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MEETING MINUTES FROM SITE 11 PROJECT TEAM MEETING FROM 24-25 JUNE 1997
WITH TRANSMITTAL LETTER NSB KINGS BAY GA
8/28/1997
NSB KINGS BAY

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28 AUG 1997

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Georgia Department of Natural Resources
Attn: Mr. Bruce Khaleghi, Unit Coordinator
Environmental Protection Division
205 Butler Street, SE, Suite 1252
Atlanta, GA 30334

Dear Mr. Khaleghi:

Attached are the meeting minutes from the Site 11 Project Team Meeting of June 24 and 25 in Knoxville, TN (enclosure 1), minutes from the Risk Assessment meeting with Mr. Opdyke held on July 1 in Atlanta, GA (enclosure 2), and minutes from a meeting with Ms. Kellam held on July 15 in Atlanta, GA (enclosure 3). Please review and provide comments as necessary.

The SUBASE Kings Bay point of contact on this matter is Ms. Rhonda L. Bath, (912) 673-2001, extension 1217. Please address all correspondence to "Commanding Officer, 1063 USS Tennessee Avenue, Naval Submarine Base, Kings Bay, GA 31547-2606."

Sincerely,

J. W. MCGONAGILL, P.E.
Lieutenant, CEC, USN
Facilities & Environmental
By direction of the
Commanding Officer

Enclosures:

1. Site 11 Project Team Meeting Minutes (June 24-25, 1997) and Associated Handouts
2. Minutes from Risk Assessment Meeting with Mr. Opdyke on July 1, 1997 in Atlanta, GA
3. Minutes from Meeting with Ms. Kellam on July 15, 1997 in Atlanta, GA

Blind copy to: (w/o encls)
ABB-ES (Laura Harris)
NAVFACENGCOM (Anthony Robinson)
USGS (Chris Leeth)

IR-16/4



August 7, 1997

08503-060-97

Southern Division
Naval Facilities Engineering Command
ATTN: Mr. Anthony Robinson
P.O. Box 10068
2155 Eagle Drive
North Charleston, SC 29418

Dear Mr. Robinson:

SUBJECT: Meeting Summary, June 24 and 25, 1997, Project Team Meeting, Naval Submarine Base, Kings Bay, Georgia, Contract Task Order (CTO) 094, Contract No. N62467-D-89-0317

On June 24 and 25, 1997, the Kings Bay project team met to discuss the status of recent and ongoing activities at Site 11. In attendance were:

Ms. Rhonda Bath, Naval Submarine Base (NSB)
Mr. Anthony Robinson, Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM)
Mr. Chris Leeth, U.S. Geological Survey (USGS)
Mr. David Hicks, USGS
Mr. Richard Tringale, ABB Environmental Services, Inc. (ABB-ES)
Mr. Rick Ryan, ABB-ES
Mr. Kurt Sichelstiel, ABB-ES
Ms. Laura Harris, ABB-ES
Ms. Jodi Laprade, Galileo Quality Institute

In addition to the above team members, visitors attending the meeting on June 25 included Mr. Cliff Casey, SOUTHNAVFACENGCOM, and Ms. Nora Keel and Ms. Julie Cozzic (by phone), both with ABB-ES.

The meeting summary from the April 1997 team meeting was reviewed. A review of action items identified during the April meeting showed that all actions had been completed, with the exception of planning the tracer test and updating the team on SOUTHNAVFACENGCOM's execution plan. The tracer test was not planned because the Navy decided the test was not needed. The update for the execution plan was not done because it was unclear how recent developments in the Navy CLEAN District I contract would effect the Navy's execution plan.

Monitoring Well Installation Mr. Leeth informed the team that representatives from the Georgia Environmental Protection Division (GEPD) had expressed a desire to have Navy upgrade the monitoring system on the east side of the landfill. The investigation history and current understanding of groundwater flow conditions at the landfill were reviewed for Mr. Casey's benefit. Further, while the Navy desired to be proactive in executing the Installation Restoration (IR) Program activities at Site 11, there was a need to have GEPD buy-in on activities geared towards addressing their concerns. The team decided that a proposal would be prepared that defined the upgrades to the monitoring network and identified a decision rule for determining whether or not groundwater on the east side of the landfill was effected by releases from the site. The team agreed on locations for three proposed new monitoring wells. All agreed that it would be impossible to prove that absolutely no chemicals were present in groundwater on the east side of the landfill as a result of past or present releases.

ABB Environmental Services Inc.

Enclosure (1)

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Conditions on the east side of the landfill differ from the west side, where the IR Program activities have been focused because of offsite contamination and proximity of potential receptors. Investigation activities such as geophysical surveys, test trenching, the initial groundwater monitoring program, and direct push groundwater sampling have not indicated that contamination is likely on the east side of the landfill. These same activities lead to discovery of groundwater contamination on the western side of the site even though the investigation programs were not ideally suited to characterize the contaminant situation. Release detection does not require a sampling scheme that will define the intricate details of any releases. In contrast to the western side of the site, the hydraulic gradient on the east side is low. If releases have occurred that are migrating to the east, natural attenuation provides a safety factor as far as exposure to the chemicals is concerned because there aren't any known receptors and groundwater flow would be relatively slow. The cyclical head responses that USGS observed in the deep unit of the surficial aquifer should be investigated, as it would appear that the surficial aquifer is being pumped on a regular daily schedule. The deep aquifer unit is not well connected to the intermediate aquifer unit in the vicinity of the landfill, based on the results of USGS assessments of groundwater chemistry in the shallow, intermediate, and deep aquifer units that comprise the surficial aquifer.

A decision was made regarding the approach to take in upgrading the monitoring network on the east side of the landfill. A proposal would be prepared and the Navy would request a meeting with GEPD so that they could present the proposal and ask for GEPD concurrence. The proposal would include a summary of historical data related to release detection, proposed new well locations, and a decision rule that the team agrees on.

The Navy plans to install as many as three new monitoring wells for purposes of monitoring performance of the Interim Measure (IM). The locations of the new wells were discussed by the team. Team members from ABB-ES and USGS were individually poled regarding proposed well locations and the results were compiled and presented during the team meeting. Navy team members were unavailable at the time of the pole. Several team members responded that an intermediate depth well should be installed at in culdesac of Cottage Court near monitoring wells KBA-11-19A and KBA-11-19B, which are completed in the shallow and deep units of the surficial aquifer, respectively. Other potential well locations selected by individual survey were generally clustered in the center of the IM area and in the southern part of the IM area. One monitoring well location was agreed on at a location south of RW-4 for purposes of monitoring methylene chloride that was found at a depth of 50 feet below land surface (bls) at direct push location V222.

Mr. Leeth added during the discussion that GEPD expressed a desire for a monitoring well on private property east of the Spur 40 right-of-way. There were unknowns associated with accessing private property, so the team decided to select an easily accessible location on Navy property and leave the possible location on private property undecided. However, on July 2, 1997, the Navy informed ABB-ES of their decision to pursue the location on private property. So, present plans are to put one new monitoring well in the culdesac of Cottage Court, one on the right-of-way south of RW-4, and one on private property west of RW-3. A proposal for upgrading the IM performance monitoring network would be prepared to present the strategy and decision rule. The decision rule will set the criteria for determining whether or not the IM system has contained further migration of contaminants from the right-of-way into the subdivision.

Hydrologic Framework Mr. Leeth presented an update of recent developments on the hydrogeologic framework. The update included results of the pumping test on the USGS deep well and an assessment of groundwater chemistry.

The USGS sampled 8 wells in the surficial aquifer and the deep well. Groundwater samples from the surficial aquifer included the shallow, intermediate, and deep units that comprise the surficial aquifer. The major anion and major cation data for the samples were plotted on piper diagrams that allow

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differences in the water chemistry to be observed. The plots showed that the water chemistry in the deep unit of the surficial aquifer (monitoring well KBA-11-11C) and the deep well completed in the first water bearing zone below the surficial aquifer were similar to one another, but different from the water chemistry in the shallow and intermediate units of the surficial aquifer. This supports the conclusion that the surficial aquifer is underlain by a confining layer that separates the surficial aquifer from deeper water bearing units. Further, the data indicate that the groundwater in the deep part of the surficial aquifer is different from the shallower groundwater. The anisotropic nature of the surficial aquifer apparently prevents mixing of the groundwater. Although the anisotropic conditions do not constitute confinement, the anisotropy is significant enough at Site 11 to cause the intermediate aquifer unit and the deep aquifer unit to have different signatures.

The pumping test for the deep well included a period of background data collection prior to pumping. The background data for monitoring well KBA-11-11C, in the deep part of the surficial aquifer, showed systematic daily variations of approximately 0.2 feet. These variations were not observed in the intermediate part of the surficial unit or in the deep well. After the background period, a step drawdown pumping test was conducted at pumping rates of 10, 15, and 20 gallons per minute. A total of 39 feet of drawdown was obtained in the deep well, but no response was observed in well KBA-11-11C in the deep part of the surficial aquifer. The drawdown data for the deep well flattened very quickly indicating that the deep well was in a water-bearing zone under confined conditions. This is the third line of evidence for concluding that the surficial aquifer is underlain by a confining unit.

Mr. Leeth commented on the 31-hour pumping test that was conducted on RW-6 in March 1997. These pumping test data have not been fully evaluated. Mr. Leeth added that the 31-hour pumping test was interrupted by a rain event and he would not be able to determine specific yield from the data. He explained the importance of estimating the specific yield for the remedial effort. The specific yield is used to assess how much water a well will yield under stress and how much stress can be applied. It represents the volume of water that the aquifer will yield under gravity drainage and relates to the effective porosity. Since RW-6 is now pumping at a higher rate for the long term, we are afforded an excellent opportunity to get the needed data for estimating specific yield, if there is a transducer and data logger at location KBA-11-13A. Mr. Sichelstiel was able to readily confirm that KBA-11-13A had a transducer and datalogger for collection of head data.

Natural Attenuation Ms. Keel presented an update on the natural attenuation data collection plan. The purpose for the plan is to define how and what type of data will be collected to support incorporating natural attenuation as a follow-up alternative to pump and treat in the upcoming Corrective Action Plan (CAP) for Site 11. Dr. Frank Chapelle, with the USGS, advised the Navy during a meeting in October 1996 to prepare in advance a strategy for replacing the pump and treat system once pump and treat reaches the point of diminished returns. Dr. Chapelle recommended that natural attenuation be evaluated as the follow-on remedial alternative to pump and treat.

Ms. Keel described the processes associated with developing the data collection plan, including assessing existing data relative to the requirements in applicable guidance documents and protocols issued by the U.S. Environmental Protection Agency (USEPA), Air Force Center for Environmental Excellence (AFCEE), and Dr. Frank Chapelle. For all intents and purposes, the USEPA and AFCEE protocols are the same. A comparison of existing data to information requirements identified in the AFCEE protocol defined the data gaps that would be addressed in the data collection plan. The data gaps include:

- determining site-specific biological decay rates;
- determining background concentrations for parameters that would be used to assess the biodegradation processes and degree of chemical degradation; and
- determining the types of biological processes and degree of chemical degradation within the plume.

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The draft plan addresses four primary contaminants, including tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC). Other contaminants, such as methylene chloride and benzene, that have been detected above maximum contaminant levels are not specifically being addressed, but the VOC data collected could provide an opportunity to assess the degradation of these compounds also.

To date, the draft plan includes installation of four monitoring wells within two areas where high concentrations of chlorinated solvents were identified during the March 1997 direct push program. One pair of wells is in an area where the degradation of PCE to DCE can be observed and the other pair of wells is in an area where the degradation of TCE to VC can be observed. The well pairs are situated along projected flow lines and will be used to obtain data for deriving site-specific degradation rates for the four chlorinated solvents.

Concerns discussed during the natural attenuation presentation included the possibility of transient conditions at the measuring point. Dr. Chapelle, an expert on natural attenuation, is facilitating this effort and the question of whether or not steady state conditions could be assumed had already been discussed with him. He is of the opinion that steady state conditions can be assumed for purposes of these evaluations. Mr. Casey added during the meeting, that there are other sources of variability in the measurements that shouldn't mask the evidence that concentrations trends and indicator parameters would provide. Another concern was expressed about spatial variability in environmental conditions that would effect decay rates. The spatial variations in environmental conditions that effect biological processes could be monitored with the biological indicator parameters. A third concern was the location of the bio-monitoring wells in the area influenced by pumping. If the pumping is creating oxygenated conditions, this could easily be determined by monitoring. Mr. Casey is going to discuss the proposed locations and overall strategy with Dr. Chapelle. Mr. Robinson and Mr. Casey will let Ms. Keel know of any revisions needed to the draft plan.

Risk Assessment Ms. Cozzie lead the discussion of the risk assessment. The objectives of the risk assessment are to estimate risk with the IM system operating and without the IM system operating. Ms. Cozzie reviewed results of the Preliminary Screening Risk Evaluation conducted in 1993 and 1994. The preliminary risk evaluation provides a framework for the baseline risk assessment. The general elements of the human health risk assessment and ecological risk assessment were reviewed. Mr. Casey inquired about risk management decisions and wanted to make sure that the risk assessment report addressed this.

One of the elements included in the human health risk assessment is a discussion of remedial goal options for each chemical and media where unacceptable risk is determined. The GEPD risk guidance for solid waste management units requests that cleanup goals be presented in the risk assessment report. Ms. Cozzie indicated she would follow-up with Cliff Opdyke, with GEPD, to confirm this.

A question was asked about how acceptable risk would be determined and would the population size be a factor. Ms. Cozzie replied that some states are progressive in considering the size of the population potentially being exposed in determining the acceptable level of risk. The Kings Bay risk evaluations will be based on assessing the probability of risk to an individual.

The Kings Bay project history and availability of multiple groundwater data sets of various degrees of completeness presents a somewhat unique situation for the risk assessors. They will be discussing this with the GEPD risk assessor to determine how a single data set for groundwater will be derived for purposes of evaluating risk associated with groundwater. Data associated with other media are more clearly defined. Whether or not air concentrations need to be modeled will be discussed with GEPD. The exposure scenarios and exposure settings will be patterned after the Preliminary Screening Risk Evaluation, which included only non-potable uses of groundwater.

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In-Well Stripping Mr. Ryan lead a discussion of in-well stripping. Mr. Ryan set up the discussion by pointing out that pilot studies are needed as early as possible if a potential remedy is going to be considered for inclusion in the CAP for a site. In general, three basic types of remediation alternatives are available, including natural attenuation, ex-situ technologies, and in-situ technologies. In-well stripping is one type of in-situ treatment technology. Reactive walls and use of surfactants are other in-situ technologies.

ABB-ES has identified three vendors that offer various in-well stripping applications. SBP is one of the vendors that ABB-ES has met with and, consequently, most of the discussion was centered around the UVB technology offered by SBP. Mr. Ryan commented that SBP seemed genuinely interested in proper application of their technology. They are the only re-circulation vendor that is in the Environmental Protection Agency's SITES Program.

The UVB technology incorporates a pump to facilitate groundwater extraction. For Site 11, groundwater would be pumped in the lower of two well screens, passed through an air stripper, and discharged through an upper screen. Treatment of the off gas from the stripper can vary depending on project needs and regulatory requirements. There is a UVB site in Georgia, but the similarity of the geology to Kings Bay is not known. Mr. Casey was interested in knowing how long the site had been operational, what the operations and maintenance costs were, what concentrations of iron were in the groundwater, and had fouling been a problem. This information may be available if the SBP client would agree to discuss the site with ABB-ES and the Navy.

Mr. Hicks expressed a concern that the UVB well would eventually be treating clean water because the gradient is not steepened. Mr. Casey stressed that UVB was not being looked at as a long term remedial technique, but was well suited for use in reducing concentrations in the areas of high concentrations found during the recent direct push program at Site 11. The in-well stripping wells would be placed just downgradient of the highest concentrations so that contaminants feed into the zone of influence.

Mr. Ryan presented some of the details from the discussions he had with SBP regarding the pilot study at Site 11. A preliminary model was done to estimate a zone of influence for Site 11. The model input parameters included hydraulic conductivity, anisotropy, and stratigraphic information that has been developed during various past activities conducted by ABB-ES and USGS. The preliminary estimate for the zone of influence was 34 feet.

The remainder of the in-well stripping discussion focused on the strategy for the Site 11 pilot study. Mr. Casey recommended that ABB-ES proceed with competitive bid solicitation from vendors. The pilot system should include all components, rather than just a pumping test to determine zone of influence. Mr. Ryan is tasked with initiating communication with NoVOCS to obtain information related to past successes, technical approach, and possible references.

Telemetry Installation An agenda item to address telemetry installation was added earlier during the meeting at Mr. Ryan's request. Mr. Ryan needed to discuss the number of wells to accommodate with telemetry components. The original plan was to install telemetry for 5 recovery wells. Presently, only three recovery wells are operational. The team agreed that the telemetry components at the treatment pad should accommodate four recovery wells.

Schedule and Budget Mr. Tringale provided team members with an organization chart for the various tasks included in the project. Regarding the schedule, the community relations support period of performance will expire in December 1997. The draft final SRFI report is scheduled for August 27 and the risk assessment report is scheduled for mid September.

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Next Meeting The next meeting was tentatively set for sometime during the last 2 weeks of August. The dates will be scheduled after Ms. Bath has a chance to discuss schedules with GEPD representatives invited to attend.

Meeting Coordinator: Anthony Robinson
Scribe: Laura Harris
Time Keeper: Rick Ryan
Location: Atlanta, GA

Action Items Following is a list of action items identified during the meeting.

- Mr. Leeth to send chloride data to Ms. Harris
- Ms. Bath to investigate pumping from the surficial aquifer near Site 11 to explain the cyclical head patterns observed in KBA-11-11C.
- Ms. Harris to prepare proposals for monitoring well locations and decision rules.
- Ms. Cozzie to check on documentation for 3-year exposure used in Preliminary Screening Risk Evaluation.
- Ms. Cozzie to confirm with Mr. Opdyke at GEPD that cleanup goals should be presented in the Risk Assessment Report.
- Mr. Robinson to communicate results of consultation with Dr. Chapelle on locations for the natural attenuation assessment monitoring wells.
- Mr. Ryan to follow-up with UVB vendor on specifics of Pellham project site.
- Mr. Ryan to initiate communication with NoVOCS.
- Ms. Laprade should be added to distribution for team.

Sincerely,

ABB Environmental Services, Inc.



Laura B. Harris, P.G.
Technical Lead

Meeting Minutes for King's Bay
Site 11- Old Camden County Landfill
July 1, 1997

Attendees:

Rhonda Bath (Naval Submarine Base Kings Bay)
Julie Cozzie (ABB-ES, Inc.)
Karen McCard (Georgia Environmental Protection Division)
Cliff Opdyke (Georgia Environmental Protection Division)
Anthony Robinson (NAVFACENGCOM Southern Division)

The meeting opened at approximately 10:00 am with a discussion of the proposed agenda and the desired outcome and expectations of each participant. Kingsbay and the Navy stated that the goal of the meeting was defined as establishing the risk assessment methodology and approach. The meeting was to determine if possible the following items:

- * establish what is an appropriate data set and data management approach for this site; determine if there are data gaps and/or if additional sample collection is necessary,
- * establish what methodology will be used to select and identify chemicals of potential concern,
- * define the method that will be used to calculate an exposure point concentration for each media including defining the groundwater plume,
- * establish what exposure scenarios and receptors will be evaluated and determine whether groundwater volatilization model will be necessary,
- * establish what exposure assumptions and parameters will be used, and
- * identify a template report that GEPD would like the format to follow.

It was agreed that the July 1, 1997 meeting and meeting minutes would serve as a substitute for a risk assessment workplan required in the GEPD guidance. Julie Cozzie of ABB Environmental Services, Inc. then gave a review of relevant Kings Bay site history including investigative activities, delays and changes to original RFI schedule, and a discussion of the groundwater interim measure.

Julie Cozzie summarized the evaluations that had been performed as part of a Screening Risk Evaluation in 1993. This Screening Risk Evaluation evaluated groundwater risks to residents from nonpotable usage including swimming, baby pool and slip-n-slide scenarios, and inhalation of volatile organic compounds (VOCs) during irrigation of private lawns. The Screening Risk Evaluation identified unacceptable cancer risks due to vinyl chloride, 1,2-dichloroethene, and noncancer risks due to toluene. There were no unacceptable risks posed from the inhalation pathway.

Data Management Approach/Determination of Data Gaps

Ms. Cozzie then discussed the data that is available for each of the following media: groundwater, surface water, sediment, surface soils, subsurface soils, and air.

Enclosure (2)

Groundwater

A table was presented that compared groundwater summary data (minimum, maximum, and mean) collected in the following time frames: September 1994, April 1995, and May through October 1996. This table was designed to illustrate any changes in the detected contaminants and/or contaminant concentrations at the site. ABB-ES proposed that the September 1994 comprehensive and validated sampling event be used. Cliff stated that GEPD did not require data validation and that therefore he felt all available data should be evaluated.

A discussion of what approach would be appropriate to manage the multiple sampling events of groundwater. Four options were discussed 1) use all data with equal weighting, 2) use the most recent sampling event from each well, 3) use the highest detected concentration of each analyte from each well, and 4) use the average analyte concentration from each well. Each option was evaluated for its merits.

* Option 1, the use of all available data using equal weighting, was discounted since some wells have been sampled with a higher frequency than others. Due to the phased sampling approach, groundwater monitoring wells that had either contamination detected or that were expected to have contamination were resampled. Therefore, option 1 would result in a biasing of the data set high.

* Option 2, use of the most recent sampling event from each well, was discarded since it would not necessarily capture all contaminants present in the groundwater (some contaminants that were present in one sample event and may have migrated to outside the monitoring well capture zone).

* Option 3, use of the highest detected concentration of each analyte from each well, was deemed conservative but acceptable to address all potential contaminants. The conservative assumptions and any migratory or degradation trends (i.e., if the contaminant has not been detected since 1994) would be discussed in the uncertainty section of the risk assessment.

* Option 4, use of the average analyte concentration from each well, was discounted as not conservative.

The groundwater data set will then be compiled using the maximum detected concentration of each analyte in each well that is defined in the plume, (the area of the plume is defined in the exposure point concentration calculation discussion below.) The maximum detected concentration from each well within the plume will then be averaged for each analyte to determine an exposure point concentration (EPC).

Surface Water and Sediment

Ms. Cozzie led a discussion of available surface water and sediment data for the risk assessment and presented comparison table of summary data to the risk based screening values. Ms. Cozzie pointed out that the surface water and sediment data available from 1994 did not exceed any human health screening criteria. Cliff Opdyke requested that additional surface water samples be collected from the pond in the subdivision to confirm that there is no contamination from Camden Landfill. This information would then be presented to the community at a public

hearing. Ms. Cozzie clarified with Mr. Opdyke in a follow up phone conversation (July 10, 1997) that the number of necessary surface water samples is three. Additionally, Mr. Opdyke also clarified that additional sediment samples were not necessary. Mr. Opdyke also stated that the surface water analyses need only include contaminants that are suspected to be from the landfill, i.e., pesticide analyses would not be necessary.

Additionally, Mr. Opdyke clarified a question of what was acceptable to use as background screening values for sediment in the pond. ABB-ES had proposed that since the lake is manmade that it was acceptable to use subsurface soil background as a screening tool for sediments. As this is primarily an ecological risk assessment issue (none of the analytes exceed human risk based screening criteria), Mr. Opdyke referred this question to Rod Stafford, an ecological risk assessor at GEPD). Mr. Stafford responded that sediment samples should be collected from a nearby surface water body for use in background screening of pond sediments.

Surface Soil and Subsurface Soil

Ms. Cozzie led a discussion of available surface and subsurface soil data for the risk assessment and presented comparison tables of the surface soil summary data to the risk based screening values. Ms. Cozzie pointed out that only PAHs exceeded the surface soil risk based screening criteria and the PAHs are located in one sample. This sample is located along the perimeter of the landfill and is presumably associated with the perimeter road.

A comparison table of the subsurface soil trenching data summary and risk based screening criteria were not available at the time of the meeting; however, Ms. Cozzie stated that it would be unusual that a landfill would require an evaluation of an excavation worker scenario. Mr. Opdyke agreed.

The discussion progressed to whether more surface soils samples were necessary to fully, characterize the landfill. A discussion of whether a residential soil scenario was required followed. Ms. Cozzie stated that a recreational user of the site scenario should be used to address the surface soil not a residential scenario. Additionally, Ms. Cozzie pointed out that the landfill was closed and covered with clean fill. Mr. Opdyke stated that he was not inclined to require a residential scenario risk evaluation of soils; however, that he would speak to Billy Hendricks (GEPD RCRA) to determine his opinions of land usage at the landfill. Mr. Opdyke stated in a follow-up phone conversation that a residential land usage scenario would not be required for the risk assessment.

In this phone conversation, Mr. Opdyke stated that Mr. Hendricks would like to see the subsurface soils characterized. The approach that GEPD would like to see was explained as the following: Samples would be collected from two depths. The first depth would be directly below the cover soil. The second depth would be collected between the first sample depth and the groundwater table. The sample would be collected at a frequency of one per acre or one per landfill cell assuming there are enough cells in the landfill to obtain a valid characterization or greater than 20 cells. Ms. Cozzie then asked for clarification of what this data would be used for since the assumption of subsurface soil exposure within a landfill is extremely conservative and

that an excavation worker scenario at a landfill would be highly unlikely. Mr. Opdyke stated that the data was more for characterization of the site rather than for the risk assessment. A discussion of GEPD's proposed exposure scenarios for subsurface soil is presented below in the exposure scenario section.

Air

Ms. Cozzie led a discussion of available air monitoring data for the risk assessment. It was agreed that the eight air samples collected on-site would be used in the risk assessment (all nondetects). It was also agreed that an air volatilization model to predict concentrations of VOCs from groundwater in the air via the use of private irrigation systems is not necessary.

Selection and identification of chemicals of potential concern methodology

In accordance with the recent USEPA Region 4 guidelines, Ms. Cozzie selecting analytes as Chemicals of Potential Concern (COPCs) using the following screening criteria:

- * the analyte is detected in at least one sample,
- * the analyte is above background screening concentrations, and
- * the analyte is above applicable screening values.

A chemical would not be selected if any of the following criteria are met:

- * the analyte is less than background levels,
- * the analyte is less than 5 percent frequency of detection when there are more than 10 samples,
- * the analyte is less than risk-based screening concentrations, standards, and guidelines, and
- * the analyte is less than essential nutrient screening values.

Background screening values are defined as the 2 times the mean of the detected analytes concentrations.

Exposure Point Concentration Calculation

In accordance with the recent USEPA Region 4 guidelines, Ms. Cozzie proposed using the lesser of the maximum detected value or the 95% upper confidence limit (UCL) of the mean analyte concentration for media with greater than 10 samples or the maximum analyte concentration for media with less than 10 samples as the EPC. For groundwater, the mean analyte concentration within the groundwater plume will be used as the EPC (the maximum analyte concentration will be used if the mean is greater than the maximum due to the inclusion of nondetected values). Maximum and minimum values will be selected after averaging duplicates. One half the Contract Required Detection Limit/Contract Required Quantitation Limit will be used as a surrogate value in determining the 95% UCL, the mean value, or the average of duplicate samples.

The mean concentration for each analyte within the plume will be used as the EPC. The

groundwater plume will be defined as the vertical depth range and horizontal area of contaminated groundwater plume, i.e., if the plume is at 10 - 20 feet at one well and the well adjacent shows contamination at 15 - 30 feet then the groundwater plume would be defined as wells screened from 10 - 30 feet within the horizontal area of the plume. Groundwater wells that are not within the plume will be treated as background samples for selecting COPCs. An EPC will be determined for groundwater wells within the interim corrective measure area and outside this area as discussed below in bullet 1B.

Exposure Scenarios and Receptors

Ms. Cozzie led a discussion of how the human health exposure assessment should be conducted. ABB proposed the use of the following residential, recreational and industrial current and future exposure scenarios:

A. Since groundwater is not used as a potable water source, ABB proposed that the groundwater assessment would include an evaluation of risk from current potential exposures via volatilization and dermal contact with groundwater via an irrigation or sprinkler system.

A. An assessment of the risks to soils under a trespasser or recreational user (jogger) as well as a worker scenario would be addressed. A residential scenario on the landfill was not proposed since development of the landfill into a residential area is highly unlikely in the future.

A. Subsurface soils would not be addressed under assumption that excavation of soils from the landfill for development is extremely unlikely and could be precluded using deed restrictions.

A. Surface water and sediment in the off-site pond under a recreational user scenario would be addressed.

A. Air exposure scenarios would include residential exposures off-site, occupational workers on-site, and recreational users on-site.

GEPD agreed to or directed the following exposure scenarios be evaluated in the risk assessment.

B. Groundwater should be evaluated under a residential potable water source. Residential groundwater exposure scenarios will include ingestion, dermal contact, and inhalation of groundwater while showering. Two groundwater exposure scenarios will be evaluated: 1) exposure outside of the interim corrective measure zone, and 2) a hypothetical scenario evaluating the risks associated with exposure to all the groundwater within the plume. It was agreed that a volatilization model for evaluating the risks to the residential neighborhood off-site from a groundwater irrigation scenario was not necessary since a residential potable water scenario is to be evaluated.

B. GEPD agreed that an assessment of the risks from soils under a trespasser or recreational user (jogger) as well as a worker scenario was an adequate characterization of current and future risks and that a residential soil exposure scenario was not necessary.

B. The assumption of subsurface soil exposure within a landfill is extremely conservative and that characterization of the risks from this pathway is not common; however, GEPD suggested that if subsurface soils is collected from within the landfill that this data could be used to evaluate hypothetical risks to workers and excavation workers. The workers (presumably site

maintenance or utility workers) would consider the soil directly below the landfill soil cover. The excavation worker exposure scenario would address subsurface soils that are between the first subsurface soil sample and the groundwater table.

B. GEPD agreed that an assessment of the risks from surface water and sediment in the off-site pond to a recreational user was an adequate characterization of current and future risks.

B. GEPD agreed that an assessment of the risks from air exposure to residents off-site, occupational workers on-site, and recreational users on-site was an adequate characterization of current and future risks.

The use of a central tendency exposure scenario will be performed for any exposure scenario that results in an unacceptable risk using reasonable maximum exposure (RME) default parameters.

Exposure Assumptions and Parameters

In accordance with the recent USEPA Region 4 guidelines, Ms. Cozzie proposed using standard RAGS supplemental guidance and Region 4 exposure defaults for the above listed residential, occupational, and industrial scenarios. The recreational exposure scenario parameters that were established are an exposure duration of 100 days per year for 10 years for an adolescent and 20 years for an adult.

The central tendency exposure parameters will differ from the RME parameters in exposure duration, frequency, and EPC. ABB will provide Mr. Opdyke with a proposed central tendency exposure parameter table and solicit comments on these parameters prior to completion of the risk assessment.

Identify a Template Report

Mr. Opdyke stated that ABB's recent Albany report formats were an appropriate template for this risk assessment.

August 6, 1997

SUBJECT: Meeting with Georgia Environmental Protection Division (EPD) on July 15, 1997

Participants:

Ms. Madeleine Kellam, Georgia Environmental Protection Division (EPD)

Mr. Woody Hicks, United States Geological Survey (USGS)

Mr. Chris Leeth, United States Geological Survey (USGS)

Mr. Anthony Robinson, Naval Facilities Engineering Command Southern Division
(SOUTHDIV)

Ms. Rhonda L. Bath, Naval Submarine Base Kings Bay (NSB, Kings Bay)

Site Delineation It is EPD's opinion that the area affected by releases from Site 11 has not been delineated as specified in the RCRA facilities permit. According to EPD, "the area of contamination must be delineated to zero, or background, both areally and vertically prior to approval of the RCRA Facility Investigation (RFI) report." EPD agreed that the RFI could be submitted without this task completed, but a written explanation must accompany the RFI describing how this task would be completed and the time frame for completion. The delineation would be submitted as an addendum to the RFI. EPD suggested that the Navy use direct-push technology to achieve delineation. EPD stated that all available data could be used for this purpose and "not to re-delineate".

Access to Private Property EPD said that "based on the nature of the principal contaminant, vinyl chloride, that is driving this remediation effort, interpolation could not be used to estimate delineation", and "in the event that Navy could not gain access to private property, they were not relieved of the responsibility to delineate." EPD also stated, that "they have no authority to force a private land owner to allow access." EPD suggested that Navy "do the best job they could by using easements, roadways, and agreeable private landowners to delineate."

Monitoring Wells EPD said "additional monitoring wells are not required for the RFI phase of the investigation. They would, however, be needed for compliance monitoring subsequent to the initiation of the remediation phase." EPD did not discourage the installation of the proposed new monitoring wells now and said that "it was important for Navy to begin developing a water-quality history at compliance monitoring points early in the process." EPD stated that "they were not interested in any new wells to evaluate the performance of the present Interim Measure (IM) system." They felt that this was a moot point and that the Navy should expend their money and energy expediting clean up. EPD would not render an opinion on the locations the team has selected, nor would they specify when the sampling density was adequate to monitor remediation. They said that "Navy must use all of the hydraulic and water-quality data to develop a monitoring network that would be scientifically sound." If the network "adequately monitored the effect of the remediation effort", then EPD would not require additional wells. If, for instance, new data were made available that suggested additional monitoring was required, EPD could require additional monitoring wells at any time during the life of the site remediation. Essentially, EPD will not provide guidance in the number or locations of monitoring wells, nor will they assure Navy that additional wells would not be requested at a later time.

Enclosure (3)

IM System Upgrades EPD stated that they would not allow additional upgrades to the IM system. EPD stated that this phase of the site work had gone on "way too long", and that Navy must proceed to remediation as soon as possible.

Vinyl Chloride (VC) Emissions EPD stated that the carbon adsorption system would not be permitted for use for the final remedy. They suggested Navy look at other methods of disposing of the volatiles, such as incineration.

UVB In-Well Stripping EPD stated that they considered this to be research/experimentation and strongly suggested Navy not to pursue. Because of the unknown efficiency of the method and the probable air releases of VC, EPD stated that they would not permit UVB at Site 11. EPD suggested Navy use this money to move forward to the final remedy in an expeditious manner.

Natural Attenuation EPD agreed that natural attenuation could be a part of the final Corrective Action Plan (CAP); however, navy should be advised that if the terminology "natural attenuation" were included in the CAP this would impose much more stringent monitoring requirements . . . ie many more monitoring wells and more frequent sampling. It is understood by all parties that natural attenuation is a process that will eventually result in the degradation of the offsite contaminants. But, Navy should not specify in the CAP that "natural attenuation" would be a part of the remedy.

Bioremediation EPD stated that "if Navy wanted to support a bioremediation investigation that was up to them. However, the same stringent monitoring requirements would be imposed for monitoring the effectiveness of bioremediation that would be required for natural attenuation." The only advantage EPD could see for completing the bioremediation investigation would be for Navy to use the results for planning and management purposes.

Protocol for Well Screen Lengths It was asked of EPD if there were specifications (standards) for well screen lengths. Instead of using 3 nested wells with 10 foot screens, could a single well with a 20 foot screen be used? EPD replied that she was unaware of any such specifications and that as long as there was good rationale behind this decision she did not have a concern with this proposed practice.

In summary, EPD said that they would require submittal of a CAP within 90 days of the submittal of the RFI. EPD suggested that Navy consider for the final CAP using a combination of pump and treat, and reinjection. The treatment system would be required to allow no air release of vinyl chloride, thus, carbon adsorption was not an option. If natural attenuation/bioremediation were to be identified as one of the remedies then all harmful contaminants, including daughter products, must be degraded before potential contact with a receptor (human or environmental). In essence, all contaminants must be degraded below maximum contaminant levels (MCL's) at the eastern edge of the subdivision .