



7.4 Review Comments from GNWT – Environment and Natural Resources

ID	Topic	Reviewer Comment/Recommendation	Proponent Response
38	General File	Comment: ENR Comment and Recommendation Letter 	
1	Topic 1: List of Fuel Type, Size and Amount	<p>Comment: Comment(s): Re-fueling of equipment will be completed within a designated re-fueling area. Fuel transfer vehicles will be equipped with transfer pumps and lines installed with c/w shut off valves. Drip trays will be used during re-fueling activities to minimize potential for spills. Re-fueling will be continuously monitored and drip trays will be inspected regularly for fluid levels and will be replaced or emptied as necessary. A minimal amount of water/methanol mix (approximately 30 meters cubed) and oil (approximately 25 meters cubed) will be stored in tanks on the lease area for less than two weeks. It is anticipated that two 20 pound propane tanks will be used on the program for heating. Suncor resubmits the below table with the fuel volumes to be stored on site throughout the program.</p> <p>Recommendation: Recommendation(s): 1) The area located within the well pad area does not specifically describe the location of the transfer fuel site. A detailed drawing of the transfer site needs to be provided detailing the layout of the secondary containment of the well pad.</p>	<p>Nov 7:  Suncor has drafted a site sketch (see attached). A certified fuel delivery truck will deliver fuel from the nearest commercial fuel depot and transfer the fuel directly into the Service Rig and supporting equipment built-in fuel tanks on-site. The equipment onsite is stationary and spread out across the wellsite pad, as such monitoring, drip trays and absorbent pads will be used to ensure no fuel is spilt and/or hits the ground during the transfer operation. On-site fluids will be stored in doubled walled storage tanks.</p>
2	None	<p>Comment: None</p> <p>Recommendation: The water/methanol mix exceeds maximum amount listed in Schedule "A" of the Spill Contingency Planning and Reporting Regulations R-069-93. It states the maximum amount allowed to be stored above ground is 20,000 L. It is recommended due to the secluded area, and the need for assistance in case of a spill, that the</p>	<p>Nov 7: The methanol will be hauled to the site in totes and then transferred from the totes directly into doubled walled storage tanks onsite using transfer pumps c/w drip trays and absorbent pads. Suncor has updated the handling and storage methods for the methanol in Table 4 of the Waste Management Plan (WMP).</p>

tanks are double walled and meets the requirement for secondary containment that can capture and contain 110% of the stored amount on the well site.

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| 3 | Topic 2: Closure and Reclamation Plan, 1.1 Final Reclamation | Comment: Comment(s): Water trucks will be used to water down the access and well site to help compact and freeze the snow.
Recommendation: Recommendation(s): 1) The proponent shall maintain a water log for the withdrawal of water during entire project. The log should note the water source utilized, the time and date of the withdrawal and the amount of the water withdrawal. The water log shall be provided to the Board and the inspector upon request and submitted to the Board for their records at the conclusion of the each year. | Nov 7: As per Section 7.3.6.4 of the EPP, Suncor will record water withdrawal rates to ensure water withdrawal volumes do not exceed the licenced amount. Suncor will only withdrawal water from one water source, Colville Lake, as discussed with the community of Colville Lake and applied for in the Water Licence application. The water log will be made available to regulatory agencies and the public upon request. |
| 4 | None | Comment: None
Recommendation: 2) That the Board makes this a condition of the Water Licence. | Nov 7: Suncor is committed to following the conditions of the Water Licence. |
| 5 | Topic 3: Removal of Equipment, Waste and Debris | Comment: None
Recommendation: Recommendation(s): 1) A description of the methods that will be used to segregate domestic and hazardous waste is required. A list should be provided that will detail what is being removed from the well site, including the locations of where the wastes/hazardous wastes are being disposed. The local land fill site does not have the capacity to handle any industrial waste or contaminated waste from the proponent. | Nov 7: Table 4 of Suncor's WMP outlines the anticipated waste streams, a description of each waste stream, the handling and storage methods, and the potential disposal options. Suncor anticipates waste reporting in the Annual Report will be a condition of the Water Licence, which will become publically available information. Suncor is not proposing to dispose of wastes to Colville Lake's landfill. |
| 6 | None | Comment: None
Recommendation: If the proponent wishes to utilize community Solid Waste Disposal Facilities to deposit domestic or camp related wastes a letter from the community approving such deposits must be submitted to the Board. | Nov 7: Table 5 of the WMP outlines potential waste management facilities which include two Sahtu communities, Fort Good Hope and Norman Wells. These two communities were identified as potential waste management facilities because they hold an active Water Licence with the SLWB and are the closest |

communities to Colville Lake. As per section 5.2 of the WMP, approval from the accepting disposal facility will be obtained prior to disposal. If the Sahtu communities are unable to accept non-hazardous, domestic waste, Suncor will remove all waste out of the Northwest Territories to Tervita's disposal facility in Rainbow Lake, AB.

7 None

Comment: None

Recommendation: 3) Community municipal waste disposal sites are not designed, engineered or permitted or licenced to accept industrial or hazardous wastes generated outside of their municipal boundaries. If industrial wastes generated outside of a municipal boundary were to be deposited to a municipal landfill, it would have to be shown that the site has been designed, engineered and licenced or permitted to accept industrial wastes generated outside of a communities municipal boundaries and the Board would have to approve such deposits.

Nov 7: Suncor is not proposing to dispose of industrial or hazardous wastes generated during the Program to Sahtu community municipal waste disposal facilities. As identified in Table 5 of the WMP, the only waste types proposed to be disposed of at community municipal waste disposal facilities are non-hazardous, domestic waste (upon approval from the community).

8 Topic 4:
Environmental
Protection
Plan,
Appendix 5
Waste
Management
Plan

Comment: Comment(s): EPP; 3.5 Waste Management - It is anticipated that domestic waste will be generated during project activities. An enclosed garbage bin will be used on-site to contain any domestic waste accumulated during daily program activities. Waste will be disposed of by local contractors at an approved landfill location. WMP; 3.1.5 Release to the receiving Environment - Suncor is proposing to haul the -down-hole material off-site for disposal at an approved Class II industrial landfill and/or an approved down-hole disposal facility. As Suncor undertakes the well maintenance activities, additional waste streams requiring disposal may be generated. Suncor will obtain all required agreements with waste disposal facilities prior to waste disposal.

Recommendation: Recommendation(s):
1) A letter of permission is required from

Nov 7: Same as previous comment. Additionally, Suncor is not proposing to operate a camp under this Water Licence. Personnel will be accommodated within the community of Colville Lake.

the community prior to depositing any domestic or camp wastes into the local Solid Waste Disposal Facilities.

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| 9 None | Comment: None
Recommendation: 2) Landfills within the Sahtu communities are not designed, engineered or licenced or permitted to allow the deposit of industrial or hazardous wastes generated outside of community boundaries, nor do any of the communities have a down-hole disposal facilities. | Nov 7: Same as previous comment. Suncor is not proposing deposit of industrial or hazardous wastes or down-hole disposal in the Northwest Territories. |
| 10 None | Comment: None
Recommendation: 3) Suncor is to provide the means/methods of transporting the wastes that are to be slated for down-hole injection. The proponent should also provide the locations of the down hole injection sites. | Nov 7: Section 5.3 and 5.4 of the WMP outline the proposed handling, storage, and transportation methods for hazardous waste. The down-hole injection site proposed for use is operated by Tervita in Rainbow Lake, AB. |
| 11 Topic 5:
Waste Management Plan - Table 4: Storage and Disposal Options for Management of Waste Streams | Comment: Comment(s): Waste Streams – Used oil, lubricants, absorbent pads and hydraulic fluids; Treatment option is to take all used oil and lubricants to be disposed of at an approved waste storage facility.
Recommendation: Recommendation(s): 1) Landfills within the Sahtu communities are not designed, engineered, licenced or permitted to allow the deposit of industrial or hazardous wastes generated outside of community boundaries, nor do any of the communities have a down-hole disposal facilities. | Nov 7: Suncor is not proposing to dispose of industrial or hazardous wastes generated during the Program to Sahtu community municipal waste disposal facilities. As identified in Table 5 of the WMP, the only waste types proposed to be disposed of at community municipal waste disposal facilities are non-hazardous, domestic waste (upon approval from the community). |
| 12 Topic 6:
Waste Management Plan - 5.3 Handling and Storage | Comment: Comment(s): Hazardous and non-hazardous waste will be stored in a safe and secure manner and in accordance with the following: Waste materials will not be stored on the surface ice of water bodies or within 100 meters (m) of the normal high water | Nov 7: A site sketch has been attached under comment 1. Suncor will use double-walled tanks to store the fluids on-site. |

mark to minimize the potential for contamination of water bodies. Drainage into and from the storage area will be controlled to prevent spills or leaks from leaving the site and to prevent run off from entering the site. Waste will be stored in a controlled area and regular inspections of the storage and handling procedures will be performed and recorded

Recommendation: Recommendation(s):
1) A detailed description and sketch of the storage layout and drainage should be provided.

13 None

Comment: None

Recommendation: 2) Storage and handling procedures and the water log sheet needs to be included in the Waste Management Plan.

Nov 7: Storage and handling procedures are outlined in Table 4 of the WMP, and further described in Section 5.3. Suncor does not consider water withdrawal from the water source a waste stream and therefore will not be including the water withdrawal log in the WMP. The water withdrawal log will be available to regulatory agencies and the public upon request.

14 Topic 7:
Waste Management Plan – Generation of Hazardous Waste

Comment: None

Recommendation: Recommendation(s):
1) Registration with ENR GNWT as a hazardous waste generator must be complete prior to the commencement of project activities.

Nov 7: Suncor will register as a hazardous waste generator with the GNWT ENR prior to the commencement of operations.

15 Topic 8:
Waste Management Plan – 5.6 Reporting

Comment: Comment(s): Analytical information on waste material collected in relation to discharge or acceptance criteria.

Recommendation: Recommendation(s):
1) Suncor needs to clarify which analytical information on waste material is being collected and the acceptance criteria that are being referenced.

Nov 7: There will only be two downhole waste fluids hauled offsite for disposal, they are the methanol water mixture and the Rimbey Platinum Fracturing Oil. Both wastes are known oilfield waste products, MSDS sheets will be made available for both, as such testing is not required for these fluids prior to downhole disposal. The WMP has been updated to remove reference to analytical information and acceptance criteria.

16 Topic 9:
Waste Management

Comment: Comment(s): There is a map of the lease area and surrounding community of Colville Lake, winter road,

Nov 7: A site sketch has been attached under comment 1. The site sketch has been added to Attachment A of the WMP.

Plan – Attachment A	access from the airport road to the well site.	
	<p>Recommendation: Recommendation(s):</p> <p>1) A detailed drawing of the well pad site itself needs to be included in Attachment A.</p>	
17 Topic 10: Environmental Protection Plan – Appendix 6	<p>Comment: Comment(s): Tweed M-4 site specific supplemental section, First Responders, Lead agencies and priority contacts, page 8</p> <p>Recommendation: Recommendation(s):</p> <p>1) ENR will be added to the first responders list.</p>	<p>Nov 7: Suncor has contacted ENR to determine the appropriate first responder contact. As per ENR's recommendation, the NT-NU 24 Hour Spill Report Line 867-920-8130 has been added to the first responders list.</p>
18 None	<p>Comment: None</p> <p>Recommendation: 2) Lead agencies and contacts will be updated to reflect staff and departmental changes in the GNWT due to devolution.</p>	<p>Nov 7: Suncor developed the ERP post-devolution and has made efforts to update the ERP based on current contacts. Suncor would appreciate the opportunity to discuss additional contacts that should be added to the ERP.</p>
19 None	<p>Comment: None</p> <p>Recommendation: 3) The wildlife emergencies contact is Jeff Walker, Superintendent of ENR, GNWT for the Sahtu Region.</p>	<p>Nov 7: The ERP has been updated to reference Jeff Walkers title.</p>
20 None	<p>Comment: None</p> <p>Recommendation: 4) All Appendixes in the application need to be updated.</p>	<p>Nov 7: Suncor believes this comment is referring to Appendix 5 - WMP and Appendix 6 - ERP and SCP. Suncor has updated both appendices as per GNWT ENR's recommendations.</p>
21 Topic 11: Spill Contingency Plan- 1.4 Scope of Work	<p>Comment: Comment(s): A 15 km long and 8 meter wide winter access road will be constructed to access the site.</p> <p>Recommendation: Recommendation(s):</p> <p>1) Due to the increased access for hunting and trapping along the road, it is recommended that Suncor utilize a check point along that road to control and ensure safe access to the areas being utilized. Environment and wildlife monitors monitoring the road and logging and not any information regarding wildlife, hunting and trapping</p>	<p>Nov 7: Suncor will install signage at the start of the access road warning unauthorized traffic to avoid the area due to industrial activity ongoing. Daily road patrols will be completed by the local Wildlife Monitor and the Suncor representative on the location. Unauthorized traffic will be stopped and warned of the industrial activity and timelines associated with it.</p>

in the area.

22 None

Comment: None

Recommendation: The access road should be blocked after yearly winter project activities are completed to minimize access when project activities are not taking place.

Nov 7: This is an existing access road/trail that, to Suncor's knowledge, has not been blocked for access prior to this operation. Suncor cannot legally block the use of lands within the Sahtu Settlement Area. The community members of Colville Lake may choose to maintain the access for snowmobile use. Suncor is not proposing to access the Tweed Lake M-47 wellsite in subsequent winters, therefore the vegetation will be allowed to re-establish which may naturally reduce access.

23 Topic 12: Spill Contingency Plan – 1.5 Hazardous Materials on Site

Comment: Comment(s): Well bore fluids – Well bore fluids (Rimbey Platinum frac oil) on ground, water, snow or ice from a tank that ruptures.
Recommendation: Recommendation(s): 1) Spill Contingency Planning and Reporting Regulations, section 2. (3), state, In Schedule "A", the amounts set out in column 3 under the heading "STORAGE CAPACITY" refer to liquids, where the amount is expressed in liters, and to solids, where the amount is expressed in kilograms. The well bore fluids being stored above ground are over the allowable amount of 20, 000 L. Suncor to provide more detail on the type of tanks used for storing the well bore fluids.

Nov 7: All fluids on-site including the Rimbey Platinum Fracturing Oil will be stored in doubled walled storage tanks. The plan is to limit the storage time as the fluids will be transported offsite for disposal as soon as possible after all fluids have been circulated out of the wellbore.

24 None

Comment: None

Recommendation: The main objective of this regulation is to prevent any contamination of the surrounding area from storage tank systems located within the well site. The Board should ensure proponents utilize secondary containment, such as double walled tanks or bermed areas with impermeable liners for above ground storage facilities to protect the environment from spills. A detailed sketch of primary and secondary containment is required prior to

Nov 7: A site sketch has been attached to comment 1. All above ground storage tanks for downhole and waste fluids will be doubled walled to prevent site contamination. The site sketch has been added as an attachment to the SCP.

activities.

- 25 Topic 13: Spill Contingency Plan **Comment:** Comment(s): The winter road system throughout the Sahtu can be very treacherous. During the 2013/2014 winter season, there had been accidents and spills. All spills, or potential spills shall be reported to the Spill Report Line as soon as possible. **Recommendation:** Recommendation(s): 1) All spills and potential spills should also be reported to ENR and DOT GNWT as well as the Spill Report Line. **Nov 7:** Suncor has updated the SCP to include the Government of the Northwest Territories Departments ENR and DOT.
- 26 Topic 14: Spill Contingency Plan – 8.0 Containment, Recovery & Clean-up Procedures **Comment:** Comment(s): 8.1 to 8.4 – Disposal: The following are a number of methods available in the Norman Wells area for disposal of oil spill products. All methods will be in accordance to Land Use Permit conditions. • In-Situ Burning at Spill site • Open Pit Burning • Burial **Recommendation:** Recommendation(s): 1) In the case of a major oil spill, some of the fuel released at the site may be disposed of through in-situ burning. Precautions must be taken to ensure fire cannot burn back to fuel storage tanks. This type of method is prohibited. Refer to the "Used Waste Oil and Waste Management Regulations". **Nov 7:** Suncor has reviewed the Used Waste Oil and Management Regulations and will undertake operations in accordance with these regulations. The Recovery and Clean-up sections of the SCP have been updated to state, "As per the Used Fuel and Waste Oil Management Regulations, unless approved by the Chief Environmental Protection Officer (Chief EPO), open burning of used oil, waste fuel and waste-derived fuel is prohibited. If immediate burning is deemed appropriate in the event of a major spill, the GNWT Resource Management Officer and the GNWT Chief EPO through Environment and Natural Resources will be contacted for approval." The Disposal sections of the SCP have been updated to state, "The proper disposal of contaminated materials will be determined by consultation among the Incident Commander, Suncor environmental staff, and external environmental consultants contracted by Suncor. Hazardous waste will be disposed of at an approved hazardous waste disposal facility." In addition, in-situ burning at spill site, open pit burning, and burial have been removed as potential disposal options in the Norman Wells area.
- 27 None **Comment:** None **Recommendation:** 2) Incineration of oil contaminated debris in open pits or open top barrels is another alternative. Surface burning, using berms and built-up areas where possible, is preferred to **Nov 7:** Suncor has reviewed the Used Waste Oil and Management Regulations and will undertake operations in accordance with these regulations. The Recovery and Clean-up sections of the SCP have been updated to state, "As per the Used Fuel and Waste Oil

disturbing the permafrost substructure. This method is prohibited. Refer to the "Guideline for General Management of Hazardous Waste in the NWT."

Management Regulations, unless approved by the Chief Environmental Protection Officer (Chief EPO), open burning of used oil, waste fuel and waste-derived fuel is prohibited. If immediate burning is deemed appropriate in the event of a major spill, the GNWT Resource Management Officer and the GNWT Chief EPO through Environment and Natural Resources will be contacted for approval." The Disposal sections of the SCP have been updated to state, "The proper disposal of contaminated materials will be determined by consultation among the Incident Commander, Suncor environmental staff, and external environmental consultants contracted by Suncor. Hazardous waste will be disposed of at an approved hazardous waste disposal facility." In addition, in-situ burning at spill site, open pit burning, and burial have been removed as potential disposal options in the Norman Wells area.

28 None

Comment: None

Recommendation: 3) Another method of disposal of large quantities of oil and oil-contaminated debris could be by burial. Permission must be granted through a Land Use Permit obtained from GNWT. If there is a possibility of oil spill debris disposal in Fort Norman, Norman Wells or any other community, permission may also be required from the Government of Northwest Territories. The community of Fort Norman is called Tulita. Disposal of oil and oil-contaminated debris is required to be transported to a licensed hazardous waste facility outside of the Sahtu Region. Landfills within the Sahtu communities are not designed, engineered, licenced or permitted to allow the deposit of industrial or hazardous wastes generated outside of community boundaries. Refer to the "Used Waste Oil and Waste Management Regulations" and "Guideline for General Management of

Nov 7: The Disposal sections of the SCP have been updated to state, "The proper disposal of contaminated materials will be determined by consultation among the Incident Commander, Suncor environmental staff, and external environmental consultants contracted by Suncor. Hazardous waste will be disposed of at an approved hazardous waste disposal facility." In addition, in-situ burning at spill site, open pit burning, and burial have been removed as potential disposal options in the Norman Wells area. Industrial and hazardous waste will be removed from the Northwest Territories and disposed at an approved hazardous waste disposal site in Alberta.

Hazardous Waste in the NWT".

29 None

Comment: None

Recommendation: A disposal method within Suncor's Spill Contingency Plan has to be removed and replaced using the preferable methods outline the GNWT regulations and guidelines for management of waste. The generator is required to determine and follow the proper management method for their waste.

Nov 7: The SCP has been updated to reflect waste management practices as outlined in Suncor's Waste Management Plan and the applicable regulations including, "Used Waste Oil and Waste Management Regulations" and "Guideline for General Management of Hazardous Waste in the NWT".

30 None

Comment: None

Recommendation: Suncor needs to include in their Waste Management Plan the appropriate regulations or guidelines from which their practices derive.

Nov 7: Section 2 of Suncor's WMP references applicable regulatory requirements. Section 2 of the SCP has been updated to include applicable regulatory requirements.

31 Topic 15: Spill Contingency Plan – 8.4 Winter Spill – On ice

Comment: Comment(s): Recovery and cleanup – If a spill is moving toward cracks in the ice or open water, an immediate burning may be desirable. The Field supervisor or Party Manager will make the decision.

Recommendation(s): 1) Suncor needs to include in their Waste Management Plan the appropriate regulations or guidelines from which their practices derive. This is not a preferable method of disposal in the Northwest Territories. Refer to the "Used Oil and Waste Fuel Management Regulations."

Nov 7: Suncor has reviewed the Used Waste Oil and Management Regulations and will undertake operations in accordance with these regulations. The Recovery and Clean-up sections of the SCP have been updated to state, "As per the Used Fuel and Waste Oil Management Regulations, unless approved by the Chief Environmental Protection Officer (Chief EPO), open burning of used oil, waste fuel and waste-derived fuel is prohibited. If immediate burning is deemed appropriate in the event of a major spill, the GNWT Resource Management Officer and the GNWT Chief EPO through Environment and Natural Resources will be contacted for approval." The Disposal sections of the SCP have been updated to state, "The proper disposal of contaminated materials will be determined by consultation among the Incident Commander, Suncor environmental staff, and external environmental consultants contracted by Suncor. Hazardous waste will be disposed of at an approved hazardous waste disposal facility." In addition, in-situ burning at spill site, open pit burning, and burial have been removed as potential disposal options in the Norman Wells area.

- 32 Topic 16: Spill Contingency Plan – Appendix 2 – Spill Report Form
Comment: Comment(s): The GNWT has currently revised the NT-NU spill report form.
Recommendation: Recommendation(s): 1) Suncor is to confirm that the most recent form is added into their Spill Contingency and Emergency Response Plan. This form can be found on the GNWT ENR website.
Nov 7: Suncor has retrieved the updated the NT-NU spill report form from the GNWT website and included the form in the SCP.
- 33 Topic 17: Spill Contingency Plan - Appendix 5 – Reporting Requirements
Comment: Comment(s): The second column – Quantity or levels, has Class 3 listed as 200 L.
Recommendation: Recommendation(s): 1) Suncor needs to adhere to the Spill Contingency Planning and Reporting Regulations 2. (4) In Schedule B, the amounts set out in column 4 under the heading "AMOUNT SPILLED" refer to liquids, where the amount is expressed in liters, and to solids, where the amount is expressed in kilograms. Quantity or levels needs to be changed to 100 L for Class 3.
Nov 7: Appendix 5 Reporting Requirements includes two tables of immediately reportable spills. The first table in Appendix 5 was obtained from the Transportation of Dangerous Goods Regulations. The second table in Appendix 5 was obtained from the Spill Contingency Planning and Reporting Regulations and states that the immediately reportable quantity for Class 3 is 100L.
- 34 Topic 18: Spill Contingency Plan – Appendix 7-MSDS
Comment: None
Recommendation: Recommendation(s): 1) Appendix 7 only has the Material Safety Data Sheet for the SF-780. For every other chemical and hazardous material used during the operations at the well site, an MSDS needs to be provided. An update in Appendix 7 needs to be completed.
Nov 7: MSDS sheets for methanol, gasoline, propane, and diesel will be provided to the SLWB prior to operations.
- 35 Topic 19: Well-site Re-suspension
Comment: Comment(s): While the application states that Suncor "has identified a need to complete maintenance and re-suspension activities on the Tweed Lake M-47 (M-47) well" specific information related to this remains unclear.
Recommendation: Recommendation(s): 1) ENR requests additional information on the results and reasons that re-suspension of the well was required (e.g. visible leaking, testing, etc.).
Nov 7: Suncor conducted the well inspection during Sept 2013 and reported the results to the National Energy Board (NEB). The inspection revealed pressure (10,700 kPa) on the production tubing side of the wellhead. The NEB responded back in October requesting Suncor to provide a remedial plan to provide proper suspension of the wellbore to comply with Section 56 of the Canada Oil and Gas Drilling and Production Regulations for suspended wells. In January 2014, Suncor received approval

from the NEB to defer the remedial repair to Q1 / 2015.

36 Topic 20:
Access Road
Crossings

Comment: Comment(s): Figure E of Appendix 1-B indicates that there may be watercourse crossings required along the 15-km access route, however, Section 1.1 of the Closure and Reclamation Plan indicates that Suncor does not indicate that any areas will require snow fills.

Recommendation: Recommendation(s): 1) ENR requests clarification from Suncor regarding the requirement of any snow fills or other watercourse crossings along proposed access routes. Should crossings be required, ENR requests specific information on crossing methodology and any mitigation measures that will be employed

Nov 7: Based on a summer 2014 inspection no water crossings were identified along the access route, as such, Suncor does not anticipate requiring snow fills for the construction of the winter road. If snow fills are deemed necessary, the measures as outlined in the Northwest Territories Operational Statement on Ice Bridges and Snow Fills will be incorporated into the construction, operation, and de-commissioning of the winter road access. Suncor will post the operational statement at the work site to ensure it is readily available for personnel. Measures to protect fish and fish habitat when constructing an ice bridge or snow fill are included in the Operation Statement. Suncor will review and follow these measures wherever possible. Suncor has also reviewed AANDC's Northern Land Use Guidelines and will incorporate the following measures for the construction of snow fills:

1. Ice and snow thickness should be sufficient to protect the stream banks from erosion (minimum 10 cm)
2. Clean snow should be used to construct approaches to crossings and fills to ensure that debris does not enter the stream during the spring
3. Snow fills should only be used in streams that freeze to bottom and should be removed, or notched, in the spring so that they do not impede stream drainage
4. Removal of stream crossings should occur progressively along the right-of-way as the winter road is closed to minimize in-stream work.

37 Topic 21: Re-
suspension

Comment: Comment(s): Section 3.3 states that tubing volume in the reservoir will be replaced with

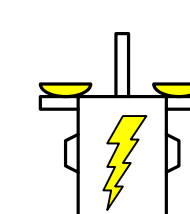
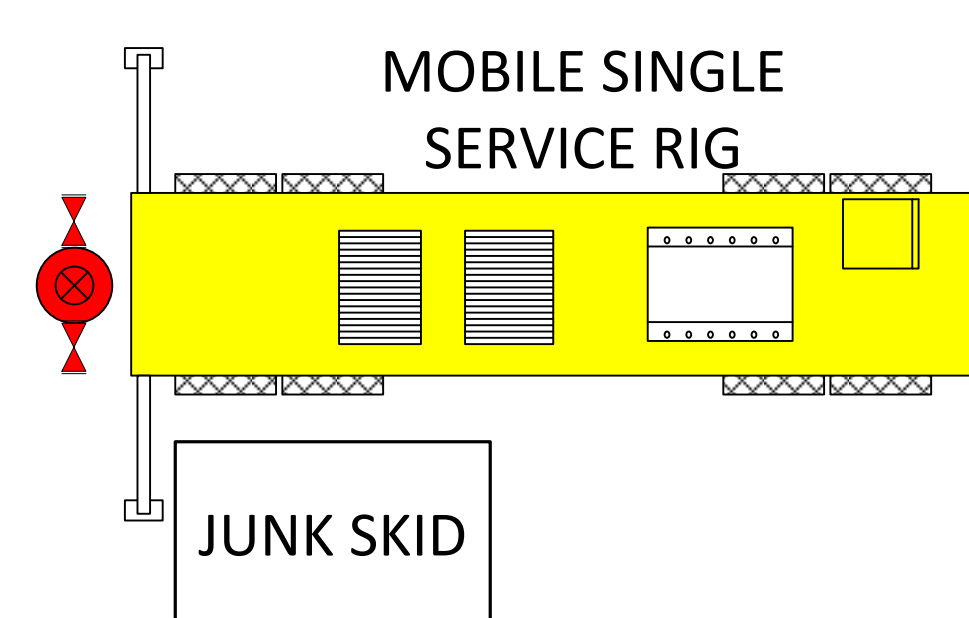
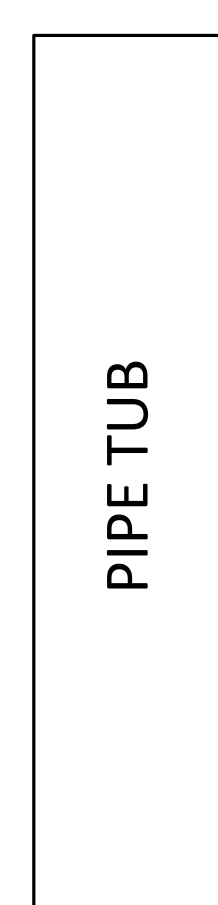
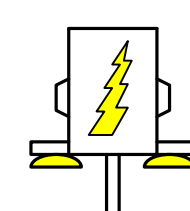
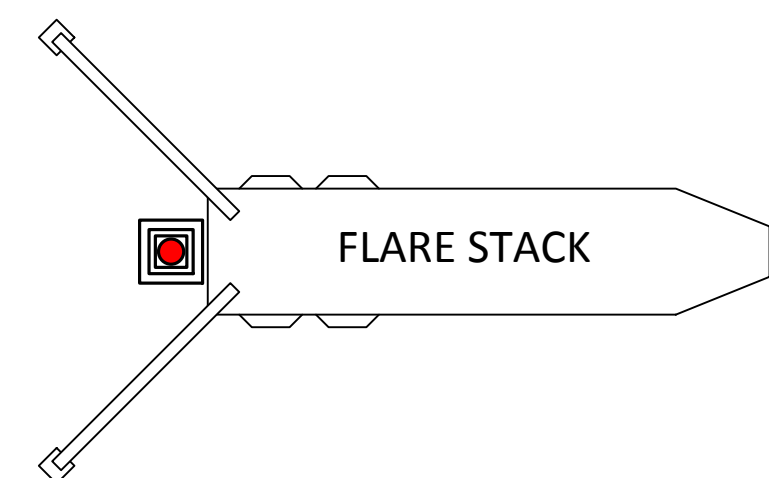
Nov 7: The current program has Suncor pumping a 1 m³ spearhead of 100% methanol down the tubing to prevent hydrate

water/methanol. It is understood from the water use information provided that only 30 m³ will be required for re-suspension activities. While the Waste Management Plan outlines that methanol will be removed by registered hazardous waste carrier it is unclear as to the ratio of water and methanol that will be injected into the well and if/how it will be recovered.

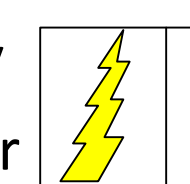
Recommendation: Recommendation: 1) ENR requests additional information on the fate, composition and quantities of material to be injected down hole during re-suspension activities as well as any mitigation measures that will be used to prevent the escape of fluids at the surface or within the wellbore.

formation. This will be followed by $\pm 5 \text{ m}^3$ of 20% methanol / 80% water to displace the gas from the tubing. Once the new bridge plug is set and holes punched in the tubing above the packer, the frac oil in the annulus will be circulated out using $\pm 24 \text{ m}^3$ of 20/80 methanol water. This methanol water will stay in the hole.

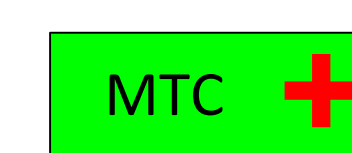
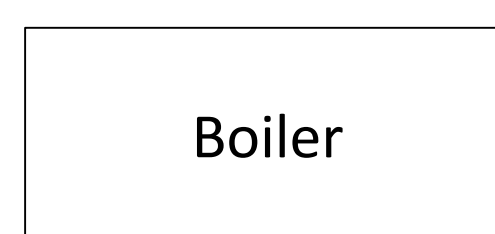
- The Service Rig itself contains a blowout preventer, or BOP system that is capable of shutting in the well, with or without pipe in the well and the system itself is redundant, it has a hydraulic primary and Nitrogen (N₂) secondary operating system. It must meet rigid testing requirements, prior to and during any job. The BOP is installed safely on the wellhead when it is safe to do so, in this case after the permanent bridge plug is set in the tail pipe and passes both a positive and negative pressure test. At that point the well is dead and the BOP system can be installed on the well.
- The existing fluid in the annulus is a frac oil installed during the initial completion due to the permafrost. The frac oil is a non-freezing fluid. It will be removed from the well, circulated out using the rig's pump and circulation system, recovered and sent for disposal. It will be replaced with non-freezing product (Methanol 20% / water 80% mixture).
- The fluid circulating system on the Service Rig consists of a pump, high and low pressure lines and a storage tank. They are all heated and portable, pressure tested prior to use and an integral part of virtually every job the rig undertakes. Lines that are opened are drained into basins and that fluid disposed of.
- No well testing is planned so there will be no fluids or gasses exiting from the well.



Light Plant/
Accumulator



Dog House

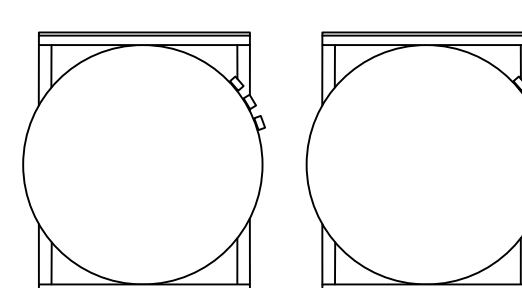


WIND



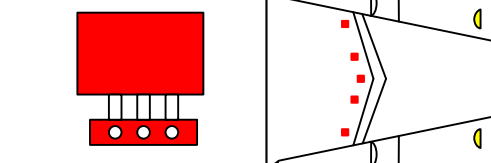
Lease
Entrance

63 m3 DOUBLE
WALLED STORAGE
TANKS

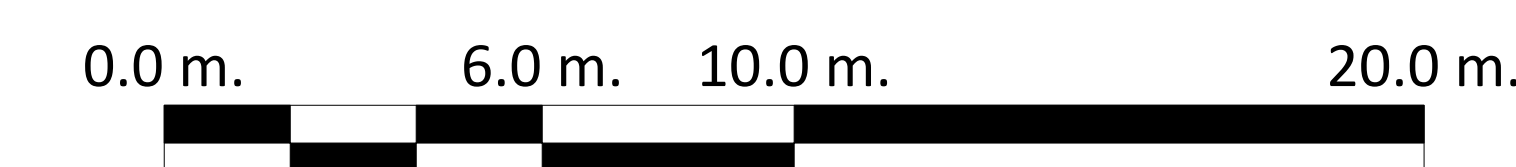


Rig Tank

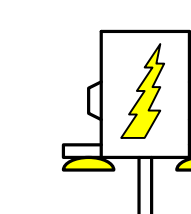
RIG PUMP



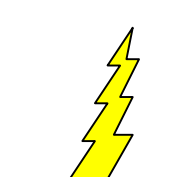
TITLE	TYPICAL WELLSITE LAYOUT
DESCRIPTION	SUNCOR ENERGY SERVICE RIG WITH P-TANK
REVISED	11/7/2014
DRAWN BY	M.J. CASSIDY



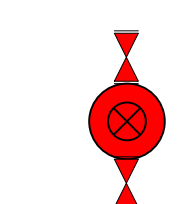
LEGEND



Light Tower



Generator



Wellhead