



Imperial Oil

**Renewal Application for Water Licence S03L1-001
Spill Response & Management Summary
(Section 17 of 20)**

Submitted to the Sahtu Land and Water Board by Imperial Oil Resources N.W.T. Limited

August 2013



Table of Contents

17.0	Spill Response & Management Summary.....	1
17.1	Introduction	1
17.2	Regulatory Requirements.....	1
17.3	IOR Management Frameworks	2
17.4	Emergency Response Competency and Training	3
17.5	Summary of Reportable Spills.....	5
17.6	Spill Prevention and Integrity Testing Results	9
17.7	Spill Clean-up.....	15
17.7.1	Spill Site Assessment and Remediation	17
17.8	Proposed Changes and Rationale.....	20
	References.....	21

Figures

Figure A:	Summary of Spills by Type and Volume	7
Figure B:	Summary of Spills by Type and Frequency	7
Figure C:	Causal Analysis of Spills 2003-2011	8
Figure D:	Environmental Alert Poster	10
Figure E:	Eye on the Environment – “Nothing Hits the Ground” Card	11
Figure F:	NEB Remediation Process Guide	15

Tables

Table A:	Summary Uncontrolled Releases by Type and Volume (m ³)	6
Table B:	Summary of Inspection and Integrity Testing Activities	11
Table C:	Assessment & Reclamation Activities at Operating Sites (2003-2013)	17

Photos

Photo A:	Emergency Response Boat on the Mackenzie River	3
Photo B:	Setting up Mid-Channel Sweep Exercises on the Mackenzie River	4
Photo C:	Mid-Channel Sweep Exercise on the Mackenzie River	4
Photo D:	IOR Spill Response Crew Deploying Boom for Shoreline Exercise	5

17.0 Spill Response & Management Summary

17.1 Introduction

Imperial Oil Resources N.W.T. limited (IOR) undertakes a variety of activities relating to spill prevention, mitigation, response, and training at its Norman Wells Operations (NWO). These activities are designed to minimize uncontrolled releases and provide for an adequate and timely response should they occur.

The main elements of IOR's spill prevention, mitigation, and response strategy include the following:

- spill prevention through routine integrity testing and maintenance;
- regularly scheduled flowline right-of-way inspections;
- regularly scheduled exercises to practice spill response on land and water;
- spill response and clean-up activities should uncontrolled releases occur; and
- reporting of uncontrolled releases as set out in regulatory requirements.

17.2 Regulatory Requirements

Conditions regulating uncontrolled releases are covered in the following items of the Water Licence:

- Part B: General Conditions Item 3. h;
 - sets out reporting requirements for unauthorized discharges.
- Part B: General Condition Item 3. n;
 - sets out reporting requirements for integrity testing.
- Part B: General Conditions Item 3. p & q;
 - sets out the reporting requirements for spill training exercises.
- Part G: Conditions Applying to Contingency Planning Item 2;
 - sets out the requirements for demonstrating spill response capability.
- Part G: Conditions Applying to Contingency Planning Item 4;
 - sets out the spill response framework and reporting requirements for unlicensed discharges.

Reportable spills in the Northwest Territories are logged through the NT-NU 24-hour Spill Report Line which is maintained by Government of the Northwest Territories

(GNWT), Department of Environment and Natural Resources (ENR). ENR maintains a searchable index of spills which is freely available to the public (ENR 2013).

17.3 IOR Management Frameworks

IOR utilizes several management frameworks to achieve its commitments to Safety, Security, Health, and Environmental (SSH&E) performance at its NWO. With respect to spill prevention and mitigation, these management frameworks include:

- Operations Integrity Management System (OIMS); and
- Facilities Integrity Management System (FIMS).

The OIMS framework establishes common expectations for addressing the risks inherent in IOR's business. OIMS addresses all aspects of IOR's business that can impact personnel, process safety, security, health, and environmental performance. The OIMS framework is composed of 11 elements. These elements are:

- 1 Management leadership, commitment, and accountability.
- 2 Risk assessment and management.
- 3 Facilities design and construction.
- 4 Information/documentation.
- 5 Personnel and training.
- 6 Operations and maintenance.
- 7 Management of change.
- 8 Third-party services.
- 9 Incident investigation and analysis.
- 10 Community awareness and emergency preparedness.
- 11 Operations integrity assessment and improvement.

OIMS is described in greater detail in Section 7 of the Renewal Application.

The Facility Integrity Management System (FIMS) framework is a key subset of OIMS which defines the processes, standards, and tools necessary to manage surface facility integrity. The FIMS system was designed to ensure integrity of critical equipment for the life of the Field. The objectives of FIMS include reducing safety and environmental risks, and maintaining the physical integrity of the area assets.

FIMS is in place to:

- ensure that all IOR owned or controlled critical equipment will operate over the complete life-cycle of an asset without significant safety or environmental consequences;
- ensure that a risk approach is used to manage all equipment and develop maintenance strategies accordingly; and
- ensure critical equipment undergoes programmatic condition monitoring, preventive maintenance, inspection and/or testing, or other measures to minimize the impact of failures.

17.4 Emergency Response Competency and Training

IOR conducts spill response and emergency preparedness exercises. The results of these exercises, along with a list of possible exercises for the next year, are presented to the SLWB as part of IOR's Annual Water Use Report. Copies of IOR's annual reports are available on the SLWB registry (www.slwb.com). Photos A through D show IOR personnel participating in a spill response drill.

Photo A: Emergency Response Boat on the Mackenzie River



Photo B: Setting up Mid-Channel Sweep Exercises on the Mackenzie River



Photo C: Mid-Channel Sweep Exercise on the Mackenzie River



Photo D: IOR Spill Reponse Crew Deploying Boom for Shoreline Exercise



Since 2004, IOR has conducted a total of 56 emergency response exercises. These have included a variety of emergency scenarios including: person down, helicopter crash, and a variety of shoreline, open water and ice-covered spill response.

17.5 Summary of Reportable Spills

IOR works to prevent uncontrolled releases (spills) at NWO through an extensive program of inspection, integrity testing, and preventative maintenance (see Sections 17.3 and 17.6 for more detail). Despite these efforts, spills have occurred. Between 2004 and 2012, IOR reported a total of 117 spills, which is an average of 13 spills per year. The number of spills on file with ENR by year and type of substance released is presented in Table A (ENR 2013). Figure A presents a summary of spills by type and volume, and Figure B presents a summary of spills by type and number from 2004 - 2012.

Please note that Table A and Figures A and B do not include a reported incident which occurred on March 14, 2006. After a failed lab test of the water outlet, re-sampling of the water outlet indicated a satisfactory result. The investigation into the cause of the first failed sampling event was inconclusive. As a very large volume of water was initially reported to ENR as potentially impacted, to include that volume here makes the scale of the graphs difficult to read and so interpretation of known spill event data difficult. As

such, it has been omitted. A discussion of this incident is presented separately in Section 13 of the Renewal Application.

Table A: Summary Uncontrolled Releases by Type and Volume (m³)

Year	Fresh Water	Production Fluids & Chemicals	Sewage	Other	Total Volume by Year	Spills to River (#)
2004	0.300	14.395	0.300	45.000	59.995	0
2005	38.210	73.260	0	0	111.47	0
2006	430.200	2.192	0	0	432.392	0
2007	127.730	2.323	0	0	130.053	0
2008	0.300	52.728	0	5.650	58.678	1
2009	15.450	133.062	0.050	0	148.562	1
2010	6.800	1.150	0.021	0	7.971	0
2011	1.000	11.764	0.005	0	12.769	0
2012	0	84.395	0.016	0.010	84.421	0
Total Volume by Type	619.990	375.269	0.392	50.660	1046.301	2

Notes: Spill data compiled in Table A is based on publically available data on file with the ENR. Volumes presented are IOR's final estimates.

The majority (59%) of reportable spills (by volume) between 2004 and 2012 have been freshwater (Table A & Figure A).

Prior to 2007, the major type of spills from IOR's NWO (by volume) was uncontrolled release of freshwater. Since 2006, the total volume of uncontrolled releases have generally been observed to be decreasing (Figure A).

The frequency of spills has remained variable over time (Figure B). The most recorded spills for a given year was in 2004 (18), while the lowest recorded number of spills was in 2010 (8).

Figure A: Summary of Spills by Type and Volume

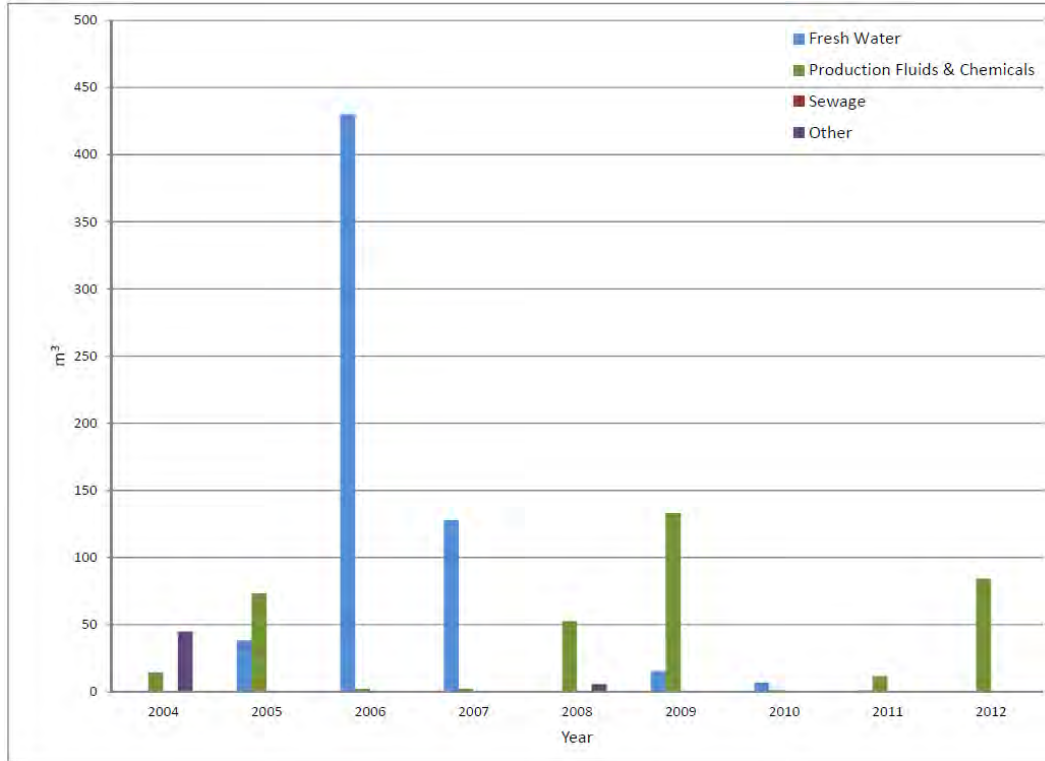
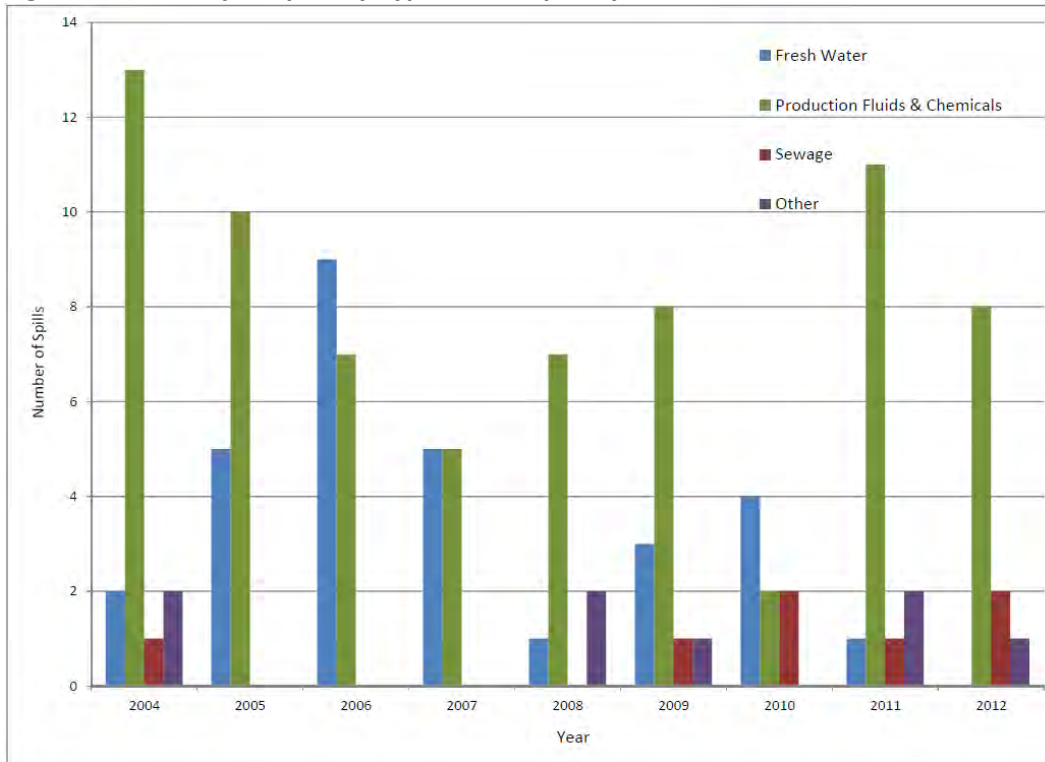


Figure B: Summary of Spills by Type and Frequency



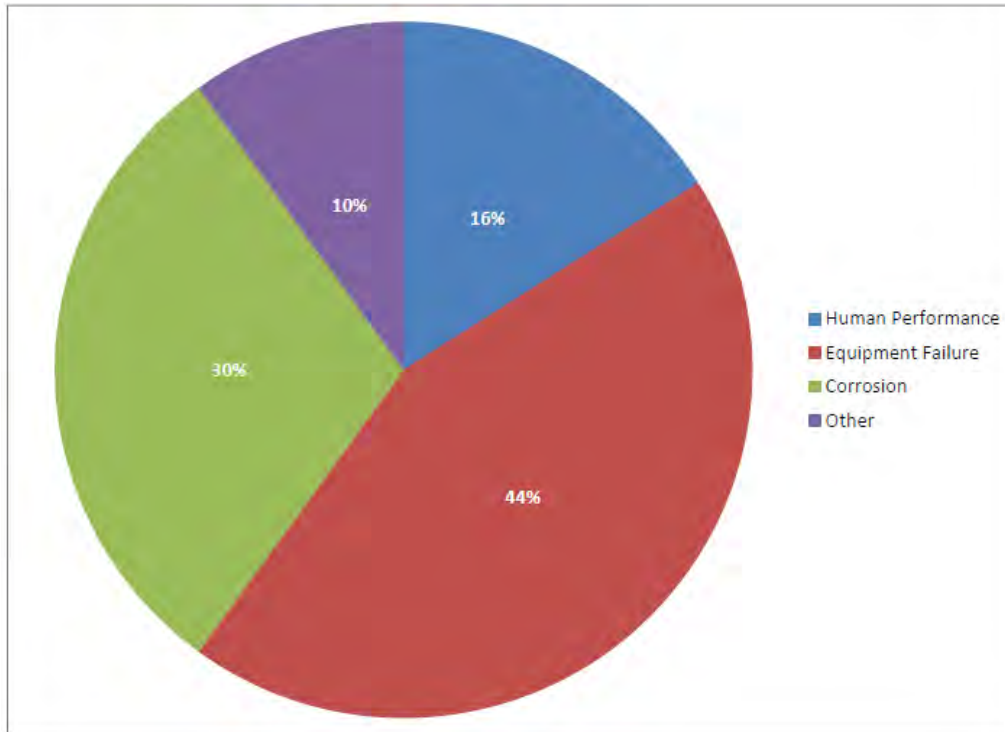
Two spills (out of 117, less than 2%) were to the Mackenzie River (Table A). On May 13, 2008, approximately 0.2 m³ of oil was released to the Mackenzie River, and on

May 19, 2009, approximately 127 m³ of produced water was released into the Mackenzie River. All remaining releases (115 out of 117, over 98%) were on land.

Both spills to the river were the result of infrastructure damage caused by ice from spring break-up. The 2008 incident was caused when ice damaged a flowline, and the 2009 incident resulted in damage to wellhead equipment at F-33X (½ inch bleed off valve). In the case of the 2008 incident, IOR personnel were able to identify the potential risk caused by record high water in the river and initiate a flowline shut-in plan (which included purging the line of fluids and isolating it) prior to it being damaged by the ice and releasing ~ 200 litres of residual oil in the flowline. This proactive approach significantly reduced the spill volume from what it might have been. Learnings from this event were incorporated into a plan (commonly referred to as the Bear Island Purge Plan) which documents a phased shut-in for facilities on Bear Island when break-up water levels reach specific elevations. In the case of the 2009 incident, the F-33x bunker lid was reinforced to improve structural integrity and the bunker is now buried under a mound of shale in the spring each year to help prevent break-up ice from catching the leading edge of the bunker lid.

IOR makes ongoing efforts to continuously improve its performance with respect to mitigating and preventing uncontrolled releases. As part of these efforts, IOR conducts causal analysis of uncontrolled releases. A summary of this causal analysis is presented in Figure C.

Figure C: Causal Analysis of Spills 2003 - 2011



Between 2004 and 2012, the majority of spills (44%) occurred as a result of equipment failures. This was followed by failures attributed to corrosion (30%), and finally by human performance which accounted for 16% of spills. IOR's efforts to prevent these causes include training, regular inspections, integrity tests, and the routine maintenance of NWO. Details of these programs are presented in Section 17.6 below.

17.6 Spill Prevention and Integrity Testing Results

Target areas for spill reduction initiatives include:

- human performance; and
- facility integrity such as equipment failures, corrosion, etc.,

Human Performance

The human performance aspect of incident reduction has been targeted through the development and implementation of environmental awareness training for operators and contractors. The awareness training covers environmental topics such as spill prevention, requirements for water releases, pre-job planning and completion, winter preparation, etc.

All Norman Wells environmental incidents (including investigation findings and follow up actions) are reviewed. One way that IOR communicates learnings from past environmental incidents at all sites is through the preparation of Environmental Alerts. These are reviewed and discussed with operations staff at morning meetings. Figure D presents an example of an Environmental Alert. Additionally, NWO specifically includes “environmental issues” as a discussion item on their regular morning meeting agenda.

In 2012, IOR also rolled out an Environmental Awareness Card. Every new contractor and employee to site receives these cards when they attend the site orientation. A copy of this card is presented as Figure E.

The intent of all these programs is to try and prevent spills before they happen. They are discussed in more detail in the Environmental Protection Plan provided in Section 18 of the Renewal Application. Summaries of these programs are submitted to the SLWB as part of the NWO Annual Water Use Report. Copies are available online at the SLWB Registry (www.slwb.com).

Figure D: Environmental Alert Poster


Esso Imperial Oil Protect Tomorrow.
Today.

Environmental ALERT

WINTER PREPARATION & OPERATION

For the past few years, we have had 5 - 15 spills each winter due to freezing and cold weather.

These spills are **PREVENTABLE!**



How Can You Prevent These Spills?

Talk to senior operators and take advantage of lessons learned in the past!

Check that vulnerable freeze points (e.g. valves, blinds, flanges) are properly drained, secured, insulated and/or heat traced.

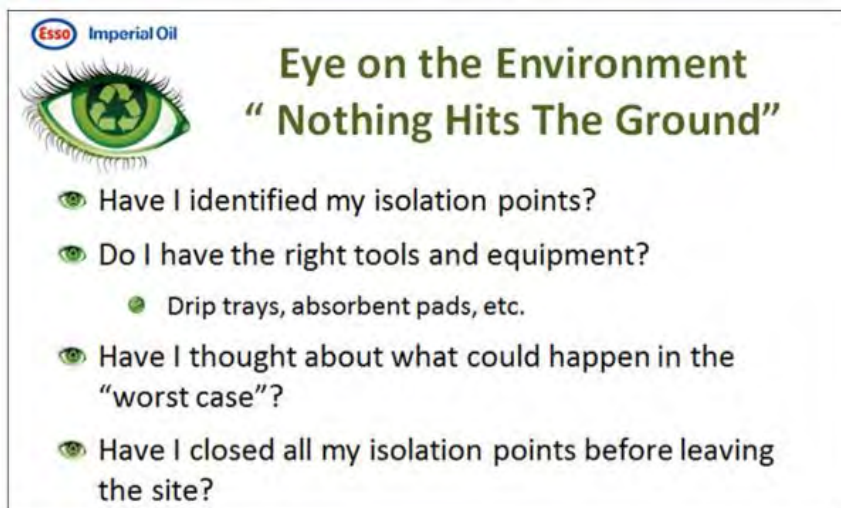
Confirm building doors are closed and latched, and check that heat tracing and insulation are in place and functional, as a regular part of your winter time surveillance practice.

Ensure environmental consequences related to weather are considered in pre-job planning (e.g., JSAs).

- Please contact your Environmental Advisor with questions -

11/02/08 10:00 AM

Figure E: Eye on the Environment – “Nothing Hits the Ground” Card



Facility Integrity

In targeting facility integrity, IOR continues to apply FIMS. This management system aims to ensure the integrity of the operation through corrosion management plans, equipment inspection, monitoring schedules, and timing standards for predetermined maintenance activities. To further mitigate the risk of line failures due to internal corrosion, a formal Corrosion Management Team meets quarterly to effectively manage and identify opportunities for improving the chemical inhibition programs.

A summary of the Inspection and Integrity testing activities undertaken at IOR’s NWO are presented in Table B.

Table B: Summary of Inspection and Integrity Testing Activities

Year	Inspection Programs	Maintenance Programs
2004	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>Flowline integrity inspections of seventeen flowlines using long-range ultrasonic sound waves.</p> <p>One in-line logging inspection for an eight inch groupline on Goose Island.</p> <p>Cathodic Protection Survey for cross-river and land based pipelines.</p> <p>Fifteen facility integrity inspections at the CPF.</p>	<p>Replacement of a flowline with fibreglass pipe.</p> <p>Flowline pigging of lines every 12 to 28 days.</p>

Year	Inspection Programs	Maintenance Programs
2005	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>Flowline integrity inspections of twelve flowlines using long-range ultrasonic sound waves.</p> <p>Cathodic Protection Survey for cross-river and land based pipelines.</p> <p>Thirty-nine facility integrity inspections at the CPF.</p> <p>Ultrasonic corrosion and mag particle inspection surveys on sixteen vessels at the CPF.</p>	<p>Established a formal Corrosion Management Team.</p> <p>Flowline pigging of lines every 12 to 28 days.</p>
2006	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>Flowline integrity inspections of twelve flowlines using long-range ultrasonic sound waves.</p> <p>Cathodic Protection Survey for cross-river and land based pipelines.</p> <p>Thirty-nine facility integrity inspections at the CPF.</p> <p>Ultrasonic corrosion and mag particle inspection surveys on sixteen vessels at the CPF.</p>	<p>Flowline pigging of lines every 12 to 28 days.</p> <p>Corrosion Management Team in place.</p>
2007	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>Flowline integrity inspections of twelve flowlines using long-range ultrasonic sound waves.</p> <p>Cathodic Protection Survey for cross-river and land based pipelines.</p> <p>Conducted equipment survey of the CPF using IOR's Static Equipment Inspection Standards (SEIS).</p>	<p>Portions of the flowline network replaced to reduce risk of external corrosion.</p> <p>Corrosion Management Team in place.</p> <p>Verification digs and one repair to a 14 inch gas line.</p> <p>Flowline pigging of lines every 12 to 28 days.</p>
2008	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>Conducted equipment survey of the CPF in accordance with IOR's SEIS.</p> <p>High resolution in-line logging inspection (ILI) completed on four cross-river lines and one mainland line.</p> <p>Cathodic Protection Survey for cross-river and land based pipelines.</p>	<p>Corrosion Management Team in place.</p> <p>Portions of the flowline network replaced to reduce risk of external corrosion.</p> <p>Flowline pigging of lines every 12 to 28 days. Ball type pigs replaced with scraper pigs for better wax removal.</p> <p>One Cathodic bed was replaced based on the results of the 2007 survey.</p>

Year	Inspection Programs	Maintenance Programs
2009	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>High resolution in-line logging inspection (ILI) completed on four cross-river lines and one mainland line.</p> <p>Cathodic Protection Survey for cross-river and land based pipelines.</p> <p>Verification digs completed.</p> <p>Conducted equipment survey of the CPF in accordance with IOR's SEIS.</p>	<p>Corrosion Management Team in place.</p> <p>Portions of the flowline network replaced to reduce risk of external corrosion.</p> <p>Flowline pigging of lines every 12 to 28 days.</p> <p>One Cathodic bed was replaced based on the results of the 2007 survey.</p>
2010	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>Conducted equipment survey of the CPF in accordance with IOR's SEIS.</p> <p>High resolution in-line logging inspection (ILI) completed on one cross-river line.</p>	<p>Corrosion Management Team in place.</p> <p>Flowline pigging of lines every 12 to 28 days.</p> <p>One Cathodic bed was replaced based on the results of the 2007 survey.</p>
2011	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>Cathodic Protection Survey for cross-river and land based pipelines.</p> <p>High resolution in-line logging inspection (ILI) completed on one cross-river line.</p> <p>Verification digs completed.</p> <p>Conducted equipment survey of the CPF in accordance with IOR's SEIS.</p>	<p>Corrosion Management Team in place.</p> <p>Flowline pigging of lines every 12 to 28 days.</p> <p>Replaced line 525 segment crossing Bosworth Creek.</p> <p>Replaced segment of line 448 near River.</p> <p>Portions of the flowline network (Lateral 2, 5, and GIT 9) replaced.</p>
2012	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>MFL tool used to inspect several cross river flowlines: two oil emulsion flowlines; one produced gas flowline and one gas lift flowline using high resolution inspection tools.</p> <p>High-resolution in-line inspection of cross river flowlines (two oil emulsion flowlines; one produced gas flowline and one gas lift flowline).</p> <p>In-line inspection of 5 3" diameter onshore oil emulsion flowlines using a UT ILI tool.</p> <p>Cathodic protection survey for cross river and land based pipelines.</p>	<p>Corrosion Management Team in place.</p> <p>Flowline pigging of lines every 12 to 28 days.</p> <p>Replacement of the freshwater flowline from BIT 3 to bunkers on Fenchy's Island.</p> <p>Replacement of oil/emulsion lines M-43X, M-46X, and M-48X to BIT 3.</p> <p>Replacement of flowlines on Fenchy's Island.</p>

Year	Inspection Programs	Maintenance Programs
2013	<p>Bathymetric Survey to look for river scour around facilities.</p> <p>MFL tool used to inspect two oil emulsion pipelines.</p> <p>High-resolution in-line inspection of two cross river oil emulsion flowlines.</p> <p>Planned in-line inspection of 15 3" diameter onshore oil emulsion flowlines using a UT ILI tool.</p>	<p>Corrosion Management Team in place.</p> <p>Flowline pigging of lines every 12 to 28 days.</p> <p>Replaced remaining portions of Line 525.</p>

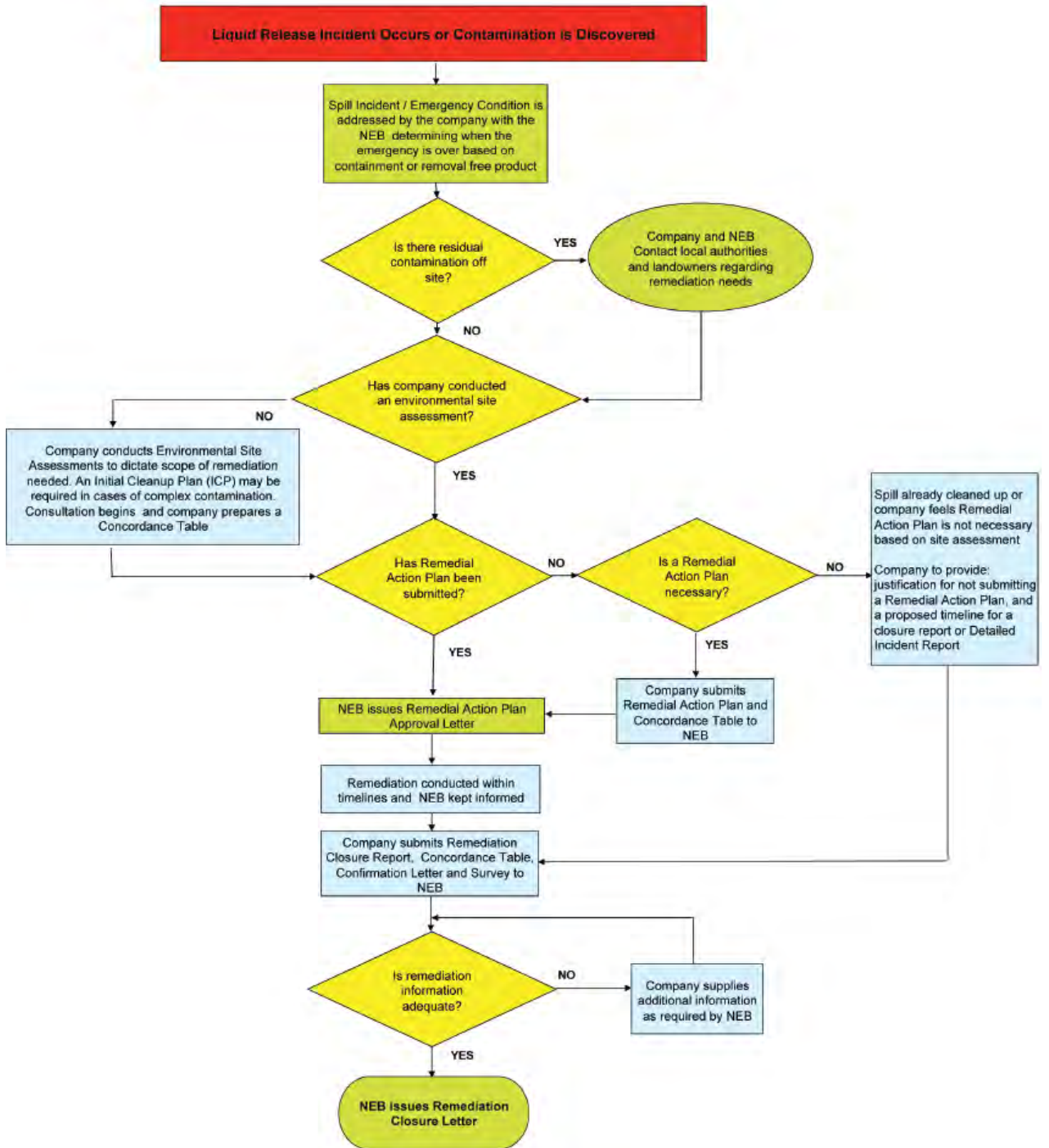
Note: Data for all years compiled from reports submitted to the SLWB.

Integrity inspections and maintenance activities are part of IOR's ongoing commitment to prevent uncontrolled releases associated with NWO.

17.7 Spill Clean-up

When spills of production fluids and chemicals do occur, IOR initiates spill response and clean-up activities to confine, contain, and collect released substances. If impacts are still present beyond the initial emergency response, IOR follows the approach outlined in the National Energy Board's (NEB's) Remediation Process Guide (NEB 2011). A high-level flowchart of the remediation process is presented in Figure F.

Figure F: NEB Remediation Process Guide



Source: NEB 2011.

17.7.1 Spill Site Assessment and Remediation

Sites that have been affected by spills are assessed. Spill sites with potential residual soil and/or water impacts remaining after the initial emergency response clean-up activities are re-assessed (following the process described in Figure F), and a site remediation action plan and closure plan are developed, approved by the NEB, and then implemented by IOR.

Below is a list of documents, including initial clean-up plans, remedial action plans, and closure plans, that have been submitted to the NEB since the guidelines were released in 2011. Copies of all these documents have also been provided to the SLWB and Water Licence Inspector with Aboriginal Affairs and Northern Development Canada (AANDC).

April 3, 2011 - M-43x Flowline Release – NT/NU Spill No.: 2011-094

- Draft Remedial Action Plan – October 14, 2011;
- Status Report – October 31, 2011;
- Remedial Action Plan – December 16, 2011; and
- Closure Plan – May 15, 2012.

August 11, 2011 - E-33-1x Flowline Release – NT/NU Spill No.: 2011-327

- Closure Plan – April 16, 2012.

November 5, 2011 - O-18x Flowline Release – NT/NU Spill No.: 2011-430

- Initial Action Plan – December 16, 2011;
- Clean Up Update – March 30, 2012;
- Remedial Action Plan – May 15, 2012;
- RAP Addendum – November 30, 2012; and
- Flowline Release Status Update and Long Term Monitoring Plan – May 31, 2013.

October 5, 2012 - Q-06x Flowline Release – NT/NU Spill No.: 2012-397

- Draft Initial Action Plan – October 17, 2012;
- Follow Up Information Request – October 24, 2012;
- Initial Clean Up Plan – November 12, 2012;
- Remedial Action Plan – February 7, 2013; and
- Remedial Closure Plan – April 30, 2013.

Additionally, NWO submits a monthly spill report to the NEB and SLWB. All NT-NU reportable spills are included in these monthly reports. The reports include an incident description, root cause and contributing factors, and any follow up actions as a results of the incident.

An annual report is also submitted to the SLWB, where details of all NT-NU reportable spills are summarized, including a detailed spill analysis. Copies are available online at the SLWB Registry (www.slwb.com).

In addition to the above noted recent spill site assessment and reclamation activities, in the last ten years, IOR has also implemented clean-up at a number of historic spills sites. A summary of both the current and historic spill assessment activities is provided in Table C below.

Table C: Assessment & Reclamation Activities at Operating Sites (2003-2013)

Sub-Area	Reclamation						Current Status
	Phase I ESA	Phase II ESA	Phase III ESA	Remediation	Surface Restoration	Routine Groundwater Monitoring	
Mainland							
C-36X Well Site	X	X	X			X	Phase III delineation complete. Groundwater monitoring is on-going.
C-38X Well Site	X	X	X	X			Phase III delineation complete.
D-44X Well Site	X	X					Phase II assessment complete.
B-42X Well Site	X	X	X				Phase III delineation partially complete.
Mainland Tank Farm	X	X				X	Phase II assessment complete. Groundwater monitoring is on-going.
Former Fuelling & Camp Site	X	X				X	Phase II assessment complete. Groundwater monitoring is on-going.
Landfarm north of Battery #3 Flare Pit	X	X	X	X	X	X	Closure report issued.

Sub-Area	Reclamation							Current Status
	Phase I ESA	Phase II ESA	Phase III ESA	Remediation	Surface Restoration	Routine Groundwater Monitoring	Closure Monitoring	
C-30X Well Site	X	X	X	X		X		Phase III delineation & surface restoration complete.
F-31X Well Site	X	X	X	X	X	X		Groundwater monitoring is on-going.
G-32X Well Site	X	X		X		X		Phase III delineation complete. Groundwater monitoring is on-going.
LT11 Satellite	X	X		X		X		Phase III delineation complete. Groundwater monitoring is on-going.
Well Services Yard & Warehouse	X	X				X		Initial Phase II assessment complete. Groundwater monitoring is on-going.
CPF	X	X				X		Initial Phase II assessment complete. Groundwater monitoring is on-going.
E-33-1X				X			X	Spill cleanup complete, closure monitoring on-going.
Bear Island								
N-39X Well Site		X	X			X		Groundwater monitoring on-going.
O-45X/O-46X Well Sites		X	X	X		X		Groundwater monitoring on-going.
P-32X Well Site		X	X			X		Groundwater monitoring on-going.
N-42X Well Site		X	X			X		Groundwater monitoring on-going.
Former Spill Sites		X	X	X		X		Groundwater monitoring on-going.
M-43X		X	X	X			X	Spill cleanup complete, closure monitoring on-going.
Goose Island								
Q-10X Site		X						Initial Phase II assessment complete.
O-14X Well Site		X						Initial Phase II assessment complete.
N-25X Well Site		X						Initial Phase II assessment complete.
P-11X Well Site		X				X		Initial Phase II assessment complete. Groundwater monitoring on-going.
Q-8X		X	X			X		Phase III delineation complete. Groundwater

Sub-Area	Reclamation						Current Status	
	Phase I ESA	Phase II ESA	Phase III ESA	Remediation	Surface Restoration	Routine Groundwater Monitoring		Closure Monitoring
Former Tank Farm							monitoring is on-going.	
Q-06X Area		X	X	X			X	Spill cleanup complete, closure monitoring on-going.
O-18X Area		X	X	X		X	X	Spill cleanup complete, closure monitoring and groundwater monitoring on-going.

17.8 Proposed Changes and Rationale

No changes are proposed at this time.

References

- IOR (Imperial Oil Resources), 1999. Norman Wells Operations Flowline Integrity Management Plan. November 1999.
- NEB (National Energy Board), 2011. Remediation Process Guide. National Energy Board, 2011.
- ENR (Environment and Natural Resources), 2013. Hazardous Materials Spill Database. Accessed: February, 2013. Available online at: www.enr.gov.nt.ca