Red Hill Administrative Order of Consent Scoping Meetings
Red Hill SOW Section 3 – Tank Upgrade Alternatives (TUA) Scoping Meeting Summary
12/3 – 12/4/2015

Attendees:

- NAVY/DLA:
  NAVFAC PAC: Perry Nakaoka, Stephen Fujino (Section 3 Lead), Debbie Loo, John Sato (Section 8 Lead)
  HDR, Prime Contractor: Frank Hino
  Enterprise Engineering Inc., EEI, Subcontractor to HDR : Kevin Murphy-Principal, Steve DiGregorio, Steve Brooks, Doug Kieley
  NAVFAC EXWC: Terri Regin (Section 2 Lead), Leslie Karr, Miguel San Pedro, Mike Rocha, Frank Kern, Tom Tehada (Section 5 Lead0
  NAVFAC Hi: Jimmy Miyamoto, CDR Burr Vogel
  NAVSUP FLC PH: John Floyd (Section 4 Lead) [12/2], Greg Yamasaki, LCDR Lovgren [12/2-afternoon only, 12/3],
  NAVSUP Energy: Danae Smith
  DLA: Elton Saito, Ron Nelson, Bob Krouse,
- EPA: Steve Linder, Omer Shalev;
  Consultants: Doug Schwarm, Phil Myers [At Red Hill 12/2, came at 1015]
- DOH: Stuart Yamada, Steven Chang, Roxanne Kwan, Josh Nagashima, Roy Ilaga, Jenny Bernier, George Tabil, Thu Perry

Introductory Session:
The introductory session focused on Overall Expectations and Goals for Section 3 Tank Upgrades Alternatives and defining success for the session. The discussion was structured around the following topics:

a. Extraordinary Outcomes

- Definitive outline for the SOW,
- Understand expectations
- Common knowledge, basic understanding of issues (level playing field)
- Get through the agenda
- Open discussion, input from ALL stakeholders
- Agree 100% on initial screening criteria
- Agree 80% minimum level on what the upgrade concepts will be, fringe ones in parking lot

b. Challenges

- Entrenched decisions: Lot of work was done prior to this meeting, need to come at this with fresh eyes; allow ideas for re-work [No one set solution, both ways: have to *have* secondary containment, even if not technically feasible OR too costly to do X alternative]
  - Overcome personal bias
  - Hidden Agendas

- Establishing the fundamental criteria in order to make a good decision on the alternative (after report is done), how are we going to judge between the alternatives
- Sheer disparity between technical levels of expertise in the room (opinion or strict engineering/science issue)
    - Level playing field

c. Processes

- Don't interrupt, let someone explain full alternative, then bring up new options
- Decision-making matrix, weighing values of the variables between the agencies (public acceptance versus cost), so coming to consensus of the values
- Active listening
- All left with common knowledge and understanding

d. Facilitator's Role

- Pull input from those not speaking
- Small groups/side bar: Group provide the topics
- Less time in small groups

Review SOW Expectations for Section 3: EPA

The EPA stated that the expectations of Section 3 are to identify the BAPT and the TIRM procedures that can be applied to these tanks. The *Red Hill Storage Facility Tank Upgrade and Release Detection Systems and Tank Tightness Testing Report by EEI dated July 2015* is only one component for final decision, because the decision must also consider the TIRM procedures that are needed based on the upgrade, and then the corresponding RDS and corrosion outcome. TIRM may need to be updated based on decision of BAPT. Later discussions focused on Section 3 would and the need to include input from other sections, specifically Section 2 (TIRM), Section 4 (Release Detection) and Section 5 (Corrosion and Metal Fatigue Practices). EPA feels Section 3 should incorporate recommendations from the other sections and the Navy/DLA agrees.

The following points were made by the EPA during this discussion:

1) After this meeting and possibly additional scoping meetings, the next deliverable is a scope of work. The next deliverable is not finalizing the report that was contracted by Navy/DLA with EEI.
2) The deliverable needs to meet conditions: timeline and that it is truly BAPT understanding the 'Iron Triangle' constraints: costs/MILCON, schedule, & quality
3) Components of BAPT must consider Sections 2, 4, and 5 reports will also be available when making the decision for BAPT.
4) Different levels of BAPT, what if it never gets funded? Navy/DLA under the 22-year time constraint, the negotiated time period considered the risk of funding.
5) EPA is looking for: Feasibility (Can it be done?) Practicability (Can it be done cost effectively.)
6) If we are not in agreement after this Scoping Meeting and a second meeting is required that is acceptable.

Overall Expectations and Goals for Section 3, Defining Success

See Introductory Session, above

Key Background Documents and Summary of Previous Efforts – Navy

EEI presented a summary of the previous documents and work performed at the facility.

1) 1997 – Upgrade of Red Hill, Tank 19: EEI completed this study which was contracted by the Navy to develop ideas for tank upgrades.
2) 2008 –Update to the 1997 Tank 19 report, and expansion to Upgrade of Red Hill Tanks (with fundamentally similar findings)
3) 2008 – Market Survey of Leak Detection Systems for the Red Hill Fuel Storage Facility, Michael Baker Jr. Inc

Discussion Points:

1) 2006: Tank 48 release – 359,000 gallons diesel release, lots of focus on FLC Pearl Harbor, then more focus on environmental matters and security Tank 48 is located at Pearl Harbor Naval Base, and is not at or similar to Red Hill.
2) Tank 19: had failure problems, fuel coming back through the wall, so took this tank down. DLA stated that the knowledge of the failure was second hand.
3) Service life of the tank: no known records. The public perception is that the tank are old and beyond their service life. EPA made the comment that there is no established service life for these tanks. EEI discussed that the concept of service life is used to obtain funding.
4) FLC has API 653 inspection reports of tanks from 2000 (about) to present

Presentation on Enterprise Engineering, Inc. (EEI) Report/Work on Tank Upgrade Alternatives and associated release detection - Navy

The Navy contracted EEI in March 2015 to perform a study of Red Hill Fuel Facility Tank Upgrade Alternatives and Release Detection and Tank Tightness. EEI made a presentation of the current status of the contracted study. The process of the study was described, initial brainstorming, initial screening and development of attributes for evaluation of alternatives. EEI's initial scope of work with the Navy did not include developing a ranking system or ranking the alternatives. Refer to Attachment 1.

Discussion points:

1) EPA asked, How far is the Navy looking at the alternatives? What sources were consulted?
    a. The Navy discussed depth of alternatives and sources consulted. EPA commented that documenting information sources is very important.
2) EEI's In Progress Report: Comments to the report. The Navy and EEI are working on responses to the In Progress Report comments.
3) Next Deliverable: Scope of Work that is agreed upon during scoping meeting(s). The Navy/DLA and EPA/DOH agreed to an interim discussion prior to final submission.
4) EEI's Preliminary Report is similar to the AOC SOW, but some differences exist with the AOC SOW Section 3.3
5) List of available technologies that EEI considered
    a. There was a discussion specifically concerning Navy Research Laboratory coatings and thermal spray aluminum (metalizing) put on many tank bottoms throughout DoD and a few at Red Hill to control corrosion.

b. Discussion on aluminizing drawbacks: The result can be porous, so there is a need to provide a coating over system of the aluminizing. EEI also expressed concern about the heat input onto the steel during the metalizing process.

6) List of Initial Screening Considerations that EEI considered: factors used to select which alternatives to fully investigate (See **BAPT Evaluation Process and Methodology**)
7) List of Evaluation Attributes: to identify common elements and differences between each alternative (See **BAPT Evaluation Criteria/Attributes for Feasible Alternatives**)
    a. Assumptions related to the condition of the current infrastructure need to be clearly identified to be able to make decision under TUA.
        i. For single-wall, then need to do a higher level quality TIRM
        ii. For double-wall, what is acceptable level of inspection of outer tank – can water leak into secondary containment or no because path to leak out; less effort for repair, no coating, etc.
            1. How do we engineer beyond this, so that we can test for corrosion or prevent water from coming in? What is acceptable level of effort?
    b. Identified limitations within Red Hill in order to install leak detection in the tanks & repair/restoration/upgrade of this magnitude:
        i. Dedicated fiber optic cable for the tank upgrades/leak detection
8) More electrical power transmission needed to actually get this work done

BAPT Evaluation Process and Methodology – Feasibility Criteria

The purpose of the Initial screening criteria was to remove alternatives that were not practicable. The group discussed the need to expand on the explanation of each screening criteria, specificity of the language and agreed to suggested descriptive changes.

1) Constructible: Can be constructed in the field at Red Hill using practicable construction means and methods.
    a. Do not want Red Hill to be a science project
    b. Example: 100’ liner to get through tunnel into the tank (probably not practicable)
2) Testable: Can be tested and shown to be acceptable during construction and startup/commissioning; verified to perform in accordance with design requirements.
    a. Can you provide contractor QA/QC?
    b. Is there an industry acceptable practice on what constitutes commissioning?
    c. Will this hold product?
    d. Example: Exterior tank upgrades, inject grout outside of the tank and concrete structure – removed from further detailed study because a test cannot be performed to verify that all voids are grouted.
3) Inspectable: Able to determine integrity on a periodic basis either while the tank contains product or out of service, i.e. no product in the tank.
    a. Once it is in use, can you determine its integrity?
    b. Secondary containment plate system with concrete can be inspected when out of service, or partially inspected, and this alternative should be kept in consideration for further detailed study.
4) Repairable: Able to be repaired in the field at Red Hill using practicable construction/repair means and methods.
    a. Can this be fixed?

Discussion Points

1) In the report, need to state the selection criteria reasons when explaining why alternatives were not moved forward.
2) Need for specialized skills identified by EPA as a possible attribute.
3) Assumptions about current condition of tanks identified by EPA as a possible attribute
4) Restorability or reversibility identified by EPA as a possible attribute; does an action preclude other alternatives in the future?

EPA/DOH called for a caucus to privately discuss the EEI's initial screening process. After the caucus, EPA/DOH concurred with the 4 initial feasibility criteria, with additional wording/slight changes (i.e. practicable vice traditional)

BAPT Evaluation Criteria/Attributes for Feasible Alternatives – EEI

The purpose of the evaluation criteria was to remove alternatives that don't work. The group discussed evaluation criteria that will be presented in the TUA Report in order to select the BAPT. EPA requested that the Navy add a level of granularity to each attribute, i.e. provide a ranking for each attribute. The purpose of this ranking system is to evaluate various alternatives and their relative performance to each other. This will aid the decision makers in selecting the BAPT. The ranking system should:

a. Try to reduce the use of yes/no; acceptable/Not acceptable
b. More rankings: 1-5; high, medium, low; etc.
c. Narrative (explanation) to validate the ranking

The following attributes were discussed. The group concurred with the following attributes and with the understanding that a more robust definition would be developed.

1) Current attributes:
    a. Primary positive attributes: summarize the pros of each alternative
    b. Primary negative attributes: summarize the cons of each alternative
    c. Constructible and Testable: How constructible/testable is the alternative? How well construction performs?
    d. Inspectable and Repairable: How inspectable/repairable is the alternative?
    e. Release Detection System Testable: Can release detection be included in this alternative?
    f. Secondary containment: Does the alternative provide secondary containment?
    g. Successful implementation at preventing leaks at large fuel depots
    h. Impact on operating requirements: High, medium, low
        i. Replaces Operating requirements and procedures
    i. Impact on maintenance requirements: High, medium, low
        i. Replaces maintenance requirements and procedures
    j. Ability to identify the release location
    k. Ability to identify the release quantity
    l. Future maintenance and integrity requirements
        i. different levels of life expectancy and inspections to maintain system
    m. In-tank release detection system, If required
        i. If it is a single-wall system, there must be a release detection method implemented per new regulations
        ii. If it is a double walled tank, it's not required to have in-tank release detection system. LDS means third party certified, NWGLDE

n. Release detection system in the interstitial space between inner and outer tanks (If applicable)
    i. Ground Water /vapor monitoring wells can be considered as 'outside primary release detection' and this is NOT what we want implied.
o. Apparent Reliability: Abused word, intent was some element of decision-making process on credibility; still need to develop a better definition of what this means; general consensus of time based failure rate;
    i. Response options: high/low acceptability, unknown,
    ii. **Parking Lot** – on definition and if keeping this attribute in or not
p. Ability to repair failures: level of difficulty to execute the repairs
q. Service life limitations: relative situation: short-1 year, long-40 years
    i. Replaces design or anticipated service life
r. Impact on volume
s. Impact on existing ATG
t. Impact on venting
    i. venting when filling/emptying the tanks is very serious at Red Hill; engineering perspective may prevent alternative because of the additional venting requirements that cannot be met
u. Impact on tank nozzles (vice piping): different difficulties with replacing the nozzles based on each alternative
v. Costs
    i. Costs provided in the report need to take into account that all the tanks will be upgraded in the time constraint of 22-years.
    ii. List assumptions for developing costs in report: 3 tanks, 2 shifts, 6 working days

2) New Attributes:
    a. Ability to stop/reduce the leak/release from going into the environment
        i. Ability to minimize the magnitude of a leak
    b. Success of construction
    c. Restorability:
        i. Can it be undone at the next service life? How difficult is it to remove/restore or turn into something else [i.e. metalizing or steel overlay – can this be undone or is tank completely done at end of service life of this upgrade?]
    d. Construction logistics: Noise, traffic – buses for workers, equipment movement, staging areas [Impacts to the community]
    e. Potential for probability of success
    f. Proprietary

3) The following attributes were deleted by the group:
    a. Environmental compliance requirement
        i. It is understood that the alternatives would meet environmental regulation.
    b. Is concept practicable? EEI believes this synthesizes the process in the report, EPA says it's not just standalone evaluation on each alternative, but when looking at all the alternatives as a whole.

i. What is best available and practicable alternative? This is part of decision-making process, not an attribute.
ii. Incrementally what level of risk is being reduced for the costs associated with the alternative (Minimal risk reduction for highest cost – not practicable)?

c. Stakeholder Acceptability, various stakeholders [cannot realistically address this properly in the report]
   i. Community/Public Acceptability
   ii. Politicians
   iii. SMEs

d. Execution years: How long would it take to construct this alternative? Labor hours per option; construction cost estimates are not done by labor hours; could be done in square/ft; will be a hard metric to develop.
   i. EEI will not be able to develop the execution years per alternative in this report due to construction contracting uncertainties.

4) **Parking Lot Attributes**:
   1. All release detection attributes
   2. Reliability

Alternatives to be included in Scope of Work – EEI

The following discussion is concerning the specific tank upgrade alternatives to move forward. EPA/DOH concurred the 14 alternatives presented are the right alternatives for consideration. After some discussion, EPA proposed a Second Tier Screening process be applied to the 14 alternatives and the following alternatives were recommended by the group to move forward with in the SOW.

The alternatives selected to move forward consist of three (3) single wall alternative and three (3) double wall alternatives. Note: Double wall is defined as having secondary containment.)

1) Single Wall Alternatives to be included in SOW:

- 1A, Restoration of Existing Tank with improved TIRM Procedures
- 1B, Restoration of Existing Tank Plus Interior Coating
  i. What is our level of confidence that no holes during the welds? Our confidence lies with the TIRM procedures, based on what scanning technology, destructive testing,
  ii. TIRM report really dependent on making a decision about 1A & 1B.
- 1E: Replace all existing steel liner (remove existing) with all new steel to start at age zero (i.e. no pitting on the back of the steel)

2) Double Wall Alternatives to be included in SOW:

- 2A: Composite Double Wall Tank (Carbon Steel)
- 2B: Composite double wall tank (duplex stainless steel). Will have to consider the grades available.
- 3A: Tank within a Tank (Carbon Steel)
  i. If strongly consider No. 3, then can consider 3B also.

Additional Discussion:

1) Second tier screening evaluation process that explains why these alternatives were kept or removed from the decision making meeting.
    i. Goal: At decision meeting, only have a few alternatives to choose from
    ii. Need detailed explanation why alternatives were NOT included
2) Does the project have to adhere to the Buy American Act?
3) What alternatives were removed by the Second Tier screening process? These alternatives were removed with input from the entire group. The report will have to provide further justification.
    - 1C: Restoration of existing tank plus Metalizing (Interior Coating) on Existing Steel Liner
    - 1D: Rubber lining bonded to existing steel liner
    - 3B: Tank within a Tank (Duplex Stainless Steel): to remove the noise, since similar to 3A, but can still see back side
    - 4: Double Wall Fiberglass System with Release Detection – not backed up with sufficient engineer data
    - 5A: Steel liner plates welded to existing steel liner
    - 5B: Steel liner plates with expanded metal between existing steel liner and new steel liner
    - 6: Stainless steel membrane over existing steel liner: requires robot to put in the tank, will technology even be able to build it, bubbling from external pressure/slight vacuum, that big and thin will buckle
    - 7: Flexible membrane liner, not bonded to steel liner – lifetime unknown (one test for 11 years, no data going beyond the date, possible life is 10 years), cannot strap the tank (huge operational/inventory issues), nothing done at this size, Bag would weigh several tons and try to construct/support within tank, plastic-chemical variability (time and brittle)

Meeting Adjourned to be continued 12/3/2015

The following summarizes the discussion prior to returning to the agenda.

1) Summary of yesterday's events - Navy
2) Outline Section 3.2 Scope of Work Content – EPA
    a. Upfront info/data that helped inform decision/summary of data for 10-20 years: what have been the failure modes, what we know of past leaks/failures. This is a Navy initiative and there was discussion on availability of the data prior to 2000.
        i. EPA/DOH will work with EPA Consultant to determine what data he is looking for.
        ii. Include in the report, the actual documents that were used (where appropriate) and, insert document names and the format the docs will be given to EPA/DOH in outline – electronic, hard copy, database, on shared website
    b. Overall alternatives (technologies) section: Include sources that were consulted (appendices with references),
    c. Initial screening criteria discussed and clarified
    d. Second screening criteria established resulting in a short list of alternatives to focus efforts on

e. Describe attributes, assign some type of ranking, (granularity), examples - value of quality contractor – good, ok, bad; binary attributes: true/false,
f. Reflect info in summary table with supporting documentation/data,
g. TIRM: How does it affect operations, level of confidence in repair, etc.
h. Release detection systems: Identify alternatives compatible with each of the TUA.

3) Discussion
   a. Timeline for AOC/SOW development: Navy targeting a draft outline by end of January.
   b. Provide in-depth analysis for the alternatives selected, provide details in order for decision-makers to decide which alternative is best
      (1) When talking about single-walled solutions, need to include the operational response. If a release is detected, then what actions are to be taken to minimize or even stop the release, i.e. move fuel to another tank?
      (2) Alternatives 1A, 1B: How extensive verification for TIRM to reduce risk. This is in TIRM report, includes the improvement for processes, but may have multiple 1As to increase the reliability of the TIRM, i.e. third party QC/QA, double welding, coating, destructive testing ranges (5 plates per area in tank versus 10).
   c. Single-shell, very clear idea of what the TIRM procedure is; if double-walled – what does the TIRM procedure look like, and need more detailed version for the upgrade alternative
      (1) If a single-wall alternative is ultimately selected instead of a secondary containment alternative, the Report should contain information that supports the basis for this decision. In this instance, EPA may need to clarify that the single-wall alternative is more protective than the secondary containment option based on the data in the report.
   d. Provide a report that outlines the effectiveness of each of the systems (including leak detection, corrosion, and tank upgrade/secondary containment), so can make a choice on the actual system that will be going into each tank.
   e. Look at all the variables for the report. The scope of work that is being done is fairly comprehensive, and needs to take into account the other reports, some risk elements, etc.
   f. Granularity of the alternatives, so various costs based on how much you do in TIRM: coatings, double welds, tightness testing frequency, range of options and costs associated with alternative 1.
   g. Life cycle cost analysis – EEI's current contract does not include this; so will need to add.
   h. Are we doing more or less than what industry is doing? If less-unsatisfactory; if more – then should be identified in detail, need to write out the procedures

Alternatives to be included in Scope of Work (continued)

BAPT Components – identify components of the alternative that will be described in the TUA Report in order to select BAPT (e.g., upgrade technology and corresponding TIRM and leak detections procedures). In addition to what is developed in Section 3, the BAPT will be a compilation of input from data developed in Sections 2, 4, & 5 reports and possibly new data

to help inform the decision; i.e. Destructive testing: If done now, then this could better help the TUA document.

QA/QC Report Requirements

1) There are two separate and distinct QA/QC concerns.
    i. QC of the auditability of data and information that EEI is basing their report on, how the testing was done (if testing is performed) and clear audit trail to any reports, technical information, telephone calls or other data referenced in the Section 3 report.
    ii. The actual level of CONSTRUCTION QC/QA for the alternatives.
2) Components EPA wants to see in QC
    i. Auditable trail of data collection
    ii. Methodology in reviewing vendor claims
    iii. Limitations to the data
    iv. Owner/Operator input/experience from other similar tanks (don't just rely on vendor claims)
    v. Don't insist on new methods/technologies in QC/QA. Stick with what is proven.
    vi. Develop/discussion of TIRM for particular alternative – make sure work with EXWC and use specifications
    vii. QC: will be a part of every alternative considered, so need to be a part of evaluation and cost factors to analyze the options

Action Items and Next Steps

15 January: EPA/DOH will provide any additional attributes they think should be included in this outline

End of January: Navy targeting a draft outline to include an example of attributes table in the report.

Parking Lot Issues:

- Attributes (evaluation criteria for feasible alternatives) that were tabled: 1) All release detection and 2) Reliability
    i. Possibly put in Section 4 – what operations currently exist at Red Hill that are even better than industry standard.

Additional Discussion on Baseline Condition of the Tank (Not included in Section 3)

The following discussion was not part of Section 3 and is for record only. Further discussion is required to identify which AOC SOW section will capture this information.

1) Baseline condition of these tanks for each tank (repairs, problems-causes); Summary of known past failure modes for the last 10-20 years: i.e. pits/cracks/types of spills.
    a. EPA/DOH wants to see a summary of all the data, not just the reports; a baseline story. What is the current condition of Red Hill based on facts?
    b. Do NOT put a judgment value; just state the history/facts
    c. EPA wants to see this by mid-January. Navy cannot complete this by that date and will continue discussion with EPA/DOH.
    d. Discussion on where does this information get presented. It is not part of the TUA. Possibly Section 2 but it is not currently required by the AOC SOW.
2) What is the existing documentation that Navy can provide?

- Modified API 653 Reports: detailed info of each tank – can provide these reports to explain overall material condition assessment of the facility (ex. Nozzles are a problem, recognize through our formal inspection that this is a known issue) - Navy will provide these reports and summary of the reports
- Operational Issues - Navy will continue discussion with EPA/DOH.
- Incidents (releases) and the causes of the releases. Explain that releases are not because the tanks are old and leaking.
    a. Navy provided that Telltale system caused most of the leaks, so removed these systems (made a systemic change; get credit for it)
    b. 1998, Willbros Report lists a spill history that is unfounded. EPA/DOH wants the Navy to refute/explain this spill history.

Red Hill Administrative Order of Consent Scoping Meetings
Red Hill SOW Section 8 – Risk/Vulnerability Assessment (RVA) Scoping Meeting Summary
12/3 – 12/4/2015

ATTENDEES:
Navy/DLA:

- NAVFAC PAC: John Sato (Navy Lead); Kris Saboda, Debbie Loo, Karen Sumida
- NAVFAC HI: CAPT Tufts (12/3), CDR Vogel, Jimmy Miyamoto
- NAVFAC EXWC: Leslie Carr, Tom Tehada (Section 5 Lead), Miguel San Pedro, Mike Rocha, Frank Kern
- NAVSUP FLC PH: John Floyd (Section 4 Lead), Tom Williams, Greg Yamasaki
- NAVSUP Energy: Danae Smith
- DLA: Bob Krouse, Elton Saito, Ron Nelson
- Moderator, Ventura Consulting: Neal Flesner
- EEI (12/3 only): Steve Brooks, Kevin Murphy, Doug Kieley

EPA: Steve Linder, Omer Shalev, Bob Pallarino (12/4)
EPA Consultants: Doug Schwarm, Phil Myers
DOH: Stuart Yamada, Steve Chang, Roxanne Kwan, Josh Nagashima, Jenny Bernier

SOW Sect 8, states, "this Section is to assess the level of risk the Facility may pose to the groundwater and drinking water aquifers and to inform the Parties in subsequent development of BAPT decisions."

1. **DISCUSSION / DECISION POINT 1 – RISK/VULNERABILITY ASSESSMENT METHODOLOGY AND APPROACH**

Discussed the overall risk/vulnerability assessment methodology and approach along with the associated expected outcomes. Navy presented the proposed methodology and approach. The proposed methodology assesses various scenarios of risk, as a function of: likelihood of occurrence, effectiveness of systems, and consequences. The scenarios and inputs will be developed with stakeholders after initial data gathering.

Navy presented a dry run on methodology

- Methodology follows Sandia National Laboratories approach, who is the DOE Lead Laboratory for physical security research and development.
- Risk equation: R = PA * (1-PE) * C
- R: Risk, PA: Likelihood of Occurrence, PE: Effectiveness of Systems, C: Consequences. This methodology has been used for similar assessments.

EPA is supportive of this approach because it is an objective methodology. EPA recommended that the equation be broken into 2 separate equations to separate 1-PE and PA. Risk is assessed with the PA factor. Then risk management and mitigation evaluated with the 1-PE factor.

After further discussions on inputs to the risk equation, the process was summarized as:

- Step 1. R = PA * C
  - Includes identifying possible causes of leaks, and likelihood of occurrence of various spill sizes, and those releases getting to the groundwater or to drinking water.

    - Includes identifying maximum, credible release, and associated consequence.
    - Need to work on what is the risk threshold that would require action be taken to make the system more effective.
- Step 2. R = PA * (1-PE) * C
    - This step incorporates effectiveness of the system.

2. **DISCUSSION / DECISION POINT 2 – INPUTS TO BE USED FOR THE METHODOLOGY**

Discussed information needed for input to the assessment methodology. Identified limitations and assumptions.

Discussion on types of data that will be needed included:

- How are tanks, nozzles, piping, storage, automated systems set up at Red Hill.
- What are the facility components critical to drinking water and groundwater vulnerability at Red Hill
- What are likely scenarios/incidents (e.g. natural disasters, operational incidents, maintenance/repair scenarios)
- Historical failures
- Detectible quantity and duration of a leak. Discussed monitoring of level of fuel in tanks during static and dynamic operations.
- Where would leaked fuel go, hydrogeology
- System redundancy
- Management controls, operation and maintenance (e.g. tank tightness testing).

Will need to develop scenarios and consequences (C) table, with relative numeric impact level for different scenarios. Some potential consequences:

- Fuel leaks out of the tank
- Fuel reaches groundwater. Would make technical assumptions for vertical migration rate.
- Contaminants reach groundwater action level
- Contaminants reach drinking water maximum contaminant level (most important)

Potential scenarios may include different categories for quantities or impact of release. Navy considers “release” to mean release into the geological formation.

Risk management. How do we improve our risk?

- Reduce likelihood of occurrence (PA)
- Increase effectiveness of systems (PE)
- Identify concerns of risk to: People, Environment, Assets, Reputation, Public Health.

Navy/DLA considers that the assessment will assess the risk/vulnerability associated with the current configuration of the facility. EPA wants this to show where those vulnerabilities are and how they are being mitigated. Identification of vulnerabilities needs to be semi-quantitative.

Relocation of Red Hill will need to be a qualitative analysis. Consider whether relocation transfers risk to others.

All acknowledged some information in the risk/vulnerability assessment will not be releasable for national security reasons. Executive Summary of final report can be released if it does not contain this type of sensitive information.

It was recognized that the Navy/DLA has proceeded with improvements to Red Hill. These improvements will be incorporated in the risk/vulnerability assessment of the current Red Hill configuration.

Comments in the Board of Water Supply letter of 3 Dec 2015 to DOH, EPA and NAVFAC Hawaii with respect to the risk/vulnerability assessment will be considered for incorporation in the risk/vulnerability assessment approach.

3. **DISCUSSION / DECISION POINT 3 – SCHEDULE**

Discussed schedule drivers and how Section 8 fits within the AOC and the other Sections.

It is recognized that updated data may be available after reports for other AOC/SOW Sections are completed. However, waiting for these reports may delay the schedule. The stakeholders will continue to assess appropriateness of revising the risk/vulnerability assessment as more information becomes available.

Action Items:

- Navy/DLA develop a more detailed scheduling visual aid (ex. GANTT Chart) illustrating development coordination between the various sections of the AOC/SOW.

4. **DISCUSSION / DECISION POINT 4 – ADDITIONAL SCOPING MEETINGS**

Discussed if additional scoping meetings are needed and what information is needed for those meetings.

The Navy/DLA will consider contractor support for developing a risk/vulnerability assessment with appropriate expertise in Quantitative Risk Assessments at petroleum depots. The Navy/DLA will also consider a multi-phased approach. First phase would be to develop a Work Plan for the development of the risk/vulnerability assessment, including methodology, data requirements, and data collection efforts. Second phase would be to implement the Work Plan. The Work Plan would support the Scoping task for Section 8 of the AOC/SOW.

Action Items:

- Navy/DLA develop Acquisition Strategy and draft scope of work for contract award.
- Hold conference call to discuss with parties scheduled through the project coordinators.