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NAS FORT WORTH
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MEETING MINUTES FROM 8 MAY 1997 RESTORATION ADVISORY BOARD MEETING NAS FORT WORTH TX
5/8/1997
RESTORATION ADVISORY BOARD

CARSWELL AFB
TEXAS

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 755

NAS Fort Worth JRB, Carswell Field
Air Force Base Conversion Agency
RAB Meeting

Summary Minutes of 08 May 1997 **Regular Quarterly Meeting**

A regular meeting of the Air Force Base Conversion Agency (AFBCA) Restoration Advisory Board was held on Thursday 08 May 97. The meeting was held in the AFBCA Conference Room at Naval Air Station (NAS) Fort Worth, Joint Reserve Base (JRB). The RAB meeting began at 1905.

In Attendance

Community Members
- Mike Gross
- Norma Robbins
- Vic Havel
- J'Nell Pate
- Barbara Baldrige
- D.W. Owen
- Guy Heveberton
- W.R. Olshefski

Carswell DERA (on-Base)
- Joe Dunkle, HQ AFCEE
- Lorraine Jamison, CH_2M Hill

Air Force Plant 4
- John Doepker, US Air Force
- Mr Victor Dozzi, IT Corp

Regulators
- Mr Lel Meoford, TNRCC
- Rafael Casanova, EPA, Region 6

DCMC-RJOD
- Karen Scarberry

Navy
- Mr Dale Lowelling, SOUTHNAVFACENGCOM

BRAC (Off-Base)
- Ms Kay Binzer, US Air Force
- Ms Linda Rengel, Informatics Corp.

Others
- Surendra B. Joshi

Agenda

I. Welcome and Introduction of attendees
II. Special Interest Topics
  A. Carswell On-Base, Joe Dunkel
    1. Natural Attenuation Presentation
  B. Air Force Plant 4 Presentation, John Doepker
    1. FY 1998 Environmental Program Overview
III. Open Discussion
IV. Adjournment

Welcome and Introductions

Joe Dunkle welcomed everyone to the meeting and introductions were done.

Minutes from Previous Meeting

The February and May minutes will be sent out together for review and corrections. Corrections and additions should be faxed to Linda Rengel, Informatics, 303-526-5211. Your input is appreciated.

Carswell On-Base, Joe Dunkle

Joe Dunkle gave a presentation regarding the process of natural attenuation as a fuels remediation technique. Highlights of the presentation include:

- Natural attenuation (NA) is the use of natural, physical and biological processes to remediate contamination. It is accepted by the EPA and many states and is a scientific approach which considers risk to human health and the environment.
- NA can be used to remediate dissolved fuel (BTEX) or chlorinated compounds such as trichlorethene (TCE). It has been proven to biodegrade hydrocarbon plumes.
- NA is achieved by dissolution, sorption, volatilization and aerobic or anaerobic biodegradation.
- NA is less expensive than pump-and-treat methods, is non-invasive and does not preclude use of the site during cleanup.
- Evidence that NA is effective includes: documented loss of contaminants over time, mass balance calculations based on chemical analytical data and microcosm studies using aquifer materials collected from the site.
- An NA treatability study is done by characterizing the site, doing groundwater sample analyses, and interpreting field data.
- A risk-based approach is taken to using NA by assessing whether biodegradation of fuels is feasible, by modeling the plume and the treatment options and by performing a risk assessment.

During the question-and-answer period, Mr Dunkle stated that approximately 80% of plumes do not extend beyond 250 feet from the source of origin. A big plume or an old plume may already be attenuating and not need further remediation.

Air Force/Plant 4-Mr John Doepker, Fiscal Year 1998 Environmental Program Report

Mr Doepker reported that the goals of the environmental program are to:

- Turn over long-term monitoring of the program to the Navy by 2002.
- Have all remedial actions in place by 2002.
- Have all closure documents prepared for transfer to the Navy.
- Have all long-term operation, long-term monitoring arrangements in place for transfer to the Navy
- Transfer all Compliance Plan responsibility to the Navy.

Mr Doepker stated that the completion strategy for achieving the goals noted above includes combining similar sites (landfills, POL sites, oil/water separators, etc.), combining steps and developing partnerships with the parties involved (regulators, the Restoration Advisory Board, the public, future land users, etc.).

The completion schedule for environmental studies extends from 1996 to 2000. The completion schedule for environmental cleanup extends from 1998 to 2001. The completion schedule for long-term monitoring extends from 1998 to at least the year 2018.

The FY1997 Cleanup program consists of:

- ◊ Long-term monitoring of Landfills 1 and 3
- ◊ Study/interim remedial action of oil/water separators
- ◊ Investigation of Landfills 2, 6, 7, 8, 9 and 10.
- ◊ Basewide long-term monitoring

The FY1998 Cleanup program consists of:

- ◊ Long-term monitoring of Landfills 1 and 3
- ◊ Study/interim remedial action of oil/water separators
- ◊ Remedial design for Landfills 2, 6, 7, 8, 9 and 10
- ◊ Basewide long-term monitoring
- ◊ Study/interim remedial action of waste accumulation areas
- ◊ Underground storage tank remedial action; RV storage area investigation; sanitary sewer remedial action

The following table outlines many aspects of the Cleanup Program.

Project Number	Relative Risk	Current Phase	Projected Remedy	Estimated Award Date	CWE	Projected Amount	Remedial Action In Place	Response Complete Projected Date	Site Name
97-002A	M	RA	Nat Atten	31-Jan-98	700K	700K	1999	2013	sep. oil/water
97-003A	M	RI/FS/RD	CAP	31-Jan-98	847K	847K	1999	2029	landfills 2,6,7,8,9
97-004A	M	LTM	Nat Atten	31-Dec-97	650K	650K	N/A	N/A	basewide LTM
98-003	NR	RA	Nat Atten	31-Jan-98	1,001K	1,001K	1999	2000	WAAs
98-004	NR	RIA	Nat Atten	31-Jan-98	1,506K	1,506K	2000	2015	USTs, RV, san sewer

Mr Doepker also mentioned that a soil vapor extraction system will be used at Building 181 which is the source of the TCE plume. The goal of the remedial design schedule is to stop the contamination before it progresses further. In 1998, money will be requested to build a reactive wall near Building 181 to treat the TCE/groundwater plume.

Also, the Rails to Trails group wants to transform the railroad tracks into a hiking trail. The soil along the tracks will be sampled.

Next Restoration Advisory Board Meeting

The next Restoration Advisory Board meeting will be held August 14, 1997. Restoration Advisory Board members will be notified by mail of the exact date, place and time. The August meeting may include a field trip to the phytoremediation site.

ADJOURNMENT

The meeting was adjourned at 1930.

This history is the writer's interpretation of the events and discussions which took place during the meeting. If there are any additions, omissions or correction to this history, please direct them to:

Linda Rengel, Informatics Inc. Fax:303-526-7827, Ph: 303-526-5211

Natural Attenuation

Remediation of Fuels

Joe Dunkle
AFCEE/ERD

8 May 1997

- **What is Natural Attenuation?**
- How is a Natural Attenuation treatability study done?
- How is a Risk-Based approach applied to a site?

Natural Attenuation

- Use of natural physical and biological processes to remediate contamination
- Accepted by the EPA and many States.
- It does not mean "Do Nothing" or "Wink and Walk"
- A Scientific approach which considers risk to human health and the environment

EPA Definition:

- The biodegradation, dispersion, dilution, sorption, volitilization, and/or chemical and biochemical stabilization of contaminants to effectively reduce contaminant toxicity, mobility, or volume to levels that are protective of human health and the ecosystem.

- Natural Attenuation is also known as Intrinsic Remediation

Where can it be used?

- Final remedy based on site risk evaluation
- Dissolved fuel (BTEX)
- Chlorinated compounds (TCE)

Removal Mechanisms in Natural Attenuation

- Physical:
  - Dilution
  - Sorption
  - Volatilization
- Biodegradation
  - Aerobic
    - Use oxygen as the electron acceptor
  - Anaerobic
    - Other compounds as electron acceptor

Biodegradation - aerobic process

- Aerobic bacteria use molecular oxygen as the terminal electron acceptor in respiration

- Most petroleum hydrocarbons are biodegradable under aerobic conditions

Biodegradation - anaerobic processes

- Anaerobic bacteria use nitrate, sulfate, or other inorganic compounds as the terminal electron acceptor in respiration.
- The preferred order of use is nitrate, manganese, iron, sulfate, and carbon dioxide (methanogenesis).

Supporting Evidence

Three lines of evidence used to gain regulatory acceptance:

- **Documented loss of contaminants over time at field scale.**
- **Mass balance calculations based on chemical analytical data (Modeling).**
- **Laboratory microcosm studies using aquifer materials collected from the site.**

- What is Natural Attenuation?
- **How is a Natural Attenuation treatability study done?**
- How is a Risk-Based approach applied to a site?

Site Characterization

- Geology and Hydrogeology
  - Groundwater table and groundwater movement
- Contamination
  - Source plume(s)
    - LNAPL and Smear Zones
  - Groundwater Contamination Plume(s)

Groundwater Sample Analyses

- Organic Parameters
  - BTEX, TPH, and/or other contaminant compounds
- Inorganic & Physical Parameter
  - Disolved Oxygen
  - Nitrate, Nitrite
  - Ferrous Iron (Fe++)
  - Sulfate
  - Methane
  - Oxydation Reduction Potential (Redox)
  - pH and Temperature

Field Data Interpretation

- What does the data say about the site?
- Are there conflicts between data items?
- How does the data change over time?

- What is Natural Attenuation?
- How is a Natural Attenuation treatability study done?
- **How is a Risk-Based approach applied to a site?**

Applying a Risk-Based Approach

- Assess whether bidegradation of fuels is feasible

  Biodegradation of fuels nearly always proceeds at some rate

- Model contamination fate and tranport

  (Bioplume II, Bioplume III, other models)

- Perform a Risk Assessment

Objectives of Modeling

- Predict future extent and concentration of a dissolved-phase plume, considering the combined effects of:
  - advection
  - dispersion
  - sorption
  - biodegradation
- Assess possible risk to potential downgradient receptors
- Provide technical support for the intrinsic remediation option at post-modeling regulatory negotiations

Risk Evaluation Process

- Review Available Site Data
- Develop Preliminary Conceptual Site Model
- Site Characterization For Intrinsic Remediation Option
- Refine Conceptual Site Model
- BIOPLUME III modeling of Chemicals of Concern
- Develop Risk Analysis
- Long-term Monitoring
- Sentry Wells

Advantages of Natural Attenuation

- If applicable Natural Attenuation is:
  - Less costly than pump-and-treat
    Put the savings to work on other remediations
  - Non-invasive
    Does not expose the contamination
  - Site may be usable during the cleanup
    (e.g., Contamination under runways)

Summary

- Natural Attenuation (NA) is not a "do nothing" approach
- NA includes the proven biodegradation of hydrocarbon plumes
- Use of NA must include risk evaluation, long-term monitoring, and modeling
- NA approach can reduce the overall costs of remediating hydrocarbon-contaminated sites
- NA is an alternative to pump and treat technology

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