Open Environmental Restoration Resource (OER2) Webinar

LTM Requirements- A Smarter Easier and Better Approach to Reporting and SAPs

Presented by:

DON NAVFAC Environmental Restoration Program

Points of Contact

- Presenter: Ken Bowers, NAVFAC LANT, Kenneth.a.bowers@navy.mil
- Champion: Jan Nielsen, janice.nielsen@navy.mil
- Moderator: Tara Meyers, NAVFAC EXWC, Tara.Meyers@navy.mil

Logistics

- Submit all questions via chat box throughout the presentation
- Presentation is being recorded
- Complete the webinar survey (main feedback mechanism)

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OER2 Webinar Series

- Why Attend?
  - Obtain and hear about the latest DOD and DON's policies/guidance, tools, technologies and practices to improve the ERP's efficiency
  - Promote innovation and share lessons learned
  - FEEDBACK to the ERP Leadership
- Who Should Attend?
  - ERP Community Members: RPMs, RTMs, Contractors, and other remediation practitioners who support and execute the ERP
  - Voluntary participation
- Schedule and Registration:
  - Every other month, 4th Wed (can be rescheduled due to holidays)
  - Registration link for each topic (announced via ER T2 email)
- Topics and Presenters:
  - ERP community members to submit topics (non-marketing and DON ERP-relevant) to POCs (Gunarti Coghlan – gunarti.coghlan@navy.mil or Tara Meyers – tara.meyers@navy.mil)
  - Selected topic will be assigned Champion to work with presenter

Speaker Bio

- **Ken Bowers**
  - **– Physical Scientist, NAVFAC Atlantic**
  - **–Experience**
    - Provided technical support and optimization recommendations for NAVFAC LANT for past 8yrs.
      - –Many of these recommendations have resulted in cost savings!!

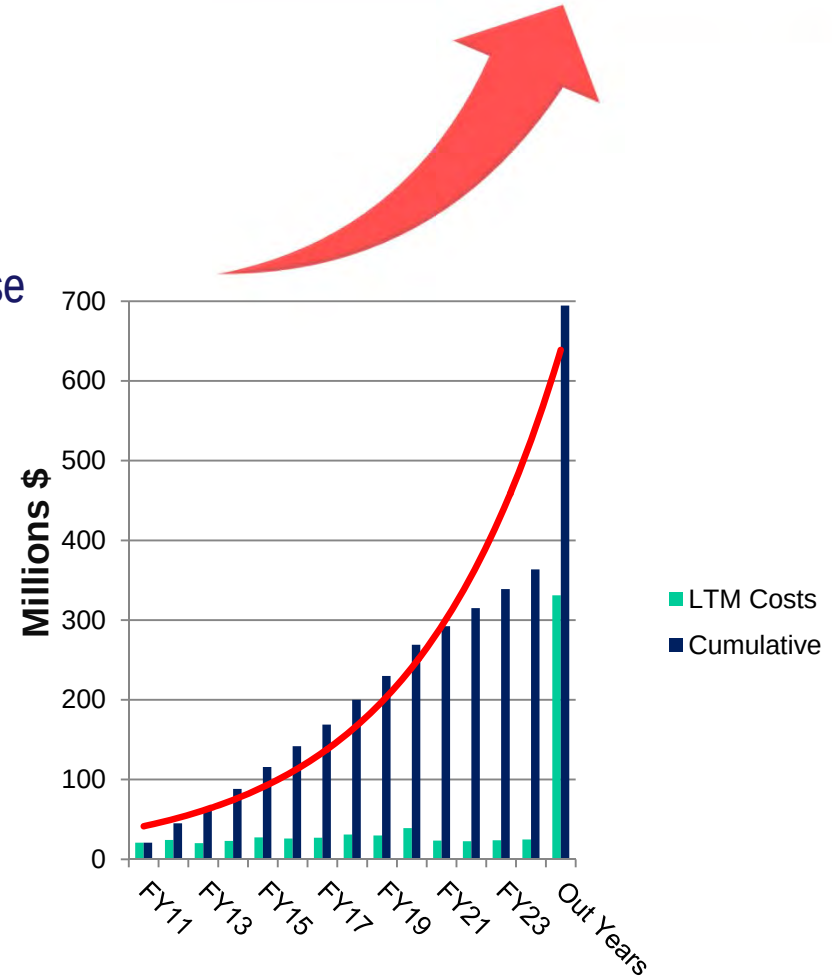
- **Ken's most recent optimization effort is focused on streamlining the LTM process – including LTM Reports and SAPs, all while ensuring projects remain on the optimum path.**

LTM Requirements- A Smarter Easier and Better Approach to Reporting and SAPs

Ken Bowers
NAVFAC Atlantic
July 2015

Why Develop this Approach?

- NAVFAC Head Quarters
  - Long term management costs significant
  - Sites reaching post decision document phase
  - Data rich environment
- Consistency across NAVFAC commands
  - Highlight critical information
  - Mirror ROD Toolkit
  - Mirror Five Year Review Toolkit
  - Easy to communicate to consultants
- Promote decision making



Source: NAVFAC NORM Database Spring 2011

Goals of Management and Monitoring Approach

Management and Monitoring Approach (MMA)

- Multi Use Tool
- Right sized and flexible
- Tell the story of the site
  - Summarize information in graphics
  - Capture past actions and agreements
  - RAO's from decision documents
  - Capture DQOs
  - Document recommendations
  - Update implementation status
- Ensure consistent high quality data
- Provide necessary detail
- Focus on site closure requirements
- Support five year reviews

Monitoring and Management Approach

- Shared the initial template and received feedback
  - Navy remedial project managers
  - Navy Headquarters
  - Intergovernmental Data Quality Task Force
  - EPA Headquarters
  - EPA Region 3 Tier III Team
  - EMEC - EPA and States
  - Federal Remediation Technologies Roundtable
  - Individual Navy teams and stakeholders
  - Restoration Advisory Boards
- Incorporated suggestions

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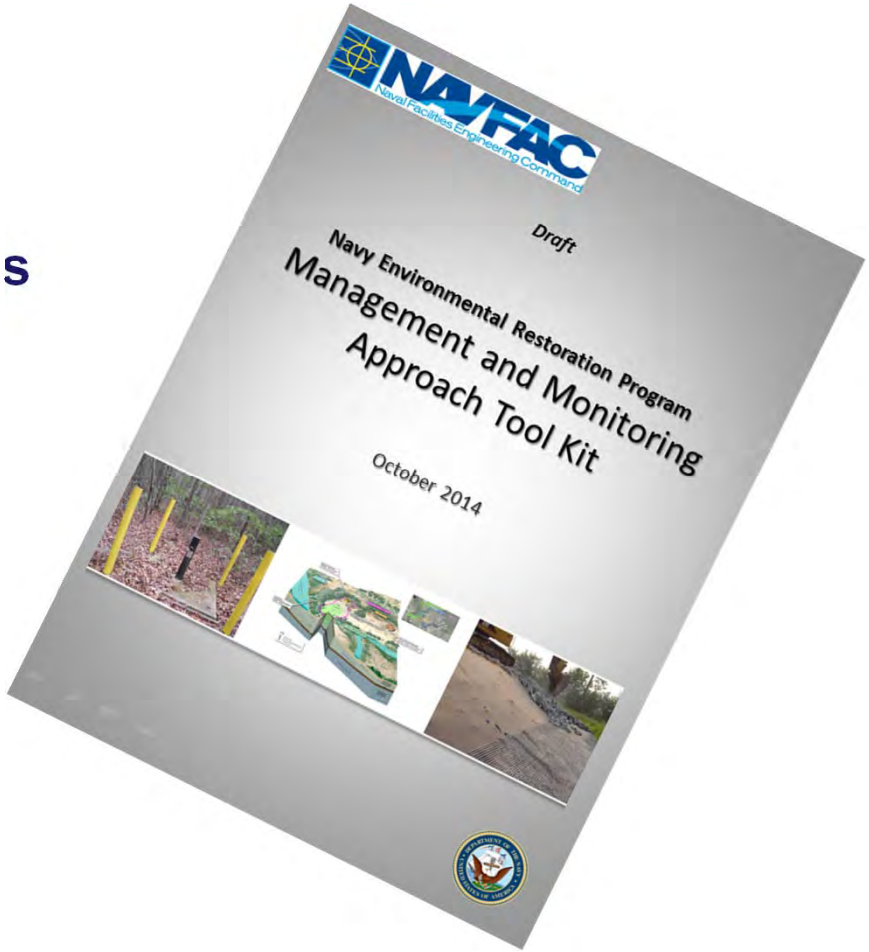
Nailing Down the Details

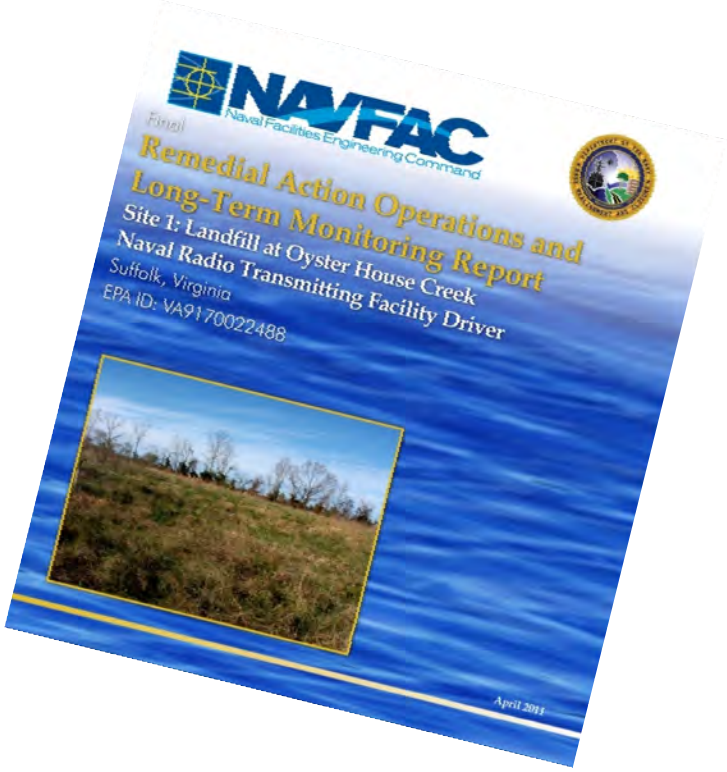
Supplement to Management and Monitoring Approach (MMA)

- Capture example formats
- Highlight flexibility in process



Example Format of MMA LTM Reports

I. Executive Summary
   1. Brief
   2. Highlights of Results and Significant Actions
   3. Recommendations
II. Introduction
   1. Site Specific Location
   2. Location
   3. History
III. Current Conceptual Site Model
IV. Remedial Action Objectives
V. Chemicals of Concern and Cleanup Numbers
VI. Remedy Implementation and Evaluation
   1. Land Use Controls
   2. Active Treatment
   3. Monitoring
   4. Data Quality Objectives
VII. Sampling Results and Data Evaluation
VIII. Site Closeout Strategy
IX. Cost
X. Optimization (if applicable)
XI. Conclusions and Recommendations



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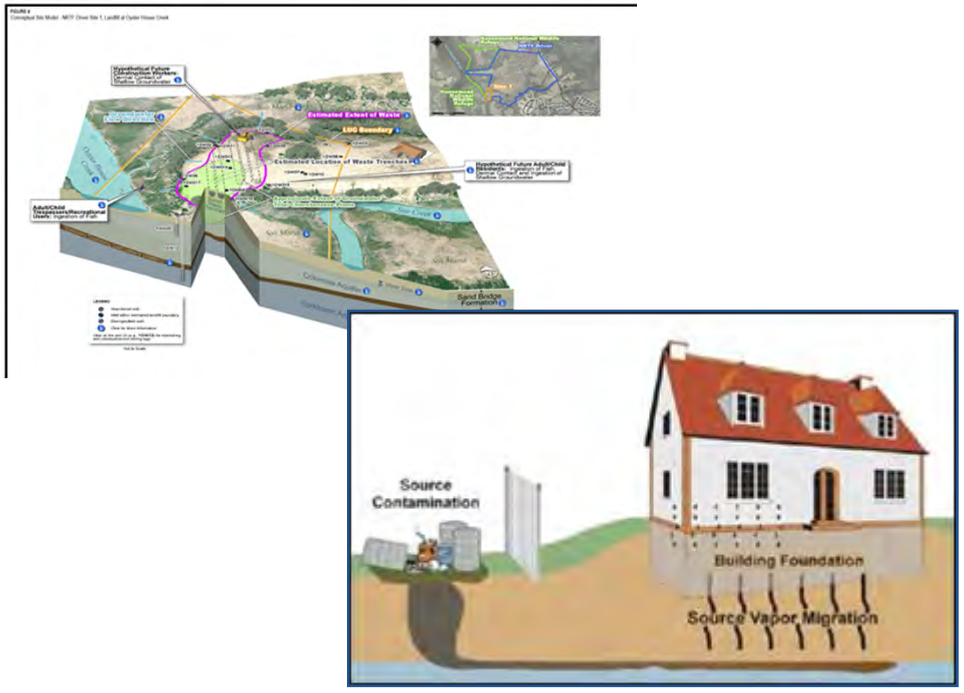
Key Elements

- **Site information**
- **Previous investigations and decisions**
- **Conceptual site model**



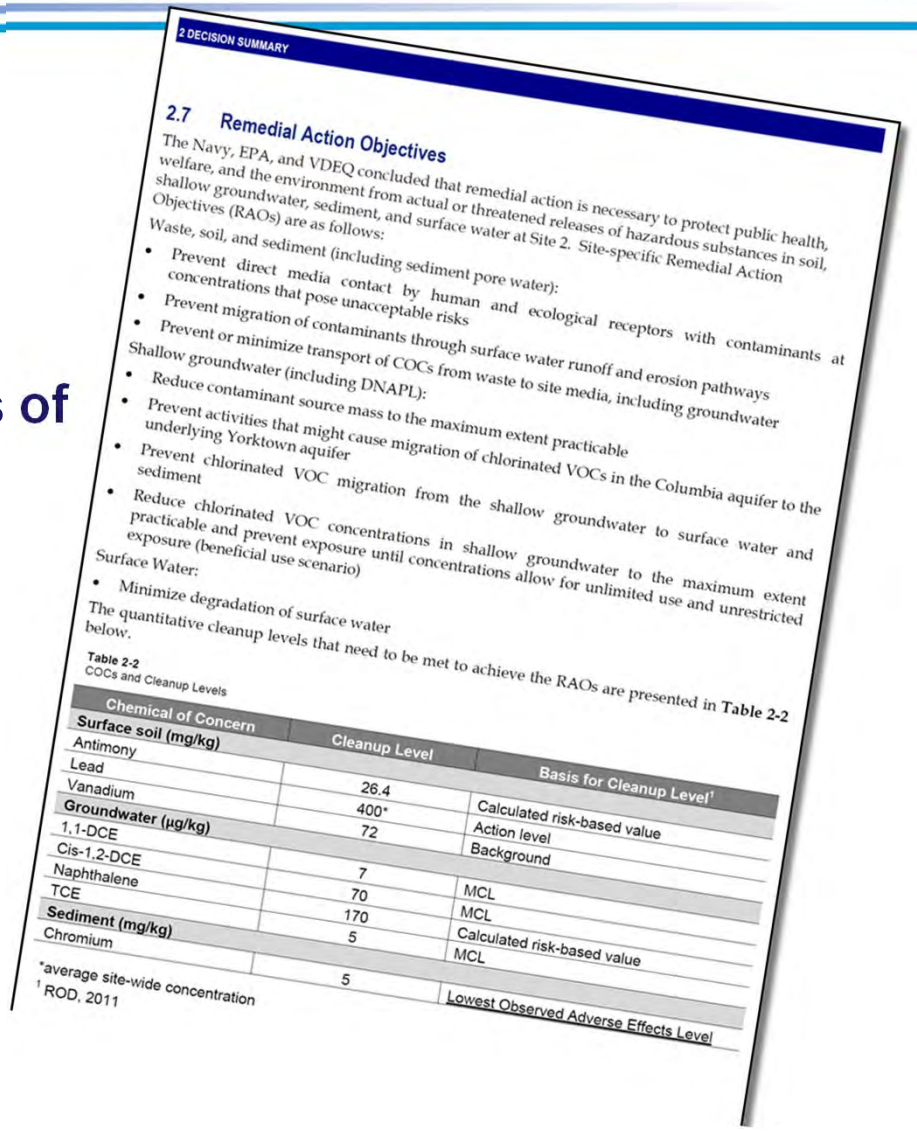
4. SITE 3 LTM

TABLE 4-1
Site 3 - Previous Investigations and Remedial Actions

Pre-ROD Previous Investigation	Date	Activities	Admin. Record No.
Initial Assessment Study (IAS) (WAR)	1983	Site 3 was identified as a waste disposal site; however, no further assessment was recommended. USEPA requested an additional investigation to determine whether hazardous substances were present.	001511
Site Inspection (Halliburton/NUS)	1991	Soil, groundwater, and sediment were evaluated. SVOCs, particularly polycyclic aromatic hydrocarbons (PAHs), were detected in the surface soil (0 to 2 ft) near the reported location of the former sawmill and at the treatment area. PAHs were detected in the surface and subsurface (15 to 17 ft bgs) soil, and groundwater within the surficial aquifer.	000331
Remedial Investigation (RI) (Baker)	1996	Evaluated the nature and extent of contamination. VOCs (particularly fuel constituents) and SVOCs (primarily PAHs) were detected in groundwater within the surficial and Castle Hayne aquifers. SVOCs were identified in both the surface and subsurface soil, particularly within the creosote treatment area. The human health risk assessment (HHRA) identified potential risks to future residential children and adults due to exposure to the following SVOCs in groundwater: benzo(a)pyrene, benzo(a)anthracene, dibenzofuran, phenanthrene, and acenapthalene.	001699 and 001700
FS (Baker)	1996	Following an evaluation of remedial alternatives for both soil and groundwater, the following two-part alternative was selected: Source removal with onsite biological treatment of PAH-contaminated subsurface soils. Monitored natural attenuation (MNA) with LUCs for groundwater.	001721
ROD (Baker)	1997	Established **Remedial Action Objectives (RAOs)** and defined the selected remedy. The RAOs were: – Prevent leaching of PAH contaminants from subsurface soil to the groundwater. – Remediate subsurface soil and shallow groundwater. – Prevent exposure to contaminated groundwater.	001753
Post-ROD Previous Investigations	**Date**	**Activities**	**Admin Record No.**
LTM	1998	LTM monitoring begins.	NA
Treatability Study (Baker)	1998	Biological treatment of PAH-contaminated subsurface soil was tested. The study indicated that biological treatment was not effective.	NA
Amended ROD (DoN)	2000	Based on the results of the 1998 Treatability Study, the remedy was amended to remove biological treatment of soils. Soil excavation with offsite disposal was chosen to address source removal at this site.	NA
Non-Time Critical Removal Action (NTCRA) (Shaw)	2000	Approximately 3,295 tons of PAH-contaminated soil was removed from Site 3 and disposed of offsite.	NA
Land-Use Control Implementation Plan (LUCIP) (DoN)	2001	The **LUC** objectives are to: – Prohibit intrusive activities that could potentially expose workers to impacted groundwater. – Prohibit the withdrawal and any use of contaminated groundwater, except for environmental monitoring, for the aquifers within 1,000 ft of the estimated extent of impacted groundwater.	NA
LTM Optimization Update	2009	Site 3 **LTM program determined sufficient to meet objectives**.	NA
Current LTM Activities	2010	Annual groundwater sampling from four monitoring wells for VOC and SVOC analyses were increased to quarterly sampling for one year to reassess the site for possible closeout.	NA

Key Elements

- **Remedial Action Objectives**
- **Cleanup levels and Chemicals of Concern**
- **Remedy Implementation and Evaluation**
  - **Data quality objectives**
  - **Land Use Controls**
  - **Active treatment and monitoring**



2 DECISION SUMMARY

2.7 Remedial Action Objectives

The Navy, EPA, and VDEQ concluded that remedial action is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances in soil, shallow groundwater, sediment, and surface water at Site 2. Site-specific Remedial Action Objectives (RAOs) are as follows:

Waste, soil, and sediment (including sediment pore water):

- Prevent direct media contact by human and ecological receptors with contaminants at concentrations that pose unacceptable risks
- Prevent migration of contaminants through surface water runoff and erosion pathways
- Prevent or minimize transport of COCs from waste to site media, including groundwater

Shallow groundwater (including DNAPL):

- Reduce contaminant source mass to the maximum extent practicable
- Prevent activities that might cause migration of chlorinated VOCs in the Columbia aquifer to the underlying Yorktown aquifer
- Prevent chlorinated VOC migration from the shallow groundwater to surface water and sediment
- Reduce chlorinated VOC concentrations in shallow groundwater to the maximum extent practicable and prevent exposure until concentrations allow for unlimited use and unrestricted exposure (beneficial use scenario)

Surface Water:

- Minimize degradation of surface water

The quantitative cleanup levels that need to be met to achieve the RAOs are presented in **Table 2-2** below.

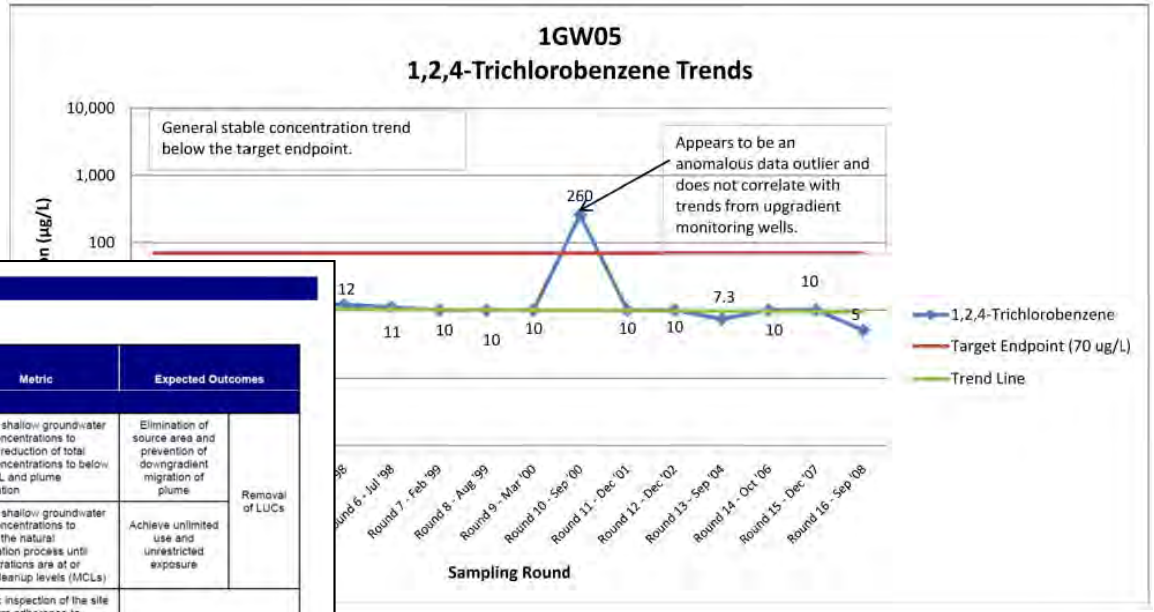
Table 2-2
COCs and Cleanup Levels

Chemical of Concern	Cleanup Level	Basis for Cleanup Level[1]
Surface soil (mg/kg)		
Antimony	26.4	Calculated risk-based value
Lead	400*	Action level
Vanadium	72	Background
Groundwater (µg/kg)		
1,1-DCE	7	MCL
Cis-1,2-DCE	70	MCL
Naphthalene	170	Calculated risk-based value
TCE	5	MCL
Sediment (mg/kg)		
Chromium	5	Lowest Observed Adverse Effects Level

*average site-wide concentration
[1] ROD, 2011

Key Elements

- **Sample results and data evaluation**
  - **Remedy performance and protectiveness**
  - **Data evaluation**
- **Site closeout strategy**



2—DECISION SUMMARY

TABLE 6
Expected Outcomes

Risk		RAO	Remedy Component	Metric	Expected Outcomes	
Human Health	Ecological					
Shallow Groundwater						
Ingestion of and dermal contact with groundwater under future potable use scenario; inhalation of vapors in shallow groundwater in an open excavation for future construction workers	No exposure pathway	Reduce concentrations of COCs in the source area and the downgradient plume to remediation goals (MCLs) through treatment to the maximum extent practicable within a reasonable amount of time	ERD	Monitor shallow groundwater COC concentrations to confirm reduction of total COC concentrations to below 500 µg/L and plume stabilization	Elimination of source area and prevention of downgradient migration of plume	Removal of LUCs
			Performance Monitoring			
			LTM	Monitor shallow groundwater COC concentrations to confirm the natural degradation process until concentrations are at or below cleanup levels (MCLs)	Achieve unlimited use and unrestricted exposure	
		Prevent exposure to Site 11a groundwater and groundwater emissions until concentrations of COCs have been reduced to levels that allow for unlimited use and unrestricted exposure	LUCs	Periodic inspection of the site to confirm adherence to LUCs until shallow groundwater COCs are at or below their respective cleanup levels (MCLs)	Removal of LUCs	
			LTM	Monitor shallow groundwater COC concentrations to evaluate the potential for vapor intrusion until concentrations are at or below cleanup levels (MCLs)		

Key Elements

- **Optimization**
- **Conclusions**
- **Recommendations**

Rolling MMA LTM Reports

- **Multiple years data in one Rolling Report**
- **7 out of 11 sections from the MMA Annual Report typically remain the same from year to year**
- **Why expend the effort to re-write this information for each Annual Monitoring Report when it hasn't changed?**

Example Format of MMA Report Addendums

Results from 2nd Year Efforts (Addendum 1)

1. Sampling Results and Data Evaluation
2. Land Use Controls
3. Cost
4. Optimization (if applicable)
5. Conclusions and Recommendations

Results from 3rd Year Efforts (Addendum 2)

1. Sampling Results and Data Evaluation
2. Land Use Controls
3. Cost
4. Optimization (if applicable)
5. Conclusions and Recommendations

Results from 4th Year Efforts (Addendum 3)

1. Sampling Results and Data Evaluation
2. Land Use Controls
3. Cost
4. Optimization (if applicable)
5. Conclusions and Recommendations

Results from 5th Year Efforts (Addendum 4)

1. Sampling Results and Data Evaluation
2. Land Use Controls
3. Cost
4. Optimization (if applicable)
5. Conclusions and Recommendations

Add each new addendum to the original report

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Meeting Requirements as a MMA SAP

The MMA SAP can only be utilized if:

- **No additional investigations are included in the effort,**
- **Team (regulator) buy-in is obtained, AND**
- **Appropriate Quality Assurance / SAP reviewer (NAVFAC LANT/PAC/SW) approves using the MMA SAP and the review and approval process is utilized**

Meeting Requirements as a MMA SAP

- **Elements required in MMA SAP**
  - **Signature to document review /approval**
  - **Conceptual Site Model**
  - **Remedial Action Objectives**
  - **Chemical of Concerns / Analytes and clean-up concentrations**
  - **Remedy Implementation and Evaluation**
  - **Data Quality Objectives**
  - **Sampling Plan**
    - **Analytes (project action limit)**
    - **Sampling Method**
    - **Frequency**
    - **Locations**
    - **Analytical Method**
    - **Lab Certification**
  - **Site closeout strategy**
- **Contracting and planning documents**

Sampling Details

4. Monitoring Program

The selected remedy identified in the ROD consists of LUCs and LTM. This section describes the ongoing implementation of the selected remedy and the current status of the site.

4.1 Groundwater Sampling

Groundwater samples were collected from twenty one existing monitoring wells (**Figure 11**) in February, May, August, and November 2007. Prior to sample collection, depth to groundwater was measured and recorded at each well. Each groundwater sample was analyzed for VOCs and natural attenuation indicator parameters.

Groundwater samples were collected using a peristaltic pump and low-flow purging techniques (USEPA, 1996). Tubing intake was placed at the midpoint of the well screen. Water quality parameters (dissolved oxygen [DO], oxidation-reduction potential [ORP], pH, temperature, conductivity, salinity, and turbidity) were field measured using a Horiba U-22® and flow through cell to ensure aquifer stability prior to sample collection and recorded in the field notebook (**Table 3**). Groundwater was considered stable when a minimum of one well volume was purged and water quality parameters, recorded 3 to 5 minutes apart, were stabilized to within 10 percent of one another, with the exception of turbidity, which was reduced to the extent practical.

Sampling Location/Well ID – KBA-11-134						
Analyte	Sampling Method	Freq-uency	Analyt-ical Method	Certifi-cation/ Calib-ration	PALs (µg/L)	Minimum PQLs (µg/L)
Cis-1,2-DCE	Low flow	Annually	SW-846 8260B	ELAP	70	23
TCE	Low flow	Annually	SW-846 8260B	ELAP	5	1.7
VC	Low flow	Annually	SW-846 8260B	ELAP	2	0.7
Field Measurements Water Quality Parameters						
DO	Horiba / Chemets	Annually	NA	daily	NA	NA
ORP	Horiba	Annually	NA	daily	NA	NA
pH	Horiba	Annually	NA	daily	NA	NA
Temperature	Horiba	Annually	NA	daily	NA	NA
Conductivity	Horiba	Annually	NA	daily	NA	NA
Turbidity	Horiba / Turbidity meter	Annually	NA	daily	NA	NA
Monitored Natural Attenuation Indicators						
Nitrate	Low flow	Every 5 Years	USEPA 300.0	ELAP	NA	NA
Nitrite	Low flow	Every 5 Years	USEPA 300.0	ELAP	NA	NA
Sulfide	Low flow	Every 5 Years	SM 4500 S-2F	ELAP	NA	NA
Chloride	Low flow	Every 5 Years	EPA 325.1	ELAP	NA	NA
TOC	Low flow	Every 5 Years	SW-846 9060	ELAP	NA	NA
Methane	Low flow	Every 5 Years	USEPA RSK-175	ELAP	NA	NA

Optimization Reports

- **Optimization efforts costly**
  - **Time to review all of the data and history**
  - **Present recommendations and track progress**
- **Document the key information from the site**
  - **Decision document information**
  - **Remedial Action Goals**
  - **Clean up goals for site**
- **Captures the conclusions**
- **Captures the logic and data used to draw conclusions**
- **Provides a report that can be easily used to describe and promote the optimization effort**
- **Folds into the next LTM report or SAP**

Optimization Report Suggested Format

I. Executive Summary
   1. Brief
   2. Highlights of Results
   3. Recommendations

II. Brief Introduction
   1. Site Specific Location
   2. Location
   3. History

III. Current Conceptual Site Model
   1. Use Existing Information
   2. Effort Specific

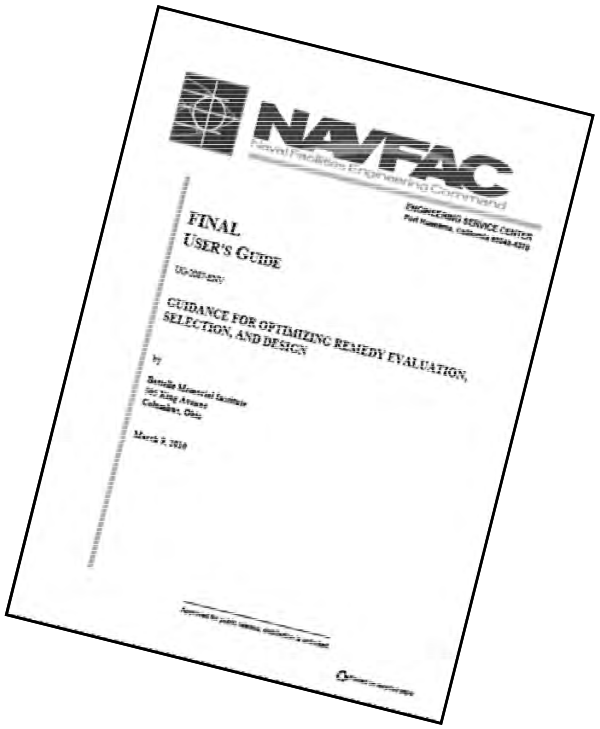
IV. Remedial Action Objectives
   1. Source of Information
   2. Regulatory Program
   3. ARARs

V. Chemicals of Concern and Cleanup Numbers

VI. Site Closeout Strategy

VII. Remedy Implementation and Evaluation
   1. Data Evaluation
   2. Effectiveness of Current Actions
   3. Optimization Potential
   4. Potential Cost Savings

VIII. Conclusions and Recommendations



Potential Results of Implementing the Approach

- Leads to Optimizing the Approach
- Presents information in an easy to use format
  - Consultants (scope of work for future events)
  - Navy
  - Regulators and Agencies
  - Any new team member
- Key elements available to support team decision making
  - Historical
  - Decision documents
  - Data from more than most recent event
- Flexible Format
  - Better, fewer reports
  - With team agreement it can be used as the MMA SAP
- Supports and captures next steps
  - Supports five year review
  - Keeps optimal path
  - Clearly states site closeout requirements

References

- **Management Monitoring Approach 2012**
  - http://navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/Environmental/Restoration/er_pdfs/m/navfac-ev-pres-mma-20120503v2.pdf

- **Points of Contact**
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  - **Joseph Michalowski 619-532-4125 joseph.michalowski@navy.mil**
  - **NAVFAC Pacific**
  - **Jocelyn Tamashiro 808-472-1468 jocelyn.tamashiro@navy.mil**

Questions???


NAVFAC
Naval Facilities Engineering Command
Final
Attachment: Optimization Tools
February 2012
NAVFAC
Naval Facilities Engineering Command
Draft
Navy Environmental Restoration Program
Management and Monitoring
Approach Tool Kit
October 2014

Wrap Up

- Please complete the feedback questionnaire at the end of this webinar. We are counting on your feedback to make this webinar series relevant!

- Next OER2 Webinar Info….

NAVFAC Guidance for Environmental Background Analysis of Sediment Overview and Case Study of Apra Harbor Sediments, Naval Base Guam

Presenters: Kim Markillie, Brian Nagy, Wendell Wen

Date: September 30th, 2015

Time: 11:00am PST/ 14:00 EST

Thank you for participating!