Interest Holder	Imperial Oil and Gas Pty Ltd	EMP Title	2021-2025 EP187 Work Program	Unique EMP ID No.	IMP 4-3	Mod No.	13	Date	August 2025
Brief Description	Imperial has updated the IMP 4-3 Spill Management Plan to align spill response management on EP 187 with commitments made in IMP 5-3; namely priority assessment, spill actions and key control measures. Additional mitigation measures have also been updated for IMP 4-3 in response to site activities. This Spill Management Plan (SMP) describes updated initial spill response guidelines to be followed by Imperial Oil & Gas Pty Ltd (Imperial) in the event of a spill under IMP 4-3.								
Geospatial Files Included?	NA								

Does the proposed change result in a new, or increased, potential or actual environmental impact or risk?	If an INCREASE in an existing potential or actual environmental impact or risk is it provided for in the approved EMP?	Does the proposed change require additional mitigation measures to be included?	Has additional stakeholder engagement been conducted?	Does it require additional environmental performance standards and measurement criteria?	Does it affect compliance with Sacred Site Authority Certificates?	Does it affect current rehabilitation, weed, fire, wastewater, erosion and sediment control, spill or emergency response plans?	Will the environmental outcome continue to be achieved and will the impacts and risks be managed to ALARP and acceptable?
No.	NA	Yes. Spill Management Plan has been updated which includes additional mitigation measures.	NA	No.	No.	Yes. Spill Management Plan has been updated.	Yes.

Imperial Oil & Gas

EP 187

Appendix 07

Spill Management Plan

IMP 4-3

Document Control

Date	Rev	Description	Author(s)	Reviewed	Approved
16/07/2021	3	Revised	Diana G.	Charles D.	Jon B.
31/07/2025	4	Revised	Rachel Leembruggen	Nick Fraser Kelvin Wuttke	Chris White

Prepared by:

inGauge Energy Australia

Level 4, 301 Coronation Drive, Milton, QLD, 4064

E: [redacted]

ABN: 51 164 429 190

Prepared for:

Imperial Oil & Gas Pty Ltd

This document has been prepared to comply with the regulatory requirements for undertaking a regulated activity in the Northern Territory. It has been prepared by personnel who have qualification and experience relevant to the preparation of this and similar documents. All care has been taken in preparing this document to comply with the regulatory requirements in the Northern Territory. Imperial Oil & Gas Pty Ltd does not accept liability if this document and the information in it is used for any purpose other than to meet the regulatory requirements for a regulated activity in the Northern Territory.

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1 Purpose

The *Code of Practice: Onshore Petroleum Activities in the Northern Territory* 2019 (*the Code*) (Part C) provides a framework for the management of well pad water used in and produced by petroleum activities, including storage, handling, transport, re-use, recycling, treatment, and disposal of wastewater.

Section C.7.2 of *the Code* details the requirements of a Spill Management Plan (SMP). A SMP must assess and manage the risks posed by potential spills of waste, wastewater, produced oil or condensate, fluids and any chemicals used or stored as part of petroleum activity. This SMP is associated with EMP IMP 4-3, approved on 17 October 2021.

The purpose of this plan is to assess the likelihood and risk of spills and minimise the potential and actual harm should one occur in Exploration Permit (EP) 187 under IMP 4-3. In addition, it provides details to ensure a rapid response and recovery from a spill, as required under Section C.7.2 of *the Code*.

2 Key Legislation

This plan has been developed in accordance with the following key legislation and guidelines:

- *Petroleum (Environment) Regulations 2016 (NT)* – Mandates that an EMP must address all environmental risks, including spills of chemicals or wastewater.
- *Code of Practice: Onshore Petroleum Activities in the Northern Territory 2025 (NT)* – Specifies requirements for chemical and wastewater management, including secondary containment, and spill preparedness.
- *Code of Practice for Wastewater Management 2020 (NT)* – Provides standards for the safe handling, treatment, and disposal of on-site wastewater.
- *Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Regulations 2010 (NT)* – Regulates the transport of hazardous materials, including vehicle and driver licensing requirements.
- *Work Health and Safety (National Uniform Legislation) Act 2011 (NT)* – Governs the safe storage and handling of chemicals in the workplace.
- *Waste Management and Pollution Control Act 1998 (NT)* – Establishes licensing and compliance requirements for waste transport, disposal, and contractor operations.

3 Objectives

The objective of this plan is to assess the potential for any loss of containment and to minimise the potential and actual harm should a loss occur. In addition, this plan provides details to ensure a rapid response to and recovery from a loss as required under section C.7.2 of *the Code*.

Broadly, this plan is designed to:

- Provide reference to the assessment and management of risk posed by potential spills of waste, wastewater, fluids and any chemicals used or stored in EP 187.
- Describe chemicals, water and wastewater and the way that they will be stored, transported and transferred in EP 187.
- Describe spill scenarios which may occur including details of mechanism, location, quality and quantity of material that may be spilled.
- Provide processes to be used to prevent or minimise the risk of a spill from occurring.
- Describe methods that will be used to detect a spill, including monitoring methods, frequency of monitoring and the minimum volume spill or leak that would likely be detected between monitoring events.
- Provide a spill management response strategy, including a communications plan.
- Be read in conjunction with IMP 4-3 and its associated plans (i.e. Waste and Wastewater Management Plan and Emergency Response Plan). If a section of the IMP 4-3 is contradicted by this SMP, the SMP will take precedence, being the most updated revision of the EMP.

4 Threats to the Receiving Environment

The effective management of threats to the environment from onshore petroleum spill scenarios relies upon the principles of isolation-containment-integrity and monitoring. Threats to the receiving environment from the proposed activity may include:

- Spills that can migrate offsite to sensitive receptors. The threat of spills migrating off site may be increased during the wet season.
- Loss of primary containment such as overflows, compromised integrity or damage by mobile plant.
- Ineffective secondary containment such as water in bunds or damage by mobile plant. The effectiveness of secondary containment may be compromised during the wet season.
- Loss of containment during transportation of wastewater or chemicals by road or flowlines.
- Loss of containment during well operations.

5 Potential Spill Materials

5.1 Fuels

Bulk fuel will be stored in tanks equipped with safety features such as double skins or temporary bunding. Spill, leak, and drip trays will be used to address the risks associated with refuelling operations. Any unused fuel will be removed from the site during decommissioning.

5.2 General Equipment Maintenance Chemicals

Equipment maintenance chemicals will be transported in their original containers or in tankers equipped with safety features such as double skins. Liquid maintenance chemicals will be stored in their original containers with temporary bunding or bulk tanks with double skins in a bunded area. Spill, leak, and drip trays and environmental liners will be used to address the risk of minor drips and spills associated with filling operations. Any unrequired general equipment maintenance chemicals will be removed from the site during decommissioning.

General equipment and maintenance chemicals are not anticipated to be hazardous, but all would be stored and handled in accordance with the SDS to limit the potential for environmental harm.

5.3 Drilling Chemicals and Cementing Additives

A list of drilling chemicals and cementing products to be used under this EMP is provided in Table 13—1 to Table 13—4. Any unused chemicals will be removed from the site during decommissioning.

5.4 Drilling fluid and cuttings

The proposed drilling fluid consists of predominantly water, with the remaining component made up of salts and fluid additives. Drilling fluids and cuttings will be stored and treated in engineered, lined pits until decommissioning. Disposal options are mentioned in IMP 4-3 Appendix 06 Wastewater Management Plan.

Where required, well pad design will consider drainage design to assist in the containment of spills during drilling to mitigate off-site runoff.

5.5 Hydraulic Fracturing Stimulation Chemicals and Tracers

Hydraulic fracturing chemicals and water tracers have been assessed in the Human Health and Environmental Risk Assessment (HHERA) submitted to DLPE under Modification #10, Regulation 22 in October 2024.

The HHERA concluded that, based on the range of systems and plans to control the transportation and storage of chemicals during field development and operational activities and outcomes of the risk assessment, no further management controls beyond those already incorporated in IMP 4-3 were considered necessary.

5.6 HF Flowback Fluids and Produced Water

Flowback fluids are a water-based solution that flows back to the surface after HF operations; it consists of the fluid used to fracture the targeted shale. Flowback Fluid storage is discussed further in Appendix 06 Wastewater Management Plan.

A chemical risk assessment for the products used is included in IMP 4-3 Appendix 06.01, and a HHERA was completed under IMP 4-3 Regulation 22, Modification #10. The HHERA concluded that the hazard quotient for all the assessed avian species was orders of magnitude less than the threshold hazard quotient level of 1. Therefore, there were no unacceptable exposures to the avian species. In addition, as a further conservative consideration, even if the potential exposure period is expanded to one year, the hazard quotient for the assessed avian species still will be orders of magnitude less than the threshold hazard quotient level of 1.

5.7 Greywater and sewage

Accommodation and messing facilities will be provided from a temporary on-site camp located on a designated pre-cleared well pad. The camp will be equipped with a fully self-contained sewage treatment plant furnished with an irrigation sprinkler system.

5.8 Wastewater filtration

Flowback fluid and drill water may be filtered onsite to allow for fluid re-use during future hydraulic stimulation activity as outlined in IMP 4-3 Regulation 22 Modification #9. Residual solids from the water filtration process are a non-hazardous to potential hazardous spill material.

6 Potential Spill Scenarios

Spill scenarios identified as potentially occurring during the Activity are listed in **Table 6—1.**

Table 6—1 Summary of Quality and Quantity of Potential Spill Scenarios

Potential Spill Scenario	Approximate Duration	Mechanisms	Location	Maximum Typical Spill Quantity	Worst Case Quantity	Maximum Time to Locate Spill	Quality of Spill	Controls
HF Flowback / Wastewater Treatment, Storage	Until removal of all above-ground tanks	• Coupling, hoses, or valve failure • Wastewater flowline leak • Overflow of an above ground tank • Leak in an above ground tank liner • Catastrophic failure of storage tank.	• Well pads • Wastewater flowlines	< 5,000 L	50 ML	~ 2 hours during operations ~ 24 hours for a slow leak (overnight at low pressure)	Chloride contamination Potentially hazardous chemicals Geogenic metals Non hazardous Condensed water	• Double lined above ground tanks for secondary containment. • Process equipment will be pressure tested and leak tested on installation. • Atmospheric pressure open separator and any, open process vessels to be double lined or within a bund with 110% capacity. • Freeboard maintained in the dry season and in the wet season. • Flowline pressures monitored during pumping. • Flowline buried to 750 mm depth of cover (DOC) to reduce risks from fire and vehicle impacts. • DOC increased to 1,200 mm under access tracks and watercourses. • Flowlines designed, installed, and operated in accordance with APGAPEGN Code [APGA, 2019]. • Leak detection sensors placed between liners that can be monitored remotely. • Remote monitoring of above ground tanks by camera and/or site personnel. • Level sensors installed in the above-ground tanks to measure freeboard. • Overland flow managed by fluid control berm to avoid washouts at tank base. • Tanks maintained in accordance with manufacturers recommendations.

Potential Spill Scenario	Approximate Duration	Mechanisms	Location	Maximum Typical Spill Quantity	Worst Case Quantity	Maximum Time to Locate Spill	Quality of Spill	Controls
								• Above ground tanks designed to withstand bushfires and be placed on pads with ~8 m fire break. • Tanks designed to meet local wind loading conditions and installed on compacted pads to ensure stability. • Any transfer to cease in the event a leak being identified. • TREAD checks prior to fluid transfers (see Section 9.4).
Loss of containment during transfer on-site (leakage from pipes, hoses, fittings etc.)	• Drilling – 30 days per well • HF – 25 days per well • Testing – 90 days per well • Operations Management – As required for the duration of the project	• Coupling, hoses, or valve failure	• Chemical mixing and transfer areas on the drilling rig • Production test equipment • Wastewater storage equipment • Well pads within EP 187	• <5000L	• 10,000L	~ 2 hours during operations ~ 4 hours for a minor slow leak	• Saline drilling fluids • Saline flowback fluids and produced water • Saline wastewater • Various chemicals, as listed in Table 13—1 to Table 13—4.	• Secondary containment to be deployed under high-risk spill/leak storage and handling areas • Spill kits available • Daily inspection of all chemicals stored, handling areas, including wastewater transfer point and chemical mixing areas during operations • Sites are manned during operations • Wastewater management Plan (WWMP) • Transfer to cease in the event of a leak being identified. • To prevent spilled material from transporting off site through ESC drains during high-risk operations (eg drilling or hydraulic

Potential Spill Scenario	Approximate Duration	Mechanisms	Location	Maximum Typical Spill Quantity	Worst Case Quantity	Maximum Time to Locate Spill	Quality of Spill	Controls
								fracturing), ESC drains will be temporarily partially blocked during the activity.
Pumping Fluid from Flowback Tank Cover to discharge	Until removal of all above-ground tanks	• Coupling, hoses, pump or valve failure • Failure of storage tank cover to isolate fluid under the cover from rainfall on top of the cover.	Treatment Tanks on Well pads	< 5,000 L	55 ML	~ 1 hour during operations ~ 12 hours for a slow leak	Chloride contamination Potentially hazardous chemicals Non hazardous Condensed water	• Pumps are inspected and maintained as per OEM. • Equipment (hoses, valves, couplings) inspected prior to pumping and confirmed to be in good condition. • Fluid tested for pH and EC prior to discharge to ESC measures. Pumping to discharge only commenced if within the approved parameters (pH between 6-9 and EC between 1-1,500 uS/cm). • Fluid continues to be sampled during discharge twice a day i.e. every 12 hours if pumping continues to confirm fluid is still within approved parameters. • Response spill kits and emergency contact numbers are available for minor coupling spills. • Discharge area is inspected weekly for signs of impact. • Any transfer to cease in the event a leak in the cover being identified
Transport of Chemicals or Wastewater	One day per transport	• Loss of containment • Vehicle accident • Bogged vehicle in the wet season	• Access tracks • Highway • Project Area	• < 25,000 L	• 25,000 L	• Immediate	• Potentially hazardous chemicals	• All transport providers licensed under the Waste Management and Pollution Control Act 1998. • During the wet season, chemicals or wastewater are not to be transported on unsealed roads if significant rainfall (>300 mm over 4 days) is forecast.

Potential Spill Scenario	Approximate Duration	Mechanisms	Location	Maximum Typical Spill Quantity	Worst Case Quantity	Maximum Time to Locate Spill	Quality of Spill	Controls
								• Wet season transport of chemicals or wastewater will not be authorised until the Site Supervisor has completed transport of chemicals or wastewater checklist. • If a chemical or wastewater transport vehicle becomes bogged, the response scenario outlined in Appendix 14 Emergency Response (Contingency) Management Plan, Table 4.1—1 is to be followed. • Chemicals and wastewater will not be transported across flowing water.
Handling of Chemicals	Duration of the Activity	• Coupling/hose/valve failure • Overfill of containers. • Broken or leaking containers	Well pad Project Area	< 1,000 L	1,000 L	Immediate	Chemical contamination Potentially hazardous chemicals	• Containment bunds under connections when in use. • Dedicated / segregated area for chemical storage and handling with secondary containment • Spill kits stocked on the site where chemicals are stored and handled. • Storage tanks handling HF flowback will have secondary containment.
Storage of Chemicals	Duration of the Activity	• Broken or leaking containers • Bunds inundated with rainwater	Well pad Project Area	< 1,000 L	1,000 L	2 hr ~12 h if a minor spill in a chemical storage area.	Chloride contamination Potentially hazardous chemicals	• Chemicals transported and stored within their original containers. • Dedicated / segregated area for chemical storage and handling with secondary containment. • Spill kits stocked and available on site where chemicals are stored and handled. • Secondary containment, when in use, is to be monitored weekly during the dry season and daily during the wet season

Potential Spill Scenario	Approximate Duration	Mechanisms	Location	Maximum Typical Spill Quantity	Worst Case Quantity	Maximum Time to Locate Spill	Quality of Spill	Controls
								for damage, spills, or water for management in accordance with A.3.8.(i) of the Code. Inspection may be by remote camera or physical inspection. • Storage of chemical in accordance with relevant MSDS requirement.
Use of Drilling Sump	Until sump rehabilitation	• Overfilling of a sump with drilling fluid, cuttings, or water • Leak in liner	Well pad Project Area	< 5,000 L	~2.5 ML	~12 h ~ 24 hours for a slow leak (overnight at low pressure)	Chloride contamination Potentially hazardous chemicals	• Freeboard maintained in the dry season in the wet season. • The drilling sump will have a raised bund around the perimeter to prevent rainwater from flowing into the sump. • Remote monitoring of sumps via camera and/or level transmitters installed in wastewater sumps to measure freeboard.
Diesel Refuelling	Duration of the Activity	• Coupling/hose failure • Overfill fuel tank • Storage tank failure	Well pad Camp site Project Area	< 1,000 L	1,000 L	Immediate	Combustible C1	• Drip trays available for use. • No fuel transfers without personnel present. • Spill kits available when refuelling.
Storage of Diesel	Duration of the Activity	• Tank failure • Impact by mobile plant	Well pad Project Area	< 50,000 L	50,000 L	2 hr	Combustible C1	• Secondary containment with sufficient capacity to hold 110% of the volume of the largest container stored in the area or be contained in double skinned tanks.
Uncontrolled Methane Emissions	Duration of the Activity	• Well integrity failure • Loss of containment • Emergency release	Well pad Project Area	3 MMscf	3 MMscf	Immediate	Flammable gas	• Appendix 10 Methane Emissions Management Plan
Storage and use of Hydraulic Fluid or Lubricant	Duration of the Activity	• Failure of storage container and/or hydraulic systems.	Well pad Project Area	< 1,000 L	3,800 L	2 hr	Not hazardous and not a Dangerous Good	• Secondary containment where hydraulic fluids and lubricants are stored.

Potential Spill Scenario	Approximate Duration	Mechanisms	Location	Maximum Typical Spill Quantity	Worst Case Quantity	Maximum Time to Locate Spill	Quality of Spill	Controls
Wastewater Flowlines (Large Scenario)	Duration of the Activity	• Flowline pierced by mechanical means.	Flowline system (buried pipeline) CPP Area	70 kL	300 kL	Rapid – initiating event is a buried flowline strike with mechanical plant and the leak location.	As above	• Event response consists of shutting down inflow of wastewater into the network which can be actioned remotely by an operator. • 0.3 ML represents the highest volume of an individual segment of the network within topographical constraints that could be fully released due to flowline strike. • The estimated quantity of 0.07 ML represents the average volume of water that could be spilt within topographical constraints due to a flowline strike at a random location on the flowline.
Wastewater Flowlines (Small scenario)	Duration of the Activity	• Pinhole leak from high point vent (HPV) valve and/or from flanged joints in HPV assembly.	High point vent installations Project Area.	3 kL	7 kL	Immediate – visual inspections of HPV assemblies will take place at least on a weekly basis by field operators. Due to the small size of leaks, visual inspections are the only credible means to identify the leaks – much sooner than any instrumented system.	As above	• Visual checking of High Point Vents. • HPVs can be manually isolated from flowlines when they are not required for flowline operation. • Engineering controls include leveraging learnings from the QLD CSG industry with respect to HPV valve selection to minimise leak potential. • Worst case leak quantity based on 1 mm pinhole leak in HPV assembly going unnoticed for 1 week with maximum pressure at HPV of ~300 kPag experienced when gathering system utilised for supply of water to frac spread. • Estimated leak quantity based on 1 mm pinhole leak in HPV assembly going unnoticed for 1 week with more typical pressure at HPV of ~50 kPag

Potential Spill Scenario	Approximate Duration	Mechanisms	Location	Maximum Typical Spill Quantity	Worst Case Quantity	Maximum Time to Locate Spill	Quality of Spill	Controls
								experienced during periods outside of gathering system frac water supply.
Greywater/ effluent discharge. (during camp operations)	While camp is operational	• Coupling/hose failure • Overfill septic tank • Irrigation leak	Campsite Irrigation discharge area	< 1,000 L	4,000 L	~12 h ~ 24 hours for a slow leak (overnight at low pressure)	Potentially hazardous	• Wastewater and treated sewage irrigated in an appropriately sized, designated area 50-100m away from camp. • Irrigation area fenced to exclude livestock and vegetated to enable high absorption. • Checked daily during use to prevent pooling. • Solids and sludge transported to a licenced facility for disposal.
Residual solids from wastewater filtration.	Post water filtration.	• Coupling/hose failure • Overfill tank • During transfer into vacuum truck	Well pad.	< 100kg	1 tonne	Immediate	Non-hazardous to Potentially hazardous	• Stored in a backwash/ residual solid tank with bunding. • Daily inspections of tank integrity, pipe, pump and filtration unit by SQP. • Transported off-site by a licenced contractor via a vacuum truck to a licenced disposal facility as soon as possible post Activity.

7 Potential Spill Impact

Appendix 01 of this EMP describes the environment at the Location of the Regulated Activities, including environmental and cultural sensitivities, with the potential to be impacted by a spill. Maps are provided throughout EMP 4-3 illustrating the separation distance between Project Activities and sensitive receptors: Heritage sites, communities, protected areas and water courses.

7.1 Pooled Water Area

The pooled water area model in IMP 4-3 Reg 22 Modification 10 HHERA Table 4-3 modelling results found that an unbunded release of 1 ML of HF flowback could impact an area of up to 30.8 ha.

Section 2.1 of the HHERA confirms that a release of 100,000 L could impact up to 4.7 ha, an area equivalent to over a third of the area of the potential well pad hardstand size.

To prevent a release above-ground storage and treatment tanks are double lined with leak detection and are monitored weekly in the Dry Season and daily in the Wet Season for integrity and leaks reducing the risk of a spill to ALARP.

7.2 Infiltration of Soil

The results of infiltration modelling in IMP 4-3 Reg 22 Modification 10 HHERA indicate that organic HF chemicals such as methanol and glutaraldehyde would take approximately 100 years to infiltrate the soil to 20m. Concentrations are very low once below 20 m depth.

The potential for chloride contamination of the soil in the event of a significant spill of flowback fluid is a key consideration. The elevated chloride levels in HF flowback are primarily from geogenic sources in the target shale formation.

HHERA modelling indicated in that the time taken for chloride to reach steady state conditions is likely to be more than 20 to 50 yrs. The steady state concentration of chloride that could potentially discharge to groundwater is estimated as 29 mg/L which is below the aesthetic criteria for drinking water. However, Increased chloride concentrations may restrict future plant growth in the affected area to salt tolerant species.

The choice of remediation of flowback fluid (aka brine) spills depends on the severity of contamination, environmental factors, cost-effectiveness, and relative efficiency of salt removal.

The Australian Petroleum Institute's *Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and* Groundwater, common remediation types are as follows:

- Natural – Natural remediation is unenhanced and/or passive. This process is usually recommended when the salt impacts are minor. The natural process requires little to no intervention. Natural remediation should be considered when reviewing any remediation effort.
- Chemical – In Situ chemical remediation are used to remove salts from the root zone. Chemical remediation is somewhat more expensive than natural remediation and could possibly be the hardest of the three techniques. There are a variety of chemical amendments can be used to remobilize salts including:
    - Neutral soils. Gypsum (CaSO4:2H2O), Calcium Chloride (CaCl2:2H2O), Limestone (CaCO3), Dolomite (CaCO3:MgCO3), Calcium Oxide (CaO), Calcium Hydroxide [Ca(OH)2]
    - Alkaline soils PH>8.5. Sulfur, Sulfuric acid (H2SO4), Aluminum sulfate [Al2(SO4)3:18H2O], Iron Sulfate (FeSO4:7H2O)
    - Other. Polymers, Proprietary chemicals, Diammonium phosphate [(NH4)2(HPO4)]
- Mechanical – Mechanical remediation involves mechanically moving the soil such as tilling or excavating. There are two basic types of mechanical treatment:
    - Dilution by land spreading effected soils into unaffected areas to reduce concentrations to an acceptable level or enhance other treatment options. Care must be taken so that land spreading does not create a larger area of contamination.
    - Disposal is usually the most expensive of treatments and is usually only considered as a last resort [Australian Petroleum Institute, 2006].

8 Risk Assessment

The risk of potential scenarios and impacts have been assessed and are considered to have been reduced to ALARP. For risk assessment refer to IMP 4-3 Appendix 04 Risk Assessment.

9 Control Measures

9.1 Key Control Measures

The key control measures to manage spills associated with the Activity under IMP 4-3 are summarised in the list below.

- Well pad site selection criteria to reduce the likelihood and mitigate the consequence of spills, including ground truthing to avoid waterways and flood zones.
- Well pads constructed with runoff diversion bunds to prevent run-on and chemical storage areas that comply with Section B.4.16.2 (h) of *the Code* where needed.
- To prevent spilled material from transporting off site through ESC drains during high-risk operations (e.g. drilling or hydraulic fracturing), ESC drains will be temporarily partially blocked during the activity.
    - This control is implemented as a targeted, low-impact measure to mitigate the risk of fluid migration off the well pad in the event of a spill. Temporary partial blockage (e.g., using sandbags, coir logs, or other reversible barriers) will be applied at identified spoon drain locations leading to Type 2 sediment controls, as depicted in IMP 4-2 Appendix 02 Figure 2.19. This approach aligns with the adaptive drainage management principles outlined in IMP 4-3 Appendix 5, which encourages minimal soil disturbance and reversible, non-invasive solutions. The drains will remain partially blocked only for the duration of high-risk operations, after which normal drainage function will be restored. This measure provides an added level of containment without compromising the overall drainage intent described in IMP 4-3 Appendix 02 Sections 2.4.3.4 and 2.4.3.5.
- All contaminated materials/waste stored on the well pads or at the campsite in containers with secondary containment or in containers in bunds to prevent off-site release.
- All drilling, HF flowback fluid, liquid chemical additives, hazardous chemicals, oil, and fuel will be stored on the well pad in a dedicated area with secondary containment so spilled material can be removed or treated.
- Secondary containment will have sufficient capacity to hold 110% of the volume of the largest container stored in the area, unless the container is equipped with individual secondary containment (Section A.3.8 (g) (i) of *the Code*). An instance of this is, above-ground tanks will be doubled lined for secondary containment or be within a bund that has the capacity to store 110% of the largest single walled tank in that bunded area.

- The drilling sump will be lined with Aquacon345, HDPE, or equivalent, which meets the Code requirements for an impermeable membrane.
- The drilling sump, and above ground tanks will be constructed and/or operated in accordance with seasonal freeboard requirements.
- The drilling sump will have a raised bund around the perimeter to prevent rainwater from flowing into the sump.
- Above ground tanks pad/s will be constructed to minimise the impact of a potential spill of wastewater; this includes compacting the tank pad surface to reduce infiltration and constructing a perimeter bund to avoid erosion around the base of the tank and as a contingency to contain any overflow from going off-site.
- Spill kits will be readily available at each worksite while operational and on all mobile service trucks or vehicles where hydrocarbons, chemicals or wastewater are stored, used, or transported.
- Weekly inspections of any constructed wastewater flowlines to detect leaks, whenever that flowline has been utilised to transport wastewater.
- Greywater/ effluent camp discharge area in a fenced, vegetated area away from the camp and checked daily during use to ensure effective operation.
- Pumps and transfer equipment (hoses, valves, couplings) are all maintained as per OEM and inspected prior to use.
- Prior to discharging fluid from Tank Covers to ESC measures, fluid must be tested to confirm it is within approved parameters (pH between 6-9 and EC between 1-1,500 uS/cm). Fluid must continue to be sampled during discharge at a minimum of twice daily, i.e. every 12 hours if pumping continues, to verify fluid is uncontaminated. Discharge area is to be inspected weekly during discharge for signs of impact.

9.2 Flowline Spill Control Measures

Section A.3.8 (f) of the Code of Practice: Onshore Petroleum Activities in the Northern Territory states, "Any hazardous chemicals or those that may cause environmental harm are to be stored within secondary containment."
The wastewater flow lines are not to store wastewater but are for handling wastewater, and do not have secondary containment due to construction and logistical constraints. Therefore, the risk profile for any potential spill is mitigated as ALARP with leak detection and remediation.

Imperial will fit inlet/outlet sensors to the wastewater flowlines with real-time flow volume monitoring. The monitoring system will alert on any discrepancy between inflow and outflow volumes in real-time to determine if there has been any wastewater lost. The system will also do a daily volume balance to determine whether there has been a gradual loss of volume. If a volume of 100 litres has been unaccounted for, Imperial will undertake an incident investigation to determine the cause of this discrepancy.

In the event of a leak being detected during operation or if daily imbalance has occurred, Imperial will cease using the Gathering Network. The leak will be located and repaired before the Gathering Network is brought back into service. The leak will be readily detected at the surface via wetted soil; if the wetting front does not travel to the surface, specific location equipment (EM38 electro coil or similar) will be used to locate the leak.

Once the leak has been detected, Imperial will excavate the flowline to expose the leak and undertake repairs. The repaired section will then be tested before being brought back into operation. Soil samples will be taken from areas where wastewater has wet the soil for analysis and soil remediation will be carried out as required, in line with this document.

9.3 Transport of Wastewater and Chemicals Control Measures

HF flowback wastewater will be transferred and managed between well pads by flowlines and/or heavy vehicles.

The Code requires that the wet season transport of chemicals and wastewater on unsealed roads must not be undertaken unless the risk of spills is demonstrated to be ALARP and acceptable.

To demonstrate that the risks of a spill during transport in the wet season of a chemicals or wastewater are reduced to ALARP and acceptable, the following key controls are to be put in place:

- During the wet season, chemicals or wastewater are not to be transported on unsealed roads if significant rainfall (> 300 mm over 4 days) is forecast.
- On-site unsealed tracks on the planned route have been visually inspected and are in good condition.
- Emergency response measures (e.g. spill kit, communication tools) are available and functional.
- Chemicals and wastewater will not be transported via road across flowing creeks or watercourses on the route.
- Wet season transport of chemicals or wastewater will not be authorised until Site Supervisor has undertaken the checklist of the above key controls.

- If a chemical or wastewater transport vehicle becomes bogged, the response scenario outlined in IMP 4-3 Modification 6 Regulation 22 Emergency Response Plan, **Table 4—1** is to be followed.

9.4 Fluid Transfer Control Measures

Transferring fluids within the well pad is required during routine operations to maintain freeboard and undertake maintenance on assets such as storage tanks or sump liners. The risk of this routine activity can be mitigated to ALARP by operators following a TREAD cautionary approach prior to transferring fluids:

T = Transfer into approved containment storage vessels only.

R = Response spill kits and emergency contact numbers are available.

E = Equipment is inspected and in good condition.

A = Adequate minimum freeboards are maintained during the transfer.

D = Designated person is available to supervise and walk the transfer line.

With the above measures in place the likelihood of a spill is greatly reduced. TREAD prompts are placed in areas where fluid transfers often occur and are included in daily toolbox meetings.

9.5 Monitoring Control Measures

All personnel onsite must report all spills as soon as possible to their supervisor. The site induction includes this requirement.

Monitoring for spills includes:

Table 9—1 IMP 4-3 Spill Monitoring Control Measures

Activity	Frequency/ Monitoring Event	Requirements	Person Responsible
Refueling	Continuous, during refuelling activities	• With bulk diesel fuel tank equipped with safety cut-off valves and spill kits must be accessible.	Refuelling operator
Above Ground Tank and Lined Drilling Sumps Level Sensors to verify Freeboard	Remote sensor or visual inspection, Weekly (Dry Season) Daily (Wet Season)	• Calibrated per manufacturer's specs • Alarms for abnormal levels.	Site Personnel Compliance Team

Activity	Frequency/ Monitoring Event	Requirements	Person Responsible
Secondary Containment Checks	Weekly (Dry Season) Daily (Wet Season)	• Inspect for integrity, leaks, or pooling (per Code A.3.8(i)). Remote cameras acceptable.	Site Personnel
Hazardous Chemical storage	Weekly (Dry Season) Daily (Wet Season)	• To be stored in secondary containment which can hold 100% of the largest container	Site Personnel
Above-Ground Tank Leak Detection	Real-time via Remote sensor alerts	• Leak detection sensors installed between liners • Immediate alarms for detected leaks	Site Personnel Compliance Team
Fluid Transfers in accordance with (TREAD)	During transfer	• Designated person is available to supervise and walk the line during the transfer. **(See Section 9.4 of this SMP)**	Site Personnel Project Manager
Tank Cover Fluid Sampling	Fluid sampled prior to discharge to ESC measures and twice daily during discharge pumping.	• Fluid tested for pH and EC. Results must be between 6-9 pH and EC between 1-1,500 uS/cm to discharge fluid to ground.	Site Personnel Project Manager
	Weekly monitoring of discharge area	• Discharge area inspected for signs of impact weekly when fluid is being actively pumped from the Tank Cover.	Site Personnel

10 Spill Response and Management

The following sections provide an overview of the response to spills.

10.1 Interaction with Emergency Response Plan

Where a spill results in an emergency, IMP 4-3 Modification 6 Regulation 22 Emergency Response Plan will take precedence over this plan.

Emergency Response Plan activation triggers include, but are not limited to the following:

- Serious injury/loss of life or emotional harm.
- Serious impact on the biological, physical environment or ecosystem functions.
- Significant damage or threat to property/assets.
- Impact on community, cultural heritage sites, or both.
- Serious regulatory breach.
- Loss or extended disruption to critical services and ability to continue operations.

10.2 Spill Incident Priority Assessment

A tiered priority framework for spills, is provided in **Table 10—1**.

Table 10—1 Spill Incident Priority Assessment

ADG Code or Description	Trigger Volume	Priority
Chemicals* with ADG Codes 2 to 8 inclusive	> 50 L	**Level 1**
Chemicals* with ADG Code 9 - Miscellaneous	> 1,000 L	
Chemicals* with ADG Code C1 – Combustible bulk diesel	> 10,000 L	
Chemicals* without an ADG Code	> 5,000 L	

ADG Code or Description	Trigger Volume	Priority
Hazardous HF Fluid	> 10,000 L	
Drilling Fluid	> 10,000 L	
HF Flowback	> 10,000 L	
Chemicals* with ADG Codes 2 to 8 listed in Level 1	< 50 L	**Level 2**
Chemicals* with ADG Code 9 – Miscellaneous	500 to 1,000 L	
Chemicals* with ADG Code C1 – Combustible bulk diesel	5,000 to 10,000 L	
Chemicals* without an ADG Code	1,000 to 5,000 L	
Hazardous HF Fluid	5,000 to 10,000 L	
Drilling Fluid	5,000 to 10,000 L	
HF Flowback	5,000 to 10,000 L	
Chemicals* with ADG Code 9 – Miscellaneous	< 500	**Level 3**
Chemicals* with ADG Code C1 – Combustible bulk diesel	1,000 to 5,000 L	
Chemicals* without an ADG Code	500 to 1,000 L	
Hazardous HF Fluid	1,000 to 5,000 L	
Drilling Fluid	1,000 to 5,000 L	
HF Flowback	1,000 to 5,000 L	
Chemicals* with ADG Code C1 – Combustible Bulk Diesel	500 to 1,000 L	**Level 4**
Chemicals* without an ADG Code	< 500 L	
Hazardous HF Fluid	500 to 1,000 L	

ADG Code or Description	Trigger Volume	Priority
Drilling Fluid	500 to 1,000 L	
HF Flowback	500 to 1,000 L	
Chemicals* with ADG Code C1 – Combustible Bulk Diesel	< 500 L	**Level 5**
Hazardous HF Fluid	< 500 L	
Drilling Fluid	< 500 L	
HF Flowback	< 500 L	

Table 10—2 Priority Level Spill Action

Priority Level	Action
1	• Ensure all personnel are safe and accounted for. • Immediately stop all work in vicinity of incident. Size of area of stop work will depend on risks posed by incident e.g. toxic gas release may require are larger safety buffer. • Assess situation to determine if activation of the Emergency Response (Contingency) Plan is required. • If incident is not an emergency and it is safe, start Initial Spill Response in **Section 10.3** of this Spill Management Plan. • Work cannot recommence until area is safe and spill cleaned up. • Refer to **Section 11** of this Spill Management Plan to determine if the incident is reportable or recordable. • Carry out detailed investigation of cause of the incident and implement corrective actions.

Priority Level	Action
2	• Ensure all personnel are safe and accounted for. • Stop all work in vicinity of incident. If chemical has an ADG Code 2 to 8, the size of area of stop work will depend on risks posed by incident e.g. toxic gas release may require are larger safety buffer. • Assess situation to determine if activation of the Emergency Response (Contingency) Plan is required. • If incident is not an emergency and it is safe, start Initial Spill Response in **Section 10.3** of this Spill Management Plan. • Work cannot recommence until area is safe and spill cleaned up. • Refer to **Section 11** of this Spill Management Plan to determine if the incident is reportable or recordable. • Carry out review of work practices and implement corrective actions.
3	• Ensure all personnel are safe and accounted for. • Cordon off area in vicinity of incident. • Assess situation to determine if activation of the Emergency Response (Contingency) Plan is required. • If incident not an emergency and it is safe, start Initial Spill Response in **Section 10.3** of this Spill Management Plan. • Area to remain cordoned off until area is safe, and spill cleaned up. • Refer to **Section 11** of this Spill Management Plan to determine if the incident is reportable or recordable.

Priority Level	Action
	• Carry out review of work practices and the cause of the incident and implement corrective actions.
4	• Ensure all personnel are safe and accounted for. • Start Initial Spill Response in **Section 10.3** of this Spill Management Plan. • Carry out review of work practices and implement corrective actions.
5	• Ensure all personnel are safe and accounted for. • Start Initial Spill Response in **Section 10.3** of this Spill Management Plan.

10.3 Initial Spill Response Guidelines

Table 10—3 provides a guideline for actions to be taken in the event of a spill to minimise impact to the environment and risks to personnel. Information has been extracted from IMP 4-3 Modification 6 Regulation 22 Emergency Response Plan which should also be referred to. Each spill scenario will have actions that differ depending on the type, location, extent and volume while factoring in local weather conditions. Some spill incidents may require additional actions and should be determined in conjunction with Imperial's Management Team.

Table 10—3 Spill Response Guidelines

SPILL RESPONSE STAGE	STEP 1 SAFETY	STEP 2 SPILL ASSESSMENT	STEP 3 SPILL CONTAINMENT	STEP 4 CLEAN UP AND RECOVERY	STEP 5 REPORTING & DOCUMENTATION	STEP 6 PREVENT REOCCURENCE
GOAL	Ensure immediate human and environmental safety	Determine extent of spill	Prevent spread beyond initial area.	Remove contaminated material from site	Maintain prescribed records and compliance	Incorporate lessons learnt
WHO	First Responder, Site Supervisor and Field Team	Site Supervisor	Site Supervisor + Field Team	Site Supervisor + Field Team	HSE Team and TEE Management	All personnel
ACTIONS	• Stop spill source only if safe to do so. Evacuate the area if a hazardous chemical spill occurs. • Notify Site Supervisor. • Consider Emergency Shut Down – depending on location, proximity, or safety needs. • Ensure all personnel are safe and clear of the area to avoid vapour, fumes, smoke, etc. (if personnel are upwind). • Remove all sources of ignition if safe to do so. • Divert or stop traffic (do not start vehicles if a low flash-point product has been spilt). • Be aware of the potential for fires. Keep ignition sources and personnel away if there is a risk of fire from flammable or combustible chemical spills. • If there is a threat to public health, property, or the environment, the state fire brigades should be contacted immediately for emergency assistance - phone 000. • Ensure appropriate PPE and equipment is available. • If applicable - provide First Aid to any injured persons (DRSABCD), continue until assistance arrives. • Create an exclusion zone.	• If safe, use vehicle placarding (if spill involves a vehicle) and HAZCHEM code to identify chemical spill. • Refer to the SDS to determine risks and appropriate remediation. • Assess if the release can be stopped or contained safely. • Notify the Project Manager. • Assess situation to determine if activation of the Emergency Response (Contingency) Plan is required. • Ensure vehicles can safely navigate to and from areas of concern – provide alternate routes if possible.	• When safe, stop the leak source (e.g., shut valves, patch ruptured tanks). • Deploy spill kit if it is appropriate for spill size. • Deploy absorbent materials (e.g., pads, booms) if spill is moving. • Block drainage paths to stop runoff into water bodies. • Transfer fluid on-site (if possible) until containment is restored. • If soil contamination has occurred, obtain samples to determine possible excavation required. • Verify bund walls and/or intact containment systems.	• Sample spilt fluid and/or contaminated soil to determine appropriate storage and/or disposal options of the material. • If contaminated soil requires excavation and disposal offsite, remove contaminated soil, store in labelled containers and transport via a licensed contractor to a licensed waste management facility for disposal as soon as possible. • Only licenced waste contractors are permitted to transport, receive, and dispose of listed wastes. • Ensure all protection systems are restored. Replenish, restore and return any emergency equipment.	• Notify the site team and contractors on or arriving to site if impacted. • Notify Imperial's Contacts. • Maintain a log of incident events, actions, messages, and decisions. • Notify relevant regulatory bodies and local stakeholders in consultation with Imperial Management Team. • Enter all spills into a spill register	• Investigate all spill Level 1-4. • Incorporate actions to avoid or mitigate future reoccurrence. • Review SMP. • Circulate lessons learnt to the team. • Confirm equipment integrity.

10.4 Contaminated Material Disposal

- Off-site disposal must be undertaken following the *Waste Management and Pollution Control Act 1998 (NT)*.
- All listed waste transportation shall be undertaken by licenced contractors and be tracked and disposed of at approved waste management facilities.
- Waste containers should be labelled in accordance with *Globally Harmonized System of Classification and Labelling of Chemicals (GHS)* based on type of hazard spill material [United Nations, 2023].
- Materials that escape from primary containment or are otherwise spilled onto secondary containment will be removed as soon as possible and returned to containment if able to be reused or disposed in accordance with this subsection.
- Quantities of contaminated material too large for sealed containers must be dealt with by engaging licensed contractors as soon as practicable.

10.5 Communications Plan

Spill prevention and monitoring strategies will be communicated to personnel via:

- This Plan.
- Site inductions.
- Safety meetings.
- Toolbox talks.
- Other scheduled meetings.

Communications regarding a spill that is an emergency will be undertaken in accordance with IMP 4-3 Modification 6 Regulation 22 Emergency Response Plan

11 Spill Incident Reporting

Incidents may have to be reported under the *Petroleum (Environment) Regulations 2016 (NT)* (PER), the *Petroleum Regulations 2020 (NT*), the *Waste Management and Pollution Control Act 1998 (NT)*.

11.1 Petroleum (Environment) Regulations 2016 (PER)

11.1.1 Reportable Incidents

Regulation 33 (1) requires Imperial give the Minister notice of a reportable incident in accordance with Regulation 33.

Regulation 3 of the *PER* reportable incident means an incident, arising from a regulated activity, that has caused or has the potential to cause material environmental harm or significant environmental harm. Material and serious environmental harm are defined in the *Environment Protection Act 2019 (NT)*.

Section 8 of the *Environment Protection Act 2019 (NT):*

> Material environmental harm means environmental harm that:
>
> (a) is not trivial or negligible in nature; and
>
> (b) is less serious than significant environmental harm.

Section 9 of the *Environment Protection Act 2019 (NT):*

> Significant environmental harm means environmental harm that:
>
> (a) is of major consequence having regard to:
>
> (i) the context and intensity of the harm; and
>
> (ii) the sensitivity, value and quality of the environment harmed and the duration, magnitude, and geographic extent of the harm; or
>
> (b) would, or is likely to, cost more to remediate than the monetary amount prescribed by the *Environment Protection Regulations 2020 (NT)* Regulation 4 ($50,000).

Imperial will notify the Minister for Lands, Planning and Environment (DLPE) orally or in writing as soon as practical but not later than two hours after a reportable incident occurred or when

Imperial becomes aware of the incident. The notification will comply with Regulation 33 (3)(c) of the *PER*.

If the Imperial gives notice orally, a written notice will be given to the Minister, not later than 24 hours after giving oral notice, that specifies all the matters mentioned in Regulation 33 (3)(c).

There are several different reports required to be provided for reportable incidents, with different timing. Templates have been developed for each stage of reporting and are available on the Onshore Gas website.

Reporting on reportable incidents is an iterative process that occurs in four stages:

1. An initial notice of a reportable incident
1. An initial reportable incident report
2. Subsequent interim report/s (where required), and
3. A final report about the reportable incident.

Refer to the *Onshore Petroleum Incident Reporting Guideline 2023* for more details [DEPWS, 2023].

11.1.2 Recordable Incidents

Regulation 3 of the *PER* defines a recordable incident as an incident arising from a regulated activity that has:

- Resulted in an environmental impact or environmental risk not specified in the current plan for the Activity; or
- Has resulted in a contravention of an environmental performance standard specified in the current plan for the Activity; or
- Is inconsistent with an environmental outcome specified in the current plan for the Activity; and
- Is not a reportable incident.

Imperial will give the Minister for Minister for Lands, Planning and Environment (DLPE) a written report about recordable incident as soon as practicable, but no later than 15 days, after the end of the reporting period.

Regulation 35(4)(b) of the *PER* requires a recordable incident report to be provided each 90 days after the day on which an EMP is approved (the reporting period), unless an agreement is made

in writing between the Minister and an interest holder about an alternative reporting period under Regulation 35(4)(a).

Imperial agrees to the uniform reporting periods previously proposed:

- Quarter 1: 1 January to 31 March. Due date 15 April.
- Quarter 2: 1 April to 30 June. Due date 15 July.
- Quarter 3: 1 July to 30 September. Due date 15 October.
- Quarter 4: 1 October to 31 December. Due date 15 January.

All recordable incident reports are to be submitted to onshoregas.dlpe@nt.gov.au and must include:

- reference to the relevant EMP title and unique code, and
- reference to the submission being made under Regulation 35(1).

Imperial will provide recordable incident reports using the template provided on the Onshore Gas website.

Refer to *Onshore Petroleum Incident Reporting Guideline 2023* for more details.

11.2 Petroleum Regulations 2020 (NT)

The following is a summary of information on how to report a petroleum operations incident taken from the Report a petroleum operations incident [NTG, 2023]:.

- Under the *Petroleum Regulations 2020 (NT)*, Imperial must report any serious and reportable incidents that occur on its petroleum interest to the minister (Department of Industry, Tourism and Trade).
- Imperial will retain all incident records and reports for at least five years after the incident occurred and acknowledges they may be prosecuted for failing to comply with incident reporting and recordkeeping obligations.

11.2.1 Serious Incidents

A serious incident is an incident arising from activities conducted under a permit or licence as a result of which any of the following occur:

- A person suffers serious injury or illness or is killed.

- An uncontrolled fire or explosion occurs.
- An uncontrolled flow of formation fluids or well fluids into the environment or into a separate underground formation occurs.
- There is a failure of, or damage to barriers, infrastructure or systems that leads to or could lead to a loss of integrity in a well or petroleum surface infrastructure that requires emergency intervention.
- A blowout preventer, pressure control equipment or emergency shutdown system is activated.
- Both primary and secondary well barriers are no longer intact.
- The security of national gas supply is prejudices or an imminent risk to the security of natural gas supply arises.

11.2.1.1 How to Report

Imperial must:

- Call 1300 935 250 within two hours of the incident happening.
- Email a written notification to **petroleum.operations@nt.gov.au** within 24 hours.

If the serious incident results from a failure of the integrity of a well or surface infrastructure, Imperial must provide a written investigation report, including all related documents, within one month after the incident occurred.

11.2.2 Reportable Incidents

Regulation 3 reportable incident means an incident arising from activities conducted under a permit or licence as a result of which:

(a) immediate action is required to prevent a serious incident; or

(b) a single barrier or control remains intact so as to prevent loss of integrity in a well or petroleum surface infrastructure, but no other barrier or control exists; or

(c) equipment or systems designed to reduce the consequences of a serious incident:

(i) fail; or

(ii) are compromised; or

(c) a designed operating envelope is exceeded.

11.2.2.1 How to Report

Fill in an incident notification form and email it to **petroleum.operations@nt.gov.au** within 72 hours of becoming aware of its occurrence.

Imperial will use the approved form and include all the information set out in the Petroleum Regulations 2020 (Regulation 66M).

11.2.3 Other Incident Reporting

Imperial may be required to report the same incident to another agency under NT legislation.

Reportable and recordable incidents under the *Petroleum (Environment) Regulations 2016* must be reported to the Department of Lands, Planning and Environment (DLPE)

Serious injuries, dangerous incidents or a death at a workplace must also be notified to NT WorkSafe under the *Work Health and Safety (National Uniform Legislation) Act 2011*.

For more information, contact NT WorkSafe on 1800 019 115 or visit the NT WorkSafe website.

11.3 Waste Management and Pollution Control Act Incident Reporting

The NT EPA website provides the following information about reporting an incident under Section 14 of *Waste Management and Pollution Control Act 1998* (NT) under the section, *Notification of an Incident*.

Imperial can notify the EPA in any of the following ways:

- Email completed Section 14 Incident Report Form.
- Submit an Online Pollution Report.
- Contact the Pollution Hotline on 1800 064 567.

11.3.1 Written Notice to the Department (as the administering authority)

The Section 14 Incident Report Form should be used for providing written notice to the EPA when a person becomes aware of an incident that may have caused or threatens serious or material environmental harm.

When reporting an incident, Imperial are to give as much of the following information as they can:

- What happened (the incident).
- Where the incident occurred.
- The date and time of the incident.
- How the pollution is occurring, or if it is not yet happening, how you think it may occur.
- The attempts being made to:
    - Prevent
    - Reduce
    - Control
    - Rectify or clean up the pollution and
    - Address any environmental harm.
- Your identity.

If Imperial reports the incident within 24 hours, the EPA cannot use the report as evidence to take legal action.

Imperial does not have to make a report if the potential pollution or environmental harm is trivial or negligible, or if the incident results in only localised:

- Noise
- Smoke

- Dust
- Fumes Or
- Odour.

Generally, Imperial will need to make a report if there has been a spill of a contaminant or waste (such as hydrocarbons, paint, pesticides, or other toxic chemicals), and the spill:

- Has entered a waterway (including a drain)
- Spread more than three metres or
- Left your premises.

If you unsure about making a report, contact the EPA.

If written notice is required to be given to the occupiers or registered owners of affected land, the person responsible for giving that written notice can use the Section 14 Incident Report Form as a guide for what information to give.

11.3.2 Calling the NT EPA Pollution Hotline

In addition to providing the written notice, if Imperial becomes aware of an event which has caused or threatens serious or material environmental harm, Imperial will call the Pollution Hotline on **1800 064 567** and report the event.

Reporting the event through the Pollution Hotline allows the department to take necessary measures to prevent further harm and to mitigate the effects of an incident or event.

12 Records and Record Keeping

Imperial will create and keep all prescribed records required by Regulation 36(1) and defined in Regulation 36(3) of the *PER*.

12.1 Spill Register

A spill register will be maintained for all liquid contaminant or hazardous chemical spills including:

- Nature and extent of spill
- Circumstances that caused the spill
- GPS coordinates of spill location
- Inclusion of chemical product identifier(s)
- Immediate actions taken
- Cross reference to the relevant entry in the Incident Register where the following details will be recorded
    - Clean up
    - Waste tracking
    - Sampling and analysis if required
    - Corrective actions

12.2 Review of Spill Management Plan

The Spill Management Plan may be reviewed and updated in response to one or more of the following:

- When major changes occur which may affect spill response coordination or capabilities
- Following an emergency involving a spill
- If a gap is identified during routine exercises

13 Chemical Tables

Drilling, completions, Hydraulic Fracture, workovers, and cementing fluids are selected and used in accordance with their designed function, the manufacturer's recommendations, and relevant Safety Data Sheets (SDS).

The below tables provide an indicative list of additives that may be used on the wells being drilled, completed, or operational under this EMP to enable an assessment of what chemicals may be hazardous or have the potential to cause environmental harm.

It is to be noted that the below list is not a complete list of what may be used on the well. Any addition to the provided list of chemicals will be formalised through a modification or revision to the EMP in accordance with the *PER*, before the change is enacted. Chemicals that are identical but are supplied under different trade names will not require a formal modification or revision to the EMP.

13.1 Indicative Chemicals in Drilling, Completions or Workover Fluids

Table 13—1 Indicative Chemicals in Drilling Fluids

Name	Description
[redacted]	Weighting agent/viscosifier
[redacted]	Weighting agent/Bridging agent
[redacted]	pH adjustment
[redacted]	pH adjustment
[redacted]	Biocide
[redacted]	Conditioning chemical
[redacted]	Fluid loss additive
[redacted]	Encapsulation
[redacted]	Potassium Carbonate
[redacted]	Inhibitor
[redacted]	Weighting agent
[redacted]	Dispersant
[redacted]	Ph Adjustment
[redacted]	Ph Adjustment
[redacted]	Oxygen scavenger
[redacted]	HT polymer stabiliser
[redacted]	Thinner
[redacted]	Viscosity
[redacted]	LCM severe loss
[redacted]	Corrosion inhibitor
[redacted]	OCNS gold rated foamer
[redacted]	Weighting agent
[redacted]	Weighting agent
[redacted]	CaCl2
[redacted]	Corrosion Inhibitor

Name	Description
[redacted]	Defoamer
[redacted]	Specialised well displacement surfactant
[redacted]	Foamer
[redacted]	Dispersant
[redacted]	Synthetic polymer, rheology modifier
[redacted]	Lubricant
[redacted]	LCM coarse
[redacted]	LCM fine
[redacted]	LCM medium
[redacted]	Starch fluid loss additive
[redacted]	Frac Attack LCM total loss
[redacted]	Amines
[redacted]	Biocide (Type THPS)
[redacted]	pH controller
[redacted]	Reservoir stimulating agent
[redacted]	Free pipe additive
[redacted]	Tracer
[redacted]	LCM coarse
[redacted]	LCM fine
[redacted]	LCM medium
[redacted]	Fluid loss additive, high temp
[redacted]	LCM total loss
[redacted]	LCM severe loss
[redacted]	Viscous sweep material
[redacted]	Sulphite free oxygen scavenger
[redacted]	H2S Scavenger

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13.2 Indicative Cementing Additives

As per Clause B.4.10.2 (a) of *the Code*, additives will be selected and managed to ensure they are used in accordance with the manufacturer's recommendations and relevant safety data sheets (SDS).

Table 13—2 Indicative Chemicals in Cementing Additives

Chemical Code	Description
[redacted]	Retarder
[redacted]	Bentonite Extender (60 lb/ft3)
[redacted]	Weighting agent
[redacted]	Low temp Solid Dispersant
[redacted]	Liquid Antifoam Agent
[redacted]	TIC Dispersant
[redacted]	Liquid Extender, Silicate Cement Additive
[redacted]	Liquid Retarder, Low temperature
[redacted]	UNIFLAC Fluid Loss Additive
[redacted]	Liquid Fluid Loss Additive
[redacted]	MUDPUSH II Spacer
[redacted]	Flyash
[redacted]	Calcium Chloride
[redacted]	Fluid Loss additive Solid
[redacted]	Fluid Loss additive Liquid
[redacted]	Mid raget fluid loss additive solid
[redacted]	Silica Flour
[redacted]	High-temperature retarder
[redacted]	Dearomatised Hydrocarbons

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13.3 Indicative HF Chemicals

For details of indicative chemicals in HF Fluid and human health and environmental risk assessment see Appendix 01 and 06.01 of IMP 4-3 Appendix 06 Waste and Wastewater Management Plan Human Health and Environmental Chemical Risk Assessment and IMP 4-3 Regulation 22, Modification #10.

Table 13—3 Indicative Hydraulic Fracturing Stimulation Chemicals

Name	CAS Number	Description
[redacted]	[redacted]	Viscosifyer
[redacted]	[redacted]	Diverter
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Impurity
[redacted]	[redacted]	Scale Inhibitor
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	pH Control, Acidizing
[redacted]	[redacted]	Viscosifyer
[redacted]	[redacted]	Viscosifyer
[redacted]	[redacted]	Diverter
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	H2S Scavenger
[redacted]	[redacted]	Scale Inhibitor

Name	CAS Number	Description
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Clay Stabilizer
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	pH Control
[redacted]	[redacted]	Scale Inhibitor
[redacted]	[redacted]	Clay Stabilizer
[redacted]	[redacted]	Proppant
[redacted]	[redacted]	Breaker
[redacted]	[redacted]	Clay Stabilizer
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	pH Control
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	Proppant
[redacted]	[redacted]	Breaker
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Crosslinker
[redacted]	[redacted]	Auxullary agent
[redacted]	[redacted]	Crosslinker
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Viscosifyer
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Emulsifyer
[redacted]	[redacted]	Solvent

Name	CAS Number	Description
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	Bactericide
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Viscosifyer
[redacted]	[redacted]	pH Control, Acidizing
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Viscosifyer
[redacted]	[redacted]	H2S Scavenger
[redacted]	[redacted]	Free-flow agent
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Impurity
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Coating
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Solvent
[redacted]	[redacted]	Clay Stabilizer
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	Proppant
[redacted]	[redacted]	Buffer
[redacted]	[redacted]	Breaker
[redacted]	[redacted]	Buffer
[redacted]	[redacted]	Clay Stabilizer
[redacted]	[redacted]	Buffer

Name	CAS Number	Description
[redacted]	[redacted]	Buffer
[redacted]	[redacted]	Scale Inhibitor
[redacted]	[redacted]	Crosslinker
[redacted]	[redacted]	Breaker
[redacted]	[redacted]	Coating
[redacted]	[redacted]	Stabilizer
[redacted]	[redacted]	Breaker
[redacted]	[redacted]	Crosslinker
[redacted]	[redacted]	Stabilizer
[redacted]	[redacted]	Viscosity Control
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Scale Inhibitor
[redacted]	[redacted]	Stabilizer
[redacted]	[redacted]	Crosslinker
[redacted]	[redacted]	Coating
The following HF chemical list was approved and risk assessed under and IMP 4-3 Regulation 22, Modification #10.		
[redacted]	[redacted]	Metal to metal friction reducer
[redacted]	[redacted]	Corrosion Inhibitor
[redacted]	[redacted]	Liquid Caustic Soda
[redacted]	[redacted]	Crosslinker
[redacted]	[redacted]	Acid
[redacted]	[redacted]	Iron Control Agent
[redacted]	[redacted]	Scale Inhibitor
[redacted]	[redacted]	Surfactant
[redacted]	[redacted]	Gelling Agent
[redacted]	[redacted]	Biocide

Name	CAS Number	Description
[redacted]	[redacted]	Breaker
[redacted]	[redacted]	High Viscosity Friction Reducer
[redacted]	[redacted]	Buffer
[redacted]	[redacted]	Acid
[redacted]	[redacted]	Sand
[redacted]	[redacted]	Sand

Table 13—4 Indicative Tracer Chemicals

Name	CAS Number	Description
[redacted]	[redacted]	Water Tracer
[redacted]	[redacted]	Water Tracer
[redacted]	[redacted]	Water Tracer
[redacted]	[redacted]	Water Tracer
[redacted]	[redacted]	Water Tracer
[redacted]	[redacted]	Water Tracer
[redacted]	[redacted]	Water Tracer
[redacted]	[redacted]	Water Tracer

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