

Problems with the planned “remediation” of the *Former Marble Quarry
Landfill Site*
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The Remedial Action Work Plan (RAWP), released in early August 2016, describes the remediation and development of the *Former Marble Quarry Landfill Site* administered under the Brownfield Cleanup Program by the New York State Department of Environmental Conservation (NYSDEC). The RAWP describes a three-step process in which additional environmental data will be collected at the site, followed by remedial activities, and finally construction of a hotel, restaurant and associated parking areas, walkways, and landscaping. Both this plan, and the Remedial Investigation which forms the basis for the remedial action, have many deficiencies. These are addressed in the comments below.

Remedial Action Work Plan

1. The selected remedy/development plan (Alternative B) has *not* been accepted by the community.

According to the Remedial Action Work Plan (RAWP, p.29) “There are a number of members in the community who have a personal history with the landfill and believe it is more toxic than actual sampling has shown it to be.” In fact, the sampling data indicate that the site has a wide variety of contaminants, which corroborates the testimony of several community members who have witnessed dumping of all manner of commercial, industrial, and residential waste materials. Groundwater has been shown to exceed New York State ambient standards for heavy metals, pesticides, PCBs, chlorinated solvents, and many other compounds. Soil vapors are known to contain hazardous levels of many volatile organic compounds, including perchloroethylene, trichloroethylene, and very high levels of Freon gases. While no drums or tanks have been uncovered during the site investigation, the NYSDEC acknowledges that drums and tanks are probably buried at the site.

The RAWP goes on to say “The project is in the process of going through a completely open and transparent local approval process. Therefore, the public has had, and will continue to have, the opportunity to comment on the preferred remedy.” In reality, public comment on the preferred remedy is no longer possible since the RAWP is now considered a final document. The RAWP was expanded and far more detailed, since the draft was released January 26, 2016. Thus the public has had no opportunity to comment on many new details. Many, if not most community members would take exception to the notion that the local approval process is “completely open and transparent,” as discussions between the developer, the NYSDEC, and the village officials have taken place behind closed doors.

2. The RAWP does not consider any alternative that does not involve construction of a hotel and restaurant.

Every alternative evaluated in the RAWP, including “No Action” (Alternative A), includes construction of a hotel and restaurant. It is not necessary to build a hotel and restaurant to address the most pressing public health risks, which are exposure to soils vapors and exposure to surface contamination. A logical approach for reducing exposure of the public to these risks is, like Alternative C, installation of a Composite Cover System and Soil Vapor Controls *only—that is, without construction of any buildings*. Such an alternative—call it Alternative E—would be less expensive and just as protective of human health and the environment as Alternative C. Moreover, Alternative E would involve little disturbance of the site soil since regarding of the site would be minimized. Thus, short-term exposure to site contaminants is also minimized.

3. The RAWP incorrectly rejects Alternative C – Composite Cover System and Soil Vapor Controls

The RAWP claims that Alternative C (Composite Cover System and Soil Vapor Controls) will “likely be less acceptable to the community than Alternative B because the most contaminated material present would remain on Site. The environmental benefits associated with the source material removal outweigh the additional associated short-term impacts. Therefore, Alternative B ...is likely to be more acceptable to the community.”

In reality, Alternative C is likely to be more acceptable to the community, because disturbance of the site is reduced. Moreover, the environmental benefits of removing a small fraction of the contamination which is present at the site are slight.

4. The containment of groundwater contamination plume is not explicitly addressed.

The RAWP requires that six new monitoring wells be installed. Namely “The plan will include installation of three overburden wells and three bedrock wells. These wells will be sampled prior to construction and during construction to establish baseline concentrations and to fulfill the BCP requirement to ascertain if contaminated groundwater is migrating from the Site and to monitor the impact of ongoing construction on groundwater quality. The BCP remedy must prevent migration of contaminants from the Site.”

DER-10, Section 4.1 (d) states, under “Groundwater protection and control measures”

“All remedial programs will consider the protection of groundwater in the development and evaluation of remedial alternatives and will consider DEC guidance including, any groundwater remediation strategy issued pursuant to ECL 15-3109. While the current use of groundwater as drinking water may be considered, the absence of such use shall not exclude the need for remediation.” The guidance manual goes on to say that “a volunteer in the

Brownfield or Voluntary Cleanup programs is only required to *evaluate the feasibility of containing the plume on-site.*” (emphasis added)

The RAWP goes into tremendous detail about controlling storm water at the site, but provides **no evaluation of how groundwater contamination will be controlled.** The groundwater monitoring conducted to date indicates severe groundwater gradients, and the presence of mobile (dissolved) contaminants such as perchloroethylene and trichloroethylene, among many others. Thus, off-site migration of contaminants is highly likely. The RAWP should evaluate the installation of groundwater collection and treatment systems, barrier walls, and the like.

5. The *Source Material Removal* component of the selected remedy is based on very incomplete data

The selected alternative (B) follows a “Track 4 Cleanup” which includes *Source Material Removal*. There are certain small areas of the site which have been identified as having elevated levels of contaminants, including PAHs, PCBs, and heavy metals. Certain layers of soil, ranging from 2 to 6 feet in thickness, will be selectively removed. But the soil contaminant data used to select these areas is very incomplete. For one, only borings installed under the Remedial Investigation (2015) are being considered. Soil data from prior investigations (Phase II Environmental Site Assessments, 2013) are ignored. Secondly, only a small fraction of soil samples were actually chemically analyzed.

In my review of all the soil boring data collected at the FMQL site, I found that 37 borings were collected, and that over 300 soil samples were retrieved, in total. However, few samples from each boring were submitted to the laboratory—typically only one or two samples per boring. Moreover, there are large areas of the site where no borings were collected. As a result, the so-called *Source Material Removal* will effectively hit a tiny fraction of the areas of the site which are actually contaminated.

It is not clear how—or if—the soil borings collected during the pre-investigation will be used to modify the *Source Material Removal* program. The RAWP makes provisions for removing grossly contaminated soils, drums tanks, and the like, but it is not clear whether new soils found to be above Soil Cleanup Objectives will be removed.

6. The RAWP does not consider the effect of driving over sixty 100-foot pilings to support the hotel.

The proposed hotel is to be constructed directly above the southern quarry hole, which is known to be 85-feet deep in its center. Other borings confirm that fill materials extend 35-50 feet below ground. Community members recall the quarry being 100-ft deep. There is almost nothing known about what is buried at depths below 35 feet. Driving pilings into a deep waste pit without doing any additional sub-surface investigation seems foolhardy. Pilings may puncture drums, or run into pockets of highly contaminated materials. Certainly the process of driving pilings will cause substantial vibrations and disturbance of the fill material, causing release of vapors and

buoyant liquids (e.g. petroleum products). Pilings may provide a preferred pathway for contaminant liquids and vapors to migrate vertically to the surface.

Remedial Investigation

7. The investigation of the site is incomplete.

Brownfield Cleanup Program (BCP) sites are supposed to be investigated and remediated according to guidance issued by the Department of Environmental Conservation's (DEC) Division of Environmental Remediation (DER). The investigations carried out under the Remedial Investigation by the applicant fail to meet this guidance. (1) Specifically:

A. The investigation of the groundwater is incomplete.

DER-10 Section 3.7.2 (a) states that one of the basic purposes of the RI is to: "determine whether the contaminant plume is expanding, contracting or stable." The Remedial Investigation provides no conclusions whatsoever as to whether the contaminant plume is expanding, contracting or stable.

Section 3.7.2 (b) of DER-10 states that the RI should:

"Delineate the vertical and areal extent of groundwater contamination and the sources of such groundwater contamination, without regard to property boundaries."

The data collected from the nine monitoring wells on the site show contamination of groundwater by metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), pesticides, and volatile organic compounds—which are above groundwater standards in the overburden aquifer, and/or the bedrock aquifer. But the vertical and horizontal extent of such contamination has yet to be determined. The investigation has been hamstrung by the lack of monitoring wells outside the property boundaries.

More fundamentally, the movement of groundwater through the bedrock and the overburden aquifers is not understood. The consultant for the Applicant has admitted that groundwater elevations at the site cannot be reasonably contoured. The relationship between the overburden aquifer and the bedrock aquifer is unclear

The RI Report, as defined in DER-10 Section 3.14 (a), should "define hydrogeological factors as needed, to include: grain size analysis, soil permeability, nature of any bedrock, depth to saturated zone, hydraulic gradients, depth to bedrock, bedrock permeability, proximity to a drinking water aquifer, surface water, floodplains and wetlands;"

The RI lacks several of these important parameters, including:

- grain size analysis,
- soil permeability,
- bedrock permeability

In addition, the depth to bedrock appears to be lacking for many wells, since six of the nine wells were completed in the fill/overburden material.

B. The investigation of historic fill material at the site is far from complete.

The FMQL site contains tens of thousands of cubic yards historic fill material, abbreviated as “HFM” in DER-10. DER-10, Section 3.11 (b), states that the Remedial Investigation “is intended to identify the location and extent of the historic fill on and around the site, as well as to characterize the nature of the fill material, including a determination of the presence of any contaminated non-HFM.” This Section goes on to require three items:

“The investigation should include:

- i. the logging and mapping of all contaminated fill material encountered, including both historic and non-historic fill;
- ii. at least four borings or test pits per acre of HFM [historic fill material]with a minimum of four borings or test pits. ***The location of the borings or test pits should be representative of the areal extent of the fill and should be advanced through the fill material to native soil, meadow mat or bedrock so that the vertical limit of the fill material is established;*** and
- iii. if the contaminated fill material extends below the water table, ***borings or test pits should extend below the water table as necessary to establish the vertical limit of the fill material;***
(emphasis added)

The RI has not quite met the requirement of four soil borings per acre: 13 borings collected on a 3.45-acre site equates to 3.8 borings per acre.

More significantly, many of the borings were not advanced through the fill material to bedrock so that the vertical limit of the fill material may be established. A single boring in the southern quarry hole—TB-6—extends to the native bedrock. No boring was advanced to bedrock in the northern quarry hole. Moreover, none of the soil borings collected during prior investigations within the limits of the former quarry holes extend to the native bedrock.

This shortcoming will not be remedied by the collection of additional soil boring as described in the RAWP. While these borings will provide much-needed delineation of the ***areal extent*** of the fill, these borings will do nothing to address the lack of information regarding the ***vertical limit*** of the fill material. In short, after the completion of the additional sampling specified in the RAWP, the vertical limit of fill in the southern quarry hole will still be approximated by a single soil boring. And the vertical limit of fill in the northern quarry hole will still be completely undefined.

C. Analysis of historic fill material is incomplete.

DER-10, Section 3.11 (b)(3) recommends that the fill material be characterized by “collecting and analyzing contaminant characterization samples from each type of historic

fill present (e.g. ash and demolition debris are considered to be different types of fill material) to determine the site-specific contaminant levels.”

Over 300 samples were collected from soil borings during Phase II Environmental Site Assessment (2013) and the Remedial Investigation. Fill at the site has been characterized as containing a wide variety of materials, including cinders, ash, sand, concrete, plastics (e.g. foam), brick, wood, metal (car parts), etc. Despite the heterogeneous nature of the fill material, the frequency of chemical analysis has not been increased to address this.

Moreover, DER-10 Section 3.11 (b)(3)(iii) requires that:

“Analysis of rubble, ash, cinders and dredge spoils should be conducted for:

(A) ***total petroleum hydrocarbons***;

(B) ***priority pollutant metals in all samples***;

(C) carcinogenic and noncarcinogenic polycyclic aromatic hydrocarbons (per EPA Priority Pollutant List); and

(D) PCBs on 25 percent of the samples, biased to samples having the highest total petroleum hydrocarbon levels;

(2) field screening for VOCs should be conducted during the installation of all exploratory borings and test pits with ***volatile organic laboratory analysis performed on all samples with elevated field instrument measurements*** (greater than five times background); (emphasis added)

No samples at the FMQL site have been tested for total petroleum hydrocarbons. Priority pollutant metals have been analyzed only in a small subset of samples collected from borings. And finally, field screening for VOCs was conducted using photoionization detector (PID). This found numerous occurrences of elevated field instrument measurements. In most instances, such samples were not analyzed for volatile organic compounds.

D. The site has not been investigated for polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs)

Two families of compounds known as polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) have received great scrutiny in environmental investigations due to their high toxicity, persistence, and tendency to biomagnify in food chains. There are seven PCDDs and ten PCDFs which are considered toxic; the most toxic member being 2,3,7,8-tetrachloro-*p*-dibenzodioxin. These will collectively be referred to as “dioxins.” The history of the FMQL site indicates there are two primary sources of these compounds:

1. Incinerator ash
2. Fires which took place at the FMQL site.

A literature review conducted by Hughes Environmental Consulting demonstrates that these highly toxic compounds are likely to be present at levels far above guidance values set

by USEPA (10-25 pg TEQ/g soil) and the Agency for Toxic Substances and disease Registry (ATSDR) (50 pg TEQ/g soil). Scientific studies predict that dioxin concentrations in ash could range from 10 to 500,000 pg TEQ/g solids. The presence of heavy metals and chlorinated compounds (PCBs, PCE, TCE, methylene chloride, etc.) at the disposal site probably contributed to formation of dioxins when waste materials were burned at the site in the 1950s-1970s. Dioxins persist in soils for many decades, so dioxin concentrations in site soils could easily exceed 5000 pg TEQ/g solids. Small diameter particles such as those found in fly ash are likely to contain the highest concentrations of dioxins. Unfortunately, these are the materials that are most likely to become airborne when the site is disturbed.

The NYSDEC has asserted that PCDD/PCDF analysis is unnecessary because so-called “precursor” compounds are not present. The paper upon which this assertion is based examined flue gases, not solid residues such as ashes. The relationship between “precursor” compounds and PCDDs and PCDFs in the solid phase is likely to be substantially different than what is observed in the gas phase. The only way to get a good understanding of the risks posed by PCDDs and PCDFs is to actually test for them.

SUMMARY

The RAWP is lacking in many important ways. Acceptance by the community has been misrepresented. Alternatives that do not involve construction of a hotel and restaurant have not been considered. The process for selecting and removing contaminated soils appears to be based on a procedure which lacks any credibility. The hotel construction requires that over sixty pilings be driven deep into fill material which has not been characterized in any way: through remote sensing devices such as ground-penetrating radar; or through exploratory soil borings in which the fill could be examined visually, subjected to screening for volatile compounds, checked for odors, and chemically analyzed. At a minimum, the presence of buried drums, tanks, automobiles, refrigeration equipment, etc. should be checked before driving piles.

In addition, the Remedial Investigation does not meet many of the requirements of DER-10. Groundwater contamination plumes have not been defined, and the vertical extent of the fill material has not been defined. Analysis of the fill material should be expanded to gain a better understanding of the contamination therein.

References

- (1) New York State Department of Environmental Conservation. *DER-10 / Technical Guidance for Site Investigation and Remediation*, May 2010.
- (2) *Remedial Action Work Plan, 109-128 Marbledale Road, Tuckahoe, New York* (July 2016). 399 pp. HydroEnvironmental Solutions, Inc. Somers, NY
- (3) *Remedial Investigation Report, 109-128 Marbledale Road, Tuckahoe, New York* (March 2016). 1054 pp. HydroEnvironmental Solutions, Inc. Somers, NY