

Audits and Enforcement at BWSC

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This April, MassDEP began the Audits Case Study training featuring one case as it progressed from Phase II through Phase V, emphasizing how each Phase builds on the previous work. Similarly, this article features four different sites that went through multiple Phases of the MCP process. Each site was audited after a Response Action Outcome (RAO) was submitted, but audit violations were largely from a specific phase in the audit findings. This article dissects the violations relevant to specific Phases of the MCP: (1) Phase II Site and Risk Characterization; (2) Phase III Feasibility Evaluation; (3) Phase IV Remedy Implementation Plan and Implementation of the Plan; and, (4) Phase V, Class C-1 RAO and Periodic Evaluations of the solution.

The Audit discussion is followed by a summary of one recent BWSC case that resulted in EPA enforcement for hazardous waste violations. The case serves as a reminder of multiple issues and regulatory authorities that may have jurisdiction at a property. MassDEP, EPA and the LSPA are currently developing a Remediation Waste Management Course for RCRA sites, planned to be offered in December this year.

FOUR AUDITS

Phase II: Site and Risk Characterization

The first case is a property comprised of two parcels (“Parcel One” and “Parcel Two”); the audit focused primarily on the Partial Response Action Outcome Statement for Parcel One. The audit included a review of the information for both parcels because of their proximity, and related site history and use.

The 120-day notification and original Class B-1 RAO Statement were submitted in May 1998. In October 2004, MassDEP issued a Notice of Audit Findings (NOAF) indicating that the RAO did not support a conclusion of No Significant Risk. The extent of contamination had not been defined and contaminants of concern had been left out of the Risk Characterization. A Tier II Classification was subsequently submitted and the site came back into the system. A revised RAO was filed for Parcel One in March 2008.

Parcel One had been used for staging construction material and concrete products. Portions of the property are located above a medium-yield potentially productive aquifer. The adjacent Parcel Two has been redeveloped into a residential apartment complex with GW-1 and S-1 as applicable cleanup standards. A small portion of Parcel One is currently paved and used for automobile “storage.” The rest of Parcel One consists of wetlands, a brook and drainage ponds. Site contaminants include: metals and petroleum hydrocarbons in soil, and perchloroethylene (PCE) and petroleum hydrocarbons in groundwater. Soil borings exhibit construction debris at depths ranging from 2 to 10 feet below ground. Groundwater generally flows toward nearby surface waters and commercial properties.

Multiple sampling events occurred at the 12 acre Parcel One. However, nine of ten total soil samples, and ten of eleven total groundwater samples, were taken from the northern half of

Parcel One. No samples were taken from the southern portion proximate to Parcel Two even though high lead concentrations (up to 720 mg/kg) had been detected near the border between the parcels. Sediment samples were taken, but the specific sampling details were unclear. Six of the sediment samples as well as several soil and groundwater samples were subsequently omitted from the site and risk characterization. The reasons for excluding specific samples varied, including several quality control issues. Some contaminants were attributed to “local conditions” but the assertion was not supported. No samples were taken from the southern portion proximate to Parcel Two even though high lead concentrations (up to 720 mg/kg) had been detected near the border between the parcels.

AUDIT FINDINGS:

MassDEP audited the site again in 2008, issuing the audit findings and “Response Action Outcome Invalidation” in September 2008 (as in 2004). The audit focused on the lack of information about the extent of contamination, and the elimination of many samples from the risk calculations (without collection of additional, valid samples), resulting in non-conservative estimates of risk. Overall, MassDEP indicated that a Condition of No Significant Risk could not be demonstrated because Exposure Point Concentrations were not properly calculated and the nature and extent of contamination was not adequately characterized.

The specific violations, largely pertaining to site and risk characterization, that were noted were:

- **310 CMR 40.0962(1)** – failure to develop Exposure Point Concentrations both for certain contaminants and for certain exposure pathways
- **310 CMR 40.0926(3)** (two citations) – failure to develop conservative estimates of the Exposure Point Concentrations; improperly averaging the small number of samples obtained to further reduce the calculated EPC
- **310 CMR 40.0904(2)** – failure to define the extent of contamination in soil and groundwater, including the area within the potentially productive aquifer; failure to provide technical justification for not sampling in the area; lack of information on the extent of the contamination
- **310 CMR 40.0904(2)&(3)** – failure to define the extent of contamination in surface water and sediment, in part because many of the sediment samples were eliminated, and those that were analyzed were not analyzed for the same contaminants, making comparisons difficult

The NOAF/NON required a new sampling plan to fully characterize contamination at the site (or technical justification to show it was not feasible), a new Phase II and ROS submittal before expiration of the Tier Classification.

[Dedham, RTN 3-0016844, NOAF/NON/RAO Invalidation]

Phase III: Feasibility Evaluation

The second case involved a Phase II/Phase III submittal for a petroleum company received by MassDEP in April 2006. A Phase IV Remedial Implementation Plan and Phase IV Status Reports were also reviewed during the audit.

Some findings in the NOAF/NON pertained to the Phase II site characterization, particularly the extent of waste oil contamination, and impacts to various environmental media at the site from typical waste oil components – polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and heavy metals. A detailed disposal site map depicting all sampling points, the boundaries of the site relative to the site plan view, and the vertical extent of contamination were also not provided.

The remedial alternative selected for the site was Monitored Natural Attenuation, together with potential use of “enhanced fluid recovery” to treat *groundwater* at the site. During review of the Phase IV Remedial Implementation Plan, the enhanced fluid recovery was also listed to treat *soil* at the site; however, the use of that specific technology to treat soil had not previously been evaluated or technically supported in the Phase III documentation.

AUDIT FINDINGS:

MassDEP issued a NOAF/NON in January 2009. While the audit cited the information missing from the Phase II site characterization, it focused mostly on the Phase III and early Phase IV submittal and the evaluation of the proposed remedial alternatives.

The specific violations noted were:

- **310 CMR 40.0833(1)(a)** – failure to fully assess the extent of the waste oil and the environmental impacts of contaminants known to typically be present in waste oil
- **310 CMR 40.0835(4)(b)** – failure to provide a detailed disposal map depicting all investigatory and sampling points
- **310 CMR 40.0853(2)** – failure to document information, reasoning and results used to identify and evaluate the remedial alternatives in sufficient detail to support the selection of the remedial action alternative proposed in the Phase III, including failure to support the selection of monitored natural attenuation through site-specific characterization data and analyses
- **310 CMR 40.0877(4)(b)&(c)** – failure to document and/or technically support the changes to the operation and monitoring of the remedy, including elimination of the proposed monthly enhanced fluid recovery events and discontinuing of surface water sampling, were not documented or technically supported in the Phase IV Status Reports

The NOAF/NON required a revised Phase II, Phase III and Phase IV RIP.

[Warren, RTN 1-2014588, NOAF/NON]

Phase IV: Remedy Implementation Plan

The third case first came into the system in 1987 after the detection of No. 6 oil in soil and groundwater from a former underground storage tank at a former laundry business. The site is located within a Potentially Productive Aquifer and groundwater is classified as GW-1.

Residential parcels border the site on three sides; surface water is located nearby on the fourth side.

Based on an Administrative Consent Order executed in 1993, assessment and response actions began. Response actions included: installation of soil borings and monitoring wells, excavation and disposal of contaminated soils, implementation of various product recovery strategies, and installation of an interceptor trench between the site and the surface water to prevent oil migration to the nearby surface water. In June 1999, the interceptor trench began operating in passive mode and was terminated in May 2002 with MassDEP's approval.

An August 2002 Phase IV Remedial Implementation Plan proposed re-activation of the passive oil recovery system at the site to achieve a permanent solution. At that time, separate phase product was known to be present at the site, but was said to be too viscous to determine the thickness. Following activation of the passive system proposed in August 2002, the December 2002 Phase V Status Report indicated recovery of 400 gallons of oil. By April 2003, another 318 gallons of oil had been recovered, for a total of approximately 9000 gallons of oil recovered at the site overall since remedial operations first began (1993). In May 2003, the system was deactivated; however, a Phase V Status Report in December 2003 indicated that another 120 gallons of oil had been recovered by the system, despite its deactivation. A Class A-3 RAO was filed in March 2004, indicating that a Permanent Solution had been achieved. Somewhat contrary to the assertions of the RAO, the oil recovery figures contained in the RAO did not show the system reaching a point of diminishing returns in collection of the recoverable oil from the site.

MassDEP began to audit the site in November 2008, and issued findings in March 2009.

AUDIT FINDINGS:

Although the Class A-3 RAO asserted a Permanent Solution had been achieved, the oil concentrations in soil at the site exceeded Upper Concentration Limits (UCLs). In addition, the difficulty in obtaining an accurate measurement of the viscous weathered #6 oil at the site was improperly used as technical justification to forego the regulatory requirement for comparison of separate phase product thickness at the site to the UCL of ½ inch.

Specific violations noted were:

- **310 CMR 40.0894** – failure to file a Phase V Completion Statement
- **310 CMR 40.0924(2)(b)** – failure to properly evaluate groundwater exposure points at the site in the aquifer area, particularly since the monitoring well installed for this purpose was upgradient of the source area
- **310 CMR 40.0932(5)(b)2** – improper application of the GW-1 exemption and failure to show that the groundwater on site met the criteria to apply the exemption
- **310 CMR 40.0994(4)(c)** – failure to demonstrate a level of no significant risk of harm to public welfare given the UCL exceedences, and use of technical justification to eliminate or modify a performance standard (i.e., the UCL)
- **310 CMR 40.1004(1)(d)** – failure to meet the performance standard (demonstration of No Significant Risk) for the RAO
- **310 CMR 40.1056(2)(e)** – failure to demonstrate that contaminant concentrations have been reduced to background or to demonstrate that achievement of background is not feasible

- **310 CMR 40.1074(4)(b)** – failure to submit certified copies of the survey plan referenced in the Activity and Use Limitation

The NOAF/NON required a revised RAO or termination of the existing RAO and AUL and submittal of a Tier Classification submittal to continue working at the site, together with a revised Phase IV Remedy Implementation Plan. An Administrative Consent Order between MassDEP and the respondent was subsequently executed to memorialize the requirements.

[Chatham, RTN 4-00406, NOAF/NON]

Phase V – a Class C-1 RAO Temporary Solution

The fourth case involves petroleum contamination at an operating facility with Phase V Comprehensive Response Actions that consist of manually bailing separate phase product from site monitoring and recovery wells. The audit focused primarily on the remedial actions being conducted as a Temporary Solution. Part of the issue at the site is that complete cleanup cannot be accomplished until certain above ground tanks are removed.

As part of the feasibility evaluation of the Temporary Solution, there was a discussion of previous, more aggressive attempts to extract separate phase petroleum product from the site including:

- Approximately 5 years using pneumatic pumps in conjunction with soil vapor extraction (recovered 175 gallons of product)
- 14 instances of vacuum truck recovery of products (recovered 855 gallons of product)
- Approximately one year of dual phase extraction (recovered 100 gallons of product)

The current manual bailing strategy had been used for five years and collected approximately 216 gallons of separate phase product.

AUDIT FINDINGS:

MassDEP issued a NOAF/NON in June 2009.

The specific violations noted were:

- **310 CMR 40.1051** – failure to meet the requirements for Class C-1 RAO; while the report indicated product thicknesses had “decreased” in several wells, the review did not compare the amounts of product recovered over time to show the effectiveness of the different remedial actions
- **310 CMR 40.0861** – failure to provide a complete Remedial Action Plan of definitive and enterprising steps to achieve a Permanent Solution; while technologies other than manual bailing were reviewed, the review did not include an evaluation of the amounts of product recovered by past strategies, which suggest that the vacuum truck extraction had been the most successful to date
- **310 CMR 40.0191** – failure to meet the Response Action Performance Standard to find an effective technology that would reduce the overall mass and volume of product in the subsurface. The comparison (above) suggests the best recovery is by vacuum truck

extraction, but no justification was given for not re-instituting this technology as a feasible alternative. Though the Phase V review stated that a true permanent solution would not be possible until above ground fuel oil storage tanks could be removed, there was no plan proposed for “Definitive and Enterprising Steps” to be taken upon tank decommissioning.

The NOAF/NON required a revised Post-Class C RAO Status Report to address the violations noted.

[Worcester, RTN 2-0001108 & 2-0010208, NOAF/NON]

ENFORCEMENT

In July 2009, a real estate developer and its management company were ordered to pay a \$227,500 fine for violating federal and state hazardous waste management requirements during a redevelopment project in North Attleboro. The parties were found by a federal administrative law judge to have violated the Resource Conservation and Recovery Act (RCRA) by failing to properly identify and dispose of hazardous waste (specifically, hazardous waste sludge lagoons for past disposal of electroplating waste) during their work to redevelop a former jewelry manufacturing facility into a residential condominium complex.

The sludge, which is listed as hazardous waste under RCRA, contained contaminants including arsenic, cadmium, chromium, lead and silver. In the course of redeveloping the property for residential reuse, the lagoon area was excavated and the contaminated material improperly sent to an out-of-state landfill.

The ruling found that the developer and management company, although working with a Licensed Site Professional, failed to properly identify the 212 tons of waste excavated from the lagoons as hazardous waste, and improperly sent 212 tons of hazardous waste to a landfill that was not authorized to receive such waste.

MassDEP is currently performing separate enforcement actions in this case for violations of the MCP, together with publicly funded response actions to evaluate contamination remaining at the site, and to ensure the protection of public health, safety, public welfare and the environment.

As EPA noted, the case is an important reminder that developers and consultants thoroughly and carefully characterize waste generated from former industrial sites prior to disposal so that the waste will be properly managed and disposed of without becoming a risk to human health and the environment. The improper characterization and management of hazardous waste is a serious offense. EPA further indicated it plans to examine these issues at other sites. EPA and MassDEP take RCRA Corrective Action obligations seriously, and if facilities fail to meet their cleanup obligations in a timely manner, they will be subject to enforcement action.

EPA is currently working toward nationwide goals that call for completing construction of final remedies at 95 percent of facilities subject to RCRA Corrective Action by the year 2020. To ensure these goals are met, they are committed to working with the regulated community to achieve reasonable, streamlined and results-oriented solutions. They are collaborating with states to achieve site cleanup work under the delegated state framework. To that end,

MassDEP/EPA and the LSPA are developing a Remediation Waste Management Course for RCRA corrective action sites, expected to be offered in December this year.

The full press release can be found on the EPA website at:

<http://www.epa.gov/region1/enforcement/waste/> The article contains a link to the full decision.