

Wetland Assessment and Impact Form

The Alberta Wetland Assessment and Impact Form (WAIF) is used to support low risk activities in wetlands regulated by Alberta Environment and Parks (AEP) and the Alberta Energy Regulator (AER). For eligible activities listed in Tables 1 and 2 below, the form is to be used in place of the Wetland Assessment and Impact Report (WAIR) and must be submitted with a regulatory application(s) or notification and all required plans.

This form must be authenticated by a qualified professional who:

- meets the requirements in the Wetland Practice Standards (Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta), or
- has been recognized by AEP under the Transition Period Directive for Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta

Although this form can be completed as a desktop analysis, the authenticating professional may choose to consider field-based wetland information, where available, to identify, delineate and classify wetlands.

Instructions for submitting a WAIF:

The following documents must be appended to this form and submitted to the regulatory body as one PDF.

- Map of the project boundary, activity footprint, and delineated wetland extent(s) overlaid on current aerial imagery
- Aerial photos and/or imagery used to delineate impacted wetlands
- ABWRET-D results

ABWRET-D: Alberta Wetland Rapid Evaluation Tool - Desktop (ABWRET-D) results must be obtained from AEP and attached to the Wetland Assessment and Impact Form. Wetlands should be delineated in accordance with desktop methods and follow the submission standards in the Alberta Wetland Identification and Delineation Directive.

To obtain ABWRET-D results, submit the completed ABWRET-D Form and delineated wetland shapefile(s) to:

- AEP.Wetlands@gov.ab.ca

Refer to [ABWRET-D Fact Sheet](#) for more information.

1. Project Information

Project name: Husky 20LLO Dig 1 Integrity Dig Program

Type of activity: Pipeline integrity dig program

Applicant name: Husky Oil Operations Limited

Related Approval numbers (if available):

Name of individual(s) who completed the wetland assessment and WAIF form: Brian Slater, RT(Ag), TechAg

Date of assessment:

Year	Month	Day
2021	05	06

Authenticating professional: Katie Bullick, B.Sc. Env., P.Biol.

Authentication date:

Year	Month	Day
2021	05	24

Professional Regulatory Organization of the Authenticating Professional: Alberta Society of Professional Biologists

Company: Summit Liability Solutions Inc. and Pintail Environmental Consulting Inc.

2. Wetland Assessment

	Wetland ID	Dominant wetland class and form (AWCS* code)	Delineated wetland area (ha)	Area of temporary wetland impacts (ha)	Area of wetland loss (ha)	ABWRET-D relative wetland value
<input type="checkbox"/> + <input type="checkbox"/> -	WL01	M-G-II	0.007	0.007	0	D
<input type="checkbox"/> + <input type="checkbox"/> -	WL02	M-G-III / S-S	0.13	0.02	0	D

*AWCS - Alberta Wetland Classification System

3. Wetland Impacts

3.1. Describe the impacts of the proposed activity to wetland vegetation:

The proposed integrity dig location and associated temporary access is located within an existing pipeline right-of-way (RoW). The proposed temporary access traverses through a Temporary Graminoid Marsh wetland (WL01) and a Seasonal Graminoid Marsh/Shrubby Swamp wetland complex (WL02).

Should wetland vegetation be affected, potential effects include alteration in species composition, introduction of non-native weed species, and growth stress on plant species. The disturbance to the identified wetland may result in changes in species composition (e.g., introduction of non-native plant species) and/or may cause stress on plant species present within the wetland (e.g., disruption of hydrological characteristics within the wetland, changes in water quality and quantity, etc.).

Removal of wetland vegetation is anticipated during Project activities. This may temporarily affect ungulates and bird species that use the wetlands for forage and cover.

3.2. Describe the impacts of the proposed activity to wetland soils:

Integrity dig activities have the potential to affect wetland soils through soil compaction, erosion, rutting, and admixing which may occur via excavation and the movement of construction equipment within wetland boundaries. Soil compaction can result in a decrease of surface water infiltrating the soil. As a result, there may be an increase in water ponding and overland flow, which can increase the potential for soil erosion.

There is the potential for increased wind and water erosion of unconsolidated soils stockpiled during integrity dig activities. The Project requires wetland soils to be stripped in the area of the trench for excavation to the existing pipeline infrastructure. The storage of stripped wetland soils has the potential to mix with mineral base soil and may result in admixing. The admixing of wetland soils with mineral soil may result in changes to the wetland soil's permeability, affecting water retention and infiltration capacity.

Furthermore, changes to wetland hydrology may have an effect on wetland soils due to changes in soil processes, nutrient availability and water chemistry. For example, the impediment of water movement within a wetland can potentially result in a reduction in the delivery of nutrients throughout a wetland.

3.3. Describe the impacts of the proposed activity to hydrology and water quality:

Integrity dig activities have the potential to affect wetland hydrological function including altering of hydrologic flow by water diversion or impoundment. Alteration of hydrological characteristics of a wetland may result to changes to wetland function. Should water within a wetland become impounded as a result of pipeline maintenance, the wetland may become more inundated, potentially altering the wetland's permanency. Alterations to a wetland's permanency may result in a change to the

wetland's function. Similarly, the diversion of water entering a wetland can result in decreased water flow within the wetland as well as decreased outflow from the wetland.

The movement of construction equipment over wetland substrate has the potential to result in compaction. As a result of compaction, water may not be able to infiltrate the soil and may flow overland, potentially affecting water quality within the wetland due to erosion and sedimentation processes.

Construction activities near or within a wetland have the potential to increase sediment entering a wetland ecosystem, resulting in increased turbidity of the water column and potentially affecting wetland vegetation and wildlife species.

During construction there is the potential for an accidental spill from onsite equipment (eg. hydraulic, gasoline, or engine oil leaks) which may affect water quality within the wetland. Accidental spills during construction can also infiltrate the soil in or near a wetland which can affect water quality. The size of the spill and substance spilled will determine the extent of the effect and remedial measures required to clean up the spill.

3.4. State the expected start and end date of the proposed activity:

Start Date:	Year	Month	Day
	2021	07	01
End Date:	Year	Month	Day
	2021	09	30

4. Wetland Mitigation

4.1. Describe efforts for wetland avoidance, in accordance with the Wetland Assessment and Impact Report Directive and Wetland Mitigation Directive, and justify the proposed impacts on the wetland(s):

Integrity dig activities involve the inspection of an existing pipeline, and the excavation and repair of any areas that require maintenance. During the inspection process, a specific location along the pipeline were identified as requiring an integrity dig. The area identified coincide with wetland areas making avoidance of the wetland not possible. Minimal disturbance techniques will be implemented to the extent possible during integrity dig activities. In addition, integrity dig activities are proposed to occur during frozen or dry conditions to reduce potential effects to the wetlands. Applicable mitigation measures described below will be implemented to further reduce potential effects to the wetland.

4.2. Describe how impacts to wetland area and function will be minimized using technically feasible mitigation measures and reclamation techniques:

Work associated with the Project is anticipated to be undertaken during frozen or dry conditions. Minimal surface disturbance methods will be used, with the exception of areas of the trench where excavation to expose the pipe is required. Matting may be used in areas to be traversed by equipment, where warranted by on-site conditions, to reduce the potential for impacts to wetland soil and vegetation within the wetlands.

Removal of wetland vegetation and root grubbing in wet areas will be reduced to the extent possible. Where the excavation of wetland soils in the trench is required to expose the pipe, wetland soils will be stored separately from upland soils and subsoil to reduce the potential for admixing. Soil piles will be stored outside of wetland areas and spatially separated. When onsite, if it is determined that soil storage outside the wetland boundaries is not feasible, then a mitigation plan will be developed and implemented to mitigate soil compaction within the wetland boundaries.

Erosion control materials (e.g., silt fencing, core logs, wattles) will be installed between the work area and intact wetland habitat to prevent sedimentation into the wetland, if deemed necessary.

Dewatering of wetlands will be avoided while work is being undertaken; a wetland will not be dewatered unless authorized by the appropriate regulatory approvals (e.g., Water Act). If excavation dewatering is required due to groundwater infiltration then mitigation measures will be implemented to prevent siltation and sedimentation of the wetland. Prior to pumping, the water will be field tested to ensure water will not impact the surrounding environment. Once the water adhere to field test requirements, pumps will be placed within secondary containment, the intakes will be elevated to ensure no uptake of sediment, the outlets will be fitted with a sediment filter bag and will be positioned within an adjacent well vegetated area to ensure sufficient sediment filtration prior to the water re-entering the wetland. No water will be pumped to another adjacent wetland during excavation dewatering.

All equipment brought on-site to complete the integrity dig activities will be clean and free of any fluid leaks. Materials needed for spill response will be readily available in the unlikely event of an accidental spill. Fueling of any equipment required to complete the integrity dig activities shall occur outside of any wetland areas with contingency measures in place (eg. spill trays, spill kits). Fuel storage container should be located within a secondary containment capable of containing at least 110% of the contents.

4.3. State the expected start and end date for meeting wetland reclamation requirements:

Start Date:	Year	Month	Day
	2021	10	01
End Date:	Year	Month	Day
	2022	06	30

4.4. Describe the wetland reclamation proposal in accordance with the Wetland Mitigation Directive (an attachment is acceptable):

Following the completion of the integrity dig activities the trench area will be backfilled. Salvaged wetland soil and mineral base soil will be replaced in correct order (mineral soil beneath wetland soil). Wetland contours will be restored to pre-construction conditions. Natural recovery is the preferred method of wetland reclamation following construction of the Project. Following construction, weed control measures will be implemented where necessary. Following construction completion, project area will be monitored for re-vegetation and weedy vegetation species until successful re-vegetation has occurred and wetland reclamation has been completed.

4.5. Will permanent wetland losses that cannot be avoided or reclaimed result from the activity?

Yes (complete 5. *Wetland Replacement* below)

No

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5. Wetland Replacement

(leave blank if no permanent loss of wetland area will occur)

	Wetland ID	Area of wetland loss (ha)	ABWRET-D relative wetland value	Replacement ratio	Replacement area (ha)	Relative Wetland Value Assessment Unit	Replacement rate (\$/ha)	Replacement cost
<div>+</div> <div>-</div>								
<div>+</div> <div>-</div>								

*If permittee-responsible replacement is proposed, a wetland replacement design proposal must be attached as an appendix to this form

Table 1. Activities regulated by Alberta Environment and Parks that require a Wetland Assessment and Impact Form (WAIF).

Activity	Activity Description	WAIF Eligibility
Outfall structures	<i>Water Act</i> Code of Practice for Outfall Structures on Water Bodies	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Watercourse crossings	<i>Water Act</i> Code of Practice for Watercourse Crossings	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Powerlines	<i>Water Act</i> Code of Practice for Powerline Works Impacting Wetlands	Yes, except for no WAIR or WAIF requirements for activities under Section 9(3) of the Code of Practice
Pipelines and Telecommunication Lines	Pipelines and associated infrastructure regulated by the <i>Water Act</i> Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
	Pipeline related infrastructure outside of the pipeline right of way - includes Cathodic Protection/Anode Bed, Header or Riser Site, Heater, Meter Station Site, Valve Site	Yes
Road widening, improvement and maintenance	Widening, improvements or maintenance of an existing road within a registered road plan right of way or within 15 m from centerline of an existing unregistered or private road. This does not include new road construction.	Yes
Access - Road construction	Road construction - all weather roads up to a maximum of 30 m Right-of-Way width (Class II and Class III - All Weather or Dry) and access roads designed for temporary or seasonal use to be used in frozen or dry conditions up to 15 m wide (Class IV - Frozen/Dry Conditions). See Public Lands Administration Regulation (PLAR) Table A1 for more details	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Road construction - minimal disturbance access or ice roads designed for temporary access up to 10 m wide. Ground disturbance, surface vegetation disturbance, grade development and surface improvements are minimized (Class V - Frozen and Class VI - Frozen). See Public Lands Administration Regulation (PLAR) Table A1 for more details	No WAIR or WAIF requirements
Borrow pits, water reservoirs and dugouts	Borrow pits, reservoirs, and dugouts if the volume of the excavated area is less than 2500 cubic metres	Yes
Other	Exploratory test hole, test pit, geotechnical survey	No WAIR or WAIF requirements where activity utilizes by-hand methods. Otherwise, a WAIF is required
	Aquatic vegetation removal	Yes
	Storage (i.e. stockpile)	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Incidental activities	Refer to parent disposition
	Temporary field authorization	Contact AEP.Wetlands@gov.ab.ca
	Recreational dispositions - trails, boardwalks, non-commercial seasonal piers	Contact AEP.Wetlands@gov.ab.ca
	Work Camp - less than or equal to 1 ha and in use for less than 1 year	No WAIR or WAIF requirements
	Monitoring (Research, Monitoring and Education)	No WAIR or WAIF requirements

Note: An enquiry about an activity that will result in low risk impacts as assessed by the authenticating professional can be sent to:

AEP.Wetlands@gov.ab.ca

Table 2. Activities regulated by the Alberta Energy Regulator that require a Wetland Assessment and Impact Form (WAIF).

Activity	Activity Description	WAIF Eligibility
Outfall structures	<i>Water Act</i> Code of Practice for Outfall Structures on Water Bodies	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Watercourse crossings	<i>Water Act</i> Code of Practice for Watercourse Crossings	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Powerlines	<i>Water Act</i> Code of Practice for Powerline Works Impacting Wetlands	Yes, except for no WAIR or WAIF requirements for activities under Section 9(3) of the Code of Practice
Pipelines	Pipelines and associated infrastructure regulated by the <i>Water Act</i> Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
	Pipeline related infrastructure outside of the pipeline right of way - includes Cathodic Protection/Anode Bed, Header or Riser Site, Heater, Meter Station Site, Valve Site	Yes
Road widening, improvement and maintenance	Widening, improvements or maintenance of an existing road within a registered road plan right of way or within 15 m from centerline of an existing unregistered or private road. This does not include new road construction.	Yes
Access - road construction	All weather roads up to a maximum of 30 m Right-of-Way width (Class II and Class III - All Weather or Dry) and access roads designed for temporary or seasonal use to be used in frozen or dry conditions up to 15 m wide (Class IV - Frozen/Dry Conditions). See Public Lands Administration Regulation (PLAR) Table A2 for more details	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Minimal disturbance assess or ice roads designed for temporary access up to 10 m wide. Ground disturbance, surface vegetation disturbance, grade development and surface improvements are minimized (Class V - Frozen and Class VI - Frozen). See Public Lands Administration Regulation (PLAR) Table A2 for more details	No WAIR or WAIF requirements
Access-Temporary	Industrial as defined in Public Lands Administration Regulation (PLAR) Table 2	No WAIR or WAIF requirements
Borrow pits, water reservoirs and dugouts	Borrow pits, reservoirs, and dugouts if the volume of the excavated area is less than 2500 cubic metres	Yes
Coal Exploration Program	Coal Exploration	No WAIR or WAIF requirements at initial application. WAIF must be submitted at the time of conversion of the infrastructure for long term use by applying for a formal disposition (no wetland reporting requirements for Miscellaneous Lease (MLL) - environmental monitoring site)
Oil Sands Exploration	OSE	No WAIR or WAIF requirements at initial application. WAIF must be submitted at the time of conversion of the infrastructure for long term use by applying for a formal disposition (no wetland reporting requirements for Miscellaneous Lease (MLL) - environmental monitoring site)
Storage	Industrial, Stockpile	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
Incidental Activity	Additional Area - Linear, Non-Linear and Wellbore, Bank Stabilization, Multi Pipe Installation, Push outs	Refer to parent disposition
	Flare Stack, Log Deck, Temporary Workspace	No WAIR or WAIF requirements

Well site (in situ, surface oil and gas)	Disposal, Injection, OS - Cold Production, PNG Production Multi Well (MW), PNG Production Single Well (SW), Storage Well	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Water Monitoring and Water Production Wells, Experimental Wells, Observation Wells	Yes
	OS - Enhanced Recovery (well pads, access for pipelines and power)	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
Work Camp - industrial	Work camp less than or equal to 1 ha and in use for less than 1 year	No WAIR or WAIF requirements
Other	Geotechnical Investigations (drilling, boreholes)	No WAIR or WAIF requirements where activity utilizes by-hand methods. Otherwise, a WAIF is required
	Geophysical	No WAIR or WAIF requirements
	Monitoring (Research, Monitoring and Education)	No WAIR or WAIF requirements

Note: An enquiry about an activity that will result in low risk impacts as assessed by the authenticating professional can be sent to:

Wetland.Reports@aer.ca

Project Name: Husky 20LLO Dig 1 (24333-001) Historical Imagery Review																	
Wetland ID	Qtr	Sec	Twp	Rge	M	Photo Date (MM/DD/YYYY)	Image Source	Photo ID (RollAS#, Photo #)	Delineated?	Season*	AWCS Wetland Class	Precipitation Year**	Precipitation Month Analysis**	Precipitation Day Analysis	Open Water Visible or Consistent Wetland Vegetation Signature***	Assessment of Permanence**	Photo Notes
WL01	SE	12	50	1	4	07/07/1966	AEP	AS 0919, Line 5307, Ph 151	Yes	Sum	M-G-II	W	11.49 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.
						09/22/1978	AEP	AS 2953, Line 10, Ph 103	Yes	F	M-G-II	W-N	79.45 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.
						05/25/1987	AEP	AS 3585, Line 43, Ph 134	Yes	S	M-G-II	N	17.59 mm within the previous 30 days	0.50 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland. A subdivision has been constructed to the east of the wetland.
						08/31/1995	AEP	AS 4676, Line 11, Ph 255	Yes	Sum	M-G-II	D	79.80 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.
						05/30/2000	AEP	AS 5105, Ph 52	Yes	S	M-G-II	W-N	41.60 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.
						07/25/2009	AEP	AS 5464B, Ph 248	Yes	Sum		D	81.80 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.

Wetland ID	Qtr	Sec	Twp	Rge	M	Photo Date (MM/DD/YYYY)	Image Source	Photo ID (RollAS#, Photo #)	Delineated?	Season*	AWCS Wetland Class	Precipitation Year**	Precipitation Month Analysis**	Precipitation Day Analysis	Open Water Visible or Consistent Wetland Vegetation Signature***	Assessment of Permanence**	Photo Notes
WL02	SE	12	50	1	4	07/07/1966	AEP	AS 0919, Line 5307, Ph 151	Yes	Sum	M-G-II	W	11.49 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland, though the area appears moist. Cultivation has affected the wetland. A railway is located west of the wetland.
						09/22/1978	AEP	AS 2953, Line 10, Ph 103	Yes	F	M-G-II	W-N	79.45 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland, though the area appears moist. Cultivation has affected the wetland.
						05/25/1987	AEP	AS 3585, Line 43, Ph 134	Yes	S	M-G-II / S-S	N	17.59 mm within the previous 30 days	0.50 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.
						08/31/1995	AEP	AS 4676, Line 11, Ph 255	Yes	Sum	M-G-II / S-S	D	79.80 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.
						05/30/2000	AEP	AS 5105, Ph 52	Yes	S	M-G-II / S-S	W-N	41.60 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.
						07/25/2009	AEP	AS 5464B, Ph 248	Yes	Sum		D	81.80 mm within the previous 30 days	0.00 mm	DV	N	No surface water is visible within the wetland. Cultivation has affected the wetland.

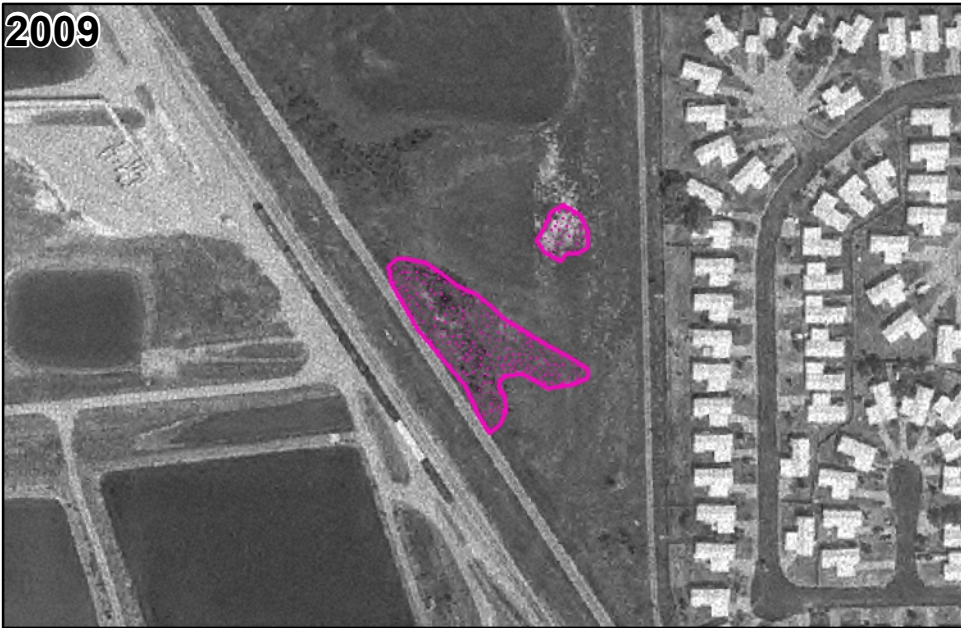
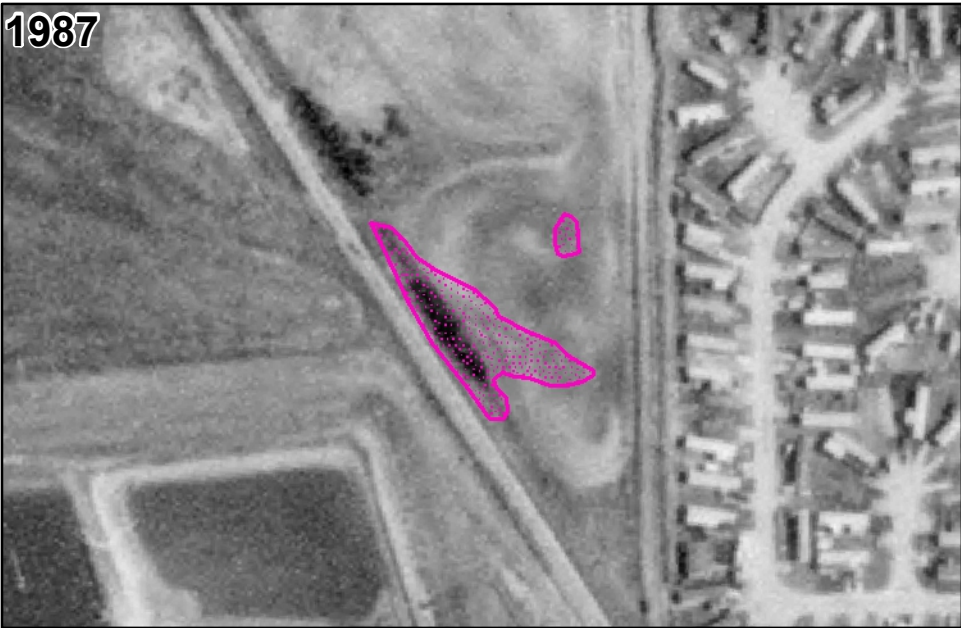
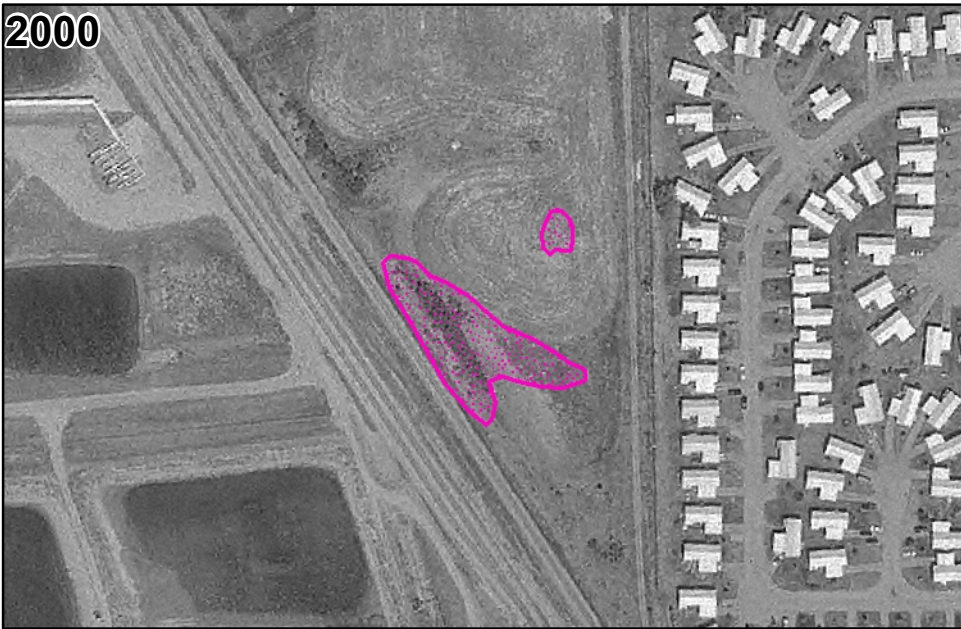
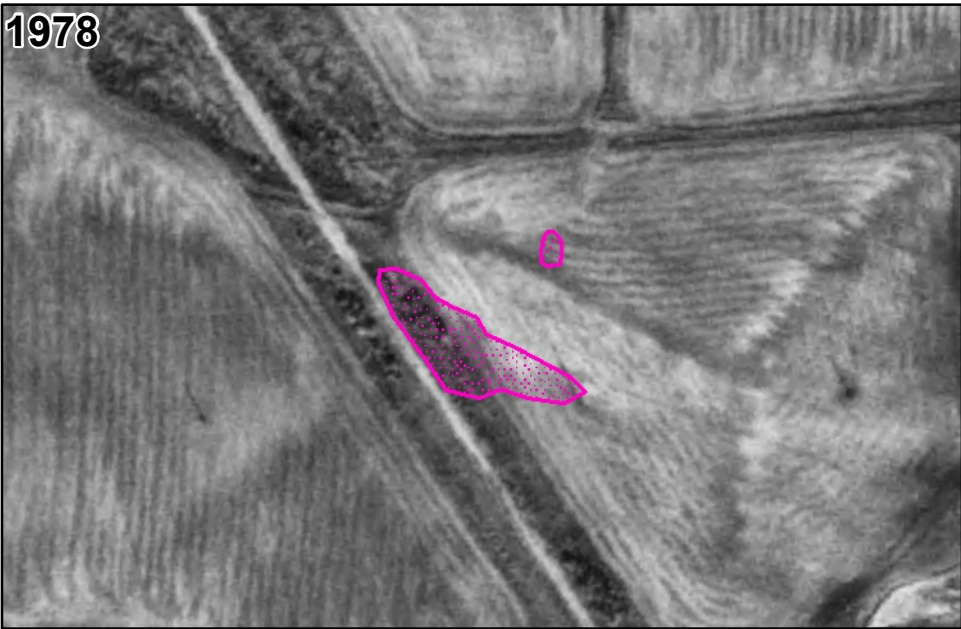
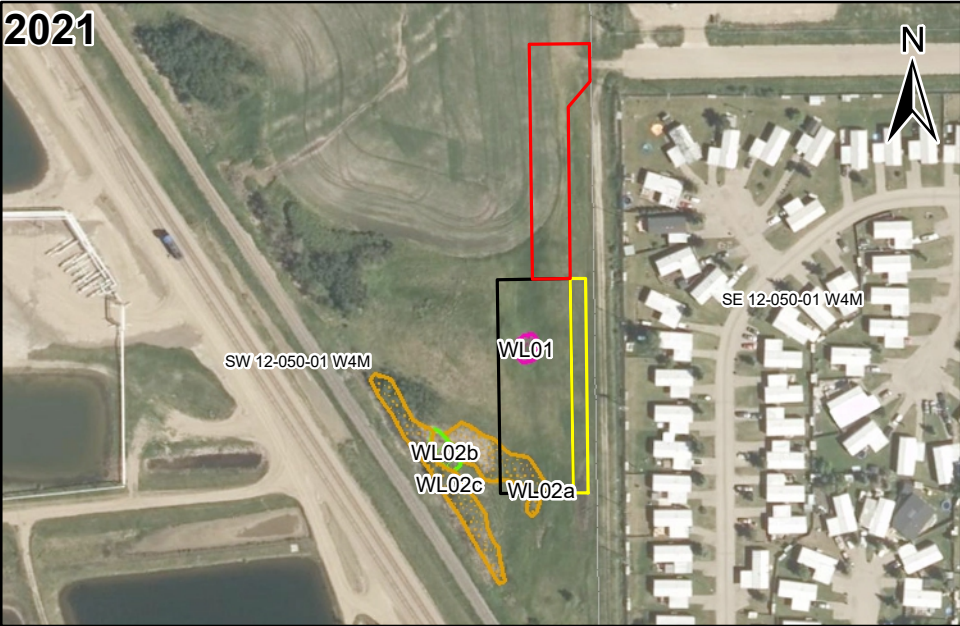
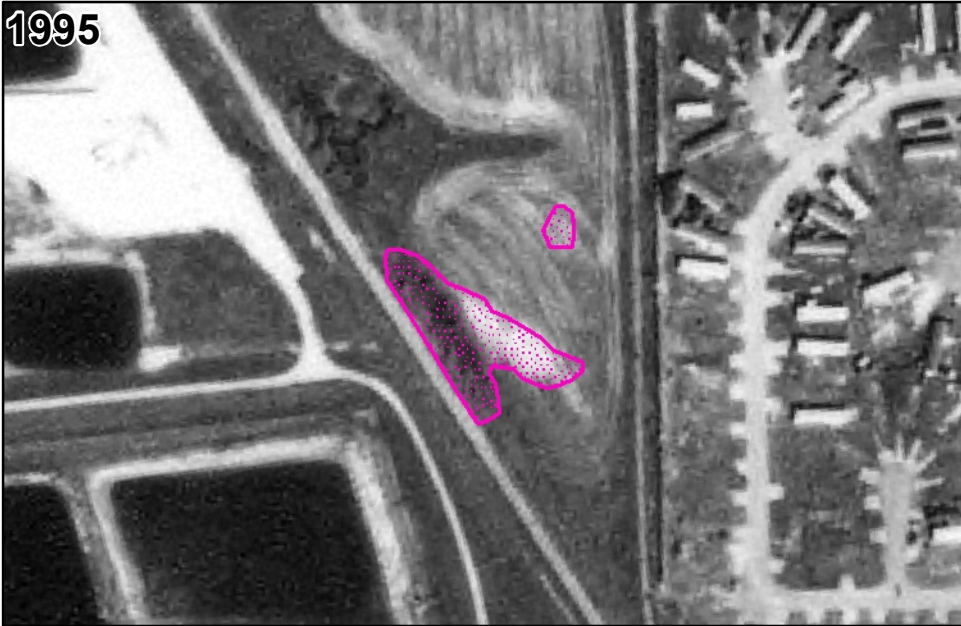
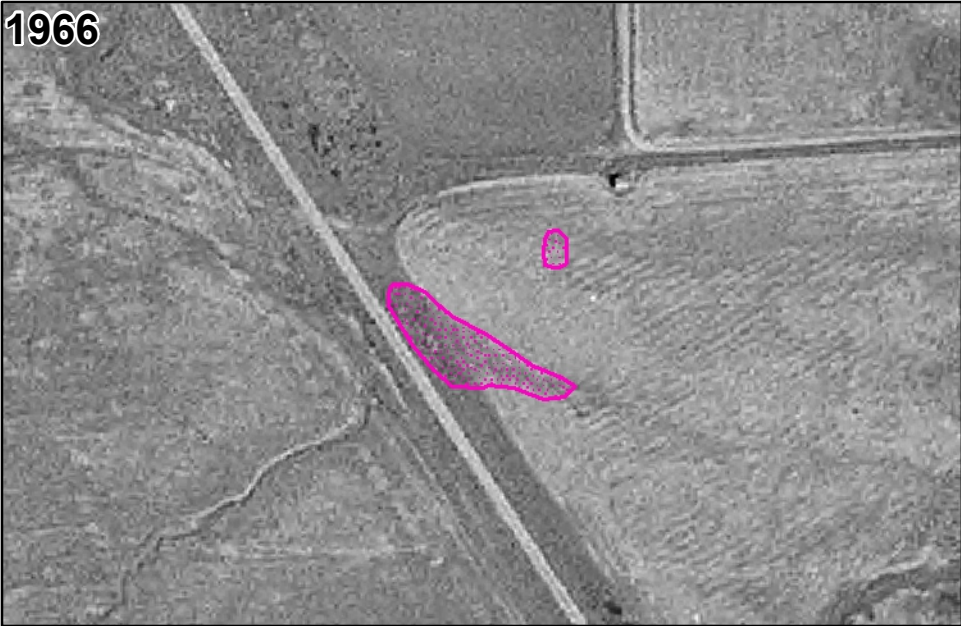
*S=Spring (April to June); Sum=Mid-Late Summer (June to Sept); F=Fall (Sept-Nov); Seasonality based on aerial image dates

**D=Dryer; N=Normal; W=Wetter; N/A=Not Available

***W=Water present/inundated; D=Dry, vegetated (consistent with wetland class); DVI=Dry, vegetated (indistinguishable from surrounding uplands)

****Y=Yes (Reasonable Permanent, a Sec 3 *Public Lands Act* body of water); N=No (Not Permanent, a wetland regulated under *Water Act*)

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LEGEND

PROJECT FOOTPRINT

- DIG SITE
- TEMPORARY ACCESS
- TEMPORARY WORKSPACE

WETLAND TYPE

- SEASONAL GRAMINOID MARSH
- SHRUBBY SWAMP
- TEMPORARY GRAMINOID MARSH

REFERENCE

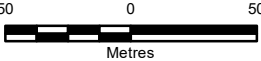
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**HUSKY 20LLO DIG 1 (24333-001)
HISTORICAL AND CURRENT
WETLAND BOUNDARIES**



PROJECT NUMBER: EPM0000357
PROJECTION: NAD 1983 UTM Zone 12N
SCALE: 1:3,000
DATE: 5/18/2021
DRAWN: CW
CHECK: BS



**FIGURE
1**