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via Email only

Alberta Energy Regulator
Oil Sands Branch
Suite 1000, 250 - 5 Street SW
Calgary, AB T2P 0R4

Attention: Shay Dodds, P.Eng., Manager, In-Situ Southeast Authorizations

Dear Mr. Dodds,

RE: Leismer 2015 - 2016 Resource Management Report

Nexen Energy ULC (Nexen) hereby submits the annual Resource Management Report (RMR) for the Leismer oil sands property as required under the Chard-Leismer Decision (EUB Decision 2003-23). This report is the twelfth RMR to be submitted for the property. This submission covers the period from January 1, 2015 to December 31, 2016. This is the final report as Nexen was granted approval on April 10, 2017 to cease submitting these reports, conditional on Nexen continuing to monitor pressure in the Leismer area and reporting any pressure anomalies to the AER Environment and Operational Performance Branch at Bonnyville.FieldCentre@aer.ca.

Please do not hesitate to contact Deepa Thomas at deepa.thomas@nexencnooltd.com or (403) 699-5115 should you have any questions or concerns.

Sincerely,

Dave Scarpino
Senior Manager – Operated Oil Sands

Enclosure

CC: Adam Judd, Interim Manager – Governance & Compliance
Chuck Davies, Sr Manager – Legal Counsel, Regulatory



LEISMER
RESOURCE MANAGEMENT REPORT
FOR THE PERIOD
JANUARY 1 2015– DECEMBER 31, 2016

Submitted to
Alberta Energy Regulator
May 2017

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1.0 Introduction

This submission is the annual Resource Management Report (RMR) for the Nexen Energy ULC (“Nexen”) Leismer oil sands property (Leismer Property) as required under the Chard-Leismer Decision (EUB Decision 2003-23). It is specified in the decision that the RMR is to include a review of the management of the oil sands resource, and an assessment of the effect that the pressure in the overlying gas zone has on the recovery of bitumen by Steam-Assisted Gravity Drainage (SAGD) . This report is the twelfth RMR to be submitted for the property. This submission covers the period from January 1, 2015 to December 31, 2016.

2.0 Area Overview

The Leismer Property is situated within the Athabasca Oil Sands Area of Alberta in Townships 76, 77, 78, 79 and 80; Ranges 6, 7, 8 and 9 W4M (**Figure 1**). The property is comprised of 134 sections or approximately 34,705 hectares. The oil sands in the Lower Cretaceous McMurray Formation are the target for delineation drilling to evaluate the original bitumen-in-place on the lands and the production potential using SAGD recovery.

The Leismer Property continues to be a part of Nexen’s integrated Athabasca Oil Sands long term development strategy.

No oil sands evaluation well drilling programs were executed in 2015 and 2016.

3.0 Land

The Leismer Property is comprised of 134 sections of oil sands leases, as shown in **Figure 1**. There have been no changes to the land base in the reporting period.

4.0 Area Development

General Area Activity

Considerable oil sands appraisal activity has occurred over the past year on the oil sands leases west, east and south of Nexen’s oil sands property. Oil sands leases to the west are operated by Grizzly Oil and StatoilHydro Canada Ltd., to the east by MEG Energy and Cenovus Energy, and to the south by Devon Energy.

Leismer Appraisal Activity

No oil sands evaluation wells were drilled in 2015 and 2016.

5.0 Bitumen Evaluation Results

The McMurray Formation Bitumen Pay Map (**Figure 2**) illustrates our interpretation of primary McMurray bitumen pay over Nexen's acreage. The bitumen pay interval is defined by the following cut-offs:

- Oil saturation (S_o) greater than or equal to 50%;
- Shale volume (V_{sh}) less than or equal to 30%.

The top of the bitumen pay section is bounded by two meters or more of continuous non-pay (intervals in which the S_o is less than 50% or V_{sh} exceeds 30%) or by 4m of cumulative non-pay. Alternatively, it may be bounded by the top of the McMurray estuarine channel section, in cases where thick, bitumen-saturated sands extend to near the top of the McMurray.

The base of the bitumen pay section may be bounded by the same non-pay thicknesses as above. Alternatively, the base of the bitumen pay section may be the contact with a McMurray bottom water zone (in which S_o is less than 50%), or it may be the top of the Devonian, in areas where clean bitumen-saturated sands directly overlie the Devonian surface.

The mapped bitumen pay zone tends to be the stratigraphically-deepest, thickest, and most laterally-continuous pay zone. Bitumen-saturated sands found above the McMurray regional A2 and B2 mudstones, and other secondary pay zones in the reservoir interval, are not included within the mapped interval.

The aforementioned cut-offs delineate the bulk of the bitumen resource within the McMurray valley-fill that may be recovered by SAGD.

Additional drilling programs and ongoing integration of seismic and well data sets will be required to delineate the distribution and orientation of the McMurray point bar sands before horizontal SAGD wells can be planned.

6.0 Region of Influence Mapping

The updated maps that determine the "region of influence" are as follows:

Figure 3 – Nexen Leismer Lease with observation well locations

Figure 4 - Wabiskaw "C" Structure

Figure 5 - Wabiskaw "C" Gas Net Thickness (m)

Figure 6 - McMurray Top Gas Net Thickness (m)

Figure 7 - McMurray Gross Top Water Isopach (m)

Figures 4 through 7 are discussed in the sections that follow.

Wabiskaw “C” Structure and Wabiskaw “C” Sand Gas Net Pay Maps

The Wabiskaw “C” sand is a thin, widespread and porous unit. Wabiskaw “C” gas pools are typically aerially large, continuous, and coincident with the Wabiskaw “C” sand structural high trends (**Figure 4**). Structure on the Wabiskaw “C” sand provides a structural reference for both the Wabiskaw “C” sand gas accumulations (**Figure 5**) and the underlying McMurray gas accumulations.

McMurray Gas Net Pay Map

The McMurray Formation gas pools are shown on **Figure 6** and illustrate where gas occurs above the McMurray regional “A2” mudstone, above the McMurray regional “B2” mudstones, and in the valley-fill/channel section, and generally coincident with structural highs.

The map includes, in part, gas that is defined in the EUB Regional Geological Study Report (Report 2004-A) (“the RGS”) as occurring in the Wabiskaw “D” Valley-fill deposits. The Wabiskaw “D” Valley-fill deposits appear to be interpreted in the RGS as occurring primarily in the McMurray channel section, and also lapping onto and across the erosional edge of the regional McMurray “A2” mudstone.

The gas pooling methodology used on this map is as follows:

- Gas-water contacts with +/- 1 meters; and
- Gas-bitumen contacts with +/- 5 meters.

Wabiskaw “D” Valley Fill

Nexen’s current position on the Wabiskaw “D” Valley-fill in the Leismer area is outlined in the Leismer RMR submitted in 2007. Although Nexen’s current interpretation of the Wabiskaw does not include a Wabiskaw “D” Valley-fill, the presence of this unit does not change Nexen’s interpretation that lateral and vertical pressure communication is likely through the Wabiskaw-McMurray interval via sand-to-sand contacts.

McMurray Gross Top Water Isopach

The numerous gas pools shown in **Figure 6**, occurring both above the preserved regional mudstones and within the McMurray channel section, overlie broad regions of top water across the Leismer lease. **Figure 7** shows Nexen’s current interpretation of water occurring in the channel section of the McMurray Formation. This map was constructed using the following cut-offs:

- Density porosity greater than or equal to 15%.
- Deep resistivity less than or equal to 10 ohm-metres.
- Shale volume less than or equal to 50%.

Nexen's interpretation is that the combination of gas pools and extensive top water forms a broad region of influence through which pressure changes can be transmitted.

7.0 Assessment of Pressure in the Leismer Area

Pressure data collection occurred in 2014 with pressure measurements taken in various formations in two (2) oil sands evaluation wells with the wireline Multi-Sample Formation Tester tool. No new pressure data has been obtained since 2014. Pressure measurements were taken to assess current pressures in the Wabiskaw-McMurray.

The observation well pressure data was also collected in 2015-16 from the existing vibrating wire piezometer (VWP) wells and will be discussed in next sections. Pressure plots for all observation wells can be found in the appendix.

It is expected that pressure measurements will continue to be taken in future drilling programs, where suitable zones are encountered. New data will be used in ongoing pressure analysis to determine and monitor the impact of offsetting gas operations in the area.

8.0 Pressure Monitoring Program/Vibrating Wire Piezometers

VWP sensors were installed in eight (8) Leismer observation wells. The locations of these wells are shown on **Figure 3**. The background information has been provided in previous RMR's and therefore will not be repeated here. Updated time-based pressure plots have been included here along with updated observations and discussions regarding VWP performance.

In May of 2009, Nexen exchanged various asset well licenses with Cenovus Energy, which included the 100/02-19-077-06W4 well, therefore no pressure data will be presented for this well.

At this time, there are four (4) wells actively recording pressure data and none of the sensors have documented any pressure anomalies from January 2015 to December 2016. The remaining four wells have lost communication and are no longer collecting pressure data. At this time there are no plans to repair these wells as all trends were stable prior to losing communication. The down wells in question are listed below:

- 100/07-13-077-08W4
- 100/08-35-077-07W4
- 100/14-02-078-07W4
- 100/16-27-077-07W4

9.0 Conclusions

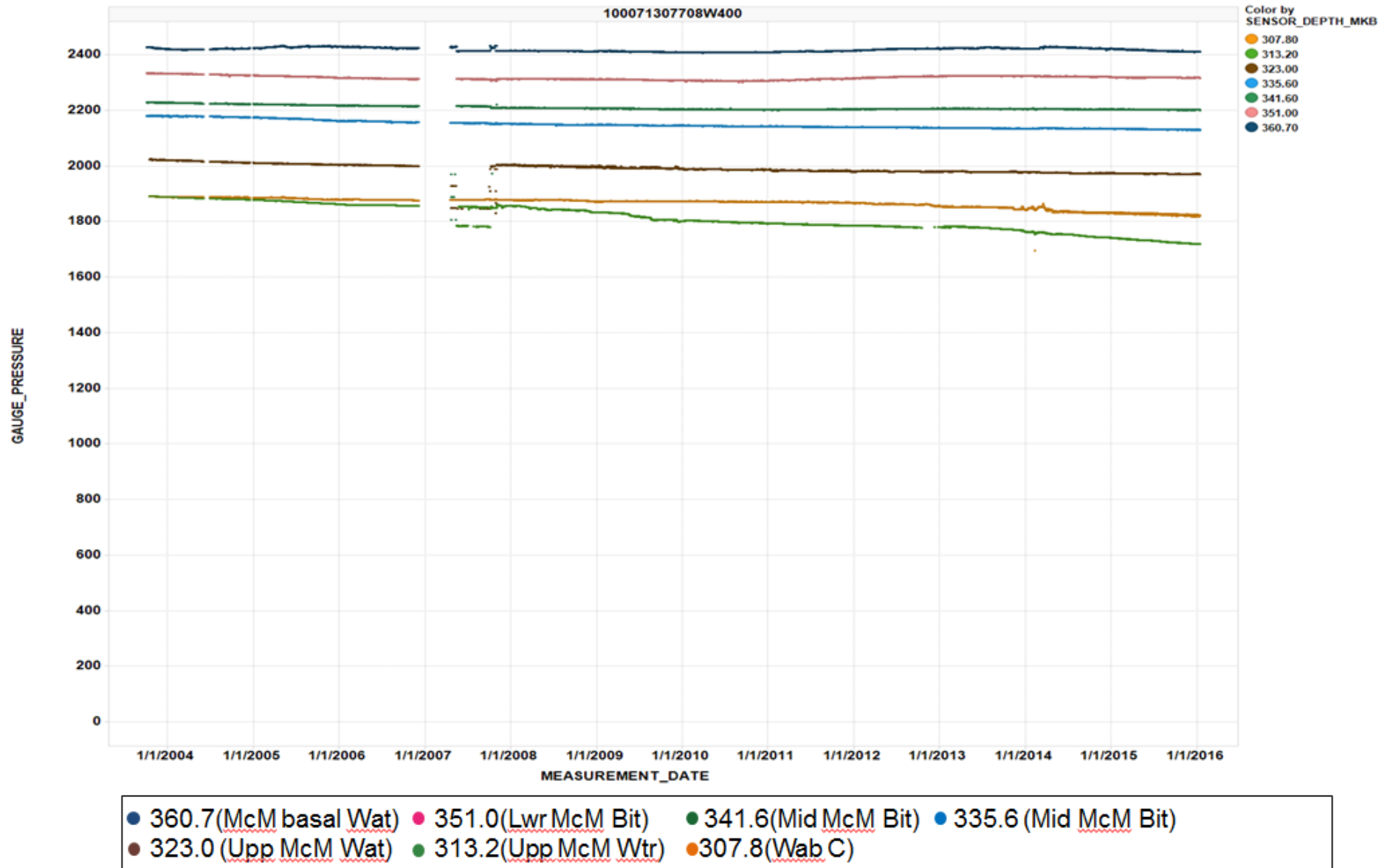
Pressure monitoring has continued through 2015 - 2016, and is expected to continue as required. Nexen maintains the position taken at the Chard - Leismer Hearing that a single

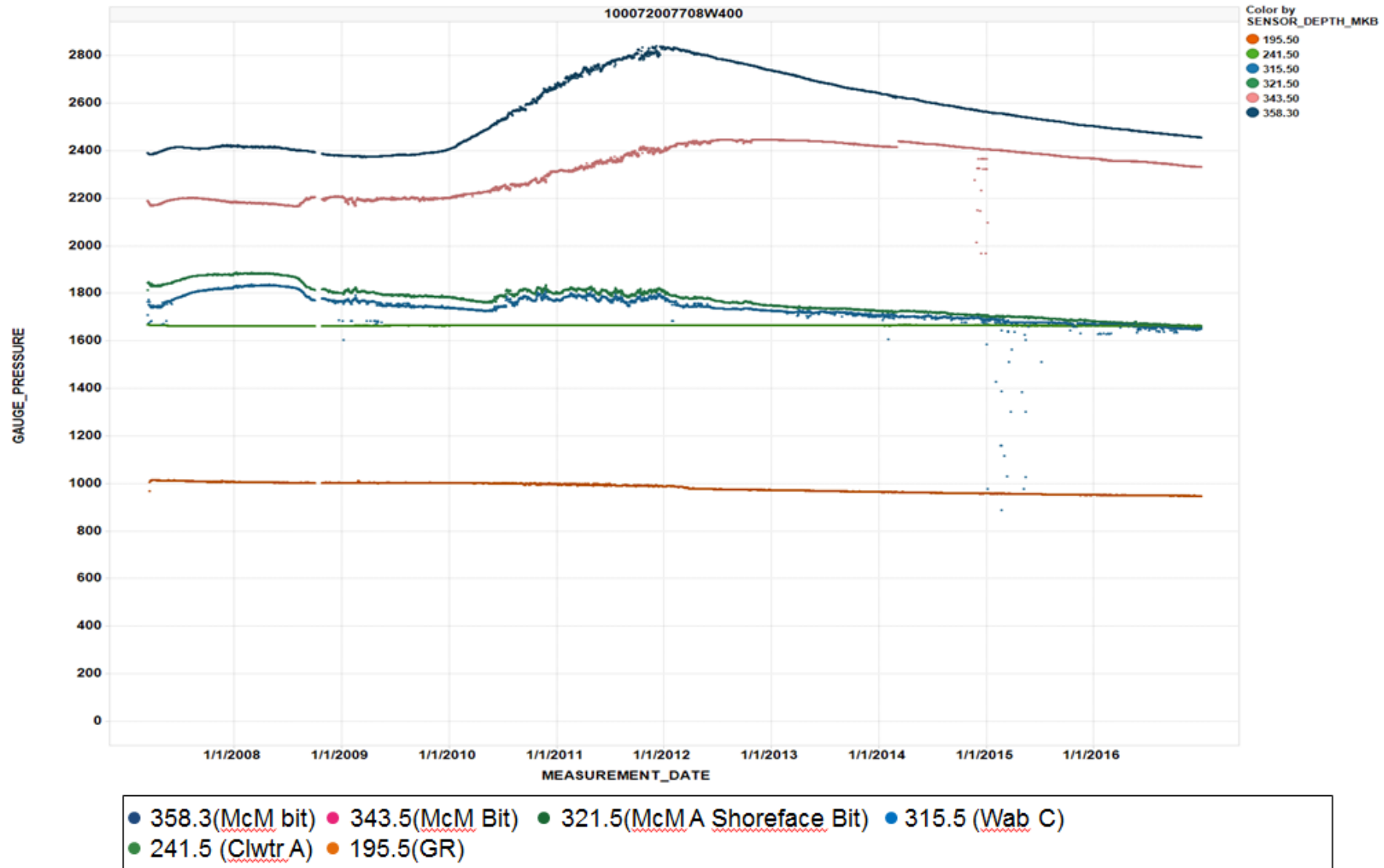
broad region of influence may exist over the entire Leismer lease area permitting pressure responses to be transmitted over long distances, and Nexen believes that the pressure data collected since the hearing continues to support that conclusion.

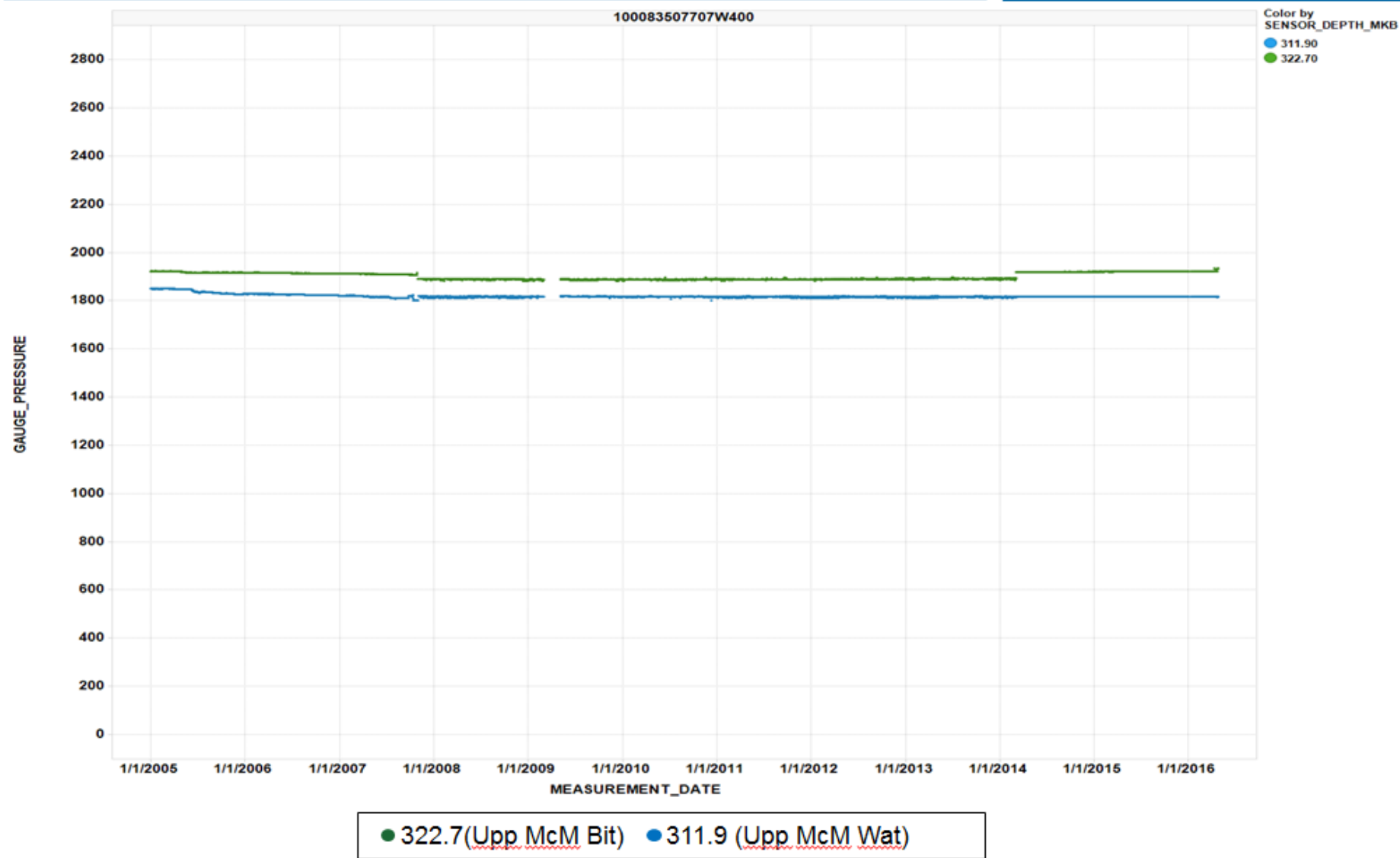


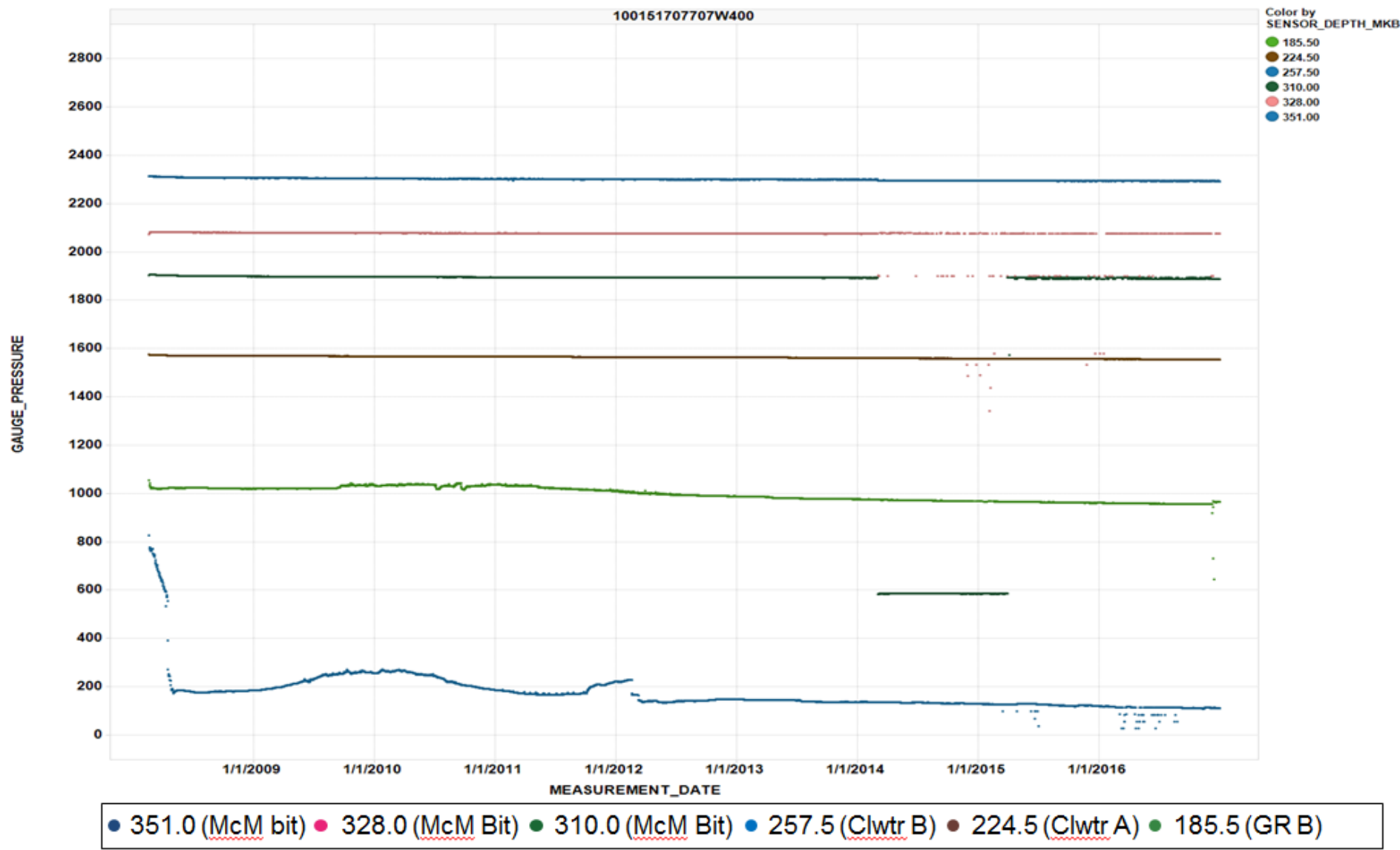
Appendix

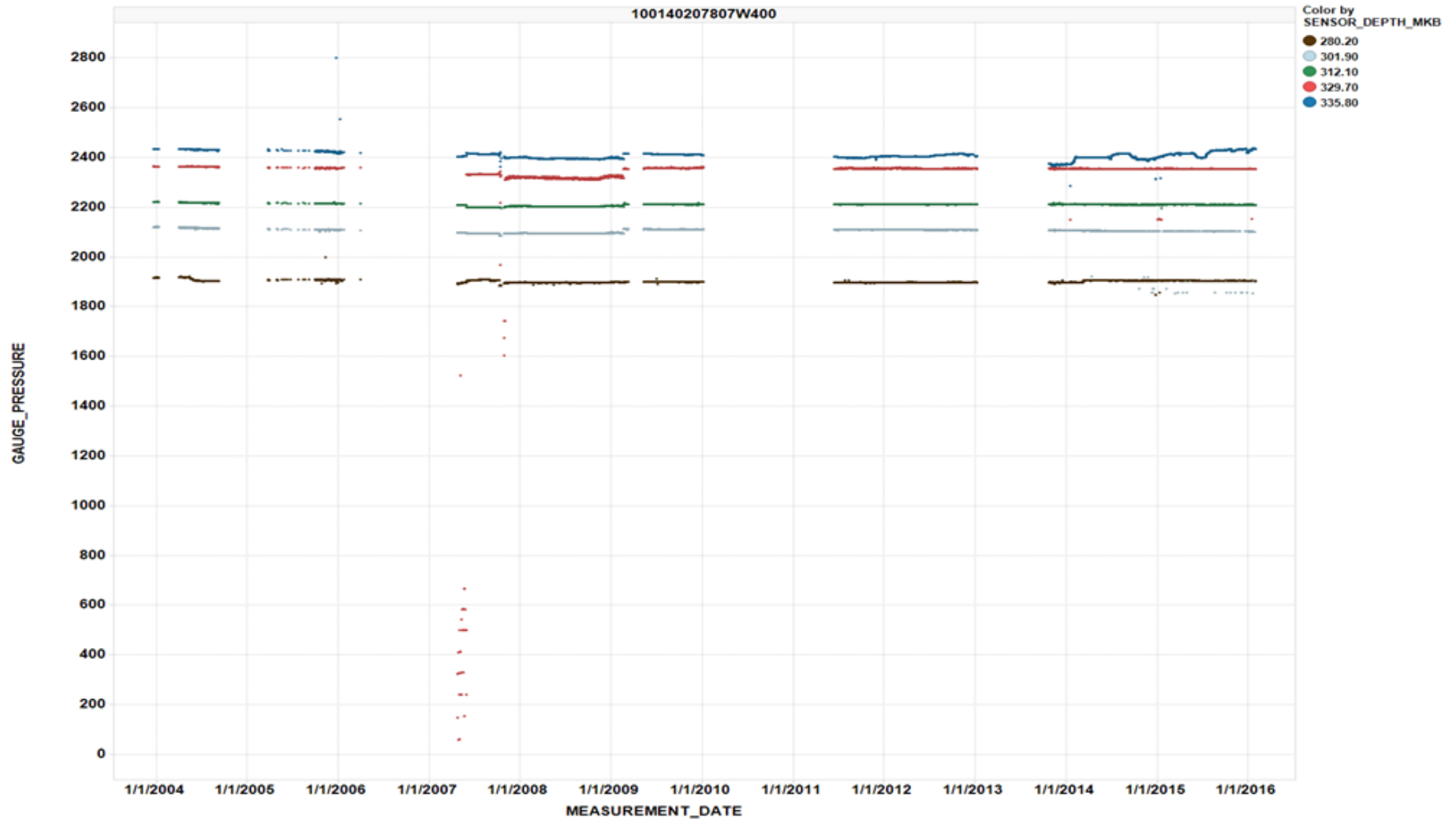












● 335.8 (Bsl McM Wtr) ● 329.7 (Lwr McM Bit) ● 312.1 (Mid McM Bit) ● 301.9 (Upp McM Wat) ● 280.2 (Wab C)

