

**Draft Waste Site Remediation Task Force Meeting Notes**  
**May 24, 2001**

**Existing Arsenic Policy**

The primary focus of this meeting was to report on DEM's experience with implementing the existing interim arsenic policy. The second part of the meeting was focussed on potential changes to the policy and to gather feedback on this draft proposal, especially on how to handle sites that will meet the residential standard. Leo Hellested briefed the group on the reason for implementing the existing policy. He mentioned the Site Remediation clean-up standards for the majority of contaminants are predicated on risk based standards. The calculated residential risk based standard for arsenic is 0.4 PPM. Long term exposure to arsenic at this level will increase the incidence of cancer by 1 excess cancer per million.

In Rhode Island, however, naturally occurring arsenic is prevalent in soils and two separate studies have confirmed that the average background level to be 1.7 PPM. This level was therefore set as the residential regulatory standard for arsenic when the regulations were last promulgated. When the background data was analyzed, it was determined that 4 PPM represented the numerical value of samples that were within one standard deviation of the average. 7 PPM represented the numerical value of samples that were within two standard deviations of the average. Based on these values, a tiered regulatory approach was developed as part of the interim policy last fall. The policy set different requirements for properties that had background levels of (1) Tier 1- from 1.7 PPM to 4 PPM,) (2) Tier 2- greater than 4 PPM to 7 PPM and (3)Tier 3- greater than 7 PPM.

The Department has required reporting above the current Direct Exposure Criteria of 1.7 PPM. Above this value, an evaluation is required in order to determine whether the observed concentrations at a particular site reflect either a release or a background condition. In the tiered system as outlined in the interim policy, the level of documentation and investigation was lower for sites whose concentration are near the mean and more for sites which are further away from the mean.

Background determinations for concentrations within Tier 1 and Tier 2 were the responsibility of an Environmental Professional. An Environmental Professional had to submit and document a certification that the site conditions are background. Arsenic concentrations above 7 PPM were assumed to be attributable to a release and required some level of response action as outlined in the Remediation Regulations. To substantiate background levels above 7 PPM, the DEM required a full site-specific background study with more substantial documentation and sampling.

Twelve submissions were filed and approved during the six-month time period of the pilot program. The Department agreed to review the certifications during the six-month pilot period as a means of providing feedback on departmental expectations. The review processes were initially time-consuming, but were less so after a few submissions were reviewed. Drawbacks of the current procedure were discussed including the need to remediate a release at a level of less than 7 PPM when there is no action at the same level if it is determined the arsenic is naturally occurring. In addition, the cost of remediation is an impediment to clean up Brownfields sites.

## **Proposed Policy Discussions:**

DEM proposed to modify the existing policy based upon the results of the six-month pilot, and the meeting participants discussed the alternatives for both residential and industrial cases. The discussion centered on:

- (A) Keeping the existing policy for residential uses for properties.
- (B) A revised policy or possible regulatory change to raise the level to 7 PPM for sites that will be used for industrial / commercial applications. :

### **Concentrations of arsenic below 7 PPM**

DEM proposed to keep the existing requirement of being notified when levels are detected between the Residential Direct Exposure Criteria of 1.7 PPM and 7 PPM. The use of Best Management Practices (BMP) was also discussed for arsenic levels above the calculated risk based standards. The Department also discussed inclusion of additional presumptive remedies in any policy revisions, which would include:

- 1) Excavation;
- 2) The use of engineered controls such as a two foot soil or 4 inch asphalt cap;
- 3) Phytoremediation;
- 4) Soil Blending with adequate dust control measures; and
- 5) Other methods approved by the Department

For industrial/commercial sites if all concentrations of arsenic are below 7 PPM and there are no other jurisdictional releases on the site, the Department would issue a Non Jurisdictional Letter. The pros and cons of including BMP recommendations for levels above the risk-based values were also discussed in considerable detail.

### **Concentrations of arsenic above 7 PPM**

Arsenic concentrations above 7 PPM will be assumed to be attributable to a release and will automatically require some level of response action as outlined in the Remediation Regulations. The Department will require a full site-specific background study for concentrations above 7 PPM. This study will be used to determine the site-specific remedial goal or to show the elevated levels are truly background levels. .

Arsenic measured above the 7 PPM level (or a higher approved site-specific background concentration greater than 7PPM) will not be allowed to remain on-site unless there is an approved engineered control in place with an associated Environmental Land Use Restriction (ELUR) requiring maintenance of the remedy. If there are no groundwater standards exceeded, approved engineered controls include:

- 1) Excavation;
- 2) Two foot clean soil cap;
- 3) 6 inches of clean soil and 4-inch asphalt cap;
- 4) One foot clean soil over a Geo fabric material meeting acceptable puncture strength;
- 5) Phytoremediation with confirmatory sampling;
- 6) Soil Blending with confirmatory sampling and dust control measures; and

Other methods approved by the Department.

Bob Vanderslice from the Health Department mentioned that DEM / DOH should develop a policy on soils and not limit the discussion to arsenic. He mentioned that DOH does not have a process to notify people of elevated levels of arsenic. The state would need to communicate the public health risk associated with raising the level the remediation action level to 7PPM.

### **BMP Issues**

- DEM was questioned if we could enforce implementing BMP on properties where soil testing measured soils having arsenic levels lower than 7 PPM since they were no longer considered jurisdictional. It was DEM's opinion that these requirements could not be enforced, but would in fact be recommendations. Concerns were raised that financial institutions would require the use of these recommended BMP's if DEM maintained this requirement in the policy. This could increase the cost of site clean up.
- The use of phytoremediation was questioned as a viable strategy. DEM mentioned this process was currently being evaluated and used in cleaning a site in Newport. The material is proposed to be harvested and then disposed as solid waste once the arsenic is bound in a form that does not pose a risk. The DEM also stated that it was continuing to look at successes and limitation of other cases nationally (in particular in Florida) as part of its evaluation.
- DEM was recommended to provide case studies of sites that were cleaned up to provide examples of the BMP that have worked in the past.
- According to the revised policy, for industrial / commercial sites, DEM would issue a Non Jurisdictional letter if arsenic levels are below 7 PPM and would recommend that BMP's be implemented. In this letter DEM felt the need to communicate the risk associated with arsenic level that remain on the property that are above the 0.4 PPM health based risk level. It was further suggested that DEM should consider revising the statement to address contaminants other than arsenic.

### **Sampling Issues**

- A question was raised on how to evaluate a site where elevated levels of arsenic (greater than 7 PPM) were found at on location. Could this value be averaged with the other samples? DEM indicated that if a single sample was found above 7 PPM, then that sample would need to be evaluated in the context of additional sampling or the site would be presumed to be contaminated as a result of a spill. It would not be possible to average away a hot spot result with surrounding "clean" areas.
- It was suggested that DEM evaluate the Massachusetts policy on sampling. Their policy has triggers to determine action levels. If, for example, 75 percent of the samples were below "y" value and no one sample was "x" % above an action level, then the site would not be jurisdictional. This would allow for a characterization of the site and DEM would have the ability to interpret data.

DEM mentioned the state is not homogeneous with respect to arsenic values in soil and it is important to evaluate both surface and subsurface sampling results. However, there is not a lot of variation experienced at a particular site. It is unusual to find arsenic levels that vary significantly within a site and questioned the use of statistical methodology to characterize the site. As long as no samples were greater than 7 PPM, the site is not jurisdictional for industrial/commercial reuse and averaging is not an issue.

Sampling protocols for urban fill was discussed. Dave Hazebrouck will evaluate the Massachusetts program to determine if we can use or modify this document for use in RI.

### **Environmental Land Use Restriction (ELUR) Issues**

- It was suggested that DEM was transferring the residual risk to the property owners and perhaps DEM should consider an ELUR for these properties. It was mentioned that the statement of residual risk is important and this information needs to be on record to define site conditions.

### **Issues raised that need further evaluation**

- Should residential properties be handled differently?
- The proposed policy does not require an ELUR for properties with arsenic above 0.4 PPM. There needs to be additional discussion on how to address ELUR requirements for properties that have measured arsenic values between 1.7 and 7 PPM, because a industrial / commercial zoning designation does not automatically restrict residential reuse. Dropping this requirement will be helpful in remediating the property. However, the letter that indicates a residual risk is problematical and could be considered a stigma to the property.
- DEM's policy determines soil that measures arsenic levels of less than 7 PPM to be non-jurisdictional. If there is no evidence of a release, could this material be moved off-site and would this movement of soil constitute a release.
- Under the previous policy, sites that had measured concentrations of arsenic of less than 7 PPM were required to place an ELUR on the property. Can these properties remove the ELUR's if this policy is finalized?
- If DEM is allowing soil blending as a BMP, how will DEM track this activity? What kind of sampling protocols are needed?
- Questions were raised concerning the use of sampling to determine if the residential standards were being met. Does DEM have a policy on the minimum number of samples needed to characterize a site? Do all samples need to be below 1.7 PPM or does the average need to be below this number?
- DEM should develop a policy for urban fill and how these sites should be remediated with respect to the arsenic standard.

- DEM should consider developing criteria for the elements of a background study. DEM should develop a policy for sites where background levels of arsenic are determined to be natural background, but where site average is above 7 PPM.
- Additional guidance and educational material needs to be prepared that explains the risk associated with properties that have arsenic levels above 0.4 PPM.
- Arsenic in soil can be bound up in forms that makes the material not bio-available for human uptake. Could this issue be evaluated to determine if the current risk based levels are appropriate?
- Vendors that supply “clean” fill for sites that are being remediated are reluctant to allow their material to be tested prior to delivery. It is possible for this “clean” soil to contain higher levels of arsenic than the sites being remediated. What can DEM do to remedy this situation?
- It was suggested that DEM raise the industrial / commercial standard. Therefore, if you record an ELUR limiting the use of the site to industrial / commercial one can apply the industrial / commercial standard of 7 PPM. The existing policy would remain in effect for residential properties along with the mechanism to determine the background arsenic levels at industrial / commercial sites.

There were many issues raised concerning the arsenic policy at this meeting. DEM will revise the policy, send it out for comment in late June. Depending on the comments received, DEM will convene a meeting to continue to discuss issues raised by this policy.

The meeting was adjourned and people were reminded that the next meeting will take place on June 28 and the topic of discussion will be the Brownfields program.