Extraction from Technical Working Group Meeting Minutes of August 23, 2007

Presentation/Discussion of the CAB's proposed drill hole locations for Pahute Mesa (Genne Nelson, CAB)
Ms. Genne Nelson, a member technical consultant for the Community Advisory Board (CAB), provided a presentation on the Pahute Mesa well site recommendations prepared by the CAB. *The presentation will be archived on the TWG website.*

Bill Wilborn introduced the CAB and TWG members, and presented an overview of the CAB's well siting process. The CAB members present in this meeting are a subset of the CAB with a mix of expertise, specifically focused on the UGTA project. The CAB had submitted their well site recommendations to the DOE, which were subsequently finalizing their report for DOE. Bill Wilborn invited the CAB to the TWG meeting to present their findings and issues, and initiate a discussion that would encourage technical interaction between DOE and the CAB. The CABs attendance was to give the TWG a better understanding of CAB's general philosophy and methods behind their wellsite recommendation.

Bill advised the group that the CAB well site recommendations will be integrated into the UGTA well siting process. The integration will take place as part of the planning and development of the CAIP Addendum for Central and Western Pahute Mesa. Any and all proposed well sites, whether by the TWG or CAB, require NDEP approval.

Genne Nelson provided background information on the CAB's well siting project. There was a public meeting in January, 2000, where the DOE presented the UGTA strategy. The CAB considers this strategy to be generally appropriate. Approximately four years ago, the DOE offered the CAB the opportunity to recommend a well site on the Nevada Test Site. The CAB, DOE, and stakeholders have been meeting over the last few years to discuss the process and proposal of a well site recommendation. The CAB provides a layman's interpretation of the DOE's scientific data, as well as presenting the stakeholders' view to the DOE. One concern of the stakeholders is that the cycle of data collection, analysis and reporting takes years, and that contamination may be moving faster than the UGTA project.

The CAB's presentation included the following talking points and associated maps and graphics:

- Key Peer Review Findings
- CAB Response to Peer Review
- Primary Question from Stakeholders: *Will the UGTA strategy reveal the location of contaminants before they show up in someone's private well?*
- Narrowing the Focus – Risk-based approach
- Singled-out (location at) Western Pahute Mesa (WPM)

Genne presented the recommendations of the CAB and summarized the group's overall concerns and conclusions as determined by the geology, ground-water flow and faulting on the NTS. The CAB based their conclusions primarily on information published in support of the UGTA program. Their knowledge base relied first on products produced as part of the Death Valley regional flow model and was extended using various local studies of the geology and hydrology, and information on underground testing and local water wells. The CAB prioritized their well-siting efforts by focusing on tests greater than 200 kiloton. The Tybo test ultimately became their highest priority. The CAB conceptualized ground-water flow using contours presented in a 1996 USGS report. These contours were modified and updated based on current well data. Their conceptualization is based on the assumption that ground water flows primarily within and through the major aquifers of the area and that flow is enhanced in the direction of the major faults. Their interpretation is consistent with the USGS groundwater flow model in that flow is generally southward in the Tybo area. Their understanding of local aquifers and confining units is based on the 46 different HSUs presented in the most current UGTA geologic framework models.

The CAB currently is recommending the three following well sites to the DOE:

- CAB Well #1: Down-gradient from Well #ER-20-5#1 with the objective of intersecting a contaminant plume.
- CAB Well #2: Down-gradient, of CAB Well #1 (3,600 feet south of ER-20-5#1) to determine how far Benham contamination has moved. The CAB believes that migration would reach their proposed site by 2020.
- CAB Well #3: At the junction of the Thirsty Canyon structure and the "bench," a remnant elevated structure preserved between the two Silent Canyon and Timber Mountain calderas.

Discussion of CAB presentation

The CAB was commended for their presentation. Chuck Russell stated that he liked their method in attempting to capture uncertainty. He explained that one alternative mechanism for transporting contaminants from Benham is prompt injection, and therefore, computing groundwater velocities by simple linear projection could result in significant error. Prompt injection is the process whereby high pressures generated by a test can open up fractures in the host rock that provide a temporary pathway for transporting contaminants great distances. As pressures decline, these fracture openings begin to close halting any continued transport away from the test. The local direction of transport is highly uncertain making optimal near field citing difficult and risky. Chuck and others indicated the CAB's process and strategy echoed similar considerations put forward by the TWG.

Andy Wolfsberg commented that when you go beyond ER-20-5, you cross a major fault. He inquired whether the CAB had considered the potential effects of faults on the local water table and geology. The CAB responded by saying that the available models and data are limited and that on a local scale the information is extremely limited.

Genne stated that one of the CAB's primary goals is to help the public, especially the residents of Oasis Valley, understand the true risks associated with underground testing on Pahute Mesa. The CAB supports DOE and the TWG and realizes that the DOE is doing all that they can to understand flow and transport on the basis of a rather limited data set. The CAB reiterated their belief that interpretations based primarily on modeling have a large degree of uncertainty that can only be reduced with additional data collection,. The CAB fully supports efforts to quantify flow velocities in the Tybo area and feels strongly that these types of efforts are necessary to reassure the local residents that the strategy being followed is adequate to protect public health and safety.

Naomi questioned the CAB as to how they would respond to a well that provided no conclusive information in regards to contaminant transport. The CAB reiterated that they are fully aware of this potential and would appreciate more dialog and technical information to help improve the chances of identifying a new well that would intercept migrating contaminants immediately or at some time in the future. The CAB also stated that any well sited, whether by the CAB or by DOE, may not provide conclusive information.

Andy Wolfsberg asked the CAB whether the sole purpose for their proposed second well location was to confirm the existence of a plume. He stated that well ER-20-5 does not provide comprehensive information on transport directions or rates. The CAB responded that they thought a second location would go a long way, not only in possibly confirming transport rates and directions, but also in improving our understanding of the transport process. Andy indicated that he would like to see additional work directed at understanding the effects of fractures in flow and transport.

Ward stated that all of the objectives given for these wells may not be realized, and that the only real guarantee from any characterization well is the acquisition of geologic information. Expected hydrologic information can depend on the well penetrating fracture zones, a goal which is difficult to achive, and even when sited correctly, the completion of the well can be highly problematic. Ward stated the TWG promotes a risk-based approach—an approach that does not rely solely on meeting a single data acquisition objective.

Dave Finnegan asked the CAB how they define contamination. Genne responded that the local well owners would define contamination as the detection of any contaminant at any detection level. Genne reiterated

that the CAB fully understands that low doses can be safe in regard to human health and recognizes that natural contamination is a reality. Jeff Daniels stated that currently contamination is based on the Federal drinking water standards. Genne countered that whatever the agreement between NDEP and DOE, any contaminant traceable to NTS testing is of great concern to the local public. Most issues and many local concerns are the result of poor public relations rather than issues of health. The best way to avoid problems of perception is to establish good communications between DOE, NDEP, and the public. The group concurred.

Walter Wegst, who identified himself as a Health Physicist and CAB member, agreed that the CAB understands the concept of safe drinking water and that the presence of contaminants don't necessarily render water unsafe, but also stated that this is a hard sell to the local public. If plutonium shows up in any well, the public is not concerned as much about safe levels, as it is with whether the levels will increase and at what rate. He assured the TWG and DOE that the public doesn't want to hear a "We do not know the answer response" in reply to their concerns. Mr. Wegst stated that he and the CAB would like more geology data from these wells, and that they are not focused solely on finding contamination. He stated that the CAB is interested in knowing exactly what the bench (geologic structure) is and what effect it might have on ground-water flow. He also stated that the CAB is interested in gaining a better understanding of the Thirsty Canyon lineament, currently a structure only substantiated by gravity interpretations.

Bill Wilborn agreed that educating and informing the public often is difficult, and that public perception could hopefully be improved through the CAB by inviting them to future DOE meetings focused on developing recommendations for future well sites. Overall the DOE and CAB have similar objectives in establishing new well sites. The CAB agreed that the UGTA program has more tools and on-board technical knowledge to best evaluate and fine tune any proposed well locations. DOE is proactive and upfront in informing the public about air or water quality. For example, the DOE supports DRI in maintaining an oversight program, the Community Environmental Monitoring Program (CEMP), where they collect and disseminate near real time information on local air quality.

Walt said the CAB doesn't necessarily need their "own" drill hole, but they stand by their objectives. He reiterated that the CAB is willing to adjust their locations, but they would need help in the refinement process.

Rick Waddell provided an example highlighting the difficulty associated with locating a well to intersect a contaminant plume. He stated that a 1994 TWG committee was created to site a well (ER-20-5#1) to intersect the contaminant plume moving away from Tybo. These data were to be used to better understand the migration process. Numerous model runs were conducted to help determine the optimal location to intersect the Tybo contaminant plume. In the end, the well did intersect contaminants, but the contaminant originated from the nearby Benham event and not the Tybo event as was originally predicted.

The CAB conveyed their concern about the high degree of uncertainty in the conceptual understanding of groundwater flow from the NTS to Oasis Valley, and again stated their concern about uncertainties associated with the Thirsty Canyon lineament. Bruce Crowe stated that the Thirsty Canyon lineament is still somewhat of a mystery both geologically and hydrologically, and restated that the lineament is based primarily on gravity data and that no surface expression has been mapped or noted. Randy Laczniak stated that the location of the lineament is also based on a discontinuity in the water-level distribution and noted differences in ground-water chemistry. The group agreed that siting a drill hole to intersect the feature would be difficult. Bruce also suggested that UGTA use a range of model constructs to help refine locations for future well sites. One drill hole rarely provides sufficient data and incorporating modeling exercises to look at "what ifs" may be the more prudent approach before committing to well-site selection.

The discussion ended with the CAB expressing their appreciation to Bill and the TWG for inviting them to the meeting. The CAB fully appreciates the expertise of the TWG and would welcome any assistance in helping them improve their current proposals recommending future drill site locations.