SRS Citizen's Advisory Board

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Facility Disposition and Site Remediation Committee

Aiken Federal Building, Aiken, SC
11/4/03

The SRS Citizens Advisory Board (CAB) Facility Disposition and Site Remediation Committee (FD&SR) met on Tuesday, November 4, 6:00 PM, at the Federal Building, Aiken, SC. The purpose of the meeting was to discuss and receive updates on Dynamic Underground Stripping Progress, Phytoremediation Update, and a draft recommendation on Monitored Natural Attenuation / Enhanced Passive Remediation.

Attendance was as follows:

CAB Members	**Stakeholders**	**DOE/Contractors**
-Perry Holcomb	Mike French	Phil Prater, DOE
Jerry Devitt	Frank Carl	Alice Doswell, DOE
-Murray Riley	Liz Goodson	Paul Sauerborn, WSRC
		M.O. Kasraii, WSRC
	Rick McLeod*	Dan Hitchcock, USFS
		Mike Griffith, WSRC
		George Mishra, DOE
		Chris Bergren, BSRI
		Michelle Ewart, DOE
		Ed McNamee, BSRI
		Paul Huber, BSRI
		Frank England, WSRC
		Karen Vangales, WSRC

Regulators
Don Siron SCDHEC

*CAB Technical Advisor
-FD&SR committee members
+Facilitator
^Press

Perry Holcomb, Chair, opened the meeting at 6:00 p.m. and welcomed those in attendance.

FD&SR Committee meeting schedule review:
Paul Sauerborn presented the schedule which listed those items the ER committee has seen to date and those items it will be reviewing for the balance of 2003. Mr. Sauerborn stated that should anyone in the public have an item relevant to the ER committee scope to please notify

him in order that he have those items reviewed and approved by the chairman of the FD&SR committee for future presentations.

Dynamic Underground Stripping (DUS) Projects:
Chris Bergren stated the purpose of his presentation to be a brief overview of the A/M area remediation, DUS first deployment results and Phase I post characterization microbiological results, and an update on the second DUS deployment. Mr. Bergren explained the remediaton history of A/M Area as follows:

- Chlorinated solvent discharges into A/M area soils totaled approximately 3.5 million pounds
- Phased remediation and characterization program has been ongoing since the 1980's. To date over 1.4 million pounds of solvents have been extracted from the subsurface
- Clean-up driven by RCRA Part B permit
- Plume containment technologies are pump and treat, soil vapor extraction and recirculation wells
- DUS successfully performed at a known source area of DNAPL's with approximately 70 thousand pounds of Volatile Organic Compound (VOC) removed

Mr. Bergren explained DUS as follows:

- Developed by Lawrence Livermore National Laboratory (LLNL) and University of California, Berkeley with DOE funding
  -Patented process
- Used to remediate free phase VOC's either above/below the saturated zone
- Does not require precise VOC location
- Greatly accelerates groundwater clean-up

How it works:

- Steam is injected by extraction wells and brought to the surface
- Electrical Resistance Tomography in combination with themocouples are used for imaging to monitor progress of heating fronts

Mr. Bergren presented the results of the Solvent Storage Tank DUS Project as follows:

- Area encompassed 1.3 million cubic feet of treatment zone targeting area of confirmed DNAPL presence
- Full operational status in September 2000
- Completed active operations in September 2001
- Phase I post-characterization activities completed in February 2003

The post characterization resulted in the following:

- The DUS technology did not sterilize the subsurface of bacteria

- DUS did effect and alter the bacterial population and physiological response of the bacterial communities of the subsurface
- There has been a shift in the portion of the bacteria able to live at temperatures greater than 60 degrees Celsius . More bacteria were able to grow at these higher temperatures than those not exposed to the DUS heating at the control sites

Mr Bergren stated that the objective of the Western Sector was part of the overall groundwater strategy within M-Area, and remove and/or destroy source term DNAPL to reduce the effort and schedule of pump and treat and vapor extraction methods. The M-Area settling basin received and estimated 2 million pounds of waste VOC's. The Western sector area encompasses 10 million cubic feet of treatment zone targeting an area of confirmed DNAPL presence. The design employs an innovative design with angled injection, extraction, and monitoring wells, with all permits secured and construction is underway. The estimated mass removal is approximately 1 million pounds of solvents.

Mr. Bergren concluded with the following milestones:

- Full Design Completed – May 15, 2002
- Drilling Started – July 17, 2003 – 75% complete
- Mechanical Contract Issued – August 28, 2003
- Steam-line mechanically complete – September 2004

Mr. Bergren stated the technology goals of the project to be:

- Aggressively remove/destroy known DNAPL source area
- Protect the RCRA cap

Mike French asked how long would it take for the heated soil to regain its normal temperature. Mr. Bergren responded by saying it is uncertain at this time to give a reasonable prediction. Murray Riley asked if the winter months would have any effect on the ground cooling. Mr. Bergren stated it would have no significant impact on the soil cool-down. Rick McLoed asked if the first DUS deployment was simply a demonstration of the process. Mr. Bergren stated no, the intent was to shut down the Soil Vapor Extraction (SVE) unit, which it did. Mike French asked if the equipment used at the first deployment would be used at the settling basin deployment. Mr. Bergren responded by saying no, the equipment will be new, because the equipment for the first deployment was furnished by the contractor. Mr. McLoed asked how many DUS deployments exist in the DOE complex. Mr. Bergren stated there were 5 known at this time, and the SRS settling basin being the largest deployment.

Mixed Waste Management Facility (MWMF) Southwest Plume (SWP) Tritium Phytoremediation Project Status Update:

Ed McNamee stated the purpose of this presentation is to provide an update on the status of the MWMF SWP tritium phytoremediation project. As an overview, Mr. McNamee stated the following:

- Tritium contaminated groundwater was seeping to the surface and draining to Fourmile Branch (FMB)
- There are multiple sources of tritium to FMB (F-Area, H-Area, C-Area, etc.), but MWMF was the largest contributor
- Tritium activities in the SWP seeps averaged 11 thousand pCi/mL. Drinking water standard for tritium is 20 pCi/mL.
- An interim measure was implemented to mitigate the discharge of tritiated groundwater from the SWP to FMB. Regulators provided an active role in the selection of the preferred Interim Measure

Mr. McNamee pointed out that the project consisted of a sheet pile dam and irrigation system constructed as a RCRA interim measure with a goal to reduce the tritium in FMB by 25%. The valve at the dam was closed in October 2000 resulting in a 60% reduction in FMB. The Phase I goal is 70% reduction in FMB. Full-scale operation of irrigation system of approximately 22 acres began in March of 2001. The operations to date is as follows:

- Irrigated approximately 33 million gallons of tritiated water
- Prevented approximately 1,450 curies of tritiated water from reaching FMB
- Approximately 90% of the irrigated water is evapotranspired
- Annual Operation and Maintenance costs of approximately 415 thousand dollars
- Original installation cost of approximately 1.4 million dollars

Mr. McNamee stated that there are currently two operational issues:

1. the 22 irrigation acres will not be sufficient during normal rainfall years to maintain the 70% Permit goal and
2. the current equipment experiences (i.e., significant clogging due to algae growth during spring and summer months)

The resolution to the issues were to install storm water drains to reduce the amount of clean water draining into the phyto pond. Based on the first six months of operation no additional irrigation field was required and a potential cost avoidance of approximately 4.6 million dollars will be realized. The project team has just concluded a low energy evaporator test and the results indicate the evaporator is 90% efficient at low flow rates and favorable temperature, humidity and wind speed. SCDHEC ahas granted a temporary authorization to run over the phyto pond for the next 6 months in order to demonstrate its efficiency over that time frame. In addition, SCDHEC has issued a new permit effective October 30, 2003 for the SWP. This states that phytoremediaton is the corrective action for tritium and that natural degradation is the corrective action for volatile organic compounds.

In conclusion, Mr. McNamee stated the following:

- Phytoremediaton is proving to be a successful method for managing tritium
- Some upgrades are planned to enhance operability of the system
- Examining new technologies to augment the phytoremediation system

Mr. Riley asked if the pond was engineered. Mr. McNamee responded in the affirmative. Mr. Devitt asked if the increase in the spray irrigation and the use of the low energy evaporators had any effect on the environmental monitoring station at the SRS. Mr. McNamee said that the change in the recorded quantity of tritium was negligible and well below any problem threshold.

Monitored Natural Attenuation/Enhanced Passive Remediation Recommendation (MNA/EPR) Recommendation Review:
Perry Holcomb led the discussion on the motion. He indicated that a presentation on the MNA/EPR had been made to both the committee and the CAB in September. Mr. Holcomb stated the motion would be presented at the November 17th combined committees meeting in Charleston, S.C. and voted on at the full CAB meeting on November 18th in Charleston.

Mr. Devitt asked if SCDHEC had a problem with the approach in the recommendation. Don Siron responded that the approach is good but not automatically acceptable by the State of South Carolina in every case. Mr. Siron stated the each case would be reviewed and if appropriate considered for MNA/EPR. Alice Doswell suggested that EPA be included on any recommendation were CERCLA sites are involved.

Public Comments:

Mr. Holcomb adjourned the meeting at 7:25 p.m.

Meeting handouts may be obtained by calling 1-800-249-8155.