Dean Clarke Contracting Ltd. Swift Current Quarry (EA Reg # 2193) - Water Management Plan (4.675 ha Quarry Area) Swift Current, Newfoundland – Quarry File # 711:12951

September 27, 2021
(Quarry Permit Application Submitted)

July 18, 2024
(Water Resource Management Plan Submission Date)

Attached Documentation: Figure 1, Figure 2, Figure 3 & Google Earth Images

Introduction

Dean Clarke Contracting Ltd. is a construction business located in Terrenceville, Newfoundland. The Swift Current quarry, also known as the Piper's Hole quarry, is located ~5 km northwest of the community of Swift Current. The 4.675-ha quarry permit area contains a resource of sand and gravel that will supply the company with the materials required to produce winter road sand utilized in road maintenance and blending sand used in asphalt production and primarily trucked to the NE Avalon Region.

The submission of this Water Management plan is required for issuance of the 4.675-ha quarry permit (File 711:12951) and is conditional to its release from Environmental Assessment (Reg #2193). Conditions of release from EA included reducing the permit boundary from 7.0-ha in size to establish a buffer to wetland areas located southeast of the permit area. The Water Management Plan for the Piper's Hole Quarry addresses primarily site water generated from surface runoff across the permit area and describes measures used to protect adjacent watercourses, waterbodies and wetlands.

The Piper's Hole Quarry is in an area of existing and historic sand and gravel quarry development. The proposed development operations will be comparable and consist of excavating the sand and gravel material using heavy equipment, crushing and screening the material as required, and stockpiling products on site for transport to various construction projects. The quarry will not use water for secondary processing, such as aggregate washing, or require a Water Use License.

Site Location and Access

The quarry permit area is located ~23 km west of the Trans-Canada Highway and 5 km northwest of Swift Current in Eastern Newfoundland, within the National Topographic System (NTS) Index Map 1M/16 (**Figure 1**). The quarry area is located on crown land near 16 approved quarry sites dating back to the 1990's. The quarry area is ~1.2 km south from the Burin Peninsula Highway (Route 210) and accessed along existing gravel quarry roads (**Figure 2**). The permit

area is adjacent to Carmon Cramm's quarry permit (711:10363) and this quarry will be utilized for site access as written approval from the quarry owner has been received.

The Piper's Hole Estuary is located 50 m northeast of the permit boundary at its closest point and separated by a forested buffer zone **(Figure 3**). A wetland area is located ~50 m south of the permit boundary at its closest point and separated by a forested buffer area. The quarry area is flat lying and with a peak in elevation of 5 m above sea level (asl). The flat topography of the quarry area will allow for site drainage to be controlled through installed collection drainage ditches. The vegetated areas surrounding the permit area provide additional buffers to sensitive areas. Also, the surficial geology underlying the area consists of glaciofluvial unconsolidated sand and gravel expected to provide good subsurface drainage, due to its permeable nature, for the proposed development. This is seen elsewhere in the larger developed quarry areas where excavation does not extend to the water table. The development at this site will not extend to the water table nor will there be any long-term standing water.

Existing Site Plan

The permit area is naturally vegetated and mostly undeveloped except for a ~0.728 ha area where previous site clearing has occurred adjacent to Carmon Cramm's quarry permit (File #711:10363). The quarry area will be utilized for the available sand and gravel resources. Bulk volumetric calculations of the 4.675 ha area crudely estimate ~160,000 m^3 of potential resource material. An annual production rate of ~7,000 m^3 of material is anticipated to meet current demand. A 5 m wide permit buffer zone will be established for windrowing and preserving the overburden for future reclamation (**Figure 3**). These berms will also help to contain site water runoff inside the quarry and facilitate implementing the Water Management Plan.

Site Drainage

Overland water drainage will initially follow the natural topographic profile of the project area prior to development and this topography dips gently to the northeast. Initial quarry production will begin in the northeast and progress to the southwest of the permit area. The primary drainage channels for site water during development will trend towards the north (**Figure 3**). In the occasion of a 1 in 100 year 24-hour climate change rainfall event, check dams can be implemented, along shallow site drainage ditches, in this area to temporarily hold water allowing suspended particles to settle out or be filtered prior to discharge along the northwest permit boundary. Also, larger settling depressions could be excavated to retain site water temporarily.

As the development expands southwest individual ~ 0.5 m - 1 m deep drainage channels may be required to collect surface runoff and direct drainage to the discharge areas along the northwest boundary. These drainage channel locations will change to suit the development footprint and the operations. A depiction of the drainage channels for the development area is shown on **Figure 3**. During peak development the available quarry floor will be utilized to maintain adequate site drainage. Rather than pooling site water the run-off from the quarry will be directed to the discharge location where fine-grained particles can be filtered by check dams,

hay bales and/or silt fencing prior to exiting the permit boundary. As previously stated, it is important to point out that the sand and gravel is permeable and site water is anticipated to naturally filter in the subsurface.

Adjacent Water Courses

The nearest watercourse to the quarry permit area is the Piper's Hole Estuary located ~50 m northeast of the northern permit boundary (**Figure 3**). The estuary is in Placentia Bay. A wetland area is located ~60m south and west of the permit area surrounding a cluster of small, isolated waterbodies located in the wetland **(Figure 2)**. The wetland areas are not identified on 1:50,000 NTS scale maps or the Provincial Land Use Atlas. The Department of Fisheries, Forestry and Agriculture required the reduction of the previous permit boundary to ensure a vegetated buffer remains around wetland areas (**Figure 3**).

Quarrying Method and Production Related to Water Management

The proposed quarry operations are for the excavation of sand and gravel from within the 4.675 ha quarry permit area. Production will begin in the northeast permit area and advance southwest along a development face not exceeding 5 m in height (**Figure 3**). Proposed drainage channels ranging upwards of 300 m in length and ~ 0.5 m - 1 m deep will direct runoff northward to the discharge point along the northwest permit boundary where it will be filtered by check dams, hay bales and/or silt fencing as required (**Figure 3**).

The annual production volume is anticipated to be 7,000 m^3 and is considered minimal from a commercial operation perspective. At this production rate it would take well over 20 years to exhaust the estimated available resource. Processing the excavated material to achieve product specifications will involve crushing, screening, and stockpiling using mobile equipment. No washing of materials or other secondary product processing will take place on site. The stockpiled aggregate will then be loaded onto trucks and transported to construction sites, Provincial Government Transportation and Infrastructure Depots or asphalt production facilities in the greater St. John's region.

The initial construction of the proposed quarry project will consist of harvesting the trees, then stripping the site of overburden including organic material and mineral soil that conceal the sand and gravel resource. Grubbing will be stockpiled in designated areas or windrowed to create visibility berms along the boundary in the 5 m buffer zone (**Figure 3**). Topsoil will be stockpiled separately and used as a reclamation material to cover the site upon closure of the quarry along with the grubbing.

Quarry excavation depths will not exceed 5 m and is not anticipated to reach the groundwater table. Adjacent active quarry areas excavating sand and gravel share the same site conditions as Dean Clarke Contracting's 4.675 Ha Piper's Hole Quarry and show no evidence of ponding or standing water where above the water table.

Site Water Management

The Water Resources Management Plan for the proposed quarry will utilise shallow drainage channels or ditching in the production area to collect overland runoff from the site and direct it toward discharge areas along northwest permit boundary (**Figure 3**). The discharge point will be monitored to ensure adequate filtration of site water using rock check dams, silt screens and/or hay bales prior to exiting the boundary. Should a 1 in 100-year climate change 24-hour rainfall event occur additional containment inside the permit area may be required to adequately remove suspended fine-grained particles from site drainage. Dean Clarke Contracting Ltd. commits to this Water Management Plan and ensuring that site runoff conforms to the Environmental Control Water and Sewage Regulations, 2003 and siltation does not enter Piper's Hole Estuary or any wetland and waterbodies in the surrounding area. A 50 m buffer to all waterbodies and watercourses and 30m buffer to wetlands will be maintained as required by the Quarry Materials Division.

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Google Earth Images

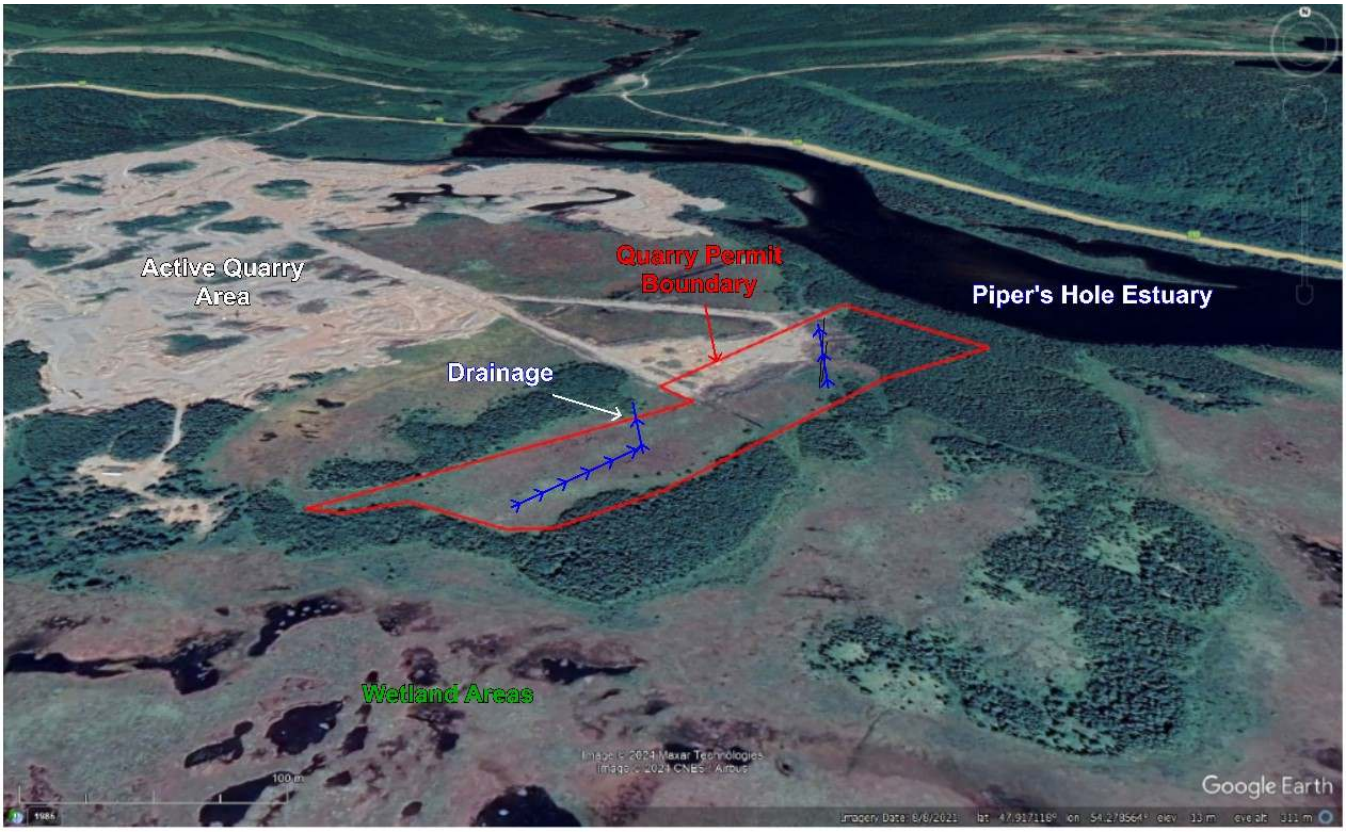

Plate 1: View of the quarry permit area looking north.

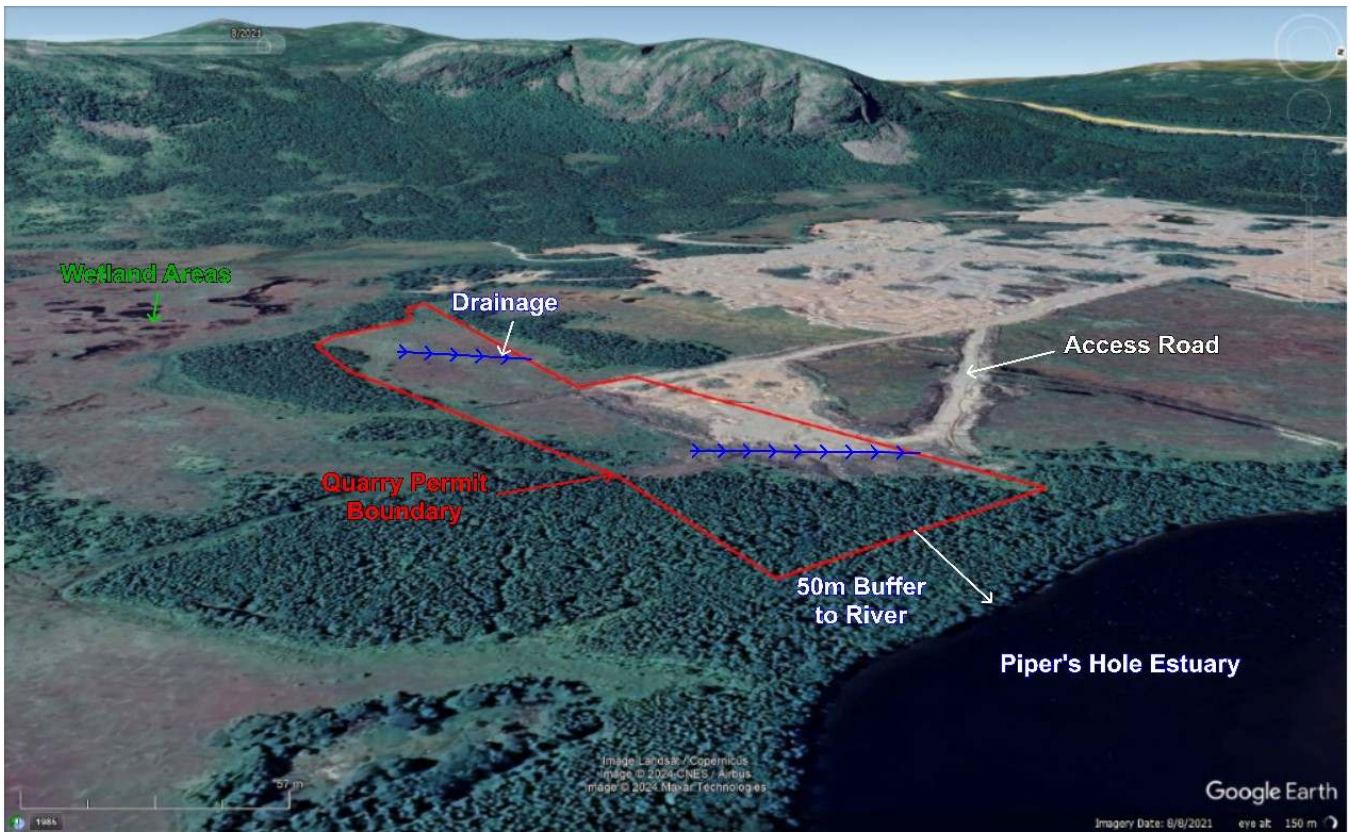

Plate 2: View of the quarry permit area looking west.

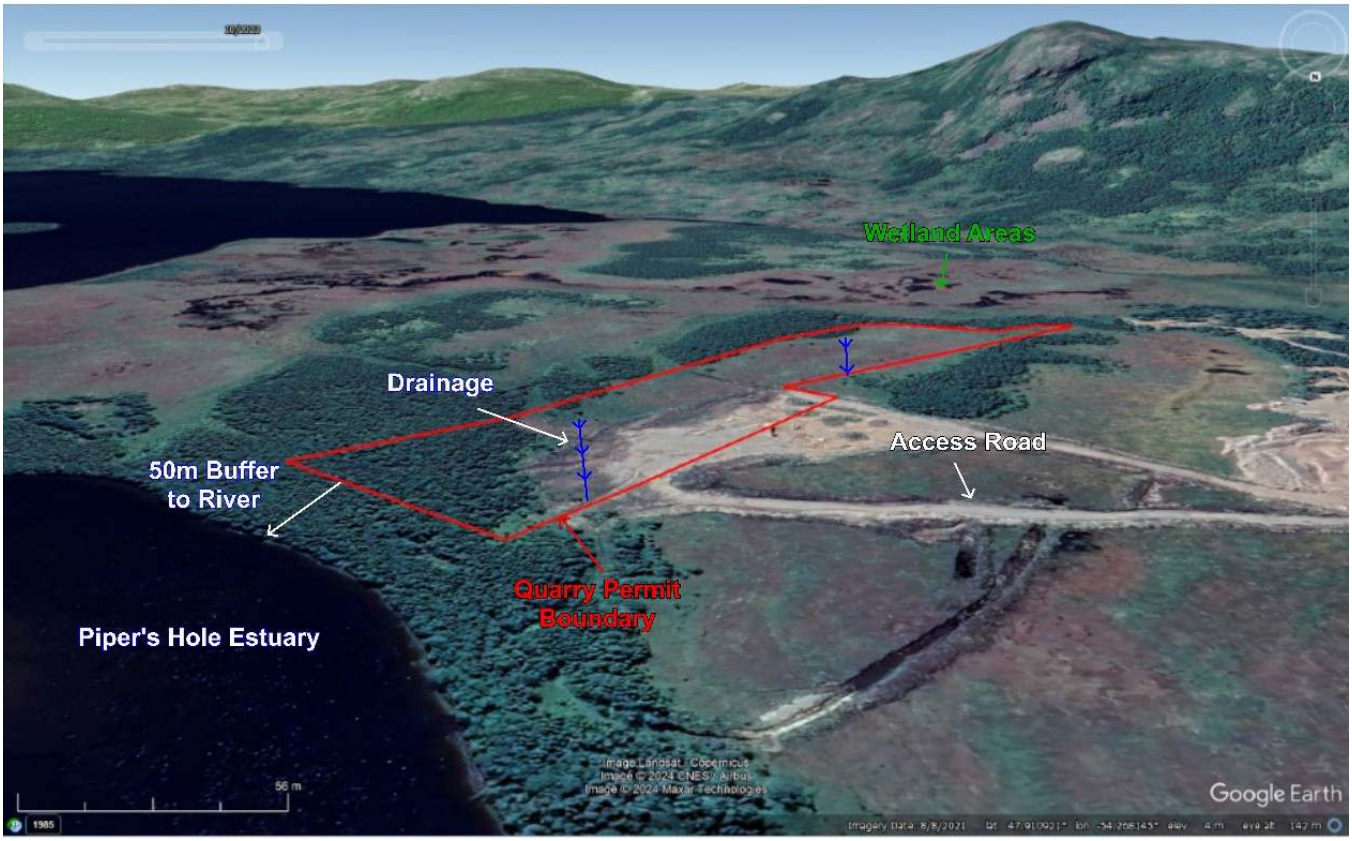

Plate 3: View of the quarry permit area looking south.

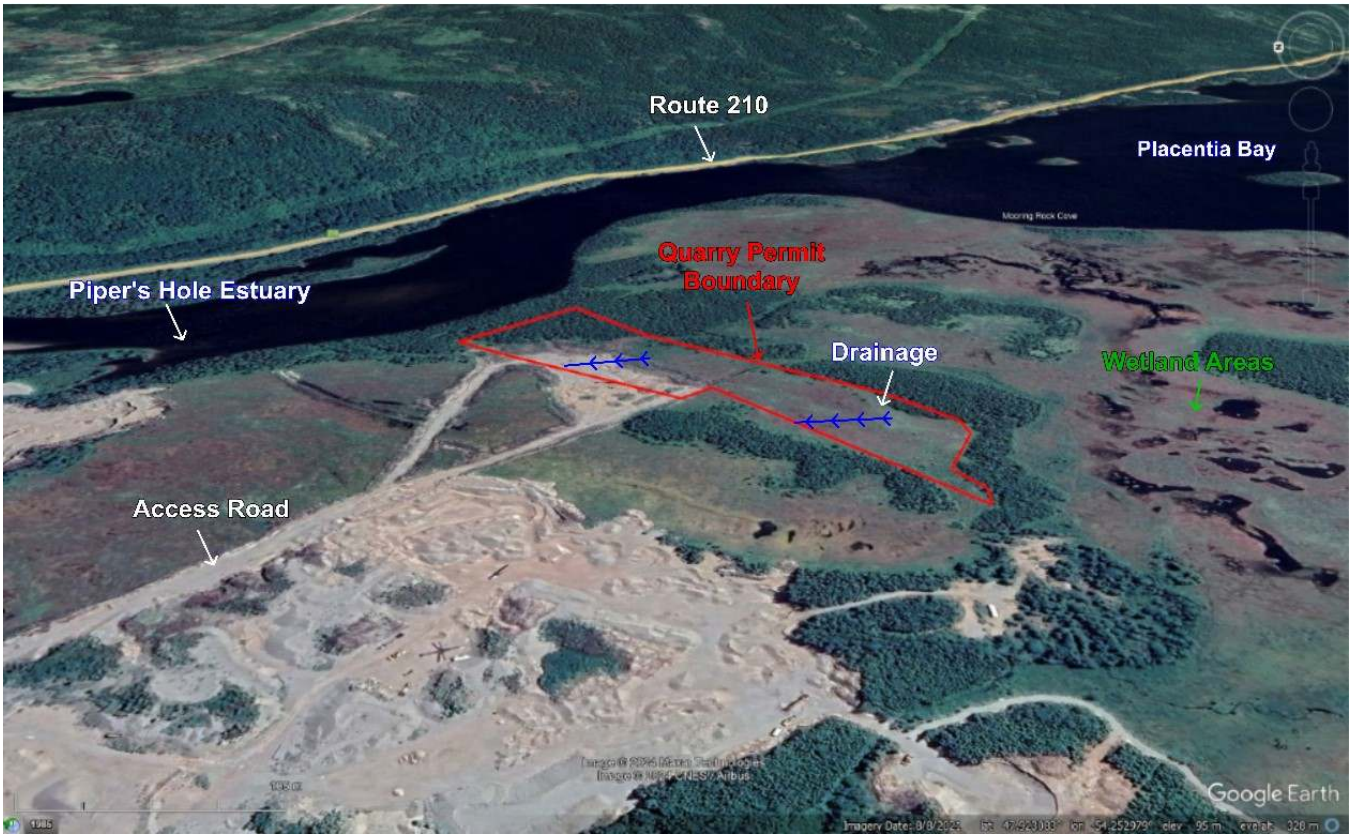

Plate 4: View of the quarry permit area looking east.