

**North Pole Refinery Technical Project Team**  
**September 14, 2011**  
**Draft Summary Comments**

**Technical Project Team Members in Attendance**

Dr. Dave Barnes	UAF, Department Chair, Civil and Environmental Engineering
Cindy Christian	DEC, Drinking Water Program, Compliance Program Manager
Ann Farris	DEC, Contaminated Sites Program, Project Manager
Loren Garner	Flint Hills Resources Alaska, Project Manager
Nim Ha	DHSS, Acting Program Manager, EPHP
Brian Jackson	DEC, Prevention and Emergency Response Program (PERP)
Elizabeth Page	Reiss Remediation (In transition as project manager)
Phil Roberts	Williams (Replacing Dennis Elliot)
Shannon Price	Flint Hills Resources Alaska
Jeanne Swartz	DEC, Spill Prevention and Response Program, Program Manager

**Support Personnel in Attendance**

Rebecca Andresen	Arcadis
Brian Angerman	Barr Engineering (via telecon)
Steve Bainbridge	DEC, Contaminated Sites Manager
Stephanie Buss	SPB Consulting, Toxicologist
Todd Dejournett	Barr Engineering (via telecon)
Denise Elston	DEC, Contaminated Sites Program, Program Specialist
JoAnn Grady	Grady and Associates, Team Facilitator
William Janes	DEC, Spill Prevention and Response Program, Program Manager
Meg Michell	Environmental Standards, Inc. (via telecom)
Gary Rumple	Barr Engineering (via telecon)
Max Schwenne	OASIS Environmental, Project Manager
Ben Sultoon	Johnson and Wright (for John Elliott)
Eric Zentner	Boreal Communications

**INTRODUCTIONS AND ACTION ITEM REVIEW**

The meeting began at 9:00 Alaska time as team members introduced themselves and reviewed the action items from the previous meeting. In regard to Action Item One, Ms. Farris said that she would send Ms. Page all documentation related to ADEC's efforts to sample the areas where petroleum had been spilled by a third party once that information has been completely assembled by ADEC. Ms. Swartz said, in regard to Action Item Four, that she would send members of the team copies of her report on the recent spill simulation once it has been finalized. The team determined that all other action items from the previous meeting had been completed.

**ACTION ITEM:** Ms. Farris will send Ms. Page all documentation related to ADEC's efforts to sample the areas where petroleum products originating from the North Pole Refinery had been spilled by a third party once the information has been completely assembled by ADEC.

**ACTION ITEM:** Ms. Schwartz will send team members a copy of the report on the recent spill simulation once it has been finalized.

### **THE TOXICOLOGY SUBGROUP**

Ms. Ha and Ms. Buss updated the team on recent developments within the toxicology group. The Department of Health and Social Services (DHSS) is writing a health consult that will address community concerns about uses of well water and include new information that was not covered in previous fact sheets, specifically, the results of the department's analysis of population data from the Alaska Cancer Registry and the Alaska Birth Defects Registry. Ms. Ha hopes to send a draft of the health consult to the Alaska Department of Environmental Conservation (ADEC) by the end of the month.

Ms. Buss presented an update on the Environmental Protection Agency's (EPA) development of a Provisional Peer Reviewed Toxicity Value (PPRTV) for sulfolane. EPA has reviewed the sulfolane toxicity data and will likely be able to present their recommendation for an oral and inhalation PPRTV for sulfolane by the end of the month. The National Institute of Health (NIH) has reviewed the sulfolane data and concluded that sulfolane is a worthy candidate for nomination to the National Toxicology Program (NTP). If sulfolane is nominated, the NIH may perform their own toxicology studies to address existing data gaps. The NIH may be able to make their decision on whether to nominate sulfolane as early as this December.

Ms. Farris noted that the Fairbanks North Star Borough Assembly, as well as Senator Coghill and Representative Wilson, have expressed interest in drafting resolutions in support of additional research on sulfolane. Ms. Page and Ms. Andresen informed the team that both Texas and California have developed reference doses for sulfolane. Ms. Andresen agreed to forward information on California's reference dose as well as that state's methodology for the analysis of sulfolane.

**ACTION ITEM:** Rebecca will forward the information she found on California's reference dose for sulfolane as well as that state's methodology for the analysis of sulfolane.

**ACTION ITEM:** Ms. Farris will follow up on a suggestion to update the project's literature search on sulfolane.

### **THE CHEMISTRY SUBGROUP**

Ms. Buss updated the team on recent updates within the chemistry subgroup. The Standard Operating Procedures (SOPs) and key element documents for the sampling of water, soil, and sediment have been completed, reviewed, and approved. The subgroup recently completed the key elements document for garden produce, but they will not request a SOP for garden samples at this time. The chemistry subgroup has been working to identify and resolve issues with the new SOPs for soil and groundwater, specifically interference from naphthalene.

Ms. Mitchell briefly outlined the data validation process. The project labs issue data packages to Shannon & Wilson where they are reviewed according to ADEC's checklist. Shannon and Wilson then informs Environmental Standards Inc. (ESI) when level 4 data packages are available so that they can review them to ensure that the project laboratories are working in accordance with the SOPs and key element documents. ESI forwards any reports of issues as well as general validation progress to the chemistry subgroup and FHRA.

The team deliberated on how it might streamline the process of communication between the project laboratories, the chemistry subgroup, and FHRA, particularly with regard to the subgroup's requirement that it be notified directly when project laboratories are unable to comply with SOPs and other directives. The team specifically discussed a recent incident in which a project laboratory was unable, due to certain contractual obligations, to inform the subgroup of an incidence of naphthalene interference until it had finalized all of the data from the package with which the incidence was associated. Mr. Garner said that he expects similar incidents in the future and asked the team whether it would be possible to condense the reporting procedure for naphthalene interference, perhaps by reporting groups of incidents rather than individual incidents.

The team continued its discussion on streamlining the notification procedure for naphthalene interference. Ms. Mitchell said that the subgroup can establish a corrective action plan for naphthalene interference but it would require an initial notification from the labs so that the team can analyze the existing interference incidents. Mr. Garner said that he would talk to the head of the project lab and request that he email interference notifications to Ms. Mitchell who could then report them to the subgroup. Ms. Buss said that the notification process and corrective action plan would be further discussed during a meeting of the chemistry subgroup scheduled to be held the following day.

**ACTION ITEM:** Stephanie will consult with the chemistry subgroup and discuss the possibility of inviting representatives from Pace Analytical and SGS to participate as members of the subgroup.

**ACTION ITEM:** Loren will consult with Mr. Homestead of SGS and request that he email notifications of naphthalene interference to Ms. Mitchell.

#### **LEVEL 4 DATA PACKAGES**

The team discussed various issues associated with the project's data validation process and timeline. Mr. Garner asked Ms. Buss if the chemistry subgroup had any idea when it will allow a transition from level four to level two data packages. Ms. Buss replied that while the subgroup would be happy to consider specific suggestions on the matter, they cannot take action on the issue at this point since none of the validated reports have been submitted to the state nor any report to the subgroup.

The team considered various suggestions of changes to be made to the way that project data is reported. The team decided all samples do not have to be included in the quarterly report if validation is not complete, provided that the contractors present updates on the samples that they have collected. Mr. Garner requested that SGS, a project laboratory, be allowed to report in the same format as Pace Analytical, another project laboratory, by using designation of "ND" when a sample's sulfolane

concentration is below the detection limit. Ms. Farris replied that she would discuss the request with Mr. Crapps of the chemistry subgroup.

**ACTION ITEM:** Ann will consult with Mr. Crapps of the Chemistry subgroup and determine whether the subgroup is in favor of allowing SGS to follow the reporting guidelines of Pace Analytical in which values between 3.1 and 10 are reported as J values and values below 3.1 are reported as non-detects.

### **THE FINAL RISK ASSESSMENT**

The team discussed how the schedule and agenda of the upcoming TPT meeting could be modified to accommodate a review and comment period on the draft version of the work plan for the Risk Assessment (RA). Mr. Garner requested that Ms. Farris notify FHRA of any major comments that she might make to the draft work plan during her review so that their management would have a chance to review them before the next TPT meeting. The team agreed to tentatively schedule the next TPT meeting sometime between 11<sup>th</sup> and the 14<sup>th</sup> of October.

### **THE SPILL DRILL**

Ms. Swartz presented an overview of a recent simulated emergency spill at the North Pole Refinery that was organized by ADEC's Industry Preparedness and Prevention (IPP) program. Ms. Swartz explained that the drill was instituted in accordance with Alaska Statute AS 46.04.200 which requires that ADEC prepare a statewide contingency plan to correspond to the management of toxic substances within the state. Part of the contingency plan, which FHRA has entered into contractually with IPP, is to test the Incident Command System's (ICS) response to a spill at the refinery at least once every five years.

Ms. Swartz said that the drill was based on a scenario in the contingency plan in which a major pipe leading to a large tank is ruptured by a piece of equipment causing a spill large enough to spread off-site beyond the refinery's secondary containment system. To simulate a spill from a rupture in a major pipe leading to a tank, the organizers of the drill released 10,000 gallons of dyed water from a fire truck. Ms. Swartz said that the primary objectives of the spill were to determine the readiness of FHRA's primary contractor, which had recently been changed, to assess how FHRA set up its ICS, and to evaluate the response of refinery personnel to a surprise situation.

Ms. Swartz said that the department was impressed by how quickly FHRA responded and how they worked together, particularly with respect to the seamless interactions between the operations and logistics centers. She suggested that FHRA develop a more detailed plan to evacuate people that live and work south of the refinery and that they provide some additional training on formal ICS. Ms. Swartz said that, while there are lessons to be learned, overall the department now has a heightened level of confidence with FHRA's ability to respond to a spill of this size.

**ACTION ITEM:** Jeanne Swartz will send her presentation to Mr. Zentner who will post it to SharePoint.

### **SITE CHARACTERIZATION**

The team transitioned to a discussion on the unresolved site characterization issues in the project's work plan. Ms. Farris briefly described the project priorities that were stated in ADEC's August 18<sup>th</sup> letter wherein the department outlined the compressed time schedule for the project. Ms. Farris said that, according to the letter, the first priority is to eliminate the possibility of off-site exposure. The second and third priorities are to initiate an aggressive on-site treatment program and to gain a better understand of off-site migration.

The team reviewed some of the immediate and short-term tasks to be addressed by the site characterization subgroup. Mr. Schwenne said that the team should attempt to establish a framework by which to evaluate the effectiveness of the pump and treat system with the data that the group is expecting to receive in the next few months. The group should also consider how the reference dose for sulfolane will impact the contaminated site as well as the way that the plume and the cleanup goal are defined. The subgroup should definitely discuss whether the team should pursue a Feasibility Study (FS) in order to consider alternative technologies and to determine whether the right data are being collected to make the appropriate decision regarding the technologies that are available.

The team discussed the possible implications the PPRTV value will have for the project once it has been finalized. Ms. Farris said that it will likely take a rather long time for the state to adopt the value into its regulations, if it decides to do so, since a proposed cleanup level would have to be included in a regulations package which would require a public comment period. She added that she is unsure whether the state will set a site specific or statewide value for sulfolane cleanup. Mr. Janes said that while it is not a certainty, it is likely that the state will use the PPRTV value as its cleanup level since, of the data that are available; it ranks the highest in the regulatory hierarchy for sources of toxicological data.

The team discussed the site's monitoring well network. Ms. Farris reiterated that one project priority is that FHRA establish a secure and extensive well network to monitor off-site migration. She added that she wants to ensure that the data coming in are being used to refine the monitoring well network and that the network is deployed in such a way that the team can evaluate the fate and transport of sulfolane and the efficacy of the site's pump and treat system. At the present time, the department cannot say with confidence that the monitoring well network proposed in the work plan can sufficiently address all flow paths and potential flow paths within the project site.

The team engaged in a lengthy discussion on the extent to which the plume must be characterized in order to meet the project objectives. Several team members suggested that the intricacies of the plume should be understood to the extent that the team can confidently propose a given treatment and then monitor whether the treatment is working effectively. Mr. Bainbridge said, for example, that if monitored natural attenuation is selected, the team should attempt to understand the intricacies of the plume to the extent that they can say that the plume is attenuating over the years. The team agreed to take up discussion of the aforementioned issues during future meetings of the site characterization subgroup. The team concluded that efforts to evaluate the intricacies of the plume should proceed according to a staged approach in which the methods and objectives of the evaluation are reconsidered at the end of each stage.

Mr. Garner reviewed the status of site characterization efforts that have been completed or that are currently underway. The third quarter ground water monitoring is now complete and its associated report is scheduled to be submitted by October 31<sup>st</sup>. FHRA is working on issues related to on-site naphthalene interference which will be addressed in the fourth quarter monitoring report that is scheduled to be submitted on January 31<sup>st</sup>, 2011. Mr. Garner pointed out that the first draft of the revised Site Characterization Report (SCR) is scheduled to be submitted in December. He asked whether it was possible to combine the draft SCR with the fourth quarter monitoring report.

FHRA is continuing its review of residential well logs and ADEC septic system records. They are now looking at the well logs from wells that are located a significant distance down-gradient in an attempt to determine whether they can use them to make meaningful interpretations from regional geological information. FHRA is attempting to coordinate their development of the monitoring well network with their attempts to delineate permafrost in the project area. A large amount of permafrost was recently discovered just north of the extraction unit at and around monitoring well (MW) 134. Mr. Garner said that the RA will include a surface soils analysis of two soils taken from each of two residential gardens. Ms. Farris remarked that, from the state's standpoint, it would be best if FHRA is able to take the soil samples from the garden sampling project participants with the highest concentration of sulfolane in their well water.

Ms. Andresen briefly updated the team on the status of various items, such as the Microbial Evaluation and the Stable Isotope Evaluation, that were proposed to demonstrate whether monitored natural attenuation is occurring. FHRA intends to proceed with the first phase of the Stable Isotope Evaluation, but they will probably not proceed with the second phase of the project unless the first phase shows tremendous progress. The content and scheduling of the program will be based on a consideration of the FS and other factors; but the program will not likely begin until the next summer due to timing issues. FHRA is proposing that the program be carried out in partnership with the University of Oklahoma.

The team discussed the possibility of performing a bio-characterization study at the University of Alaska Fairbanks. Dr. Barnes said that he spoke with the director of the University's stable isotope lab who said that the lab is fully equipped and able to carry out insitu or exsitu biodegradation experiments provided that they are furnished with the appropriate radio labeled material. Dr. Barnes said that he would provide Mr. Garner with the contact information for the director of the lab.

**ACTION ITEM:** Dr. Barnes will provide Mr. Garner with the contact information for the head of the stable isotope lab at the University of Alaska Fairbanks.

Mr. Garner and Mr. Andresen reviewed recent efforts to characterize the Light Non-Aqueous Phase Liquid (LNAPL) plume and to determine whether sulfolane can transition into Dense Non-Aqueous Phase Liquid (DNAPL). Ms. Andresen said that a sample of sulfolane from the refinery was recently submitted to a project lab to determine whether sulfolane can, in fact, transition into DNAPL under the environmental conditions that are present at the project site. Mr. Garner pointed out the proposed locations of 19 additional wells which will be installed to augment the monitoring network and LNAPL

recovery system. FHRA is currently evaluating data gaps, particularly with regard to permafrost influence, to assess potential locations for an additional 12 monitoring wells to be installed in off-site areas in the current season.

## **TRANSECT PROPOSAL**

The team discussed a recent suggestion made by ADEC that FHRA establish a transect north of the refinery to determine the mass flux across the refinery's property boundary. Mr. Garner said that while FHRA recognizes that it must ultimately establish a network that demonstrates a reduction in the concentration of sulfolane from on-site capture, they are not sure that they can set forth a detailed plan to achieve that goal at this phase of the project. Mr. Garner commented that the proposed transect is located in a wetlands area and it may not be possible for FHRA to acquire the permits necessary to work in that area this year. FHRA feels that the ground water model, if appropriately calibrated, will allow them to determine the flux rate at any point within the plume with a reasonable degree of confidence. He questioned whether the model combined with data from a recent capture test would be sufficient to estimate the rate of mass flux at this stage of the project.

The team took up consideration of Mr. Garner's remarks. Ms. Farris said that the full measure of the site characterization subgroup's expertise must be applied to the question of whether the model is sufficiently calibrated to determine how much contamination is moving offsite and whether the remediation system is performing adequately. She said that, at any rate, the team needs to have a full understanding of the off-site flow of contamination by the end of the year.

Mr. Garner suggested that, instead of establishing the aforementioned transect, FHRA could strengthen an existing line of wells on the on-site side of the property line which is roughly delineated by existing wells S-55, MW-102, MW-131, and MW-143. He asked the team to consider whether an augmented on-site line, combined with the groundwater model and capture test data, would provide an adequate approximation of the flux rate, and, a reasonable level of confidence that the source areas are being contained during the interim period and before a final technology is selected.

The team discussed Loren's proposal. Both Ms. Farris and Mr. Schwenne agreed that they did not see any problem with the area being enhanced. Ms. Farris explained that the idea behind the proposed transect was to gain an understanding of the lithology line which would provide a good sense of the maximum concentrations and the depth of the aquifer. The team discussed the spacing along the proposed transect. Ms. Farris said that she would consider 100 foot spacing for this particular plume but added that the permafrost data should be taken into account when determining the spacing distance.

The team continued its discussion on the proposed transect. Dr. Barnes said he felt that the location proposed by Mr. Garner would be suitable to determine whether mass is crossing the boundary, but he added that the line may be too close to the source to be used to determine whether attenuation is occurring. He said that at this point, he would like to wait to see more data before making any suggestions about the spacing on the proposed line. The team discussed various ways of sampling along the proposed transect. Mr. Schwenne suggested that the team consider a certain sampling procedure that was used in a similar situation during a recent Oasis project in Galena, Alaska. He offered to review

the procedures used during that project and to inform the team of whether they are applicable to the North Pole site.

The team concluded its discussion on the proposed transect. Mr. Garner said that he would write up the proposal and submit it for approval in the plan. He commented that, due to time constraints, they would probably not be able to sample every 10 feet in 100 foot spacing, but they could plan on installing an additional 8 to 10 wells to strengthen the existing line. Mr. Schwenne suggested that it may be possible to place the wells at less than ideal distances provided that team realizes that additional wells may have to be placed between them in the future. Ms. Farris remarked that while the notion of strengthening the existing line is a good place to start, she is not sure that the timeframe for the work plan precludes the possibility of establishing a full transect. The team agreed to discuss the matter further during the next meeting of the site characterization subgroup.

**ACTION ITEM:** Ms. Andresen will check to see whether any information is available on the permeability of sulfolane in a semi-permeable membrane.

**ACTION ITEM:** Mr. Schwenne will review the procedures used by Oasis during its Galena project and inform the team if they are applicable to the proposed continuous monitoring of the project site's aquifer.

The team discussed concerns about drilling through permafrost. Mr. Garner said he would like to know whether the department feels that they should drill through the permafrost while they are setting up the transect. Ms. Farris remarked that the transect is located on the southern side of a large, relatively shallow area of permafrost located further north of the refinery area. She said that she is interested in seeing the vertical profile, particularly with regard to the depth of permafrost and where the contamination is spilling or diving. She added that it will be useful to have a sense of the locations of the up-gradients and down-gradients within the vertical profile.

## **DRINKING WATER UPDATE**

Mr. Price presented an update on FHRA's efforts to resample wells using the new isotope dilution technique. He explained that FHRA has decided to resample wells that were determined to be non-detect using the previous analytical method, but which were located close enough to wells with sulfolane detections. FHRA has decided to resample them using the new technique, which is more accurate at lower ranges of concentration. Mr. Price said that of the 155 formerly non-detect wells that have been resampled, 61 have shown a non-detect result, 58 have shown a concentration of sulfolane between the Limit of Quantification (LOQ) and 20 parts per billion (ppb), and 1 has shown a concentration of sulfolane of 21.1 ppb. There are still 10 wells with samples that are being processed in the lab.

Mr. Price said that, overall, FHRA has sampled 528 wells. Sulfolane has been detected in 293 of these wells. Of the 293 wells with detections, 138 have shown a sulfolane concentration of less than 20 ppb, 26 have shown concentrations between 20 ppb and 32 ppb, 38 have shown results between 32 ppb and 70 ppb, and 91 have shown a concentration of greater than 70 ppb. FHRA has connected 29 residences



to the municipal water system and provided 17 residences with long-term bottled water. FHRA has installed 50 residential bulk water tanks and 88 water treatment systems. Commercial bulk water systems have been installed at 5 locations and 201 locations have been provided with interim bottled water service.

Mr. Garner explained that the improved accuracy of the new methodology has raised questions about the plume movement. He said while they are uncertain about how the net movement is affected by natural attenuation. FHRA will attempt to determine whether the movement is occurring in a figure-like pattern. FHRA will continue resampling and providing bottled water to non-detect residences within a buffer zone along the edge of the plume as a precautionary measure. Mr. Farris stressed the importance of establishing institutional controls on the long-term preservation of the buffer zone and the maintenance of the alternative water supplies being provided within the affected area. The team will add a discussion of institutional controls to a future agenda.

### **THE RISK COMMUNICATION SUBGROUP**

Ms. Grady updated the team on recent developments within the Risk Communication subgroup. The subgroup recently completed a project survey but had to delay uploading it due to issues with the program's format analytics. The survey consists of seven questions that ascertain the community's informational needs and to determine how best those needs are addressed. The survey will be distributed to the community in a number of ways; it will be posted on the department's website, it will be announced and linked on the project listserv, and it will be mailed to the residents who have requested a mail out. Ms. Grady also reported the second edition of the project newsletter will be coming out in the next two to three weeks.

### **THE LEGISLATIVE BRIEFINGS**

Ms. Farris described recent meetings with Mayor Hopkins and Mayor Isaacson. She said that the mayors were most concerned about the longevity of the alternative water supply and the maintenance of the systems in general, particularly in the event that FHRA sells the facility.

Ms. Farris also reported that Mayor Hopkins has agreed to sign a letter in support of the request to the NIH nominating sulfolane for additional research.

### **FUTURE MEETINGS**

The team agreed to tentatively schedule the next TPT meeting for either October 11 or 14. The team agreed to schedule the December TPT for the 1<sup>st</sup> and the following TPT meeting for January 11, 2011.

The meeting adjourned at 4:25 PM Alaska Time.