

Memo

To: Mike Cormier, P.Eng. – Director, Authorizations Branch, New Brunswick Department of Environment and Local Government

From: Daniel Guest, Hammond River Holdings Ltd.

Cc: Justin Chase – Environmental Impact Assessment Branch, New Brunswick Department of Environment and Local Government

Date: August 31, 2022

Subject: Monthly Monitoring Report – Upham East Gypsum Quarry – July 2022

Our File: File # 21-3049

Introduction

This monthly report details activities associated with the operation of the Upham East Gypsum Quarry for the month of July 2022, in accordance with conditions of the Approval to Operate I-10936. Activities included surface water monitoring, groundwater monitoring, air monitoring, and blasting. Details of environmental malfunctions and public complaints are also provided. For previous monthly activities, refer to the monthly reports provided from December 2019 through June 2022.

Weekly compliance surface water monitoring in July was conducted as per the following:

- Week 1: July 4, 2022
- Week 2: July 13, 2022
- Week 3: July 20, 2022
- Week 4: July 30, 2022

The July 20 sampling event was conducted in conjunction with a heavy rain event, defined as more than 25 mm of rain over a 24-hour period. One additional sampling event was conducted on July 7, 2022 due to a heavy rain event.

Surface Water Sampling

Field Methods

Field parameters were measured using a calibrated turbidity meter and probe. Field parameters are temperature, conductivity, and turbidity. These parameters were measured at three sampling locations as per the Environmental Management Plan (EMP) for Operation (Dillon 2020). All samples were submitted for lab analysis of total suspended solids (TSS).

Surface water samples were collected from three locations (**Figure 1**). They are as follows:

- PDP-1 was collected at the discharge point from the site, which is located before the confluence with the unnamed tributary to the Hammond River. This is the point of compliance;
- SW3 was the background sample. It was collected within the unnamed tributary approximately 100 m upstream from the PDP-1;
- SW5 was collected within the unnamed tributary approximately 100m downstream from PDP-1

Quarterly samples were collected, as per the EMP (Dillon 2020), on July 4, 2022. Quarterly sampling included recording additional field parameters (pH and dissolved oxygen) and analysis of additional laboratory parameters (alkalinity, calcium, chloride, hardness, magnesium, potassium, sodium, sulphate, total phosphorus and total dissolved solids). In addition to the sites described above, samples were collected from two locations in the Hammond River (H1 and H2).

Surface water samples were collected using laboratory supplied bottles. The bottles were rinsed three times in the watercourse and then submerged below the water surface. The samples were submitted to the Research Productivity Council (RPC) in Fredericton, NB. RPC is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for each of the laboratory analytical methods utilized and have in-house QA/QC programs to govern sample analysis and analytical data quality assurance.

Compliance Monitoring Results

Results of the surface water compliance monitoring are provided in **Table 1**. Analytical certificates are attached. The monthly average of grab samples for TSS was calculated for each site, presented in **Table 2**. The monthly averages for TSS were all below the site-specific guideline for each site laid out in the Approval to Operate, displayed in **Figure 2**.

A QA/QC program was implemented to evaluate whether the data collected was of suitable quality to characterize the surface water conditions observed. This program required the collection of field duplicates and the calculation of the relative percent difference (RPD). The calculation method and acceptance level of 40% are discussed in CCME (2016). One duplicate sample was collected during the July water sampling program. The RPD results could not be calculated due to both the results being below the laboratory detection limit. Therefore, the data satisfies the quality objectives for the monitoring program.

Groundwater Monitoring

Groundwater samples were collected from the perimeter monitoring wells on July 4, 2022 (**Figure 3**). Results of the previous groundwater sampling programs can be found in the *Groundwater Report – Upham East Gypsum Quarry*, submitted on June 29, 2021, and the July and October 2021 monitoring reports.

Field Methods

The depth to groundwater from surface was measured using an electronic interface probe. Representative water samples were being collected from the aquifer via macro purge methodology using dedicated waterra tubing and foot valve from a dedicated reference point at the top of casing (TOC). All samples were submitted to RPC for general chemistry and metals analysis.

Monitoring Results

The results of the groundwater monitoring program are provided in **Table 3**. Analytical certificates are attached. The results were compared to the Health Canada Drinking Water Quality Summary Table (2020), which include a maximum allowable concentration (MAC) guideline that is health based, and an aesthetic objective (AO) that is based on taste, odour, staining of plumbing fixtures, etc., and is not health based.

Manganese, boron, fluoride and strontium were above the MAC in MW20-02D; manganese was above the MAC for MW20-02S. Arsenic was above the MAC for MW20-04D. Manganese, pH, sulphate, iron and total dissolved solids were above the AO in at least one monitoring well.

A QA/QC program was implemented to evaluate whether the data collected was of suitable quality to characterize the groundwater conditions observed. This program required the collection of field duplicates and the calculation of the relative percent difference (RPD). The calculation method and acceptance level of 40% are discussed in CCME (2016). The RPD was not calculated or calculated parameters. Calculated parameters can be the sum of, the difference of, or the percentage of several different parameters, many of which are reported as measured values (e.g. pH and alkalinity). Therefore, the discussion of variability should pertain to the measured parameters only. RPDs were also not calculated if one or both the results were less than the analytical detection limit, or one or both of the results were within 5x the detection limit. One duplicate sample was collected during the October sampling program. The RPD results ranged from 0 to 8% (**Table 4**). Therefore, the data satisfies the quality objectives for the monitoring program.

The analytical results are consistent with baseline samples, as presented in the *Groundwater Report – Upham East Gypsum Quarry*, submitted on June 29, 2021. Therefore, operations at the Upham East Gypsum Quarry do not appear to negatively impact the groundwater, as observed in the perimeter monitoring wells.

Environmental Accidents and Malfunctions

There were no reported environmental accidents or malfunctions during the July 2022 monitoring period.

Ambient Air Quality Monitoring – Total Suspended Particulate

24-hour air samples are collected every 6 days in accordance with the National Air Pollution Surveillance (NAPS) schedule. The air quality monitor used to conduct the monitoring is a BGI PQ100 air sampler, a high-volume sampler for total suspended particulate matter. In July there were 5 air quality monitoring events, July 6, 12, 18, 24, and 30, 2022. The results are provided in **Table 5**. There were no exceedances of the 120 µg/m³ maximum permissible ground level concentration of total suspended particulate that is specified in Schedule B of the *New Brunswick Air Quality Regulation – Clean Air Act*.

Blasting

Four blasts occurred during the July 2022 monitoring period, occurring on July 4, 7, 13, and 22, 2022. There were no exceedances of the Approval to Operate limits for maximum velocity and sound pressure for both blasting events. Blast reports are attached.

Public Complaints

There were two complaints during the July 2022 monitoring period. On July 21st and July 27, 2022, residents located north of the quarry filed a complaint indicating dust was covering their pool cover etc.. Dust suppression (use of a water truck) was focused to the northern portion of operations. Options of a larger water truck are also being investigated.

Summary

Since extraction activities began in July 2020 at the Upham East Gypsum Quarry, the water chemistry at the discharge point into the unnamed tributary has remained comparable to background, groundwater measured in the perimeter monitoring wells remains comparable to pre-operation conditions, air quality monitoring has remained below guidelines, and decibel levels have remained below guidelines for blasting.

References

Canadian Council of Ministers of the Environment (CCME). 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment: Volume 1 Guidance Manual. Canadian environmental quality guidelines. ISBN 978-1-77202-026-7.

Dillon (Dillon Consulting Limited). 2020 Environmental Management Plan (EMP) for Operation. Upham East Gypsum Quarry Project, Upham New Brunswick. Prepared for Hammond River Holdings Limited by Dillon Consulting Limited, Fredericton, New Brunswick. Project 18-8346. June 2020.