United States Environmental Protection Agency
Region 1 – New England
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

MEMORANDUM

Date: October 23, 2018

To: Coakley Landfill Superfund Site File

From: Richard Hull, Remedial Project Manager
Office of Site Remediation and Restoration

Re: Response to *Statement by Thomas P. Ballestero for Seacoast Cancer Cluster Commission meeting 10 October 2018*

During the October 10, 2018, meeting of the New Hampshire Legislative Commission on the Seacoast Cancer Cluster Investigation, Mr. Mark Gearreald, attorney for the Town of Hampton, NH, provided a statement prepared by Mr. Thomas P. Ballestero from the University of New Hampshire (enclosed) regarding groundwater contamination at the Coakley Landfill Superfund Site (the "Site"). Mr. Ballestero had also provided a statement on the same topic dated December 1, 2017, as well as comments in response to a bedrock investigation work plan prepared by the Coakley Landfill Group (CLG), dated June 6, 2018. USEPA responded to Mr. Ballestero's June 6, 2018, comments by email to Mr. Gearreald on July 12, 2018 (enclosed). This memorandum provides a response to Mr. Ballestero's October 10, 2018 statement.

In his October 10, 2018 statement, Mr. Ballestero concludes that "there is a need for additional investigation as well as mitigation strategies necessary farther afield than the existing Operable Units 1 and 2." Mr. Ballestero also provides a brief explanation of the sources of PFAS contamination and a summary of the timeline for the discovery of PFAS and 1,4 dioxane in the environment and at the Site in particular. Mr. Ballestero states that the discovery of PFAS contamination at the Site and "especially in wells outside of the operable units", has been characterized to the public as being at concentrations below those established for drinking water and "that there are other potential sources of the chemicals." USEPA, NHDES and the CLG have provided the public access to all groundwater data from the Site, including data from groundwater monitoring wells at the Site that have levels of PFAs above the USEPA's health advisory of 70 nanograms per liter (ng/L) for PFOA and PFOS. To date, there have been no PFAS results from any residential or other water supply wells sampled by the NHDES or CLG in the vicinity of the Site that have been above 70 ng/L. There are also many established sources of PFAS other than the Site in the seacoast area of New Hampshire.

Mr. Ballestero further expressed that he has provided earlier written and oral testimony at public meetings, and that he has raised issues about the conceptual hydrogeologic model for the Site,

and the movement of the "leachate plume" and that none of his suggestions have been implemented. He also stated that he has "pointed out errors in the existing conceptual hydrogeologic model" and that "this issue has been largely ignored." In my July 12, 2018, email to Mr. Gearreald (attached), I specified that USEPA and NHDES had considered the comments and suggestions that Mr. Ballestero had provided in his statement of December 1, 2017, and his June 6, 2018, comments, when directing the CLG to initiate a deep bedrock investigation at the Site. More specifically, the bedrock investigation currently being implemented by the CLG, as directed by USEPA, includes the installation of new deep bedrock wells, and the geophysical surveying and sampling of new and existing bedrock wells located in all directions from the Site, including to the south and east. The bedrock investigation will also include a pumping test to characterize flow connectivity between the bedrock well network at the Site. In addition, USEPA and USGS are coordinating on an evaluation of the current site-specific hydrogeologic model based on updated data, including data from the bedrock investigation. All of this information and data will provide an updated conceptual model of the flow characteristics and contaminant transport from the Site that can be used to determine if additional remedial actions are required. This approach appears to be consistent with the recommendation of Mr. Ballestero for "additional investigation, and remedial actions, if warranted" to address the current interpretation of existing data.

Enclosures

cc: Andrew Hoffman, NHDES
Jim Murphy, USEPA
Mark Gearreald, Town of Hampton

From:	Hull, Richard
To:	"Mark Gearreald"
Cc:	Andrew.Hoffman@des.nh.nh.gov; Catri, Cindy; Sherman, RuthAnn; Murphy, Jim; Dumville, Kelsey
Subject:	RE: Coakley landfill migration of PFAS
Date:	Thursday, July 12, 2018 1:07:00 PM

Mr. Gearreald,

Thank you for forwarding Mr. Ballestero's June 6 comments regarding the ongoing bedrock investigation being conducted at the Coakley Landfill Superfund Site. We have carefully reviewed the comments and appreciate the added technical input from Mr. Ballestero. USEPA and NHDES have taken these comments, along with Mr. Ballestero's December 1, 2017, written version of the comments he provided at the November 15, 2017, public meeting, in to consideration while working with CLG to develop the workplan for the bedrock investigation, and we believe that Mr. Ballestero's questions and concerns will be addressed by the bedrock investigation.

The CLG is currently in the midst of drilling three additional bedrock monitoring wells at the Site, as well as identifying existing bedrock wells surrounding the Site for geophysical surveying and sampling. It appears that a primary concern raised by Mr. Ballestero is a lack of investigative efforts to the south and east of the Landfill. The initial phase of the investigation will seek to collect additional data from existing bedrock wells, many located east and south of the Landfill. Review and interpretation of this data will be used to develop the scope for subsequent phases of the investigation.

EPA is preparing additional comments in response to the CLG's May 31, *Revised Draft Deep Bedrock Investigation Work Plan.* I will forward these to you once they are finalized and issued.

Thank you again for this information.

Regards,
Skip

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From: Mark Gearreald [mailto:mgearreald@town.hampton.nh.us]
Sent: Thursday, June 07, 2018 3:16 PM
To: Hull, Richard <Hull.Richard@epa.gov>
Cc: Andrew.Hoffman@des.nh.nh.gov
Subject: Coakley landfill migration of PFAS

Dear Mr. Hull,

As you may recall, I am the Town Attorney for the Town of Hampton, which is concerned that its public drinking water supplier's wells (owned by Aquarion Water Company of New Hampshire, Inc.) are showing significant PFAS contamination that may be coming from the Coakley Landfill.

Attached are some Review comments dated June 6, 2018 as provided to the Town of Hampton by its consulting expert hydrologist, UNH Professor Thomas Ballestero, regarding the currently proposed bedrock investigation to be performed by the Coakely Landfill Group. These Review comments will shortly be posted on the Town of Hampton's website.

Where neither Professor Ballestero nor I will be present at tonight's "Community Meeting" to be held in Portsmouth about the Coakley Landfill, at which you or other representatives of your agency and NH DES are likely to be present, I wanted to pass these Review comments along to you for your consideration in advance.

Also attached please find Professor Ballestero's resume. As you can see, Professor Ballestero has served on EPA's Science Advisory Board for Hydraulic Fracturing Review and has provided peer review of proposals and served on expert review panels for EPA. He has also taught courses in Concord, NH for personnel employed by the NH DES including landfill design, introduction to ground water hydraulics and hydrology, and surface water hydrology.

Thank you,

Mark S. Gearreald, Esq.
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Statement by Thomas P. Ballestero for Seacoast Cancer Cluster Commission meeting 10 October 2018

After a review of the initial documents from the 1980's that investigated groundwater contamination at and peripheral to the Coakley Landfill, as well interim and most recent documents also concerning the groundwater contamination issue I have come to conclude that there is a need for additional investigation as well as mitigation strategies necessary farther afield than the existing Operable Units 1 and 2. During the clean-up of contamination sites, the sites may be subdivided into several distinct areas to make the response more efficient. These areas, called operable units (OUs), may address geographic areas, specific problems, or medium (e.g., groundwater, soil) where a specific action is required. Although contaminants from the landfill were present outside of the operable units, once the units were defined (and in the case of Coakley, expanded), it was left to the responsible parties, here the Coakley Landfill Group (CLG), to manage the operable units such that the contaminants were not continuing to pollute groundwater and that health and environmental risks to nearby populations would be reduced.

Unfortunately for the almost quarter century of the clean-up process the class of chemicals now known as Per- and Polyfluoroalkyl Substances (PFAS) were never looked for. Some of these chemicals are carcinogens, however most do not have toxicity studies or even approved analytical methods. The largest sources of the PFAS were military operations, airports, and firefighting. However, many household items also contain these chemicals, and given the relatively short useful life of household items, most find their way to landfills. When ultimately groundwater samples from wells around the Coakley Landfill were tested for PFAS, they were found. The chemicals are in the overburden and in the bedrock groundwaters. 1,4 dioxane is now also found at wells at and outside of the operable units. The 1,4 dioxane is considered by the USEPA to be a likely human carcinogen.

Once these chemicals were found and attributed to the landfill, especially in wells outside of the operable units, a posture that was presented to citizens is that a.) the concentrations are below that established for drinking water, and b.) that there are other potential sources of the chemicals.

Given the facts that we know very little about these chemicals, other than they are persistent and travel easily in groundwater, as well as that of those that have been studied, most have serious health consequence, there is a necessity for a stronger and more urgent response at the Coakley Landfill and lands peripheral to the operable units. To underscore this urgency, the drinking water limit in force in New Hampshire at this time could be lowered as has already occurred in other states. Should this occur, there will be homeowner and possibly community water wells that fail to meet the criteria.

In the past year I have provided written and oral testimony at public meetings for the Coakley Landfill. Although I have raised issues about the conceptual hydrogeologic model, the

movement of the leachate plume, and how best to monitor, none of my suggestions have been implemented. In addition, I have pointed out errors in the existing conceptual hydrogeologic model that I field verified myself, and this issue has been largely ignored.

To conclude, the leachate plume from the Coakley Landfill has moved past the management boundaries (operable units), as groundwater data indicate. As concluded in the 1980's contaminated groundwater moves radially away from the landfill in both overburden and bedrock. This radial flow continued up until the landfill was capped. The landfill capping most likely affected groundwater flow at the landfill, however the leachate plume that left the landfill decades earlier was unaffected by this management strategy. I continue to assert that contaminants have moved radially away from the landfill. Since no strategy was implemented to retrieve the leachate plume that escaped, additional groundwater monitoring and assessment of groundwaters farther afield from the landfill, and in all directions, is warranted. The cost of monitoring is greatly overshadowed by the threat to human health. I interpret the existing data and conclusions as imperfect, and only by additional investigation, and remedial actions id warranted, can these imperfections be addressed.