



Alberta Wilderness Association
"Defending Wild Alberta through Awareness and Action"

January 26, 2024

Marguerite Lake Compressed Air Energy Storage Project
Impact Assessment Agency of Canada
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By Email: Marguerite@iaac-aeic.gc.ca

RE: Marguerite Lake Compressed Air Energy Storage Project

The Alberta Wilderness Association (AWA) appreciates the opportunity to provide comments for on the Marguerite Lake Compressed Air Energy Storage Project proposed near Whitecourt, Alberta. Founded in 1965, AWA strives to help Albertans understand the intrinsic values that wildlife and wilderness provide, and encourages communities to participate in conservation initiatives that will ensure a legacy for future generations. With over 7,000 members and supporters in Alberta and across Canada, AWA is dedicated to conserving and protecting Alberta's wilderness.

The Marguerite Lake Compressed Air Energy Storage Project is proposing to construct a power plant, using stored compressed air to operate turbines during times of low power supply or high energy demand. The project will use a 125 MW compressor train and two 160 MW expander trains, powered by hydrogen and natural gas, to store and release the gas. A salt cavern 1,100 m below the surface will be mined for storage space, and a 14 km long pipeline will be installed to provide natural gas.

AWA supports a responsible transition to renewable energy, including the construction of energy storage systems important in maintaining a reliable electrical grid. Compressed air energy storage may be a long-lasting solution to energy storage, although the technology is still being developed. On reviewing the *Initial Project Summary*, we have concerns for the use of natural gas and hydrogen fuels, the impact to wetlands and pasture soils, and the long-term impact to Indigenous cultures.

Compressed air energy storage (CAES) provides an option for long-term storage. Unlike battery storage, compressed air systems are known to last for long lengths of time, and require no hazardous materials. However, the use of natural gas during the expansion phase will contribute to Canada's emissions. We appreciate that consideration has been given to use of Adiabatic-CAES, which would not require additional fuel, although accept that it would provide only short-term energy storage with current technologies. We acknowledge also that the project aims to use 100 percent hydrogen fuel by 2035, although we question the use of natural gas initially, particularly as this use of natural gas will require the building of a pipeline that is to be "abandoned in place."

In addition, the hydrogen must be sourced in a way that does not rely on fossil fuels, which would negate the reduction in carbon emissions produced by using hydrogen as a fuel. Hydrogen can be produced by electrolysis of water, considered green hydrogen, or by natural gas and fossil fuel reforming, considered grey hydrogen. Because grey hydrogen is derived from fossil fuels, creation of hydrogen releases carbon, and there are suggestions that reforming to carbon releases more emissions than direct use of fossil

fuels¹. To date, the vast majority of hydrogen produced is grey. The increased use of hydrogen fuels would not help to reduce emissions and achieve a net-zero grid by 2035 where grey hydrogen is used.

We approve of the choice to site the project mainly on previously disturbed areas and tame pasture, and to minimize new access, as access to the project is expected to be through an existing highway. The siting of the project makes use of existing infrastructure, limiting new disturbance. We appreciate the acknowledgement that construction of the project will impact wildlife habitat and movement, and could affect listed species-at-risk. These impacts must be minimized by monitoring seasonal wildlife use of the area and developing a clear, detailed mitigation plan. While tame pasture generally contains less biodiversity than native grasslands or old growth forests, some species will use pasture fields for foraging or as stopover sites during migration. Mitigation plans should not only consider direct impacts of construction and operation of the CAES, but should also account for indirect impacts to the surrounding lands and watersheds, as well as cumulative effects with other development.

As well, the project area occurs on four wetlands, which “will be permanently affected by construction of the Project.” While we understand the Project has approval to alter these wetlands, and has paid the wetland replacement fees, there should be efforts towards actually replacing these wetlands. According to the *Alberta Wetland Policy*², where avoidance and minimization of wetland loss or degradation has failed, wetlands should be replaced as a last resort. Wetland replacement should be equal to the area, value and function of the wetland that was lost. Restorative replacement is the preferred method, where restoration, enhancement or construction of another wetland occurs. There is no indication in the summary that any wetland replacement is planned for the loss of the four wetlands in the project area.

The summary mentions “Reclamation and revegetation will depend on the desired end land use.” However, reclamation to a functional ecosystem has proven difficult once soil is disturbed. While the plan to salvage topsoil and subsoil separately is admirable, disturbance of soil layers is likely to cause significant erosion and loss, as well as alteration of soil structure and microbial system³. Reclamation can take many years to re-establish soil to a functional state, and requires detailed planning, as well as knowledge of the soil conditions and landscape prior to disturbance. A comprehensive analysis of soils should be undertaken prior to construction, and significant planning undertaken to return the soils to as similar a state as possible, for the chance of reclaiming land to pasture after the CAES system is decommissioned.

The potential impact on Indigenous Treaty rights and ways of life needs to be fully addressed. We are pleased to hear that engagement with Indigenous communities will be continuous throughout the project, and that jobs will attempt to benefit both the local and Indigenous populations. We emphasize that a lack of evidence for traditional use should not preclude Indigenous use of lands, and that short-term benefits from employment during construction may not compensate for a degradation of nearby lands or impact to wildlife, with detrimental effect on Indigenous ways of life.

¹ Bossel and Eliassen. 2024. Department of Energy. Energy and the Hydrogen Economy. Available at: https://afdc.energy.gov/files/pdfs/hyd_economy_bossel_eliasson.pdf

² Government of Alberta. 2013. Alberta Wetland Policy. Available at: <https://open.alberta.ca/dataset/5250f98b-2e1e-43e7-947f-62c14747e3b3/resource/43677a60-3503-4509-acfd-6918e8b8ec0a/download/6249018-2013-alberta-wetland-policy-2013-09.pdf>

³ West, J.R. and Whitman, T., 2022. Disturbance by soil mixing decreases microbial richness and supports homogenizing community assembly processes. *FEMS Microbiology Ecology*, 98(9), p.fiac089.

While AWA encourages a responsible transition to renewable energy, we believe that the transition must proceed in a way that respects and protects wildlife and minimizes harm to natural landscapes. The Marguerite Compressed Air Energy Storage is sited in a place that minimizes new disturbance, although more assurance is needed to support the claim for hydrogen as a clean fuel, and additional measures could be taken to mitigate wetland loss and wildlife impacts, as well as to address long-term impacts of the project on land degradation.

Thank you for considering our comments. We look forward to hearing your responsible decision.

Sincerely,

ALBERTA WILDERNESS ASSOCIATION

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Conservation Specialist