

MEC UFP-QAPP Adak Island Former Adak Naval Air Facility Adak, Alaska

2009 Navy and Marine Corps Cleanup Conference

Port Hueneme, California

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Presentation Objectives



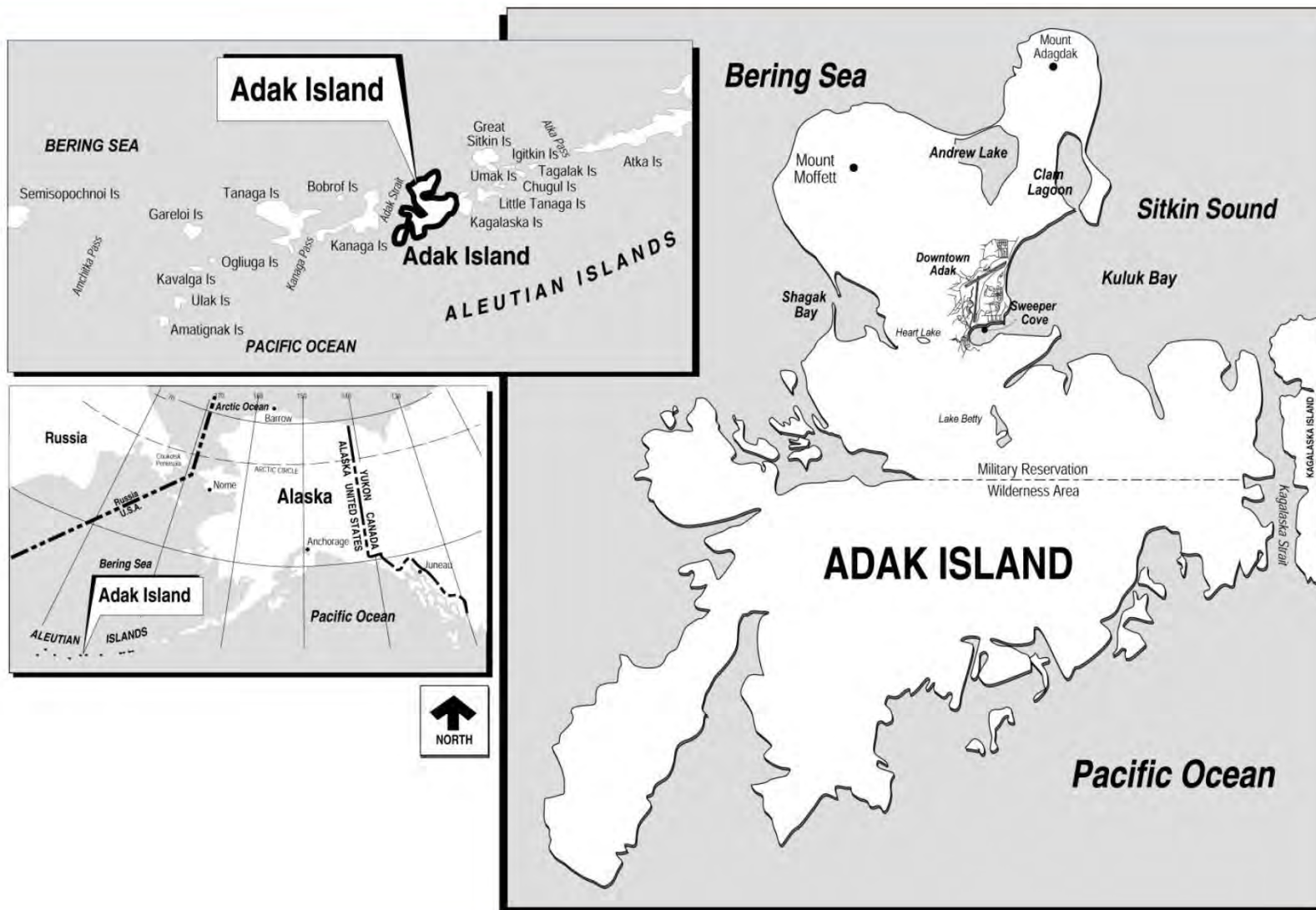
- **Background and timeline**
- **Why was the UFP QAPP format used?**
- **How was the case-study UFP QAPP developed?**
- **Differences between the case study QAPP and the UFP QAPP?**
- **Production, quality control, quality assurance and the regulator perspective**
- **Lessons learned**
- **Questions**

Case Study Background

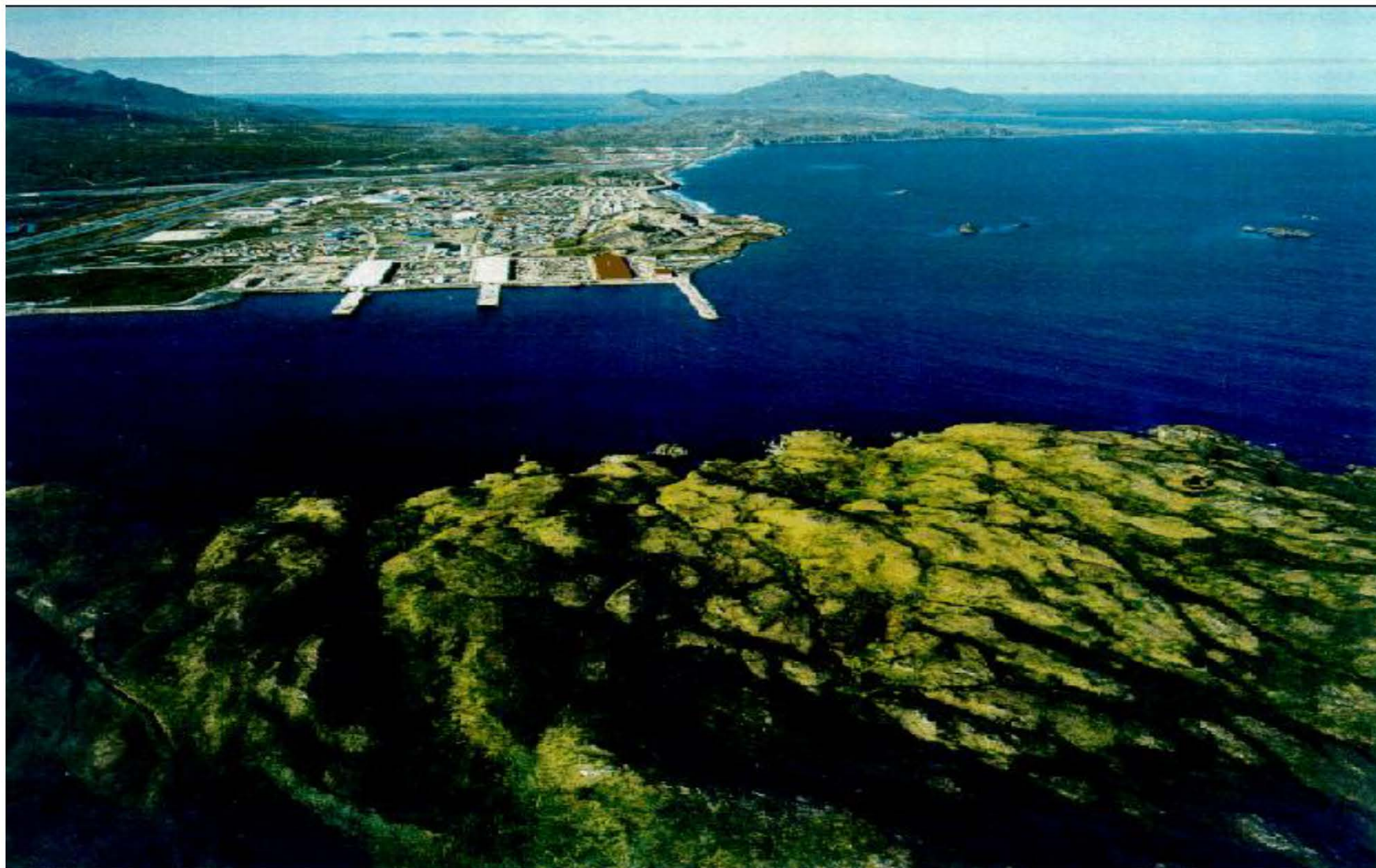


- **Located 1,200 miles southwest of Anchorage**
- **366 acres over three areas of concern**
- **Part of 5,600 acres remaining under Navy control**
- **Part of the OUB-1 ROD Remedy**
- **Wildlife refuge land use**
- **Remedy includes a clearance depth to four feet**

Locating Adak, Alaska



City of Adak and Beyond



Case Study Area

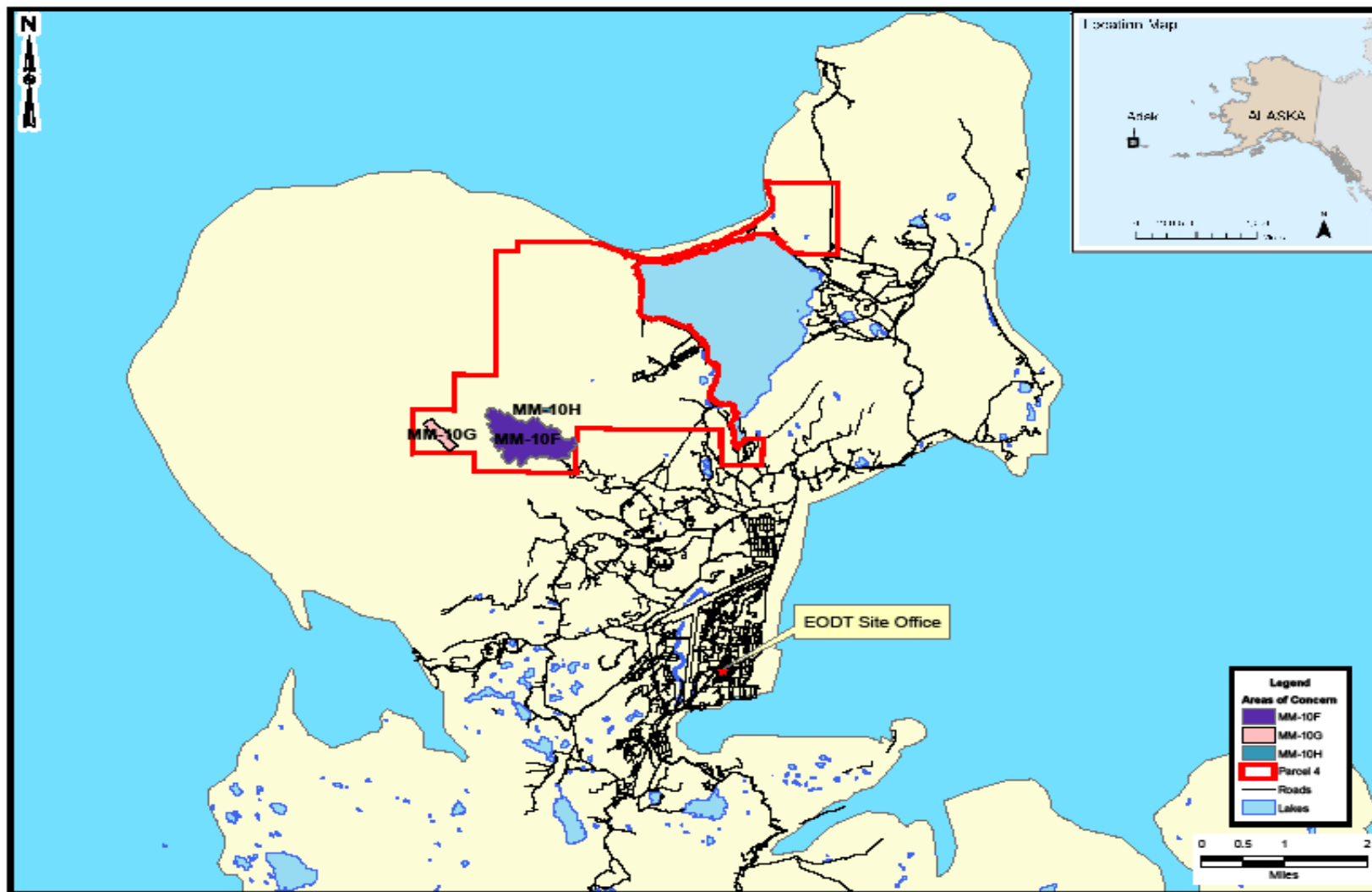


Case Study Background (continued)



- Area used by the U.S. Army to train artillery crews
- Munitions were World War II-era projectiles and mortars
- Munitions mainly consisted of high explosives and target practice rounds
- Remediation primarily occurred in 2004 and 2008, and will likely complete in 2009
- EOD Technology, Inc. is the contractor
- Competitive firm-fixed price contract
- First contract of this type for munitions at NAVFAC Northwest

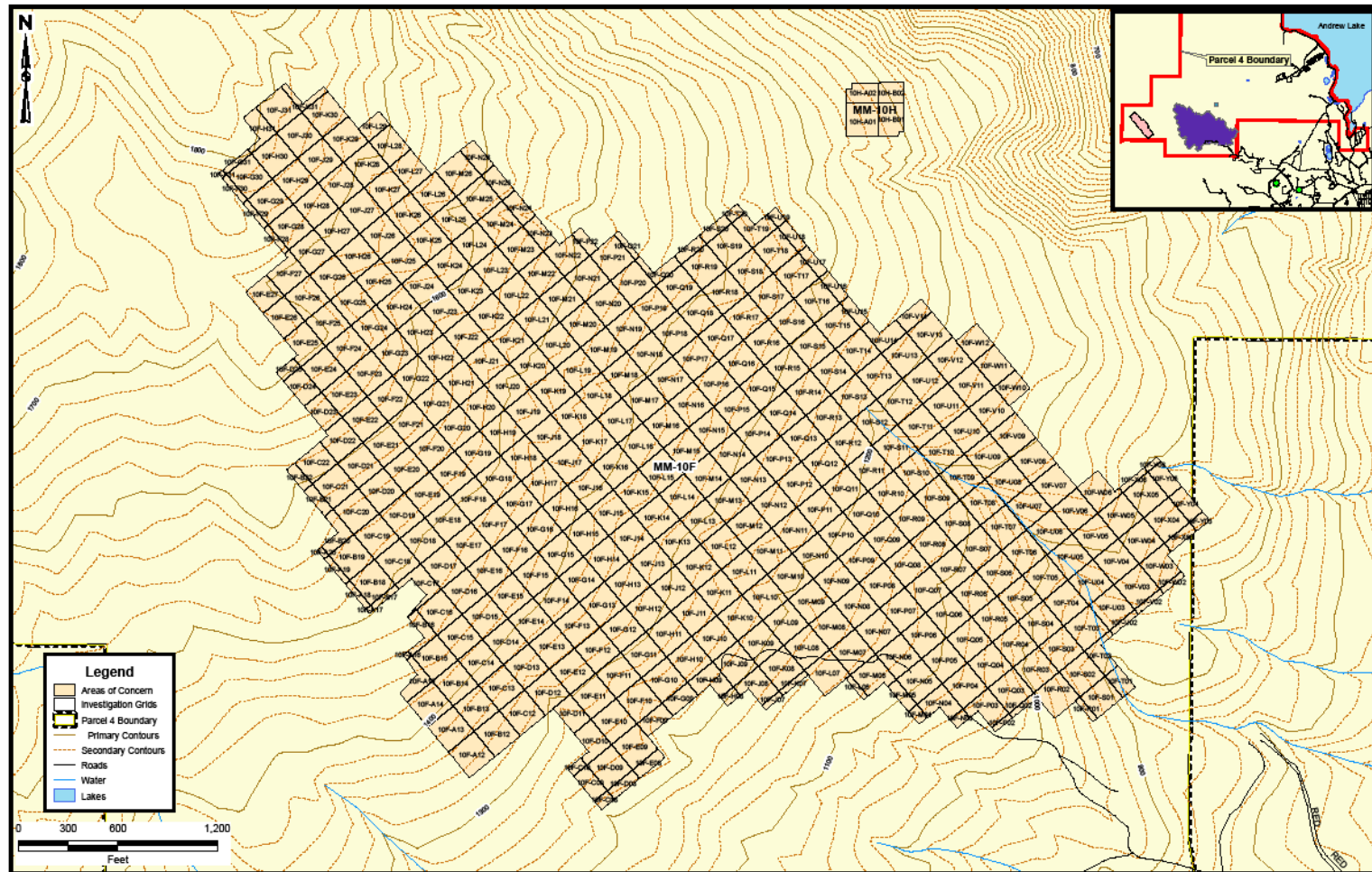
Remaining Navy-Managed Property and Case Study AOCs



Case Study Terrain and DGM



Case Study Grids



- **2004:** Case study clearance began - used traditional format plans
- **2006:** NAVFAC encouraged the use of the UFP QAPP for chemical sampling
- **February 2007:** First of three 2008 project plans was submitted in traditional format
- **March 2007:**
 - NAVFAC HQ encouraged use of UFP QAPP for MEC sampling
 - Made decision to use UFP QAPP format for all three 2008 projects
- **September 2007:** first 2008 draft project plans submitted in UFP QAPP format

- **October 2007: NAVFAC directive – use UFP QAPP format**
- **December 2007: Case study contract awarded**
- **January 2008: 2nd Project plans submitted in UFP QAPP format**
- **April 2008: UFP QAPP format embraced, and the draft case study plans were submitted in this format**
- **May 2008: Final case study plans completed**

Why Was A UFP QAPP Format Used?



- Earlier traditional plans contained outdated QC steps and procedures
- Issues with organization, repetitiveness, inconsistencies and completeness were identified
- UFP QAPP format provided benefits to the project
- NAVFAC HQ requirement

- **Provides a clear, systematic, planning process with detailed instructions**
- **Follows a logical process promoting a consistent format that meets established requirements**
- **Focused on obtaining the type and quantity of data needed to support decisions**
- **Establishes clear and explicit project quality objectives**
- **Provides a documented starting point for procedures/SOPs**

Benefits of the UFP QAPP (continued)



- **Defines expected QC (contractor) and QA (third party) roles and responsibilities**
- **Provides criteria for quality assessment and contractor oversight**
- **Documents the planning process and agreement of stakeholders**
- **Increases stakeholder buy-in on QC and QA efforts**

Using the UFP QAPP Format for Explosive Hazards



- **UFP QAPP format can be used but modifications are needed**
 - No off site laboratory analysis of media samples (soil, GW, SW, seds)
 - Different QA and QC procedures (geophysical versus analytical)
- **Evaluate all UFP QAPP Guidance and Worksheets**
 - Determine relevance to explosive hazards
 - Adopt worksheets “as is” or modify for your project
 - Document rationale for eliminating worksheets that do not apply

- Three project MEC QAPPs were developed over a 14-month period
- Populated the worksheets using the UFP-QAPP\NAVFAC guidance
- No QAPP-focused scoping meetings were held for the first QAPP
- QAPPs followed the graded approach advocated by guidance
- QAPPs were tailored to address stakeholder concerns
- Multiple comment resolution meetings were held
- Each meeting resulted in MEC QAPP improvements

- **Initial approach – prepare the QAPP according to the guidance but work plan retains most of the traditional information**
- **Evolution**
 - The QAPP drives the work, not the work plan so remove most of the traditional information from the work plan and place in the QAPP
 - Add supplemental information behind the QAPP worksheets, as needed
 - Simply direct the reader from the work plan to the QAPP
- **Result**
 - Eliminated repetitive information and reduced the opportunity for inconsistencies
 - More clear instructions for field staff and a higher-quality project
 - Short work plan, QAPP worksheets and SOPs

Differences Between Case Study and UFP QAPP



- **All QAPP worksheets were included to maintain familiarity, avoid confusion with renumbering, and to aid in review, training and field implementation**
- **Worksheets 15, 18, 19, 20, 23 through 28, and 30 did not apply.**
- **Slides were not applicable because they addressed samples submitted to an analytical laboratory**
- **A water mark was included on worksheets that did not apply**
- **WS #4 – Project Personnel Sign Off Sheet: included signatures of contractor personnel only – not all stakeholders**
- **Aligned the definable features of work introduced in the work plans with topics discussed in Worksheets 12, 14, 34 and 35**
- **WS #13 – Secondary Data Criteria and Limitations Table: included previous investigations and reports vice studies and analytical data**

Definable Features of Work in Work Plan



• 7.0 FIELD OPERATIONS.....	6-1
• 7.1 MOBILIZATION/SITE PREPARATION.....	6-1
• 7.1.1 MOBILIZATION.....	6-1
• 7.1.2 SITE PREPARATION.....	6-2
• 7.2 SITE-SPECIFIC TRAINING/GPO CERTIFICATION.....	6-2
• 7.3 SURFACE CLEARANCE.....	6-1
• 7.4 GEOPHYSICAL SURVEY.....	6-1
• 7.5 TARGET REACQUISITION.....	6-1
• 7.6 INTRUSIVE OPERATIONS.....	6-1
• 7.7 MEC DISPOSAL.....	6-1
• 7.7.1 MEC HANDLING, STORAGE, AND DISPOSAL.....	6-1
• 7.8 MPPEH CERTIFICATION, FLASHING, AND DISPOSAL.....	6-1
• 7.9 DONOR EXPLOSIVES HANDLING AND STORAGE.....	6-2
• 7.10 SOIL SAMPLING AND DISPOSITION OF MC.....	6-2
• 8.0 QUALITY CONTROL PLAN.....	7-1
• 8.1 INSPECTION PROCESS.....	7-1
• 8.1.1 PREPARATORY PHASE INSPECTION.....	7-1
• 8.1.2 INITIAL PHASE INSPECTION.....	7-1
• 8.1.3 FOLLOW-UP PHASE INSPECTION.....	7-1
• 8.2 EQUIPMENT OPERATIONAL PARAMETERS.....	7-1
• 8.3 INSPECTION SCHEDULE.....	7-1
• 8.4 AOC CERTIFICATION PROCESS.....	7-1
• 8.5 QUALITY CONTROL MEETINGS.....	7-1
• 8.5.1 COORDINATION AND MUM MEETINGS.....	7-1
• 8.5.2 ON-SITE QUALITY CONTROL MEETINGS.....	7-1
• 8.6 QUALITY CONTROL DOCUMENTATION.....	7-1
• 8.6.1 FIELD QC LOGBOOK.....	7-2
• 8.6.2 PROJECT FILES.....	7-2

- **Excerpt from Work Plan Table of Contents**
- **Consistent with Definable Features of Work in MEC QAPP**
- **Work plan directs the reader to the QAPP, which contains multiple references to the definable features of work, and associated SOPs**

- **WS #17 – Sampling Design and Rationale – included supplemental information not requested by the worksheet to reduce information in the work plan**
- **WS #32 – Change Control Management - Contains rigorous change control and deficiency management processes**
- **WS #34 – Verification (Step I) Process Table – includes the preparatory and initial phase inspections of the three phases of control. Includes a strong tie between the DFW and SOPs vice analytical methods.**

Differences Between the Case Study and UFP QAPP (continued)



- **WS #35 – Tier 2 QC Process Summary Table. Verification including the follow-up phase inspections.**
- **WS #36 – Product QC Tier 3 Summary Table. Includes the AOC certification process, vice analytical validation process. Compliance with methods, procedures, contracts. A step-wise process toward validation.**
- **WS #37 – Usability Assessment. AOC certification checklist for each AOC, a discussion of whether project quality objectives were met, and an exit strategy with stakeholder buy-in**

Definable Features of Work in QAPP WS#12



Project-Specific
Operable Unit B-1 AOCs MM-10F, MM-10G, and MM-10H
Former Naval Air Facility, Adak, Alaska

Title: MEC QAPP
Revision Number: 04 – Revised Final
Revision Date: June 12, 2008

SAP Worksheet #12 – Measurement Performance Criteria Table (UFP-QAPP Manual Section 2.6.2)

Measurement Performance Criteria Table

DFW: Measurement Activity: ----- Data Type	Geophysical Anomaly Measurement Data Quality Indicator	QC Sample and/or Activity to Assess Measurement Performance	Measurement Performance Criteria
DFW: Surface Clearance ----- Magnetometer	Response	Function check: Daily instrument checks to determine response of magnetometer to metallic object	Positive response to presence of any MEC item on the surface. The test will be conducted with a small metal object.
DFW: Surface Clearance ----- DGPS	Accuracy	QC audit of positioning system error test records. (UXO positioning)	Positional error at known monuments will not exceed 25cm.
DFW: Site Prep/Grid Layout ----- Positional Data	Accuracy	QC audit of positioning system error test records	Positional error at known monuments will not exceed ± 25 cm
DFW: Geophysical Survey ----- Raw Geophysical Sensor Data	Precision	Standardization tests: QC audit of response test records	Response above background to standard object will not vary more than $\pm 20\%$ for the instrument used (Geonics EM61 MK2 or approved equivalent)
	Completeness	All DGM grid data will be checked by the data processors to ensure adequate coverage is obtained. Initially reviewed at 100 percent with step down as directed by the PQCM	Total positioning holidays or “drop-outs” will not exceed 2% of the accessible area surveyed. If the total area of the gaps exceeds this percentage, data will be recollected in those gaps if possible.
	Sensitivity	Operator ensures settings in data logger are set to project requirements prior to geophysical data collection	Minimum data density of twelve points per second (approximately one point per 0.15 meters)
	Precision	Standardization tests: EM61 MK2 daily am/pm static tests	Response above background to standard object will not vary more than $\pm 20\%$

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Definable Features of Work in QAPP WS#14



Project-Specific
Operable Unit B-1 AOCs MM-10F, MM-10G, and MM-10H
Former Naval Air Facility, Adak, Alaska

Title: MEC QAPP
Revision Number: 03 - Final
Revision Date: May 31, 2008

SAP Worksheet #14 – Summary of Project Definable Features of Work

(UFP-QAPP Manual Section 2.8.1)

The implementation of the MEC investigation has been divided into definable features of work (DFW) and the tasks required to complete each DFW have been identified. Procedures for these tasks, including recording data, forms and checklists, data generation, QC checks, data management, and information management, are defined in the SOPs for the project indexed in Worksheet #21.

Project DFW and Tasks

Definable Feature of Work	Tasks
Mobilization/ Site Preparation	• Project Plan Preparation • Verify Personnel Qualifications • Setup Administrative Offices • Equipment Setup and Checkout • Installation of TPU • Installation of Explosives Magazine • Grid Survey and Layout
Site-specific Training/GPO Certification	• Initial Orientation and Training • GPO Certification
Surface Clearance	• Surface Clearance of AOCs MM-10G and MM-10H
Geophysical Survey	• Geophysical Survey • Data Download • Data Upload to ftp site
	• Data Processing • Initial Target Selection

Definable Features of Work in QAPP WS#34



Project-Specific
Operable Unit B-1 AOCs MM-10F, MM-10G, and MM-10H
Former Naval Air Facility, Adak, Alaska

Title: MEC QAPP
Revision Number: 04 – Revised Final
Revision Date: June 4, 2008

SAP Worksheet #34 – Verification (Tier I) Process Table – Preparatory and Initial Inspections

(UFP-QAPP Manual Section 5.2.1)

A preparatory phase inspection will be performed prior to beginning each definable feature of work. The purpose of this inspection is to review applicable specifications and verify the necessary resources, conditions, and controls are in place and compliant before start of work activities. An initial phase inspection will be performed at the beginning of each definable feature of work. The purpose of this inspection is to observe/review the application of procedures to ensure their adequacy, ensure adequate resources are applied to the activity and that a clear understanding exists as to the quality control requirements of the DFW. The responsible person will inspect the relevant items from the checklist in the appropriate SOP.

Definable Feature of Work	Supporting QC Document(s)	Responsible for Verification (title, organization)
Mobilization/Site Preparation	Project Readiness Review, Pre-Construction and Mutual Understanding Meeting, SOP 9, ATV/Utility Vehicle Operation, Attachment 4, Preparatory/Initial Checklist, ATV/Utility Vehicle Inspection Sheet	Program Manager, EODT Navy QA Lead, NAVFAC, NW
Site-specific Training and GPO Certification	Verification of Personnel Qualifications/Training Checklist GPO Certification	Project Geophysicist, EODT Navy QA Contractor, Battelle
Surface Clearance	SOP-01, Surface Clearance, Attachment 5, Preparatory/Initial Checklist	PQCM, EODT
Geophysical Survey	SOP-02, Geophysical Survey, Attachment 3, Preparatory/Initial Checklist	PQCM, EODT
Geophysical Data Processing/Interpretation	SOP-03, Geophysical Data Processing and Interpretation, Attachment 2, Preparatory/Initial Checklist	PQCM, EODT
Target Reacquisition	SOP-04, Target Reacquisition, Attachment 1, Preparatory/Initial Checklist	PQCM, EODT
Intrusive Operations	SOP-05, Intrusive Operations, Attachment 5, Preparatory/Initial Checklist, MEC Daily Activity Checklist	PQCM, EODT
MPPEH Certification, Flashing, and Disposal	SOP-06, Operation of the Thermal Flashing Unit, Attachment 3, Preparatory/Initial Checklist	PQCM, EODT
MEC Disposal	SOP-07, Explosive Demolition for Munitions Disposal, Attachment 7, Preparatory/Initial Checklist	PQCM, EODT
Donor Explosive Handling and Storage	SOP-08, Magazine Inspection and Security, Attachment 2, Preparatory/Initial Checklist	PQCM, EODT

Definable Features of Work in MEC QAPP WS#35



Project-Specific
Operable Unit B-1 AOCs MM-10F, MM-10G, and MM-10H
Former Naval Air Facility, Adak, Alaska

Title: MEC QAPP
Revision Number: 04 – Revised Final
Revision Date: June 4, 2008

SAP Worksheet #35 – Tier 2 QC Process Summary Table

Follow-up inspections are conducted to ensure that procedures are being correctly performed, no changed conditions exist which may impact the quality of work, and lessons learned are being applied as identified. The responsible individual will inspect the relevant Follow-up items from the checklist in the appropriate SOP at least as often as specified in this worksheet. Worksheet 32 describes actions to be taken in the event that nonconforming conditions are observed during the QC inspections.

Definable Feature of Work	Frequency of Inspection	Supporting QC Document(s)	Responsible for Verification (title, organization)
Mobilization/Site Preparation	N/A	No follow-up required for this DFW	
Site-specific Training and GPO Certification	N/A	No follow-up required for this DFW	
Surface Clearance	Minimum of one team each day	SOP-01, Surface Clearance, Attachment 5, Follow-up Checklist	PQCM, EODT
Geophysical Survey	Minimum of one team each day	SOP-02, Geophysical Survey, Attachment 3, Follow-up Checklist	PQCM, EODT
Geophysical Data Processing/Interpretation	Weekly	SOP-03, Geophysical Data Processing and Interpretation, Attachment 2, Follow-up Checklist	PQCM, EODT
Target Reacquisition	Weekly	SOP-04, Target Reacquisition, Attachment 1, Follow-up Checklist	PQCM, EODT
Intrusive Operations	Minimum of one team each day	SOP-05, Intrusive Operations, Attachment 5, Follow-up Checklist, MEC Daily Activity Checklist	PQCM, EODT
MPPEH Certification, Flashing, and Disposal	Once per day when TFU operating	SOP-06, Operation of the Thermal Flashing Unit, Attachment 3, Follow-up Checklist	PQCM, EODT
MEC Disposal	Weekly	SOP-07, Explosive Demolition for Munitions Disposal, Attachment 7, Follow-up Checklist	PQCM, EODT
Donor Explosive Handling and Storage	Weekly	SOP-08, Magazine Inspection and Security, Attachment 2, Follow-up Checklist	PQCM, EODT

- **First project plans (including the MC and MEC QAPPs) cost at least 4 times the Navy traditional plan**
- **Cost varied depending on the contractor and the type of work (i.e. remedial action versus remedial investigation)**
- **Case study MEC QAPP cost two times the Navy traditional plan**
- **The first UFP-QAPP took 14 months to complete**
- **The case study UFP-QAPP took five months to complete**
- **Agency review times were accelerated compared to the FFA**
- **Anticipated cost of the next Adak QAPP is 1.5 times Navy traditional plan**
- **Anticipated time to complete the next Adak QAPP - six months, assuming typical FFA deliverable schedule**

- **EODT was the production\QC contractor**
- **Up to 75 person workforce**
- **Case study quality objectives were similar to other projects with active regulator involvement**
- **Roughly half of the forms in the UFP QAPP were either fill-in-the blank or could be taken from QAPPs already under development**
- **The other half required project-specific analysis and customization**
- **Preparation of the UFP QAPP is rigorous and forces consideration of quality control in all tasks during planning**

- **Consistent plans**
- **Consistent review/acceptance path between stakeholders**
- **Increased accountability with field staff**
- **QC/QA Requirements were well defined**
 - acceptance and failure criteria
 - inspection points and frequency

- **By tying all QC inspection points back to definable features of work (DFOWs) and the SOPs, all the stakeholders agreed on the frequency and acceptance criteria for the each inspection**
- **Specific, transparent QC requirements meant less opportunities for interpretation**
- **Increased rigor in QC inspections meant that any deviations from the QAPP were easily identified**
- **Generally, early identification prevented critical item failures**

- **A written “order of precedence” between the QAPP, Technical Management Plan, and SOPs would minimize conflict and differing interpretations of the plans**
- **Change control and non-conformance report (NCR) response, updates, and management requires strong internal knowledge of roles and responsibilities**
- **Open discussion between the project team streamlined the completion of the QAPP**
- **Project-specific deviations and additions to the UFP-QAPP requirements allow non-traditional projects to meet the spirit of the UFP**

Quality Assurance Perspective



- **Battelle was the QA contractor**
- **About 10 person workforce**
- **Provided full time oversight**
- **Navy technical representative also present to provide oversight on all three projects and QA**
- **QA responsibility included installing the geophysical prove out area and providing oversight with**
 - **contractor GPO certification**
 - **target reacquisition**
 - **production digital geophysical mapping**
 - Reprocessing of DGM Data
 - Concurrence with Target Lists
 - Evaluation of Data Quality
 - **intrusive investigation**
 - **contractor QC**
 - **final grid QA**
 - QA Review of QC Documentation
 - Hole and No-Find Checks
 - QA DGM Sampling

QA Perspective (continued)



QAPP Worksheet Topic	QA Design and Execution Influence
WS#3 – Distribution List	Project Contact List on Sharepoint (Data Management Element)
WS#7 – Personnel Responsibilities and Qualifications	Administrative QA Inspection – to verify that personnel meet the education, training and experience requirements for the respective billet that they occupy on the project
WS#8 – Special Personnel Training Requirements	Identifies any special or specific training that the contractor will provide, by definable feature of work – QA personnel will require similar levels of training
WS#12 – Measurement Performance Criteria	These are the metrics against which QA will evaluate the contractor for each definable feature of work. • QA uses these same metrics as a minimum standard for their own site activities
WS#14 – Project DFW and Tasks	Also identifies all the DFWs for the project. QA uses this information to determine staffing, equipment and support needs.
WS#17 – Project Design and Rationale	QA uses this information to understand the sequencing for the contractors' work, which guides how QA sequences their activities to support this particular project. It also provides the information to identify where critical QA evaluations need to occur within the overall project sequence.
WS#21 – Project SOP References Table	Self explanatory
WS#22 – Field Equipment Calibration, Maintenance, Testing and Inspection Table	Identifies for QA, which checks on which pieces of equipment occur at which frequency. This information forms part of the basis for the review of contractor QC documents and also provides metrics for field QA surveillances.

- **UFP QAPP information is readily accessible from specific worksheets**
- **All definable features of work (and subtasks) are presented in a single table (WS #14)**
- **All metrics for the tasks supporting the DFWs are presented in a single table (WS #12)**
- **All of the relevant SOPs and QC check sheets are referenced in specific tables (WS #34 – Tier 1, WS #35 – Tier 2)**
- **DFWs and metrics are easily understood**
- **Metrics from worksheets are transferred to QA Tracking Documentation**

- **Regulators are State of Alaska and U.S. EPA Region 10**
- **State of Alaska audited the project twice during the field season**
- **2006 and 2007 contractor plans contained numerous redundant sections that lead to inconsistencies within the plan**
- **Purpose of recommending the UFP QAPP was to**
 - **Provide a table format that streamlined the work plan and make information easy to find**
 - **Help gain consistency between work plans to aid in regulatory review**
 - **Provide consistency in work quality among the various contractors**

- **UFP QAPP case study plans – the pros**
 - consistent format between projects
 - consistent quality requirements between projects
 - requirements presented in table format
 - forced rigorous evaluation of quality during planning
 - eliminated redundancy and contradiction

- **UFP QAPP case study plans – the cons**
 - intertwined document reviews
 - numerous individual documents for each set of project plans (TMP, MEC QAPP, MC QAPP, ESS, etc.)
 - redundancies between project plans (i.e. MC QAPP)
 - including NA work sheets

- Review was a significant effort by regulatory agencies
- Expedited document reviews (7 to 10 day turn around time) for multiple iterations of multiple plans
- No major issues during work implementation
- Included procedures to correct identified deficiencies (FCR/DCN)
- No major conflict among project team since most requirements were clearly established
- Contractors and their quality personnel indicate they liked the format - easier to use

- **Worksheets should be formatted into Excel or Access to facilitate completion**
- **Explore incorporating MC QAPP with MEC QAPP into single unified format**
- **Start with contractor Standard Operating Procedures (SOP) and fill out automated worksheets as a project team**
- **Renumber worksheets to remove unnecessary sheets and streamline document**
- **Create one document with QAPP tables incorporated into any needed narrative sections with SOPs included as appendices**

- **Get stakeholder buy-in before submitting the draft plans**
- **Allow flexibility when following the UFP QAPP guidance**
- **Move away from the traditional work plan**
- **Place as much information in the QAPP as possible**

- **Supplement worksheets with site-specific information not required by a worksheet**
- **Remove this information from the work plan and place directly behind the applicable worksheet**
- **Recognize the reader must still be directed to the QAPP**
- **Align the definable features of work presented in the work plan with those presented in the various QAPP worksheets**
- **Use electronic deliverables and .ftp sites to expedite stakeholder review and comment resolution**

- **Case Study QAPP** can be found at the following site:
- **Hostname:** <ftp://geofp.eodt.com>
- **Username:** adak
- **Password:** @d@k