
SUBJECT GW/VZ INTEGRATION OPEN PROJECT MEETING - MARCH 6, 2000

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FROM Michael J. Graham, Groundwater/Vadose Zone Integration Project Manager

DATE March 17, 2000

ATTENDEES

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Attendees
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NEXT GW/VZ INTEGRATION PROJECT OPEN MEETING:

Next Meeting: Monday, March 20, 2000 – 1-3 p.m.
Location: Bechtel Hanford, Inc., Assembly Room (Badging Required)
Local Call-In Number: (509) 376-7411
Toll Free Call-In Number: (800) 664-0771

MEETING MINUTES:

A Groundwater/Vadose Zone (GW/VZ) Integration Project Open Meeting was held on March 6, 2000 in Richland, Washington, at the Bechtel Hanford, Inc. (BHI) Assembly Room.

PROJECT REPORT:

WASTE DISPOSAL AND HANDLING ISSUES (Michael Graham):

I'd like to give an update on the waste disposal and handling issues that we're dealing with on the project. The first is a waste disposal issue. When taking groundwater samples around the 200 West Area where there is the carbon tetrachloride plume, we have in the past been disposing of gloves and wipes and other miscellaneous stuff by surveying it for contamination and then sending it to a solid waste landfill. That carbon tetrachloride is listed waste. We've been notified that this is an issue, and we're doing tests to determine if there's any detectable carbon tetrachloride in this refuse. Any amount of carbon tetrachloride that may have been present was extremely small and carbon tetrachloride evaporates quickly, leading us to believe that it is unlikely that any detectable amount would still be on these materials by the time they were disposed. Past tests on similar materials have determined that evaporation makes the carbon tetrachloride undetectable. Results are expected in a few days, but we don't expect anything to come of it.

COMMENT: It just goes to prove that if you pile on enough regulations, that sooner or later you'll have a "gotcha".

RESPONSE: This came to light as part of an issue raised by our folks in the field. Their concern was with disposal of possible tritium contaminated items, and this popped up. This is something you

might hear about in the near future, and I just wanted to give a heads up. I thought fact sheet would be ready prior to this meeting, but it's still being reviewed internally. (Attachment 1)

The second item is a waste handling issue. We've been storing "investigation derived waste" from our well operations in a central location, and there's some disagreement among the regulators as to whether we have an approved Waste Control Plan. Basically, it comes down to how much of the waste we are able to centralize and how much we should keep at the individual waste sites.

COMMENT: This is just an incidental point. I assume that these practices have been going on for some time.

RESPONSE: Not in this case. A new Waste Control Plan was developed last September, but apparently we didn't get the review of both regulatory agencies. Anyhow, the Waste Control Plan is being re-reviewed by the lead agencies, and we're modifying what we're doing now to go back to the more distributed process we were using previously until we get approval. This all gets really complicated from a regulatory standpoint with wells serving multiple purposes. You might be in compliance with one of the well's purposes, but not with something else.

GROUNDWATER MONITORING:

Tritium Update (Jane Borghese):

I'd like to start off with a brief update on the tritium investigation around the 618-11 Burial Ground. On February 15 we finished the sampling of 22 wells near well 699-13-3A. That's the well that returned the sample of over 8 million pCi/L (picocuries per liter) of tritium in the groundwater. We're waiting on the full analysis from the lab, but we do have all of the tritium sampling results back already. 699-13-3A is the only well returning a high reading. None of the others are out of whack from what's expected in that area. The remaining data we're getting back from the lab concerns metals and such. We don't expect any of that data to show anything unusual for that area.

QUESTION: Does this imply that the groundwater transport velocity is very low?

ANSWER: No. There's not enough data to come to that conclusion.

QUESTION: How close are the other wells? Is that the reason you can't tell?

ANSWER: The nearest is about a quarter-mile away.

RESPONSE: To know the velocity by the groundwater sampling, you'd need to know when it first hit the groundwater. That's something we don't know.

COMMENT: What we do know is that there is only one well up in the millions. The rest are consistent with the sitewide condition. It's an unknown what the plume looks like between wells.

COMMENT: The good news is that it appears localized. The bad news is that we have only one well to draw conclusions from.

QUESTION: Are the other surrounding wells sufficient to know the flow direction?

ANSWER: We know the direction of groundwater flow. This well was placed where it was to specifically monitor that burial ground. With the wells that we have now and the data they've returned, we've no other conceptual model that would indicate any source other than that particular burial ground as the source of the tritium.

QUESTION: What's the flow direction?

ANSWER: Generally toward the river. A little east by southeast.

QUESTION: The source had to originate somewhere close to where measured?

ANSWER: Right.

COMMENT: We are developing a characterization effort to get into the field to determine the extent of the contamination.

QUESTION: When something like this happens, why don't you have some sort of crude impact assessment model that, over a few days, can give an idea of significance? 8 million pCi/L sounds big, but what does it really mean in terms of impact?

ANSWER: The problem is that we don't know the nature of the plume and how much tritium is really there. Having only one well with two data points is grossly lacking to be able to work up any kind of model.

COMMENT: All the assumptions made for such a model wouldn't stand up.

COMMENT: What seemed to happen in this case is the media presented it as the sky is falling and then started looking to point fingers as to who should be punished. It just seems that if only bad news is allowed to be disseminated, that there should be something to counter it with, even if it's crude.

COMMENT: It was only a week after the first press release that we had the second press release out with the information that nothing additional had been found in the other 22 wells. This let people know that we didn't miss a major plume.

PACIFIC NORTHWEST NATIONAL LABORATORIES CRITIQUE OF OCCURRENCE REPORTING
(Gary McNair):

One of the reasons this became an issue was that we missed identifying a data anomaly (the high tritium reading). Attached is a formal critique of the events surrounding the sampling of tritium for Well 699-13-3A (Attachment 2). Pacific Northwest National Laboratories (PNNL) led the critique, but the team included members from the Environmental Restoration Contractor (ERC), Department of Energy (DOE), and the CH2MHill Group (CHG). It includes a chronology of the events and what could be done in the future to prevent it from happening again. Rather than expect everyone here to read through nine pages of critique, I've prepared some viewgraphs (bullets below).

- Key Issues Noted
 - Exceedance of Derived Concentration Guide (DCG) value for Tritium
 - Missed Data Anomaly
 - Reporting/Classification of Event

Basically, we went back in two different critique meetings and listed the events that led up to missing the data point. These were the three key issues identified. Since the exceedance of the DCG and the reporting of the event are described in the chronology, and since corrective actions for those will be handled elsewhere, this critique concentrated on the missed data anomaly.

- Summary of Tritium Sampling & Analysis for 699-13-3A

Date	Process Steps	Results (Actual)	Results (Expected)
1/6/99	PNNL requests Tritium to be added to analyte sampling list for Well 699-13-3A	Tritium is added to sampling plan for upcoming annual sampling	As Expected
1/25/99	Well 699-13-3A sampled for Contaminants of Concern and Tritium	Samples obtained and sent to Quanterra for analysis	As Expected
4/26/99	PNNL receives Tritium results from Quanterra	Results are received, verified and loaded into HEIS Database (5/1/99)	Results expected approximately 6 weeks earlier. Delayed due to logistics at Quanterra
6/99	Internal quarterly report for 1-3/99 prepared and reviewed by Tech Spec	Tritium values above MCL are flagged and trends are noted	As Expected (27 of 54 wells in area are flagged)
6/99-8/99	Tech Spec and Project Scientist responsible for area review entire area data report	Approximately 150 pages of data reviewed/analyzed. RDR's prepared for anomalies	<i>TS and Project Scientist fail to identify Tritium value as anomalous</i>
1/2000	PNNL notified by DOH of high Tritium value from HEIS Database	PNNL requests expedited sampling of well and files RDR	As Expected
1-2/2000	Well sampled and results obtained on Tritium	Multi-Contractor team assembled to develop/implement sampling plan and path forward	As Expected

By looking at the sequence of events, we analyzed when and where we might have caught it the first time. In January 1999, PNNL put in the original tritium-sampling request for 699-13-3A. The well was sampled, and the sample sent to Quanterra Analytical Services for analysis. The first bump in the normal system happened in April of 1999 when the analysis results came back about six weeks late. It was a logistical problem at Quanterra, but in the overall scheme of things was of no great consequence.

QUESTION: Is that where the tritium level of 1.8 million pCi/L came from?

ANSWER: Yes.

Basically when the data comes in from the lab, it arrives in an electronic format. We simply check it to make sure it's formatted correctly for our system and then plug it into the Hanford Environmental Information System (HEIS) database. Once it's in HIES, we start carving it up and doing our internal

analysis of the data. A technical specialist goes through the data, flags it if it's over the maximum concentration limit (MCL) for drinking water, and makes notes of any trends.

In June we bring in a research scientist that works through the data with the technical specialist and notes any anomalies. They are to file a request for data verification if anything is found to be out of line. In this case, they had to go through 150 pages of data in column format to look for irregularities. This is where the process went awry.

We went back to the analysts and asked them what they would have done if they'd noted the anomaly, and they gave the right answer. The problem is that they simply missed it.

QUESTION: They missed it as being over 20,000 pCi/L or what?

ANSWER: It was missed as an anomaly. For some areas in the west basin, a reading of over 2 million pCi/L is expected. A month ago, we would have been concerned about an anomaly in the hundreds of thousands for this location, let alone in the millions. That's the kind of anomaly were looking for. When we asked them, if they had noticed it, if they would have called it an anomaly they both said yes. We went back to see how we can cause something like this to be seen better in the future.

- Standard Review Successful in Early Stages
 - Tritium value present in quarterly data report
 - Tritium value flagged with an asterisk
 - Tritium value highlighted in yellow (value above MCL)
 - Tritium value noted as initial measurement for tritium from this well

We focused in on the process and what occurred in this instance. The number was in the data sheet sent to the analyst. It was flagged by the computer as having a tritium level of over 20,000 pCi/L. The technical specialist verified the number, highlighted it in yellow, and noted that there was no other data existing to be able to build a trend. Everything worked fine to that point. The next step was to review the highlighted data and determine which values were anomalies.

- Why Did We Fail?
 - Direct Cause
 - Personnel Error... Inattention to Detail
 - "...failure of the reviewers to recognize that the tritium value was anomalous for the location of the well..."

As a team why did we fail? It's a simple answer. We expect the scientist and engineer to wade through the volumes of data and catch what's off normal. This time they simply didn't catch it.

COMMENT: But there is no formal criteria tied to location that defines when somebody should get excited.

ANSWER: No.

COMMENT: It was mentioned in the last meeting that the alarm would have gone off at the 2 million pCi/L level, and this was just under that.

RESPONSE: That's what would have set the flags off in the HEIS database. The definition of an anomaly is different for the analysts. Size and location are both factors in determining if a reading is anomalous. At 2 million it would have been flagged as being above the DCG.

This was a simple mistake, and we could just say that the analysts should pay more attention in the future. We wanted to go further. Are we giving them the data in the best possible way?

- What Caused the Failure?
 1. What were we asking from the staff?
 2. What were we providing to the staff?
 3. Would others be likely to fail?

We went back and asked more probing questions. What were we really asking the analysts to do, and what tools did we provide to them do what we asked? Given the task and the tools provided, would it be likely that others would fail too?

1. What were we asking from the staff?
 - Identify and report anomalous (higher than expected values over time and/or space) values in recorded data

We were asking the staff to find anomalies in the data. They were to look at trends over time to see if the contaminant levels were increasing or decreasing. They were to use those values to determine if the contamination was possibly moving. They were to look at the contamination at a particular location to see if the levels were unexpected. They had to make all of those calls before something could be classified as anomalous.

2. What were we providing to the staff?
 - Too much data over too short a time
 - System where value distinction is minimal
 - Little or no aerial orientation

We were asking the analysts to look at 150+ pages of single column data on a quarterly basis and look for individual anomalies. It is too much data to analyze in too short a time. Plus, the distinctions between the data was real minimal, as you can see by looking at this slide (Attachment 3). It's the specific page from the quarterly report that contains the entry of the 1.8 million pCi/L of tritium for Well 699-13-3A. Keep in mind that this is just one of over 150 pages of data that all look pretty much just like this. It did have an asterisk for being over the drinking water standard, it was highlighted, and had a note that there was only 1 data point available for trending. There were 54 wells analyzed for tritium in this particular quarter, 27 of which were above the drinking water standard. That's exactly half. The well locations contained in the report are spread over the entire site, including the 200 area. This is what the analysts were given and expected to find any anomalies.

QUESTION: Are all the readings different wells?

ANSWER: Yes. There are a few that were sampled more than once in the quarter, but for the most part they are all different wells. They are scattered all over the map. This is the data used to map contamination contours. The analysts are given this and are expected to determine if the data is changing over time or if it is anomalous for a given location. The data on the page I'm showing is all tritium. The report contains other contaminants of concern as well.

3. Would others be likely to fail?

- Probably.

Given the tools provided, would others be likely to fail? The answer we came up with was a definite yes. In our estimation, this isn't the right set of tools or the right approach for researchers to pull out anomalies.

- Why did we fail?
 - Root Cause
 - Management Problem ... Poor Work Organization and/or Planning Deficiency
 - Defense in Depth
 - Allocation of Resources
 - Roles and Responsibilities

Going back to why we failed, the main reason is simply we missed it, but if there had been a little better work organization or planning and the analysts had the right tools, then there would have been a better chance to be successful.

The allocation of resources could have been better as well. A single guy looking at 150 pages of data in a short period of time isn't the best system. Also, there's not a defined set of what an anomaly actually is and who you tell when you find one. The roles and responsibilities need to be better defined.

- Defense in Depth
 - Design of system provided only a single process step for early identification of data anomalies.
 - Relied solely on ability of reviewer to identify anomalies from lengthy and detailed columnar data display.
 - Insufficient planning was performed to define an appropriate "defense in depth" approach.

The quarterly analysis stage is the only place this can be caught initially, then when the data is put onto a plume map would be the next chance. In this case that was almost a year later. There's a single failure point for this process. In this case that point broke that and there was no backup.

QUESTION: What about the way the information is displayed? It seems like there might be room for more columns. It seems like it would be difficult to assign meaning to column after column of numbers. Isn't there a way to clump wells in certain areas together?

ANSWER: Yes, in fact we're working on how to present the data in different ways for next time.

- Corrective Actions
 - By 3/30/00 additional data reports will be prepared:
 - Data reports will be prepared/reviewed for new wells and/or constituents. This report would

contain constituents/wells with three or fewer measurements. Expected value ranges would be determined prior to sampling.

- Data reports will be prepared in which the highest (10-15) values for major constituents, for the time period, are reported in descending order.
- Data will be delineated with commas and alignment of decimal points for ease of review.
- Plume Data will be posted and reviewed on quarterly basis. Data will be represented as circles of varying size/color for easier discrimination.
- Automated screening processes will be implemented.

We're working on different ways to slice up the data in the future and will have something to that end by the end of this month. A few things stood out. New wells and new constituents will be handled differently. In that case we'd draw those out and look at those more closely. Every time we had new wells and new constituents we'd establish what we would expect their results to be beforehand. Secondly, we'd take the list and pull out the highest values for the major constituents and look at those for certain areas. Third, the report comes out so that the data is not really well defined inside the columns. We'll start printing the data with comma delineated. We'd prepare plume maps on quarterly basis with the new values, instead of doing it yearly. It would give us one more shot to identify anomalies. Additionally, we'll implement an automated screening process. We feel that we need three to four layers of defenses rather than the single layer we have currently.

- Allocation of Resources
 - Review performed quarterly and required the reviewer to note single value anomalies from within a listing of ~150 pages of columnar data
 - Insufficient time for review of data increases likelihood that data will not be recognized as significant or anomalous.
- Corrective Actions
 - By 3/30/00 additional data reports will be prepared on a biweekly/monthly schedule, as determined by project manager, rather than quarterly.

The allocation of resources was a problem. We waited until the data had piled up for a quarter. Then we gave the analysts 150 pages of raw data and asked for a quick turnaround. Reports will now be prepared on a biweekly or monthly basis. This would give the analysts a reduced set of data and allow for better focus.

- Roles and Responsibilities
 - Project failed to note specific roles and responsibilities for staff members involved in review of sampling analyses.
 - No documentation was in place to define actions to take when anomalous data were noted.
- Corrective Actions
 - By 3/30/00 roles, responsibilities and actions that should be taken following identification of anomalous data will be documented and distributed to affected staff.
 - By 4/30/00 interface responsibilities for utilization and dissemination of data between projects will be defined and documented.

The definition of roles and responsibilities for staff was lacking in this process. By the end of this month we'll disseminate to staff their responsibilities and the actions that should be taken following identification of anomalous data. By the end of April, we'll get out a project-wide specification. This second item deals

more with sharing of data across project lines. We need to recognize that what the Groundwater Monitoring Project is doing could affect the work of the Remediation Project, or vice versa. For example, maybe there's water being sprayed by one project that affects the reading another project is taking. We'll have a matrix of that ready by the end of April.

- Lessons Learned
 - By 6/30/00 a “lessons learned” paper will be developed and issued. This paper will report on lessons learned from this incident that would be applicable to other scientific measurement processes/programs.

This isn't just germane for only this type of report or annual, but it is applicable across the DOE complex. There's monitoring going on elsewhere for plumes that have been there for 30 years. In most cases things don't change much. We're not dumping any more and infiltration is controlled. Most of the monitoring consists of just going back and taking a look every so often. The issue is how highlight possible anomalies and present it in such a way to keep a researcher from getting bored and not seeing an anomaly when one pops up. We'll take our lessons learned, see where else they might apply, and see what we could do to make them useful to other programs.

QUESTION: Was this an open process?

QUESTION: Were there any regulators on the criteria team? There don't appear to be any among the names listed.

ANSWER: No, there weren't any regulators on the original team. We have discussed this with Senator Wyden's office due to their interest in things happening out this way. The idea was to send this out as our review and criteria of the process. It's not a finalized document. It's still open. We decided to use this Open Project Meeting as our vehicle of sending it out.

QUESTION: Have Ecology or EPA indicated if they're satisfied with the critique?

ANSWER: This is the first presentation of the critique. They're seeing it for the first just as you are.

QUESTION: Will you be presenting this to the Hanford Advisory Board (HAB) Environmental Restoration (ER) Committee?

ANSWER: We have time scheduled on the agenda for the HAB-ER Committee March 14 meeting.

QUESTION: Ecology would like you to come over and give us a presentation.

ANSWER: We'd be more than willing to do that. I (Gary McNair) will get with you (Dib Goswami) to schedule something.

QUESTION: Is EPA similarly involved?

ANSWER: I'll invite EPA also.

QUESTION: Four or five years ago, a fellow developed database software package that could go into HEIS and split the data into well plots. This was something that Ecology recommended DOE buy, but it never was due to budget considerations. Would this incident be something that could be used to push the site management board to authorize getting similar data management packages for scientists?

ANSWER: I'm not sure of the specific package you're referring to. Ron Smith of PNNL talked as part of the critique about a package like that which was developed locally. It's part of looking at better packages to display the data. I would think that the short answer to your question is yes, it opens up possibilities. We're trying to open the door to maintaining consistency.

COMMENT: One would hope that all of the talk turns into action.

RESPONSE: The basic structure is simple. It's just a matter of doing it. The system needs to be upgraded to be up to doing the job. Trends need to be better identified.

COMMENT: That wouldn't have helped here since there was no trend to be identified.

COMMENT: You can find anything you want if you set things up to look for it. The issue is knowing what you want to find.

DISCUSSION OF M-24 MILESTONE:

A Change Control Form was signed and delivered to Wade Ballard of DOE-RL by Ecology on Friday concerning the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Milestone M-24. It identifies 19 Resource Conservation and Recovery Act (RCRA) compliant wells that need to be constructed in Fiscal Year 2000 (FY00) in order meet the M-24 milestone. These wells breakdown as follows: 5 in the Single Shelled Tank (SST) T Waste Management Area (WMA), 5 in the SST TX-TY WMA, 6 in the SST S-SX WMA, 1 at the U-12 Crib, and 2 at the Low Level WMA. Those are the wells needed to be constructed in FY00 both to meet the M-24 Milestone and to fill in key data gaps for characterization. We (Ecology) will be putting in at least one additional Change Control Form identifying wells needing to be constructed in FY01 through FY04. The reason is that the monitoring system is not up to snuff to be able to detect contaminants from specific units, such as specific tanks in the 200 Area.

QUESTION: I'm curious. It sounds like a legitimate concern that's RCRA driven, but how does this interact with development of a sitewide system model? The system model says we need data here, here, and here. RCRA says put wells here, here, and here. Who has the final word? How do the two work together?

ANSWER: Ecology looks at the RCRA wells from the aspect of sitewide need.

COMMENT: Sitewide data needs to be integrated.

QUESTION: I'm a little foggy what RCRA calls for. The law says "we want a well here." Can that be done without regard to the total system?

ANSWER: No, it looks at the total system.

QUESTION: Don't you really mean that these well are to be constructed in Calendar Year 2000 (CY00) and not FY00?

ANSWER: That's correct. I should have been saying CY00.

COMMENT: Just to let you know, Ecology has undergone a pretty good DQO process for these wells. There is a real need for these wells regardless of the M-24 Milestone.

QUESTION: Was this DQO done solely by Ecology or was DOE involved?

ANSWER: It was a joint DQO.

COMMENT: We each came with our ideas of where wells should be. That's the easy part. The hard part is finding the money for constructing these wells. Each well costs approximately \$150,000 to \$200,000 each. It's going to come down to what work will have to be turned off in order to free up the money.

QUESTION: Have you provided the CHG with a copy of this Change Control Form?

ANSWER: A copy was given to the RPP and they'll pass it on.

RESPONSE: A summary was given to CHG over the weekend.

QUESTION: Where's the funding for this coming from? Will it be the Office of River Protection (ORP) or the Groundwater Program?

ANSWER: That's still under discussion.

QUESTION: Is there a potential that something else will need to be sacrificed?

ANSWER: Of course. That's almost a given. There's no additional money coming in for this. It's going to have to come from someplace where money has already been allotted.

ENVIRONMENTAL SURVEILLANCE AND MONITORING PUBLIC FORUM:

This Thursday there will be an Environmental Surveillance and Monitoring Public Forum at the Tower Inn in Richland. It will cover Columbia River monitoring and groundwater monitoring results here at Hanford. There will also be some poster presentations. This was a new item to our calendar and we just wanted to give a heads-up.

RIVER PROTECTION PROJECT ASSESSMENTS (Michael Graham):

The DQO process for the drilling in the B-BX-BY Area is being kicked off today. That's actually why I'm delivering the update for the RPP instead of Tony Knepp. He's in those meetings right now.

Another thing happening in terms of RPP activities is the test drilling for the slant borehole at SX-108. That started today. The test rig is about actually about 400 yards from the S-SX Tank Farm. This gives us a chance to check out the technology, as well as get some readings on moisture and other soil properties in

that general area. We try to take full advantage of any work in the field, so there are some science and technology (S&T) tests going on in conjunction with the rig testing.

QUESTION: Is this drilling under the tank farm?

ANSWER: Not yet. This is just a dry run of the equipment and the technique. We want to know what to expect before we actually get under the tank. That way if there's something in the process that we didn't anticipate, we'll identify it now without affecting the tank. We definitely don't want to rupture the tank. This gives us a chance to measure the seismic effects and things like that.

REGULATORY PATH FORWARD WORKGROUP UPDATE (Moses Jarayssi):

In the last Regulatory Path Forward Workgroup Meeting (February 16) we talked about the 100 Area Source Units with the regulators and contractors. This was one of the better meetings to date in my opinion. We stayed focused on the objectives of the meetings and got down to the bottom of issues. All of this will be added to the 100 Area endpoints discussion. We talked about several hot topics, an example being the issue of data collected by remedial actions (RA) as they do their work. There are huge amounts of data to be obtained throughout the cleanup process that can be used to verify assumptions and check model runs. We need to get a meeting between the SAC and RA people, among others, to see how to collect and make use of this data.

Another issue was final versus interim cleanup. We're now working under interim Records of Decision (RODs). What does it take to move from interim to final mode? Another issue is the way regulations are written and implemented, particularly Model Toxic Control Act (MTCA). We talked about success measures for 100 Area cleanup, even going so far as to say that the regulations might need to change. We talked about how to measure the effectiveness of the pump-and-treats, and if they're determined ineffective, when do we have enough to say stop and spend the available money on developing new technologies instead? This all will be put into the final report on the 100 Area later this month.

QUESTION: Isn't there a workshop coming up on this topic soon?

ANSWER: On March 13, the HAB is sponsoring a 100 Area workshop. That's the day before their regular HAB-ER Committee meeting.

QUESTION: Will people from the Integration Project be in attendance?

ANSWER: Yes.

QUESTION: What's the difference between the two groups?

ANSWER: The meeting held on February 16 was broader in scope. The workshop upcoming on March 13 is concerned with 100 Area risk assessment.

QUESTION: How do you bring these two together?

ANSWER: We're waiting to see how exactly we can link them together.

COMMENT: One issue is the determination of a risk view to radiological contamination. It's not clear in MTCA. We're hoping to come to a reconciliation between the stakeholders, DOE, and the regulators of what we can use. That's not something that's defined currently.

COMMENT: The workshop in March before the HAB-ER Committee meeting is looking at specific individual waste sites.

CNBC DOCUMENTARY ON HAZARDOUS AND RADIOACTIVE WASTE HANDLING:

There will be a documentary on hazardous and radioactive waste handling airing on CNBC on March 11 at 12:30 p.m. (PST). It will include the use of In-Situ Reduction/Oxidation (REDOX) Manipulation (ISRM) at Hanford. Last fall Ed Berkey was out here doing some bits on the ISRM work. We originally thought it would be on the Discovery Channel, but I guess CNBC was the higher bidder.

GROUNDWATER MONITORING ANNUAL REPORT FOR FY99:

The Groundwater Monitoring Annual Report for FY99 is now available on the internet at <http://hanford.pnl.gov/groundwater>. Hardcopies should be available in a couple of weeks.

There's also been a personnel change in the Groundwater Monitoring Project that you might want to be aware of. Steve Kowall has moved to Idaho to work with the Idaho National Engineering and Environmental Laboratory (INEEL). Stuart Luttrell will be acting in his stead through the end of month. John Proctor will be taking over as the new project manager in about two weeks.

INTEGRATION PROJECT SEMI-ANNUAL REPORT (Dru Butler):

I just wanted to mention that the Integration Project Semi-Annual Report is available. It's been circulated to the Senator Wyden and the rest of the congressional staff, and is now ready for general release. If you'd like a copy, it can be obtained from the Integration Project website at <http://www.bhi-erc.com/vadose> in the General Information section, or call Gary Jewell at (509) 372-9192 to request a hard copy.

QUESTIONS AND COMMENTS:

COMMENT: In January you handed out a Project Schedule that outlined deliverables and milestones. It was helpful to me at least as a guideline of things that should be covered.

RESPONSE: We'll be sure to provide that at future meetings.

QUESTION: I have a question about the tritium issue. Is the SAC Rev. 0 going to be the first opportunity to do quick and dirty impact analysis for something like this? When will there be that capability?

ANSWER: The capability exists now and would probably only take a couple of days to do something rough, but that's not the problem. The problem is that there's not sufficient data to do any kind of assessment in this case. Having only data from one well with only two data points a year apart isn't sufficient.

QUESTION: If you had better, more abundant data for a specific situation, then you'd do something like that?

ANSWER: Sure. What the SAC would do is give the overall sitewide picture. That's the capability we're lacking right now. I wasn't saying that we wouldn't do it if it were feasible. I was just saying that one well and two data points simple isn't enough data.

COMMENT: We need to monitor the location carefully and get more data over time. We need something more than just one source of data. It's entirely possible that the contamination's been there a very long time, and we just didn't see it until we specifically looked for that particular contaminant.

COMMENT: The TV didn't give the impression that this was all harmless.

RESPONSE: TV has a tendency to sensationalize. Part of the issue is how you effectively communicate to the public the magnitude of contamination. One thing that we rely on is the drinking water standard. Sometimes when dealing with the press, you deal with reporters without a lot of experience in this kind of thing. Four hundred times the standard sounds huge.

COMMENT: It was presented as don't drink the water anymore and the sky is falling, rather than this identifies something that we need to look at and monitor closely.

QUESTION: What was the feedback from Congress on the Semi-Annual Report like, specifically the response from Wyden's office?

ANSWER: We talked to Wyden's staff and the response was very positive. We also got some very good comments from senior folks back at DOE Headquarters.

QUESTION: Have you gotten any informal feedback from the Integration Project Expert Panel (IPEP) from their last session?

ANSWER: We haven't gotten any feedback from the IPEP since the meeting closeout presentation. We know they're working on a official report, but we haven't seen or heard anything yet

QUESTION: Can we have a minute or two in each of these meetings to cover SAC model development?

QUESTION: You want to discuss that each meeting?

ANSWER: For just a minute or two.

ANSWER: Sure. We could do that.

UPCOMING EVENTS AND OPPORTUNITIES FOR PARTICIPATION:

See attached calendar (Attachment 4).

NOTES:

GW/VZ Web Site location: <http://www.bhi-erc.com/vadose>

If you have questions or comments please contact Dru Butler (509-375-4669), Gary Jewell (509-372-9192), or Karen Strickland (509-372-9236)

ATTACHMENTS:

- 1) Waste Issue Fact Sheet
- 2) PNNL Critique of Tritium Sampling Process
- 3) Copy of page from Quarterly Report showing high tritium value
- 4) GW/VZ Integration Project Two Month Look Ahead Calendar

ATTENDEES:

Jane Borghese – BHI
Dru Butler – BHI
Dib Goswami – Ecology
Mike Graham – BHI
Dave Holland – Ecology
Mike Hughes – BHI
Moses Jarayssi – BHI
Gary Jewell – BHI
Stan Leja – Ecology

Stuart Luttrell – PNNL
Katy Makeig – SMS
Fred Mann - FDNW
Gary McNair – PNNL
Gordon Rogers – HAB
Steve Sautter – BHI
Mike Thompson – DOE-RL

Attachment 1

WASTE ISSUE FACT SHEET

This fact sheet is a follow-up to earlier conversations regarding review of the waste handling practices related to groundwater monitoring.

During a self assessment conducted in February, Bechtel Hanford, Inc. (BHI) determined that non-radioactive miscellaneous sampling wastes were being managed as solid waste, and had been transported off the Hanford Site and disposed of in permitted Subtitle D landfills. This practice was stopped and a full examination of the situation is under way.

There is no health risk associated with this waste. The activities that generated this waste included groundwater well sampling, maintenance, drilling and water level measurements.

The waste consists of items such as wipes, surgical gloves, 5 micron filters, stickers, and tape. Prior to 1995 this waste was managed on the Hanford Site. The Richland Landfill received this waste from 1995-1998, the Roosevelt Regional Landfill received this waste from 1998 until mid-February 2000.

The total amount of waste transported off-site is still being determined. The current estimate is 325 pounds per year since 1995.

A regulatory review of this situation to determine which rules apply has resulted in the following determination. Some of the groundwater on the Hanford site is contaminated with carbon tetrachloride (a volatile organic). This groundwater is managed as a listed waste in accordance with the Washington State Dangerous Waste Rules (WAC173-300). The waste stream of gloves, wipes, etc., may have come in contact with this groundwater. By definition any material that comes in contact with a listed waste may also need to be considered listed waste, and therefore managed as a dangerous waste. Dangerous waste generated on the Hanford Site is managed on site.

It is expected that little or no carbon tetrachloride would be present in the waste that was shipped offsite. Past tests on similar materials have determined that carbon tetrachloride was undetectable and evaporates quickly. New tests are underway on materials identical to those disposed of offsite to verify the earlier findings. Results from these tests are expected in a few days. We will continue to status you on our progress and share information with you as we collect it.

As mentioned in initial conversations, the Owners/Operators of the Solid Waste Facilities were notified last week. The regulatory agencies, including those with regulatory authority for solid

-more-

waste management, were also contacted. The same information was conveyed to all of those contacted.

Information in summarized form will be provided to interested stakeholders and the public. This summary is attached. As new information becomes available, you will be informed. If you have questions, contact Julie Atwood at (509) 372-9343.

Attachment 2

**Critique – High
Tritium Levels in Well
699-13-3A
FEBRUARY 16, 2000**

CRITIQUE LEADER:
Ron Smith

FACILITATOR:
Larry Cassaza

ATTENDEES:
Mary Ace
Taffy Almeida
Jane Borghese (CHI)
Steve Cooke
Joe Devary
Evan Dresel
Lynn Eberhardt
Mike Fullmer
Marv Furman (DOE)
Michael Graham (ERC)
Ron Hall

George Henckel (ERC)
Jan Jaeger
Stan Jones
Steve Kowall
Stuart Luttrell
Gary McNair
Tom Page
Joanne Rieger
Byron Robertson
Karla Smith
Ron Smith
John Trevino (DOE)

Critique Process Description

This critique was performed in accordance with the SBMS Subject Area, Critiques. The general process was as follows:

- Establish a chronology of events (time line).
- Gather any relevant facts associated with the event.
- Establish the direct cause, any contributing causes and the root cause of the event.
- Determine corrective actions needed to preclude recurrence of this event.

Event Summary

Well 699-13-3A was sampled on 1/25/1999 and analyzed for tritium. The result, 1,860,000 pCi/L, was received by PNNL, passed through the verification checks, and entered into the HEIS database on 5/1/1999. Although below the Derived Concentration Guide for tritium, the result was higher than expected. The routine PNNL technical evaluations of the datum failed to identify this value as anomalous. As a result, DOE and Hanford’s Environmental Restoration Contractor (ERC) were not notified of the high tritium concentration in a timely manner.

Well 699-13-3A was again sampled by PNNL’s Hanford Groundwater Monitoring Project on 1/27/00 and analyzed for tritium. The result was 8,140,000 pCi/L, which exceeds the Derived Concentration Guide (DCG) for tritium of 2,000,000 pCi/L.

NOTE: There are three key issues associated with this event: (1) The exceedance of the DCG value for tritium, as described in the second paragraph of the Event Summary; (2) The missed data anomaly, as described in the first paragraph; and (3) The issues that occurred as part of reporting/classification of this event. The first and third issues are described in the Event Summary and Chronology, but corrective actions will be handled by separate multi-contractor groups. This review will, therefore, be focused primarily on issue #2.

Reference Documents:

ONC Log Book Notes (Copy)

Chronology

- 1995 Well 699-13-3A, located immediately down gradient of burial ground 618-11 was drilled and analyzed for the contaminants of concern, which were negotiated with the regulatory agencies (metals, gross alpha and beta, and uranium). Well 699-13-3A has been on an annual sampling and analysis schedule since that time. Burial ground 618-11 is located northwest of Energy Northwest.
- 1/6/99 PNNL examined the sampling schedule at burial ground 618-11. PNNL added tritium to this analyte sampling list to better delineate the spatial distribution of a low concentration region of the site-wide tritium plume and to document groundwater quality upgradient from the Energy Northwest facility.
- 1/25/1999 Well 699-13-3A was sampled for the contaminants of concern and tritium.
- 4/26/1999 PNNL received the tritium analysis from Quanterra Analytical Services.
- 5/1/1999 The data package was QA/QC verified and loaded into the Hanford Environmental Information System (HEIS) Database.
- 6/11/1999 The internal PNNL January-March quarterly summary report of all data collected between 1/1/99 and 3/31/1999 was prepared and reviewed by a PNNL technical specialist. Water samples from 54 wells in the “surveillance central” area were analyzed for tritium and included as part of the data summary for that time period. The report automatically flagged each tritium analysis that equaled or exceeded 20,000 pCi/L (maximum concentration limit (MCL) for drinking water) with an asterisk; 27 (or half) of the analyses were so flagged. The technical specialist then examined the data and highlighted with a yellow marker all flagged data and evaluated the trends for all tritium data. The trends were plotted and the trend noted on the report as an “up-arrow“, “down-arrow”, or an “OK” if the trend had not changed. The datum in question was included in this report, flagged with an asterisk indicating that it exceeded the MCL, highlighted in yellow by the reviewer, and a note indicating “only 1 data pt.” was hand written beside the value, indicating that no trend could be identified.
- 6/11/1999 to 8/19/1999 The technical specialist and the project scientist (responsible for oversight of the “surveillance central” area) reviewed the data report with the notes described above and the trend plots. At this time, the technical specialist and project scientist failed to identify the datum as anomalous.
- 8/19/1999 The internal PNNL quarterly summary report for January-March was issued.
- Fall 1999 The Project instituted bi-weekly data reviews for site-wide data similar to procedures in place for RCRA sites.

- 09/1999 ERC accessed the HEIS database for Well 699-13-3A. Evaluation of data was required to support annual update of 300-FF-2 Limited Field Investigation (LFI).
- 12/1999 PNNL began questioning the anomaly of the high tritium level for Well 699-13-3A in its annual review, after the datum was added to an aerial map.
- 12/8/1999 A letter report (Annual 300-FF-2 Groundwater Sampling Results for FY99) was prepared by ERC including evaluation of Well 699-13-3A groundwater sample results. The high tritium value was noted and attributed to migrating tritium from Hanford’s 200 Area. Tritium is not designated as a contaminant of concern for 618-11 burial ground.
- 1/18/2000 At a Unit Manager meeting, the Department of Ecology notified DOE of the high tritium level in the HEIS database. No DOE communication with PNNL occurred regarding the issue brought up by the Department of Ecology.
- 1/24/2000 Department of Health inquired with PNNL about high tritium value in Well 699-13-3A. The decision was made by PNNL to move up the routine annual sampling date of Well 699-13-3A.
- 1/24/2000 PNNL staff submitted a request for data review (RDR) to Quanterra Analytical Services on the anomalous data point.
- 1/25/2000 The data review was completed by Quanterra Analytical Services and no problems were noted with previous analytical work. It was also noted that some of the original sample material was available so it was submitted for re-analysis.
- 1/27/2000 Well 699-13-3A was sampled a second time as part of the annual cycle.
- 1/28/2000 The second sample was screened prior to shipping to Quanterra for analysis. The screen results detected ~4,000,000 pCi/L of tritium in the sample. ERC initiated the Off-Normal Occurrence (ONO) process, but a report was not filed. ERC informed DOE of the sample screen results.
- 1/31/2000 Re-analysis results of the original sample material (sample taken on 1/25/99) were received from Quanterra and were within 4% of original results.
- 1/31/2000 A multi-contractor meeting was held and DOE was notified that the 1.8 million pCi/L results were accurate. DOE requested PNNL to start the Off-Normal Occurrence process as a Management Concern as it was considered a newsworthy event even though the results had not breached the Derived Concentration Guide.
- 2/1/2000 1040 hrs PNNL project staff called 375-2400.
- 2/1/2000 1100 hrs PNNL occurrence classifier was notified.

2/1/2000 1230 hrs Event classified by PNNL as Off Normal Event, Management Concern 10(C) A.13. The PNNL Event Classifier reclassified the event as 2.A, Environmental-Radionuclide Release and recommended that event be categorized as an Abnormal Event. The ONC chose not to categorize the event as an Abnormal Event.

2/1/2000 1300 hrs DOE STO notified.

2/2/2000 Preliminary tritium results on second annual sample were received from Quanterra Analytical Services reading 8,140,000 pCi/L.

2/3/2000- 0525 hrs PNNL submitted the official Notification report to DOE via ORPS.
2/3/2000- 1156 hrs ONC issued Abnormal Event report in accordance with HFID 232.1B.

2/3/2000 - 2/4/2000 Sampling plan developed to further analyze high tritium value and to evaluate the extent of the tritium contamination.

2/7/2000 Field sampling initiated to further evaluate the tritium results for Well 699-13-3A as well as others in the area.

2/7/2000 First critique of the event was held.

2/8/2000 Screening results from field samples received.

2/14/2000 Partial tritium results received. Remaining radionuclide analyses are still in progress. Well 699-13-3A is the only well showing higher than expected levels of tritium.

2/16/2000 A second critique of the event was held.

Relevant Facts

1. The process to sample Well 699-13-3A in January 1999 and load the data into HEIS took 14 weeks. Normally this process takes only 7 to 8 weeks with 6 weeks allowed to perform laboratory analyses. The approximately 6 week delay in loading the value into HEIS was caused by schedule delays at Quanterra, particularly in analyzing tritium levels.
2. When the technical specialist and project scientist reviewed the FY99 second quarter summary report, the anomalous data was not noted. Therefore, no requests for data review (RDRs) were filed on any of the tritium results including the measurement from Well 699-13-3A. An RDR would have been expected at this time if an anomalous result had been noted.
3. The standard process expectations are as follows:
 - The elevated tritium datum should have been identified as anomalous at the time the technical specialist noted that “only 1 data pt.” existed or when the technical specialist and project scientist reviewed the data report and trend graphs shortly afterwards.

- Identification of this anomaly should have caused staff to question the reliability of the laboratory result and file an RDR. 1
 - The RDR would start the laboratory checking their records for errors and, on finding no analytical or calculational errors, PNNL would request a reanalysis on a 15-day normal reanalysis schedule.
 - The reanalysis result (if affirmative) would prompt the well to be sampled and analyzed on an expedited turnaround response.
 - The elevated tritium level would be confirmed and would prompt a multi-contractor meeting with DOE to establish a path forward.²
4. Standard project expectations for evaluating the data were followed and successfully performed up to the point at which the datum failed to be identified as anomalous. To reiterate:
- the value was present in the quarterly data report,
 - the value was flagged with an asterisk,
 - the value was highlighted in yellow showing that the reviewer recognized that the datum was flagged as being over the MCL, and
 - the reviewer noted that the datum was the initial measurement for tritium at well 699-13-3A.
5. One project scientist was responsible for the data review of a large area with many wells and data.
6. The significance of groundwater data is more easily understood by displaying the data spatially. This was done for the annual review in 12/99, at which time the anomalous datum was questioned (but no immediate action taken).
7. Data QA/QC Verification Process includes:
- Receive data from Quanterra (electronic and hard copy).
 - Check data for completeness.
 - Load electronic data file into HEIS database.

Causal Analysis

Direct Cause:

3. Personnel Error
 - a. Inattention to Detail

The direct cause of the failure to report the anomalous data in a timely manner is the failure of the reviewers to recognize that the tritium level was anomalous for the location of the well. Both reviewers stated that if they had recognized the high tritium value as an anomaly, they would have immediately started the RDR process described in the previous section.

1 An RDR was filed on January 24, 2000 requesting an expedited reanalysis. The datum was deemed valid within 5 days.

2 This actually happened in early February 2000 when a sampling and analysis plan was developed and executed.

Root Cause:

6. Management Problem
 - b. Work Organization/Planning Deficiency

The project had overall work organization and planning deficiencies as detailed below:

- 1) ***Defense in Depth*** ... Design of review process provided only a single process step for early identification of data anomalies. The process relied solely upon the reviewers' ability to identify anomalous data from a lengthy and detailed columnar listing of data. Insufficient planning was performed to define a "defense in depth" approach toward data analyses.
- 2) ***Allocation of Resources*** ... The review process was performed on a quarterly basis that required the reviewer to note single value anomalies from within a listing of approximately 150 pages of columnar data. Because the individuals responsible for the "surveillance central" area were also responsible for all general data and interpretation, they may have taken insufficient time to review the data, increasing the chance that the datum went unrecognized as being significant or an anomaly.
- 3) ***Roles and Responsibilities*** ... The project failed to note specific roles and responsibilities for staff members involved in review of sampling analyses. No documentation was in place to define actions to take when anomalous data were noted.

Corrective Actions:

The overall project review process is not greatly flawed; some easily incorporated modifications can improve the process to eliminate the deficiencies identified above. The corrective actions corresponding to the identified deficiencies are described below:

Defense in Depth

A series of actions will be implemented to assure future reviews adequately highlight future anomalous data and provide multiple defense in depth cross-checks for completeness.

1. On or before 3/30/2000, the Project Manager will assure that data reports are being prepared in a manner that has all values delimited by commas and the decimals aligned. This will help distinguish relative size of reported data.
2. On or before 3/30/2000, the Project Manager will assure that an additional data report is being prepared in which new wells and constituents are reported. The report will include constituents from wells with three or fewer measurements and trends not readily apparent. A DQO-like process will be established to determine a range of expected values prior to new well/constituent sampling.
3. On or before 3/30/2000, the Project Manager will assure that periodic data reports are being prepared in which the highest (10 or 15) values for the major constituents, for the time period, are reported in

descending order. This will highlight high values across the site for all major constituents.

4. On or before 3/30/2000, the Project Manager will assure that on a quarterly basis plume data is being posted and reviewed on the previous year's plume maps. Data will be presented as circles of varying color and size with the brightest color and largest size applied to the highest concentrations.
5. On or before 6/30/2000, the Project Manager will implement appropriate automated screening tools to aid in the detection of anomalous data values for sensitive wells and/or constituents.

Allocation of Resources

1. On or before 3/30/2000, the Project Manager will assure that primary data reports (1-3 described above) are being prepared on a bi-weekly (1&2) or monthly (3), rather than quarterly, basis. This will reduce quantity of data being reviewed at any given time.

Roles and Responsibilities

1. The Project Manager on or before 3/30/2000 will document and distribute to affected staff roles, responsibilities and actions, which personnel should take for identification of anomalous data including notification actions.
2. On or before 4/30/2000, the Program Manager will work with the appropriate management and staff within the GW/VZ Integration project (and associated core projects) to define/document interface responsibilities for utilization and dissemination of data between projects.

Lessons Learned

The Program Manager will develop/issue to appropriate management and staff a lessons learned discussion paper prior to 6/30/00. This paper will report a series of lessons learned from this incident that should be applicable to other scientific measurement processes/programs within the Laboratory.

Attachment 3

Copy of page from Quarterly Report showing high tritium value

QUARTERLY REPORT

SAMPLE DATE PERIOD: 1/1/99-3/31/99

CONSTITUENT	SHORT NAME	METHOD NAME	GRDT	WELL	SAMPLE DATE	SAMPLE NUMBER	F	OWNER	RESULT	MDL	MCL	UNITS
Tritium	TRITIUM	906.0_H3_LSC	ND	299-W18-33	2/23/99	B0TPY3	N	PNLW	GW	231	20000	pCi/L
			ND	299-W19-16	1/20/99	B0T839	N	PNLW	GW	272	20000	pCi/L
			ND	299-W19-3	1/11/99	B0T851	N	PNLW	GW	133	20000	pCi/L
			ND	299-W19-42	2/22/99	B0TNW4	N	PNLW	GW	249	20000	pCi/L
			ND	299-W19-9	1/6/99	B0T847	N	PNLW	GW	373	20000	pCi/L
			ND	299-W22-42	3/15/99	B0TXH7	N	PNLW	GW	47400* OK	20000	pCi/L
			ND	299-W22-46	3/3/99	B0TNC3	N	PNLW	GW	34100* ↓trend	20000	pCi/L
			ND	299-W23-15	3/4/99	B0TNR7	N	PNLW	GW	13700 ↓trend	20000	pCi/L
			ND	299-W23-9	3/16/99	B0TWD4	N	PNLW	GW	262000* OK	20000	pCi/L
			ND	299-W27-1	1/6/99	B0TD47	N	PNLW	GW	193	20000	pCi/L
			ND	299-W6-10	2/17/99	B0TMV4	N	PNLW	GW	49400* ↓trend	20000	pCi/L
			ND	499-S0-7	1/12/99	B0TD62	N	PNLW	GW	16700	20000	pCi/L
			ND	499-S0-7	2/11/99	B0TR21	N	PNLW	GW	20200*)OK	20000	pCi/L
			ND	499-S0-8	1/12/99	B0TD58	N	PNLW	GW	4790	20000	pCi/L
			ND	499-S0-8	2/11/99	B0TR27	N	PNLW	GW	4640	20000	pCi/L
			ND	499-S1-8J	1/12/99	B0TD60	N	PNLW	GW	4210	20000	pCi/L
			ND	499-S1-8J	2/11/99	B0TR19	N	PNLW	GW	4380	20000	pCi/L
			ND	699-10-54A	3/8/99	B0TPX0	N	PNLW	GW	-80.8	20000	pCi/L
			ND	699-13-3A	1/25/99	B0TLK3	N	PNLW	GW	1860000* only 1 data pt.	20000	pCi/L
			ND	699-22-35	2/10/99	B0TNV7	N	PNLW	GW	70.9	20000	pCi/L
			ND	699-23-34A	2/9/99	B0TNV0	N	PNLW	GW	3220 ↓trend	20000	pCi/L
			ND	699-23-34B	2/9/99	B0TMT1	N	PNLW	GW	146	20000	pCi/L
			ND	699-23-34B	2/9/99	B0TMT2	N	PNLW	GW	192	20000	pCi/L
			ND	699-24-33	2/9/99	B0TMR4	N	PNLW	GW	47100* ↓trend	20000	pCi/L
			ND	699-24-34A	2/9/99	B0TMP7	N	PNLW	GW	5980 ↓trend	20000	pCi/L
			ND	699-24-34B	2/10/99	B0TMP0	N	PNLW	GW	9420 ↓trend	20000	pCi/L
			ND	699-24-34C	2/8/99	B0TMN3	N	PNLW	GW	45900* ↓trend	20000	pCi/L
			ND	699-24-35	2/10/99	B0TMM6	N	PNLW	GW	1120 ↓trend	20000	pCi/L
			ND	699-25-33A	2/8/99	B0TMC4	N	PNLW	GW	1750 ↑trend	20000	pCi/L
			ND	699-25-34A	2/8/99	B0TMD1	N	PNLW	GW	80800* ↓trend	20000	pCi/L
			ND	699-25-34B	2/9/99	B0TMD8	N	PNLW	GW	78800* OK	20000	pCi/L
			ND	699-25-34C	2/10/99	B0TML9	N	PNLW	GW	67900* ↓trend	20000	pCi/L
			ND	699-25-34D	2/8/99	B0TMF5	N	PNLW	GW	75700* ↓trend	20000	pCi/L
			ND	699-25-70	2/23/99	B0TPX9	N	PNLW	GW	276	20000	pCi/L
			ND	699-25-33	2/10/99	B0TMH2	N	PNLW	GW	85600* ↓trend	20000	pCi/L
			ND	699-26-34A	2/4/99	B0TMH9	N	PNLW	GW	73200* ↓trend	20000	pCi/L

Project Scientist: Evan Dreisel

Collect date: 1/5/99 - 3/31/99

Report Project: Surveillance Central

Attachment 4

GW/VZ INTEGRATION PROJECT
MARCH 20 – MAY 31, 2000
 TWO MONTH LOOK AHEAD CALENDAR

March 20	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler)
March 28	Oregon Hanford Waste Board Meeting Hermiston, OR
March 28	DOE FY 2002 Hanford Budget Meeting Seattle – Seattle Center – 7-10 p.m.
March 30	DOE FY 2002 Hanford Budget Meeting Portland – State Office Building – 7-10 p.m.
April 3	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler)
April 6-7	Hanford Advisory Board Meeting Richland, WA – Red Lion Hanford House
April 11	HAB Environmental Restoration Committee Meeting PNNL EMSL Building Room 1077 – 9 a.m.-4 p.m.
April 17	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler)
May 1	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler)
May 9	HAB Environmental Restoration Committee Meeting BHI Assembly Room – 8 a.m.-4 p.m.
May 15	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler)
May 24-26	Integration Project Expert Panel (IPEP) Meeting BHI Assembly Room
May 31	HAB Public Involvement Committee Meeting LaGrande, OR