



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**



**Robert R. Scott, Commissioner**

EMAIL ONLY

October 21, 2019

John Gay  
Casella Waste Management, Inc.  
1855 VT Route 100  
Hyde Park, VT 05655

**Subject:** **Bethlehem** – North Country Environmental Services (NCES) Landfill,  
581 Trudeau Road, DES Site #**198704033**, Project #1737

**July 2019 Tri-Annual/2019 Annual Water Quality Monitoring Results**,  
prepared by Sanborn, Head & Associates, Inc., and dated August 22, 2019

**August 2019 PFAS Groundwater Results Data Transmittal**, prepared by  
Sanborn, Head & Associates, Inc., and dated September 3, 2019

Dear Mr. Gay:

The New Hampshire Department of Environmental Services (NHDES) has reviewed the above-referenced documents for the NCES Landfill, as submitted on your behalf by Sanborn, Head & Associates, Inc. (SHA). The subject documents were prepared to comply with the on-going monitoring and reporting requirements of the site Groundwater Management and Release Detection Permit **GWP-198704033-B-007** (the Permit). Based on our review of the most-recent water quality data provided, we note that the monitoring results generally remain consistent with recent prior findings, with the exception of the results discussed below.

Based on our review of the above documents, we developed the comments that follow below. Comments requiring a response from Casella and/or SHA are summarized in ***bolded italicized font***.

1. As noted by SHA within the Annual Report, 1,4-dioxane was detected during the April 2019 monitoring round at a concentration of 1.8 micrograms per liter ( $\mu\text{g/L}$ ) in the groundwater sample from monitoring well B-304UR, which is above the Ambient Groundwater Quality Standard (AGQS) and the highest detection on record for the monitoring well. We note B-304UR is within the Groundwater Management Zone (GMZ) related to the former (removed) unlined landfill where impacts to groundwater have been noted previously. The 1,4-dioxane detections during the last five monitoring rounds that included 1,4-dioxane analysis each exceeded the revised AGQS of 0.32  $\mu\text{g/L}$ , which took effect September 1, 2018. Included in the Annual Report is an expanded evaluation of the 1,4-dioxane occurrences at B-304UR and B-304DR, as requested by NHDES. The evaluation identified the presence of an unused piezometer couplet, B-304S and B-304D, and historical subsurface infrastructure related to the former landfill gas flare in the vicinity of B-304UR and B-304DR. We understand, as discussed within the Annual Report, that subsurface infrastructure related to the former flare including; conduits, piping, condensate knock-out, and concrete pads, along with approximately 5,000 cubic yards of soil were removed from an area upgradient of B-304UR and B-304DR as part of reconstruction of stormwater pond #4 in May 2019. We note decommissioning of the B-304S and B-304D piezometer couplet was consistent with SHA's June 26, 2019 Work Plan. ***Concentrations of 1,4-dioxane in the groundwater samples collected from monitoring wells B-304UR and B-304DR should be reevaluated following the November 2019 Permit monitoring round. The results should be transmitted to***

[www.des.nh.gov](http://www.des.nh.gov)

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**NHDES as part of the November 2019, due in January 2020, and include an evaluation of the results and any associated recommendations.**

2. On July 18, 2019, the New Hampshire Joint Legislative Committee on Administrative Rules (JLCAR) adopted rules that establish Maximum Contaminant Levels (MCLs) and either revised or established AGQS for four per- and polyfluoroalkyl substances (PFAS) that include: 12 nanograms per liter (ng/L) for perfluorooctanoic acid (PFOA), 15 ng/L for perfluorooctane sulfonic acid (PFOS), 18 ng/L for perfluorohexane sulfonic acid (PFHxS), and 11 ng/L for perfluorononanoic acid (PFNA). The rules became enforceable standards on September 30, 2019. In consideration of the new standards we note concentrations of PFOA have been detected above the new AGQS during the most recent monitoring rounds at monitoring wells MW-701 (PFOA 20.6 ng/L), MW-802 (PFOA 14.2 ng/L), B-918M (PFOA 17.3 ng/L), and B-919U (PFOA 14.1 ng/L). As discussed within the Annual Report, MW-802 and B-919U are located within the GMZ for the former unlined landfill where other impacts to groundwater have been noted historically. Although impacts at MW-701 and MW-802 are believed to be associated with previously identified historical issues, the impacts should be tracked closely, as discussed below. **PFAS occurrences at the site should be reassessed in comparison to the new PFAS standards and the adequacy of the existing monitoring well network should be evaluated.**
3. In consideration of the reoccurring detections of PFAS and consistent with the requirements of NHDES' *Groundwater Release Detection Permits* rules (NH Code of Administrative Rules Chapter Env-Or 700), Assessment Monitoring shall commence at release detection monitoring wells B-701 and B-918M. Sampling shall be completed on a quarterly basis for PFAS, NHDES Waste Management Division Full List of Analytes for volatile organics, including 1,4-dioxane (using a 0.25 micrograms per liter (ug/L) reporting limit), specific conductance @25°C, pH, temperature, turbidity, nitrate, sulfate, TKN, chloride, iron, and manganese. To better understand the occurrence of PFAS, the first round of sampling should include an expanded analytical list, using isotope dilution following the protocols outlined in the United States Department of Defense (USDOD) Quality Systems Manual (QSM) 5.2 (or later), reporting 25 individual PFAS. Results of the assessment monitoring shall be submitted to NHDES within 45 days of the date of each round of sampling. Sampling shall continue until the results indicate two consecutive rounds during which PFAS is not detected or NHDES determines further action is necessary. The list of required analyses may potentially be narrowed if the Assessment Monitoring results support such a reduction. **Release detection monitoring wells B-701 and B-918M shall be sampled on a quarterly basis for PFAS, NHDES Waste Management Division Full List of Analytes for volatile organics, including 1,4-dioxane (using a 0.25 ug/l reporting limit), specific conductance @25°C, pH, temperature, turbidity, nitrate, sulfate, TKN, chloride, iron, and manganese until the conditions outlined above are met. Results are to be submitted to NHDES' within 45 days of sampling and should include an evaluation of the results and recommendations for corrective actions, further monitoring, and/or additional investigation.**
4. As discussed by SHA within the Annual Report, increased chloride concentrations have been detected above the historical data results at monitoring locations S-1, S-101 and SF-1, with the concentration detected at S-1 being the highest since 1996. Based on information provided within the Annual Report, the recent chloride impacts are likely the result of salt storage and mixing operations performed in the northern portion of the former "Tucker Pit". Based on the above-noted water quality impacts, NHDES requires that corrective measures to mitigate the chloride impacts in the area of the on-site salt storage and mixing operations be undertaken. Improvements to consider should include implementation of best management

practices (BMPs) such as those outlined in NHDES' [WD-DWGB-22-30 Fact Sheet](#). Based on the elevated concentrations of chloride at S-1, S-101, and SF-1, the monitoring locations should continue to be monitored closely. Monitoring locations S-1 and SF-1 are sampled for chloride during each Permit monitoring round. However, sampling of the S-101 location should be included with the November 2019 and April 2020 monitoring rounds and should include the same parameters as are required by Permit at the S-1 and SF-1 locations. **Monitoring location S-101 should be sampled during November 2019 and April 2020 as outlined above. Also please document any mitigation steps or BMPs NCES plans to implement, or has implemented, at the salt operations area as part of the November Data Transmittal, due in January 2020.**

5. As indicated on the "Groundwater Quality Field Sampling Summary" table attached to the Annual Report as Appendix D we note the observed depth to the bottom of monitoring well B-304DR is less than the documented installed depth by nearly 10 feet. Please review the difference and discuss the reason for the discrepancy. If the monitoring well needs to be rehabilitated, please coordinate prior to conducting the November Permit monitoring round. **Please address discrepancy in the depth of monitoring well B-304DR as part of the November Data Transmittal, due in January 2020.**
6. Consistent with NHDES guidance, samples collected for PFAS analysis should be analyzed using an isotope dilution method following the protocols for PFAS by LC/MS/MS outlined in the USDOD or USEPA methods reference in Item #3 above. NHDES recommends that samples be submitted for a broad PFAS analysis to evaluate the potential source, fate, and transport PFAS impacts at your site. Quantification of linear and branched isomers should be completed as required by USEPA Method 537.1. The laboratory should report acid forms, accounting for the mass of the counterion as described in USEPA Method 537.1. NHDES recommends that analytical data summary tables (and laboratory reports) include both CAS Nos. and the analyte names. Laboratory testing guidelines for PFAS can be found at:

[https://www4.des.state.nh.us/nh-pfas-investigation/wp-content/uploads/2019/05/201905\\_Lab-Guidance-1.pdf](https://www4.des.state.nh.us/nh-pfas-investigation/wp-content/uploads/2019/05/201905_Lab-Guidance-1.pdf)

In addition, on summary tables, NHDES recommends that the PFAS be ordered by carbon chain length, and split by families.

If you have any questions with regard to our comments, please contact me directly at NHDES' Waste Management Division.

Sincerely,



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Board of Selectmen, Town of Bethlehem  
Attention Health Officer, Town of Bethlehem