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From: Sarah Zembiak, Project Manager  
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Date: December 1, 2020

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**Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area**

The East Mackay I-78 Wellsite Area (Wellsite Area) and East Mackay I-78 Staging Area (Staging Area), collectively called the Site, are located in the Sahtu Settlement Area (SSA), Northwest Territories (NWT). The Wellsite Area is located approximately 110 km southeast of Norman Wells. The Staging Area is located approximately 22 km north of the Wellsite Area along the banks of the Mackenzie River (Attachment A: Figure A.1). The Wellsite Area is approximately 2.7 ha and includes a Wellhead, Recovered Wellhead Bare Area and groundwater monitoring wells (Attachment A: Figure A.2; Attachment B: Photos B.1 and B.2). The decommissioned Staging Area is a 0.80 ha parcel (Attachment A: Figure A.3 and Attachment B: Photos B.12 and B.13).

On March 11, 2020, the World Health Organization assessed COVID-19 as a pandemic. This global health emergency has resulted in unprecedented restrictions being imposed by health officials, governments, and other organizations on the movement of goods and people, including travel restrictions and quarantines. Due to travel restrictions to the NWT, the environmental site monitoring program did not include out-of-territory discipline experts as part of the field assessment team. In 2020, a reconnaissance level assessment was conducted by local Kālo Stantec Ltd. (Kālo Stantec) personnel to document on-site conditions through photographs. Discipline experts that would normally have conducted the fieldwork developed a field plan prior to fieldwork for the site assessor's on-site photography. Based on previous site reports and areas of interest and concern, specific instructions were provided on what needed to be documented in the photographs. The scope of work for the reconnaissance level assessment did not include collection of quantitative data including active layer measurements, electromagnetic surveys, thermistors and weather station data, soil and water sampling, or vegetation monitoring plots. Photographs were reviewed and evaluated by discipline experts located across Canada to develop the 2020 Environmental Site Monitoring Report for the East Mackay I-78 Wellsite Area and Staging Area.

**Table 1 2020 Site Specifications**

<b>Site</b>	East Mackay I-78 Wellsite and Staging Area	<b>Coordinates</b>	Wellsite Area: 64° 47' 42.540" N and 125° 43' 24.840" W Staging Area: 64° 55' 09.899" N and 125° 53' 06.599" W		
<b>Permittee</b>	MGM Energy		<b>Contractor</b>	Kālo Stantec Ltd.	
<b>Land Use Permit #</b>	S12A-001	<b>Expiry Date</b> July 23, 2017	<b>Water License #</b>	S12L1-001	<b>Expiry Date</b> July 23, 2017
<b>Site Assessors</b>	Michael Fabijan, Site Assessor (photographer) Lionel Borges, B.Sc., Desktop Review Assessor Olivier Piraux, M.Sc., Desktop Review Assessor		<b>Monitoring Date</b>	August 20, 2020	

**Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area**
**Table 1 2020 Site Specifications**

Type of Inspection	<input checked="" type="checkbox"/> Ground <input type="checkbox"/> Aerial	Current Stage of Remediation/Reclamation	<input checked="" type="checkbox"/> In progress <input type="checkbox"/> Planned <input type="checkbox"/> Complete	Locations Inspected	<input checked="" type="checkbox"/> Well Site <input type="checkbox"/> Sump <input checked="" type="checkbox"/> Staging Area
Summary of Ongoing Work Completed to Date	<input checked="" type="checkbox"/> Decommissioning <input type="checkbox"/> Erosion Control <input type="checkbox"/> Excavation/Capping <input type="checkbox"/> Phytoremediation <input checked="" type="checkbox"/> Seeded <input type="checkbox"/> Planted <input type="checkbox"/> Other		Key Issues	<input type="checkbox"/> No issues <input checked="" type="checkbox"/> On Site Materials <input type="checkbox"/> Wastes/Spills <input type="checkbox"/> Erosion <input type="checkbox"/> Terrain Conditions <input checked="" type="checkbox"/> Soil Exceedances <input checked="" type="checkbox"/> Water Exceedances <input checked="" type="checkbox"/> Vegetation <input type="checkbox"/> Wildlife Signs	<b>Recommended for:</b> <input type="checkbox"/> Closure <input type="checkbox"/> No further environmental monitoring or remediation/ reclamation treatments until closure <input checked="" type="checkbox"/> Additional monitoring only (see Table 3) <input type="checkbox"/> Additional treatment and monitoring

**Key Findings and Recommendations**

Upon arrival at the Site, the field assessor visually assessed the Site by documenting on-site conditions with photographs (Attachment B).

A summary of observed conditions in 2020 is provided in Table 2. Key findings and recommendations are summarized in Table 3.

**Table 2 Summary of 2020 Environmental Monitoring**

Parameter	Observation	
	Well Site	Staging Area
On Site Materials	A	IP
Erosion Control/Drainage	A	A
Terrain conditions	A	A
Soil	NI	NI
Standing Water	NI	N/A
Vegetation Cover	A	IP
Invasive Plants/Weeds	A	NI
Wildlife Signs of Use	A	A
NOTE: 'A' = Acceptable – meeting permit/license conditions, no further work required • Water – below CCME Freshwater Guidelines, GNWT CSR Guidelines • Soils – below CCME Parkland, GNWT CSR Guidelines • Vegetation – 70% vegetation cover and no weed treatment 'IP' = In Progress - Further work required 'N/A' = Not Applicable 'NI' = Not Inspected, planned for 2021		

**Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area**
**Table 3 2020 Summary of Key Findings and Recommendations**

Parameters	Qualitative Monitoring Observations and Results	Recommendations for 2021
On-Site Materials	<b>Wellsite Area:</b> <ul style="list-style-type: none"> <li>Contained a wellhead and three groundwater monitoring wells (GW001, GW002, and GW003). All were observed to be in good condition during the site visit.</li> <li>No other surface structures, materials, or waste were observed within the remainder of the Site during the site visit.</li> </ul> <b>Staging Area:</b> <ul style="list-style-type: none"> <li>Previously documented third-party trailer, wooden outbuilding, scrap wood and metal wastes remained in the southwest corner of the Staging Area.</li> <li>A fuel oil/kerosene tank with a slight leak was observed on the trailer.</li> <li>Materials present at the Staging Area are not the property of MGM Energy. The ownership of the materials is unknown.</li> </ul>	<b>Wellsite Area:</b> <ul style="list-style-type: none"> <li>Re-attach the GW001, GW002, and GW003 identification signs to the monitoring well posts.</li> <li>No other actions related to on-site materials are recommended until the wellhead is cut, capped and abandoned.</li> </ul> <b>Staging Area:</b> <ul style="list-style-type: none"> <li>No physical/operation work required related to third-party materials.</li> <li>Continue monitoring third-party materials and activity in Staging Area and continue communication with the regulator regarding the activity occurring at the Staging Area by the unknown third-party.</li> </ul>
Terrain	<ul style="list-style-type: none"> <li>No terrain stability concerns were observed at the Wellsite Area or Staging Area during the site visit. Terrain conditions observed to be stable.</li> </ul>	<ul style="list-style-type: none"> <li>Continue visual monitoring for potential signs of instability at the Wellsite Area.</li> <li>No monitoring of terrain conditions required at the Staging Area.</li> </ul>
Standing Water	<b>Wellsite Area:</b> <ul style="list-style-type: none"> <li>No standing water was sampled during the site visit.</li> <li>Standing water was observed around the wellhead.</li> </ul> <b>Staging Area:</b> <ul style="list-style-type: none"> <li>No standing water was sampled during the site visit.</li> <li>No standing water was observed at the Staging Area during the site visit.</li> </ul>	<b>Wellsite Area:</b> <ul style="list-style-type: none"> <li>Standing water sample collection in 2021 at the wellhead location for petroleum hydrocarbons (PHCs), metals and extractable barium for confirmation of exceedances and chemistry trending.</li> <li>Collect reference water sample in 2021 for routine parameters and metals (total and dissolved), if standing water is observed off-site.</li> </ul> <b>Staging Area:</b> <ul style="list-style-type: none"> <li>No further sampling of standing water recommended, unless visible evidence<sup>1</sup> triggers sample collection during a future site visit.</li> </ul>

<sup>1</sup> Evidence that would trigger the collection of soil and/or standing water samples may include: crust formation on exposed soil surfaces, vegetation changes (discoloration, decline in health, or lack of vegetation), discolored soil surfaces (e.g., staining), presence of a hydrocarbon-like sheen on the surface of standing water, standing water on the sump cap or slopes, or reasonably proximate to the sump and perceived to be possibly related to sump changes.

**Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area**

**Table 3 2020 Summary of Key Findings and Recommendations**

Parameters	Qualitative Monitoring Observations and Results	Recommendations for 2021
Soils	<p><b>Wellsite Area:</b></p> <ul style="list-style-type: none"> <li>Soil samples were not collected during the site visit.</li> <li>No evidence of soil contaminants such as sheen, surface staining, or surface crusts were observed at the Wellsite Area.</li> </ul> <p><b>Staging Area:</b></p> <ul style="list-style-type: none"> <li>No soil samples were collected during the site visit.</li> <li>Surface staining (oily residue) on the ground below the kerosene/fuel tank found slightly leaking. The fuel tank is associated with the third-party trailer located in the southwest corner of the site.</li> </ul>	<p><b>Wellsite Area:</b></p> <ul style="list-style-type: none"> <li>Soil sample collection in 2021 at the wellhead area for PHCs, metals and extractable barium to laterally delineate previously reported exceedances.</li> <li>Remediation recommended when the wellhead is cut, capped and abandoned.</li> </ul> <p><b>Staging Area:</b></p> <ul style="list-style-type: none"> <li>Soil sampling for PHCs to confirm and delineate the surface staining associated with the fuel tank recommended once leak is fixed.</li> </ul>
Vegetation	<p><b>Wellsite Area:</b></p> <ul style="list-style-type: none"> <li>Site had naturally revegetated in lease area around wellhead location.</li> <li>Native vegetation cover and health on the Wellsite Area was meeting land use permit S12A-001 requirements (&gt;70% vegetation cover, in healthy condition).</li> <li>Recovered Wellhead Bare Area (Attachment A, Figure A.2) continued to have a well-established vegetation cover and was meeting permit requirements.</li> <li>Vegetation appeared healthy; no health issues observed.</li> <li>No invasive plants/weeds observed within the Site during the site visit</li> </ul>	<p><b>Wellsite Area:</b></p> <ul style="list-style-type: none"> <li>No reclamation treatments recommended until the wellhead is cut, capped and abandoned.</li> <li>Reconnaissance level vegetation monitoring only at the Site to assess growth and establishment of vegetation and document any issues that arise.</li> <li>Carry out detailed vegetation monitoring in 2021 in conjunction with proposed soil and water sampling at wellhead location.</li> </ul>

**Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area**

**Table 3 2020 Summary of Key Findings and Recommendations**

Parameters	Qualitative Monitoring Observations and Results	Recommendations for 2021
Vegetation (cont'd)	<b>Staging Area:</b> <ul style="list-style-type: none"> <li>West end of Staging Area has naturally revegetated with native trees, shrubs, and forbs. Vegetation cover was meeting permit requirements (&gt;70% cover, healthy conditions).</li> <li>East portion has revegetated with seeded agronomic grasses and legumes and has naturally revegetated with native trees, shrubs, and forbs.</li> <li>Vegetation cover in the east portion of the Staging Area was approximately 55% to 70% cover. Vegetation appeared healthy; no health issues observed.</li> <li>Overall, vegetation cover in the east portion met land use permit conditions for vegetation health but was slightly under for vegetation cover (&lt;70% cover).</li> <li>Previously observed invasive plant locations were not monitored during the 2020 site visit.</li> </ul>	<b>Staging Area:</b> <ul style="list-style-type: none"> <li>No reclamation treatments recommended.</li> <li>Defer reclamation treatments until the third-party use of the Staging Area and responsibility for site reclamation is resolved with the GNWT regulators.</li> <li>Monitor for invasive plants in previously identified infestation locations<sup>2</sup>.</li> </ul>
Wildlife Signs	<b>Wellsite Area:</b> <ul style="list-style-type: none"> <li>Moose (<i>Alces alces ssp. americanus</i>) hoof prints were observed within the Wellsite Area during the site visit.</li> <li>No other wildlife signs of use were observed within the Wellsite Area during the site visit.</li> </ul> <b>Staging Area:</b> <ul style="list-style-type: none"> <li>Moose droppings observed in the west and east ends of the Staging Area.</li> <li>No other wildlife signs of use were observed within the Staging Area during the site visit.</li> </ul>	<ul style="list-style-type: none"> <li>No treatment work is recommended for the Wellsite Area or Staging Area.</li> <li>Continue monitoring for wildlife use whenever at the Wellsite Area and Staging Area.</li> </ul>

<sup>2</sup> MGM Energy – 2017 Environmental Site Monitoring Report Site: East Mackay I-78 Wellsite and Staging Area. November 2017.

**Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area**

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### **Limitations and Closure**

This summary report document was prepared in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this summary report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

**Kālo Stantec Limited**

Attachments: Attachment A: Figures

Figure A.1: MGM Energy Wellsite, Sump and Staging Area Locations within the Sahtu Settlement Area

Figure A.2: East Mackay I-78 Wellsite Area Features

Figure A.3: East Mackay I-78 Staging Area Features

Attachment B: Site Photographs

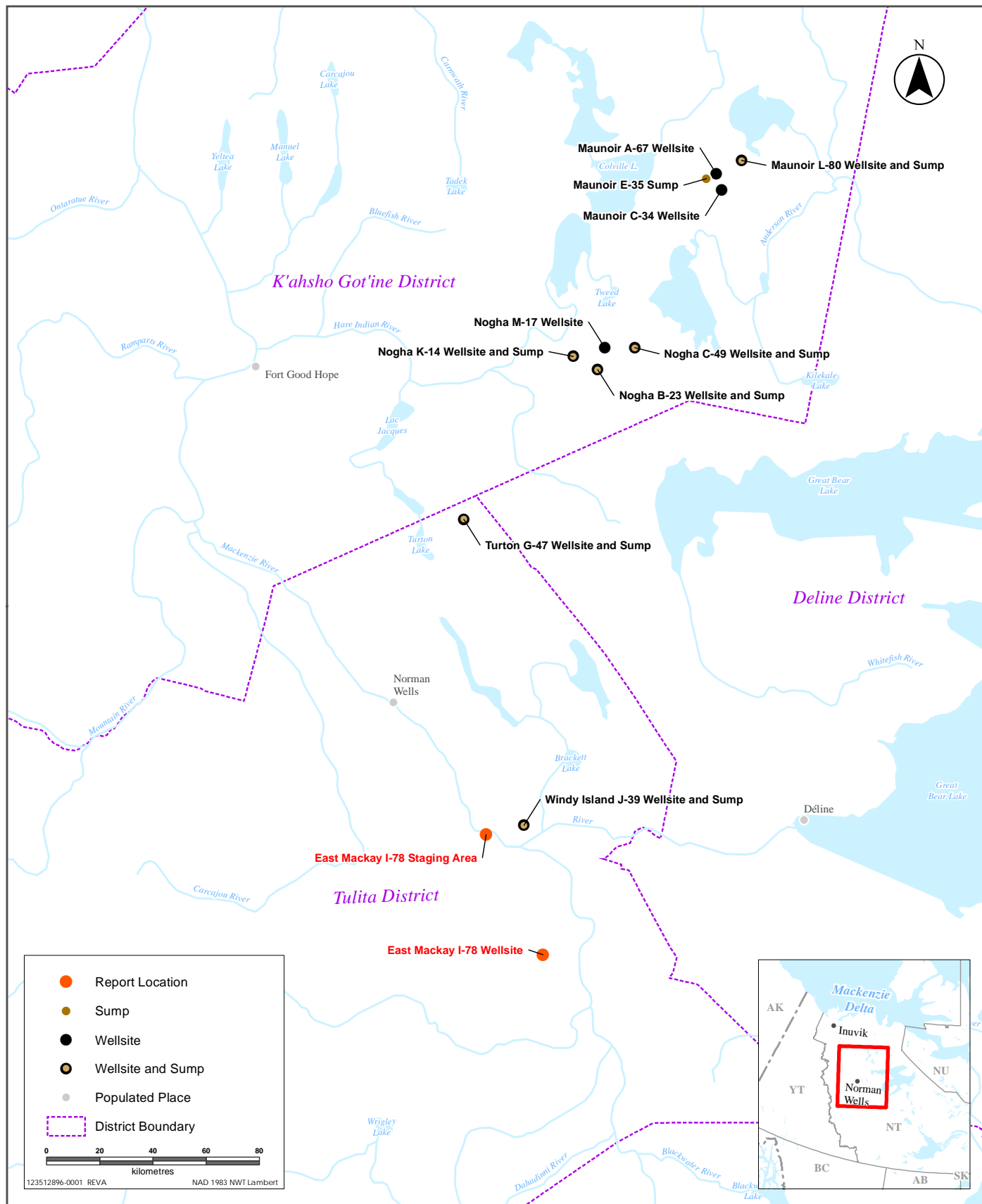


MGM Energy  
Page A.1

**Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area**

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**Attachment A      Figures**



Sources: Base Data - Natural Earth. Thematic Data - Kalo Stantec Ltd, Government of Northwest Territories

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

## MGM Energy Wellsite, Sump and Staging Area Locations within the Sahtu Settlement Area







Sources: Base Data - Natural Earth. Thematic Data - Kalo Stantec Ltd  
Imagery: SkyWatch Space Applications Inc

*Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.*

## East Mackay I-78 Wellsite Area Features







Sources: Base Data - Natural Earth. Thematic Data - Kalo Stantec Ltd  
 Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

*Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.*

## East Mackay I-78 Staging Area Features



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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## **Attachment B      Site Photographs**

### **Photo B.1      I-78 Wellsite Area: Overview**



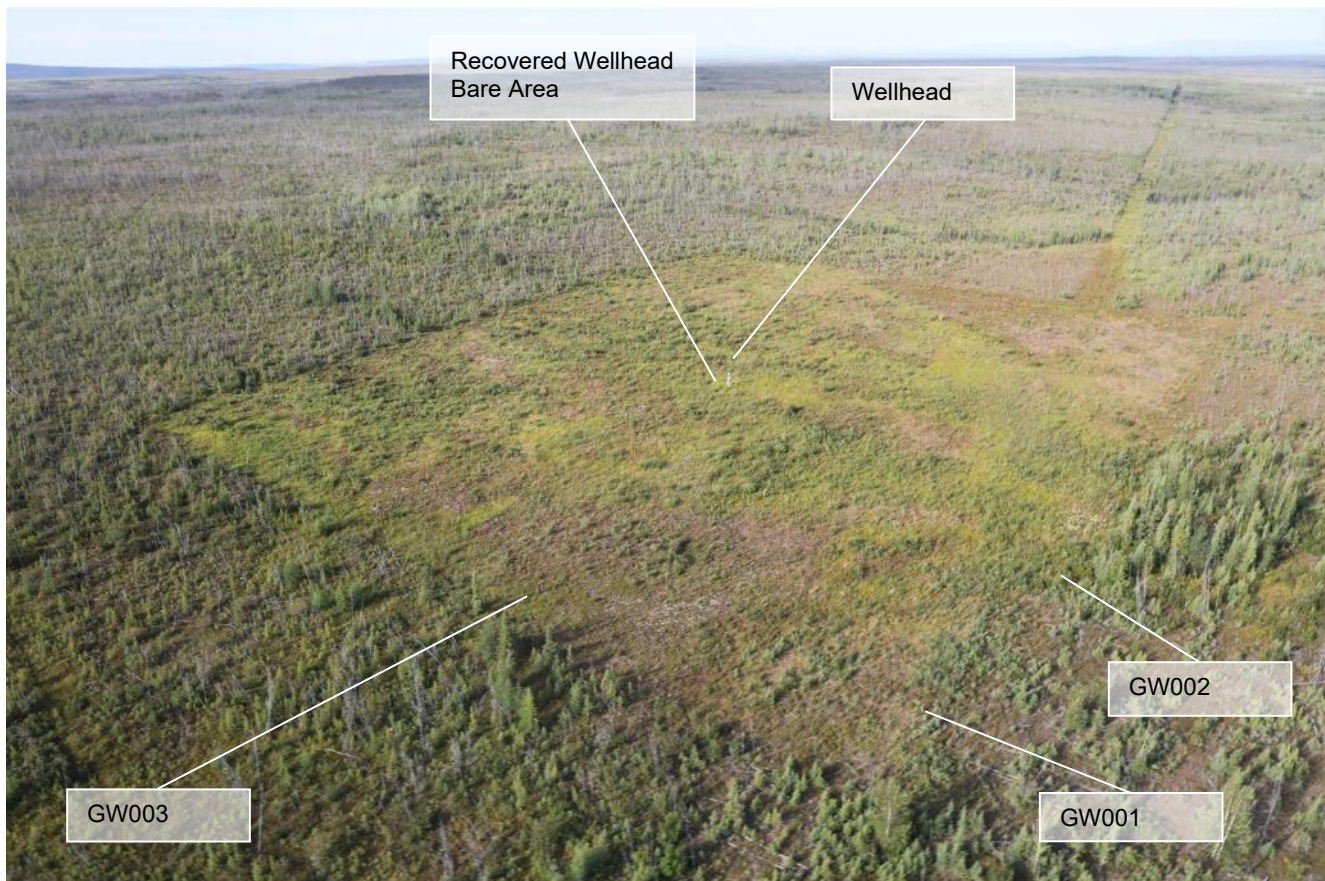
**NOTE:** Overview of the Wellsite Area and surrounding area showing overall terrain and vegetation conditions (August 20, 2020).



Reference: 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.2 I-78 Wellsite Area: Overview**



NOTE: Overview showing the Wellsite Area and locations of the Wellhead, Recovered Wellhead Bare Area, and Groundwater Monitoring Wells (GW001, GW002, GW003) (August 20, 2020).

**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.3** I-78 Wellsite Area: On-Site Materials



NOTE: On-site materials showing wellhead and sign (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.4** I-78 Wellsite Area: On-Site Materials



NOTE: Condition of Groundwater Monitoring Well I-78 GW001 in Wellsite Area (August 20, 2020).

**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.5** I-78 Wellsite Area: On-Site Materials



**NOTE:** Condition of Groundwater Monitoring Well I-78 GW002 in Wellsite Area (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.6** I-78 Wellsite Area: On-Site Materials



NOTE: Condition of Groundwater Monitoring Well I-78 GW003 in Wellsite Area (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.7** I-78 Wellsite Area



**NOTE:** View of ground and vegetation conditions in the Wellsite Area looking southeast. Wellsite Area was undisturbed and has revegetated with naturally established native trees, shrubs, and forbs. Vegetation cover, was meeting permit requirements (>70% cover, healthy conditions) (August 20, 2020).

**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.8** I-78 Wellsite Area



**NOTE:** View of ground and vegetation conditions in the Wellsite Area looking northeast. Wellsite Area was undisturbed and has revegetated with naturally established native trees, shrubs, and forbs. Vegetation cover was meeting permit requirements (>70% cover, healthy conditions) (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.9** I-78 Wellsite Area

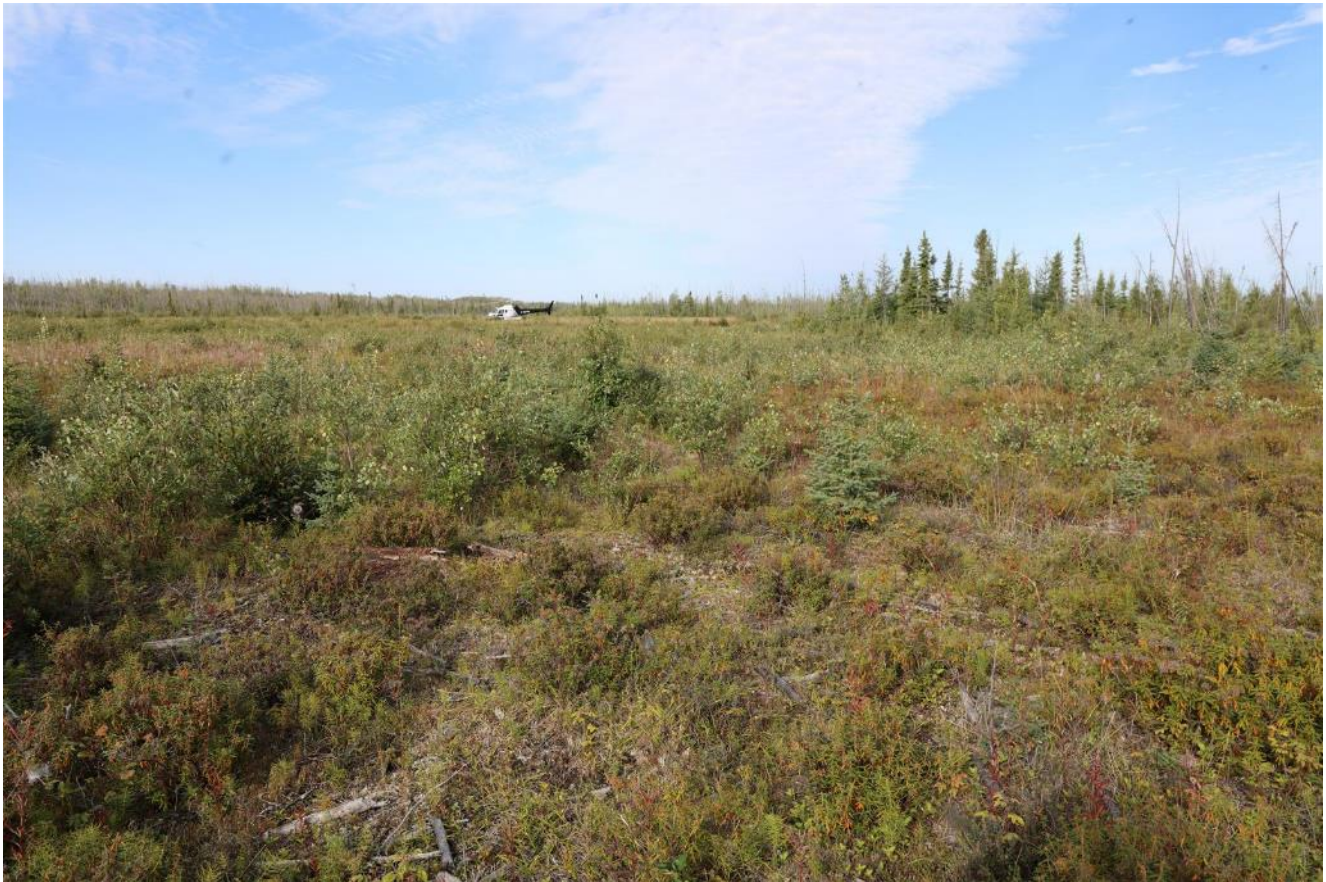


**NOTE:** View of ground and vegetation conditions in the Wellsite Area looking northwest. Wellsite Area was undisturbed and has revegetated with naturally established native trees, shrubs, and forbs. Vegetation cover was meeting permit requirements (>70% cover, healthy conditions) (August 20, 2020).

**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.10** I-78 Wellsite Area



**NOTE:** View of ground and vegetation conditions in the Wellsite Area looking south. Wellsite Area was undisturbed and has revegetated with naturally established native trees, shrubs, and forbs. Vegetation cover was meeting permit requirements (>70% cover, healthy conditions) (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.11** I-78 Wellsite Area: Recovered Wellhead Bare Area



**NOTE:** The ground immediately around the wellhead is the Recovered Bare Area. Vegetation cover was meeting permit requirements (>70% cover, healthy condition) (August 20, 2020). Standing water was observed in the vegetated area immediately adjacent to the Wellhead casing.

**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.12 I-78 Staging Area: Overview**



**NOTE:** Overview of the Staging Area and surrounding area showing overall terrain, water, and vegetation conditions (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.13 I-78 Staging Area: Overview**



**NOTE:** Overview showing the overall ground and vegetation conditions and location of the third-party on-site materials (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.14** I-78 Staging Area: On-Site Materials



**NOTE:** Aerial overview of the Staging Area showing third-party trailer, outbuildings, and debris located in the southwest corner of the Staging Area.



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.15** I-78 Staging Area: On-Site Materials



NOTE: Third-party trailer and outbuilding located in the southwest corner of the Staging Area.



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.16** I-78 Staging Area: On-Site Materials



NOTE: Third-party debris located in the southwest corner of the Staging Area.

**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.17** I-78 Staging Area: On-Site Materials



**NOTE:** Observed fuel oil/kerosene tank with slight leak on trailer located in the southwest corner of the Staging Area.



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.18** I-78 Staging Area



**NOTE:** View of ground and vegetation conditions in the west end of the Staging Area looking west. West end of Staging Area has naturally revegetated with native trees, shrubs and forbs. Vegetation cover in the west end was meeting permit requirements (>70% cover, healthy conditions) (August 20, 2020).



**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.19** I-78 Staging Area



**NOTE:** View of ground and vegetation conditions in the east portion of the Staging Area looking east. East portion has revegetated with seeded agronomic legumes and grasses and naturally established native trees, shrubs, and forbs. Vegetation cover in the east portion was approximately 55% to 70% cover and appeared healthy (August 20, 2020).

**Reference:** 2020 Environmental Site Monitoring Report: East Mackay I-78 Wellsite Area and Staging Area

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**Photo B.20 I-78 Staging Area**



**NOTE:** View of ground and vegetation conditions in the east portion of the Staging Area looking west. East portion has revegetated with seeded agronomic legumes and grasses and naturally established native trees, shrubs, and forbs. Vegetation cover in the east portion was approximately 55% to 70% cover and appeared healthy (August 20, 2020).