IEG CONSULTANTS LTD.

Shell Canada Energy

Unipkat I-22

2014 Monitoring and Maintenance Program Summary Report

February 2015
A04025A03

ISO 9001:2008
Certificate No. FS 62747

February 05, 2015

Northwest Territories Water Board
P.O. Box 2531
#302, 125 Mackenzie Road
Inuvik, NT
X0E 0T0

Ms. Mardy Semmler
Executive Director

Dear Ms. Semmler:

Unipkat I-22
2014 Monitoring and Maintenance Program Summary Report

IEG Consultants Ltd. is pleased to submit the 2014 Monitoring and Maintenance Program Summary Report on behalf of Shell Canada Energy.

If you have any questions, please call the undersigned at (403) 730-6809.

Yours truly,
IEG CONSULTANTS LTD.

Nicole Wills, P. Ag.
Project Manager

NW
c.c. Randall Warren – Shell Canada Energy
c.c. Mike Harlow – Inuvialuit Land Administration
c.c. Donald Arey – Government of the Northwest Territories
c.c. Veronique D'Amours-Gauthier – Fisheries and Oceans Canada

150205R_NWTWB_2014 Unipkat I-22 Report
A04025A03

Shell Canada Energy

Unipkat I-22

2014 Monitoring and Maintenance Program Summary Report

TABLE OF CONTENTS

List of Figures

List of Appendices

1 BACKGROUND

The Unipkat I-22 wellsite (Site) was an exploration natural gas well drilled by Shell Canada Ltd. (Shell) in 1972 and 1973. The well was originally spudded on September 8, 1972 and the drilling rig was released on March 6, 1973. Drilling was completed at the Site under Indian and Northern Affairs Canada land use license N72A088. The drilling sump was constructed on July 29, 1972, enlarged during drilling operations, and capped April 3, 1972.

Shell conducted a drilling sump remediation program at the Site between February and April 2011. The Site is located within the Inuvialuit Settlement Region, along the eastern bank of Arvoknar Channel, southwest of the Kendall Island Bird Sanctuary. The closest community is Tuktoyaktuk, Northewest Territories (NT).

As part of the remedial program, a Type "B" water licence was granted by the Northwest Territories Water Board (NWTWB). Licence N7L1-1831 required that a Site monitoring and sampling program, approved by the NWTWB, be conducted in 2012 and 2013. IEG Consultants Ltd. (IEG) submitted a Site monitoring and sampling plan in June 2011 to the NWTWB for review, and approval was granted in February 2012. A Site Monitoring and Sampling program was conducted at the Site in 2012 (IEG, 2012) and 2013 (IEG, 2013).

Based on the 2013 visual inspection, the backfilled former drilling sump area and shoreline exhibited signs of erosion where sloughing resulted in soil loss (IEG, 2013). A monitoring and maintenance program to monitor Site conditions and conduct Site maintenance was suggested during discussions with Aboriginal Affairs and Northern Development Canada (now Government of Northwest Territories) in December 2013. This report summarizes the monitoring and maintenance activities conducted at the Site in 2014.

2 OBJECTIVE AND SCOPE OF WORK

The objective of the 2014 Monitoring and Maintenance Program was to monitor Site conditions and conduct Site maintenance. The scope of work included the following:

- mobilization to Site;
- conduct a visual inspection of the Site;
- promote slope stabilization of the eroding river bank with willow staking;
- reseed bare areas and cover with coconut matting;
- collect Global Positioning System (GPS) coordinates of the shoreline;
- demobilization from Site; and,
- preparation and submission of a report summarizing the 2014 Site activities.

3 VISUAL INSPECTION

One IEG personnel and three Northwind Industries personnel mobilized to Site from Camp Farewell via boat on August 12, 2014.

IEG personnel conducted a visual inspection of the Site and collected data including:

- observations of: subsidence, erosion or frost action, potential seepage, areas of water pooling or discharge, shoreline stability, soil staining, vegetation stress, and odours; and,
- photographic evidence of the inspection.

The backfilled former drilling sump area and shoreline exhibited signs of erosion where sloughing has resulted in soil loss (Appendix I; Photographs 1 and 2). At the section of shoreline observed to have the greatest degree of erosion, the shoreline has eroded approximately 3 m since August 2013, approximately 12 m since June 2012, and approximately 16 m since June 2011. Cracks in the earth were observed approximately 10 m back from the bank (Appendix I; Photograph 3).

At the time of the assessment, vegetation appeared to be establishing on the majority of the backfill cap and appeared to be more sparse west, north, and east of the backfill cap (Appendix I; Photographs 1-5).

Odours were not noted and signs of subsidence, staining, seepage, water pooling, or cap failure were not observed.

4 SITE MAINTENANCE

Site maintenance activities conducted on August 12, 2014 involved planting approximately thirty willow stakes along the riverbank to assist with slope stabilization (Appendix I; Photographs 1, 2, and 4). In addition, areas of sparse vegetation were reseeded with a native seed mix and covered with coconut matting (Appendix I; Photographs 7 to 11).

GPS coordinates of the current shoreline of the Arvoknar Channel adjacent to the Site were collected (Figure 1).

5 CONCLUSIONS

Based on the 2014 visual inspection, the backfilled former drilling sump area and shoreline exhibited signs of erosion, however the rate of erosion was less than half the distance measured in 2013 and appears to be stabilizing. At the section of shoreline observed to have the greatest degree of erosion, the shoreline has eroded approximately 3 m since August 2013, approximately 12 m since June 2012, and approximately 16 m since June 2011. Vegetation was noted to be establishing on the majority of the backfill cap.

Odours were not noted and signs of subsidence, staining, seepage, water pooling, or cap failure were not observed.

6 CLARIFICATIONS OF THIS REPORT

This report was prepared by IEG for the account of Shell Canada Energy. The material in it reflects IEG's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. IEG accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

7 CLOSING

We trust this report meets your approval and satisfies your current needs. Should you have any questions or comments, please contact the undersigned at (403) 730-6809.

IEG CONSULTANTS LTD.

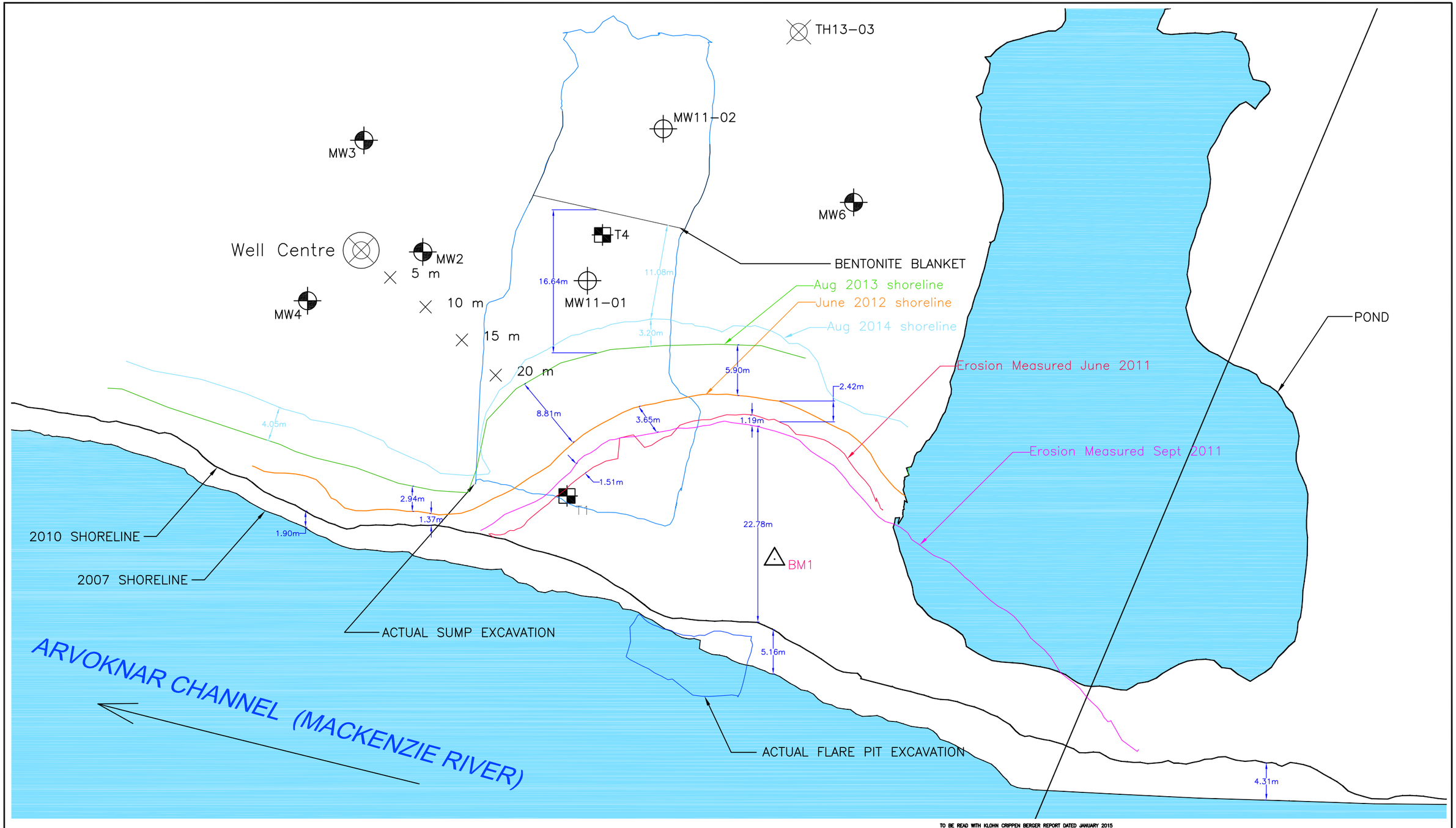
Nicole Wills, P. Ag. (Alberta)
Project Manager

REFERENCES

IEG Consultants Ltd. (IEG), 2012. Unipkat I-22 2012 Monitoring and Sampling Program. September 2012.

IEG Consultants Ltd. (IEG), 2013. Unipkat I-22 2013 Monitoring and Sampling Program. September 2013.

FIGURES



TO BE READ WITH KLOHN CRIPPEN BERGER REPORT DATED JANUARY 2015

SCALE 1:430 0 4.3 8.6 m

NOT FOR CONSTRUCTION

PROJECTION NOTES:

1. HORIZONTAL DATUM: –
2. GRID ZONE: –
3. VERTICAL DATUM: –
4. SCALE: –

CLIENT: Shell Canada Energy

IEG CONSULTANTS LTD.

PROJECT: UNIPKAT I–22 2014 SITE MAINTENANCE AND MONITORING PROGRAM

TITLE: Site Plan

SCALE	PROJECT No.	FIG. No.
1:430	A04025A03	FIGURE 1

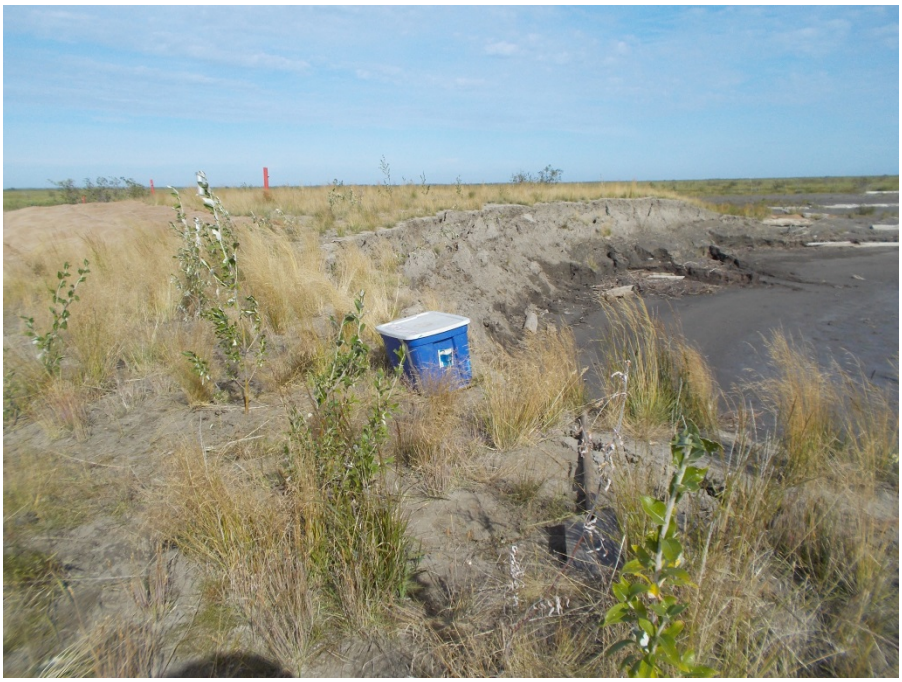
KCB-FIG-B-L

Z:\ACGY\Alberta\A04025A03 SCE Unipkat I-22 2014 Site Maint\400 Drawings\410 Drawings\150114 A04025A03 - FIG 1.dwg Layout=LAYOUT1 Monday, January 19, 2015 9:40:19 AM

APPENDIX I

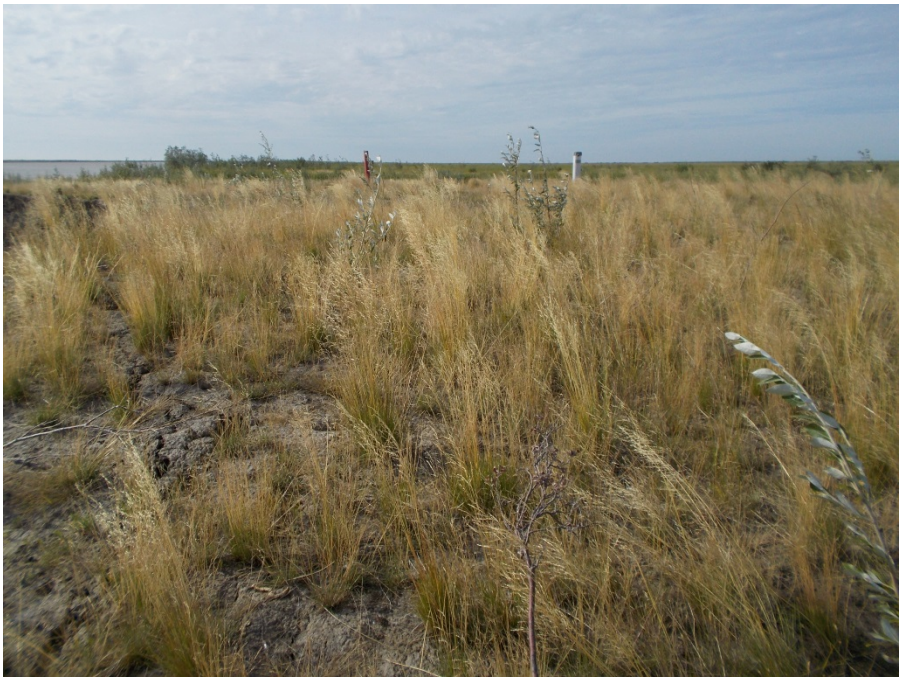
Site Photographs

Photograph 1: Vegetation establishing on the backfill cap and willow staking (August 12, 2014).



Photograph 2: Shoreline and willow staking (August 12, 2014).

Photograph 3: Vegetation establishing on backfill cap. Cracks observed approximately 10 m back from the bank (August 12, 2014).



Photograph 4: Vegetation establishing on the backfill cap and willow staking (August 12, 2014).

Photograph 5: Area of sparse vegetation on western and northern portion of the backfill cap (August 12, 2014).

Photograph 6: Area of sparse vegetation west of the backfill cap (August 12, 2014).

Photograph 7: Coconut matting staked down over area of sparse vegetation west of the backfill cap (August 12, 2014).

Photograph 8: **Coconut matting staked down over area of sparse vegetation on western portion of the backfill cap (August 12, 2014).**

Photograph 9: **Coconut matting staked down over area of sparse vegetation on western and northern portion of backfill cap (August 12, 2014).**

Photograph 10: Coconut matting staked down over area of sparse vegetation on northern portion of the backfill cap (August 12, 2014).

Photograph 11: Coconut matting staked down over area of sparse vegetation east of the backfill cap (August 12, 2014).