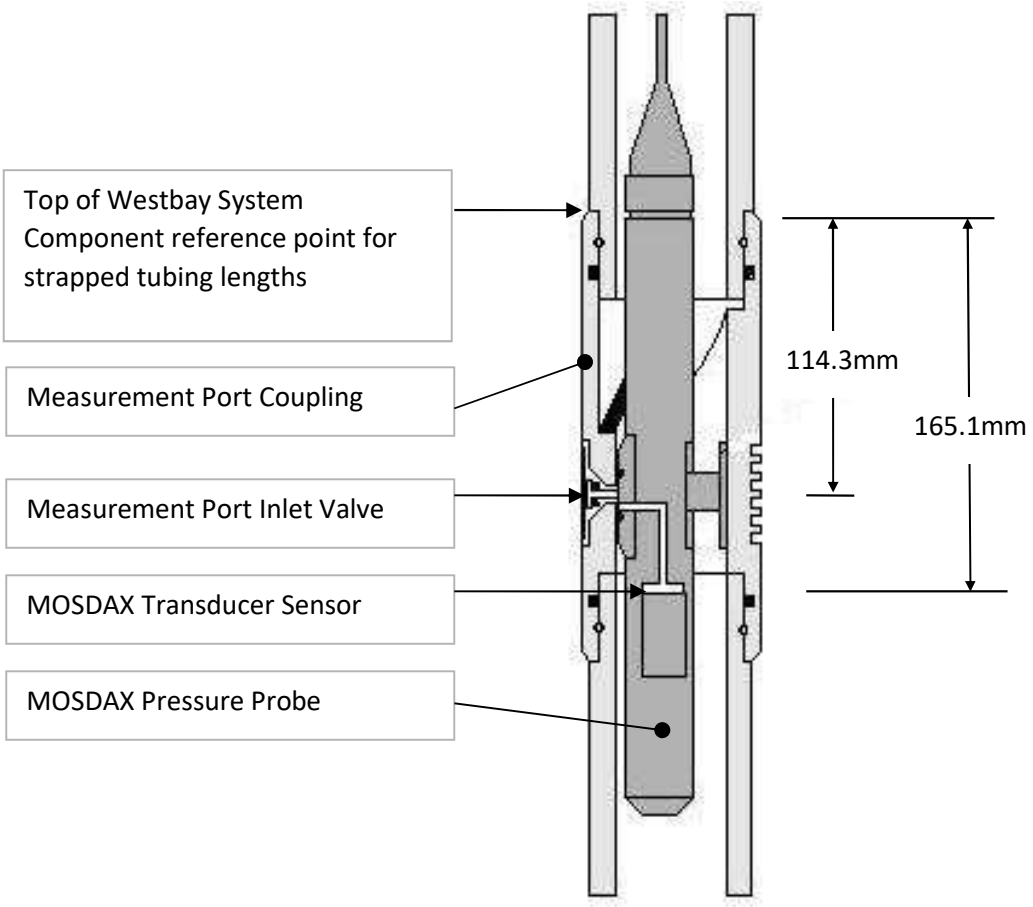
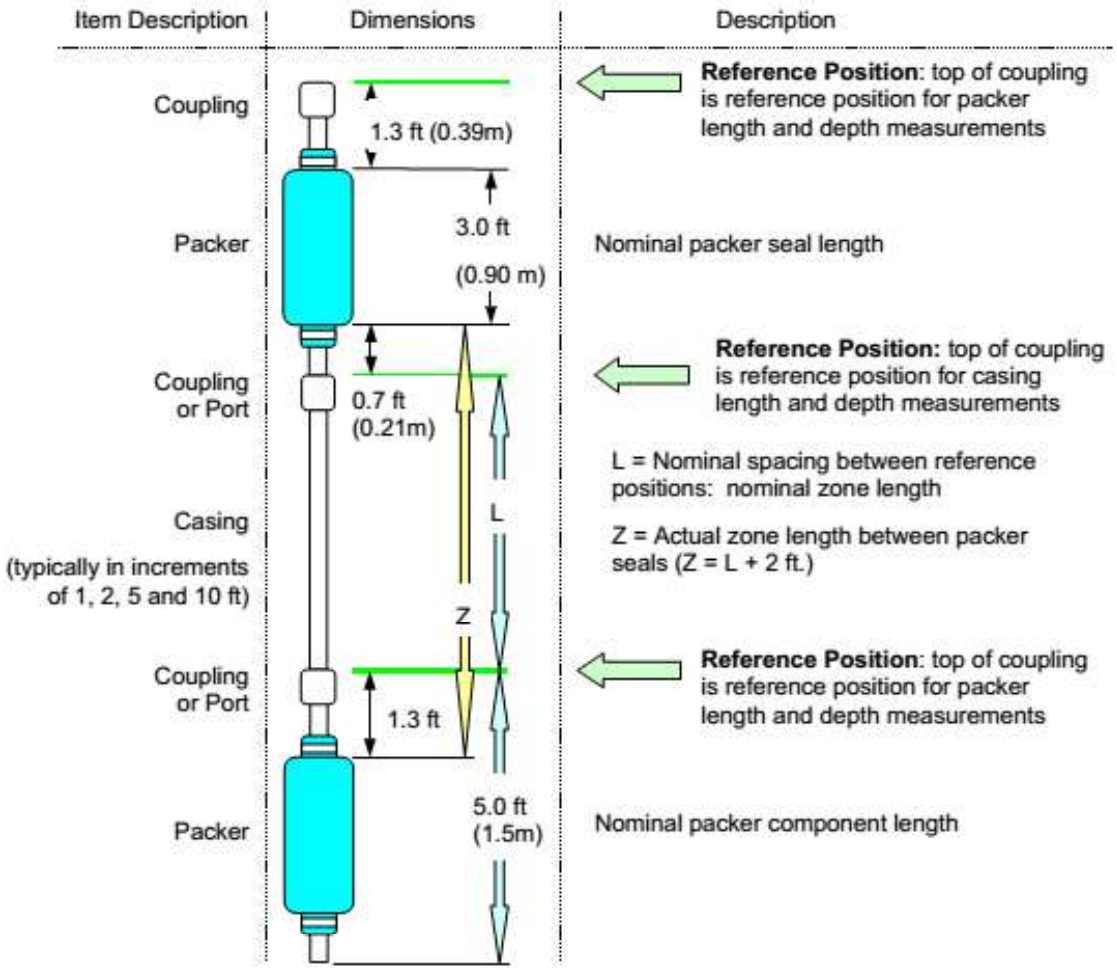


Figure 2:

Dimensions of Packer Seals and Monitoring Zones Westbay MP38 System 0238 Packers

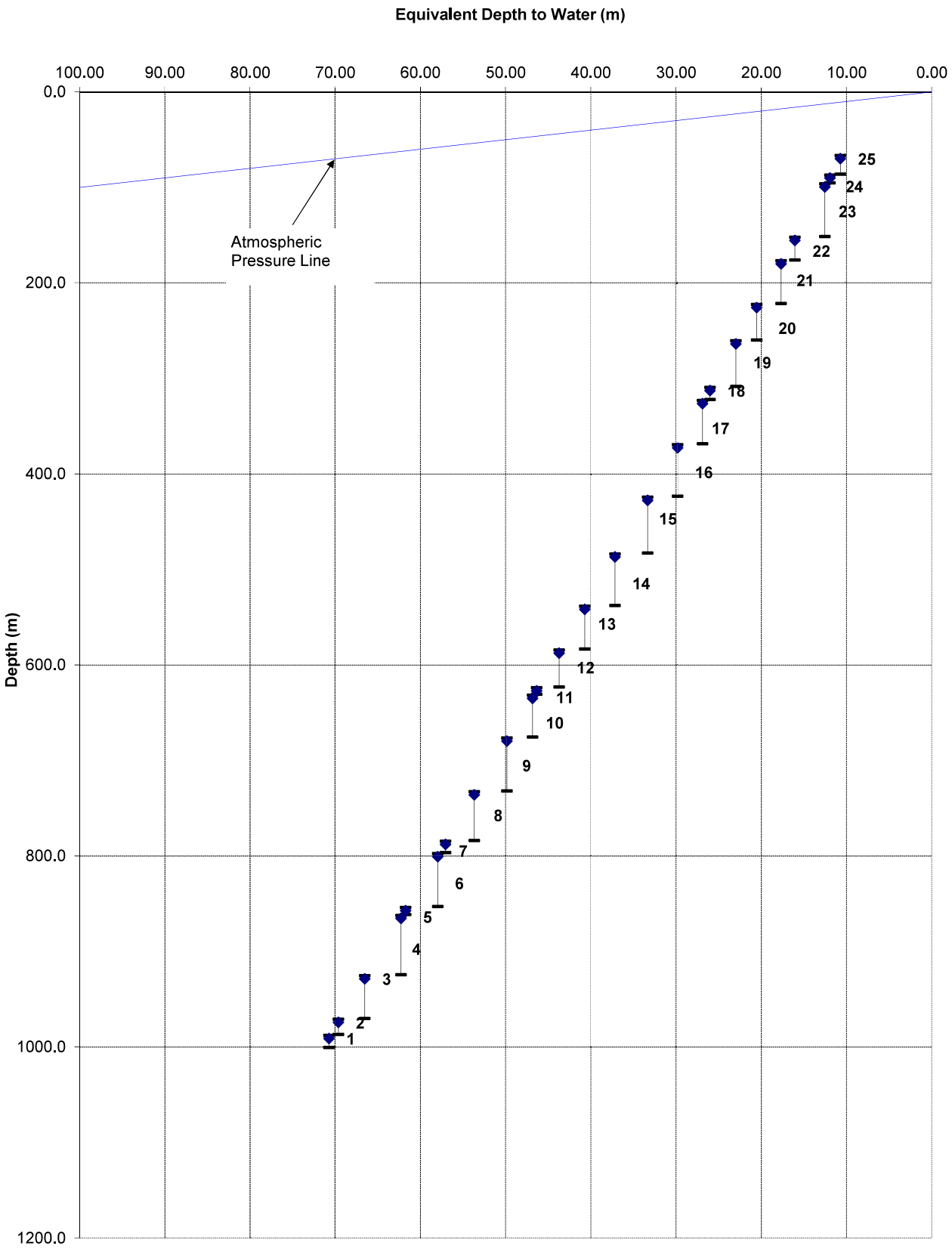


Discussion Points:

- The top of a coupling (Regular Coupling, Measurement Port or Pumping Port) is the reference point for describing nominal depths and nominal lengths. Actual positions of packer seals and zone lengths are determined with respect to the appropriate reference positions.
- Packer Position Example: A packer with a nominal depth of 50 ft (15.2m), will have a nominal packer seal position of 51.3 to 54.3 ft. (15.59 to 16.49m)
- Zone Length Example: A zone whose upper packer is at 50 ft (15.2m) and bottom packer is at 70 ft (21.3m) will have a nominal zone length of 15 ft (4.6m) and an actual zone length (between packer seals) of 15.0+1.3+0.7 = 17.0ft. (4.6 + 0.39 + 0.2 = 5.19m)
- Information on the position of Measurement Port Valve and MOSDAX Transducer sensor, used for detailed calculation of piezometric level measurements, are described separately.

Piezometric Profile:
Monitoring Well:IG_BH05

Profile Date:November 7, 2021
Comments:Pre-Inflation Profile



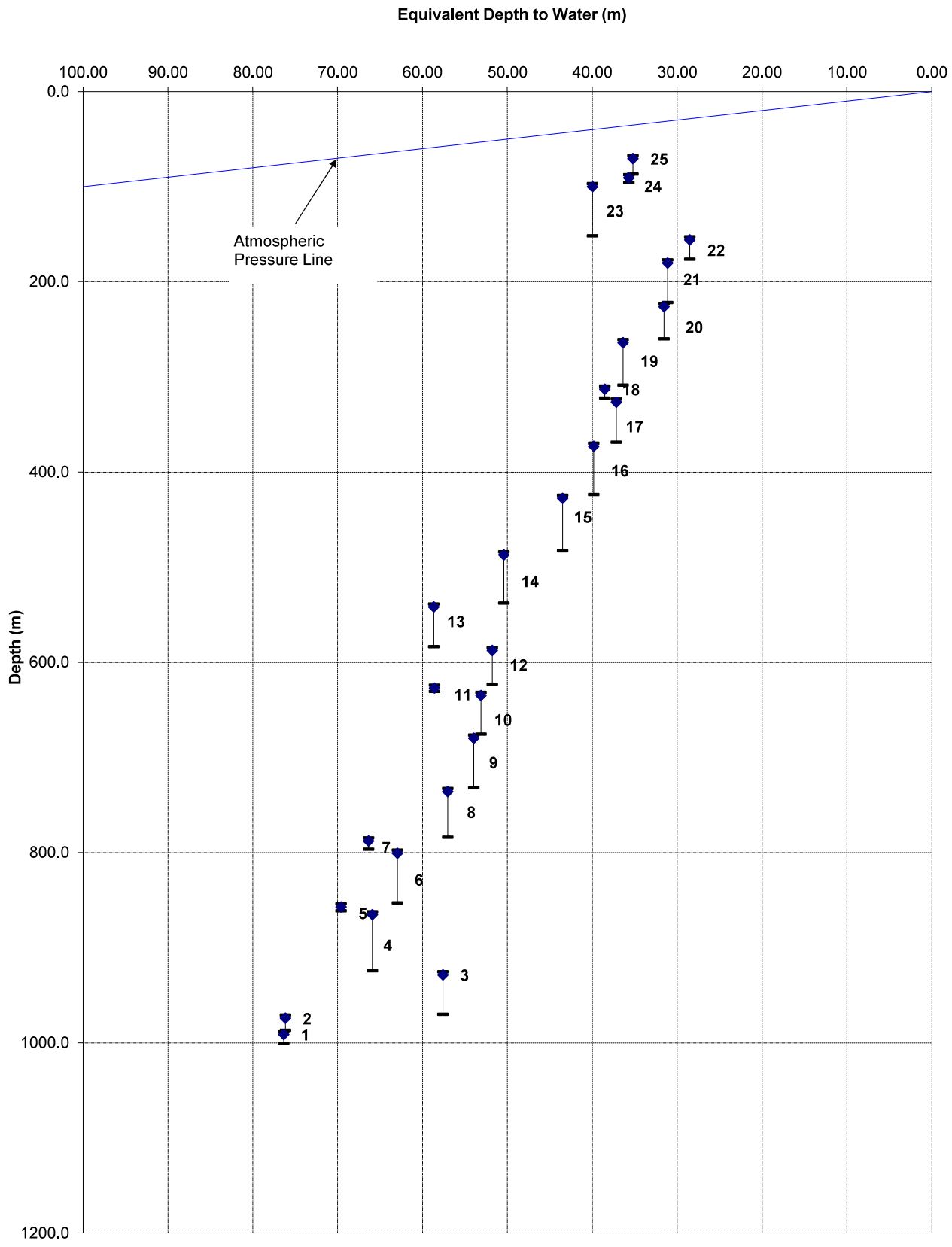
Client:Golder/NWMO
Site:Ignace, ON
Datum:Ground Level

Figure 3

Plote By: TK Date: Dec. 3/21
Checked By: DL Date: Dec 3/21
Westbay Project: WB 981

Piezometric Profile:
Monitoring Well:IG_BH05

Profile Date:November 14, 2021
Comments:Post-Inflation Profile



Client:Golder/NWMO
Site:Ignace, ON
Datum:Ground Level

Figure 4

Plote By: TK Date: Dec. 3/21
Checked By: DL Date: Dec 3/21
Westbay Project: WB 981

APPENDIX A
IG-BH05

WESTBAY FIELD QA SUMMARY FORM

Westbay Field QA Summary Form - 1 page

QA/QC Summary of Westbay System MP38 Installation

Client: Golder / NWMO Project: WB 981

Well: IG-BH05

			Check ✔	Initials	Date
1	**Client Data and Approvals**				
	1.1	Client design request and Borehole/Well information	✓	TK	Oct 14, 25/21
	1.2	Client approved final design (file name: IG-BH05)	✓	TK	Oct 25/21
	1.3	Client decision on filter sleeves for Measurement Ports	✓	TK	Nov3/21
	1.4	Client approval to install, including well and borehole conditions	✓	TK	Nov3/21
Comments					
	Hold Point – Design and well information are complete				
2	**Layout of Completion Components**				
	2.1	Installation Log and Confirmation Log printed from approved design (file name: IG-BH05)	✓	TK./ML.	Nov1/21.
	2.2	Components taken from inventory	✓	TK/ML.	Nov3/21
	2.3	Layout completed according to log, plus copy S/N and packer data)	✓	TK/ML/MB	Nov4/21
	2.3	Independent confirmation of layout (use Confirmation Log)	✓	TK/ML/MB	Nov1, 4, 5/21
	2.4	Independent check on laid out length vs design length	✓	TK/ML	Nov1/21
Comments					
	Hold Point – Layout is good to install				
3	**Lowering of Completion String**				
	3.1	Independent staff for layout rack and installation check list	✓	TK/ML/MB	Nov1.4.5/21
	3.2	Components individually verified with approved log (with call-back repeat)	✓	TK/ML/MB	"
	3.3	Pressure test tool and apparatus verified	✓	TK/ML	Nov3-6/21
	3.4	Components pass pressure test	✓	TK/ML	Nov3-6/21
	3.5	Tensile loads managed within system limits	✓	TK/ML	Nov3-6/21
	3.6	Depth to water in Westbay tube checked and adjusted	✓	TK/ML	Nov3-6/21
	3.7	Hydraulic integrity test is passed	✓	TK/ML	Nov3-6/21
	3.8	Pre-Inflation profile is completed, analyzed and accepted	✓	TK/ML	Nov7/21
	3.9	Top of Westbay tubing is positioned according to the approved log	✓	TK/ML	Nov7/21
Comments					
	Hold Point – Completion is good to inflate packers				
4	**Packer Inflation**				
	4.1	Inflation tool and apparatus verified	✓	ML/TK	Nov8-14/21
	4.2	Inflation data recorded on forms at time of inflation	✓	ML/TK.	Nov8-14/21
	4.3	Inflation V and P consistent with BH diameter and packer model	✓	ML/TK	Nov8-14/21
	4.4	De-stressing procedure followed (if required)	✓	ML/TK	Nov8-14/21
	4.5	All packers inflated normally	✓	ML/TK.	Nov8-14/21
	4.6	Post inflation profile completed, analyzed and accepted	✓	ML/TK.	Nov14/21
Comments					
	Hold Point – Packer inflation is complete				
5	**Documentation**				
	5.1	Wellhead completion sketch completed	✓	ML/TK	Nov14/21
	5.2	Draft completion Log and pressure profile data given to client	N/A	N/A	N/A
	5.3	Completion Report data appendix is complete	✓	TK/ML	Dec3/21
	Installation and Documents Complete				

Signature: _____ **Date:** Dec 3/21

APPENDIX B

IG-BH05

WESTBAY COMPLETION LOG (FIELD COPY)

Westbay Completion Log (field copy) - 22 pages

Westbay Completion Log

Company: Golder/NWMO
Well: IG_BH 05
Site: Ignace,ON
Project: Groundwater Characterization Study

Job No: WB981
Author: TK/DL

Well Information

Reference Datum:
Elevation of Datum: 0.00 m.
MP Casing Top: 0.00 m.
MP Casing Length: 994.45 m.

Borehole Depth: 1001.00 m. 1000.6 m
Borehole Inclination: 70 degrees
Borehole Diameter: 98.00 mm

Well Description:
Plastic MP38 System
Other References:
Revision after Oct 14,2021 meeting
Approval on R3 via e-mail on Oct 25

File Information

File Name: IG_BH05.WWD
Report Date: Mon Oct 25 15:39:05 2021

File Date: Oct 25 15:13:26 2021

Comments

Zero reference is 0.81 m below top of PQ - MB
Filter socks to be used on Measurement Ports - MB
Borehole water level - 22.27 m MB
Guide tube at 841 m - MB

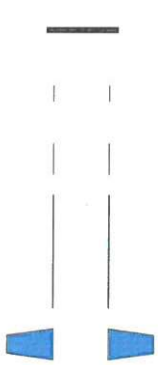
Log Information

Borehole condition confirmed.	(method) Rods	Date: Nov 1/21
MP well design & preparation.	By: TK	Date: Oct 25/21
MP well design checked.	By: TK / MB	Date: Nov 3/21
MP well and borehole approved to install.	By: MB	Date: Nov 3/21

Legend

(Qty) MP Components

(Library - WD Library 04/29/15)



(1) 0203 - MP38 End Cap

(11) 020102 - MP38 Casing 3 (2F/0.6M)

(34) 020105 - MP38 Casing 2 (5F/1.5M)

(295) 020110 - MP38 Casing 1 (10F/3M)

(25) 0238 - MP38 Packer - 74mm (5F/1.5M)

(1) 020305 - Tapered End Plug

(335) 0202 - MP38 Regular Coupling

(25) 0205 - MP38 Measurement Port

(6) 0206 - MP38 Hydraulic Pumping Port

(26) 0216 - Magnetic Location Collar

(55) 0250002C2 - Abrasion Protector

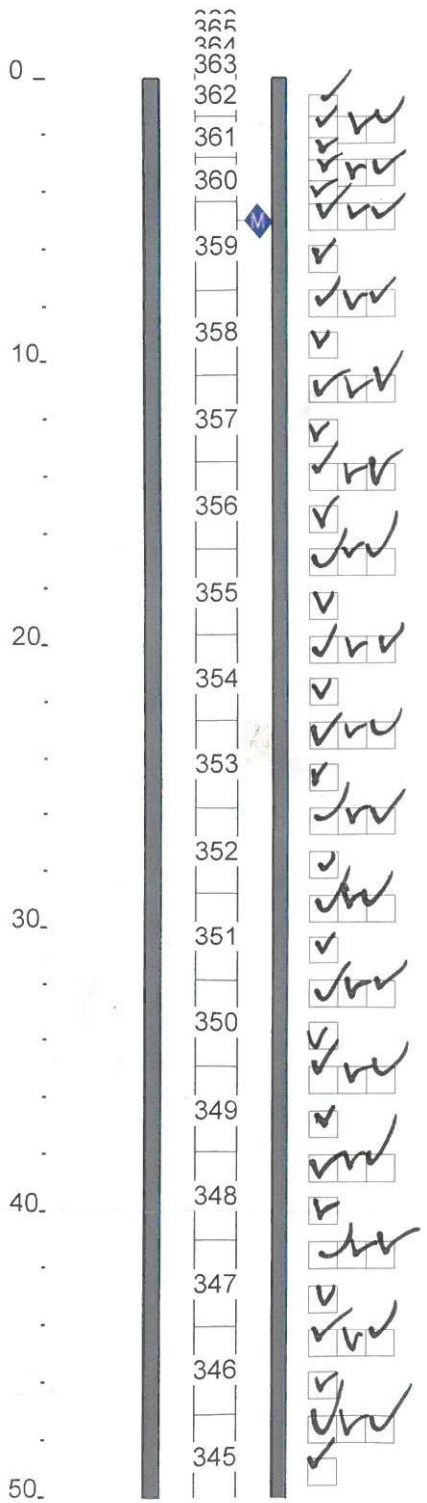
Geology

Backfill/Casing

Mild Steel

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



Serial Numbers

#362 in hole.
Pressure landing 5:10pm Nov 6/24

#358 top coupling o-ring replaced.

Hydraulic Integrity test.
(top of #362 component)

5:13 pm	124.522 m
5:15 pm	124.517 m
5:20 pm	124.505 m
5:35 pm	124.502 m
5:45 pm	124.501 m
5:55 pm	124.501 m
6:05 pm	124.501 m

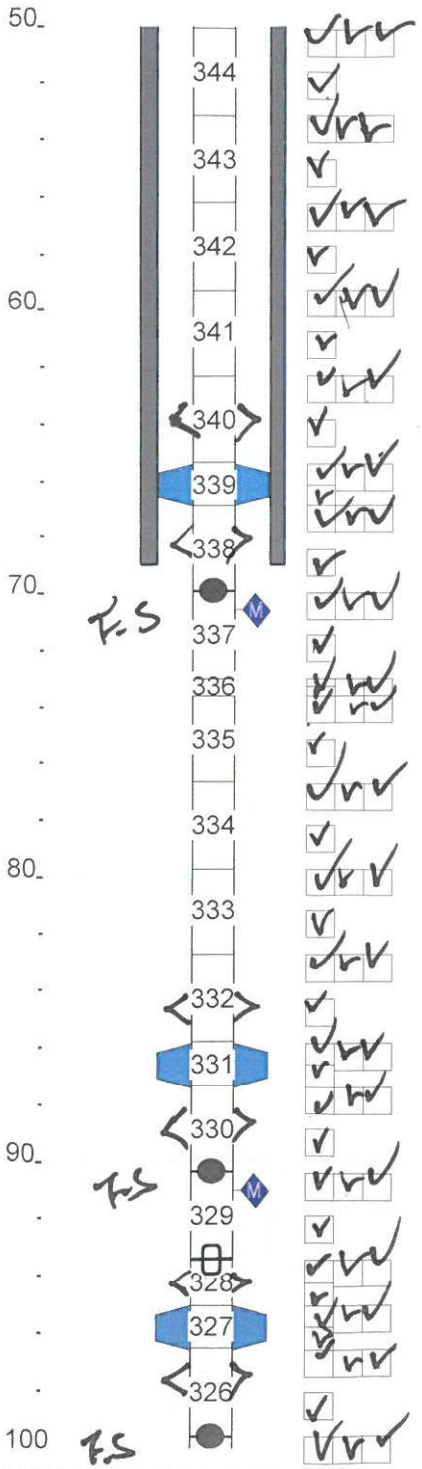
Nov 6, 2024 TK/ML

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Mon Oct 25 15:53:29 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



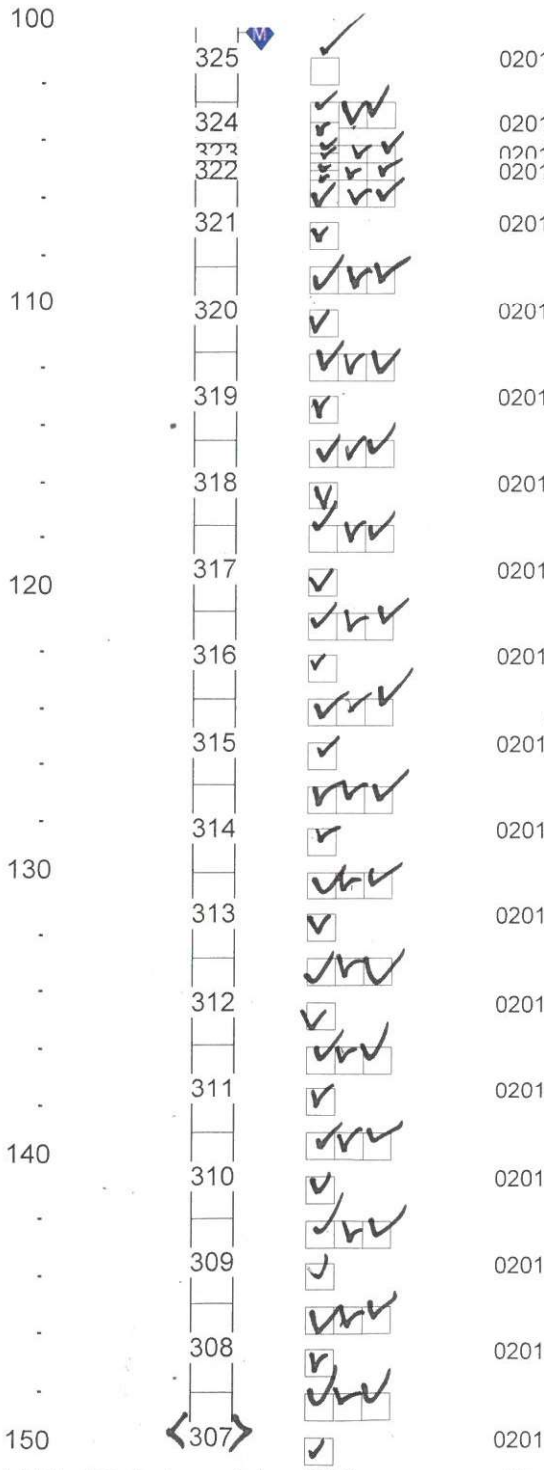
WB Tubing Description	Serial Numbers
020110 - MP38 Casing 1 (10F/3M)	
020110 - MP38 Casing 1 (10F/3M)	
020110 - MP38 Casing 1 (10F/3M)	
020110 - MP38 Casing 1 (10F/3M)	
020110 - MP38 Casing 1 (10F/3M)	
0238 - MP38 Packer - 74mm (5F/1.5M)	P = 19757
020110 - MP38 Casing 1 (10F/3M)	MP = 9505
0205 - MP38 Measurement Port	
020110 - MP38 Casing 1 (10F/3M)	
020102 - MP38 Casing 3 (2F/0.6M)	DTW in WB ~106m
020110 - MP38 Casing 1 (10F/3M)	add water ~60 l
020110 - MP38 Casing 1 (10F/3M)	
020110 - MP38 Casing 1 (10F/3M)	
020110 - MP38 Casing 1 (10F/3M)	
0238 - MP38 Packer - 74mm (5F/1.5M)	P = 19742
020110 - MP38 Casing 1 (10F/3M)	
0205 - MP38 Measurement Port	MP = 9504
020110 - MP38 Casing 1 (10F/3M)	
0206 - MP38 Hydraulic Pumping Port 020105 - MP38 Casing 2 (5F/1.5M)	PP = 4775
0238 - MP38 Packer - 74mm (5F/1.5M)	P = 19744
020110 - MP38 Casing 1 (10F/3M)	
0205 - MP38 Measurement Port	MP = 9506

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Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



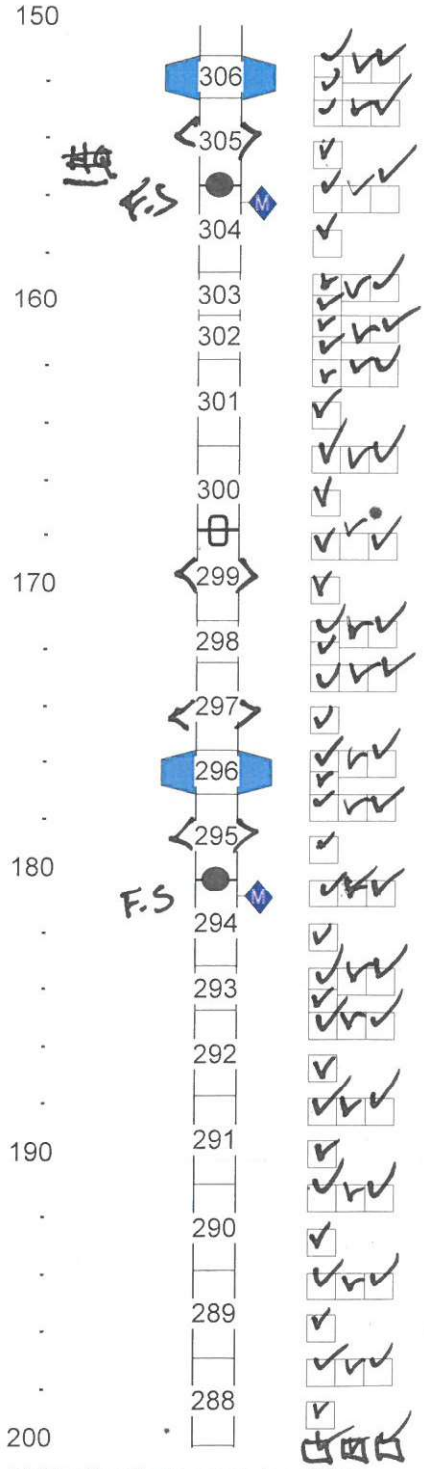
Add under ~90l

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Mon Oct 25 15:53:30 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05

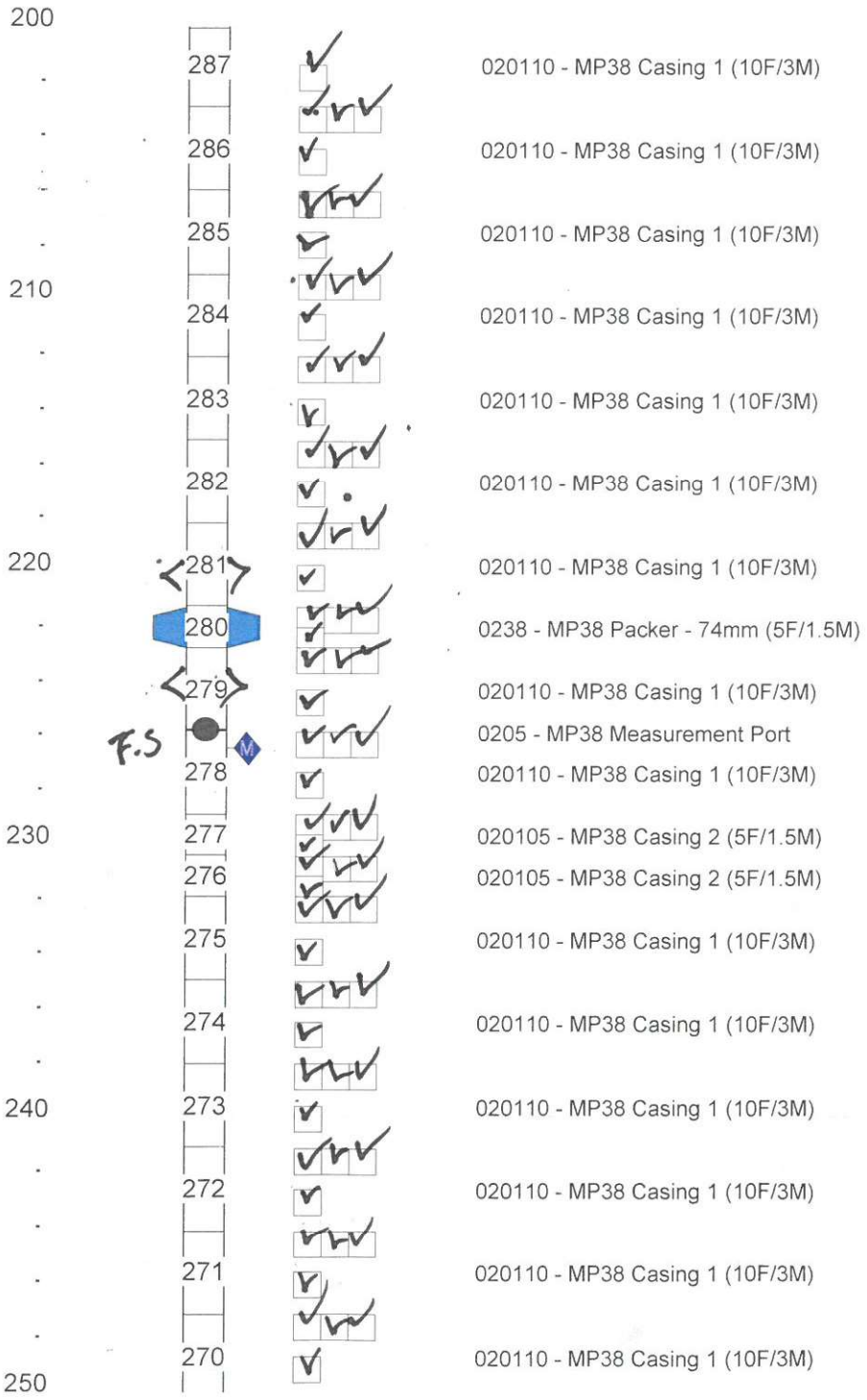


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Mon Oct 25 15:53:30 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05

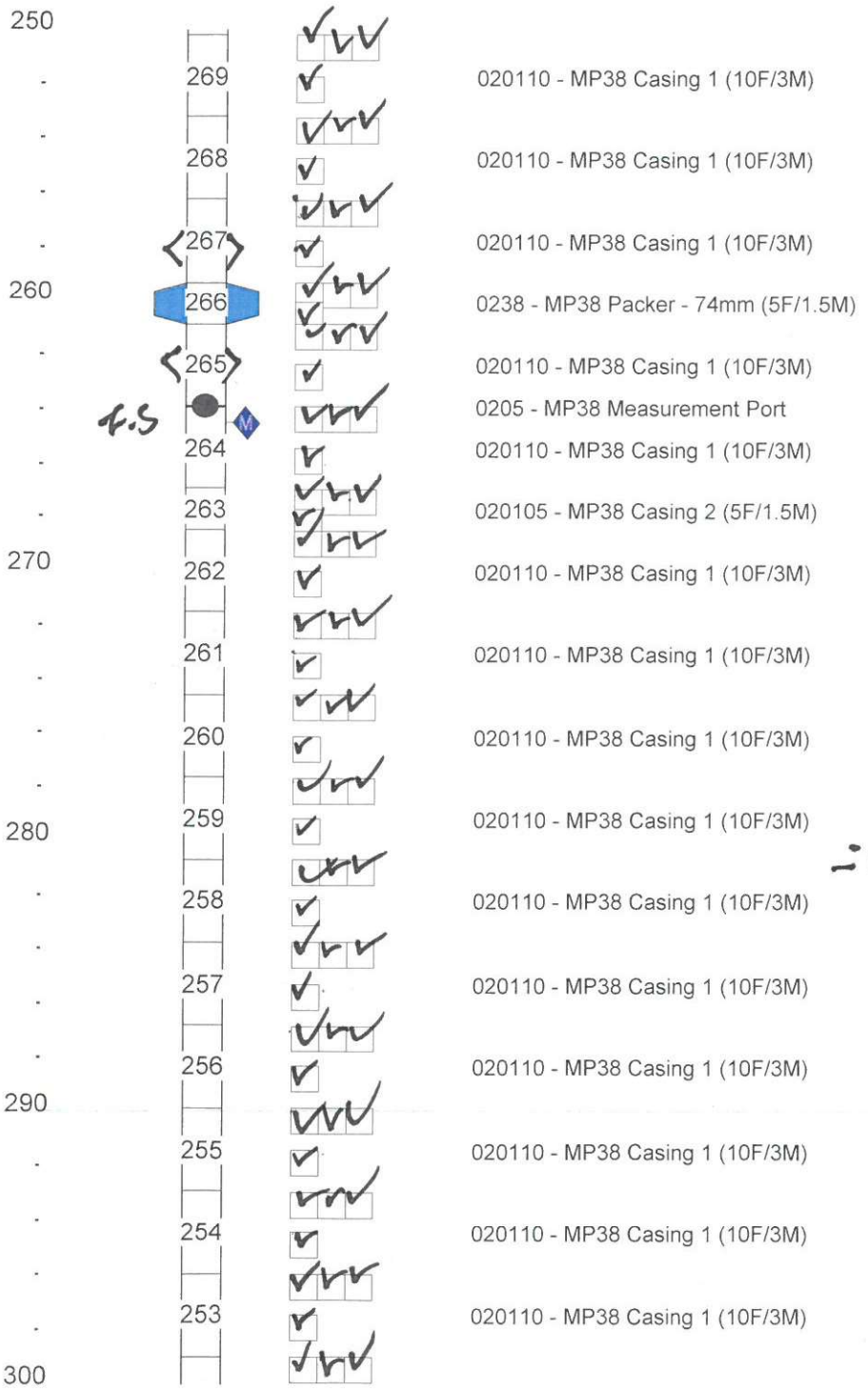


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Mon Oct 25 15:53:31 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



P= 19736

HP= 9510

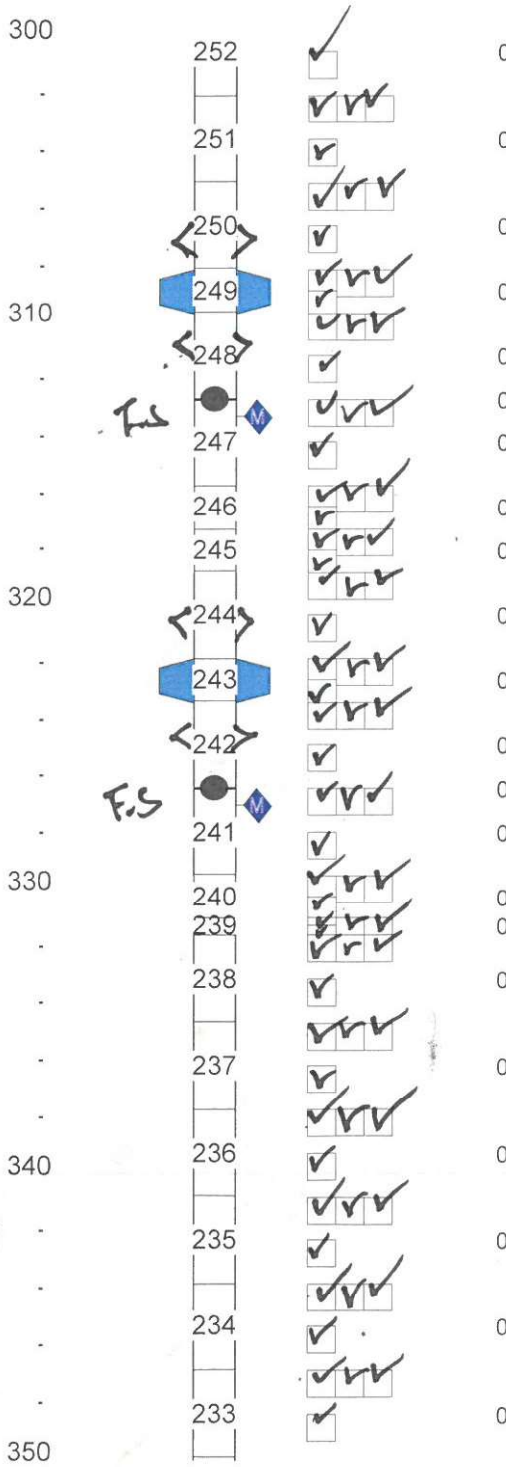
∴ Add water ~ 90 L.

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Mon Oct 25 15:54:18 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



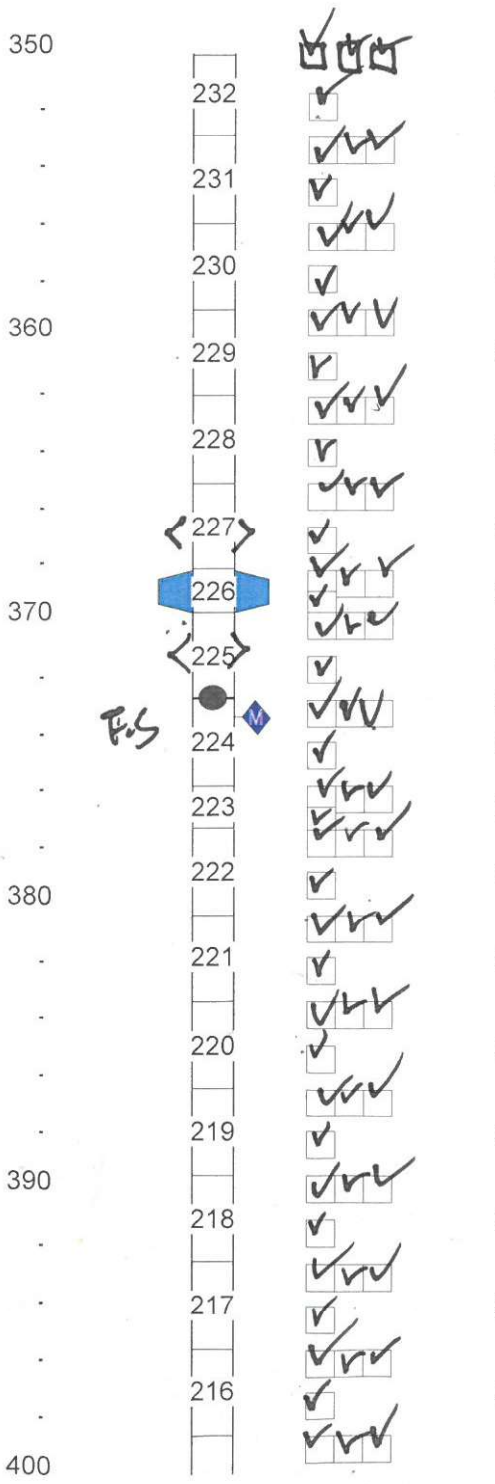
WB Tubing	WB Tubing Description	Serial Numbers
252	020110 - MP38 Casing 1 (10F/3M)	
251	020110 - MP38 Casing 1 (10F/3M)	
250	020110 - MP38 Casing 1 (10F/3M)	
249	0238 - MP38 Packer - 74mm (5F/1.5M)	P = 19741
248	020110 - MP38 Casing 1 (10F/3M)	MP= 9508
F.S	0205 - MP38 Measurement Port	
247	020110 - MP38 Casing 1 (10F/3M)	
246	020105 - MP38 Casing 2 (5F/1.5M)	
245	020105 - MP38 Casing 2 (5F/1.5M)	
244	020110 - MP38 Casing 1 (10F/3M)	
243	0238 - MP38 Packer - 74mm (5F/1.5M)	P= 19745
242	020110 - MP38 Casing 1 (10F/3M)	
F.S	0205 - MP38 Measurement Port	MP= 9513
241	020110 - MP38 Casing 1 (10F/3M)	
240	020105 - MP38 Casing 2 (5F/1.5M)	
239	020102 - MP38 Casing 3 (2F/0.6M)	
238	020110 - MP38 Casing 1 (10F/3M)	
237	020110 - MP38 Casing 1 (10F/3M)	
236	020110 - MP38 Casing 1 (10F/3M)	
235	020110 - MP38 Casing 1 (10F/3M)	
234	020110 - MP38 Casing 1 (10F/3M)	# 233 = Nov 6/21 Issue lowering with a rig 8:00am add ~80 L of water DTW in WB ~60m
233	020110 - MP38 Casing 1 (10F/3M)	

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Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



Serial Numbers

add ~30 L.
#232 in the hole
- stopped for rig. lowering & rig repair.
The 1:50 pm Nov 5/21

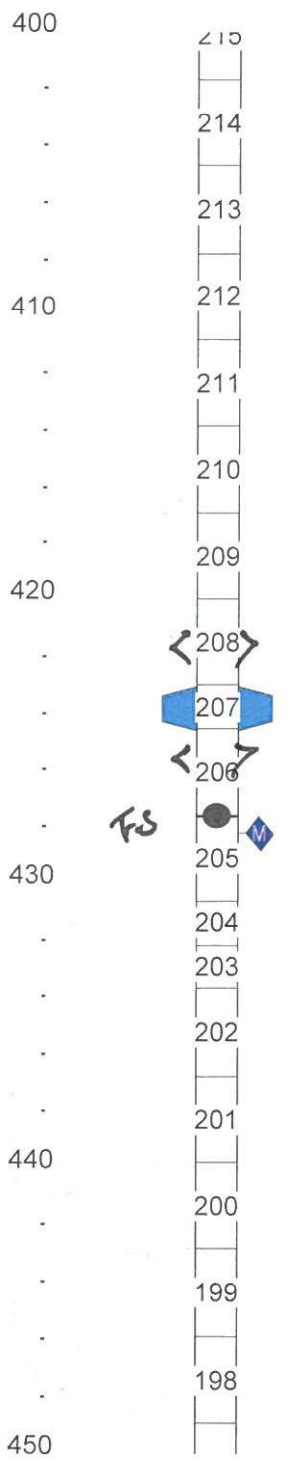
P= 19738

MP= 9511

Add water ~30 L

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



WB Tubing Description

Serial Numbers

020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
0238 - MP38 Packer - 74mm (5F/1.5M) P= 197143
020110 - MP38 Casing 1 (10F/3M)
0205 - MP38 Measurement Port MP= 9509
020110 - MP38 Casing 1 (10F/3M)
020105 - MP38 Casing 2 (5F/1.5M)
020105 - MP38 Casing 2 (5F/1.5M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)
020110 - MP38 Casing 1 (10F/3M)

Add water ~30L.

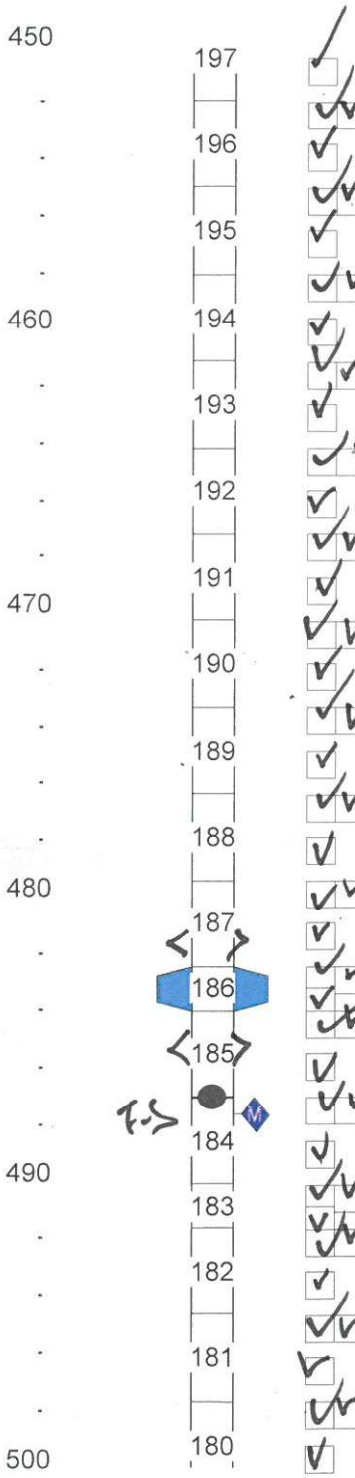
#202 = Bottom O-ring had a PVC shaving: Retested: OK

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Mon Oct 25 15:54:19 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



WB Tubing	WB Tubing Description	Serial Numbers
197	020110 - MP38 Casing 1 (10F/3M)	
196	020110 - MP38 Casing 1 (10F/3M)	
195	020110 - MP38 Casing 1 (10F/3M)	
194	020110 - MP38 Casing 1 (10F/3M)	
193	020110 - MP38 Casing 1 (10F/3M)	
192	020110 - MP38 Casing 1 (10F/3M)	
191	020110 - MP38 Casing 1 (10F/3M)	
190	020110 - MP38 Casing 1 (10F/3M)	
189	020110 - MP38 Casing 1 (10F/3M)	
188	020110 - MP38 Casing 1 (10F/3M)	
187	020110 - MP38 Casing 1 (10F/3M)	
186	0238 - MP38 Packer - 74mm (5F/1.5M)	$= 19746
185	020110 - MP38 Casing 1 (10F/3M)	MP = 9507
	0205 - MP38 Measurement Port	
184	020110 - MP38 Casing 1 (10F/3M)	
183	020105 - MP38 Casing 2 (5F/1.5M)	Add ~30 l water
182	020110 - MP38 Casing 1 (10F/3M)	
181	020110 - MP38 Casing 1 (10F/3M)	
180	020110 - MP38 Casing 1 (10F/3M)	

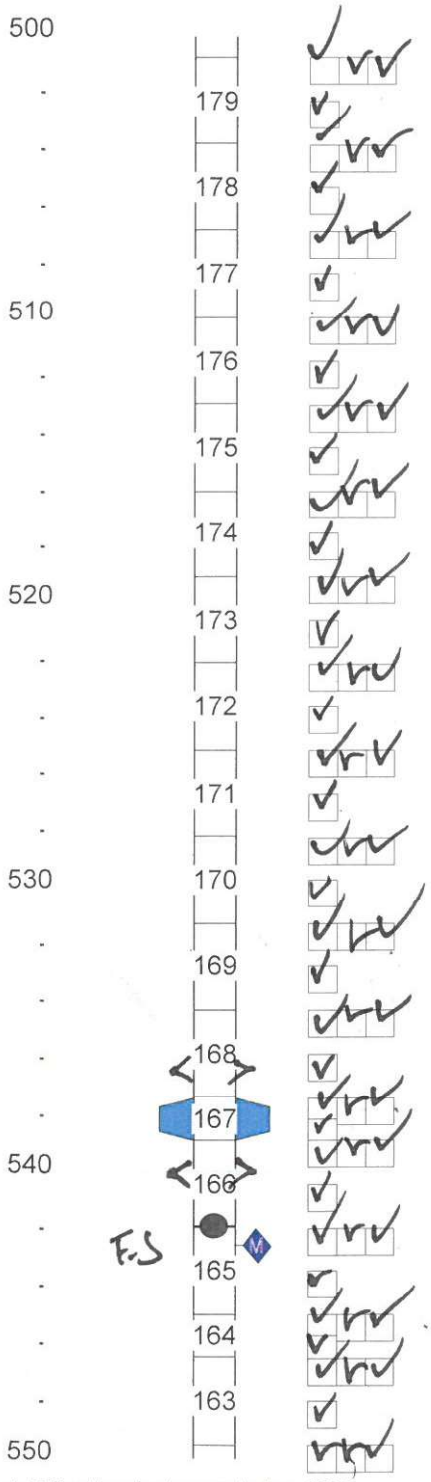
* check DTW in WB 10:45 am ~126m
* add water ~30 l

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Mon Oct 25 15:54:19 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05

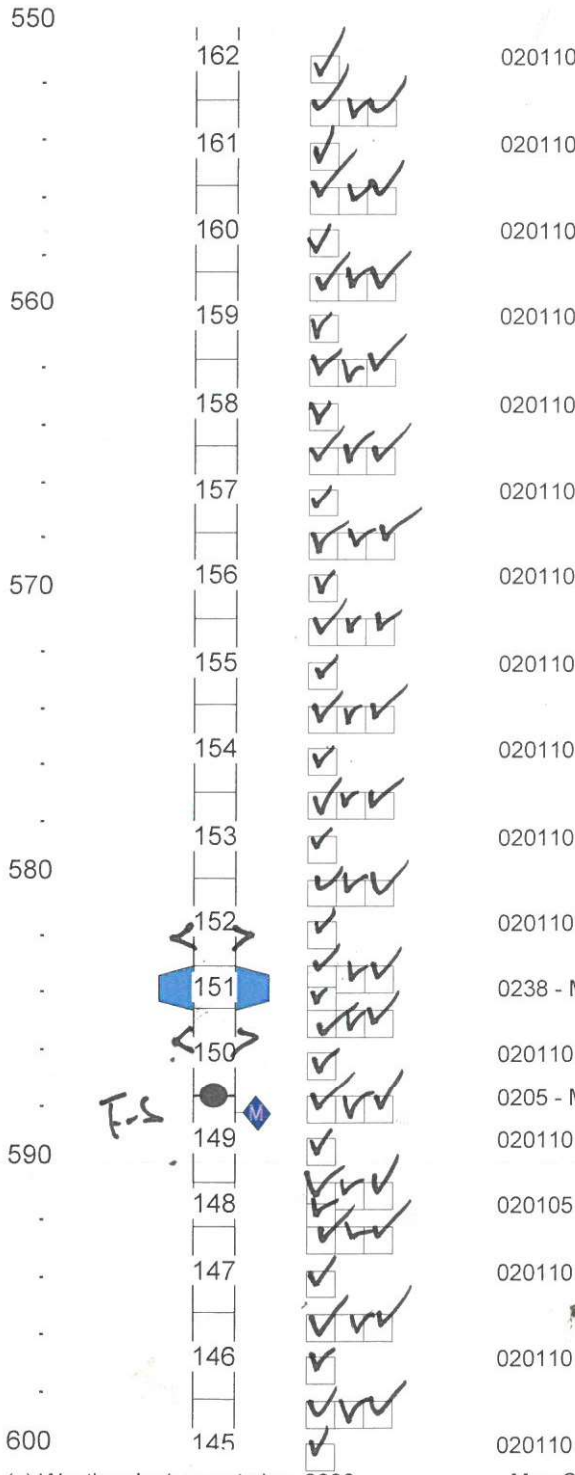


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Mon Oct 25 15:55:26 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



Add water ~ 30 l

Nov 5/21 8am
DTW in WB = ~17.77 m
with #149 in the hole

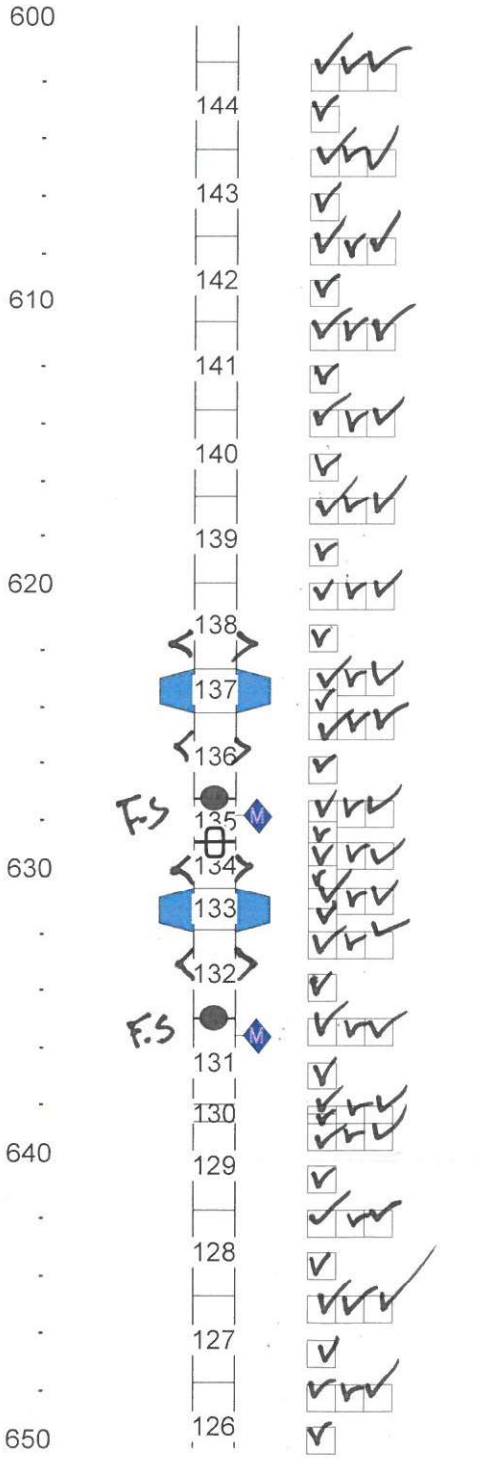
#149 pressure lowering
8:10am Nov 5/21
#148 in the hole.
5:15 pm Nov 4/21
add water ~ 40 l

(c) Westbay Instruments Inc. 2000

Mon Oct 25 15:55:26 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



P = 19749

MP = 9499
PP = 4972

P = 19751

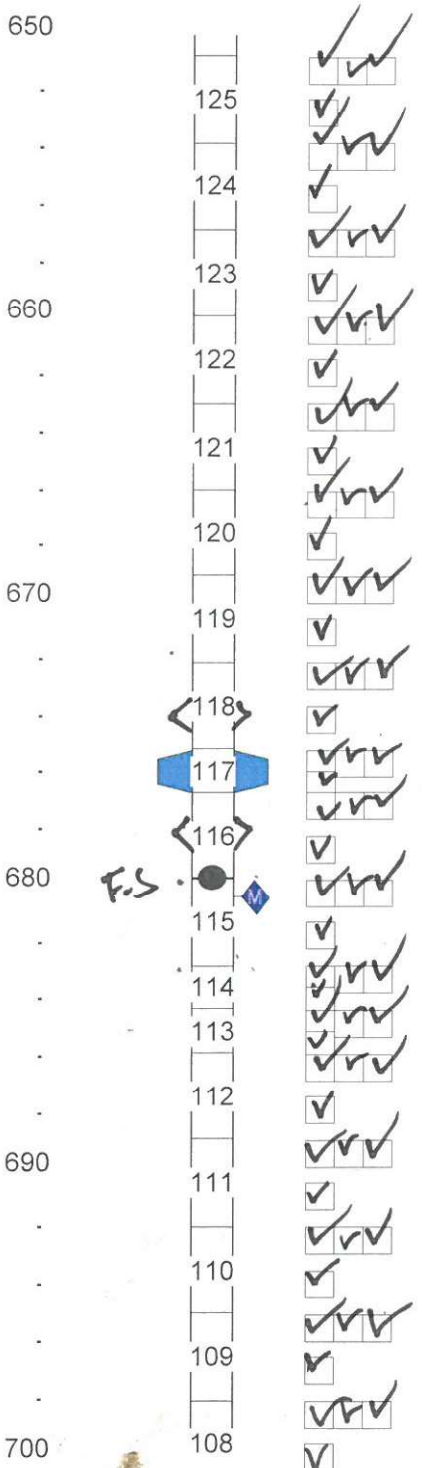
MP = 9513

#132 in the hole
stop for 2nd lay-out
2:00 pm Nov 4/21

* add water ~30 L
* resume lowering #133
at 4:30 pm Nov 4/21

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



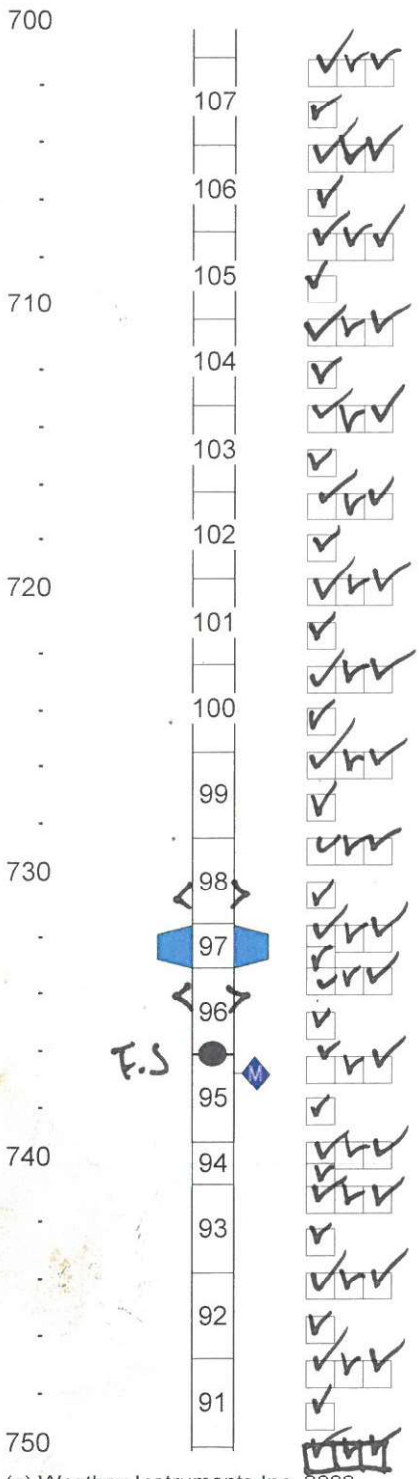
WB Tubing Description	Serial Numbers	
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		Add water ~ 30 L.
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
0238 - MP38 Packer - 74mm (5F/1.5M)	P= 19752	
020110 - MP38 Casing 1 (10F/3M)		
0205 - MP38 Measurement Port	MP= 9519	
020110 - MP38 Casing 1 (10F/3M)		
020105 - MP38 Casing 2 (5F/1.5M)		
020105 - MP38 Casing 2 (5F/1.5M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		
020110 - MP38 Casing 1 (10F/3M)		Add water ~ 30 L

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Mon Oct 25 15:55:26 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



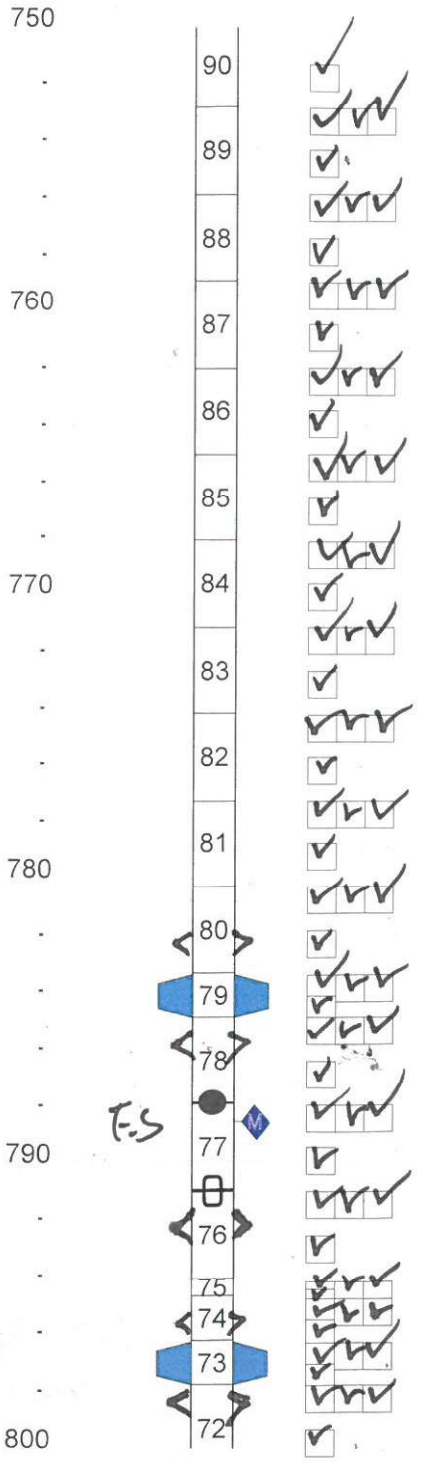
Add ~ 30 l water
P = 190253
MP = 095116

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Mon Oct 25 15:55:26 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



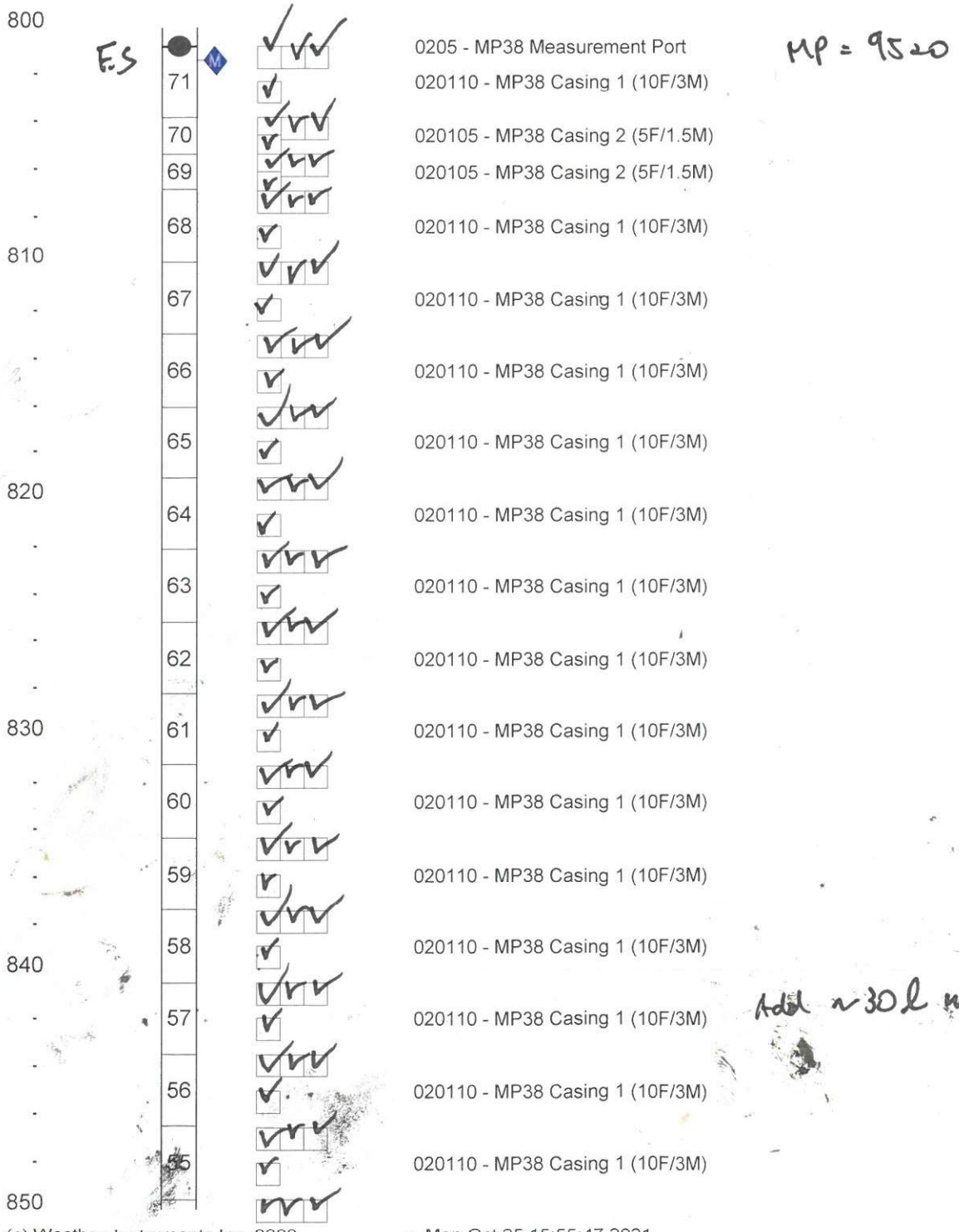
WB Tubing	WB Tubing Description	Serial Numbers
90	020110 - MP38 Casing 1 (10F/3M)	
89	020110 - MP38 Casing 1 (10F/3M)	
88	020110 - MP38 Casing 1 (10F/3M)	
87	020110 - MP38 Casing 1 (10F/3M)	
86	020110 - MP38 Casing 1 (10F/3M)	
85	020110 - MP38 Casing 1 (10F/3M)	~30L water added
84	020110 - MP38 Casing 1 (10F/3M)	
83	020110 - MP38 Casing 1 (10F/3M)	
82	020110 - MP38 Casing 1 (10F/3M)	
81	020110 - MP38 Casing 1 (10F/3M)	
80	020110 - MP38 Casing 1 (10F/3M)	
79	0238 - MP38 Packer - 74mm (5F/1.5M)	P = 19754
78	020110 - MP38 Casing 1 (10F/3M)	MP. 9205
T.S	0205 - MP38 Measurement Port	added water ~30L
77	020110 - MP38 Casing 1 (10F/3M)	
	0206 - MP38 Hydraulic Pumping Port	PP = 4711
76	020110 - MP38 Casing 1 (10F/3M)	
75	020102 - MP38 Casing 3 (2F/0.6M)	
74	020105 - MP38 Casing 2 (5F/1.5M)	
73	0238 - MP38 Packer - 74mm (5F/1.5M)	P = 19755
72	020110 - MP38 Casing 1 (10F/3M)	

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Mon Oct 25 15:55:47 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



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Mon Oct 25 15:55:47 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
850	54	✓	020110 - MP38 Casing 1 (10F/3M)	
	53	✓	0238 - MP38 Packer - 74mm (5F/1.5M)	
	52	✓	020110 - MP38 Casing 1 (10F/3M)	
F.S	51	✓	0205 - MP38 Measurement Port	
		✓	020105 - MP38 Casing 2 (5F/1.5M)	
		✓	020102 - MP38 Casing 3 (2F/0.6M)	#50
860	49	✓	020105 - MP38 Casing 2 (5F/1.5M)	
	48	✓	0238 - MP38 Packer - 74mm (5F/1.5M)	
	47	✓	020110 - MP38 Casing 1 (10F/3M)	
F.S		✓	0205 - MP38 Measurement Port	
	46	✓	020110 - MP38 Casing 1 (10F/3M)	
	45	✓	020102 - MP38 Casing 3 (2F/0.6M)	
870	44	✓	020110 - MP38 Casing 1 (10F/3M)	
	43	✓	020110 - MP38 Casing 1 (10F/3M)	
	42	✓	020110 - MP38 Casing 1 (10F/3M)	
880	41	✓	020110 - MP38 Casing 1 (10F/3M)	
	40	✓	020110 - MP38 Casing 1 (10F/3M)	
	39	✓	020110 - MP38 Casing 1 (10F/3M)	
	38	✓	020110 - MP38 Casing 1 (10F/3M)	
890	37	✓	020110 - MP38 Casing 1 (10F/3M)	
	36	✓	020110 - MP38 Casing 1 (10F/3M)	
	35	✓	020110 - MP38 Casing 1 (10F/3M)	
900				

water from HP. (displacement)
P = 19583
HP = 9501
PP = 4073.

P = 19582

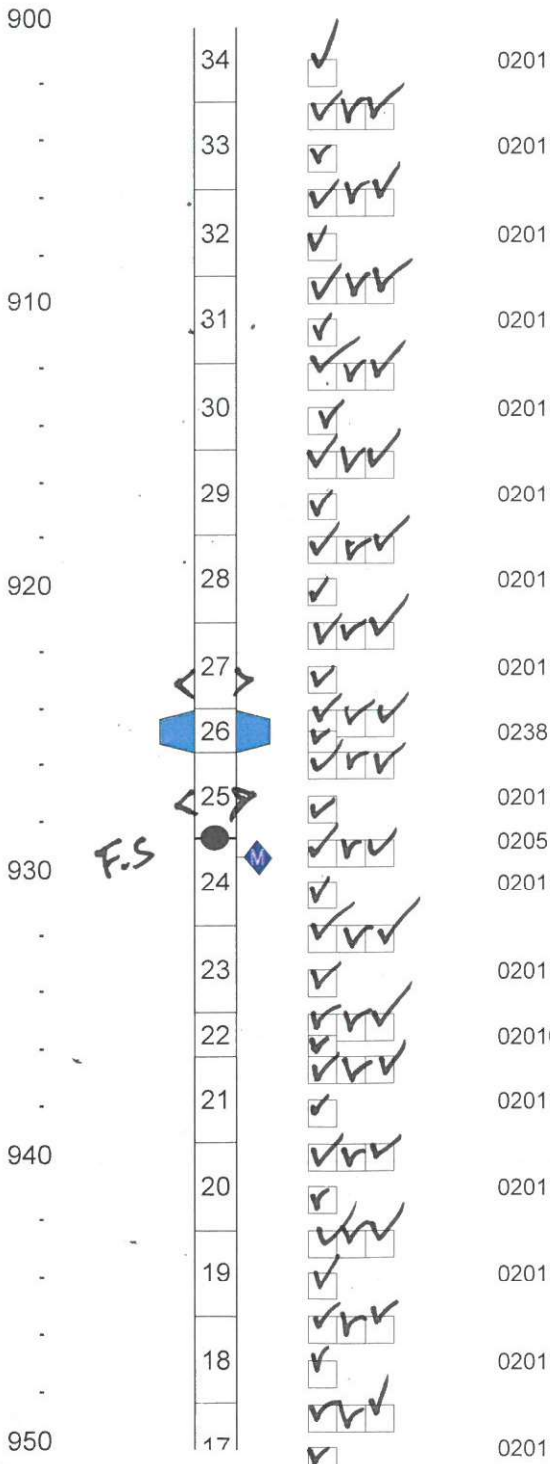
HP = 9271

Add ~45l water.

Add water ~40l

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05

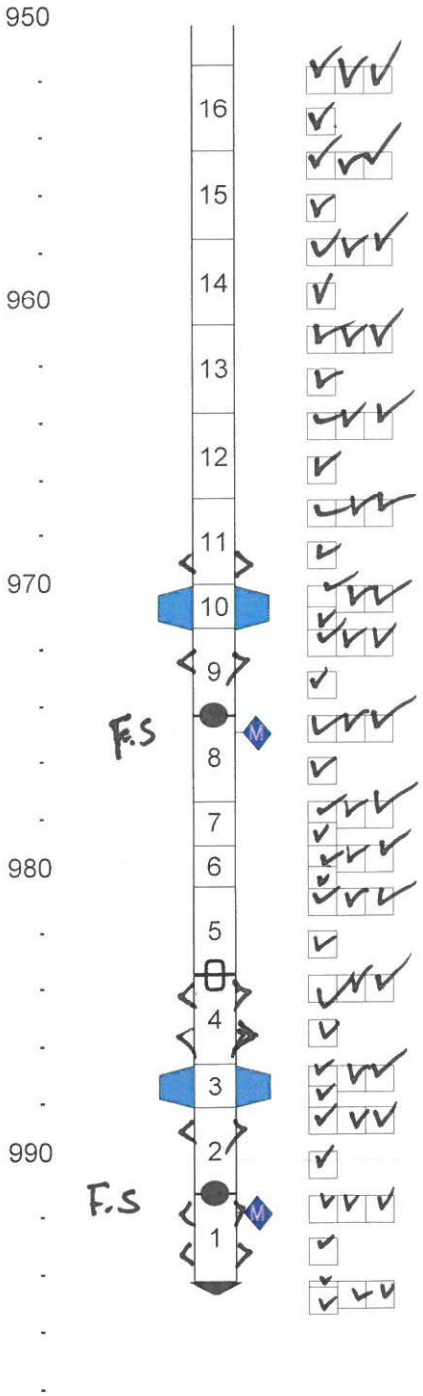


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Mon Oct 25 15:55:47 2021

Westbay Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



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Mon Oct 25 15:55:48 2021

APPENDIX C

IG-BH05

SUMMARY COMPLETION LOG

Summary Completion Log - 7 pages

Summary Completion Log

Company: Golder/NWMO **Job No: WB981**
Well: IG_BH05 **Author: TK/DL**
Site: Ignace,ON
Project: Groundwater Characterization Study

Well Information

Reference Datum: Ground Level
Elevation of Datum: 432.29 masl
MP Casing Top: 0.00 m.
MP Casing Length: 994.45 m.

Borehole Depth: 1000.63 m.
Borehole Inclination: 70 degrees
Borehole Diameter: 98.00 mm

Well Description:
Plastic MP38 System
Other References:
Revision after Oct 14,2021 meeting
Approval on R3 via e-mail on Oct 25

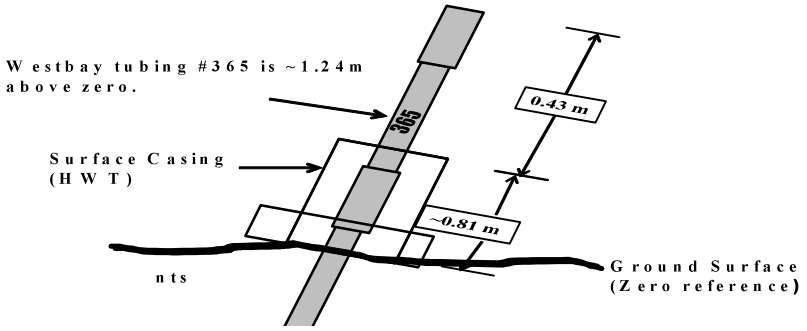
File Information

File Name: IGBH05AB.WWD
Report Date: Wed Nov 24 08:46:28 2021

File Date: Nov 24 08:43:06 2021

Sketch of Wellhead Completion

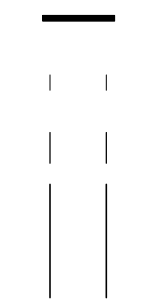
IG_BH05 Completion Sketch



Legend

(Qty) MP Components

(Library - WD Library 04/29/15)



(1) 0203 - MP38 End Cap

(11) 020102 - MP38 Casing 3 (2F/0.6M)

(34) 020105 - MP38 Casing 2 (5F/1.5M)

(295) 020110 - MP38 Casing 1 (10F/3M)

(25) 0238 - MP38 Packer - 74mm (5F/1.5M)

(1) 020305 - Tapered End Plug

(335) 0202 - MP38 Regular Coupling

(25) 0205 - MP38 Measurement Port

(6) 0206 - MP38 Hydraulic Pumping Port

(26) 0216 - Magnetic Location Collar

(55) 0250002C2- MP38 Abrasion Protector

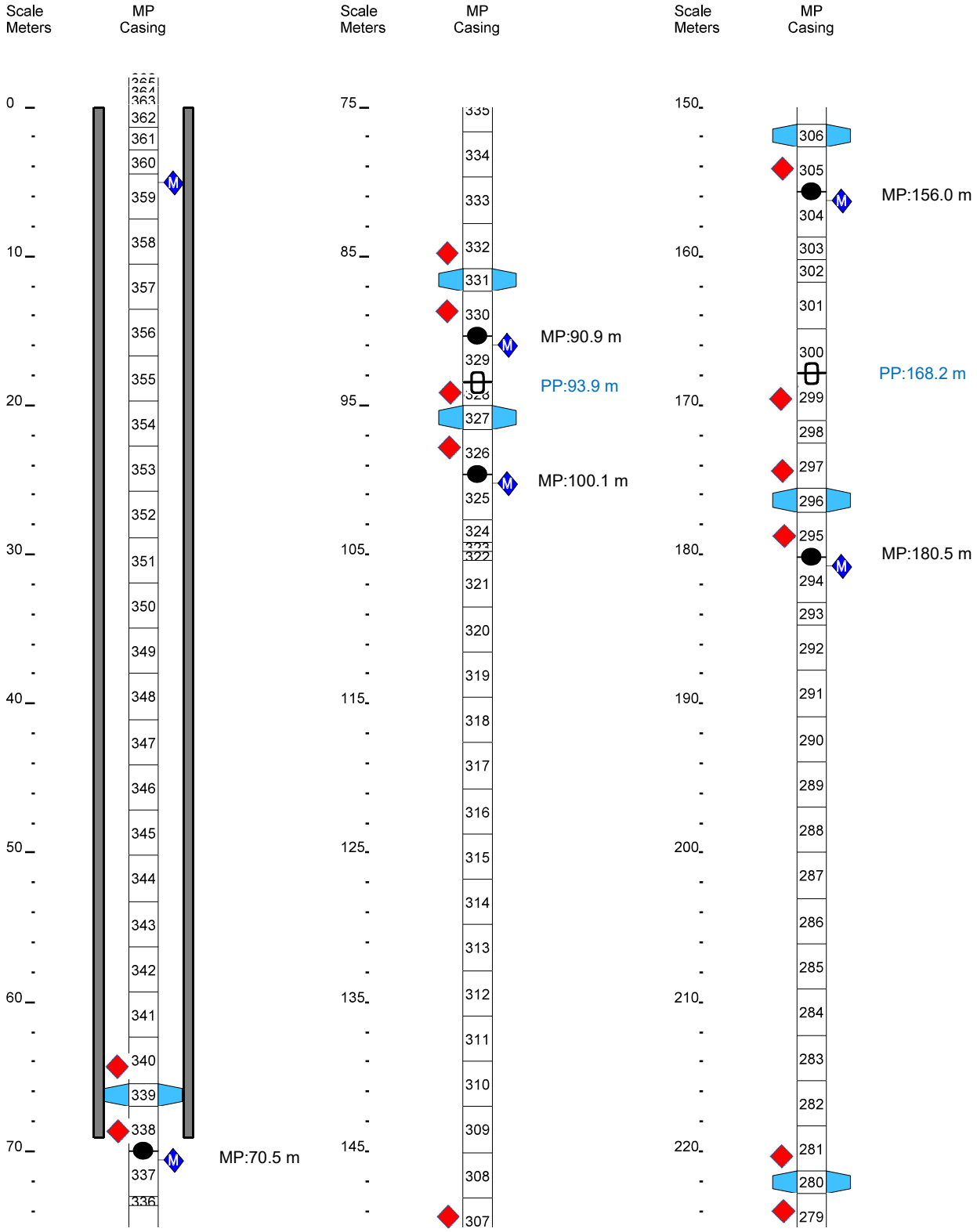
Geology

Backfill/Casing

Mild Steel

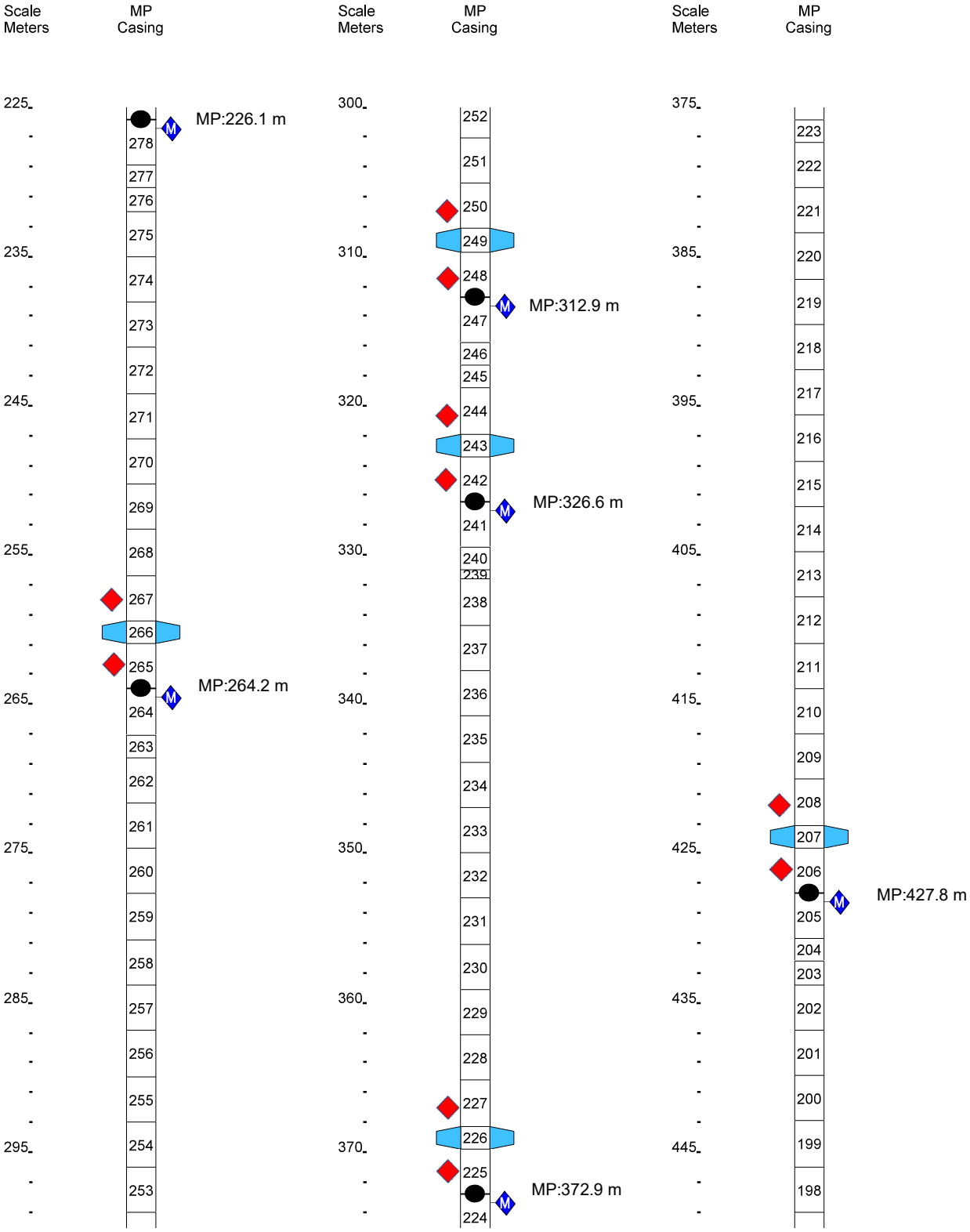
Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH05



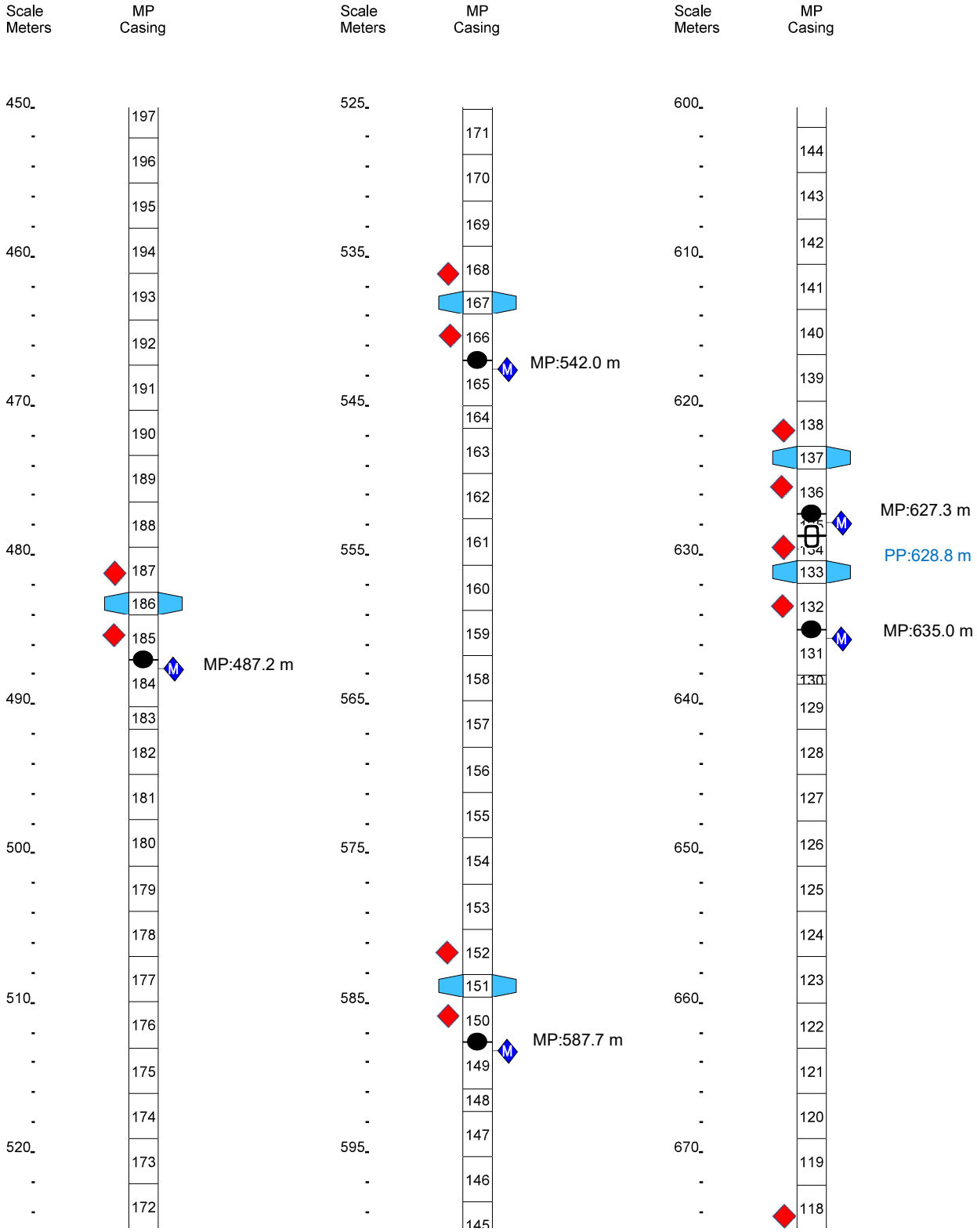
Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH05



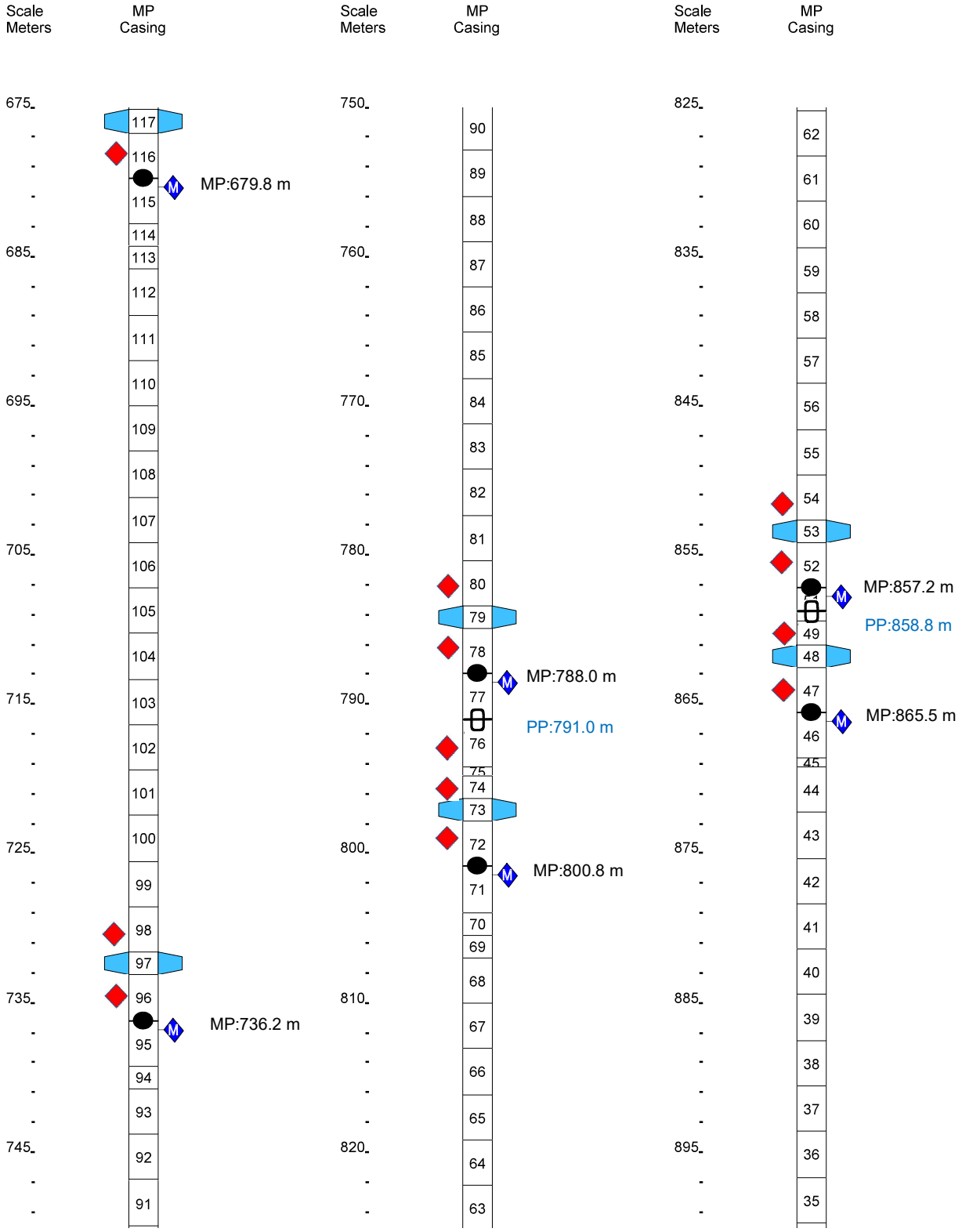
Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH05



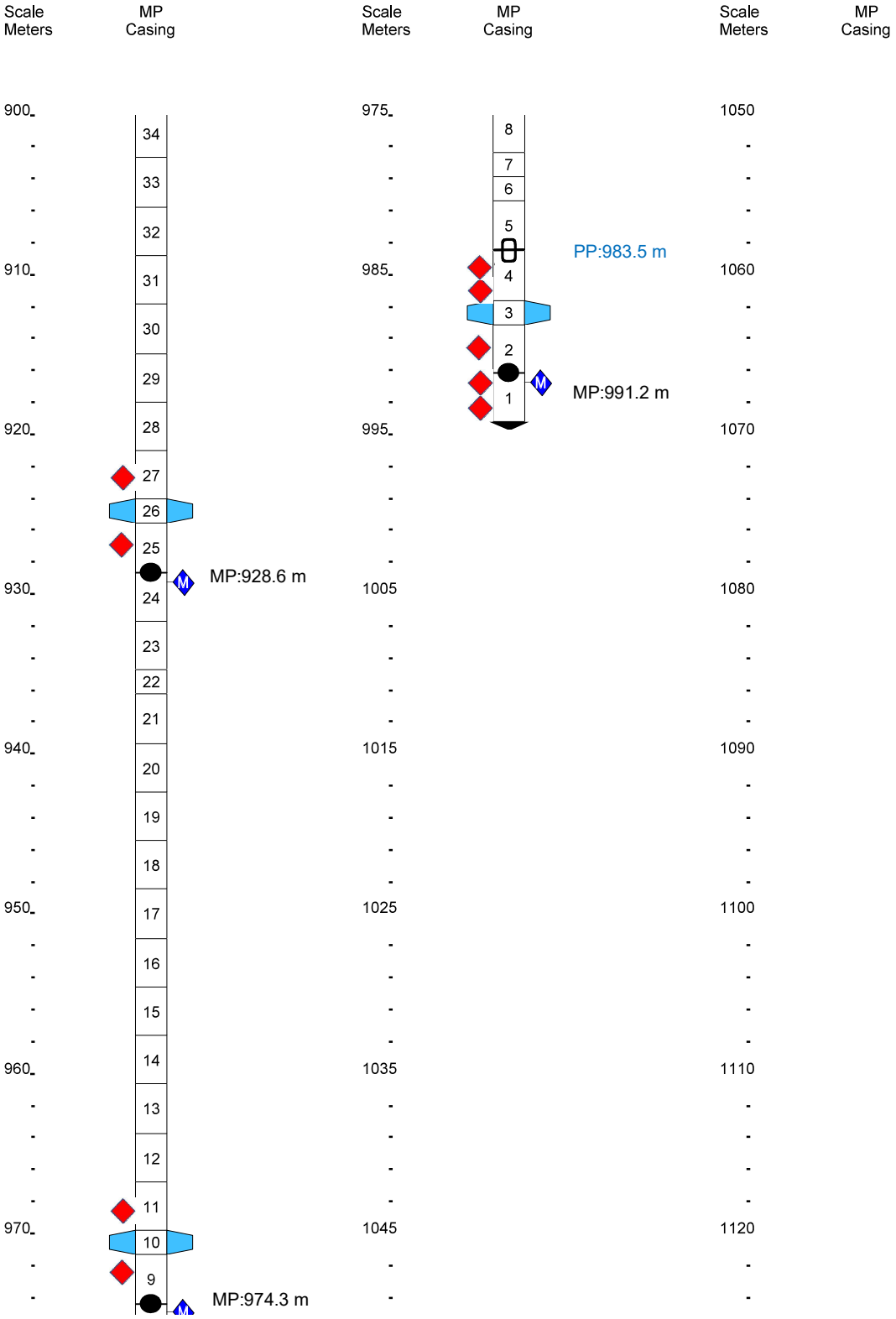
Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH05



Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH05



APPENDIX D

IG_BH05

TUBING SUMMARY (FIELD COPY)

Tubing Summary (field copy) - 9 pages

No	Comp.Part#	Coupling Part#	Accessory Part #	Depth (m)	Measured (m)	Packer Element	
						Top(m)	Bottom(m)
366	0203			-2.01			
365	020102	0202		-1.96	N/A		
364	020102	0202		-1.35	N/A		
363	020102	0202		-0.74	N/A		
362	020105	0202		-0.13	1.522		
361	020105	0202		1.39	1.522		
360	020105	0202		2.92	1.522		
359	020110	0202	0216	4.44	3.048		
358	020110	0202		7.49	3.046		
357	020110	0202		10.54	3.046		
356	020110	0202		13.58	3.046		
355	020110	0202		16.63	3.046		
354	020110	0202		19.68	3.046		
353	020110	0202		22.73	3.046		
352	020110	0202		25.78	3.046		
351	020110	0202		28.82	3.046		
350	020110	0202		31.87	3.046		
349	020110	0202		34.92	3.046		
348	020110	0202		37.97	3.046		
347	020110	0202		41.01	3.046		
346	020110	0202		44.06	3.046		
345	020110	0202		47.11	3.046		
344	020110	0202		50.16	3.046		
343	020110	0202		53.21	3.047		
342	020110	0202		56.25	3.047		
341	020110	0202		59.30	3.047		
340	020110	0202		62.35	3.046		
339	0238	0202		65.40	1.523	65.79	66.69
338	020110	0202		66.92	3.046		
337	020110	0205	0216	69.97	3.047		
336	020102	0202		73.02	0.608		
335	020110	0202		73.63	3.046		
334	020110	0202		76.67	3.046		
333	020110	0202		79.72	3.047		
332	020110	0202		82.77	3.046		
331	0238	0202		85.82	1.522	86.21	87.11
330	020110	0202		87.34	3.046		

329	020110	0205	0216	90.39	3.046		
328	020105	0206		93.44	1.599		
327	0238	0202		95.04	1.523	95.43	96.33
326	020110	0202		96.56	3.046		
325	020110	0205	0216	99.61	3.047		
324	020105	0202		102.66	1.522		
323	020102	0202		104.18	0.608		
322	020102	0202		104.79	0.609		
321	020110	0202		105.40	3.047		
320	020110	0202		108.45	3.046		
319	020110	0202		111.50	3.046		
318	020110	0202		114.54	3.046		
317	020110	0202		117.59	3.047		
316	020110	0202		120.64	3.046		
315	020110	0202		123.69	3.047		
314	020110	0202		126.73	3.046		
313	020110	0202		129.78	3.046		
312	020110	0202		132.83	3.046		
311	020110	0202		135.88	3.046		
310	020110	0202		138.93	3.047		
309	020110	0202		141.97	3.046		
308	020110	0202		145.02	3.046		
307	020110	0202		148.07	3.047		
306	0238	0202		151.12	1.523	151.51	152.41
305	020110	0202		152.64	3.047		
304	020110	0205	0216	155.69	3.047		
303	020105	0202		158.74	1.522		
302	020105	0202		160.26	1.522		
301	020110	0202		161.79	3.047		
300	020110	0202		164.83	3.047		
299	020110	0206		167.88	3.128		
298	020105	0202		171.01	1.522		
297	020110	0202		172.53	3.047		
296	0238	0202		175.58	1.522	175.97	176.87
295	020110	0202		177.10	3.046		
294	020110	0205	0216	180.15	3.046		
293	020105	0202		183.20	1.522		
292	020110	0202		184.72	3.046		
291	020110	0202		187.77	3.047		
290	020110	0202		190.82	3.046		
289	020110	0202		193.86	3.046		
288	020110	0202		196.91	3.046		
287	020110	0202		199.96	3.046		

243	0238	0202		321.87	1.523	322.26	323.16
242	020110	0202		323.40	3.045		
241	020110	0205	0216	326.45	3.046		
240	020105	0202		329.49	1.523		
239	020102	0202		331.02	0.608		
238	020110	0202		331.63	3.046		
237	020110	0202		334.67	3.046		
236	020110	0202		337.72	3.046		
235	020110	0202		340.77	3.045		
234	020110	0202		343.82	3.046		
233	020110	0202		346.87	3.046		
232	020110	0202		349.91	3.046		
231	020110	0202		352.96	3.046		
230	020110	0202		356.01	3.046		
229	020110	0202		359.06	3.046		
228	020110	0202		362.11	3.046		
227	020110	0202		365.15	3.046		
226	0238	0202		368.20	1.523	368.59	369.49
225	020110	0202		369.72	3.046		
224	020110	0205	0216	372.77	3.046		
223	020105	0202		375.82	1.522		
222	020110	0202		377.34	3.046		
221	020110	0202		380.39	3.046		
220	020110	0202		383.44	3.046		
219	020110	0202		386.49	3.046		
218	020110	0202		389.54	3.047		
217	020110	0202		392.58	3.046		
216	020110	0202		395.63	3.047		
215	020110	0202		398.68	3.046		
214	020110	0202		401.73	3.046		
213	020110	0202		404.78	3.046		
212	020110	0202		407.82	3.046		
211	020110	0202		410.87	3.047		
210	020110	0202		413.92	3.047		
209	020110	0202		416.97	3.046		
208	020110	0202		420.01	3.047		
207	0238	0202		423.06	1.523	423.45	424.35
206	020110	0202		424.59	3.047		
205	020110	0205	0216	427.63	3.047		
204	020105	0202		430.68	1.522		
203	020105	0202		432.21	1.522		
202	020110	0202		433.73	3.047		
201	020110	0202		436.78	3.047		

286	020110	0202		203.01	3.046		
285	020110	0202		206.06	3.047		
284	020110	0202		209.10	3.046		
283	020110	0202		212.15	3.046		
282	020110	0202		215.20	3.046		
281	020110	0202		218.25	3.046		
280	0238	0202		221.29	1.522	221.68	222.58
279	020110	0202		222.82	3.046		
278	020110	0205	0216	225.87	3.046		
277	020105	0202		228.91	1.522		
276	020105	0202		230.44	1.522		
275	020110	0202		231.96	3.046		
274	020110	0202		235.01	3.046		
273	020110	0202		238.06	3.046		
272	020110	0202		241.11	3.047		
271	020110	0202		244.15	3.046		
270	020110	0202		247.20	3.047		
269	020110	0202		250.25	3.046		
268	020110	0202		253.30	3.047		
267	020110	0202		256.34	3.047		
266	0238	0202		259.39	1.522	259.78	260.68
265	020110	0202		260.92	3.047		
264	020110	0205	0216	263.96	3.046		
263	020105	0202		267.01	1.523		
262	020110	0202		268.54	3.047		
261	020110	0202		271.58	3.047		
260	020110	0202		274.63	3.047		
259	020110	0202		277.68	3.046		
258	020110	0202		280.73	3.045		
257	020110	0202		283.78	3.045		
256	020110	0202		286.82	3.045		
255	020110	0202		289.87	3.046		
254	020110	0202		292.92	3.046		
253	020110	0202		295.97	3.046		
252	020110	0202		299.01	3.046		
251	020110	0202		302.06	3.046		
250	020110	0202		305.11	3.046		
249	0238	0202		308.16	1.523	308.55	309.45
248	020110	0202		309.68	3.045		
247	020110	0205	0216	312.73	3.046		
246	020105	0202		315.78	1.523		
245	020105	0202		317.30	1.523		
244	020110	0202		318.83	3.046		

200	020110	0202		439.83	3.047		
199	020110	0202		442.87	3.046		
198	020110	0202		445.92	3.046		
197	020110	0202		448.97	3.046		
196	020110	0202		452.02	3.046		
195	020110	0202		455.06	3.046		
194	020110	0202		458.11	3.046		
193	020110	0202		461.16	3.046		
192	020110	0202		464.21	3.046		
191	020110	0202		467.26	3.046		
190	020110	0202		470.30	3.047		
189	020110	0202		473.35	3.047		
188	020110	0202		476.40	3.047		
187	020110	0202		479.45	3.046		
186	0238	0202		482.50	1.522	482.89	483.79
185	020110	0202		484.02	3.046		
184	020110	0205	0216	487.07	3.047		
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182	020110	0202		491.64	3.047		
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180	020110	0202		497.73	3.047		
179	020110	0202		500.78	3.046		
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177	020110	0202		506.88	3.046		
176	020110	0202		509.93	3.046		
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174	020110	0202		516.02	3.047		
173	020110	0202		519.07	3.047		
172	020110	0202		522.12	3.047		
171	020110	0202		525.17	3.047		
170	020110	0202		528.21	3.046		
169	020110	0202		531.26	3.047		
168	020110	0202		534.31	3.046		
167	0238	0202		537.36	1,522	537.75	538.65
166	020110	0202		538.88	3.047		
165	020110	0205	0216	541.93	3.047		
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153	020110	0202		576.98	3.046		
152	020110	0202		580.03	3.047		
151	0238	0202		583.07	1.522	583.46	584.36
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148	020105	0202		590.69	1.522		
147	020110	0202		592.22	3.047		
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140	020110	0202		613.55	3.046		
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137	0238	0202		622.70	1.523	623.09	623.99
136	020110	0202		624.22	3.047		
135	020105	0205	0216	627.27	1.522		
134	020105	0206		628.79	1.599		
133	0238	0202		630.39	1.523	630.78	631.68
132	020110	0202		631.92	3.046		
131	020110	0205	0216	634.96	3.047		
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129	020110	0202		638.62	3.047		
128	020110	0202		641.67	3.047		
127	020110	0202		644.72	3.047		
126	020110	0202		647.77	3.046		
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124	020110	0202		653.86	3.047		
123	020110	0202		656.91	3.047		
122	020110	0202		659.96	3.046		
121	020110	0202		663.00	3.046		
120	020110	0202		666.05	3.046		
119	020110	0202		669.10	3.047		
118	020110	0202		672.15	3.047		
117	0238	0202		675.20	1.523	675.59	676.49
116	020110	0202		676.72	3.046		
115	020110	0205	0216	679.77	3.046		

114	020105	0202		682.82	1.522		
113	020105	0202		684.34	1.522		
112	020110	0202		685.86	3.046		
111	020110	0202		688.91	3.046		
110	020110	0202		691.96	3.046		
109	020110	0202		695.01	3.046		
108	020110	0202		698.05	3.046		
107	020110	0202		701.10	3.046		
106	020110	0202		704.15	3.045		
105	020110	0202		707.20	3.046		
104	020110	0202		710.25	3.047		
103	020110	0202		713.29	3.046		
102	020110	0202		716.34	3.046		
101	020110	0202		719.39	3.046		
100	020110	0202		722.44	3.047		
99	020110	0202		725.49	3.046		
98	020110	0202		728.53	3.046		
97	0238	0202		731.58	1.522	731.97	732.87
96	020110	0202		733.10	3.046		
95	020110	0205	0216	736.15	3.046		
94	020105	0202		739.20	1.522		
93	020110	0202		740.72	3.046		
92	020110	0202		743.77	3.046		
91	020110	0202		746.82	3.046		
90	020110	0202		749.87	3.046		
89	020110	0202		752.92	3.046		
88	020110	0202		755.96	3.046		
87	020110	0202		759.01	3.046		
86	020110	0202		762.06	3.046		
85	020110	0202		765.11	3.046		
84	020110	0202		768.16	3.046		
83	020110	0202		771.20	3.045		
82	020110	0202		774.25	3.046		
81	020110	0202		777.30	3.046		
80	020110	0202		780.35	3.046		
79	0238	0202		783.39	1.523	783.78	784.68
78	020110	0202		784.92	3.045		
77	020110	0205	0216	787.97	3.046		
76	020110	0206		791.01	3.127		
75	020102	0202		794.14	0.608		
74	020105	0202		794.75	1.522		
73	0238	0202		796.27	1.523	796.66	797.56
72	020110	0202		797.80	3.046		

71	020110	0205	0216	800.84	3.046		
70	020105	0202		803.89	1.521		
69	020105	0202		805.42	1.522		
68	020110	0202		806.94	3.045		
67	020110	0202		809.99	3.046		
66	020110	0202		813.03	3.046		
65	020110	0202		816.08	3.046		
64	020110	0202		819.13	3.046		
63	020110	0202		822.18	3.046		
62	020110	0202		825.23	3.046		
61	020110	0202		828.27	3.050		
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59	020110	0202		834.37	3.046		
58	020110	0202		837.42	3.046		
57	020110	0202		840.47	3.047		
56	020110	0202		843.51	3.046		
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54	020110	0202		849.61	3.046		
53	0238	0202		852.66	1.523	853.05	853.95
52	020110	0202		854.18	3.046		
51	020105	0205	0216	857.23	1.522		
50	020102	0206		858.75	~~0.609~~ 0.686		
49	020105	0202		859.44	1.522		
48	0238	0202		860.96	1.523	861.35	862.25
47	020110	0202		862.49	3.046		
46	020110	0205	0216	865.53	3.046		
45	020102	0202		868.58	0.607		
44	020110	0202		869.19	3.046		
43	020110	0202		872.24	3.045		
42	020110	0202		875.29	3.046		
41	020110	0202		878.34	3.045		
40	020110	0202		881.38	3.047		
39	020110	0202		884.43	3.046		
38	020110	0202		887.48	3.046		
37	020110	0202		890.53	3.046		
36	020110	0202		893.57	3.045		
35	020110	0202		896.62	3.047		
34	020110	0202		899.67	3.046		
33	020110	0202		902.72	3.047		
32	020110	0202		905.77	3.046		
31	020110	0202		908.81	3.046		
30	020110	0202		911.86	3.045		
29	020110	0202		914.91	3.045		

28	020110	0202		917.96	3.046		
27	020110	0202		921.01	3.046	1.523	
26	0238	0202		924.05	~~5.123~~	924.44	925.34
25	020110	0202		925.58	3.046		
24	020110	0205	0216	928.62	3.046		
23	020110	0202		931.67	3.046		
22	020105	0202		934.72	1.523		
21	020110	0202		936.24	3.046		
20	020110	0202		939.29	3.046		
19	020110	0202		942.34	3.046		
18	020110	0202		945.39	3.046		
17	020110	0202		948.44	3.047		
16	020110	0202		951.48	3.046		
15	020110	0202		954.53	3.047		
14	020110	0202		957.58	3.046		
13	020110	0202		960.63	3.046		
12	020110	0202		963.67	3.046		
11	020110	0202		966.72	3.047		
10	0238	0202		969.77	1.523	970.16	971.06
9	020110	0202		971.29	3.046		
8	020110	0205	0216	974.34	3.046		
7	020105	0202		977.39	1.522		
6	020105	0202		978.91	1.522		
5	020110	0202		980.44	3.046		
4	020110	0206		983.49	3.125		
3	0238	0202		986.61	1.523	987.00	987.90
2	020110	0202		988.13	3.046		
1	020110	0205	0216	991.18	3.047		
0	020305	0202		994.23	0.223		

APPENDIX E

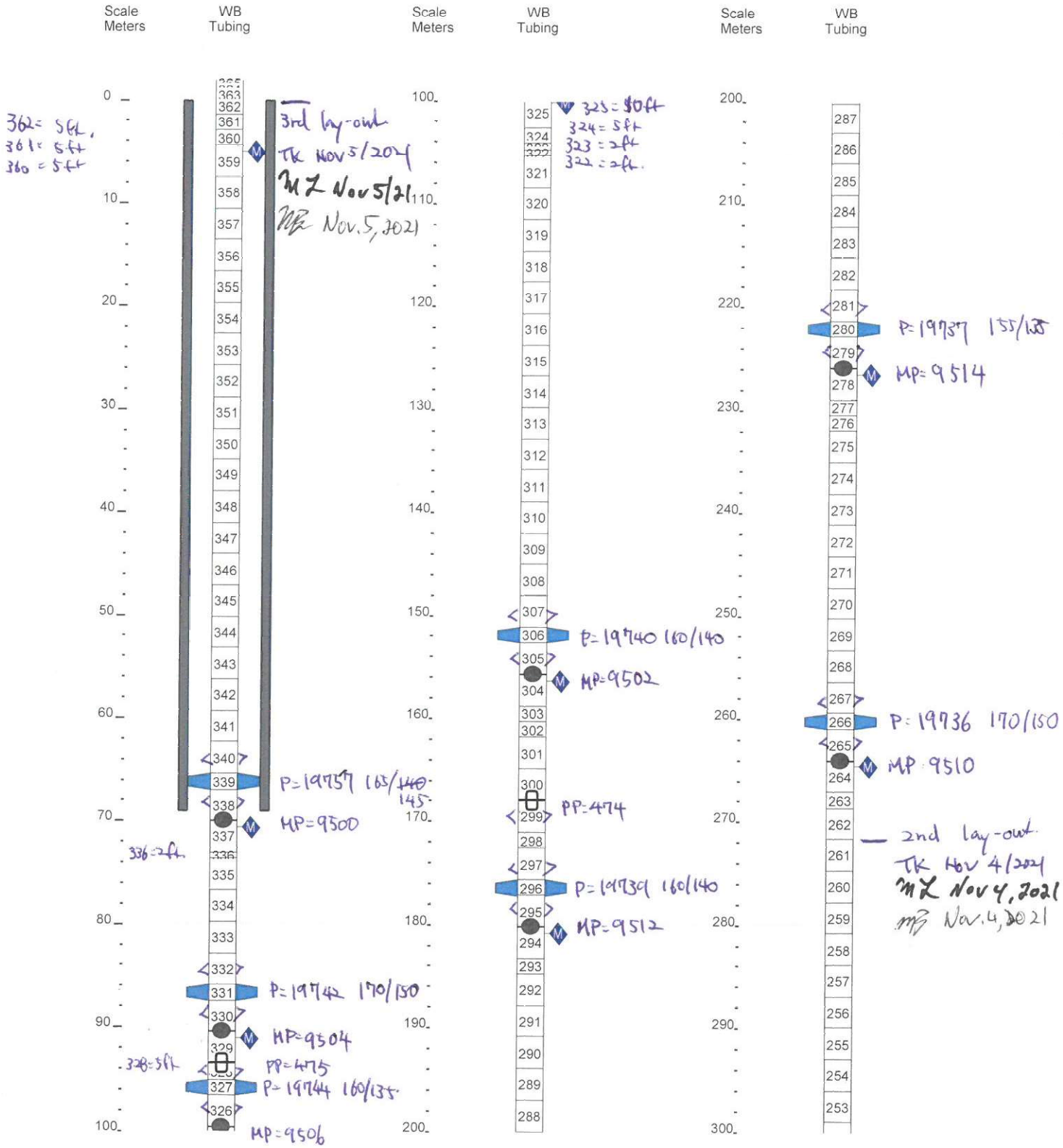
IG-BH05

SUMMARY COMPLETION LOG (FIELD COPY)

Summary Completion Log (field copy) - 4 pages

Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05

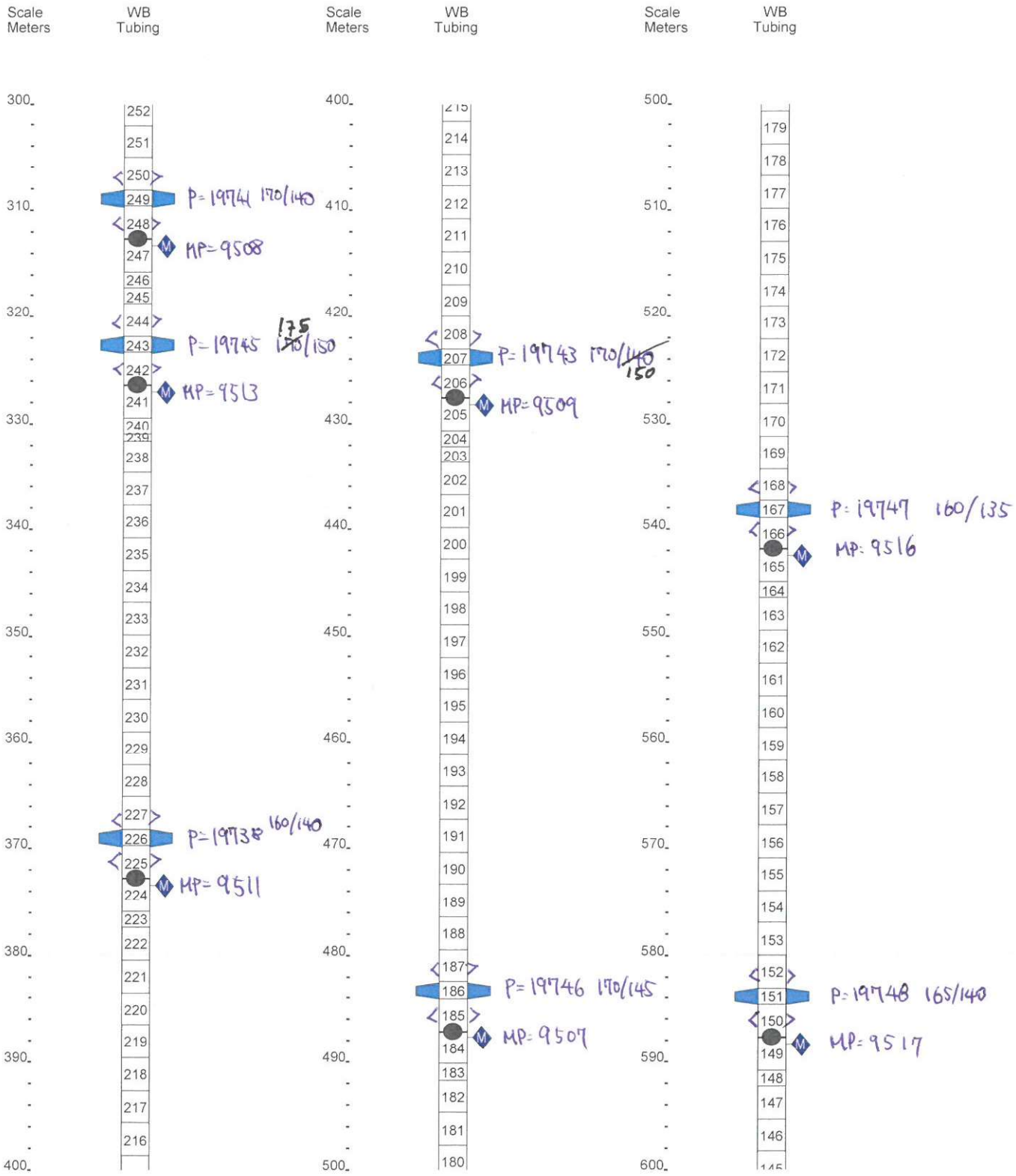


(c) Westbay Instruments Inc. 2000

Mon Oct 25 15:20:03 2021

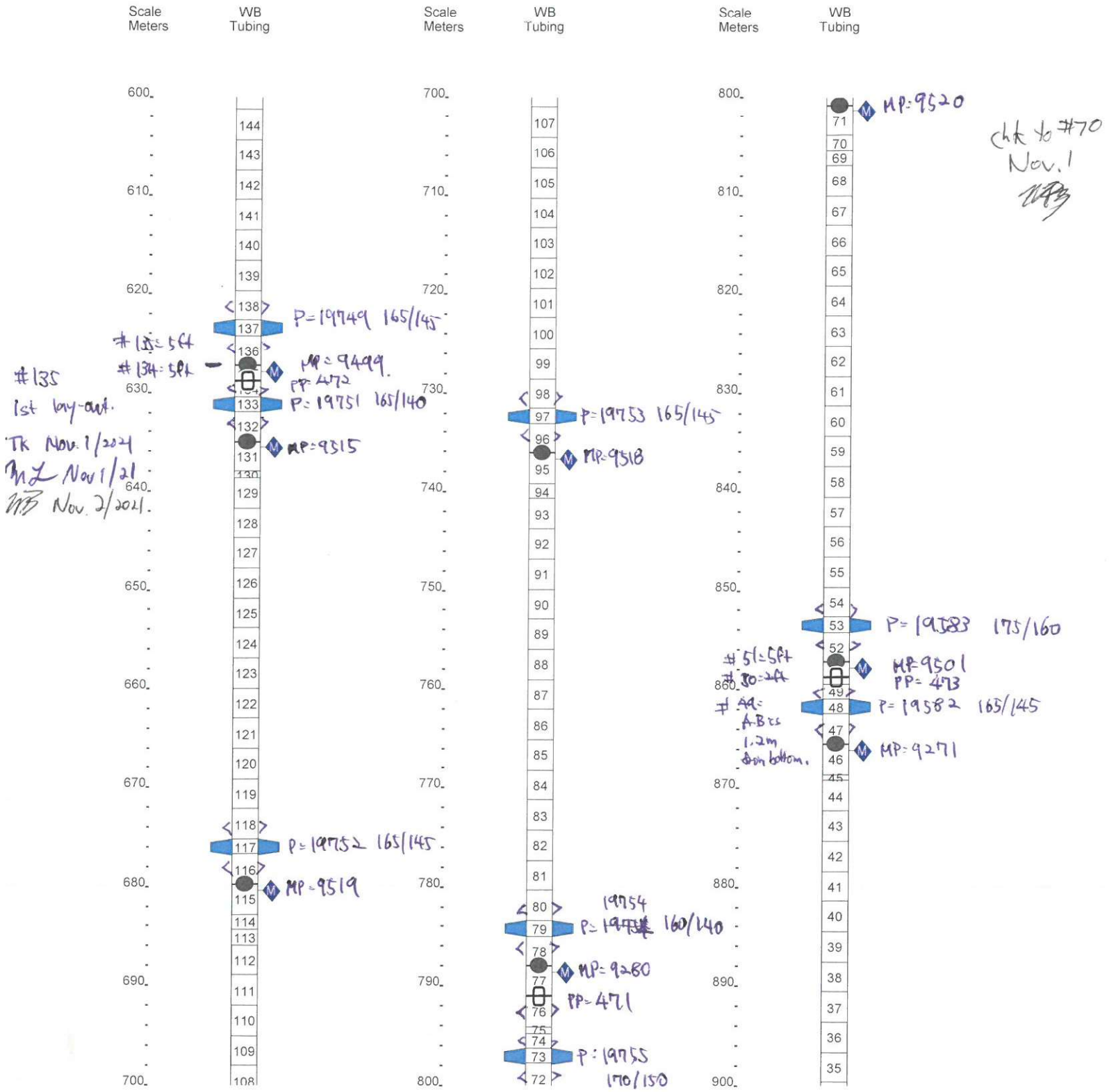
Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



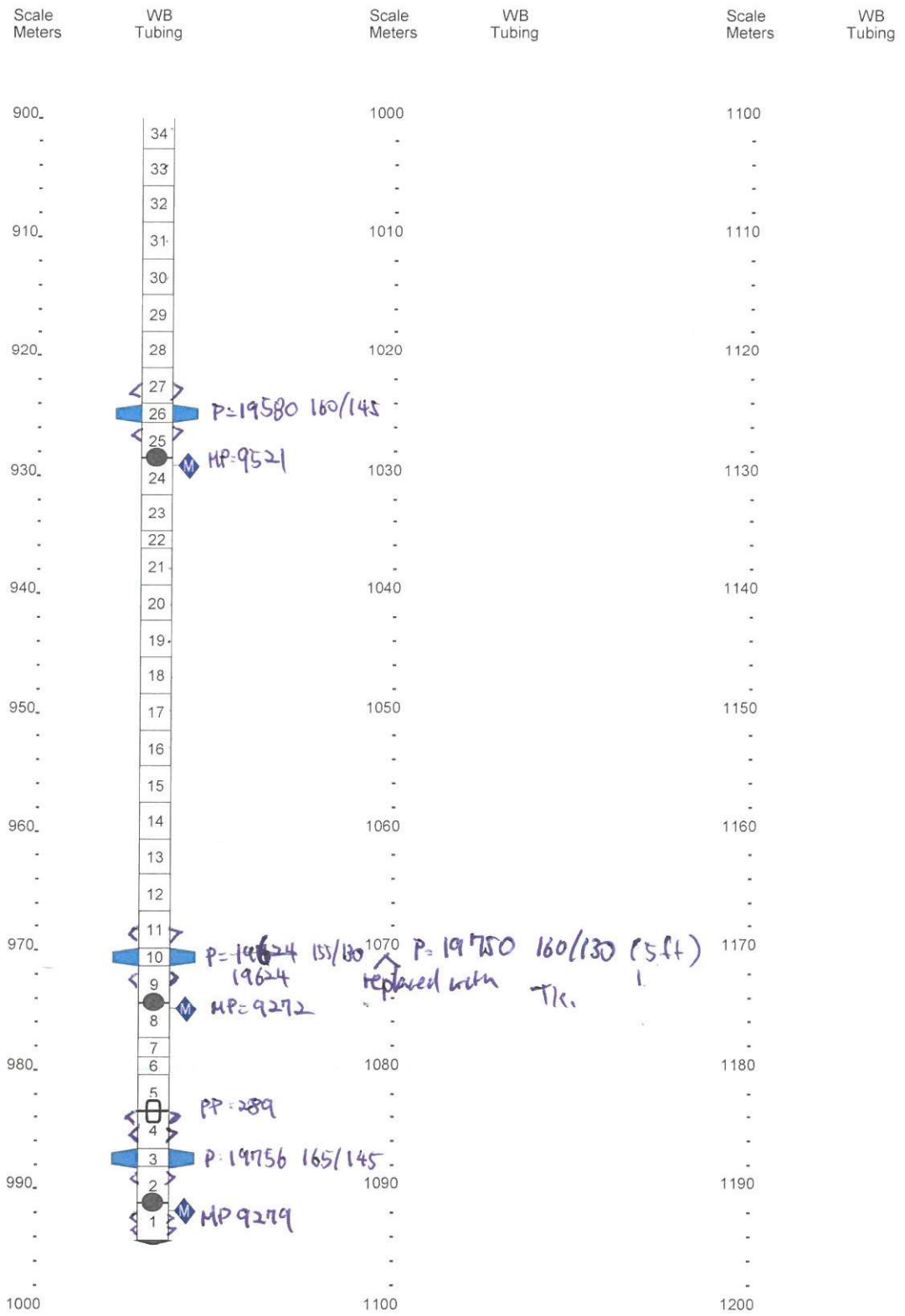
Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



Summary Completion Log
Golder/NWMO

Job No: WB981
Well: IG_BH 05



APPENDIX F
IG-BH05

PRE-INFLATION PRESSURE PROFILE

Pre-Inflation Field Data and Calculation Sheet (November 7, 2021) - 2 pages

Westbay Piezometric Pressures/Levels

Field Data and Calculation Sheet

Pre-Inflation Profile.

Well No.: IGBH-05
Datum: G.L
Elev. G.S.: N/A
Height of Westbay above G.S.: N/A
Elev. top of Westbay Casing: N/A
Reference Elevation: N/A
Borehole angle: 70°

Probe Type: O/C sampler
Serial No.: EMS ~~4960~~ 5230
Probe Range: 2000 psi TK
Westbay Casing Type: MP38
Sampler Valve Position: closed

Date: Nov 7 / 2024
Client: Golder / NWMO
Job No.: WB981
Location: Ignace, ON
Weather: overcast/sunny
Operator: ML / TK

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz).

Ambient Reading (P_{atm}) (pressure, temperature, time)

		Finish:
Start: Pressure	14.21	14.20
Temp	20.04	5.76
Time	11:45	14:15

P_{atm} 14.21 psi

Port No.	Port Position From Log (m)	Port Position From Cable (m)	True Port Depth "Dp" (m)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Time H:M:S	Probe Temp. (°C)	Inside Casing (P1)	Pressure Head Outside Port (m) H = (P2-Patm)/w	Piez. Level Outside Port (m) Dz = Dp - H	Comments: M = mag collar	Comments: R = rotation
1	991.2			1173.24	1323.11	12:28	12.61	1173.30	920.46	70.74	M = 983.75	R = 15
2	974.3			1158.85	1300.72	12:33	13.11	1158.84	904.72	69.58	M = 967.00	R = 15
3	928.6			1089.84	1240.13	12:38	13.13	1089.80	862.11	66.49	M = 921.60	R = 15
4	865.5			1005.53	1156.44	12:44	12.75	1005.56	803.26	62.24	M = 859.00	R = 15
5	857.2			994.58	1145.42	12:48	12.51	994.50	795.51	61.69	M = 850.70	R = 15
6	800.8			919.33	1070.58	12:53	12.12	919.21	742.88	57.92	M = 794.7	R = 15
7	788.8	788.0		902.11	1053.60	12:57	11.80	902.14	730.94	57.06	M = 781.9	R = 15
8	736.2			832.95	984.69	13:02	11.49	832.94	682.48	53.72	M = 730.5	R = 15
9	679.8			757.72	909.96	13:08	11.02	757.73	629.92	49.88	M = 674.5	R = 15
10	635.0			697.96	850.51	13:13	10.55	697.95	588.12	46.88	M = 630.1	R = 15
11	627.3			687.66	840.28	13:15	10.30	687.69	580.92	46.38	M = 622.4	R = 15
12	587.7			634.72	787.67	13:19	10.07	634.76	543.92	43.78	M = 583.0	R = 15
13	541.9			573.63	726.93	13:24	9.67	573.62	501.21	40.69	M = 537.6	R = 15
14	487.1			500.28	653.97	13:28	9.20	500.29	449.90	37.20	M = 483.0	R = 15
15	427.6			420.73	574.92	13:32	8.73	420.72	394.31	33.29	M = 423.9	R = 15

Notes: w = 0.4335 psi/ft (1.422psi/m) of H_2O Dz = piezometric level in zone Patm = atmospheric pressure H = pressure head of water in zone Dp = true depth of measurement port

Westbay Piezometric Pressures/Levels

Field Data and Calculation Sheet

Pre - Inflation Profile.

Well No.: IGBH-05
Datum: G.L
Elev. G.S.: N/A
Height of Westbay above G.S.: N/A
Elev. top of Westbay Casing: N/A
Reference Elevation: N/A
Borehole angle: 70°

Probe Type: O/C sampler
Serial No.: EMS 5330
Probe Range: 2000 psi
Westbay Casing Type: MP38
Sampler Valve Position: Closed

Date: Nov 7/2021
Client: Golder / NWMO
Job No.: WB981
Location: Ignace, ON
Weather: Sunny
Operator: ML/TK

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz).

Ambient Reading (P_{atm}) (pressure, temperature, time)

		Start:	Finish:
	Pressure	14.21	14.22
	Temp	20.04	5.76
	Time	11=45	14=15

P_{atm} 14.21 psi

Port No.	Port Position From Log (m)	Port Position From Cable (m)	True Port Depth "Dp" (m)	Fluid Pressure Readings					Pressure Head Outside Port (m)	Piez. Level Outside Port (m)	Comments
				Inside Casing (P1)	Outside Casing (P2)	Time H:M:S	Probe Temp. (°C)	Inside Casing (P1)	H = (P2-Patm)/w	Dz = Dp - H	M = mag. collar R = rotation
16	372.8			347.28	501.91	13=37	8.17	347.24	342.97	29.83	M=369.4 R=15
17	326.5			285.24	440.24	13=42	7.52	285.26	299.59	26.90	M=323.3 R=15
18	312.7			266.85	421.90	13=46	7.23	266.89	286.70	25.99	M=309.7 R=15
19	264.0			201.59	356.95	13=50	6.96	201.54	241.03	22.97	M=261.1 R=15
20	225.9			150.52	306.24	13=54	6.60	150.59	205.37	20.53	M=223.2 R=15
21	180.2			89.41	245.31	13=58	6.29	89.36	162.52	17.68	M=177.7 R=15
22	155.7			56.56	212.79	14=00	6.04	56.61	139.65	16.05	M=153.4 R=15
23	99.6			14.42	138.04	14=05	5.76	14.40	87.08	12.52	M=97.6 R=15
24	90.4			14.38	125.76	14=07	5.72	14.34	78.45	11.95	M=88.4 R=15
25	70.0			14.33	98.48	14=10	5.68	14.34	59.26	10.74	M=68.0 R=15

Notes: w = 0.4335 psi/ft (1.422psi/m) of H_2O Dz = piezometric level in zone Patm = atmospheric pressure H = pressure head of water in zone Dp = true depth of measurement port

APPENDIX G
IG-BH05

WESTBAY SYSTEM PACKER INFLATION RECORDS

Westbay System Packer Inflation Records - 27 pages

Sheet 1 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: TK/ML | Date Inflated: Nov 8/2024

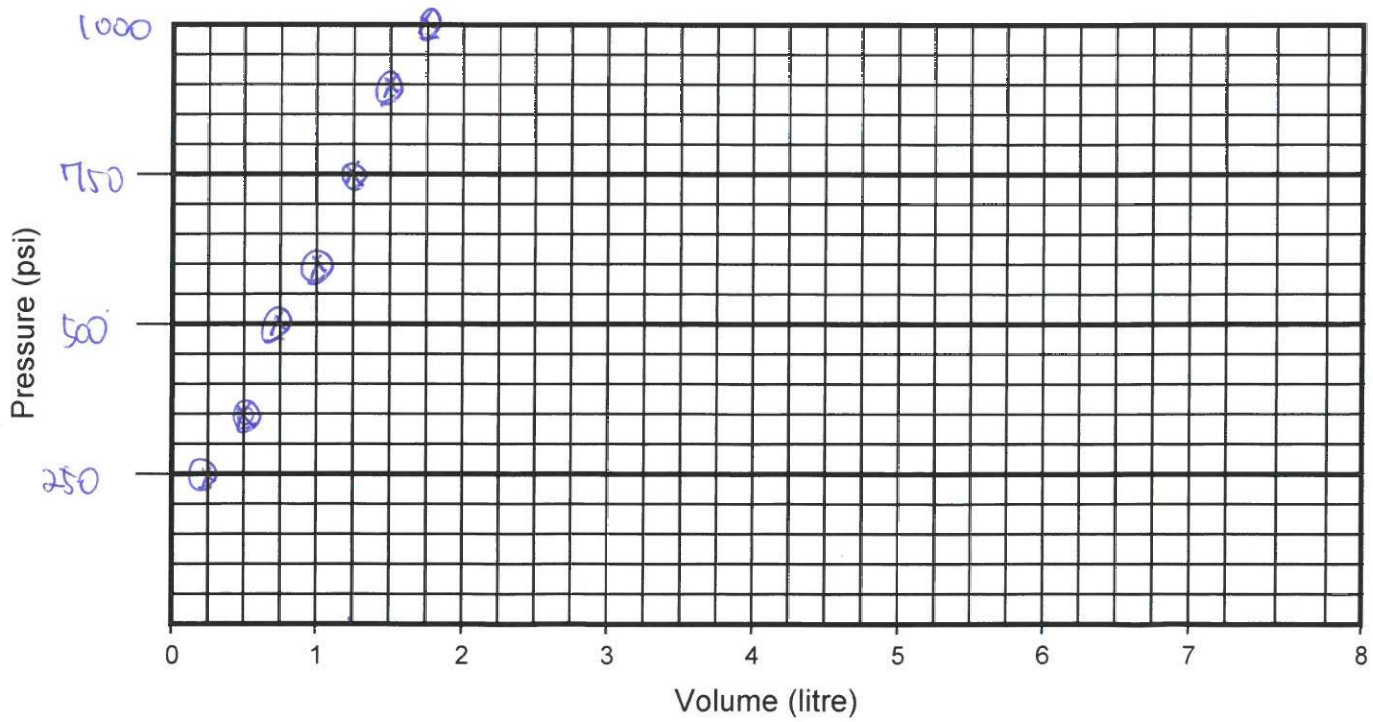
Packer No. Blank wall | Depth (m): 989.3 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: _____ psi | Final Line Pressure, P_L: 1000 psi | Tool Pressure, P_T: 700 psi

Borehole Water Level: ~98 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = N/A psi

Volume, litres	0.25	0.5	0.75	1.0	1.25	1.5	1.75	0.6		
Pressure, psi	250	350	500	600	750	900	1000	Ø		
Volume, litres										
Pressure, psi										



Comments: Blank Wall | Time - 11:27.

Sheet 2 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 8/21.

Packer No. 1, comp 3 SN#19756 | Depth (m): 986.6 | Inflation Tool No.: TIW3197

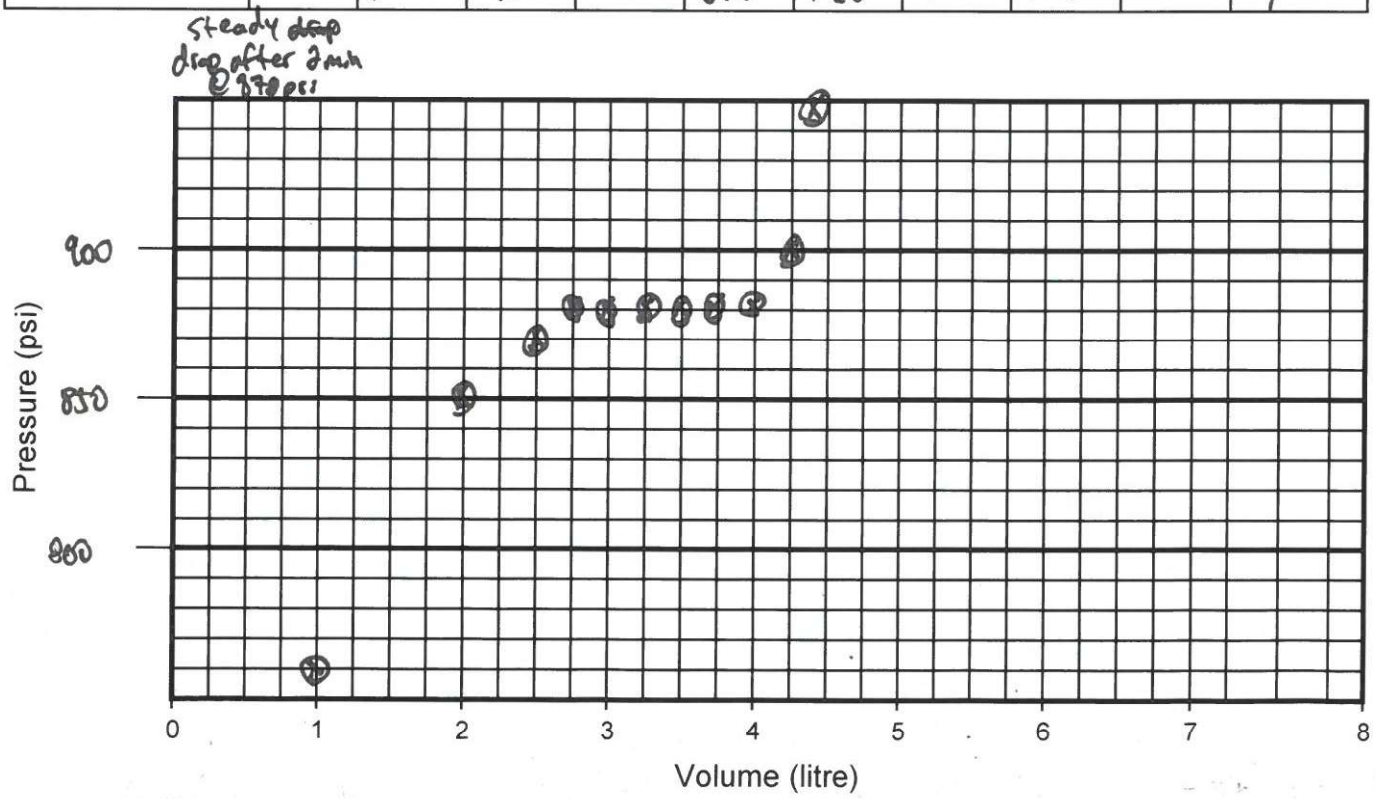
Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 950 psi | Tool Pressure, P_T: 700 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 115 psi

~1160psi

Volume, litres	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75	4.0
Pressure, psi	760	820	850	870	880	870	870	870	870	870
Volume, litres	*4.0	/	3.5	0.5	0.75	1.0	1.25	1.35	/	0.5
Pressure, psi	400	/	ø	200	600	760	900	950	/	ø



Comments: ~940psi | Time - 12:15pm

*Tool may have been vented inadvertently. Tool was checked in blank wall section & was ok. 12:54pm

1L - 780/1min
760/90sec
755/0min

3.25L 900psi/2min
870psi/2:20
sharp drop

↳Inflation resumed.

Sheet 3 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: MC / TK | Date Inflated: Nov 8/21

Packer No. 2, comp 10 SN# 19750 | Depth (m): 969.8 | Inflation Tool No.: TIW3197

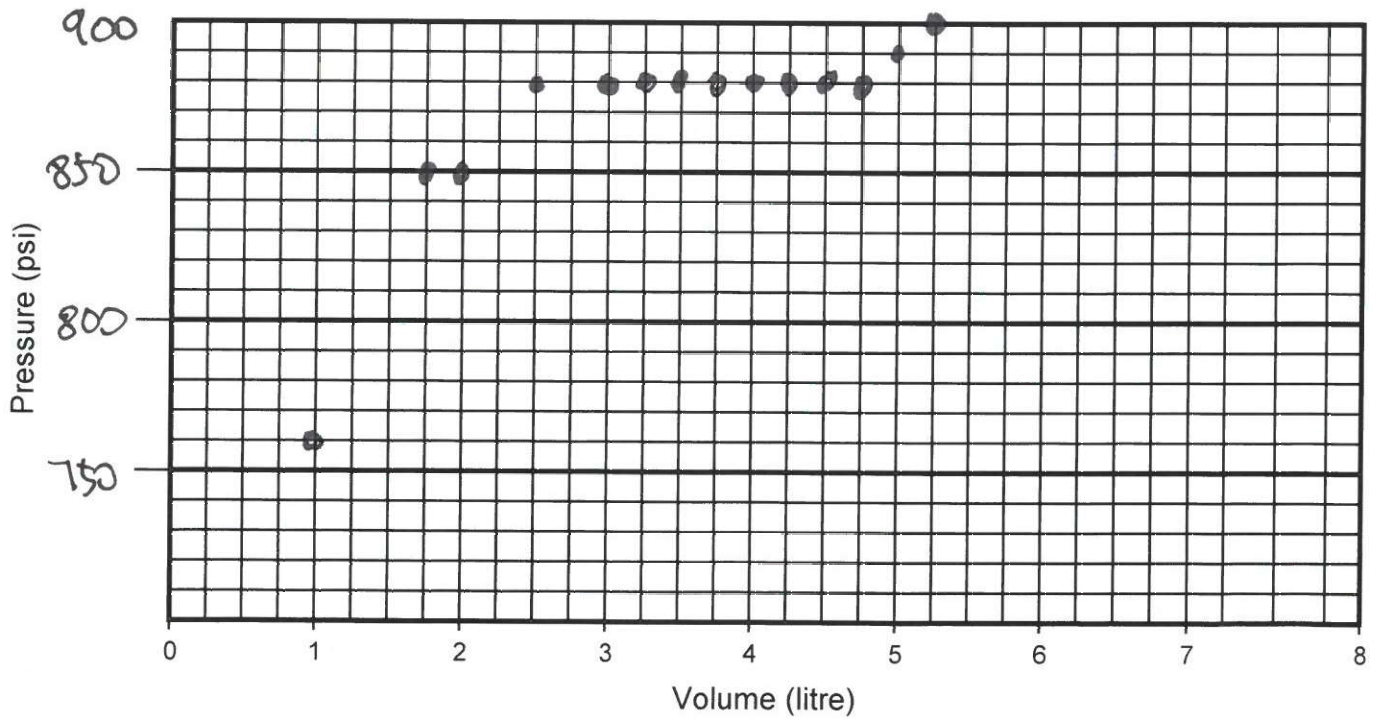
Packer Valve Pressure, P_V: 130 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 700 psi

Borehole Water Level: 8 (m) = ~10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 80 psi

900 @ 20 sec

Volume, litres	1.0	2.0	1.75	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	760	/	850	850	880	880	880	880	880	880
Volume, litres	4.0	4.25	4.5	4.75	5.0	5.25	/	4.25		
Pressure, psi	880	890	880	880	890	900	/	Ø		



Comments: Time - 8:24 pm

Sheet 4 of 29

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: TK / ML | Date Inflated: Nov 8/24

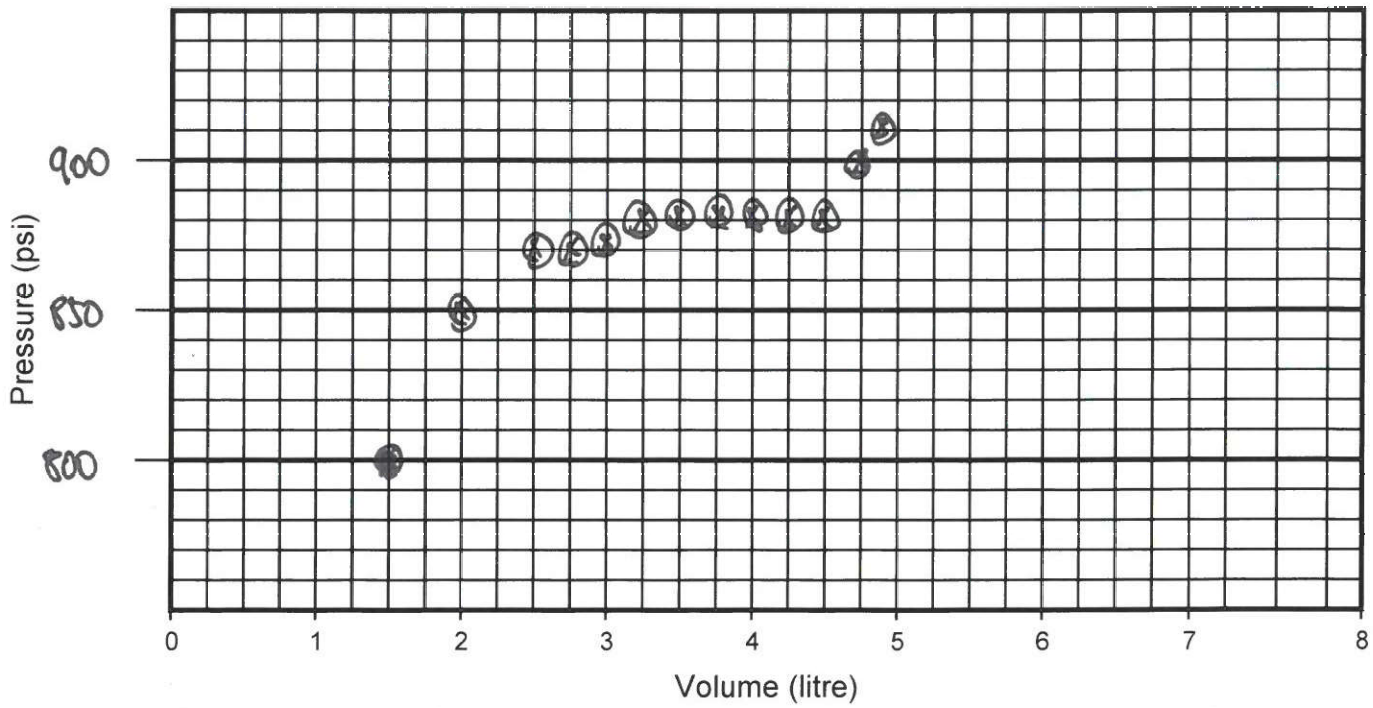
Packer No. 3, comp 26, SN 19580 | Depth (m): 924.1 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 910 psi | Tool Pressure, P_T: 700 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 75 psi

Volume, litres	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75	4.0
Pressure, psi	720	800	850	870	870	870	880	880	880	880
Volume, litres	4.25	4.5	4.75	4.85	3.75					
Pressure, psi	880	880	900	910	Ø					



Comments: Time - 15:21

Sheet 5 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 8/21

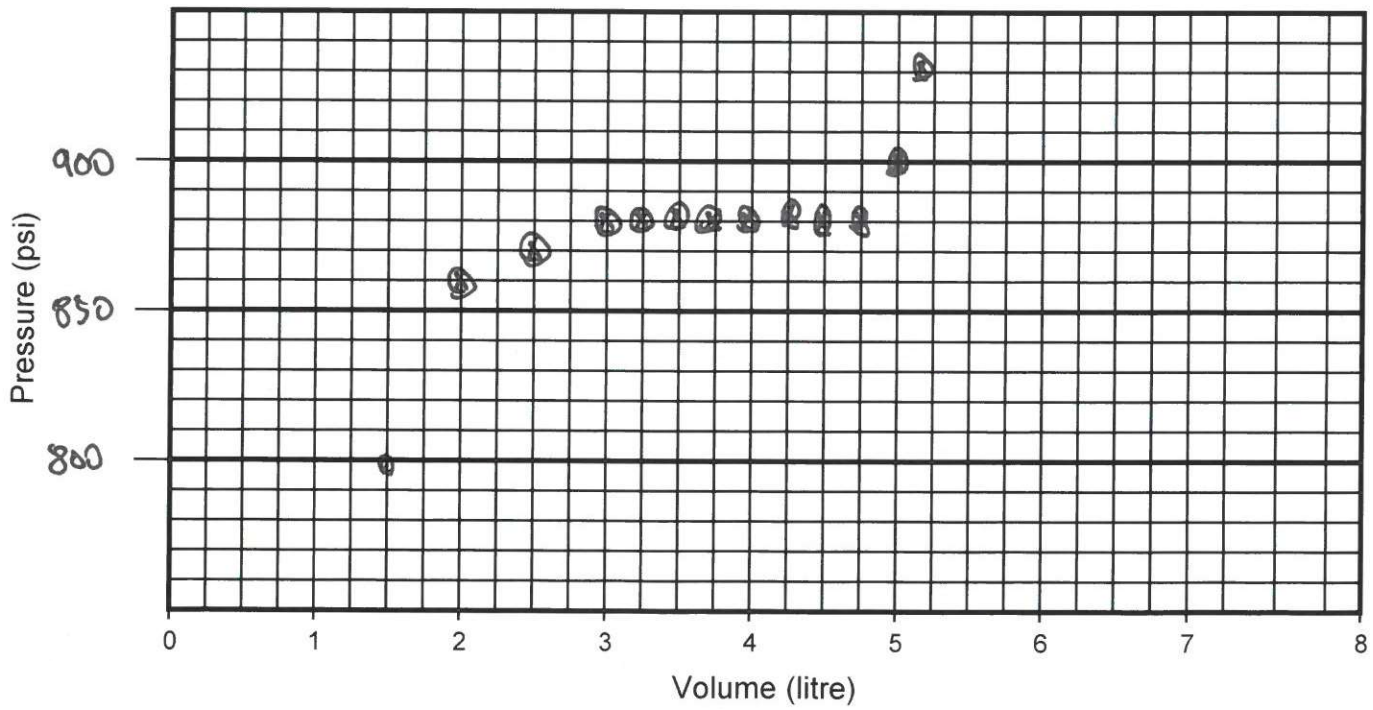
Packer No. 4, cmp48, SN 19582 | Depth (m): 861 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 930 psi | Tool Pressure, P_T: 700 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 95 psi

Volume, litres	1.0	1.5	2.0	2.5	3.0	3.25	3.5	3.75	4.0	4.25
Pressure, psi	730	800	860	870	890	890	890	890	890	890
Volume, litres	4.5	4.75	5.0	5.2	/	4.2				
Pressure, psi	890	890	900	930	/	Ø				



Comments: Time - 4:22 pm

Sheet 6 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 8/21

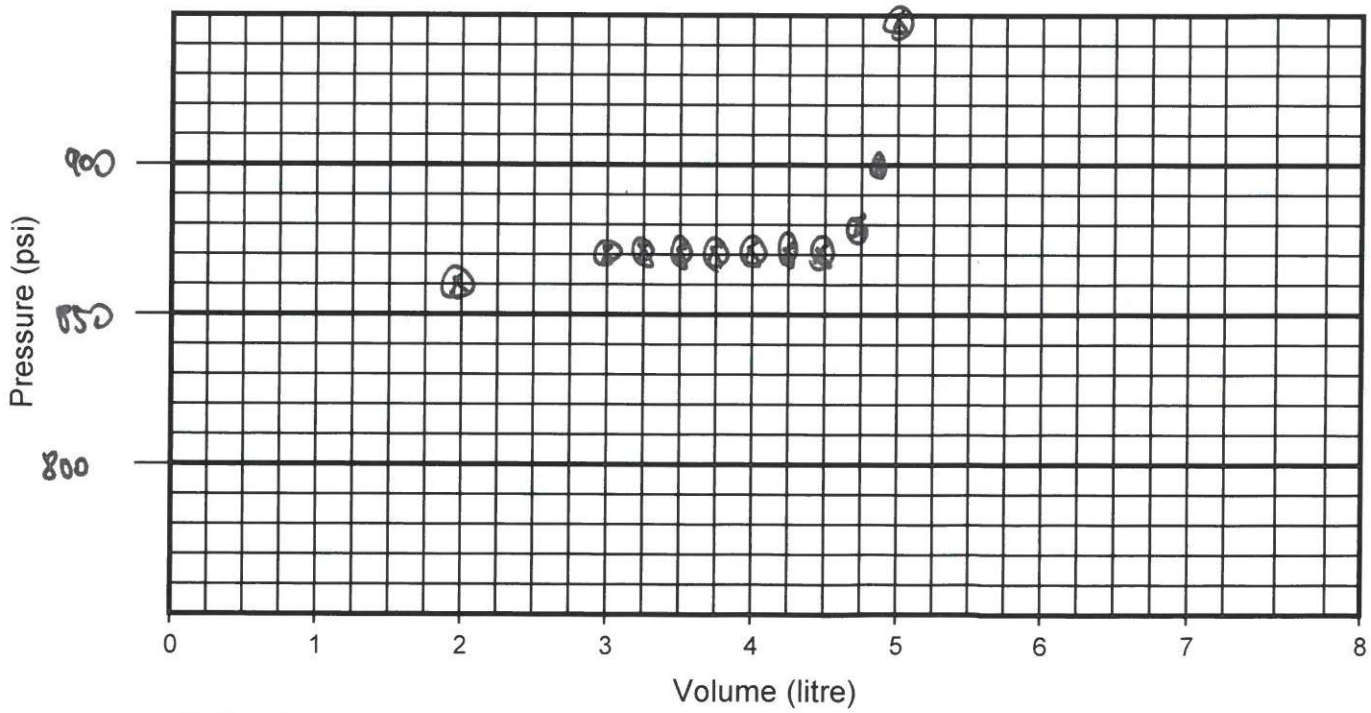
Packer No. #6 - comp 53.5/M 19503, #5 (#6) | Depth (m): 852.7 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 160 psi | Final Line Pressure, P_L: 950 psi | Tool Pressure, P_T: 700 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 100 psi

Volume, litres	1.0	2.0	3.0	3.25	3.5	3.75	4.0	4.25	4.5	4.75
Pressure, psi	780	860	870	870	870	870	870	870	870	880
Volume, litres	4.9	5.0	/	4.0						
Pressure, psi	900	950	/	0						



Comments: Packer #5
1-900
1½-870
2-860
2L

Time - 4:58 pm

Sheet 7 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: | Date Inflated: Nov 9/21

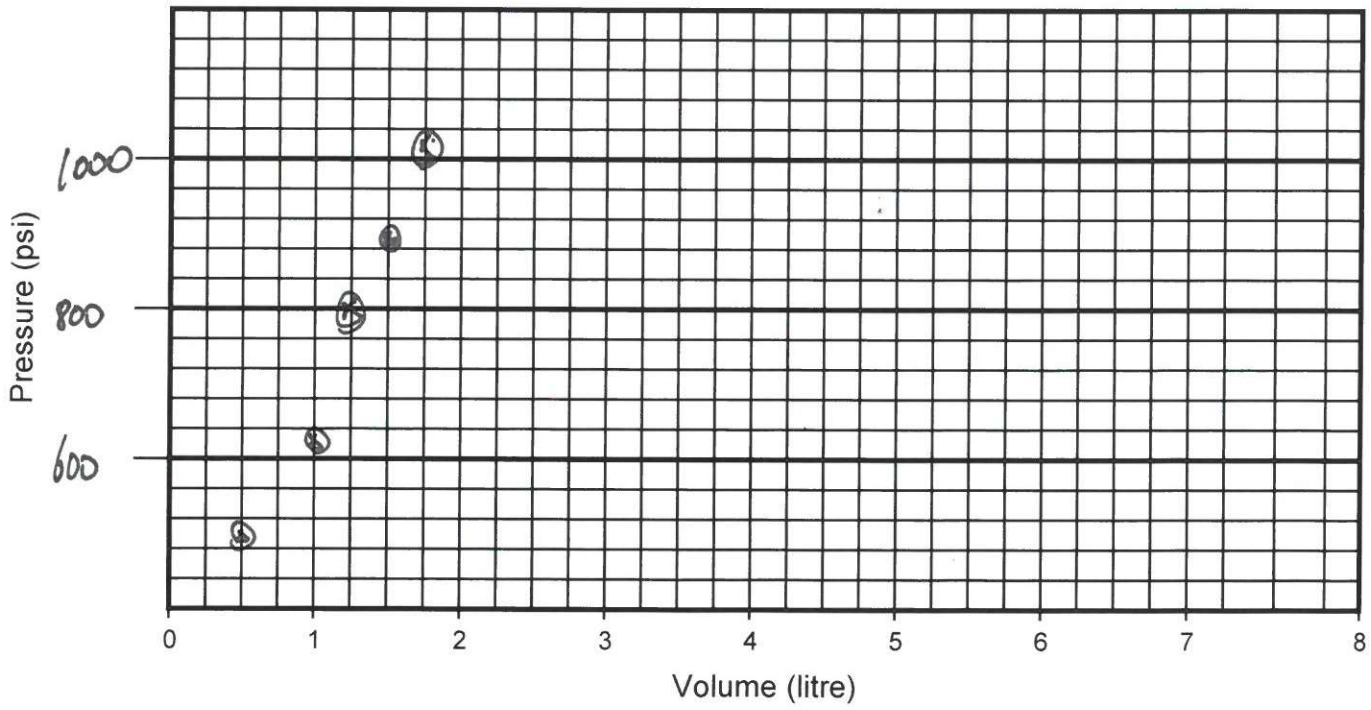
Packer No.: Blank wall | Depth (m): 799.68 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: _____ psi | Final Line Pressure, P_L: 1050 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: ~8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = _____ psi

Volume, litres	0.5	1.0	1.25	1.5	1.75	0.5				
Pressure, psi	400	650	800	940	1050	0				
Volume, litres										
Pressure, psi										



Comments: _____ Time - 13:50

Sheet 8 of 47

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 9/21

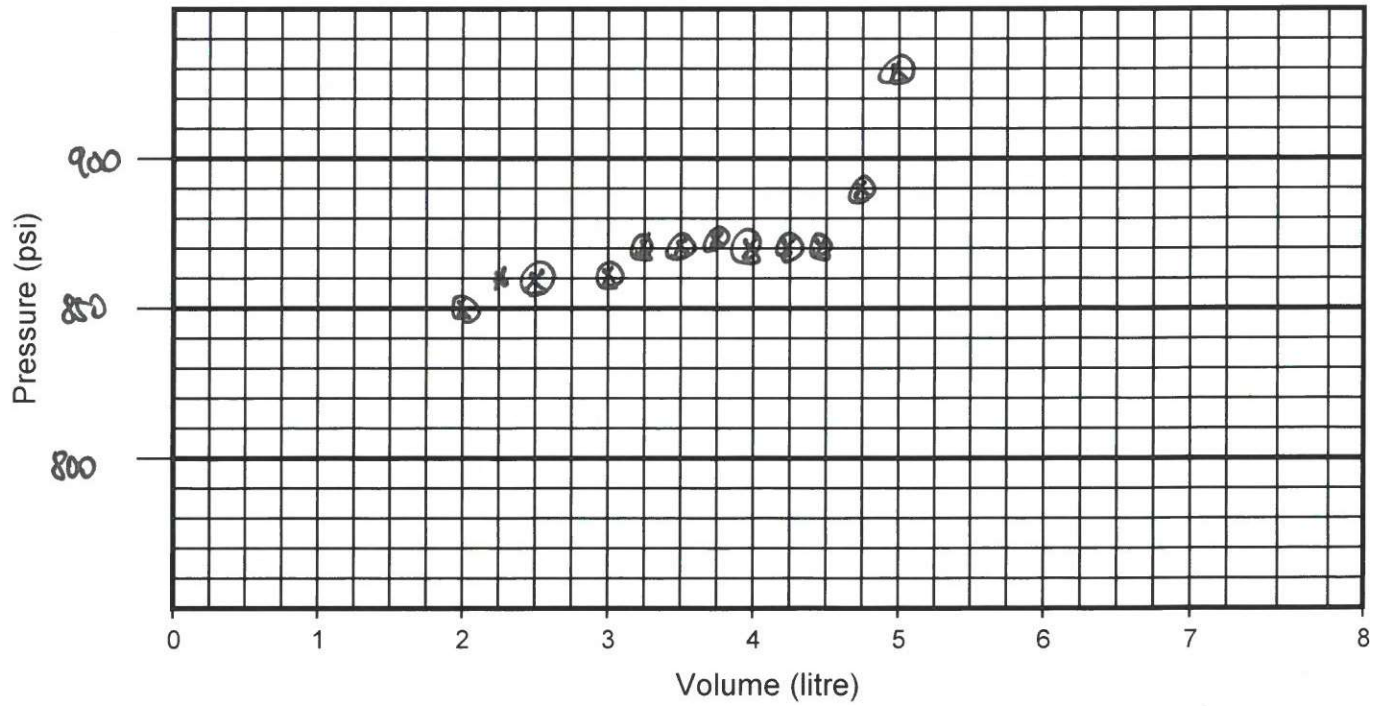
Packer No. 6, comp 73 SN# 19755 | Depth (m): 496.3 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 150 psi | Final Line Pressure, P_L: 980 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 140 psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	4.0	4.25	4.5
Pressure, psi	750	850	860	860	870	870	870	870	870	870
Volume, litres	4.75	5.0	/	4.0						
Pressure, psi	890	930	/	Ø						



Comments: Time - 2:33 pm

Sheet 9 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TH | Date Inflated: Nov 9/21

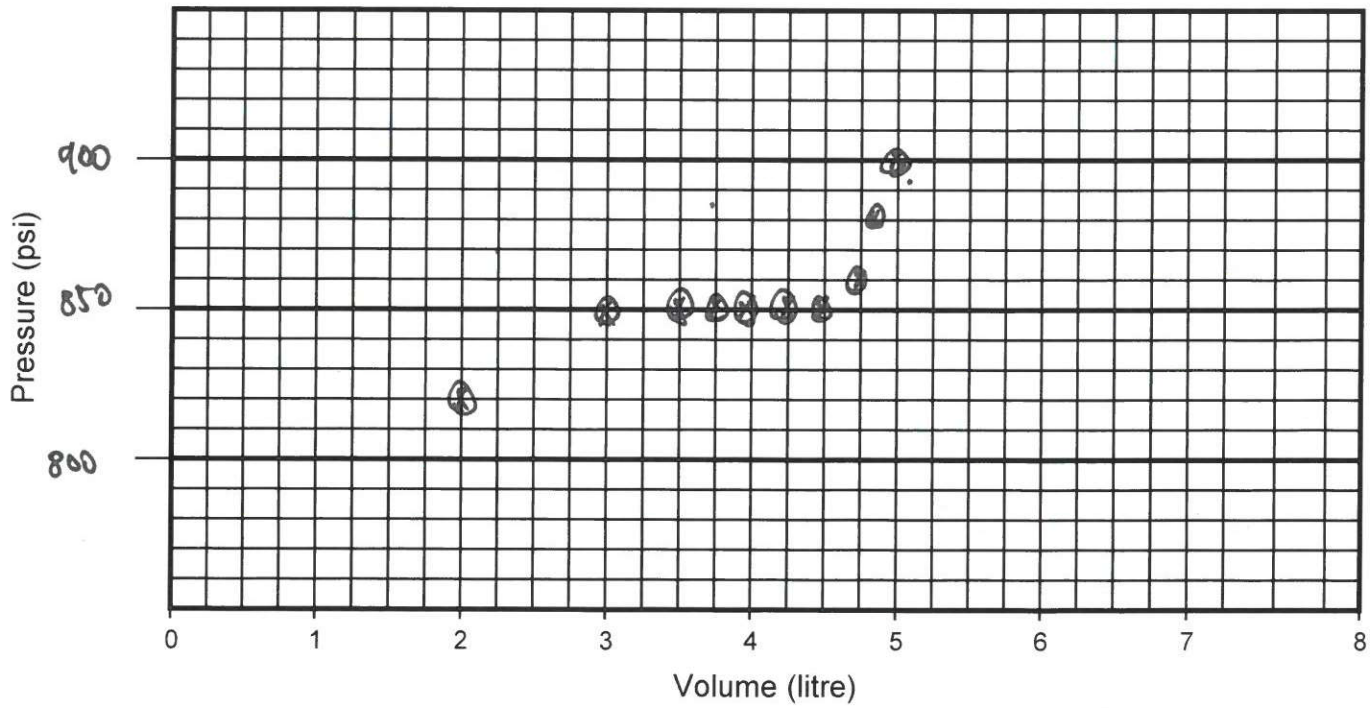
Packer No. 7, comp 79 SN# 19754 | Depth (m): 783.4 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 140 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 120 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	4.75	4.9
Pressure, psi	710	820	850	850	850	850	850	850	860	880
Volume, litres	5.0	/	4.0							
Pressure, psi	900	/	Ø							



Comments: Time - 3:13 pm

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 9/21

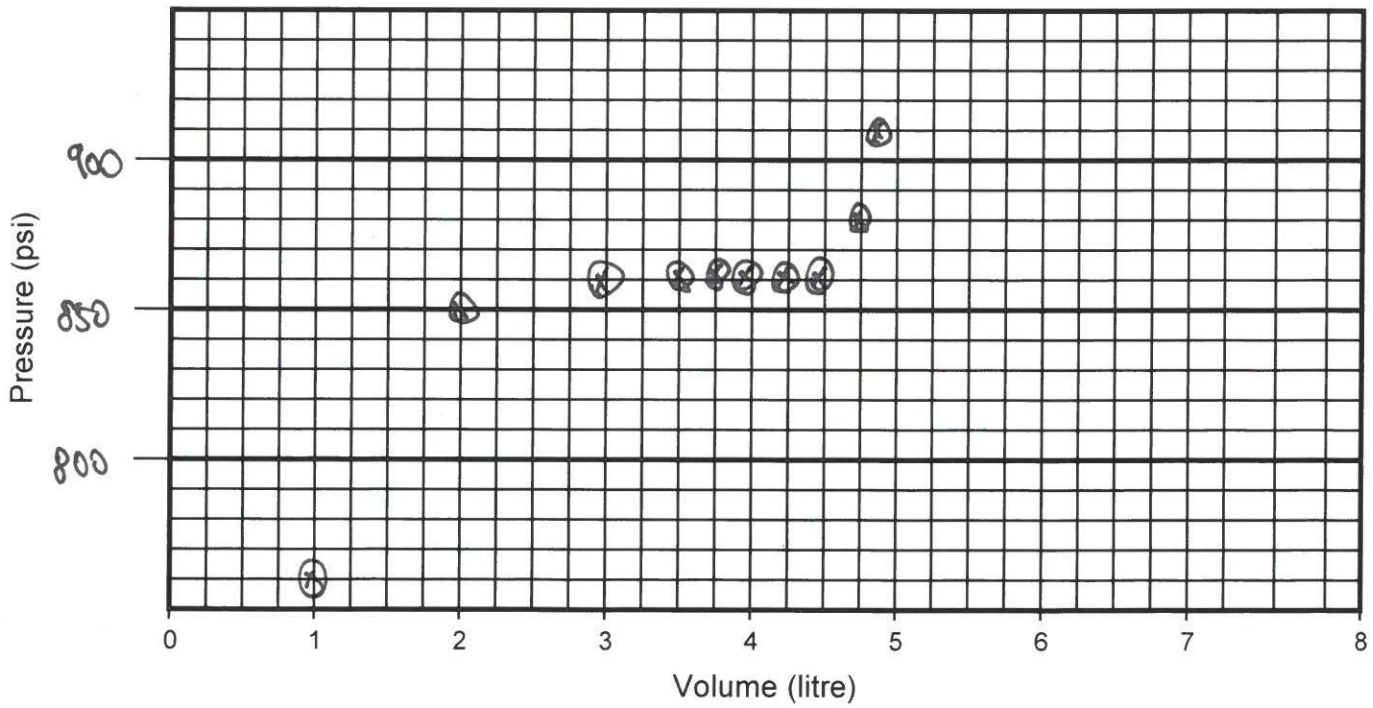
Packer No. 8.comp 97 SN# 19753 | Depth (m): 731.6 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 910 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 125 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	4.75	4.85
Pressure, psi	760	850	860	860	860	860	860	860	880	910
Volume, litres	/	3.8								
Pressure, psi	/	Ø								



Comments: Time - 3:55 pm

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 10/21

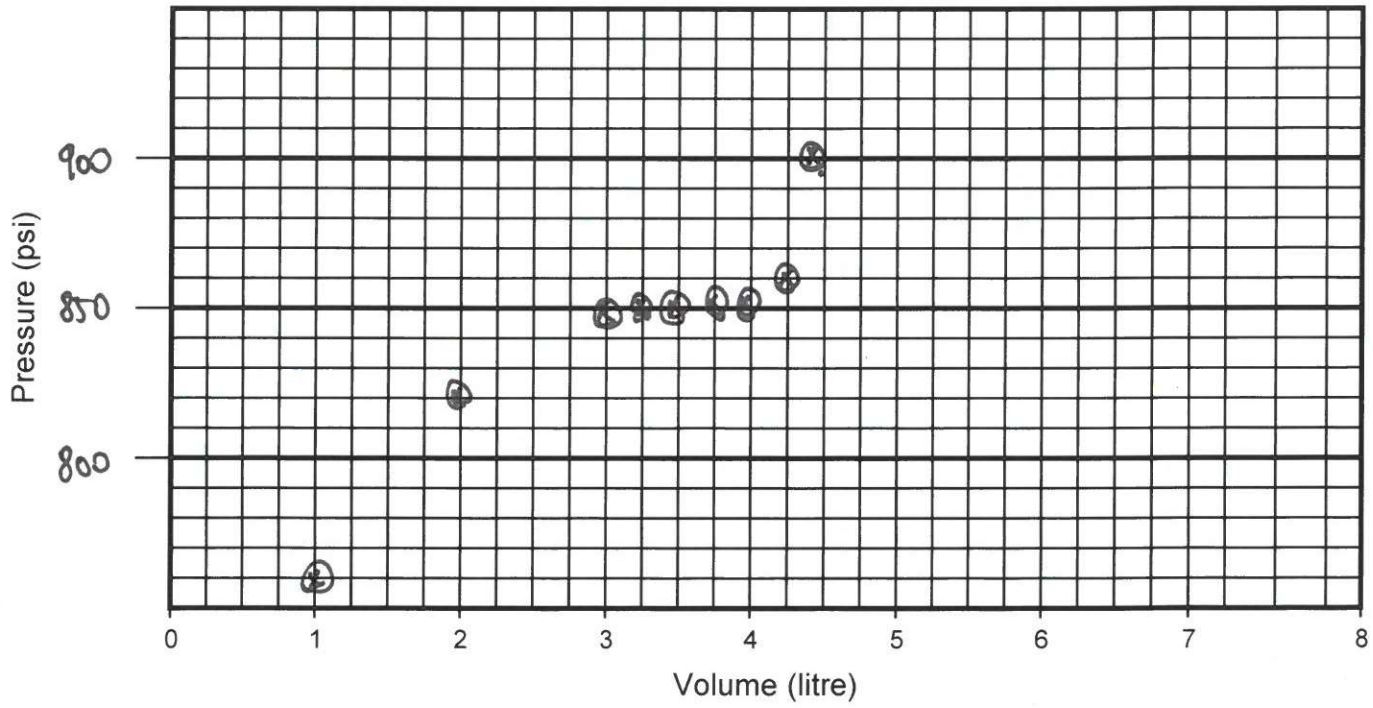
Packer No. 9, comp 117 SN# 19752 | Depth (m): 675.2 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 115 psi

Volume, litres	1.0	2.0	3.0	3.25	3.5	3.75	4.0	4.25	4.4	✓
Pressure, psi	760	820	850	850	850	850	850	860	900	✓
Volume, litres	3.6									
Pressure, psi	Ø									



Comments: Time - 12:12 pm

Sheet 12 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 10/21

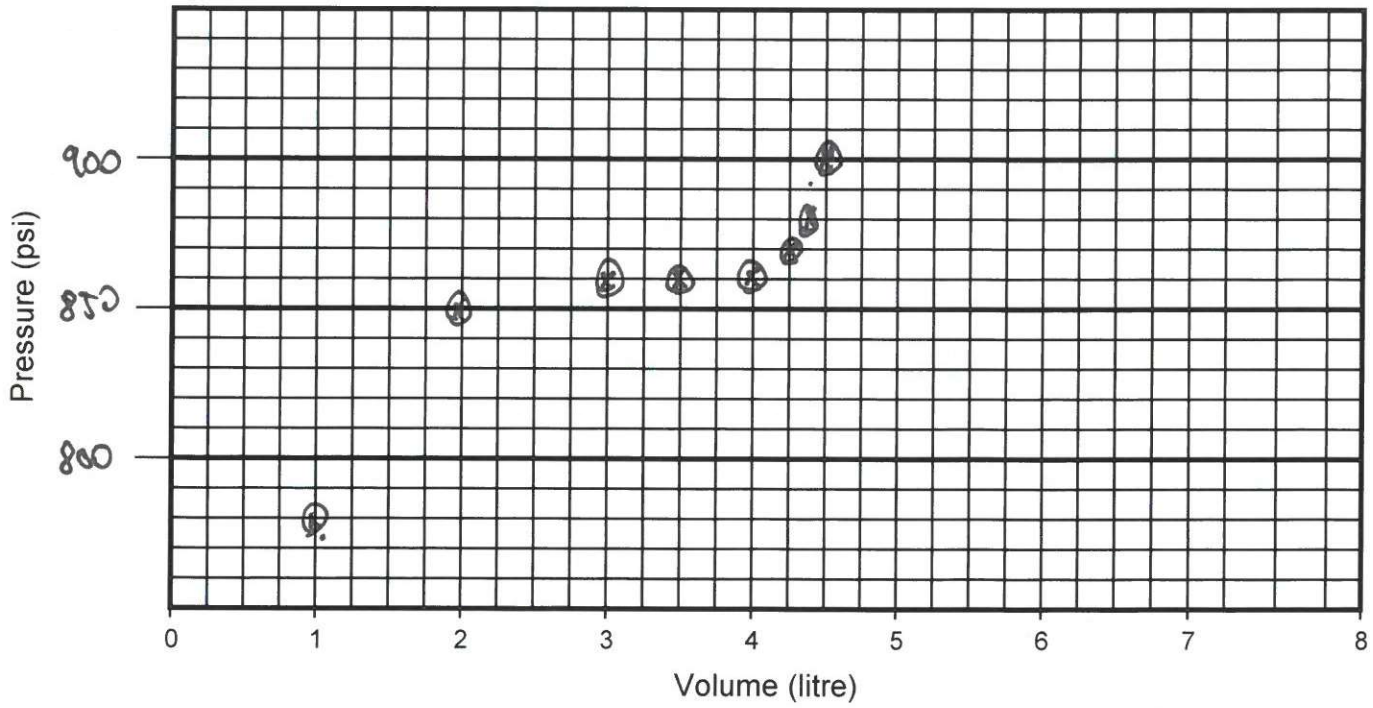
Packer No. 10, comp 133 SN# 19751 | Depth (m): 630.4 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 140 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = ~~100~~ TK 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 120 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	4.5	✓
Pressure, psi	780	850	860	860	860	860	870	880	900	✓
Volume, litres	3.7									
Pressure, psi	✓									



Comments: 900 | :40
870 | :60
860 | :75

Time - 12:44 pm

Sheet 13 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 10/21

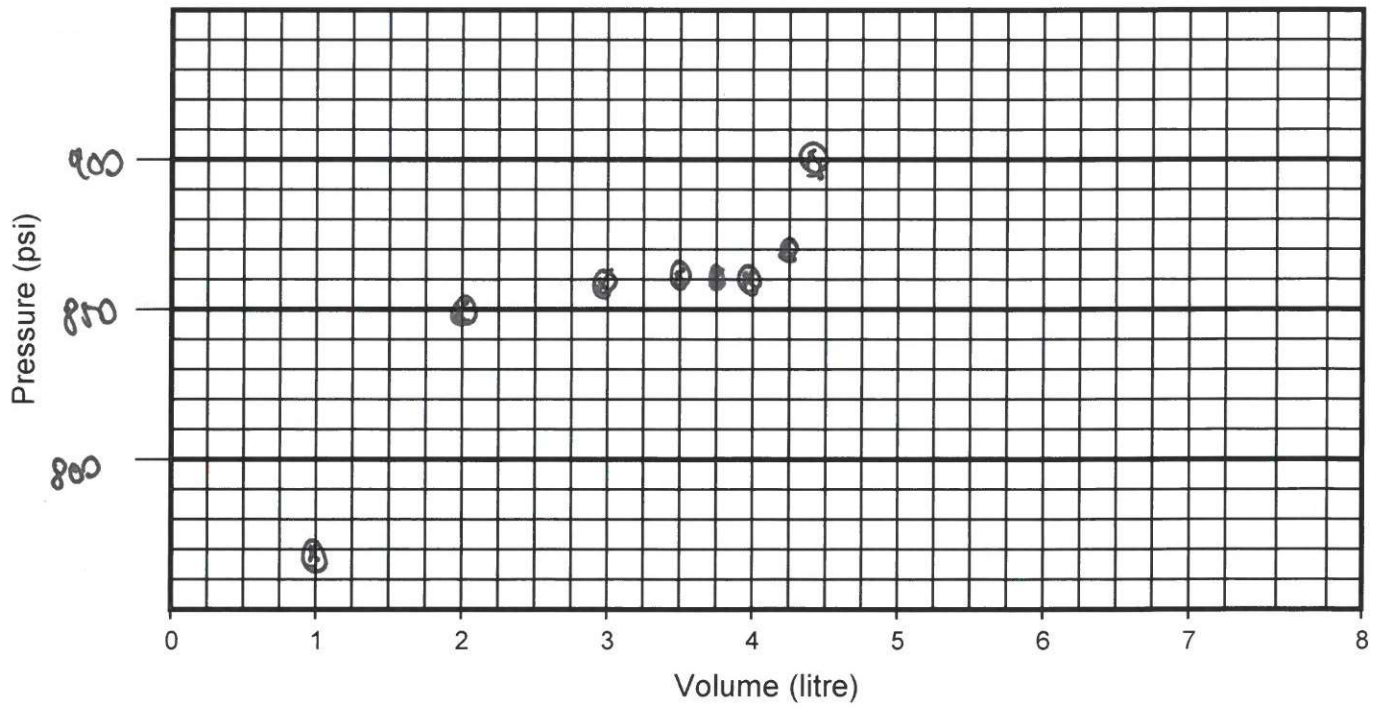
Packer No. 11, comp 137 SN# 14749 | Depth (m): 622.7 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 115 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	/	3.7
Pressure, psi	770	850	860	860	860	860	870	900	↓	∅
Volume, litres										
Pressure, psi										



Comments: Time - 1:09 pm

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 20/21

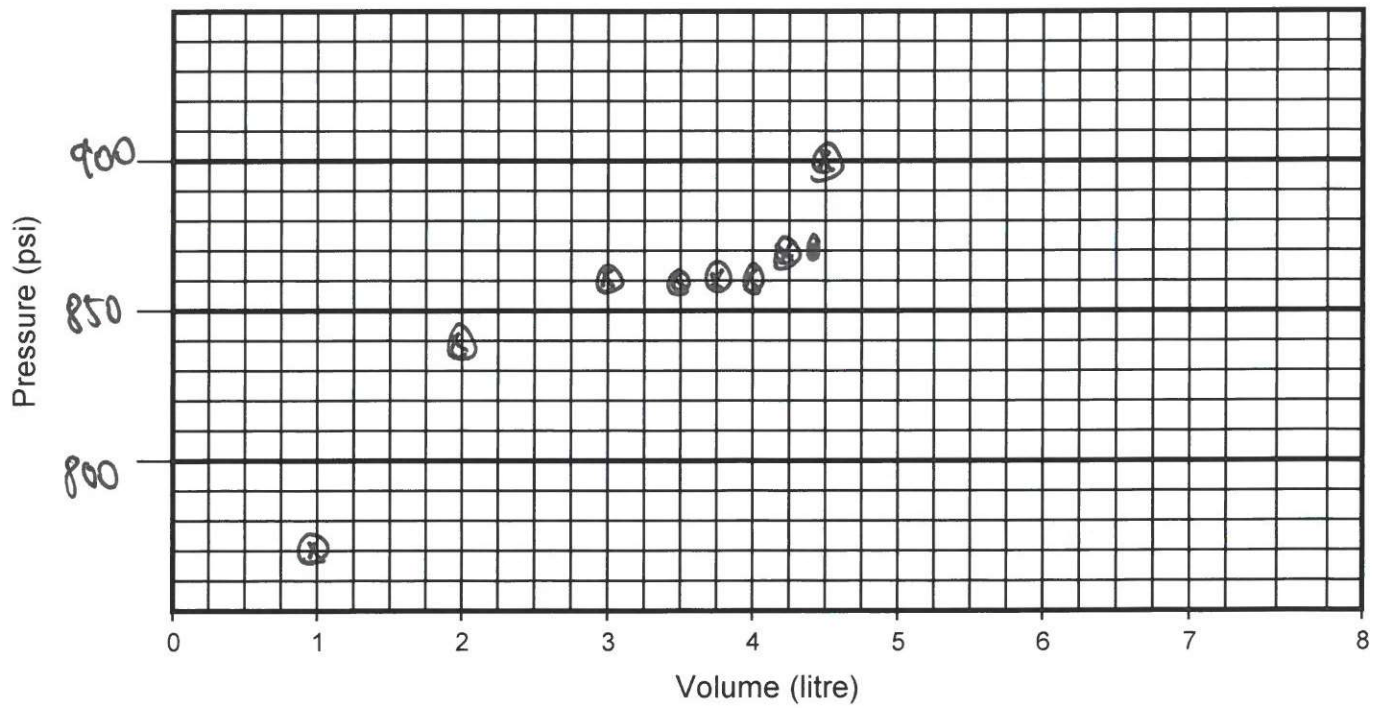
Packer No. 12, comp 151 SN# 19748 | Depth (m): 583.1 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 140 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 60 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 120 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	4.5	✓
Pressure, psi	770	840	860	860	860	860	870	870	900	✓
Volume, litres	3.75									
Pressure, psi	0									



Comments: Time - 1:51 pm

Sheet 15 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 11/21

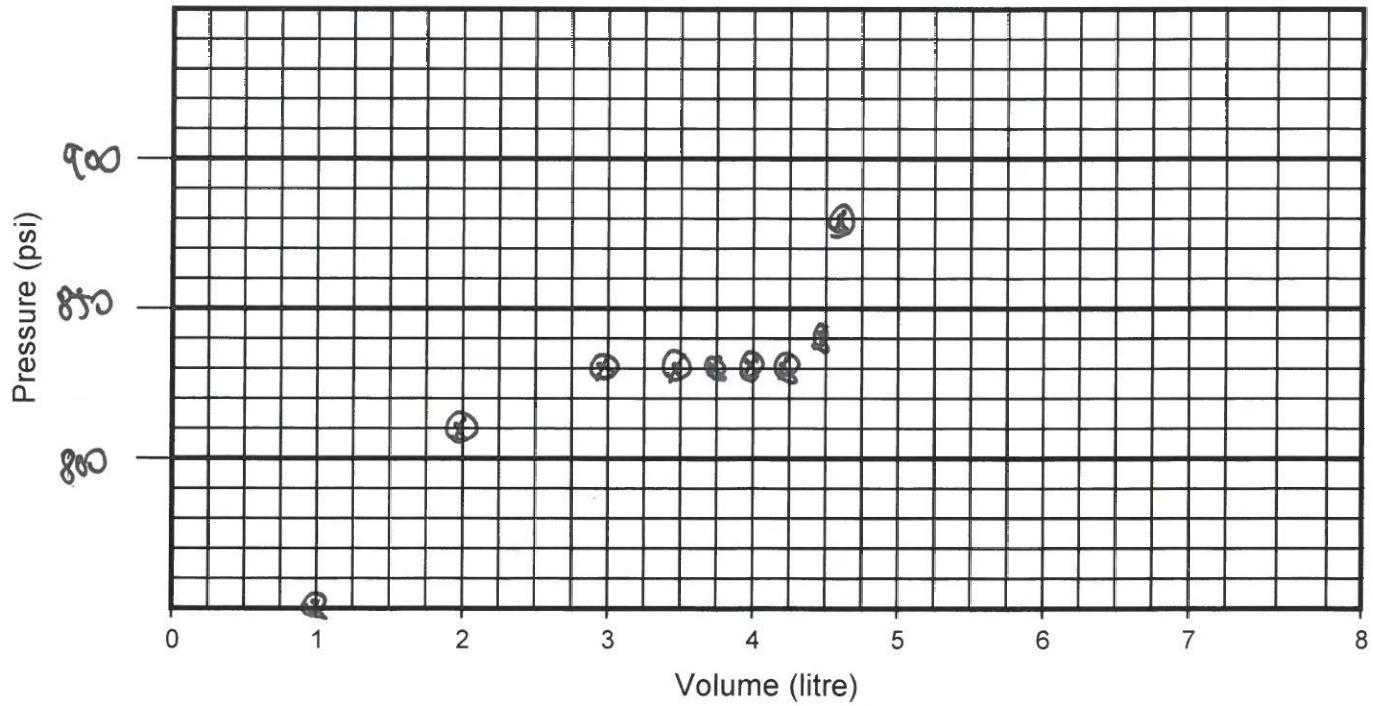
Packer No. 13, comp 167 SN# 19747 | Depth (m): 539.4 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 135 psi | Final Line Pressure, P_L: 880 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 105 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	4.6	✓
Pressure, psi	750	810	830	830	830	830	830	840	880	✓
Volume, litres	3.8									
Pressure, psi	0									



Comments: 2L 810 :60 | 3L 850 :45, 830 :60, 820 :75

Time - 11:48 am

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML / TK | Date Inflated: Nov 11/21

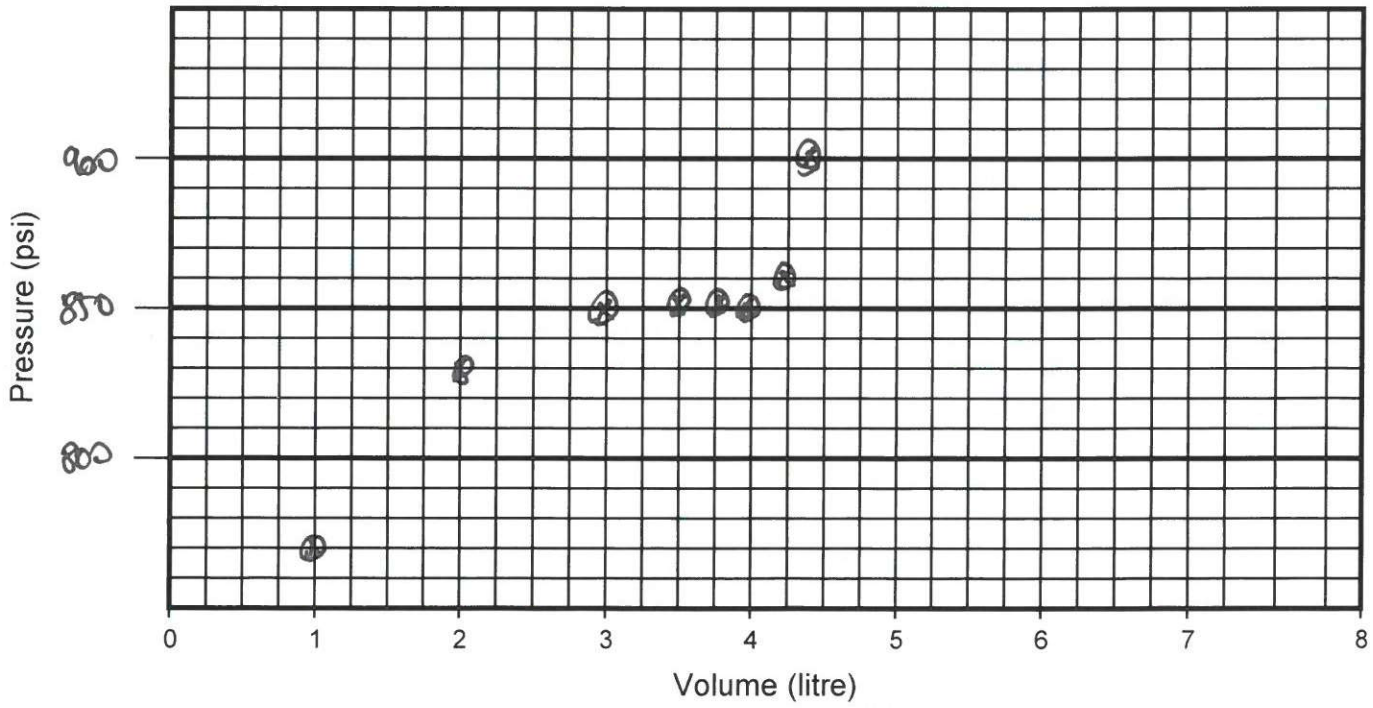
Packer No. 14, comp 186 SN# 19746 | Depth (m): 482.6 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 115. psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	✓	3.7
Pressure, psi	770	830	850	~~850~~	850	850	860	900	✓	Ø
Volume, litres				850						
Pressure, psi										



Comments: Time - 12:17pm

Sheet 17 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: MC/TK | Date Inflated: Nov 11/21

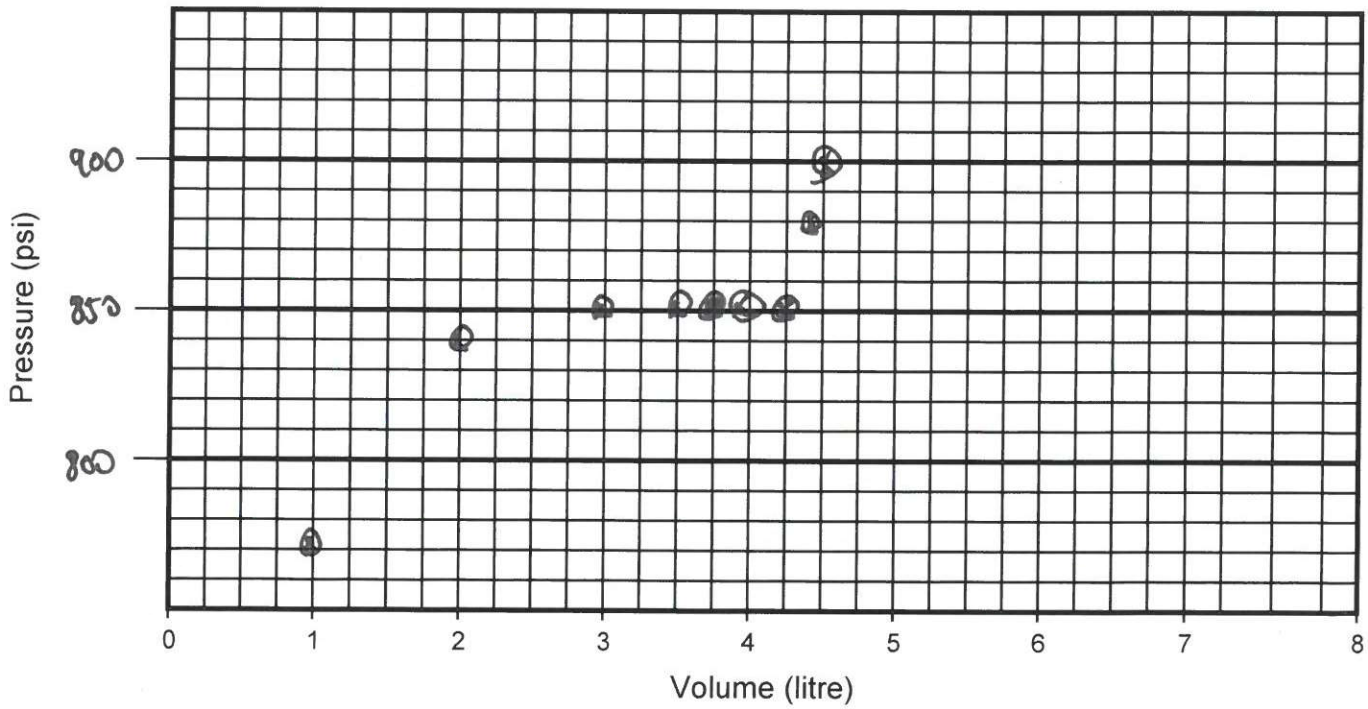
Packer No. 15, comp 207 SN# 19743 | Depth (m): 423.2 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 150 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 110 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	9.5	/
Pressure, psi	770	840	850	850	850	850	850	880	900	/
Volume, litres	3.7									
Pressure, psi	Ø									



Comments: Time - 1:33 pm

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 11/21

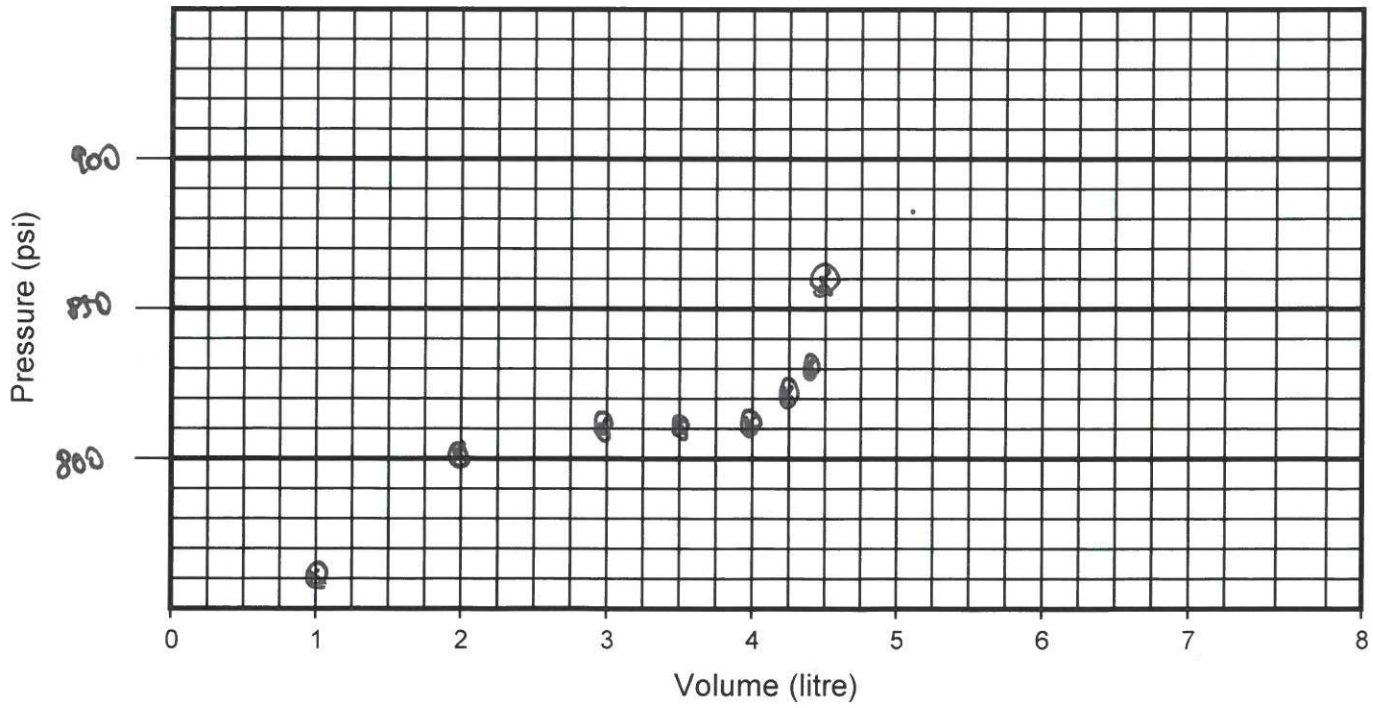
Packer No. 16, comp 226 SN# 19738 | Depth (m): | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 140 psi | Final Line Pressure, P_L: 910 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 130 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	4.5	✓
Pressure, psi	760	850	860	860	860	860	870	880	910	✓
Volume, litres	3.75									
Pressure, psi	✓									



Comments: Time - 2:03 pm

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 11/21

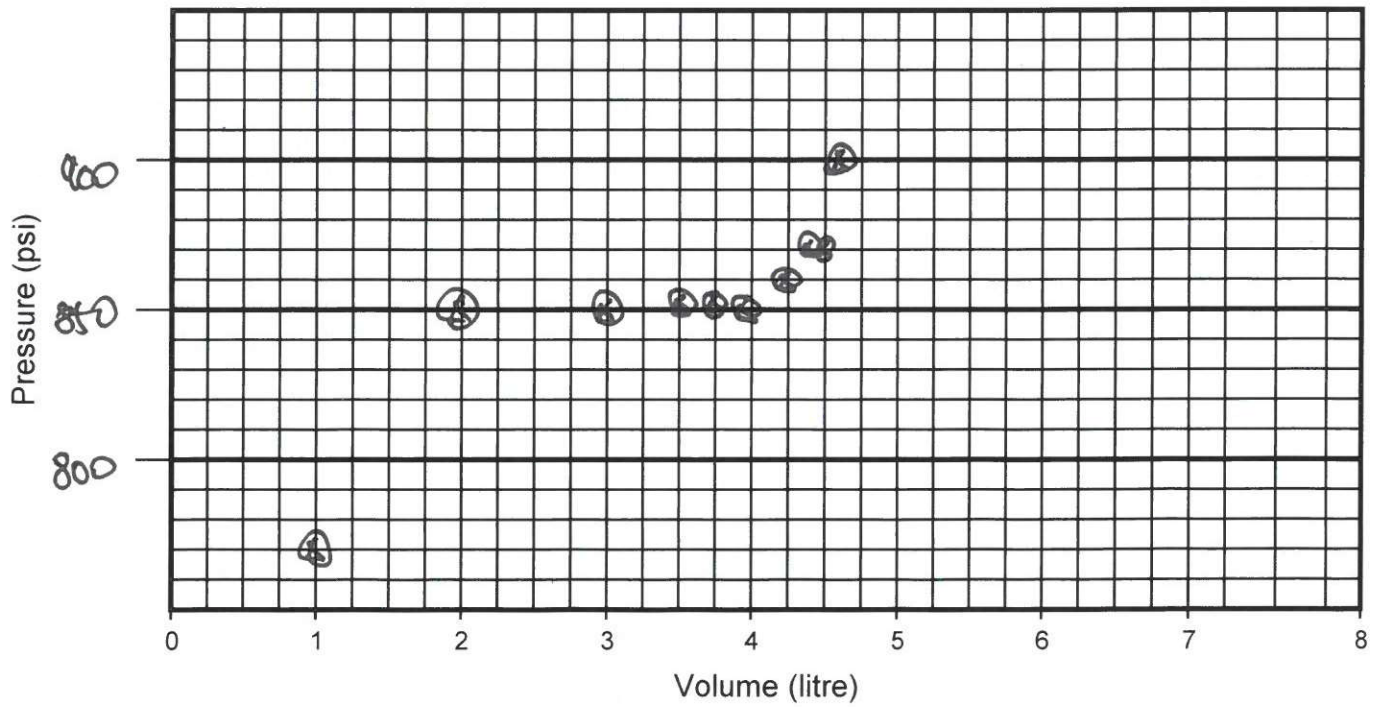
Packer No. 17, comp 243 SN#19745 | Depth (m): 322.1 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 150 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 110 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	4.5	4.6
Pressure, psi	770	850	850	850	850	850	860	870	870	900
Volume, litres	/	3.75								
Pressure, psi	/	0								



Comments: Time - 2:38 pm

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 11/21

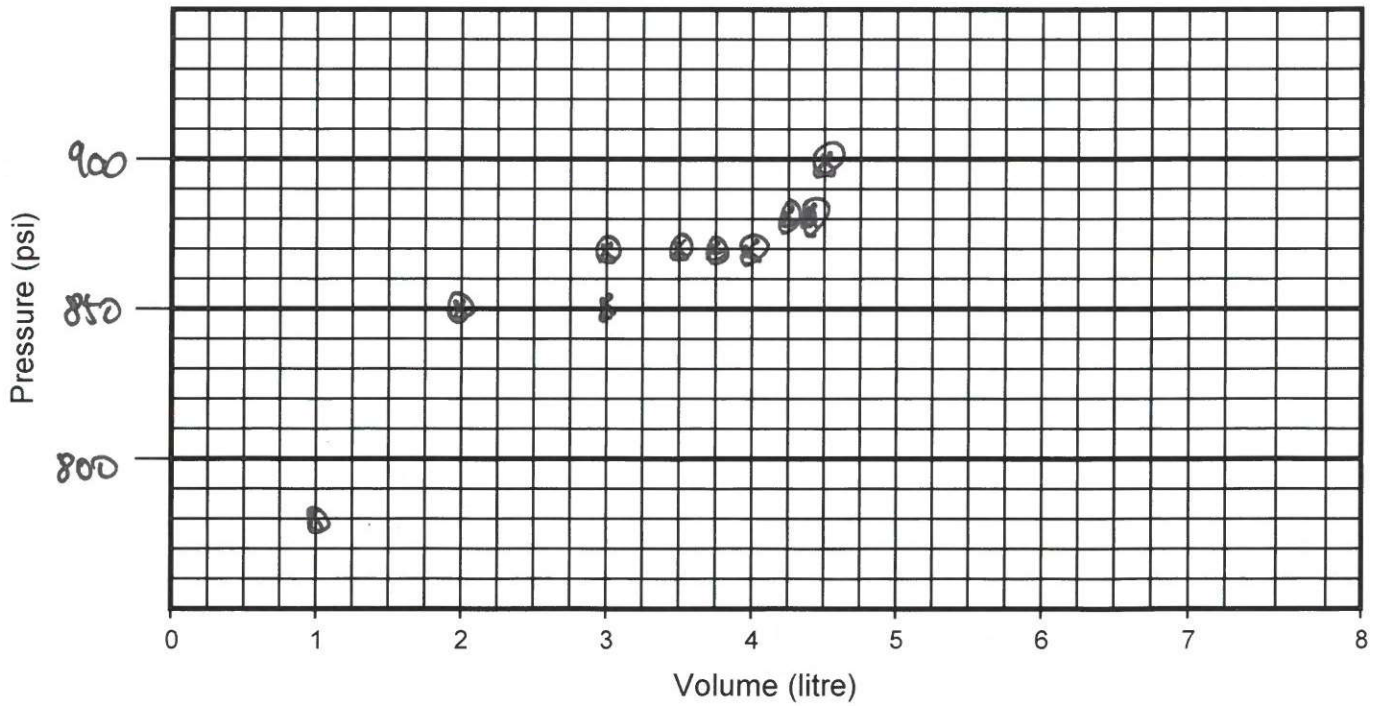
Packer No. 18, comp 249 SN#19741 | Depth (m): 308.4 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 140 psi | Final Line Pressure, P_L: 920 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.4	4.5	4.6
Pressure, psi	780	850	870	870	870	870	880	880	900	920
Volume, litres		3.75								
Pressure, psi		0								



Comments: Time - 3:04 pm

Sheet 21 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: MC/TK | Date Inflated: Nov 13/21

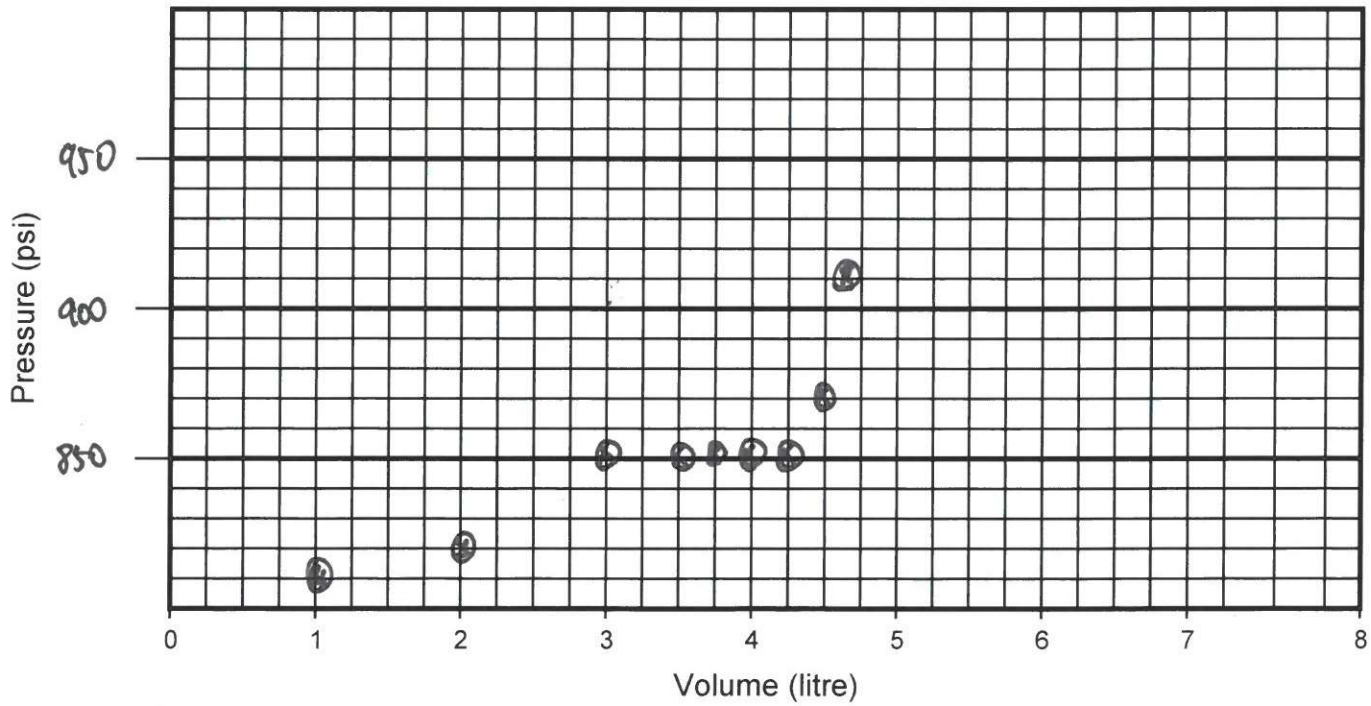
Packer No. 19, comp 266 SN#19736 | Depth (m): 259.6 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 150 psi | Final Line Pressure, P_L: 910 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 120 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	4.6	/
Pressure, psi	760	820	850	850	850	850	850	870	910	/
Volume, litres	3.75									
Pressure, psi	0									



Comments: 850 / :45
840 / :60

Time - 11:01 am

Sheet 22 of 29

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 13/21

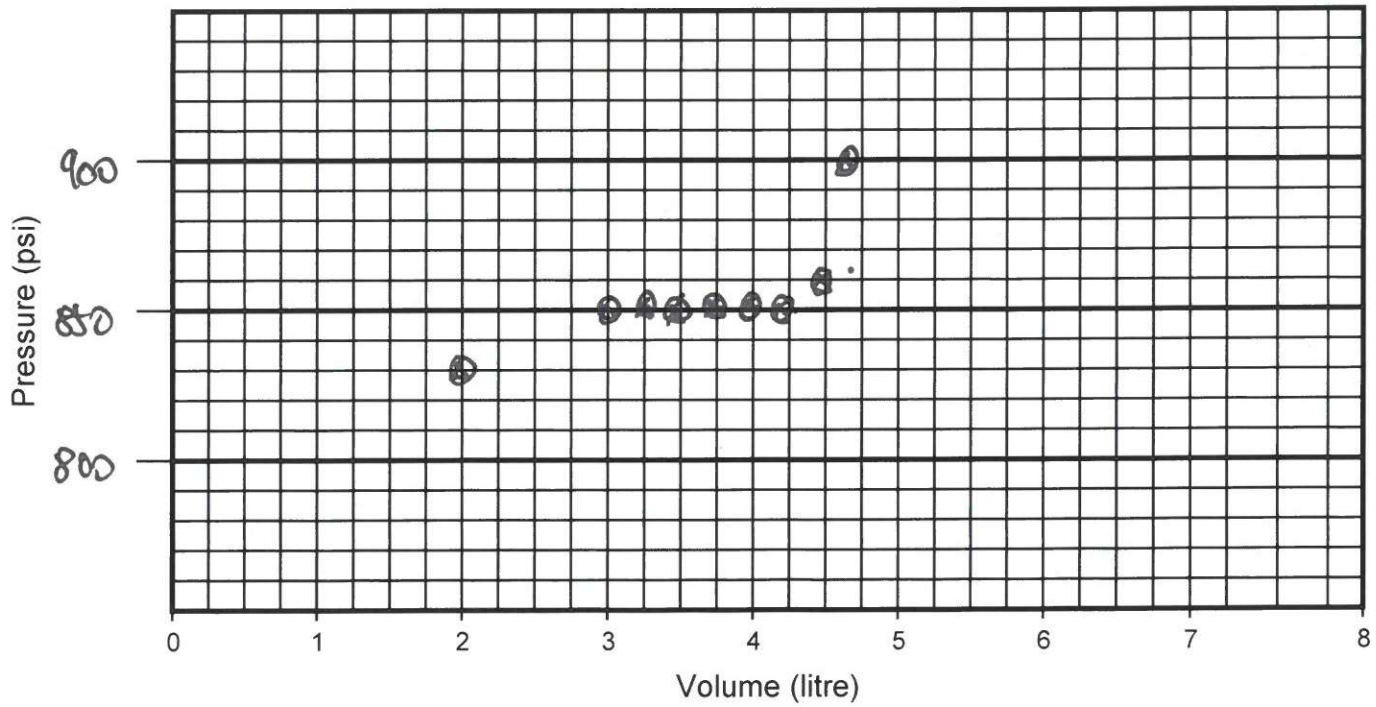
Packer No. 20, comp ~~280~~ 280 SN# 19737 | Depth (m): 221.6 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 135 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 125 psi

Volume, litres	1.0	2.0	3.0	3.25	3.5	3.75	4.0	4.25	4.5	4.6
Pressure, psi	760	830	850	850	850	850	850	850	860	900
Volume, litres	/	3.75								
Pressure, psi	/	0								



Comments: Time - 11:27 am

Sheet 23 of 29

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 13/21

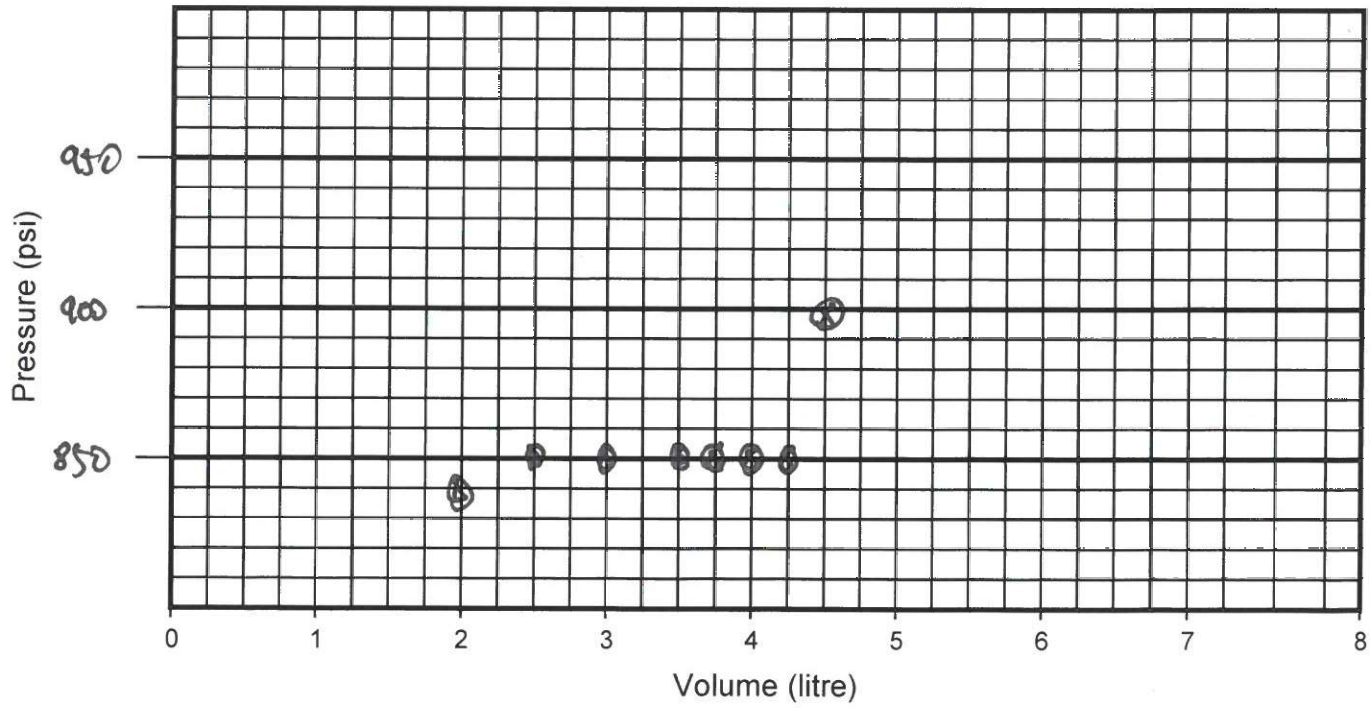
Packer No. 21, comp 296 SN# 19739 | Depth (m): 175.9 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 140 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 120 psi

Volume, litres	1.0	2.0	2.5	3.0	3.5	3.75	4.0	4.25	4.5	✓
Pressure, psi	770	840	850	850	850	850	850	850	900	✓
Volume, litres	3.75									
Pressure, psi	Ø									



Comments: Time - 12:03 pm

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 13/01

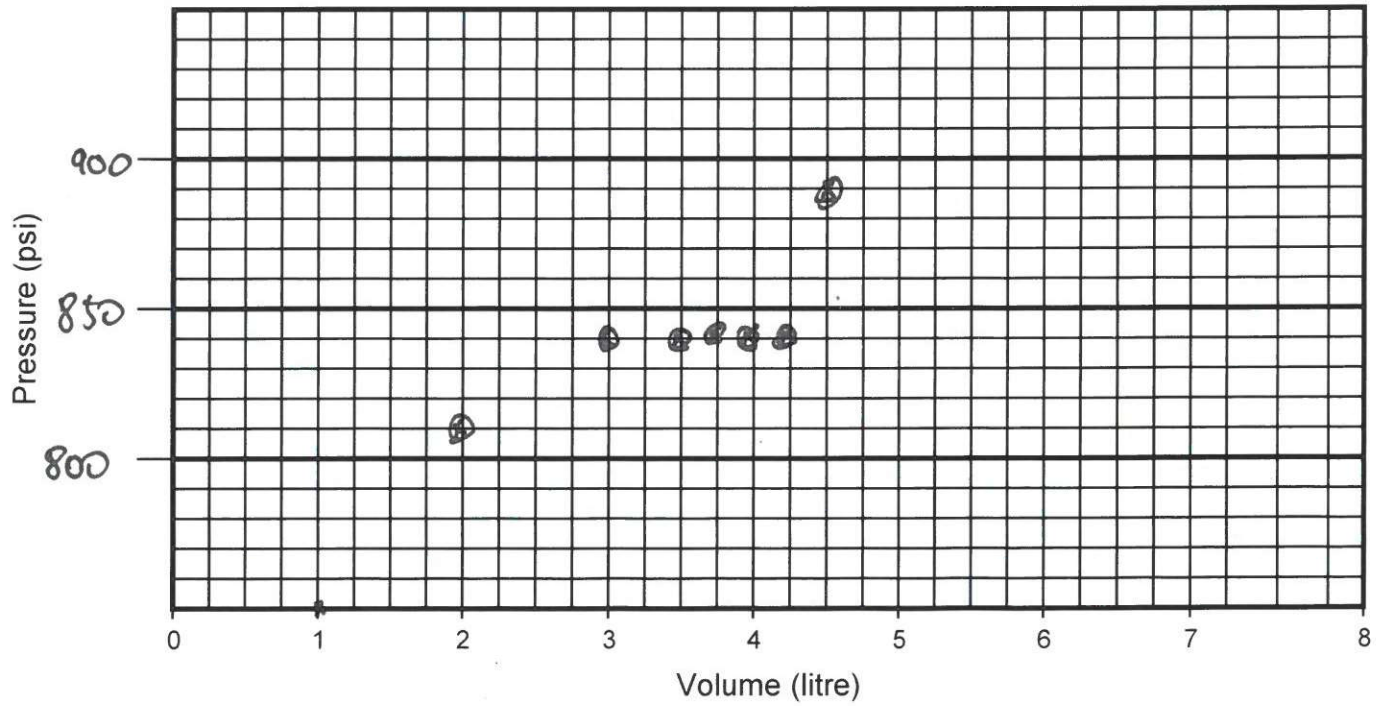
Packer No. 22, comp 306 SN#19740 | Depth (m): 151.5 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 140 psi | Final Line Pressure, P_L: 890 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 60 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 110 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	/	3.75
Pressure, psi	750	820	840	840	840	840	840	890	/	Ø
Volume, litres										
Pressure, psi										



Comments: Time - 3:40 pm

Sheet 25 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ME/TK | Date Inflated: Nov 14/21

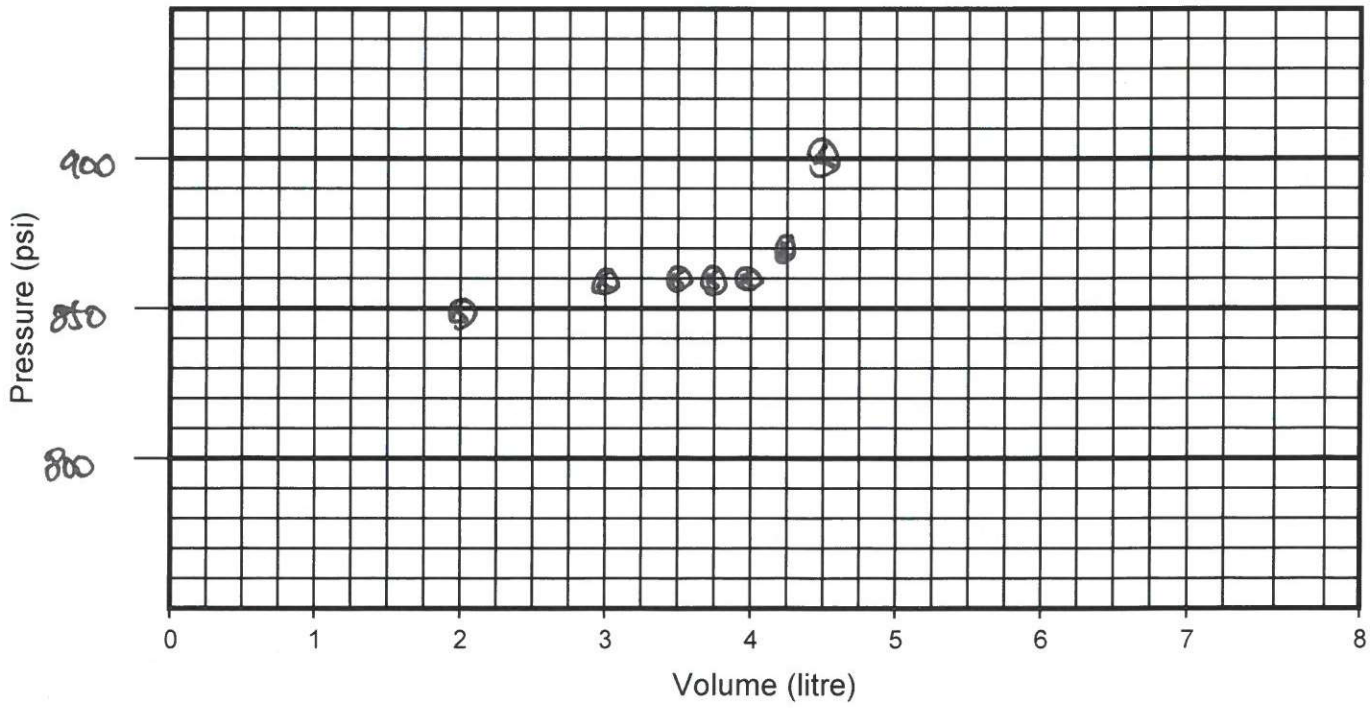
Packer No. 23, comp 327 S/N#19744 | Depth (m): 95.5 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 135 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 125 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	/	3.75
Pressure, psi	770	850	860	860	860	860	870	900	/	ø
Volume, litres										
Pressure, psi										



Comments: Time - 9:03 am

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TH | Date Inflated: Nov 14/21

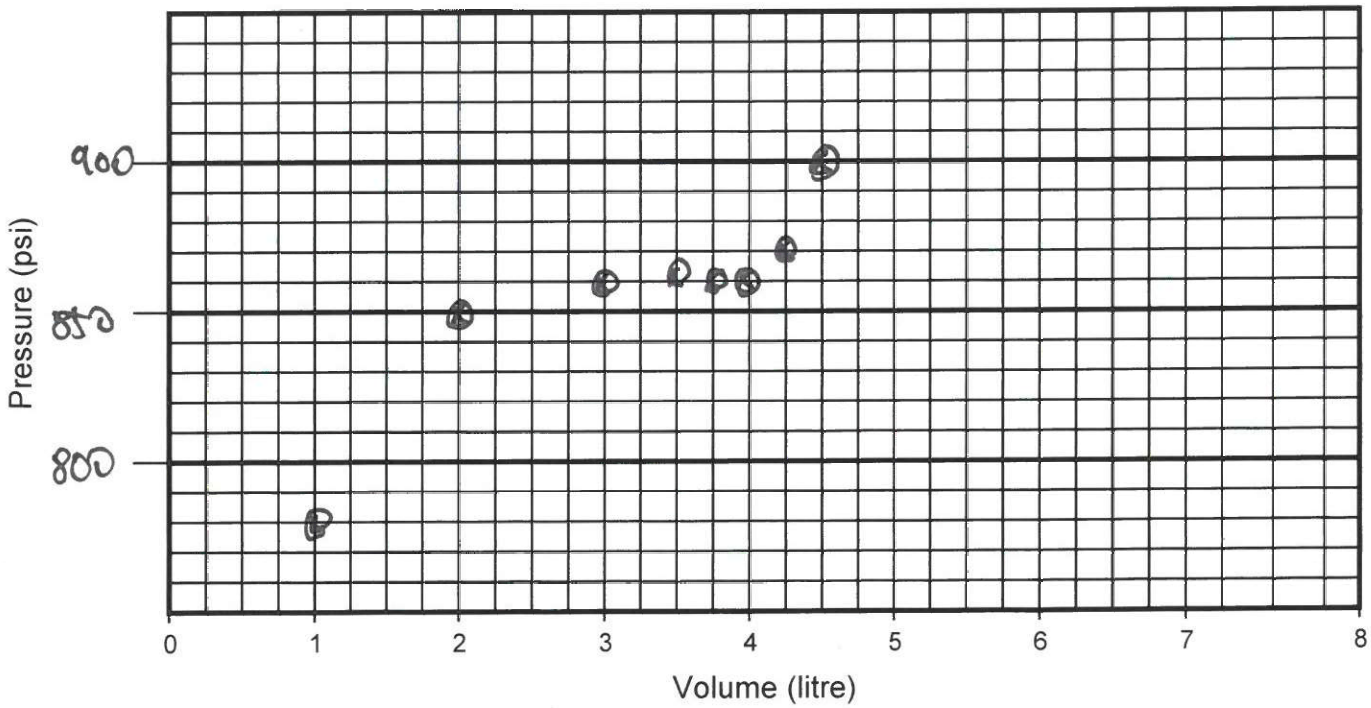
Packer No. 24, comp 331 SN# 19742 | Depth (m): 80.3 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 150 psi | Final Line Pressure, P_L: 900 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 5 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 110 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	/	3.7 3.6
Pressure, psi	780	850	860	860	860	860	870	900	/	ø
Volume, litres										
Pressure, psi										



Comments: Time - 9:23 am

Sheet 27 of 27

Westbay Packer Inflation Record

Project: Golder / NWMO | Project No.: WB981 | Well No.: IGBH-05

Location: Ignace, Ontario | Completed by: ML/TK | Date Inflated: Nov 14/21

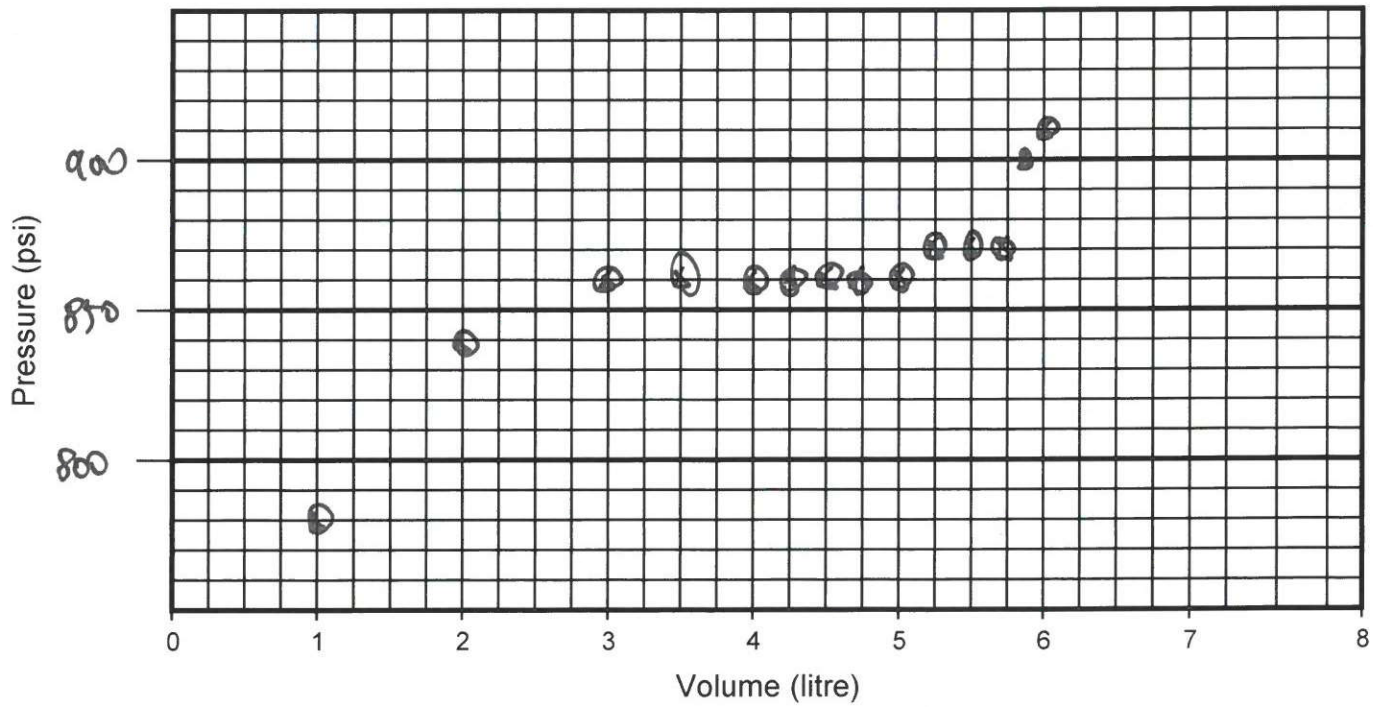
Packer No. 25, comp 339 SN# 19757 | Depth (m): 65.9 | Inflation Tool No.: TIW3197

Packer Valve Pressure, P_V: 145 psi | Final Line Pressure, P_L: 910 psi | Tool Pressure, P_T: 650 psi

Borehole Water Level: 8 (m) = 10 psi (P_W)

Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 125 psi

Volume, litres	1.0	2.0	3.0	3.5	3.75	4.0	4.25	4.5	4.75	5.0
Pressure, psi	780	840	860	860	860	860	860	860	860	860
Volume, litres	5.25	5.5	5.75	5.9	6.0	/	5.1			
Pressure, psi	870	870	870	900	910	/	Ø			



Comments: In surface casing | Time - 9:58am

APPENDIX H
IG-BH05

AS-BUILT TABLES 6 AND 7

As-Built Packer and Port Summary (Table 6) - 1 page
As-Built Tubing Summary (Table 7) - 7 pages

TABLE 6
As-Built Packer and Port Summary

Interval No.	Measurement Port Depth (m)	Pumping Port Depth (m)	Magnetic Collar Depth (m)	Top of Interval (m)	Bottom of Interval (m)	Comments
1	991.2		991.8	988.0	1000.6	
2	974.3	983.5	974.9	971.2	987.1	
3	928.6		929.2	925.4	970.3	
4	865.5		866.1	862.4	924.5	
5	857.2	858.8	857.8	854.1	861.5	
6	800.8		801.4	797.7	853.2	
7	788.0	791.0	788.6	784.8	796.8	
8	736.2		736.8	733.0	783.9	
9	679.8		680.4	676.6	732.1	
10	635.0		635.6	631.8	675.7	
11	627.3	628.8	627.9	624.1	630.9	
12	587.7		588.3	584.5	623.2	
13	542.0		542.6	538.8	583.6	
14	487.2		487.8	484.0	537.9	
15	427.8		428.4	424.6	483.1	
16	372.9		373.5	369.8	423.7	
17	326.6		327.2	323.5	368.9	
18	312.9		313.5	309.8	322.6	
19	264.2		264.8	261.0	308.9	
20	226.1		226.7	223.0	260.1	
21	180.5		181.1	177.3	222.1	
22	156.0	168.2	156.6	152.9	176.4	
23	100.1		100.7	96.9	152.0	
24	90.9	93.9	91.5	87.7	96.0	
25	70.5		71.1	67.3	86.8	

Note 1: All depth measurements are not corrected for borehole angle.
Note 2: All depth measurements in meters below ground surface along the borehole axis.
Note 3: All depth measurements use 'Nominal' casing lengths.
Note 4: Not corrected for borehole deviation or borehole temperature effects.
Note 5: All Westbay Port depth measurements to upper edge of coupling item.
Note 6: Depths for top and bottom of zone based on packer seal position.

IG_BH 05 As-Built Tubing Summary										
Item No.	Component P/N	Component S/N	Coupling P/N	Coupling S/N	Accessory P/N	Mag Collar (m)	Initial Depth (m)	Nominal Length (m)	Measured Lenghts (m)	**Final Depth (m)
366	0203						-2.01			
365	020102		0202				-1.96	0.61	N/A	-1.2
364	020102		0202				-1.35	0.61	N/A	-0.6
363	020102		0202				-0.74	0.61	N/A	0.0
362	020105		0202				-0.13	1.52	N/A	0.6
361	020105		0202				1.39	1.52	1.522	2.1
360	020105		0202				2.92	1.52	1.522	3.6
359	020110		0202		0216	5.7	4.44	3.05	3.048	5.1
358	020110		0202				7.49	3.05	3.046	8.2
357	020110		0202				10.54	3.05	3.046	11.2
356	020110		0202				13.58	3.05	3.046	14.3
355	020110		0202				16.63	3.05	3.046	17.3
354	020110		0202				19.68	3.05	3.046	20.3
353	020110		0202				22.73	3.05	3.046	23.4
352	020110		0202				25.78	3.05	3.046	26.4
351	020110		0202				28.82	3.05	3.046	29.5
350	020110		0202				31.87	3.05	3.046	32.5
349	020110		0202				34.92	3.05	3.046	35.5
348	020110		0202				37.97	3.05	3.046	38.6
347	020110		0202				41.01	3.05	3.046	41.6
346	020110		0202				44.06	3.05	3.046	44.6
345	020110		0202				47.11	3.05	3.046	47.7
344	020110		0202				50.16	3.05	3.046	50.7
343	020110		0202				53.21	3.05	3.047	53.8
342	020110		0202				56.25	3.05	3.047	56.8
341	020110		0202				59.30	3.05	3.047	59.8
340	020110		0202				62.35	3.05	3.046	62.9
339	0238	19757	0202				65.40	1.524	1.523	65.9
338	020110		0202				66.92	3.05	3.046	67.4
337	020110		0205	9500	0216	71.1	69.97	3.05	3.047	70.5
336	020102		0202				73.02	0.61	0.608	73.5
335	020110		0202				73.63	3.05	3.046	74.1
334	020110		0202				76.67	3.05	3.046	77.2
333	020110		0202				79.72	3.05	3.047	80.2
332	020110		0202				82.77	3.05	3.046	83.3
331	0238	19742	0202				85.82	1.523	1.522	86.3
330	020110		0202				87.34	3.05	3.046	87.8
329	020110		0205	9504	0216	91.5	90.39	3.05	3.046	90.9
328	020105		0206	475			93.44	1.60	1.59	93.9
327	0238	19744	0202				95.04	1.524	1.523	95.5
326	020110		0202				96.56	3.05	3.046	97.0
325	020110		0205	9506	0216	100.7	99.61	3.05	3.047	100.1
324	020105		0202				102.66	1.52	1.522	103.1
323	020102		0202				104.18	0.61	0.608	104.6
322	020102		0202				104.79	0.61	0.609	105.2
321	020110		0202				105.4	3.05	3.047	105.8
320	020110		0202				108.45	3.05	3.046	108.9
319	020110		0202				111.5	3.04	3.046	111.9
318	020110		0202				114.54	3.05	3.046	115.0
317	020110		0202				117.59	3.05	3.047	118.0
316	020110		0202				120.64	3.05	3.046	121.1
315	020110		0202				123.69	3.04	3.047	124.1
314	020110		0202				126.73	3.05	3.046	127.1
313	020110		0202				129.78	3.05	3.046	130.2
312	020110		0202				132.83	3.05	3.046	133.2

IG_BH 05 As-Built Tubing Summary										
Item No.	Component P/N	Component S/N	Coupling P/N	Coupling S/N	Accessory P/N	Mag Collar (m)	Initial Depth (m)	Nominal Length (m)	Measured Lenghts (m)	**Final Depth (m)
311	020110		0202				135.88	3.05	3.046	136.3
310	020110		0202				138.93	3.04	3.047	139.3
309	020110		0202				141.97	3.05	3.046	142.3
308	020110		0202				145.02	3.05	3.046	145.4
307	020110		0202				148.07	3.05	3.047	148.4
306	0238	19740	0202				151.12	1.52	1.523	151.5
305	020110		0202				152.64	3.05	3.047	153.0
304	020110		0205	9502	0216	156.6	155.69	3.05	3.047	156.0
303	020105		0202				158.74	1.52	1.522	159.1
302	020105		0202				160.26	1.53	1.522	160.6
301	020110		0202				161.79	3.04	3.047	162.1
300	020110		0202				164.83	3.05	3.047	165.2
299	020110		0206	474			167.88	3.13	3.128	168.2
298	020105		0202				171.01	1.52	1.522	171.3
297	020110		0202				172.53	3.05	3.047	172.9
296	0238	19739	0202				175.58	1.52	1.522	175.9
295	020110		0202				177.1	3.05	3.046	177.4
294	020110		0205	9512	0216	181.1	180.15	3.05	3.046	180.5
293	020105		0202				183.2	1.52	1.522	183.5
292	020110		0202				184.72	3.05	3.046	185.0
291	020110		0202				187.77	3.05	3.047	188.1
290	020110		0202				190.82	3.04	3.046	191.1
289	020110		0202				193.86	3.05	3.046	194.2
288	020110		0202				196.91	3.05	3.046	197.2
287	020110		0202				199.96	3.05	3.046	200.3
286	020110		0202				203.01	3.05	3.046	203.3
285	020110		0202				206.06	3.04	3.047	206.4
284	020110		0202				209.1	3.05	3.046	209.4
283	020110		0202				212.15	3.05	3.046	212.4
282	020110		0202				215.2	3.05	3.046	215.5
281	020110		0202				218.25	3.04	3.046	218.5
280	0238	19737	0202				221.29	1.53	1.522	221.6
279	020110		0202				222.82	3.05	3.046	223.1
278	020110		0205	9514	0216	226.7	225.87	3.04	3.046	226.1
277	020105		0202				228.91	1.53	1.522	229.2
276	020105		0202				230.44	1.52	1.522	230.7
275	020110		0202				231.96	3.05	3.046	232.2
274	020110		0202				235.01	3.05	3.046	235.3
273	020110		0202				238.06	3.05	3.046	238.3
272	020110		0202				241.11	3.04	3.047	241.4
271	020110		0202				244.15	3.05	3.046	244.4
270	020110		0202				247.2	3.05	3.047	247.5
269	020110		0202				250.25	3.05	3.046	250.5
268	020110		0202				253.3	3.04	3.047	253.6
267	020110		0202				256.34	3.05	3.047	256.6
266	0238	19736	0202				259.39	1.53	1.522	259.6
265	020110		0202				260.92	3.04	3.047	261.2
264	020110		0205	9510	0216	264.8	263.96	3.05	3.046	264.2
263	020105		0202				267.01	1.53	1.523	267.3
262	020110		0202				268.54	3.04	3.047	268.8
261	020110		0202				271.58	3.05	3.047	271.8
260	020110		0202				274.63	3.05	3.047	274.9
259	020110		0202				277.68	3.05	3.046	277.9
258	020110		0202				280.73	3.05	3.045	281.0
257	020110		0202				283.78	3.04	3.045	284.0
256	020110		0202				286.82	3.05	3.045	287.0
255	020110		0202				289.87	3.05	3.046	290.1
254	020110		0202				292.92	3.05	3.046	293.1

IG_BH 05 As-Built Tubing Summary										
Item No.	Component P/N	Component S/N	Coupling P/N	Coupling S/N	Accessory P/N	Mag Collar (m)	Initial Depth (m)	Nominal Length (m)	Measured Lenghts (m)	**Final Depth (m)
253	020110		0202				295.97	3.04	3.046	296.2
252	020110		0202				299.01	3.05	3.046	299.2
251	020110		0202				302.06	3.05	3.046	302.3
250	020110		0202				305.11	3.05	3.046	305.3
249	0238	19741	0202				308.16	1.52	1.523	308.4
248	020110		0202				309.68	3.05	3.045	309.9
247	020110		0205	9508	0216	313.5	312.73	3.05	3.046	312.9
246	020105		0202				315.78	1.52	1.523	316.0
245	020105		0202				317.3	1.53	1.523	317.5
244	020110		0202				318.83	3.04	3.046	319.0
243	0238	19745	0202				321.87	1.53	1.523	322.1
242	020110		0202				323.4	3.05	3.045	323.6
241	020110		0205	9513	0216	327.2	326.45	3.04	3.046	326.6
240	020105		0202				329.49	1.53	1.523	329.7
239	020102		0202				331.02	0.61	0.608	331.2
238	020110		0202				331.63	3.04	3.046	331.8
237	020110		0202				334.67	3.05	3.046	334.9
236	020110		0202				337.72	3.05	3.046	337.9
235	020110		0202				340.77	3.05	3.045	341.0
234	020110		0202				343.82	3.05	3.046	344.0
233	020110		0202				346.87	3.04	3.046	347.0
232	020110		0202				349.91	3.05	3.046	350.1
231	020110		0202				352.96	3.05	3.046	353.1
230	020110		0202				356.01	3.05	3.046	356.2
229	020110		0202				359.06	3.05	3.046	359.2
228	020110		0202				362.11	3.04	3.046	362.3
227	020110		0202				365.15	3.05	3.046	365.3
226	0238	19738	0202				368.20	1.52	1.523	368.4
225	020110		0202				369.72	3.05	3.046	369.9
224	020110		0205	9511	0216	373.5	372.77	3.05	3.046	372.9
223	020105		0202				375.82	1.52	1.522	376.0
222	020110		0202				377.34	3.05	3.046	377.5
221	020110		0202				380.39	3.05	3.046	380.5
220	020110		0202				383.44	3.05	3.046	383.6
219	020110		0202				386.49	3.05	3.046	386.6
218	020110		0202				389.54	3.04	3.047	389.7
217	020110		0202				392.58	3.05	3.046	392.7
216	020110		0202				395.63	3.05	3.047	395.8
215	020110		0202				398.68	3.05	3.046	398.8
214	020110		0202				401.73	3.05	3.046	401.9
213	020110		0202				404.78	3.04	3.046	404.9
212	020110		0202				407.82	3.05	3.046	408.0
211	020110		0202				410.87	3.05	3.047	411.0
210	020110		0202				413.92	3.05	3.047	414.1
209	020110		0202				416.97	3.04	3.046	417.1
208	020110		0202				420.01	3.05	3.047	420.1
207	0238	19743	0202				423.06	1.53	1.523	423.2
206	020110		0202				424.59	3.04	3.047	424.7
205	020110		0205	9509	0216	428.4	427.63	3.05	3.047	427.8
204	020105		0202				430.68	1.53	1.522	430.8
203	020105		0202				432.21	1.52	1.522	432.3
202	020110		0202				433.73	3.05	3.047	433.9
201	020110		0202				436.78	3.05	3.047	436.9
200	020110		0202				439.83	3.04	3.047	440.0
199	020110		0202				442.87	3.05	3.046	443.0
198	020110		0202				445.92	3.05	3.046	446.0
197	020110		0202				448.97	3.05	3.046	449.1
196	020110		0202				452.02	3.04	3.046	452.1

IG_BH 05 As-Built Tubing Summary										
Item No.	Component P/N	Component S/N	Coupling P/N	Coupling S/N	Accessory P/N	Mag Collar (m)	Initial Depth (m)	Nominal Length (m)	Measured Lenghts (m)	**Final Depth (m)
195	020110		0202				455.06	3.05	3.046	455.2
194	020110		0202				458.11	3.05	3.046	458.2
193	020110		0202				461.16	3.05	3.046	461.3
192	020110		0202				464.21	3.05	3.046	464.3
191	020110		0202				467.26	3.04	3.046	467.4
190	020110		0202				470.30	3.05	3.047	470.4
189	020110		0202				473.35	3.05	3.047	473.4
188	020110		0202				476.40	3.05	3.047	476.5
187	020110		0202				479.45	3.05	3.046	479.5
186	0238	19746	0202				482.50	1.52	1.522	482.6
185	020110		0202				484.02	3.05	3.046	484.1
184	020110		0205	9507	0216	487.8	487.07	3.05	3.047	487.2
183	020105		0202				490.12	1.52	1.522	490.2
182	020110		0202				491.64	3.05	3.047	491.7
181	020110		0202				494.69	3.04	3.047	494.8
180	020110		0202				497.73	3.05	3.047	497.8
179	020110		0202				500.78	3.05	3.046	500.9
178	020110		0202				503.83	3.05	3.046	503.9
177	020110		0202				506.88	3.05	3.046	507.0
176	020110		0202				509.93	3.04	3.046	510.0
175	020110		0202				512.97	3.05	3.047	513.0
174	020110		0202				516.02	3.05	3.047	516.1
173	020110		0202				519.07	3.05	3.047	519.1
172	020110		0202				522.12	3.05	3.047	522.2
171	020110		0202				525.17	3.04	3.047	525.2
170	020110		0202				528.21	3.05	3.046	528.3
169	020110		0202				531.26	3.05	3.047	531.3
168	020110		0202				534.31	3.05	3.046	534.4
167	0238	19747	0202				537.36	1.52	1.522	537.4
166	020110		0202				538.88	3.05	3.047	538.9
165	020110		0205	9516	0216	542.6	541.93	3.05	3.047	542.0
164	020105		0202				544.98	1.52	1.522	545.0
163	020110		0202				546.50	3.05	3.047	546.6
162	020110		0202				549.55	3.05	3.047	549.6
161	020110		0202				552.60	3.04	3.047	552.7
160	020110		0202				555.64	3.05	3.047	555.7
159	020110		0202				558.69	3.05	3.047	558.7
158	020110		0202				561.74	3.05	3.047	561.8
157	020110		0202				564.79	3.05	3.047	564.8
156	020110		0202				567.84	3.04	3.046	567.9
155	020110		0202				570.88	3.05	3.047	570.9
154	020110		0202				573.93	3.05	3.046	574.0
153	020110		0202				576.98	3.05	3.046	577.0
152	020110		0202				580.03	3.04	3.047	580.1
151	0238	19748	0202				583.07	1.53	1.522	583.1
150	020110		0202				584.60	3.05	3.047	584.6
149	020110		0205	9517	0216	588.3	587.65	3.04	3.046	587.7
148	020105		0202				590.69	1.53	1.522	590.7
147	020110		0202				592.22	3.05	3.047	592.3
146	020110		0202				595.27	3.04	3.046	595.3
145	020110		0202				598.31	3.05	3.046	598.4
144	020110		0202				601.36	3.05	3.047	601.4
143	020110		0202				604.41	3.05	3.047	604.5
142	020110		0202				607.46	3.05	3.047	607.5
141	020110		0202				610.51	3.04	3.046	610.5
140	020110		0202				613.55	3.05	3.046	613.6
139	020110		0202				616.60	3.05	3.046	616.6
138	020110		0202				619.65	3.05	3.046	619.7

IG_BH 05 As-Built Tubing Summary										
Item No.	Component P/N	Component S/N	Coupling P/N	Coupling S/N	Accessory P/N	Mag Collar (m)	Initial Depth (m)	Nominal Length (m)	Measured Lenghts (m)	**Final Depth (m)
137	0238	19749	0202				622.70	1.52	1.523	622.7
136	020110		0202				624.22	3.05	3.047	624.3
135	020105		0205	9499	0216	627.9	627.27	1.52	1.522	627.3
134	020105		0206	472			628.79	1.60	1.599	628.8
133	0238	19751	0202				630.39	1.53	1.523	630.4
132	020110		0202				631.92	3.04	3.046	632.0
131	020110		0205	9315	0216	635.6	634.96	3.05	3.047	635.0
130	020102		0202				638.01	0.61	0.607	638.0
129	020110		0202				638.62	3.05	3.047	638.7
128	020110		0202				641.67	3.05	3.047	641.7
127	020110		0202				644.72	3.05	3.047	644.7
126	020110		0202				647.77	3.04	3.046	647.8
125	020110		0202				650.81	3.05	3.047	650.8
124	020110		0202				653.86	3.05	3.047	653.9
123	020110		0202				656.91	3.05	3.047	656.9
122	020110		0202				659.96	3.04	3.046	660.0
121	020110		0202				663.00	3.05	3.046	663.0
120	020110		0202				666.05	3.05	3.046	666.1
119	020110		0202				669.10	3.05	3.047	669.1
118	020110		0202				672.15	3.05	3.047	672.2
117	0238	19752	0202				675.20	1.52	1.523	675.2
116	020110		0202				676.72	3.05	3.046	676.7
115	020110		0205	9519	0216	680.4	679.77	3.05	3.046	679.8
114	020105		0202				682.82	1.52	1.522	682.8
113	020105		0202				684.34	1.52	1.522	684.4
112	020110		0202				685.86	3.05	3.046	685.9
111	020110		0202				688.91	3.05	3.046	688.9
110	020110		0202				691.96	3.05	3.046	692.0
109	020110		0202				695.01	3.04	3.046	695.0
108	020110		0202				698.05	3.05	3.046	698.1
107	020110		0202				701.10	3.05	3.046	701.1
106	020110		0202				704.15	3.05	3.045	704.2
105	020110		0202				707.20	3.05	3.046	707.2
104	020110		0202				710.25	3.04	3.047	710.3
103	020110		0202				713.29	3.05	3.046	713.3
102	020110		0202				716.34	3.05	3.046	716.3
101	020110		0202				719.39	3.05	3.046	719.4
100	020110		0202				722.44	3.05	3.047	722.4
99	020110		0202				725.49	3.04	3.046	725.5
98	020110		0202				728.53	3.05	3.046	728.5
97	0238	19753	0202				731.58	1.52	1.522	731.6
96	020110		0202				733.10	3.05	3.046	733.1
95	020110		0205	9518	0216	736.8	736.15	3.05	3.046	736.2
94	020105		0202				739.20	1.52	1.522	739.2
93	020110		0202				740.72	3.05	3.046	740.7
92	020110		0202				743.77	3.05	3.046	743.8
91	020110		0202				746.82	3.05	3.046	746.8
90	020110		0202				749.87	3.05	3.046	749.9
89	020110		0202				752.92	3.04	3.046	752.9
88	020110		0202				755.96	3.05	3.046	756.0
87	020110		0202				759.01	3.05	3.046	759.0
86	020110		0202				762.06	3.05	3.046	762.1
85	020110		0202				765.11	3.05	3.046	765.1
84	020110		0202				768.16	3.04	3.046	768.2
83	020110		0202				771.20	3.05	3.045	771.2
82	020110		0202				774.25	3.05	3.046	774.3
81	020110		0202				777.30	3.05	3.046	777.3
80	020110		0202				780.35	3.04	3.046	780.4

IG_BH 05 As-Built Tubing Summary										
Item No.	Component P/N	Component S/N	Coupling P/N	Coupling S/N	Accessory P/N	Mag Collar (m)	Initial Depth (m)	Nominal Length (m)	Measured Lenghts (m)	**Final Depth (m)
79	0238	19754	0202				783.39	1.53	1.523	783.4
78	020110		0202				784.92	3.05	3.045	784.9
77	020110		0205	9280	0216	788.6	787.97	3.04	3.046	788.0
76	020110		0206	471			791.01	3.13	3.127	791.0
75	020102		0202				794.14	0.61	0.608	794.1
74	020105		0202				794.75	1.52	1.522	794.8
73	0238	19755	0202				796.27	1.53	1.523	796.3
72	020110		0202				797.80	3.04	3.046	797.8
71	020110		0205	9520	0216	801.4	800.84	3.05	3.046	800.8
70	020105		0202				803.89	1.53	1.521	803.9
69	020105		0202				805.42	1.52	1.522	805.4
68	020110		0202				806.94	3.05	3.045	806.9
67	020110		0202				809.99	3.04	3.046	810.0
66	020110		0202				813.03	3.05	3.046	813.0
65	020110		0202				816.08	3.05	3.046	816.1
64	020110		0202				819.13	3.05	3.046	819.1
63	020110		0202				822.18	3.05	3.046	822.2
62	020110		0202				825.23	3.04	3.046	825.2
61	020110		0202				828.27	3.05	3.05	828.3
60	020110		0202				831.32	3.05	3.046	831.3
59	020110		0202				834.37	3.05	3.046	834.4
58	020110		0202				837.42	3.05	3.046	837.4
57	020110		0202				840.47	3.04	3.047	840.5
56	020110		0202				843.51	3.05	3.046	843.5
55	020110		0202				846.56	3.05	3.046	846.6
54	020110		0202				849.61	3.05	3.046	849.6
53	0238	19583	0202				852.66	1.52	1.523	852.7
52	020110		0202				854.18	3.05	3.046	854.2
51	020105		0205	9501	0216	857.8	857.23	1.52	1.522	857.2
50	020102		0206	473			858.75	0.69	0.686	858.8
49	020105		0202				859.44	1.52	1.522	859.4
48	0238	19582	0202				860.96	1.53	1.523	861.0
47	020110		0202				862.49	3.04	3.046	862.5
46	020110		0205	9271	0216	866.1	865.53	3.05	3.046	865.5
45	020102		0202				868.58	0.61	0.607	868.6
44	020110		0202				869.19	3.05	3.046	869.2
43	020110		0202				872.24	3.05	3.045	872.2
42	020110		0202				875.29	3.05	3.046	875.3
41	020110		0202				878.34	3.04	3.045	878.3
40	020110		0202				881.38	3.05	3.047	881.4
39	020110		0202				884.43	3.05	3.046	884.4
38	020110		0202				887.48	3.05	3.046	887.5
37	020110		0202				890.53	3.04	3.046	890.5
36	020110		0202				893.57	3.05	3.045	893.6
35	020110		0202				896.62	3.05	3.047	896.6
34	020110		0202				899.67	3.05	3.046	899.7
33	020110		0202				902.72	3.05	3.047	902.7
32	020110		0202				905.77	3.04	3.046	905.8
31	020110		0202				908.81	3.05	3.046	908.8
30	020110		0202				911.86	3.05	3.045	911.9
29	020110		0202				914.91	3.05	3.045	914.9
28	020110		0202				917.96	3.05	3.046	918.0
27	020110		0202				921.01	3.04	3.046	921.0
26	0238	19580	0202				924.05	1.53	1.523	924.1
25	020110		0202				925.58	3.04	3.046	925.6
24	020110		0205	9521	0216	929.2	928.62	3.05	3.046	928.6
23	020110		0202				931.67	3.05	3.046	931.7
22	020105		0202				934.72	1.52	1.523	934.7

IG_BH 05 As-Built Tubing Summary

Item No.	Component P/N	Component S/N	Coupling P/N	Coupling S/N	Accessory P/N	Mag Collar (m)	Initial Depth (m)	Nominal Length (m)	Measured Lenghts (m)	**Final Depth (m)
21	020110		0202				936.24	3.05	3.046	936.2
20	020110		0202				939.29	3.05	3.046	939.3
19	020110		0202				942.34	3.05	3.046	942.3
18	020110		0202				945.39	3.05	3.046	945.4
17	020110		0202				948.44	3.04	3.047	948.4
16	020110		0202				951.48	3.05	3.046	951.5
15	020110		0202				954.53	3.05	3.047	954.5
14	020110		0202				957.58	3.05	3.046	957.6
13	020110		0202				960.63	3.04	3.046	960.6
12	020110		0202				963.67	3.05	3.046	963.7
11	020110		0202				966.72	3.05	3.047	966.7
10	0238	19624	0202				969.77	1.52	1.523	969.8
9	020110		0202				971.29	3.05	3.046	971.3
8	020110		0205	9272	0216	974.9	974.34	3.05	3.046	974.3
7	020105		0202				977.39	1.52	1.522	977.4
6	020105		0202				978.91	1.53	1.522	978.9
5	020110		0202				980.44	3.05	3.046	980.4
4	020110		0206	289			983.49	3.12	3.125	983.5
3	0238	19756	0202				986.61	1.52	1.523	986.6
2	020110		0202				988.13	3.05	3.046	988.1
1	020110		0205	9279	0216	991.8	991.18	3.05	3.047	991.2
0	020305		0202				994.23		0.223	994.2

Depths are with respect to the ground level.

****The final depth measurements are not corrected for the borehole angle.**

* Component positions are referenced to the top of the subject Westbay System coupling.

* Packer positions are referenced to the top Westbay System coupling on the packer.

Monitoring zone dimensions are determined as described on the attached "Dimensions of Packer Seals and Monitoring Zones".

The position of a MOSDAX Transducer in a Measurement Port is illustrated in the attached "MOSDAX Transducer Position".

This information may be used in calculating piezometric levels.

The item number 366 was not installed at the time of installation.

APPENDIX I
IG-BH05

POST INFLATION PRESSURE PROFILE

Post-Inflation Field Data and Calculation Sheet (November 14, 2021) - 2 page

Westbay Piezometric Pressures/Levels

Field Data and Calculation Sheet

Post - Inflation Profile.

Well No.: IGBH-05
Datum: G.L
Elev. G.S.: N/A
Height of Westbay above G.S.: N/A
Elev. top of Westbay Casing: N/A
Reference Elevation: N/A
Borehole angle: 70°

Probe Type: O/C sampler
Serial No.: ~~EMS 4960~~ EMS4960
Probe Range: 2000 psi
Westbay Casing Type: MP38
Sampler Valve Position: closed.

Date: Nov 14 (2021
Client: Golder / NWMO
Job No.: WB981
Location: Ignace, ON
Weather: overcast
Operator: ML/TK/MB

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz).

P_{atm} ~~101~~ 14.11 TK psi

Ambient Reading (P_{atm}) (pressure, temperature, time)

	Start:	Finish:
Pressure	14.11	14.00
Temp	14.24	5.53
Time	10:55 am.	13:17

Port No.	Port Position From Log (m)	Port Position From Cable (m)	True Port Depth "Dp" (m)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Time H:M:S	Probe Temp. (°C)	Inside Casing (P1)	Pressure Head Outside Port (m) H = (P2-Patm)/w	Piez. Level Outside Port (m) Dz = Dp - H	Comments M= mag collar R= rotation.
1	991.2			1280.03	1315.01	11:34	12.96	1280.03	914.84	76.36	M=986.2 R=15
2	974.3			1257.46	1291.34	11:39	13.26	1257.51	898.19	76.11	M=969.4 R=15
3	928.6			1196.45	1252.70	11:44	13.11	1196.46	871.02	57.58	M=924.0 R=15
4	865.5			1112.08	1151.17	11:50	12.62	1112.06	799.62	65.88	M=861.2 R=15
5	857.2			1100.85	1134.14	11:53	12.39	~~994.97~~	787.64	69.56	M=853.0 R=15; Lift valve live. Pi back to normal (994.97 ⇒ 1100.98)
~~6~~	~~800.8~~ TK							1100.98			
6	800.8			1025.64	1063.38	12:02	11.94	1025.62	737.88	62.92	M=796.9 R=15
7	788.			1008.57	1040.24	12:05	11.73	1008.50	721.61	66.39	M=784.2 R=15
8	736.2			939.18	979.82	12:10	11.41	939.21	679.12	57.08	M=732.8 R=15
9	679.8			864.01	904.03	12:16	10.88	864.02	625.82	53.98	M=676.7 R=15
10	635			804.12	841.54	12:20	10.43	804.13	581.88	53.12	M=632.2 R=15
11	627.3			793.81	822.85	12:22	10.20	793.86	568.73	58.57	M=624.6 R=15
12	587.7			740.98	776.21	12:26	9.93	740.92	535.94	51.76	M=585.2 R=15
13	541.9			679.79	701.41	12:30	9.55	679.77	483.23	58.57	M=539.8 R=15
14	487.1			606.34	635.17	12:34	9.05	478.64	436.75	50.35	M=485.2 R=15; Lift valve live. Pi back to normal.

606.36

(478.64 ⇒ 606.36)

Notes: w = 0.4335 psi/ft (1.422psi/m) of H_2O Dz = piezometric level in zone Patm = atmospheric pressure H = pressure head of water in zone Dp = true depth of measurement port

Westbay Piezometric Pressures/Levels

Field Data and Calculation Sheet

Post - Inflation Profile.

Well No.: IGBH-05
Datum: G.L
Elev. G.S.: N/A
Height of Westbay above G.S.: N/A
Elev. top of Westbay Casing: N/A
Reference Elevation: N/A
Borehole angle: 70°

Probe Type: O/C sampler
Serial No.: EMS 4960
Probe Range: 2000 psi
Westbay Casing Type: MP38
Sampler Valve Position: closed

Date: Nov 14/21
Client: Golder / NWMO
Job No.: WB981
Location: Ignace, ON
Weather: overcast
Operator: ML / TK / MB

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz).

Ambient Reading (P_{atm}) (pressure, temperature, time)

	Start	Finish
Pressure	14-11	14-00
Temp	14-26	5.53
Time	10:55 am	13:17

P_{atm} 14-11 psi

Port No.	Port Position From Log (m)	Port Position From Cable (m)	True Port Depth "Dp" (m)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Time H:M:S	Probe Temp. (°C)	Inside Casing (P1)	Pressure Head Outside Port (m) H = (P2-Patm)/w	Piez. Level Outside Port (m) Dz = Dp - H	Comments (M= mag collar, R= rotation)
15	427.6			526.71	550.53	12:41	8.45	424.53	384.26	43.34	M=426.2 R=15, P (424.53→526.77)
~~16~~	~~372.8~~ TK							526.77			
16	372.8			453.21	487.77	12:47	7.95	453.18	333.09	39.71	M=371.7 R=15
17	326.5			391.14	425.75	12:50	7.52	391.17	289.48	37.02	M=325.7 R=15
18	312.7			372.75	404.31	12:53	7.21	372.77	274.40	38.30	M=312.0 R=15
19	264.0			307.51	338.10	12:57	6.90	307.46	227.84	36.16	M=263.6 R=15
20	225.9			256.39	290.83	13:00	6.55	256.38	194.60	31.30	M=225.7 R=15
21	180.2			195.09	226.51	13:04	6.14	195.15	149.37	30.83	M=180.4 R=15
22	155.7			162.39	195.47	13:06	5.94	162.39	127.54	28.16	M=156.0 R=15
23	99.6			87.26	99.57	13:10	5.70	87.26	60.10	39.50	M=100.4 R=15
24	90.4			74.82	92.36	13:12	5.61	74.88	55.17	35.23	M=91.3 R=15
25	70.0			47.47	64.27	13:14	5.54	47.47	35.27	34.73	M=71.0 R=15

Notes: w = 0.4335 psi/ft (1.422psi/m) of H_2O Dz = piezometric level in zone Patm = atmospheric pressure H = pressure head of water in zone Dp = true depth of measurement port


Westbay
Instruments

APPENDIX B

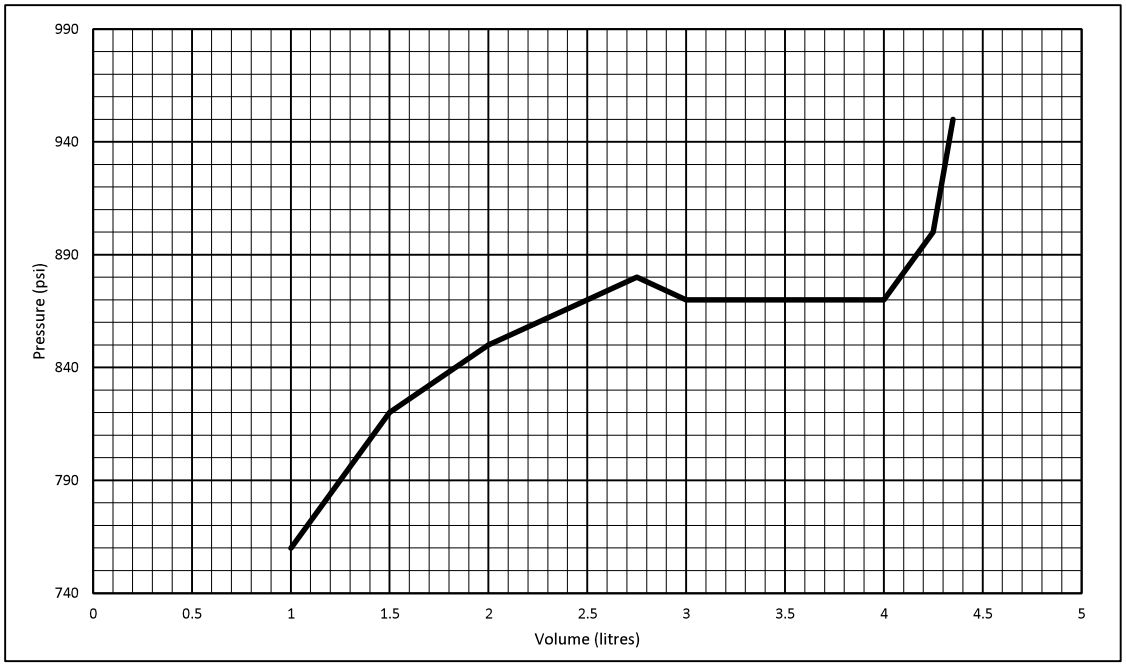
Pressure Measurement Records

GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_001

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	01 s/n 19756	145.0	950.0	700.0	8.0	11.4	116.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet, after initial inflation attempt re-inflation/check carried out at 12:54								

Volume (L)	Pressure (psi)
1	760
1.5	820
2	850
2.5	870
2.75	880
3	870
3.25	870
3.5	870
3.75	870
4	870
4.25	900
4.35	950



Golder Senior Reviewer & Approver Sign-off

Reviewed by:

2022-03-03

Signature Date

Approved by:

2022-03-04

Signature Date

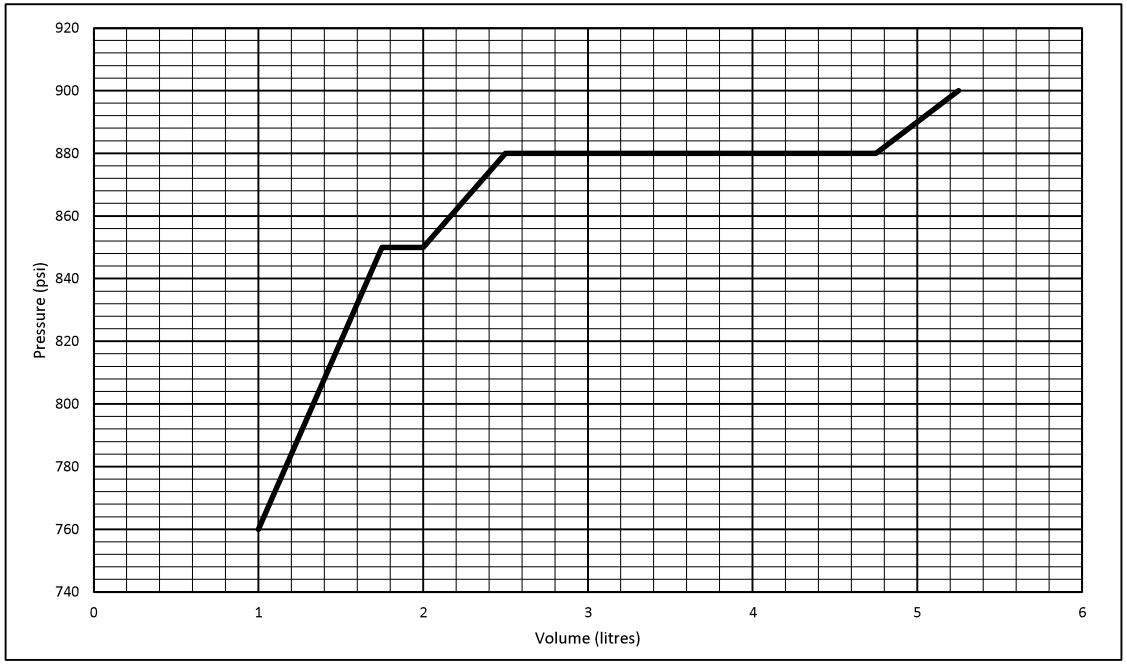
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_002

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	02 s/n 19750	130.0	900.0	700.0	8.0	11.4	81.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
1.75	850
2	850
2.5	880
2.75	880
3	880
3.25	880
3.5	880
3.75	880
4	880
4.25	880
4.5	880
4.75	880
5	890
5.25	900



Golder Senior Reviewer & Approver Sign-off

Reviewed by:

Signature

2021-12-15
Date

Approved by:

Signature

2022-03-04
Date

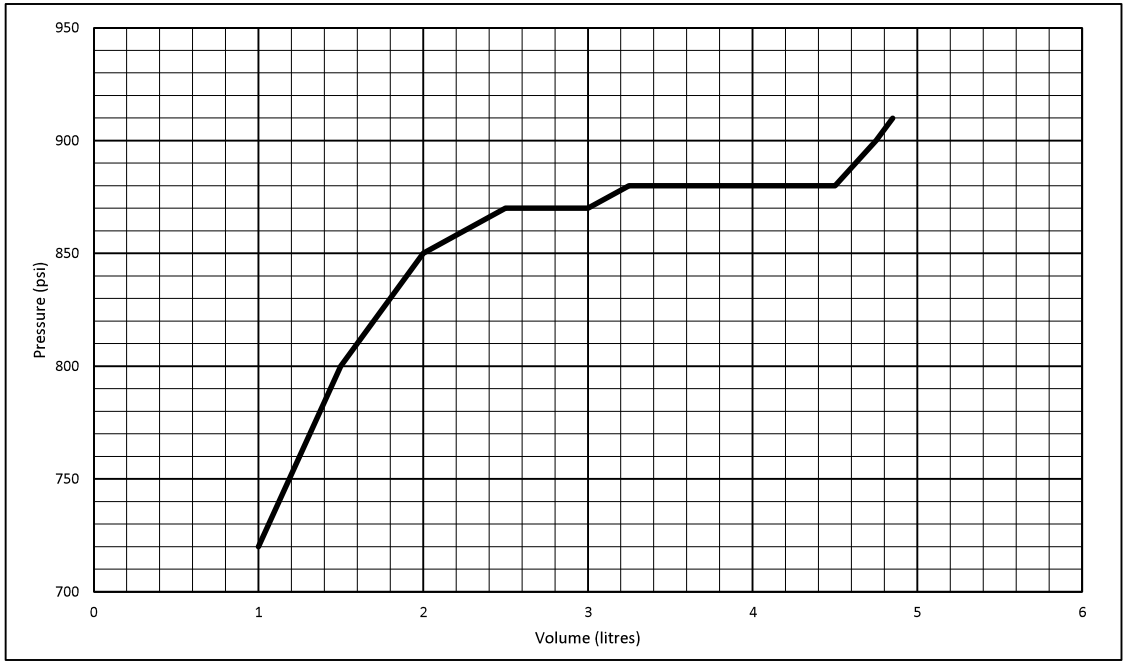
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_003

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	03 s/n 19580	145.0	910.0	700.0	8.0	11.4	76.4	*08-Nov-21*	*TK/ML*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	720
1.5	800
2	850
2.5	870
2.75	870
3	870
3.25	880
3.5	880
3.75	880
4	880
4.25	880
4.5	880
4.75	900
4.85	910



Golder Senior Reviewer & Approver Sign-off

Reviewed by:

2021-12-15

Signature Date

Approved by:

2022-03-04

Signature Date

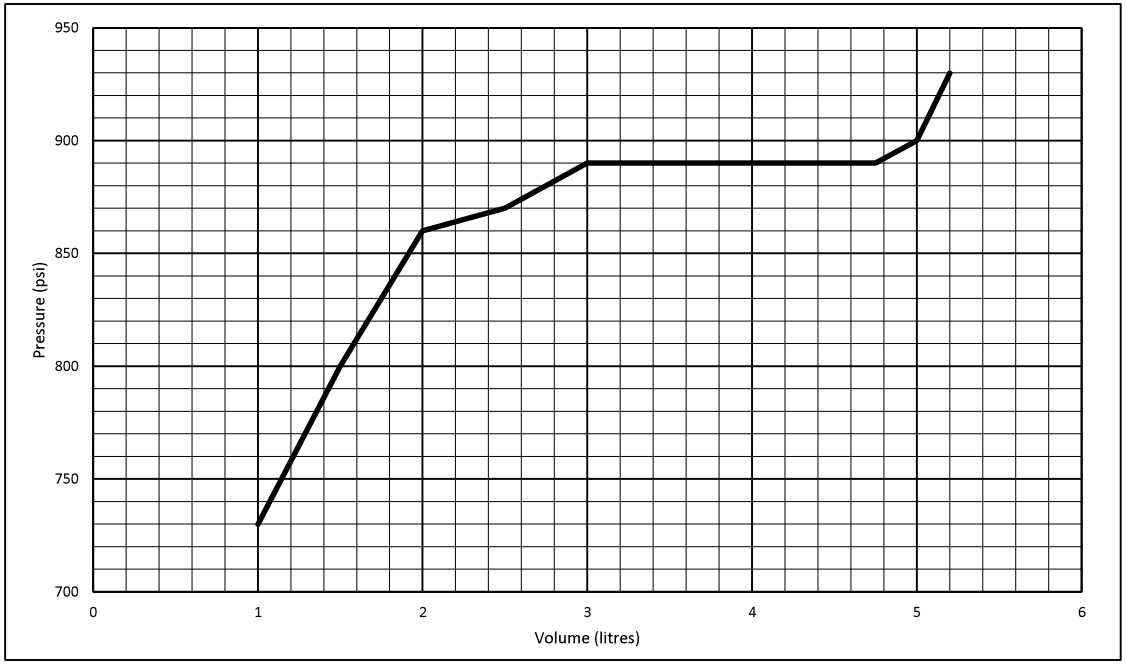
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_004

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	04 s/n 19582	145.0	930.0	700.0	8.0	11.4	96.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	730
1.5	800
2	860
2.5	870
3	890
3.25	890
3.5	890
3.75	890
4	890
4.25	890
4.5	890
4.75	890
5	900
5.2	930



Golder Senior Reviewer & Approver Sign-off

Reviewed by:

2021-12-15

Signature Date

Approved by:

2022-03-04

Signature Date

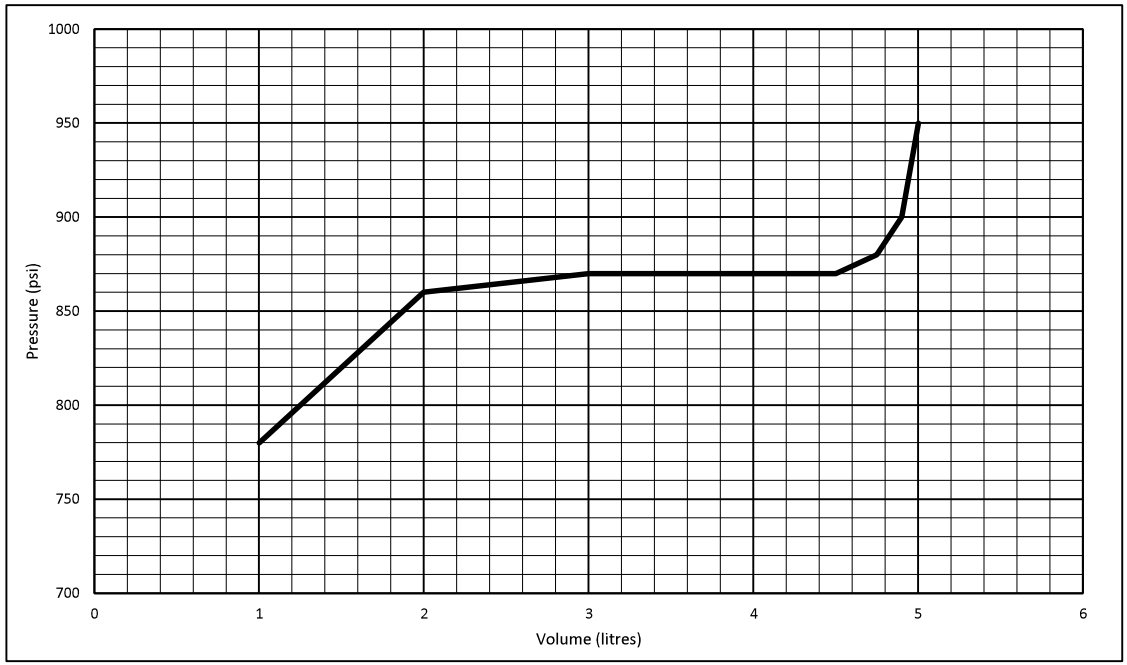
Form ID: NWMO-IGNACE-20253946-WP09-F004

GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_005

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	05 s/n 19583	160.0	950.0	700.0	8.0	11.4	101.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	860
3	870
3.25	870
3.5	870
3.75	870
4	870
4.25	870
4.5	870
4.75	880
4.9	900
5	950



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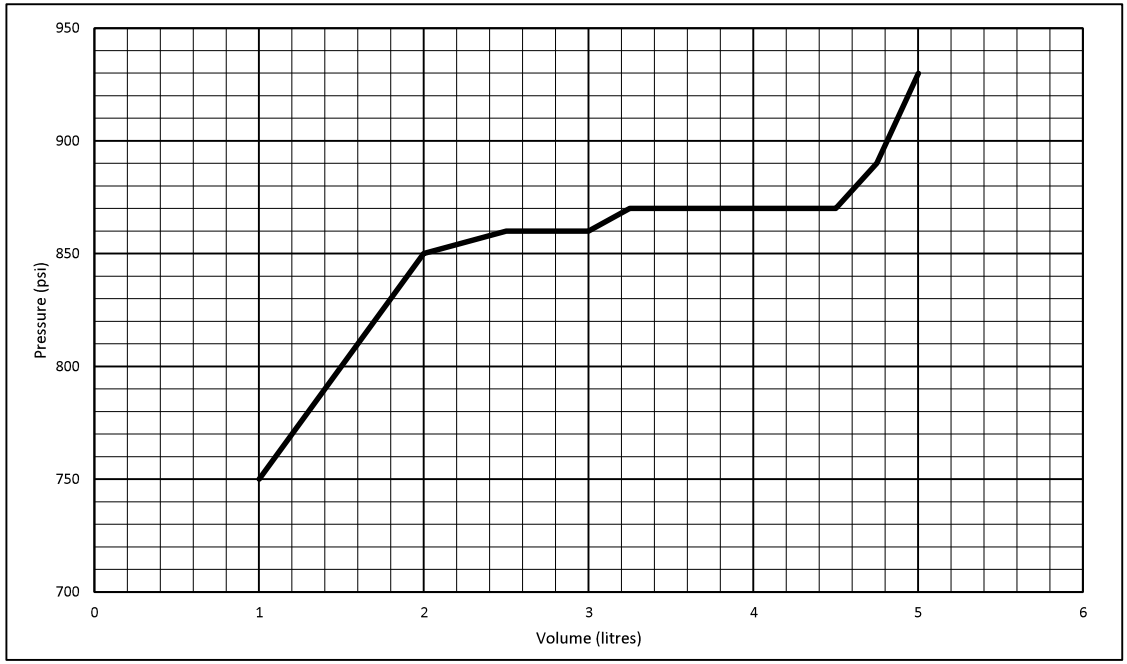
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_006

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	06 s/n 19755	150.0	930.0	650.0	8.0	11.4	141.4	*09-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	750
2	850
2.5	860
3	860
3.25	870
3.5	870
3.75	870
4	870
4.25	870
4.5	870
4.75	890
5	930



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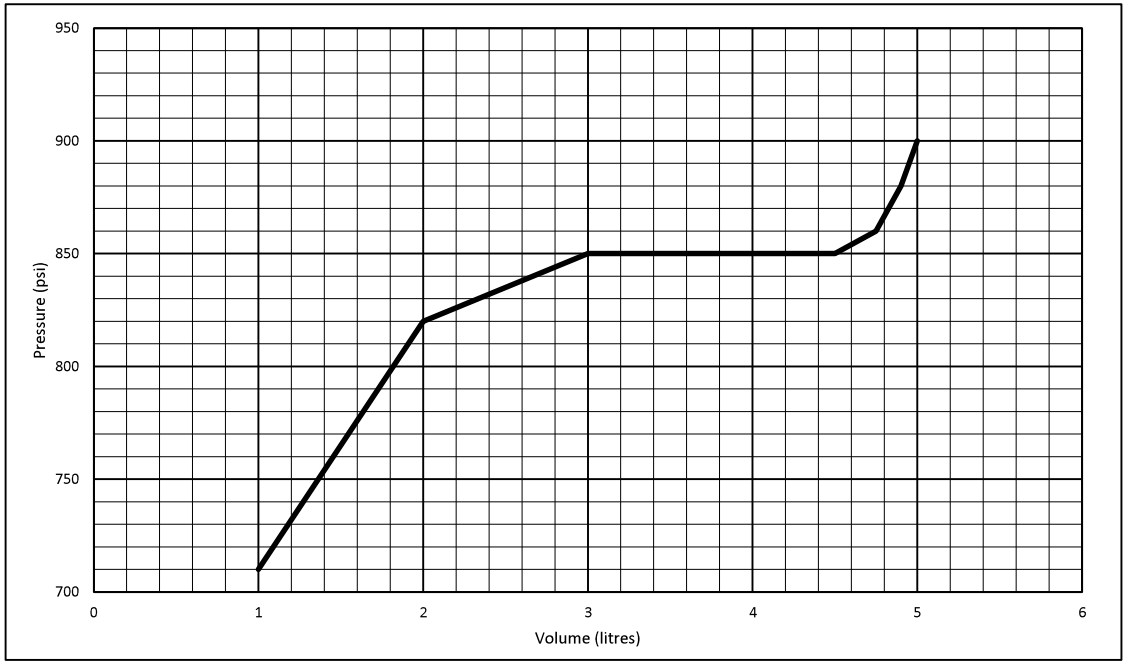
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_007

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	07 s/n 19754	140.0	900.0	650.0	8.0	11.4	121.4	*09-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	710
2	820
3	850
3.5	850
3.75	850
4	850
4.25	850
4.5	850
4.75	860
4.9	880
5	900



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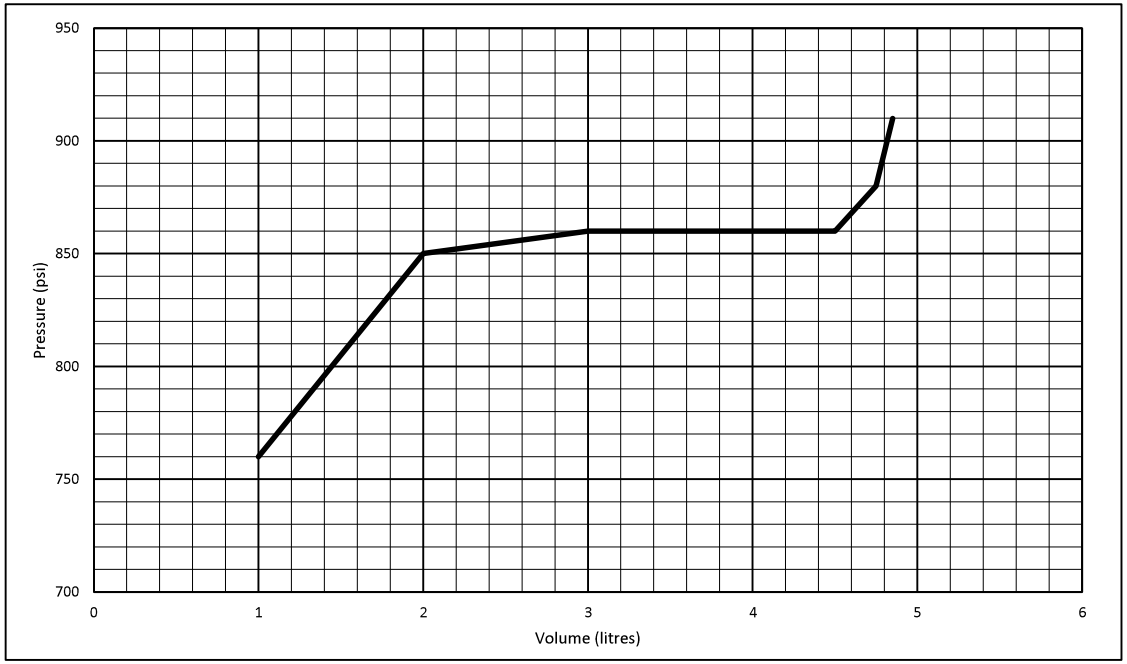
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_008

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	08 s/n 19753	145.0	910.0	650.0	8.0	11.4	126.4	*09-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	850
3	860
3.5	860
3.75	860
4	860
4.25	860
4.5	860
4.75	880
4.85	910



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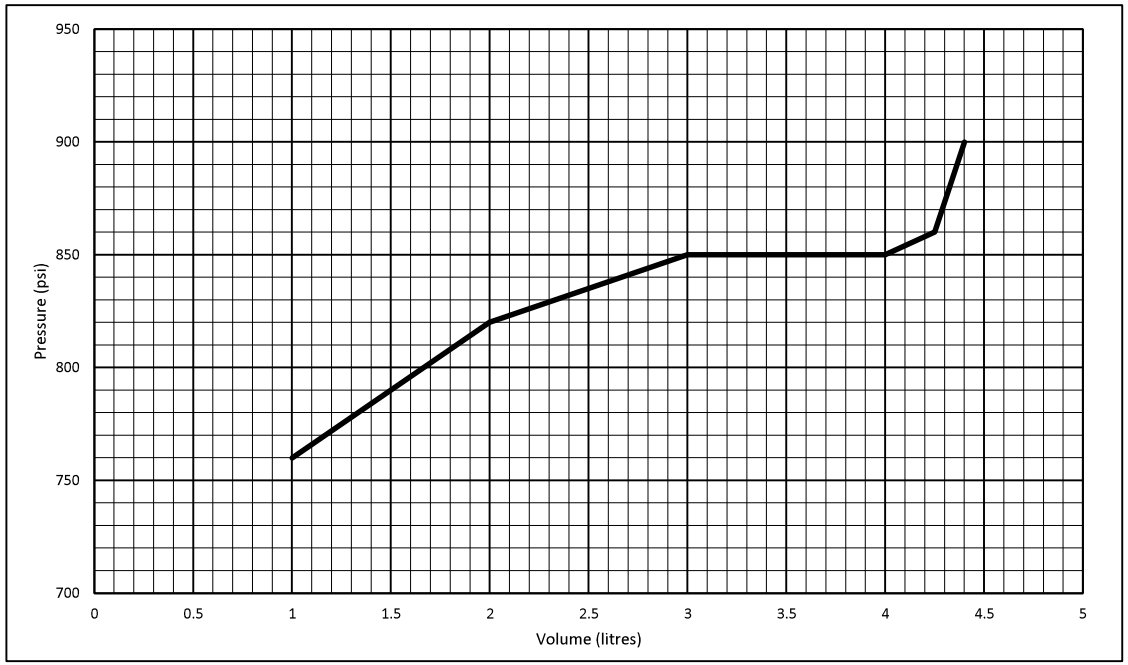
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_009

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	09 s/n 19752	145.0	900.0	650.0	8.0	11.4	116.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	820
3	850
3.25	850
3.5	850
3.75	850
4	850
4.25	860
4.4	900



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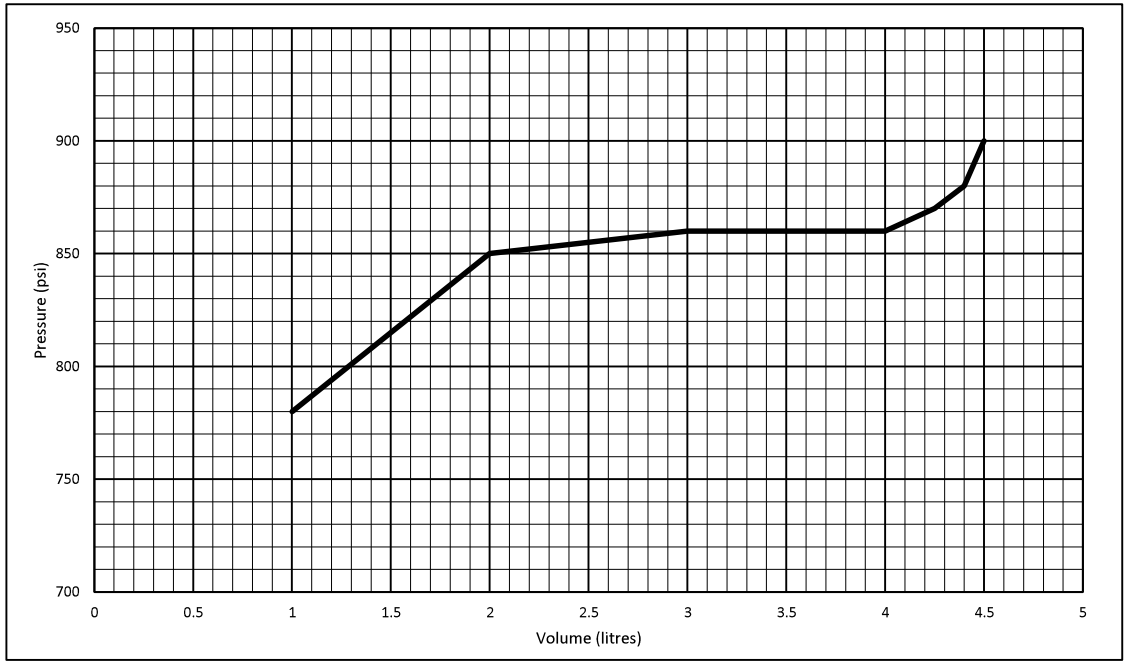
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_010

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	10 s/n 19751	140.0	900.0	650.0	8.0	11.4	121.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	880
4.5	900



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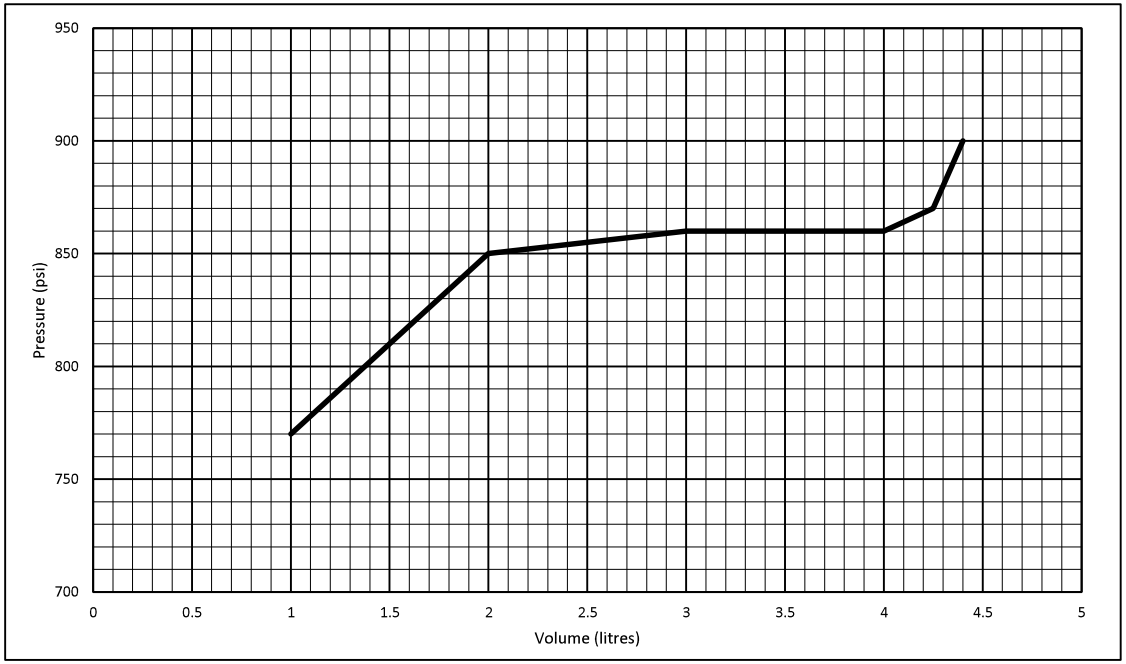
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_011

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	11 s/n 14749	145.0	900.0	650.0	8.0	11.4	116.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	900



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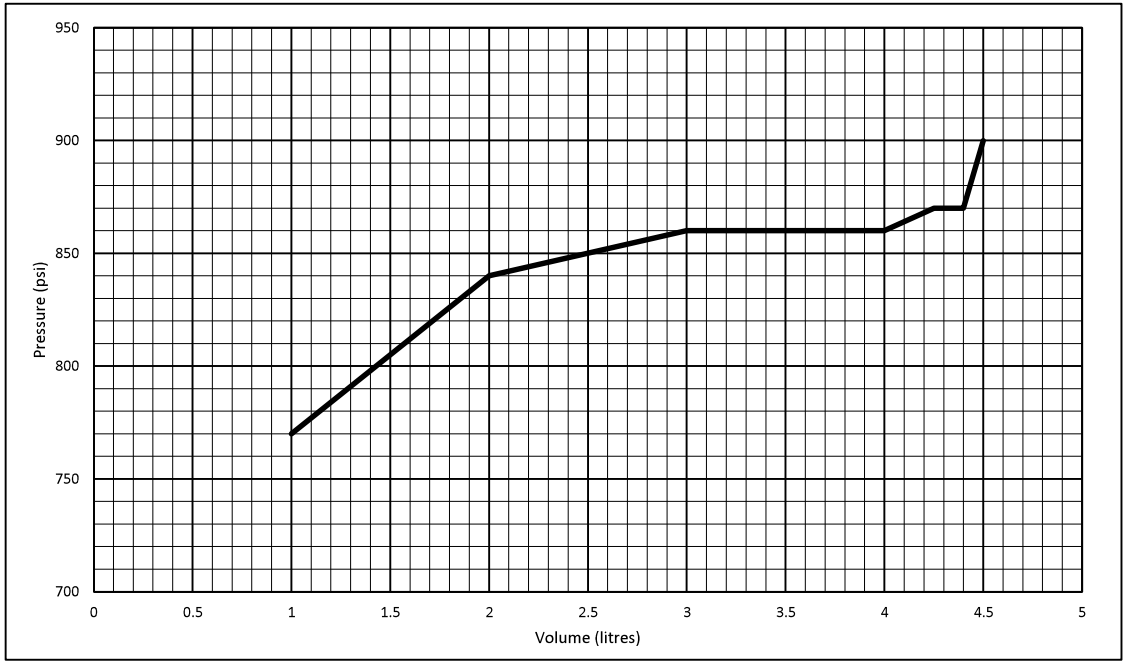
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_012

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	12 s/n 19748	140.0	900.0	650.0	8.0	11.4	121.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	840
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	870
4.5	900



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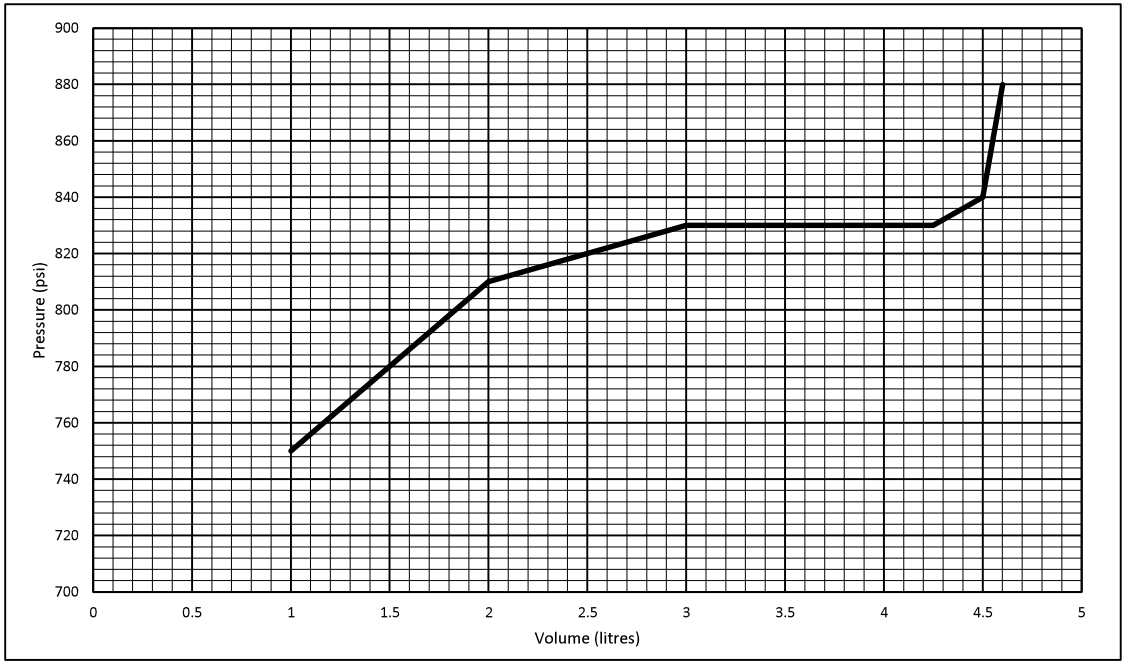
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_013

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	13 s/n 19747	135.0	880.0	650.0	8.0	11.4	106.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	750
2	810
3	830
3.5	830
3.75	830
4	830
4.25	830
4.5	840
4.6	880



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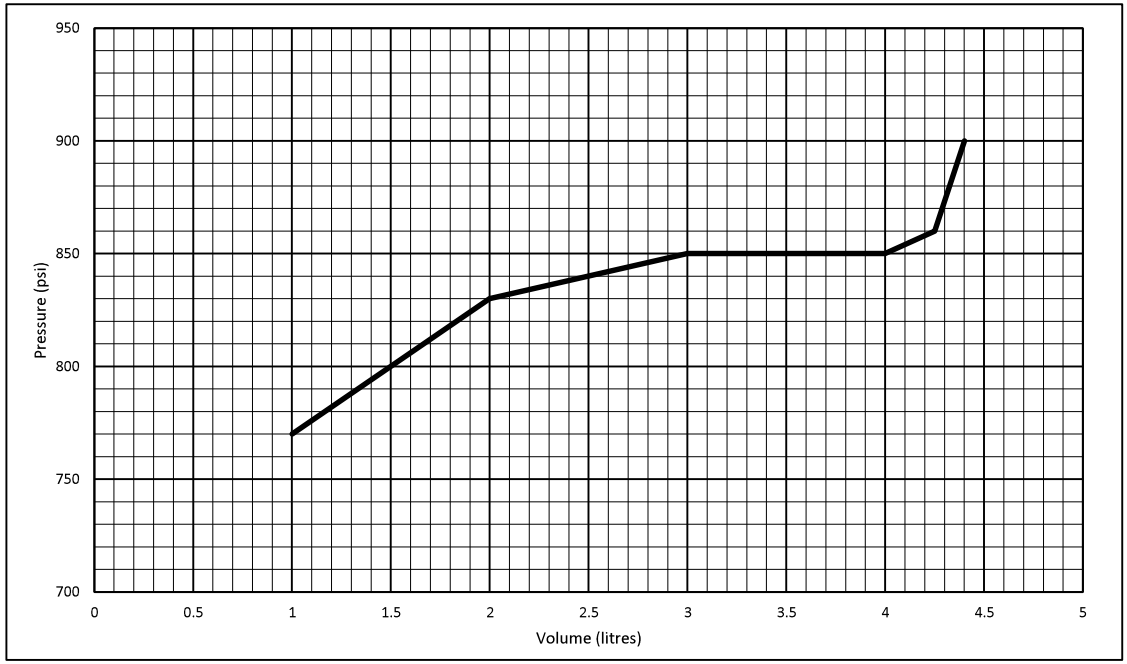
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_014

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	14 s/n 19746	145.0	900.0	650.0	8.0	11.4	116.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	830
3	850
3.5	850
3.75	850
4	850
4.25	860
4.4	900



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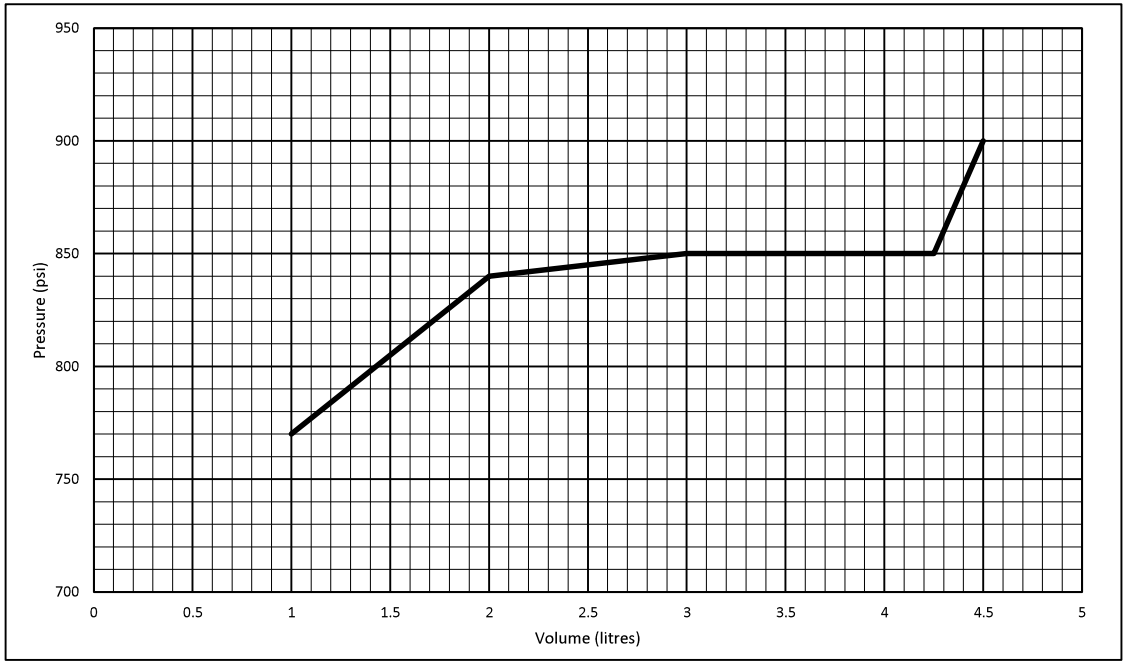
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_015

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	15 s/n 19743	150.0	900.0	650.0	8.0	11.4	111.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	840
3	850
3.5	850
3.75	850
4	850
4.25	850
4.4	880
4.5	900



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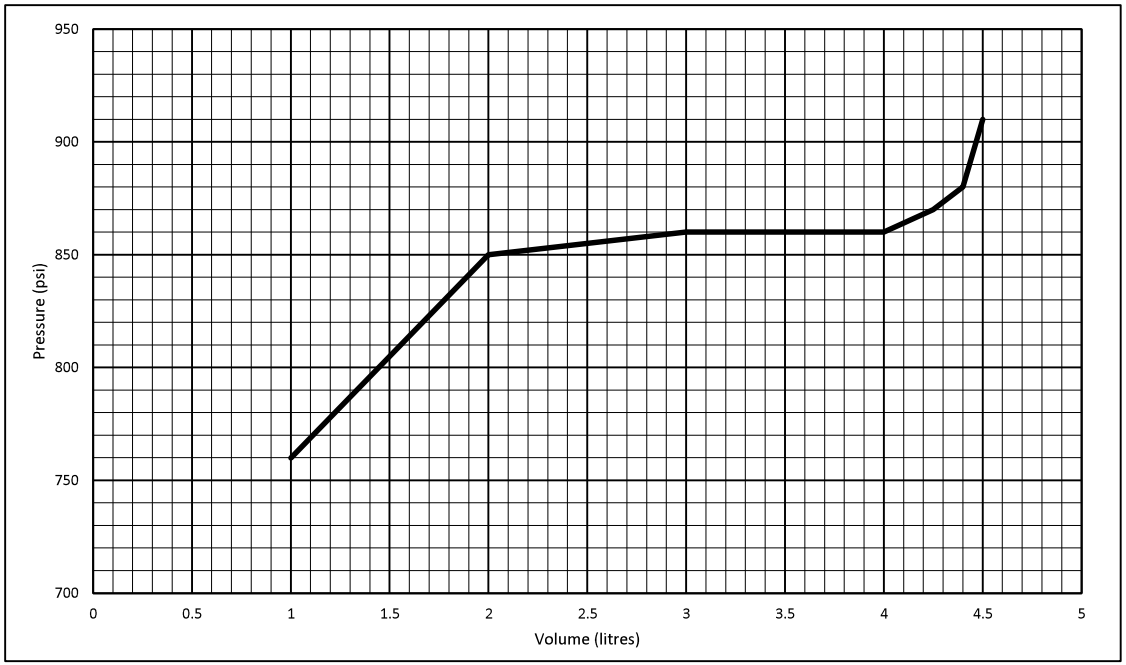
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_016

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	16 s/n 19738	140.0	910.0	650.0	8.0	11.4	131.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	880
4.5	910



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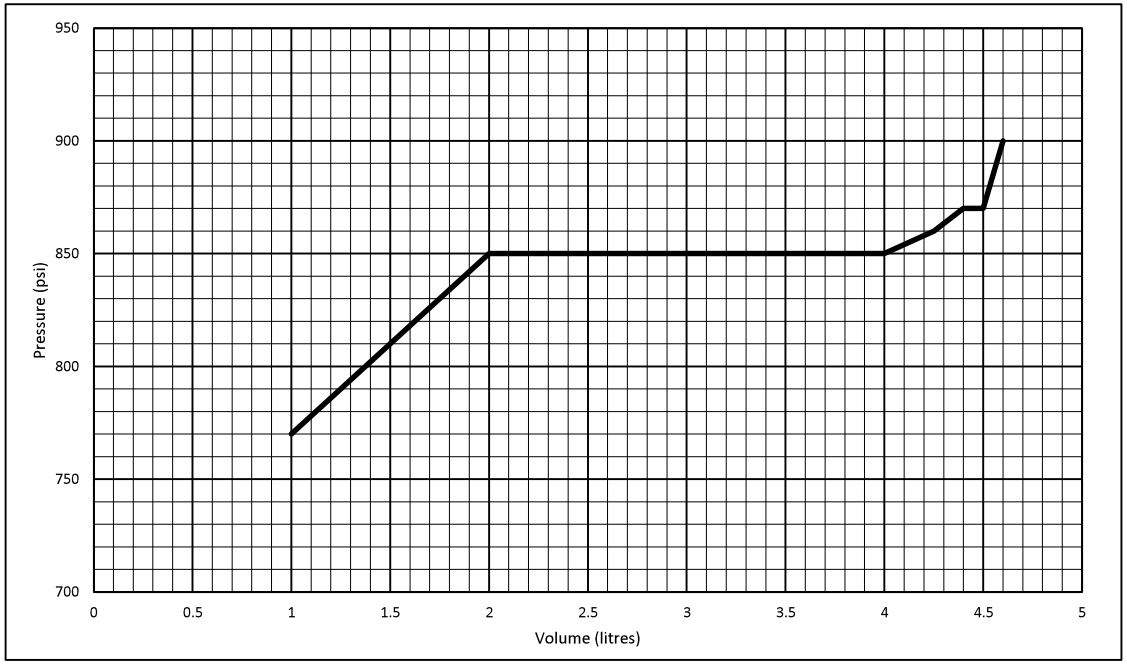
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_017

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	17 s/n 19745	150.0	900.0	650.0	8.0	11.4	111.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	850
3	850
3.5	850
3.75	850
4	850
4.25	860
4.4	870
4.5	870
4.6	900



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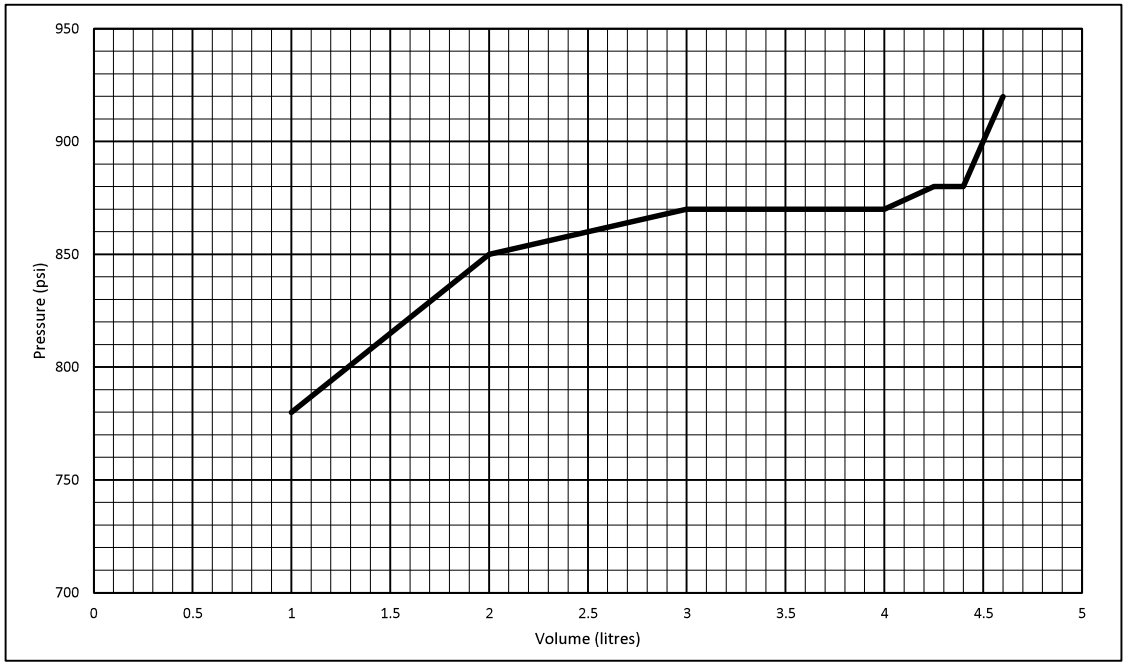
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_018

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	18 s/n 19741	140.0	920.0	650.0	8.0	11.4	141.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	850
3	870
3.5	870
3.75	870
4	870
4.25	880
4.4	880
4.5	900
4.6	920



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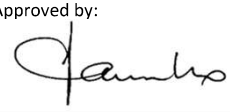
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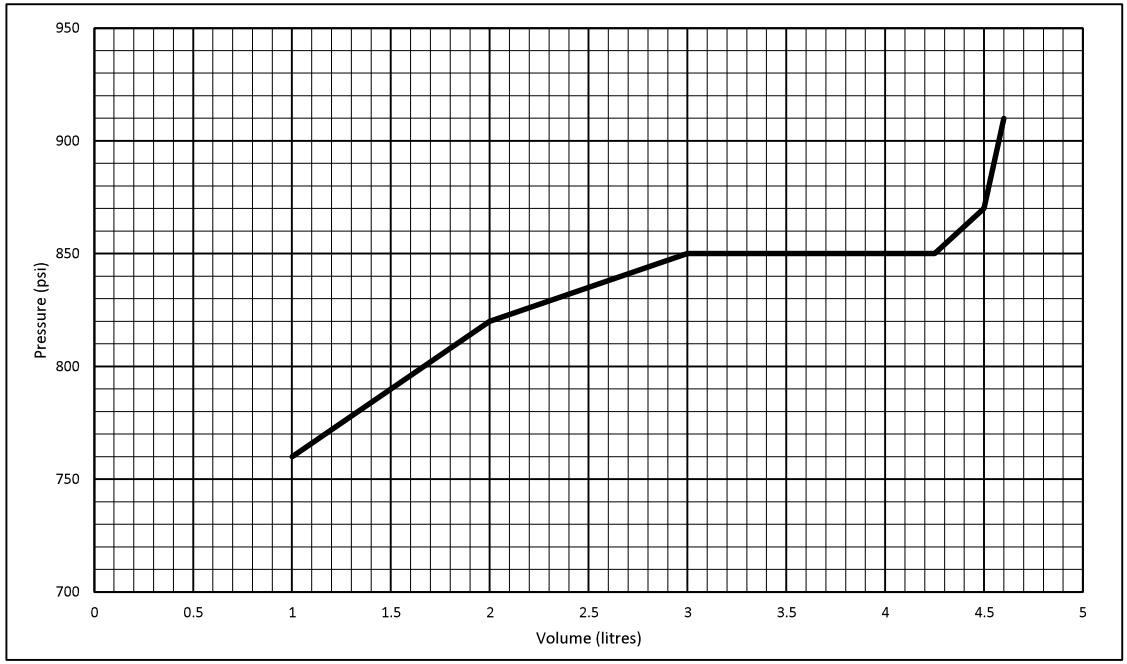
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_019

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	19 s/n 19736	150.0	910.0	650.0	8.0	11.4	121.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	820
3	850
3.5	850
3.75	850
4	850
4.25	850
4.5	870
4.6	910



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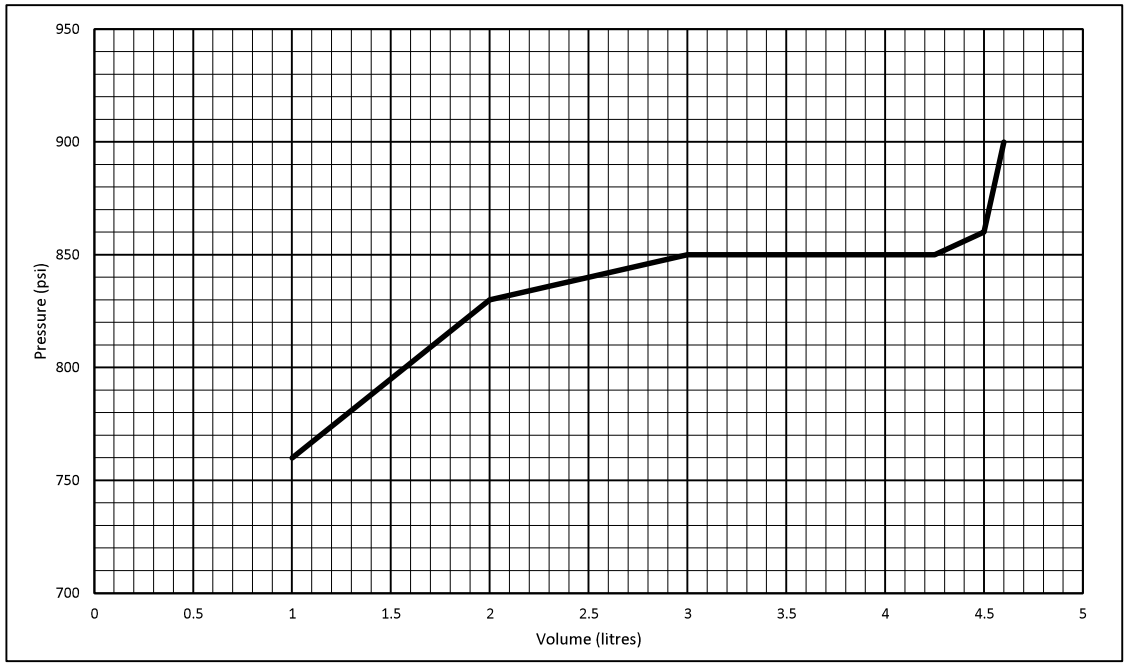
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_020

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	20 s/n 19737	135.0	900.0	650.0	8.0	11.4	126.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	830
3	850
3.25	850
3.5	850
3.75	850
4	850
4.25	850
4.5	860
4.6	900



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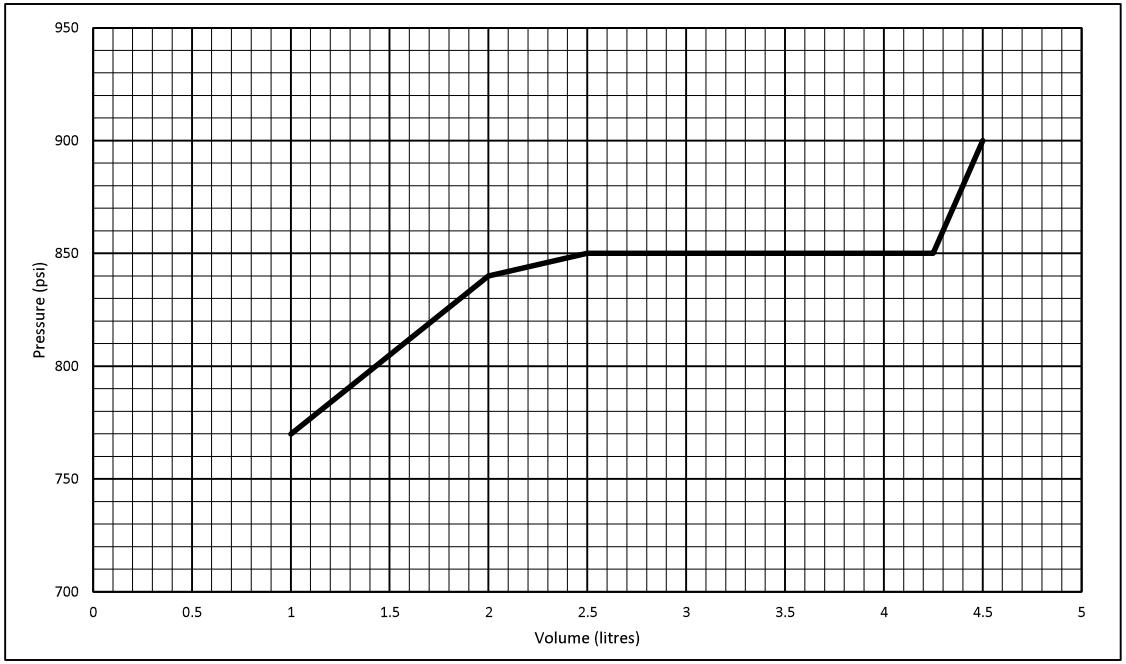
Form ID: NWMO-IGNACE-20253946-WP09-F004

GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_021

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	21 s/n 19739	140.0	900.0	650.0	8.0	11.4	121.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	840
2.5	850
3	850
3.5	850
3.75	850
4	850
4.25	850
4.5	900



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Form ID: NWMO-IGNACE-20253946-WP09-F004

GOLDER
MEMBER OF WSP

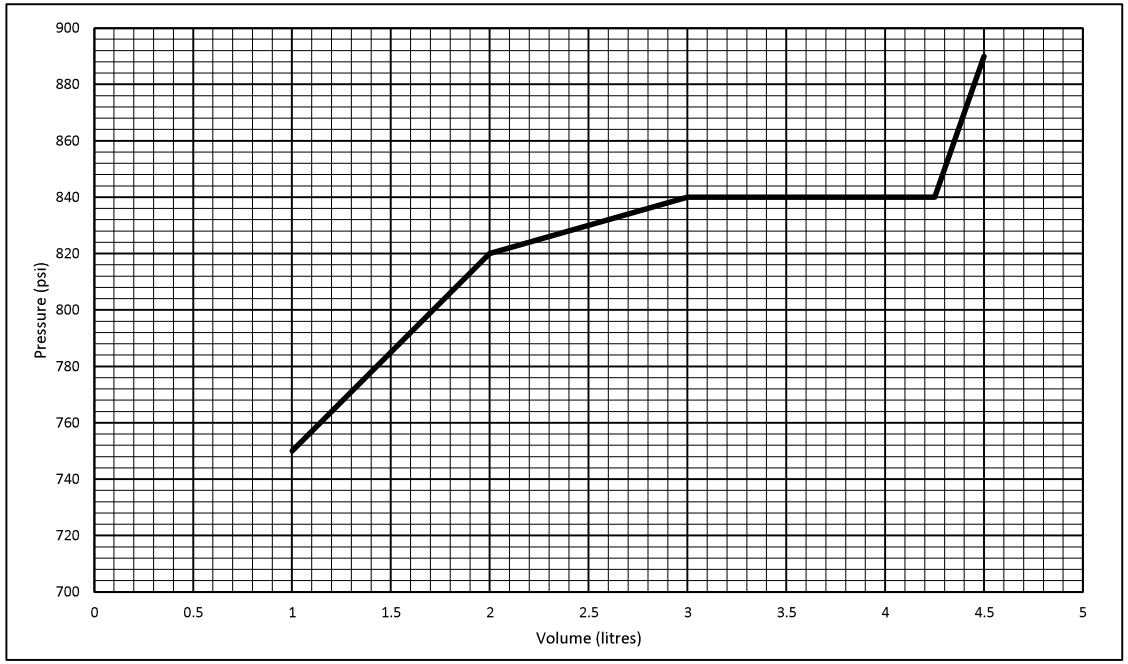
WP09 - Westbay MP38 Casing Installation
Record of Packer Inflation

Project No.: 20253946

Test # IG_BH05_HT_022

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	22 s/n 19740	140.0	890.0	650.0	8.0	11.4	111.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	750
2	820
3	840
3.5	840
3.75	840
4	840
4.25	840
4.5	890



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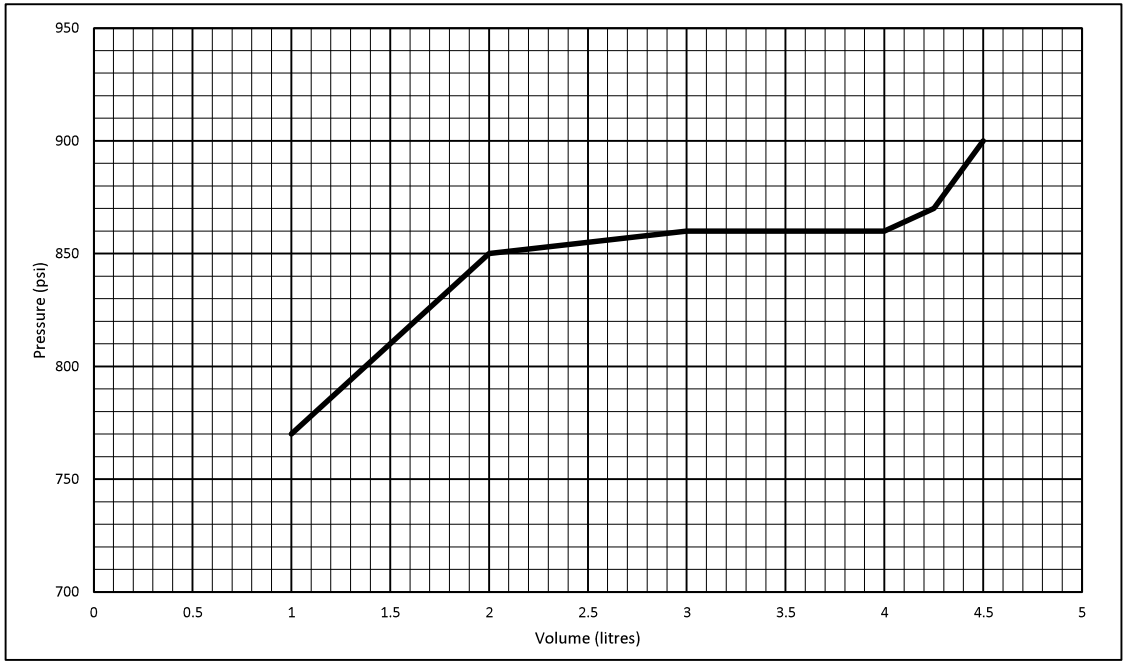
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_023

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	23 s/n 19744	135.0	900.0	650.0	8.0	11.4	126.4	*14-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.5	900



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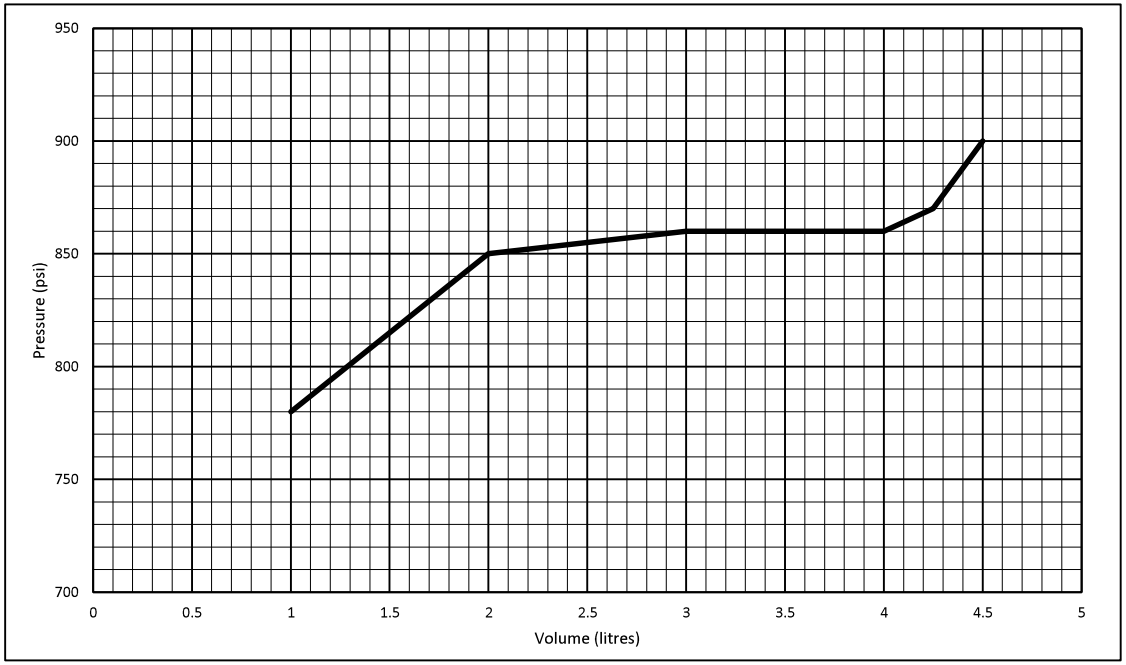
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_024

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	24 s/n 19742	150.0	900.0	650.0	8.0	11.4	111.4	*14-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.5	900



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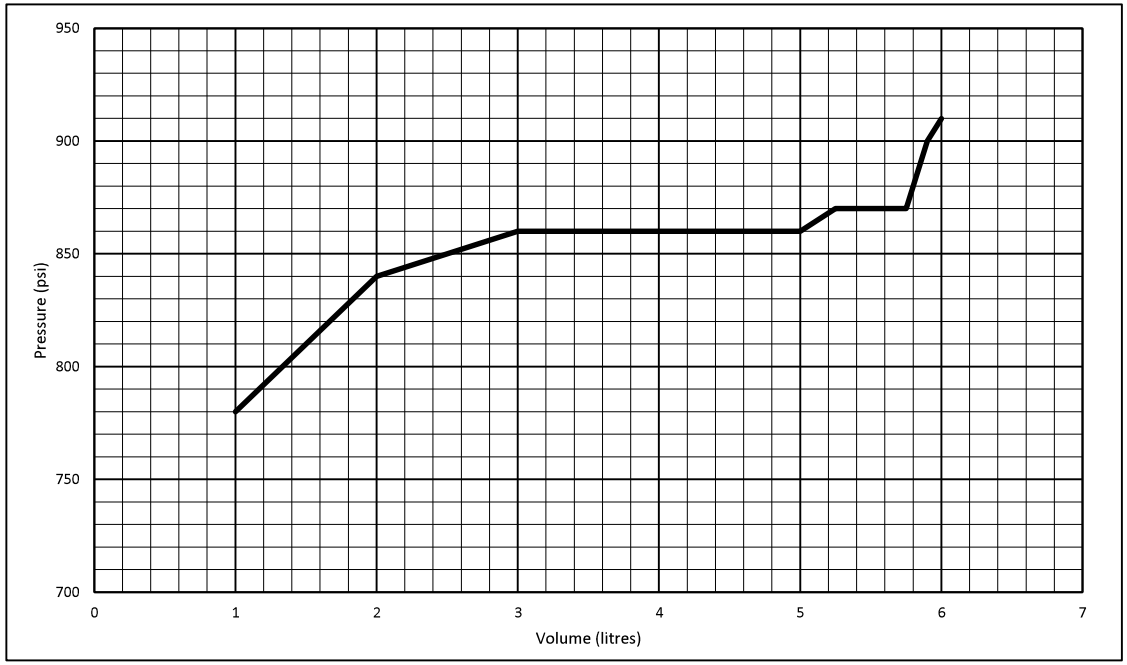
Form ID: NWMO-IGNACE-20253946-WP09-F004

GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_025

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	25 s/n 19757	145.0	910.0	650.0	8.0	11.4	126.4	*14-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	840
3	860
3.5	860
3.75	860
4	860
4.25	860
4.5	860
4.75	860
5	860
5.25	870
5.5	870
5.75	870
5.9	900
6	910



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Form ID: NWMO-IGNACE-20253946-WP09-F004

APPENDIX C

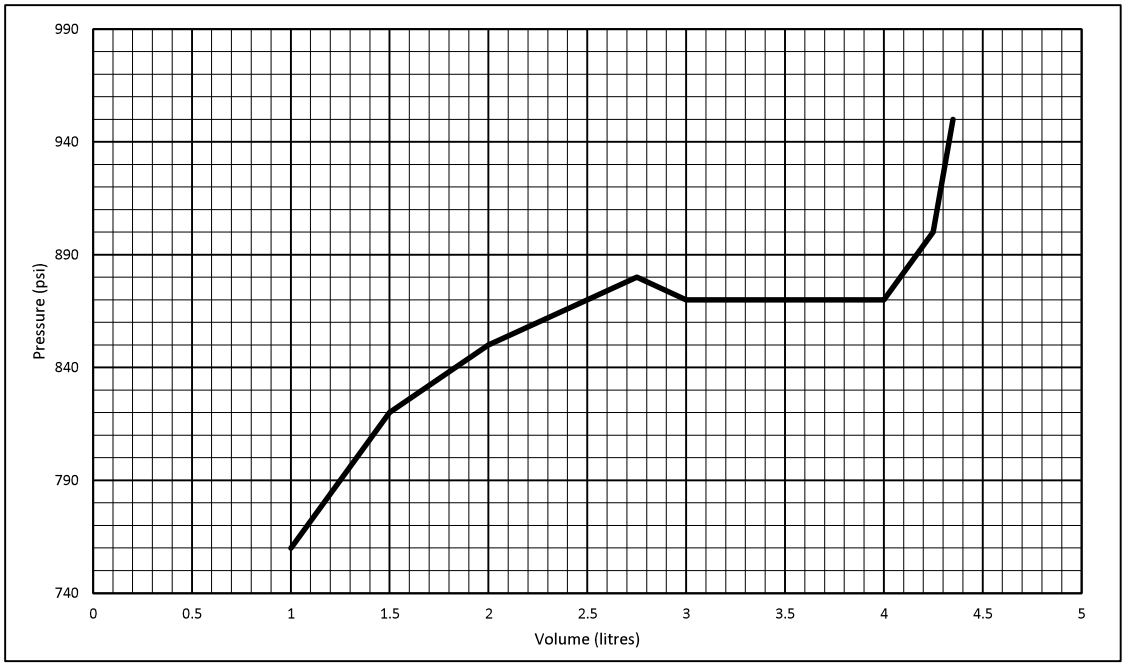
Packer Inflation Records

GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_001

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	01 s/n 19756	145.0	950.0	700.0	8.0	11.4	116.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet, after initial inflation attempt re-inflation/check carried out at 12:54								

Volume (L)	Pressure (psi)
1	760
1.5	820
2	850
2.5	870
2.75	880
3	870
3.25	870
3.5	870
3.75	870
4	870
4.25	900
4.35	950



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2022-03-04

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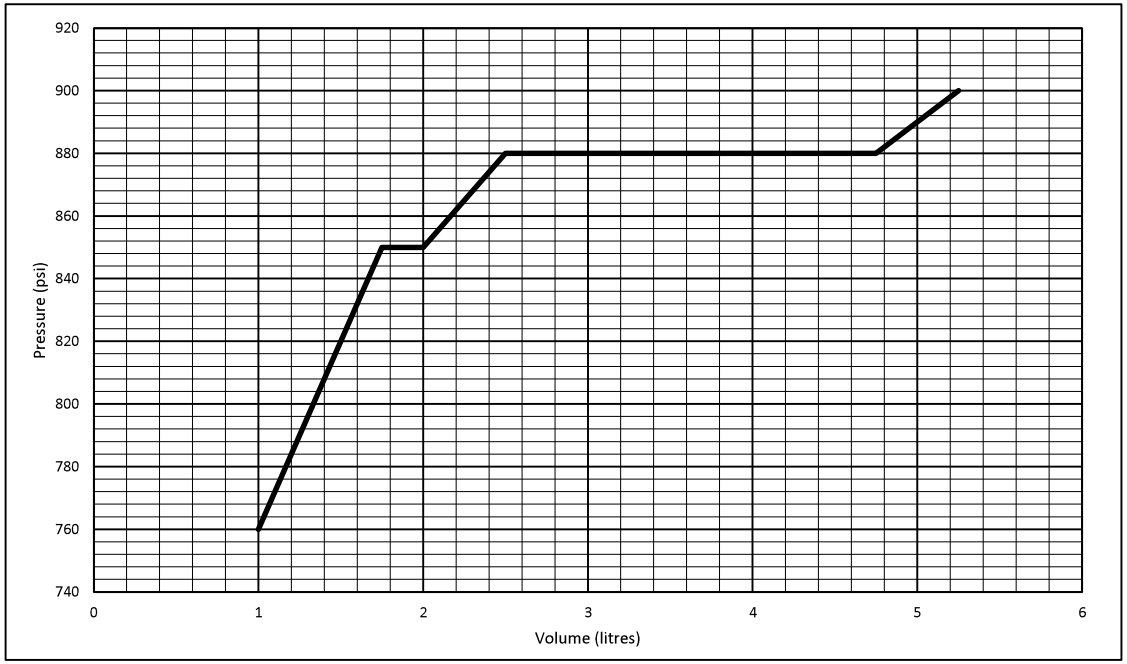
Form ID: NWMO-IGNACE-20253946-WP09-F004

GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_002

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	02 s/n 19750	130.0	900.0	700.0	8.0	11.4	81.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
1.75	850
2	850
2.5	880
2.75	880
3	880
3.25	880
3.5	880
3.75	880
4	880
4.25	880
4.5	880
4.75	880
5	890
5.25	900



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2022-03-04
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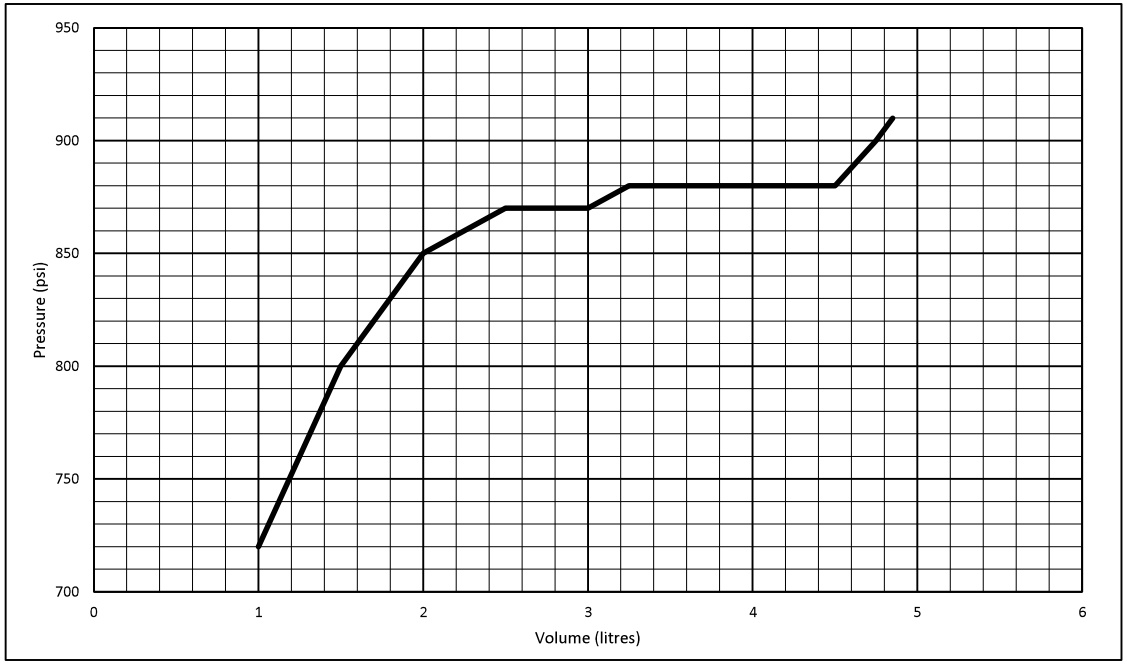
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_003

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	03 s/n 19580	145.0	910.0	700.0	8.0	11.4	76.4	*08-Nov-21*	*TK/ML*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	720
1.5	800
2	850
2.5	870
2.75	870
3	870
3.25	880
3.5	880
3.75	880
4	880
4.25	880
4.5	880
4.75	900
4.85	910



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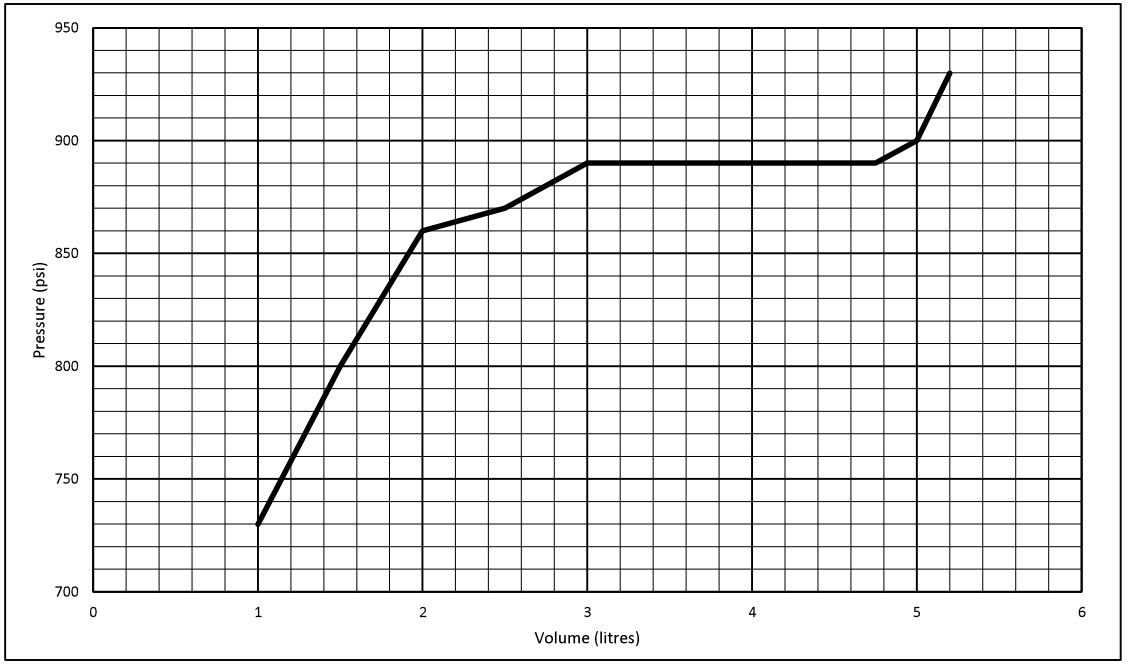
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_004

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	04 s/n 19582	145.0	930.0	700.0	8.0	11.4	96.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	730
1.5	800
2	860
2.5	870
3	890
3.25	890
3.5	890
3.75	890
4	890
4.25	890
4.5	890
4.75	890
5	900
5.2	930



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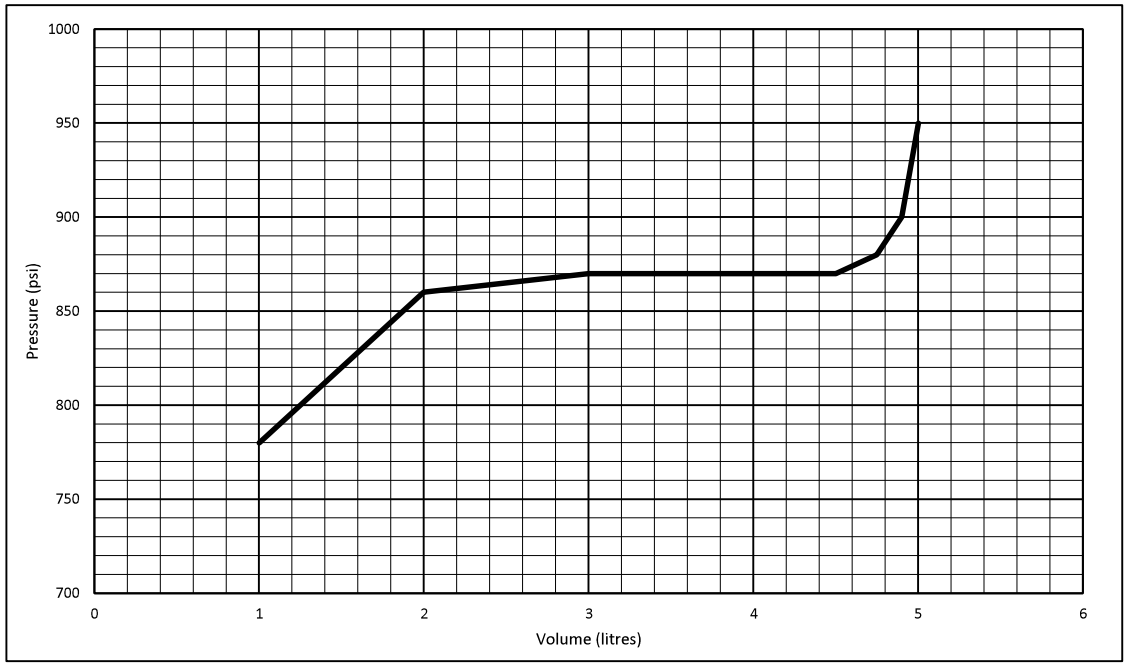
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_005

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	05 s/n 19583	160.0	950.0	700.0	8.0	11.4	101.4	*08-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	860
3	870
3.25	870
3.5	870
3.75	870
4	870
4.25	870
4.5	870
4.75	880
4.9	900
5	950



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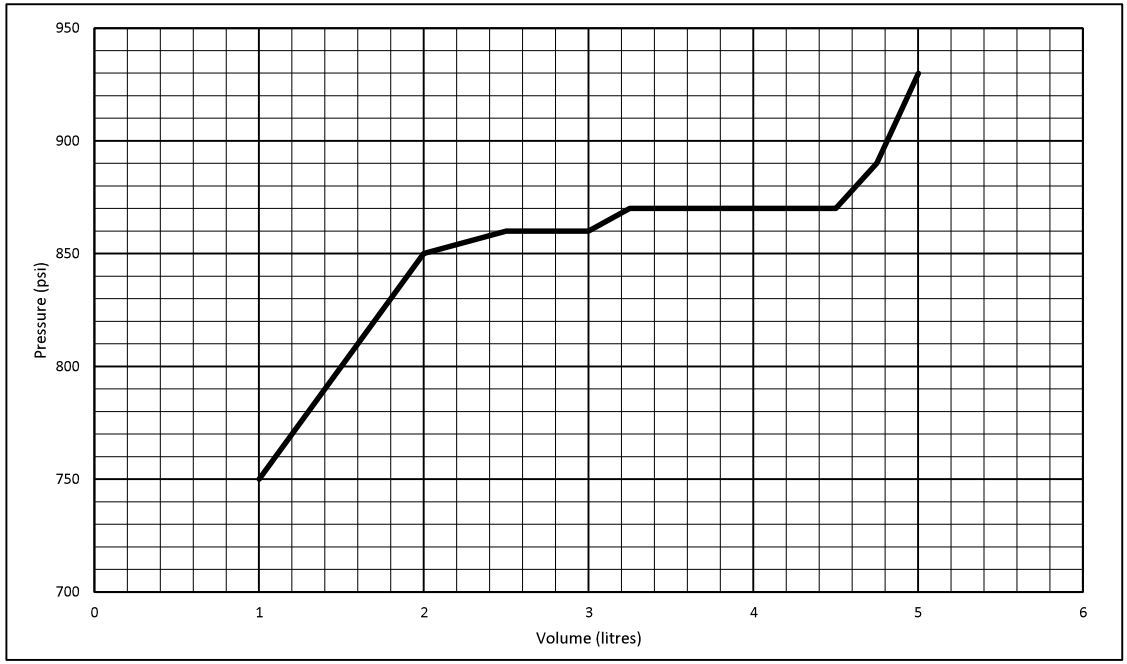
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_006

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	06 s/n 19755	150.0	930.0	650.0	8.0	11.4	141.4	*09-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	750
2	850
2.5	860
3	860
3.25	870
3.5	870
3.75	870
4	870
4.25	870
4.5	870
4.75	890
5	930



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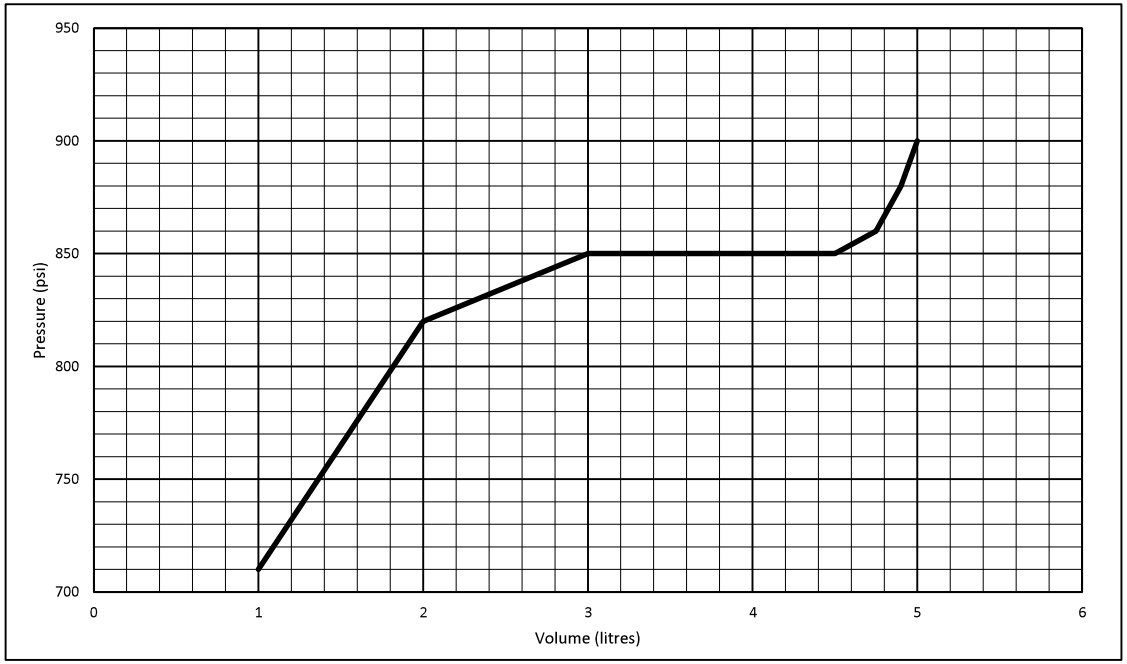
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_007

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	07 s/n 19754	140.0	900.0	650.0	8.0	11.4	121.4	*09-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	710
2	820
3	850
3.5	850
3.75	850
4	850
4.25	850
4.5	850
4.75	860
4.9	880
5	900



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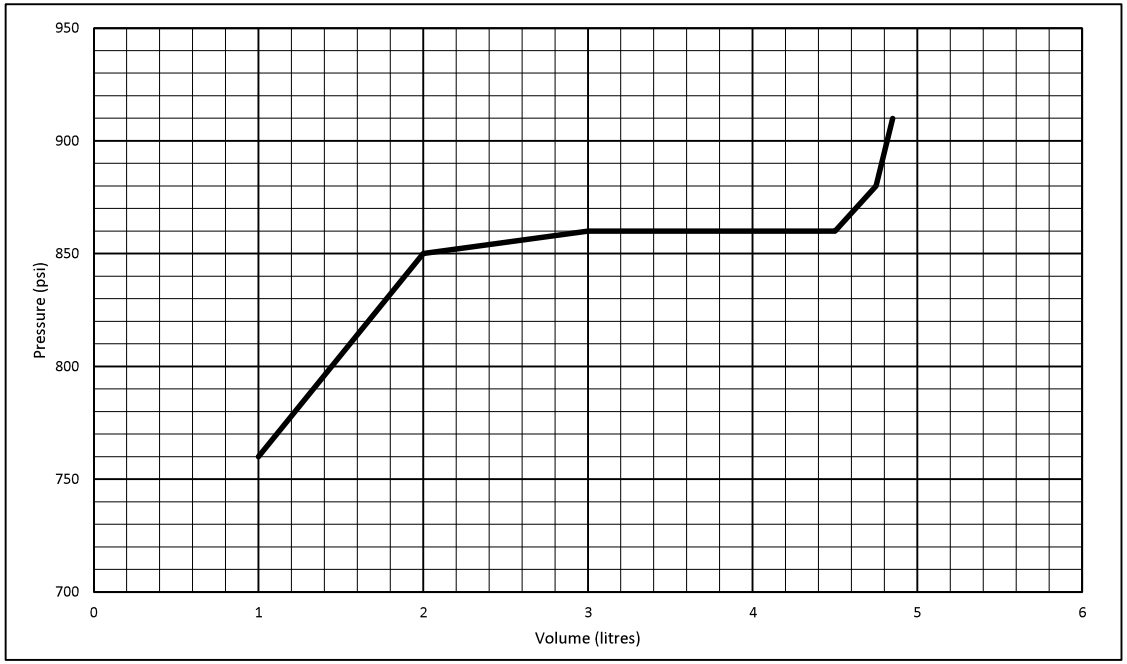
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_008

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	08 s/n 19753	145.0	910.0	650.0	8.0	11.4	126.4	*09-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	850
3	860
3.5	860
3.75	860
4	860
4.25	860
4.5	860
4.75	880
4.85	910



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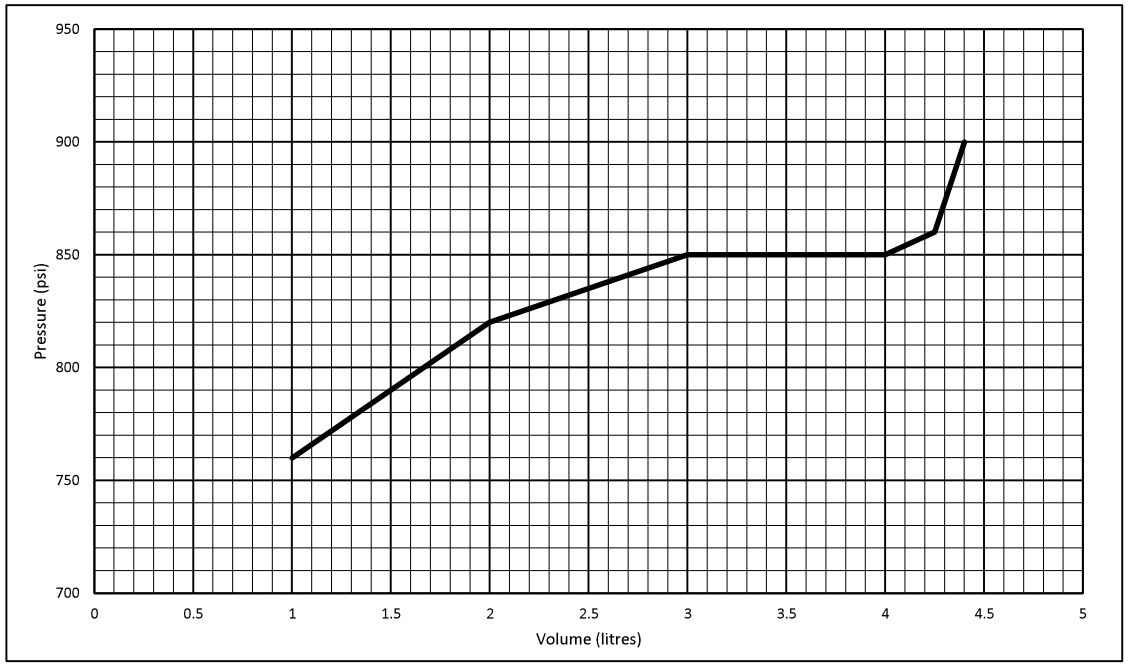
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_009

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	09 s/n 19752	145.0	900.0	650.0	8.0	11.4	116.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	820
3	850
3.25	850
3.5	850
3.75	850
4	850
4.25	860
4.4	900



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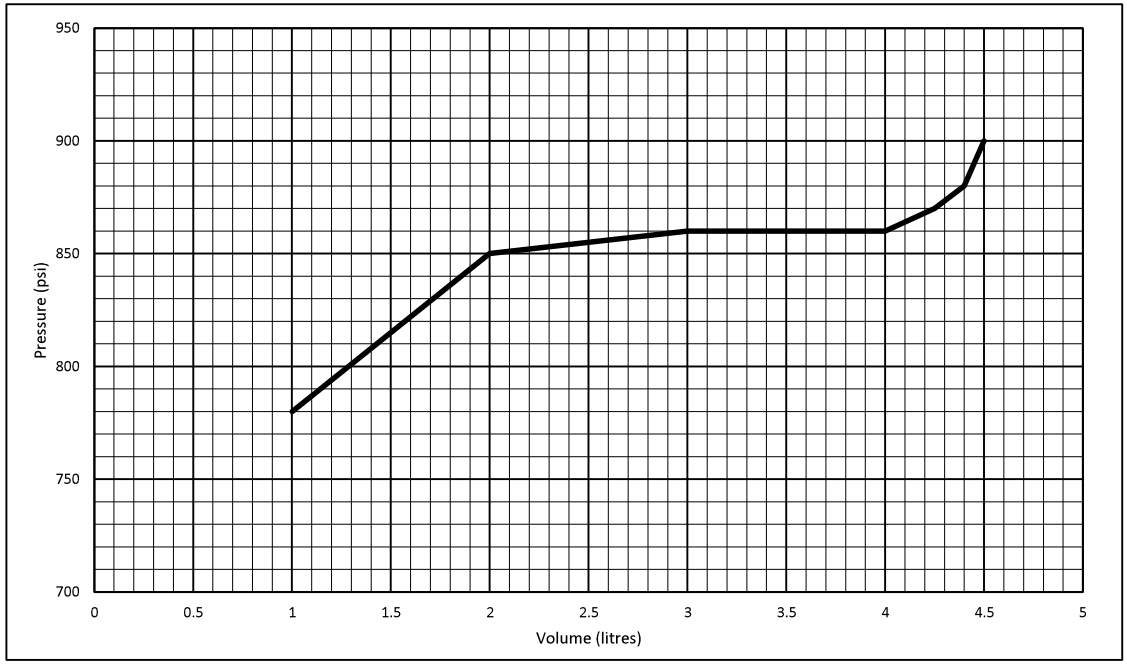
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_010

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	10 s/n 19751	140.0	900.0	650.0	8.0	11.4	121.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	880
4.5	900



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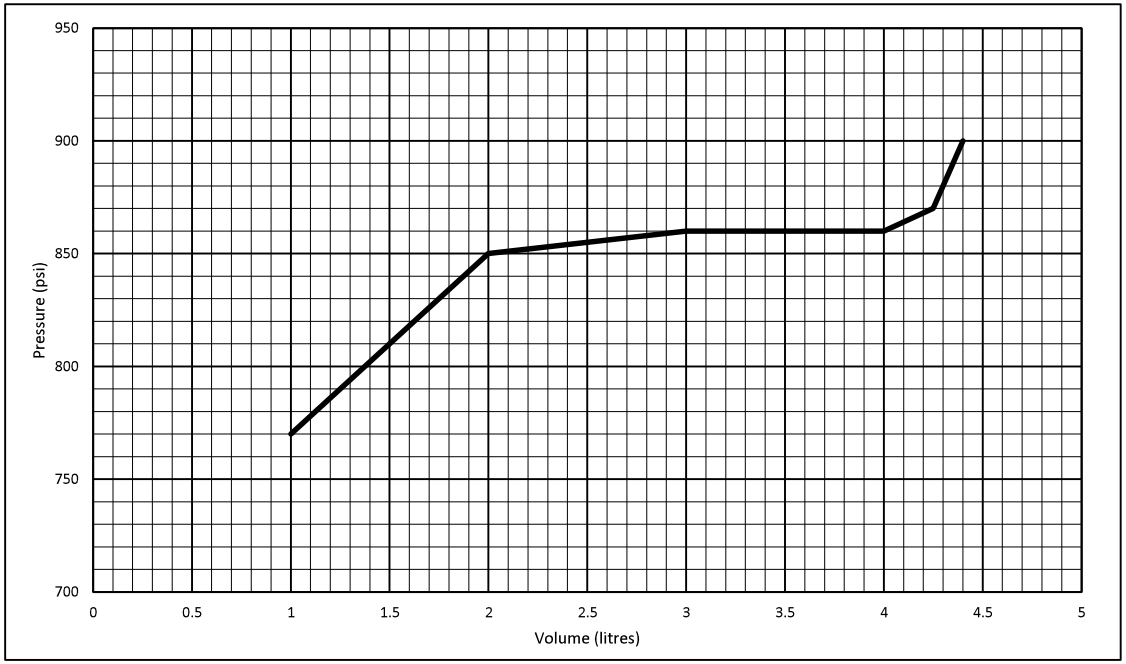
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_011

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	11 s/n 14749	145.0	900.0	650.0	8.0	11.4	116.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	900



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2021-12-15

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Approved by:

2022-03-04

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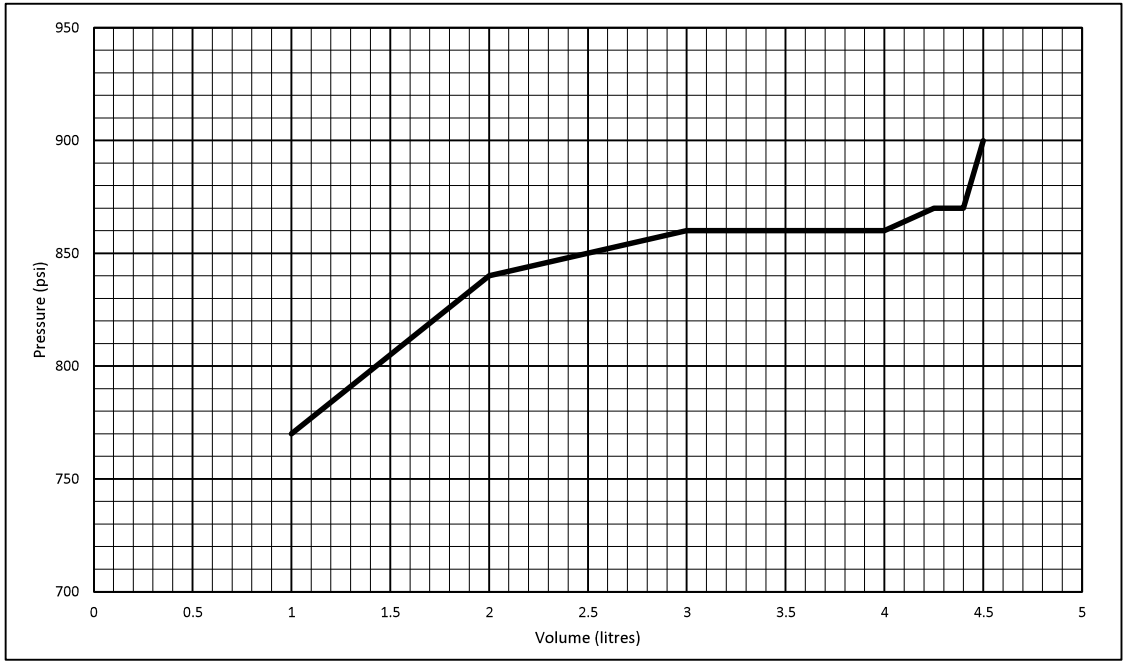
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_012

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	12 s/n 19748	140.0	900.0	650.0	8.0	11.4	121.4	*10-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	840
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	870
4.5	900



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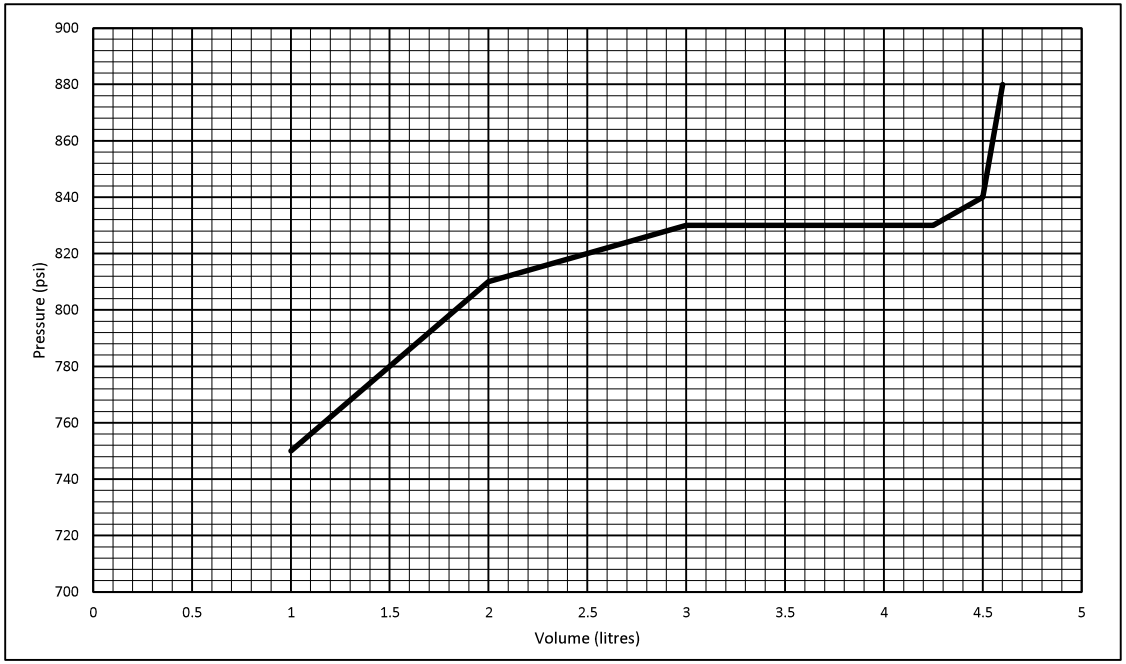
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_013

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	13 s/n 19747	135.0	880.0	650.0	8.0	11.4	106.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	750
2	810
3	830
3.5	830
3.75	830
4	830
4.25	830
4.5	840
4.6	880



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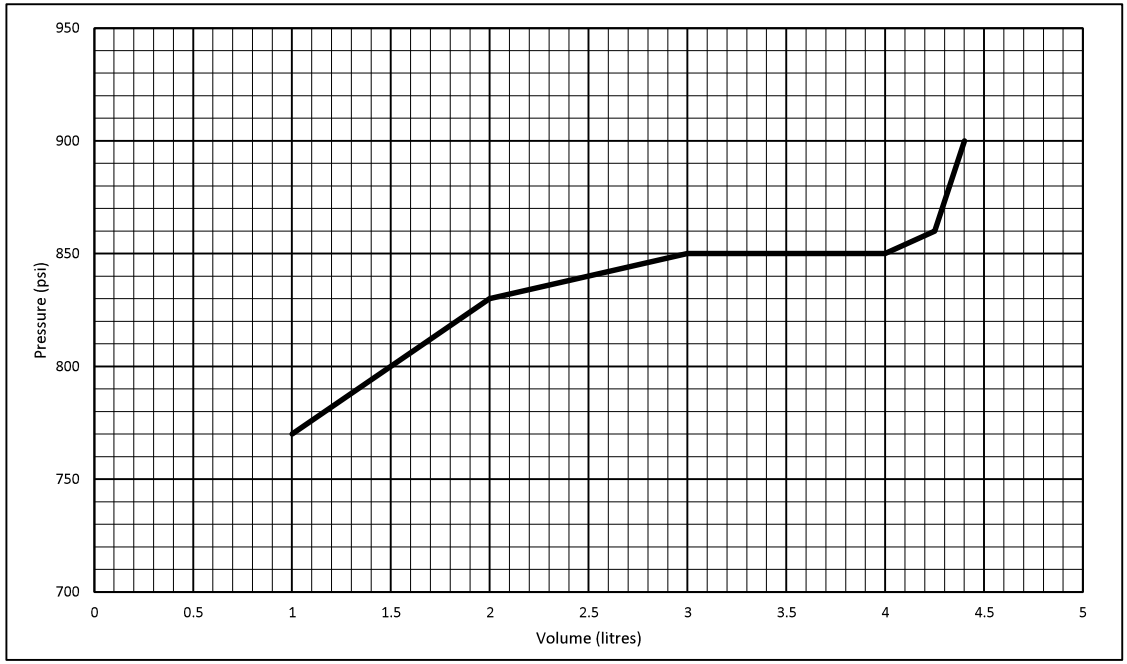
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_014

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	14 s/n 19746	145.0	900.0	650.0	8.0	11.4	116.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	830
3	850
3.5	850
3.75	850
4	850
4.25	860
4.4	900



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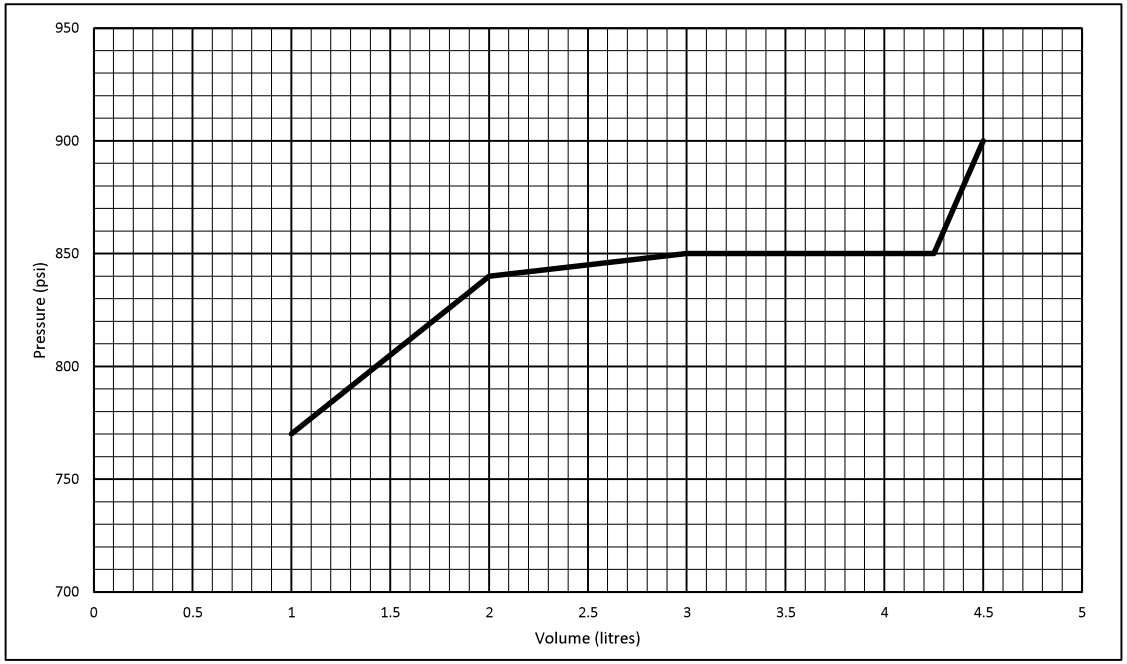
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_015

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	15 s/n 19743	150.0	900.0	650.0	8.0	11.4	111.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	840
3	850
3.5	850
3.75	850
4	850
4.25	850
4.4	880
4.5	900



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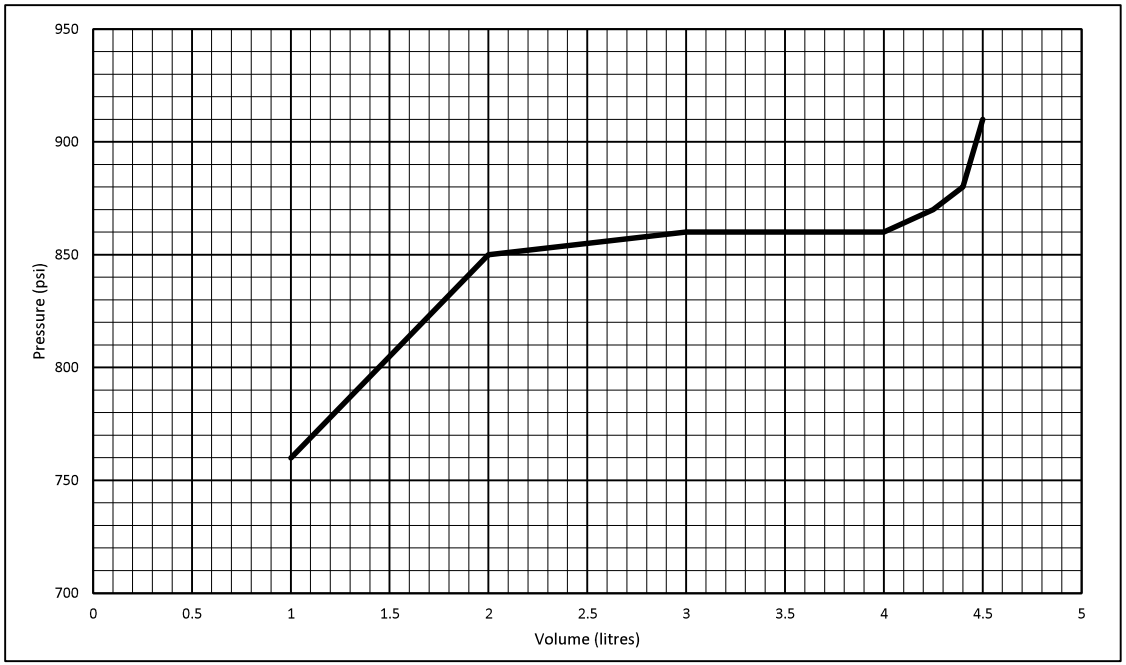
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_016

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	16 s/n 19738	140.0	910.0	650.0	8.0	11.4	131.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.4	880
4.5	910



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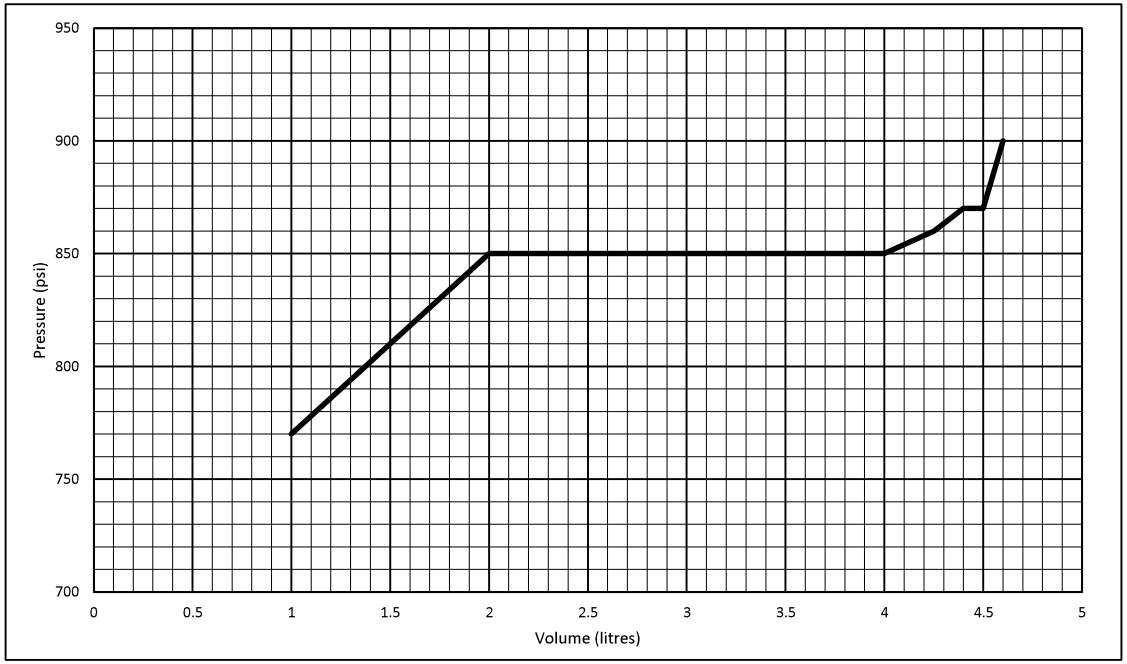
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_017

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	17 s/n 19745	150.0	900.0	650.0	8.0	11.4	111.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	850
3	850
3.5	850
3.75	850
4	850
4.25	860
4.4	870
4.5	870
4.6	900



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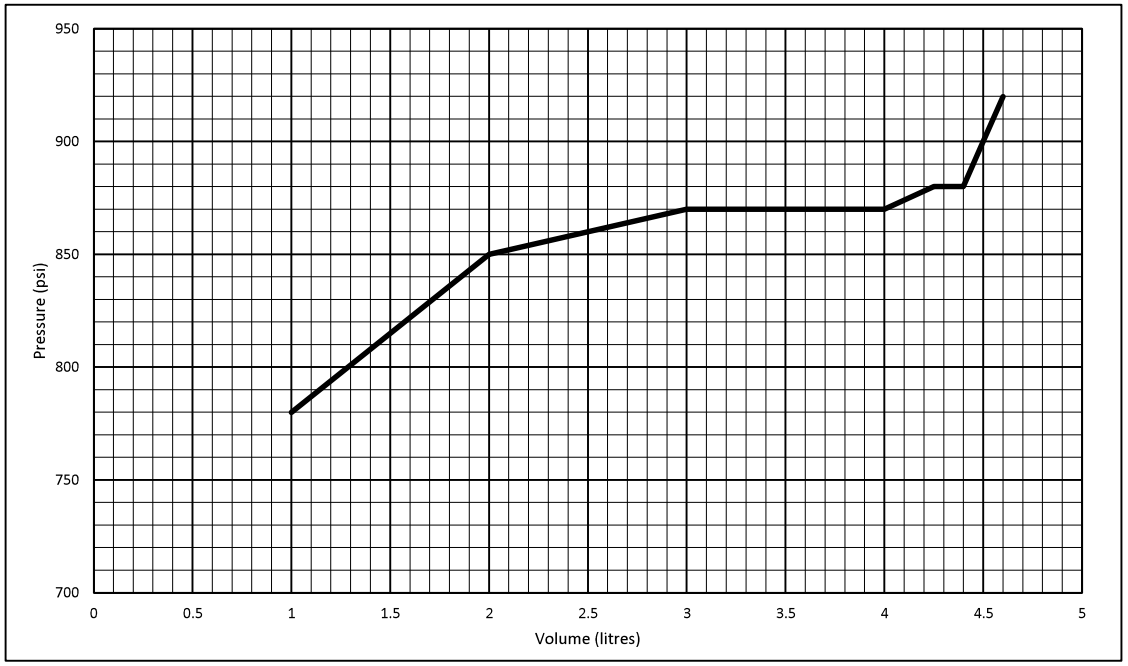
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_018

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	18 s/n 19741	140.0	920.0	650.0	8.0	11.4	141.4	*11-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	850
3	870
3.5	870
3.75	870
4	870
4.25	880
4.4	880
4.5	900
4.6	920



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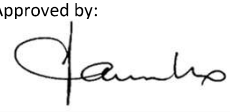
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2022-03-04

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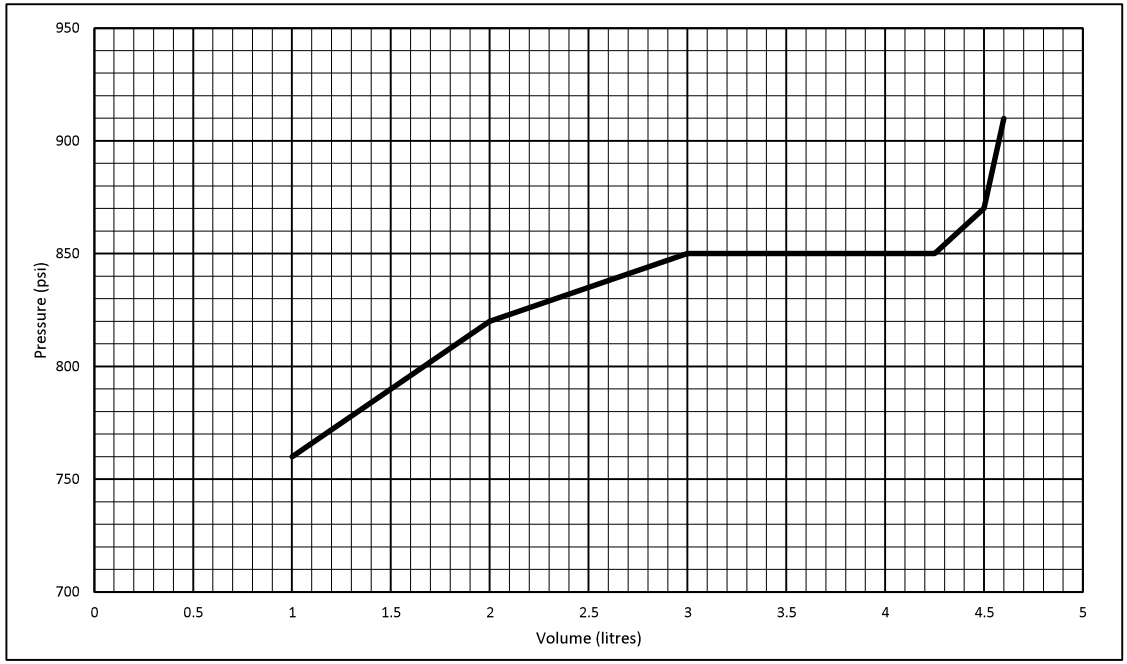
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_019

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	19 s/n 19736	150.0	910.0	650.0	8.0	11.4	121.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	820
3	850
3.5	850
3.75	850
4	850
4.25	850
4.5	870
4.6	910



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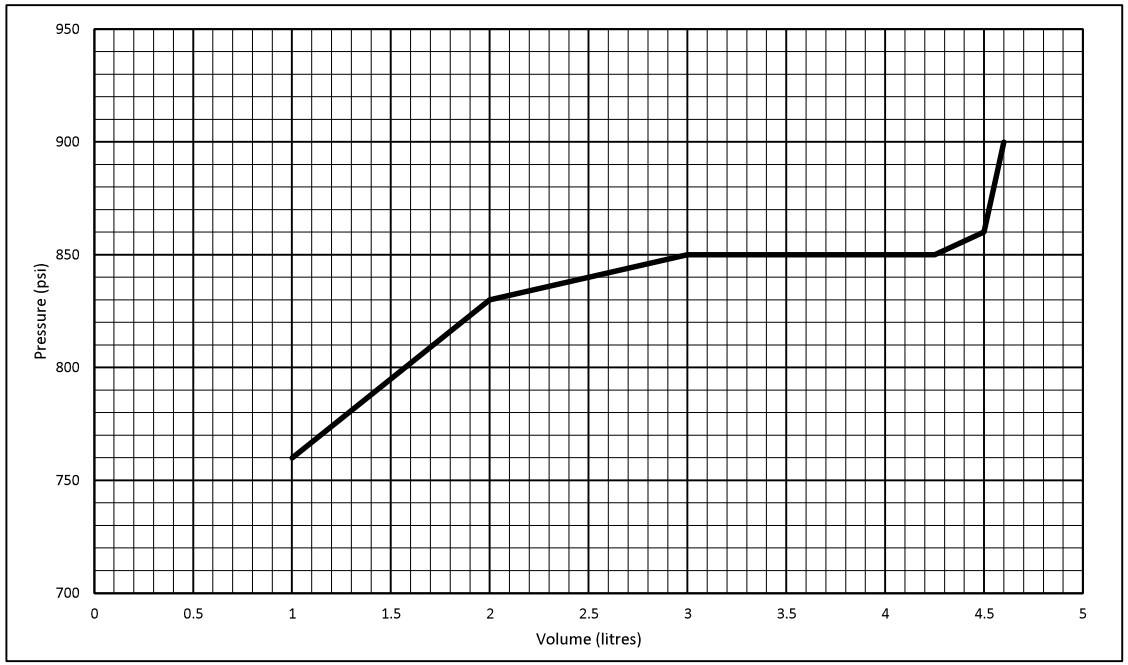
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_020

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	20 s/n 19737	135.0	900.0	650.0	8.0	11.4	126.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	760
2	830
3	850
3.25	850
3.5	850
3.75	850
4	850
4.25	850
4.5	860
4.6	900



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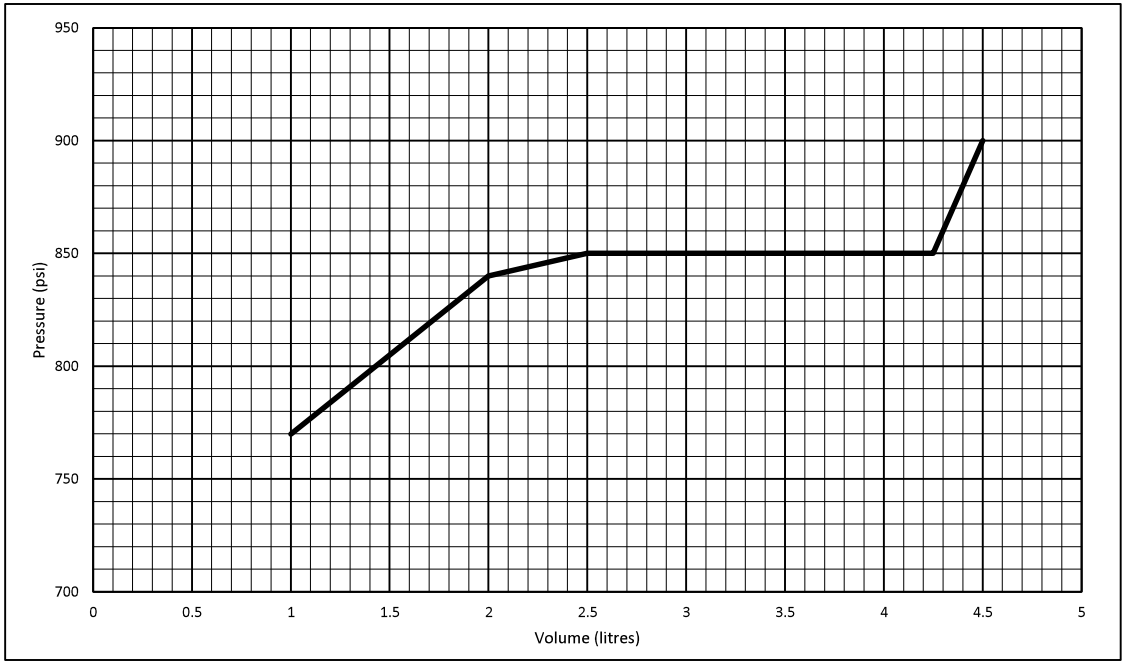
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_021

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	21 s/n 19739	140.0	900.0	650.0	8.0	11.4	121.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	840
2.5	850
3	850
3.5	850
3.75	850
4	850
4.25	850
4.5	900



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Form ID: NWMO-IGNACE-20253946-WP09-F004

GOLDER
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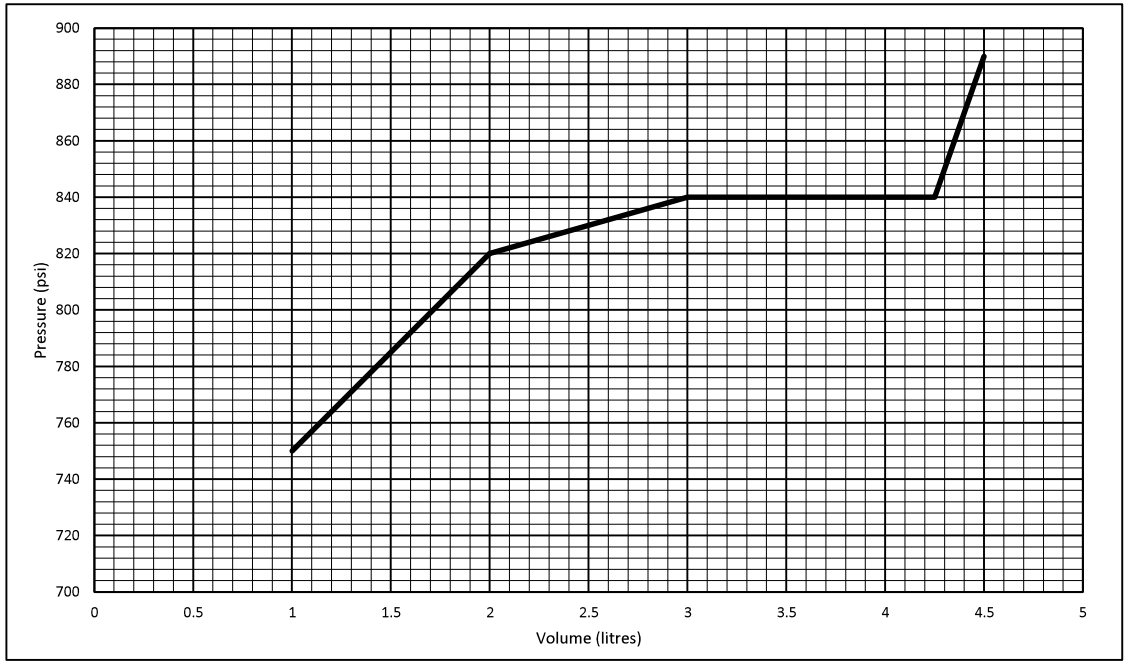
WP09 - Westbay MP38 Casing Installation
Record of Packer Inflation

Project No.: 20253946

Test # IG_BH05_HT_022

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	22 s/n 19740	140.0	890.0	650.0	8.0	11.4	111.4	*13-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	750
2	820
3	840
3.5	840
3.75	840
4	840
4.25	840
4.5	890



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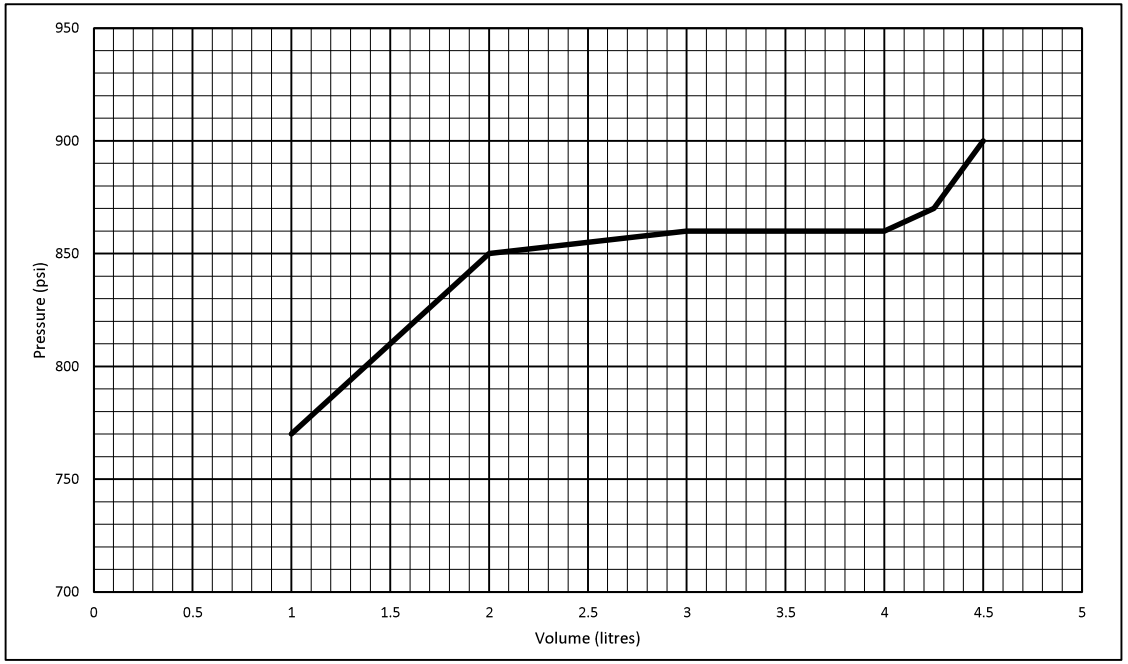
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_023

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	23 s/n 19744	135.0	900.0	650.0	8.0	11.4	126.4	*14-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	770
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.5	900



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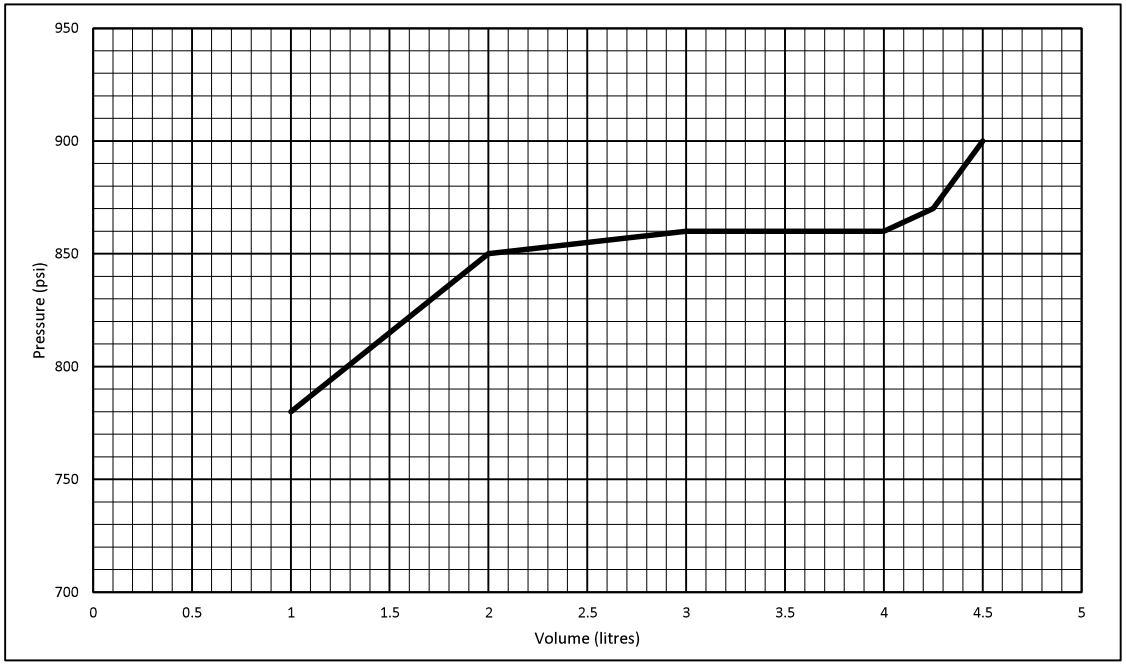
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_024

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	24 s/n 19742	150.0	900.0	650.0	8.0	11.4	111.4	*14-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	850
3	860
3.5	860
3.75	860
4	860
4.25	870
4.5	900



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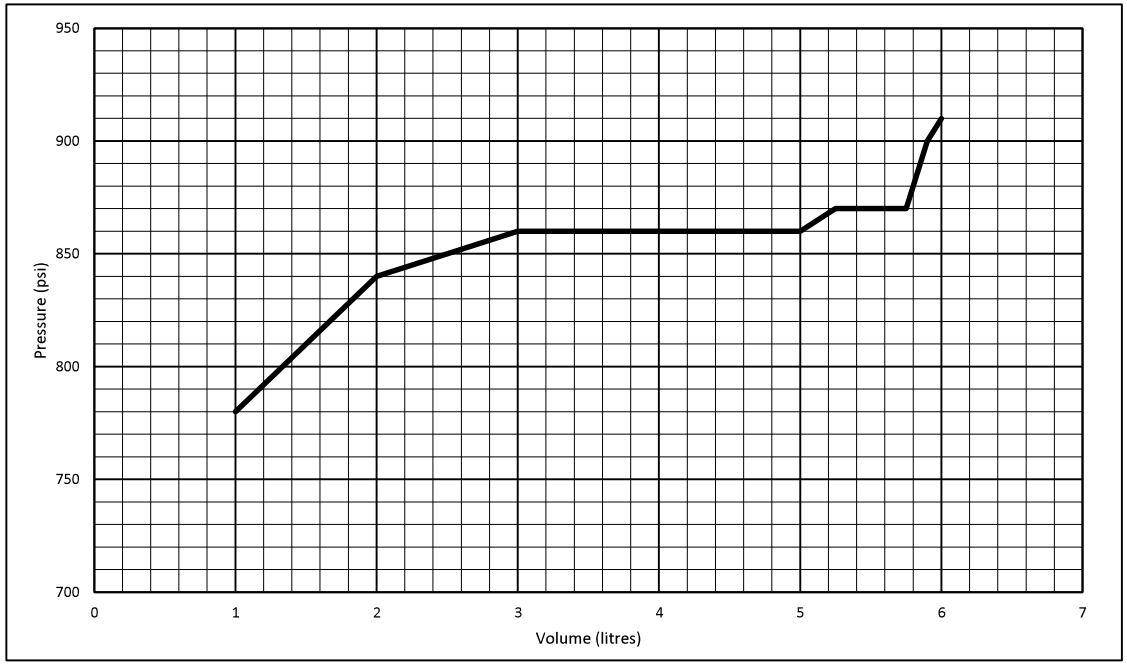
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GOLDER MEMBER OF WSP	**WP09 - Westbay MP38 Casing Installation** **Record of Packer Inflation**	**Project No.:** **20253946**

Test #	IG_BH05_HT_025

	Packer No.	Packer Valve Pressure, P_V (psi)	Final Line Pressure, P_L (psi)	Tool Pressure, P_T (psi)	Borehole Water Level (m)	Equivalent Borehole Pressure, P_W (psi)	Calc. Packer Element Pressure $P_E = P_L + P_W - P_V - P_T$ (psi)	Date and Time	Initials
Packers and Inflation Line	25 s/n 19757	145.0	910.0	650.0	8.0	11.4	126.4	*14-Nov-21*	*ML/TK*
Other (explain)	Note - Pw and Pe are calculated in this sheet								

Volume (L)	Pressure (psi)
1	780
2	840
3	860
3.5	860
3.75	860
4	860
4.25	860
4.5	860
4.75	860
5	860
5.25	870
5.5	870
5.75	870
5.9	900
6	910



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