

APPENDIX G – FIVE-YEAR REVIEW SITE INSPECTION CHECKLISTS

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O&M site manager

Gary Munekawa

Navy ROICC

5/14/09

Name

Title

Date

Interview: at site at office by phone phone no. 650.603.9834

Report attached: _____

Problems, suggestions:

The areas that showed evidence of gopher and ground squirrel activity have not been treated yet. They have been demarcated and are in the process of being addressed.

O&M site staff

Name

Name

Title

Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, suggestions:

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

A. O&M Documents

- O&M manual Readily available Up-to-date N/A
- As-built drawings Readily available Up-to-date N/A
- Maintenance logs Readily available Up-to-date N/A

Remarks:

B. Site-Specific Health and Safety Plan

- Readily available Up-to-date N/A
- Contingency plan/emergency response plan Readily available Up-to-date N/A

Remarks:

C. O&M and OSHA Training Records:

- Readily available Up-to-date N/A

Remarks:

D. Permits and Service Agreements:

- | | | | |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Air discharge permit | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Effluent discharge | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Waste disposal, POTW | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other permits | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

E. Gas Generation Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

F. Settlement Monument Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

G. Groundwater Monitoring Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

H. Leachate Extraction Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

I. Discharge Compliance Records:

- | | | | |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Air | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Water (effluent) | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

J. Daily Access/Security Logs:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

IV. ACCESS AND INSTITUTIONAL CONTROLS

A. FENCING:

- | | | | |
|--|---|---|------------------------------|
| <input type="checkbox"/> Fencing Damaged | <input type="checkbox"/> Location shown on site map | <input checked="" type="checkbox"/> Gates | <input type="checkbox"/> N/A |
|--|---|---|------------------------------|

Remarks:

Fencing surrounding the site was intact and appeared to be in good condition.

B. OTHER ACCESS RESTRICTIONS:

Signs and other security measures Location shown on site map N/A

Remarks:

Security around this federal facility is manned 24 hour/day, 7 days/week, with gated and controlled access roads. There were two checkpoints and two locked gates to get to the site. The perimeter fence of the site was marked with warning signs.

C. INSTITUTIONAL CONTROLS (ICs):

1. Implementation and Enforcement:

Site Conditions Imply ICs Not Properly Implemented Yes No N/A

Site Conditions Imply ICs Not Being Fully Enforced Yes No N/A

Type of Monitoring (e.g., self-reporting, drive-by): Visual site inspections

Frequency: Quarterly

Responsible party/agency: Navy/NASA

Contact:

Name	Title	Date	Phone no.
Reporting is up-to-date	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Violations have been reported	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		

Other Problems or Suggestions: Report Attached

2. Adequacy: ICs are Adequate ICs are Inadequate N/A

Remarks:

D. GENERAL

1. Vandalism/Trespassing Location shown on site map No Vandalism evident

Remarks:

2. Land use changes on-site N/A

Remarks:

There were no land use changes on site.

3. Land use changes off-site N/A

Remarks:

No land use changes were observed off site.

V. O&M COSTS

A. O&M Organization

- State in-house Contractor for State
 PRP in-house Contractor for PRP
 Federal Facility in-house Contractor for Federal Facility
 Other _____

Remarks:

B. O&M Cost Records

- Readily available Up to date
 Funding mechanism/agreement in place

Original O&M cost estimate: Not Available Breakdown attached

Total annual cost by year for review period:

From	<u>1/1/2007</u> Date	To	<u>12/31/2007</u> Date	<u>\$72,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/2008</u> Date	To	<u>12/31/2008</u> Date	<u>\$75,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	_____ Date	To	_____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached
From	_____ Date	To	_____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached
From	_____ Date	To	_____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached

C. Unanticipated or Unusually High O&M Costs During Review Period

Describe costs and reasons:

N/A

VI. GENERAL SITE CONDITIONS

A. Roads

Applicable N/A

1. Road Damaged Location shown on site map Roads Adequate N/A

Remarks:

Roads leading to the site were in good condition.

B. Other Site Conditions:

VII. GROUNDWATER/SURFACE WATER REMEDIES

Applicable N/A

A. Monitoring Wells

Properly Secured/Locked Functioning Routinely sampled Good Condition
 All Required Wells Located Needs Maintenance N/A

Remarks:

Monitoring wells were not labeled with identification tags.

B. Groundwater Extraction Wells, Pumps, and Pipelines

Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical

Good condition All required wells properly operating Needs Maintenance N/A

Remarks:

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances

Good condition Needs Maintenance

Remarks:

N/A

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks:

N/A

C. Treatment System

Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

Air stripping Carbon adsorbents

Filters _____

Additive (e.g., chelation agent, flocculent) _____

- Others: _____
- Good Condition Needs Maintenance
- Sampling ports properly marked and functional
- Sampling/maintenance log displayed and up to date
- Equipment properly identified
- Quantity of groundwater treated annually _____
- Quantity of surface water treated annually _____

Remarks:

2. Electrical Enclosures and Panels (properly rated and functional)

- N/A Good condition Needs Maintenance

Remarks:

3. Tanks, Vaults, Storage Vessels

- N/A Good condition Proper secondary containment Needs Maintenance

Remarks:

4. Discharge Structure and Appurtenances

- N/A Good condition Needs Maintenance

Remarks:

5. Treatment Building(s)

- N/A Good condition (esp. roof and doorways) Needs repair
- Chemicals and equipment properly stored

Remarks:

VIII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

- 1. Settlement (Low spots)** Location shown on site map Settlement not evident

Areal extent _____ Depth _____

Remarks:

2. Cracks	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Cracking not evident
Lengths _____ Widths _____ Depths _____		
Remarks:		
3. Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
Areal extent _____ Depth _____		
Remarks:		
4. Holes	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Holes not evident
Areal extent _____ Depth _____		
Remarks:		
Minor areas of apparent active gopher and ground squirrel burrowing were observed on the landfill.		
5. Vegetative Cover	<input type="checkbox"/> Grass	<input checked="" type="checkbox"/> Cover properly established
	<input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)	<input checked="" type="checkbox"/> No signs of stress
Remarks:		
N/A		
6. Alternative Cover (armored rock, concrete, etc.)	<input checked="" type="checkbox"/> N/A	
Remarks:		
7. Bulges	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Bulges not evident
Areal extent _____ Height _____		
Remarks:		
8. Wet Areas/Water Damage	<input checked="" type="checkbox"/> Wet areas/water damage not evident	
<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Areal extent _____
<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Areal extent _____
<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____
<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____
Remarks:		
N/A		
9. Slope Instability	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map
		<input checked="" type="checkbox"/> No evidence of slope instability
Areal extent _____		
Remarks:		
N/A		
B. Cover Penetrations	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A

- 1. Gas Vents** Active Passive
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 2. Gas Monitoring Probes**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 3. Monitoring Wells** (within surface area of landfill)
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

No monitoring wells were located within the surface area of the landfill.

- 4. Leachate Extraction Wells**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 5. Settlement Monuments** Located Routinely surveyed N/A

Remarks:

- C. Gas Collection and Treatment** Applicable N/A

- 1. Gas Treatment Facilities**
 Flaring Thermal destruction Collection for reuse
 Good condition Needs Maintenance

Remarks:

- 2. Gas Collection Wells, Manifolds and Piping**
 Good condition Needs Maintenance

Remarks:

- 3. Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
 Good condition Needs Maintenance N/A

Remarks:

IX. OVERALL OBSERVATIONS

A. IMPLEMENTATION OF THE REMEDY

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

The remedy is designed to contain landfill refuse and prevent exposure of contents to human or ecological receptors. Evidence of gopher and ground squirrel burrowing was observed. However, it appeared superficial and no evidence of penetration into the interior of the landfill was observed. All other aspects of the remedy were observed to be in good condition and functioning as intended. In addition to the passive gas venting trench and groundwater collection trench, landfill gas and groundwater are monitored routinely to ensure no off site migration of landfill gas or landfill contaminants. Additionally, O&M activities ensure the integrity of the landfill cap.

B. ADEQUACY OF O&M (Including pre-construction communications)

Describe issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long term protectiveness of the remedy.

Evidence of gopher and ground squirrel burrowing activity was observed. These areas had been marked with survey flags. According to the ROICC, they are in the process of addressing the recent burrowing activity. The activity appeared to be superficial and did not penetrate into the interior of the landfill. The Navy backfills burrowing mammal holes after they are found during routine quarterly inspections. O&M activities are effective in maintaining the integrity of the site and the selected remedy.

C. EARLY INDICATORS OF POTENTIAL REMEDY PROBLEMS

Describe issues and observations such as unexpected changes in the cost of scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

There are no early indicators of potential problems associated with the remedy selected.

D. OPPORTUNITIES FOR OPTIMIZATION

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Alternatives to the current gopher and ground squirrel maintenance activities could be researched so that a more effective and permanent solution could be developed. No additional opportunities for optimization were observed during the site inspection.



Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site Name: IR Site 22 Landfill		Date of Inspection: 5/14/09
Location and Region: Former NAS Moffett Field, CA; Region 9		EPA ID: CA2170090078
Agency, office or company leading the five-year review:	DON	Weather/ Temperature: Sunny, breezy, low 70s

Remedy Includes: (Check all that apply)

<input checked="" type="checkbox"/> Landfill Cover/Containment	<input type="checkbox"/> Monitored Natural Attenuation	<input checked="" type="checkbox"/> Institutional Controls
<input type="checkbox"/> Access Controls	<input type="checkbox"/> Groundwater Containment	<input type="checkbox"/> Vertical Barrier Walls
<input type="checkbox"/> Groundwater Pump and Treatment	<input type="checkbox"/> Surface water Collection and Treatment	<input checked="" type="checkbox"/> Groundwater Monitoring

Other Landfill gas monitoring, managing surface water flow across site to prevent ponding, installing a barrier to prevent burrowing animals from disturbing subsurface contamination

II. INTERVIEWS

Agency: Santa Clara County DEH

Contact: <u>Chris Rummel</u>	Inspector	7/8/09
Name	Title	Date

Interview: at site at office by phone phone no. by email

Report attached: Appendix H

Problems, regulations or policy changes, suggestions:

Mr. Rummel was interviewed with regard to landfill maintenance activities and quarterly inspections at IR Site 22. The interview is included in Appendix H.

Agency: _____

Contact: _____	_____	_____
Name	Title	Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, regulations or policy changes, suggestions:

O&M site manager

	Name	Title	Date
--	------	-------	------

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, suggestions:

O&M site staff

	Name	Title	Date
--	------	-------	------

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, suggestions:

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

A. O&M Documents

- | | | | |
|---|---|--|------------------------------|
| <input checked="" type="checkbox"/> O&M manual | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> As-built drawings | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Maintenance logs | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |

Remarks:

B. Site-Specific Health and Safety Plan

- | | | |
|---|--|-------------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
| <input type="checkbox"/> Contingency plan/emergency response plan | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date |
| | | <input type="checkbox"/> N/A |

Remarks:

C. O&M and OSHA Training Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

D. Permits and Service Agreements:

- | | | | |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Air discharge permit | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Effluent discharge | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Waste disposal, POTW | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other permits | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

E. Gas Generation Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

F. Settlement Monument Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

G. Groundwater Monitoring Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

H. Leachate Extraction Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

I. Discharge Compliance Records:

- | | | | |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Air | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Water (effluent) | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

J. Daily Access/Security Logs:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

IV. ACCESS AND INSTITUTIONAL CONTROLS

A. FENCING:

- | | | | |
|--|---|--------------------------------|---|
| <input type="checkbox"/> Fencing Damaged | <input type="checkbox"/> Location shown on site map | <input type="checkbox"/> Gates | <input checked="" type="checkbox"/> N/A |
|--|---|--------------------------------|---|

Remarks:

B. OTHER ACCESS RESTRICTIONS:

Signs and other security measures Location shown on site map N/A

Remarks:

Security around this federal facility is manned 24 hours/day, 7 days/week, with gated and controlled access roads. There were two checkpoints and two locked gates to get to the site.

C. INSTITUTIONAL CONTROLS (ICs):

1. Implementation and Enforcement:

Site Conditions Imply ICs Not Properly Implemented Yes No N/A

Site Conditions Imply ICs Not Being Fully Enforced Yes No N/A

Type of Monitoring (e.g., self-reporting, drive-by): Visual site inspections

Frequency: Quarterly

Responsible party/agency: Navy/NASA

Contact:

Name	Title	Date	Phone no.
Reporting is up-to-date	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Violations have been reported	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		

Other Problems or Suggestions: Report Attached

2. Adequacy: ICs are Adequate ICs are Inadequate N/A

Remarks:

D. GENERAL

1. Vandalism/Trespassing Location shown on site map No Vandalism evident

Remarks:

2. Land use changes on-site N/A

Remarks:

There were no land use changes on site.

3. Land use changes off-site N/A

Remarks:

No land use changes were observed off site.

V. O&M COSTS

A. O&M Organization

- State in-house Contractor for State
 PRP in-house Contractor for PRP
 Federal Facility in-house Contractor for Federal Facility
 Other _____

Remarks:

B. O&M Cost Records

- Readily available Up to date
 Funding mechanism/agreement in place

Original O&M cost estimate: Not Available Breakdown attached

Total annual cost by year for review period:

From	<u>1/1/2007</u> Date	To	<u>12/31/2007</u> Date	<u>\$72,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/2008</u> Date	To	<u>12/31/2008</u> Date	<u>\$75,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	_____ Date	To	_____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached
From	_____ Date	To	_____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached
From	_____ Date	To	_____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached

C. Unanticipated or Unusually High O&M Costs During Review Period

Describe costs and reasons:

N/A

VI. GENERAL SITE CONDITIONS

A. Roads

Applicable N/A

1. Road Damaged

Location shown on site map Roads Adequate N/A

Remarks:

Roads leading to the site were in good condition.

B. Other Site Conditions:

VII. GROUNDWATER/SURFACE WATER REMEDIES

Applicable N/A

A. Monitoring Wells

Properly Secured/Locked Functioning Routinely sampled Good Condition
 All Required Wells Located Needs Maintenance N/A

Remarks:

Several of the monitoring wells were missing bolts (WGC2-4, WGC2-10, WGC2-12) or had broken bolt heads (WGC2-8) . One additional, unnamed and unlabeled monitoring well was found to the southeast of WGC2-9.

B. Groundwater Extraction Wells, Pumps, and Pipelines

Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical

Good condition All required wells properly operating Needs Maintenance N/A

Remarks:

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances

Good condition Needs Maintenance

Remarks:

N/A

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks:

N/A

C. Treatment System

Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation
 Air stripping Carbon adsorbents
 Filters _____
 Additive (e.g., chelation agent, flocculent) _____

- Others: _____
- Good Condition Needs Maintenance
- Sampling ports properly marked and functional
- Sampling/maintenance log displayed and up to date
- Equipment properly identified
- Quantity of groundwater treated annually _____
- Quantity of surface water treated annually _____

Remarks:

2. Electrical Enclosures and Panels (properly rated and functional)

- N/A Good condition Needs Maintenance

Remarks:

3. Tanks, Vaults, Storage Vessels

- N/A Good condition Proper secondary containment Needs Maintenance

Remarks:

4. Discharge Structure and Appurtenances

- N/A Good condition Needs Maintenance

Remarks:

5. Treatment Building(s)

- N/A Good condition (esp. roof and doorways) Needs repair
- Chemicals and equipment properly stored

Remarks:

VIII. LANDFILL COVERS **Applicable** N/A

A. Landfill Surface

- 1. Settlement (Low spots)** Location shown on site map Settlement not evident

Areal extent _____ Depth _____

Remarks:

<p>2. Cracks <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident</p> <p>Lengths _____ Widths _____ Depths _____</p> <p>Remarks:</p>												
<p>3. Erosion <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident</p> <p>Areal extent _____ Depth _____</p> <p>Remarks:</p>												
<p>4. Holes <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Holes not evident</p> <p>Areal extent _____ Depth _____</p> <p>Remarks:</p> <p>Evidence of gopher and ground squirrel burrowing was not observed during this site inspection, however, it has been noted in the past.</p>												
<p>5. Vegetative Cover <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input checked="" type="checkbox"/> No signs of stress</p> <p><input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)</p> <p>Remarks:</p> <p>N/A</p>												
<p>6. Alternative Cover (armored rock, concrete, etc.) <input checked="" type="checkbox"/> N/A</p> <p>Remarks:</p>												
<p>7. Bulges <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident</p> <p>Areal extent _____ Height _____</p> <p>Remarks:</p>												
<p>8. Wet Areas/Water Damage <input checked="" type="checkbox"/> Wet areas/water damage not evident</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> Wet areas</td> <td style="width: 33%;"><input type="checkbox"/> Location shown on site map</td> <td style="width: 33%;">Areal extent _____</td> </tr> <tr> <td><input type="checkbox"/> Ponding</td> <td><input type="checkbox"/> Location shown on site map</td> <td>Areal extent _____</td> </tr> <tr> <td><input type="checkbox"/> Seeps</td> <td><input type="checkbox"/> Location shown on site map</td> <td>Areal extent _____</td> </tr> <tr> <td><input type="checkbox"/> Soft subgrade</td> <td><input type="checkbox"/> Location shown on site map</td> <td>Areal extent _____</td> </tr> </table> <p>Remarks:</p> <p>N/A</p>	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Areal extent _____	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Areal extent _____	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____
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<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____										
<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____										
<p>9. Slope Instability <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of slope instability</p> <p>Areal extent _____</p> <p>Remarks:</p> <p>N/A</p>												
<p>B. Cover Penetrations <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A</p>												

- 1. Gas Vents** Active Passive
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 2. Gas Monitoring Probes**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 3. Monitoring Wells** (within surface area of landfill)
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

Several of the monitoring wells were missing bolts (WGC2-4, WGC2-10, WGC2-12) or or had broken bolt heads (WGC2-8)

- 4. Leachate Extraction Wells**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 5. Settlement Monuments** Located Routinely surveyed N/A

Remarks:

- C. Gas Collection and Treatment** Applicable N/A

- 1. Gas Treatment Facilities**
 Flaring Thermal destruction Collection for reuse
 Good condition Needs Maintenance

Remarks:

- 2. Gas Collection Wells, Manifolds and Piping**
 Good condition Needs Maintenance

Remarks:

- 3. Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
 Good condition Needs Maintenance N/A

Remarks:

IX. OVERALL OBSERVATIONS

A. IMPLEMENTATION OF THE REMEDY

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

The remedy is designed to contain landfill refuse and prevent exposure of contents to human or ecological receptors. No evidence of gopher and ground squirrel burrowing was observed, however it has been noted in the past. All other aspects of the remedy were observed to be in good condition and functioning as intended. Landfill gas and groundwater are monitored routinely to ensure no off site migration of landfill gas or landfill contaminants. Additionally, O&M activities ensure the integrity of the landfill cap.

B. ADEQUACY OF O&M (Including pre-construction communications)

Describe issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long term protectiveness of the remedy.

O&M activities are effective in maintaining the integrity of the site and the selected remedy. The Navy addresses monitoring well maintenance as part of routine maintenance activities during quarterly site inspections. Gopher and ground squirrel maintenance activities should continue as prescribed in the Operations, Maintenance, and Monitoring Plan and Addendum to ensure protectiveness of the remedy.

C. EARLY INDICATORS OF POTENTIAL REMEDY PROBLEMS

Describe issues and observations such as unexpected changes in the cost of scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

There are no early indicators of potential problems associated with the remedy selected.

D. OPPORTUNITIES FOR OPTIMIZATION

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Quarterly groundwater monitoring could be requested to be conducted on a semi-annual basis. Gopher and ground squirrel burrowing control alternatives could be researched to determine a more effective and permanent solution to the ongoing issue. No additional opportunities for optimization were observed during the site inspection.



Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site Name: IR Site 26	Date of Inspection: 5/14/09
Location and Region: Former NAS Moffett Field, CA; Region 9	EPA ID: CA2170090078
Agency, office or company leading the five-year review: DON	Weather/ Temperature: Sunny, breezy, mid 70s

Remedy Includes: (Check all that apply)

- | | | |
|--|---|--|
| <input type="checkbox"/> Landfill Cover/Containment | <input type="checkbox"/> Monitored Natural Attenuation | <input checked="" type="checkbox"/> Institutional Controls |
| <input type="checkbox"/> Access Controls | <input type="checkbox"/> Groundwater Containment | <input type="checkbox"/> Vertical Barrier Walls |
| <input checked="" type="checkbox"/> Groundwater Pump and Treatment | <input type="checkbox"/> Surface water Collection and Treatment | <input checked="" type="checkbox"/> Groundwater Monitoring |
| <input type="checkbox"/> Other | | |

II. INTERVIEWS

Agency: _____

Contact: _____
Name
Title
Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, regulations or policy changes, suggestions:

Agency: _____

Contact: _____
Name
Title
Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, regulations or policy changes, suggestions:

O&M site manager

Name

Title

Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, suggestions:

O&M site staff

Name

Name

Title

Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, suggestions:

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

A. O&M Documents

- | | | | |
|--|--|-------------------------------------|---|
| <input type="checkbox"/> O&M manual | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> As-built drawings | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Maintenance logs | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

B. Site-Specific Health and Safety Plan

- | | | | |
|--|---|-------------------------------------|------------------------------|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A | |
| <input checked="" type="checkbox"/> Contingency plan/emergency response plan | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |

Remarks:

C. O&M and OSHA Training Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

D. Permits and Service Agreements:

- | | | | |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Air discharge permit | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Effluent discharge | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Waste disposal, POTW | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other permits | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

E. Gas Generation Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

F. Settlement Monument Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

G. Groundwater Monitoring Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

H. Leachate Extraction Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

I. Discharge Compliance Records:

- | | | | |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Air | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Water (effluent) | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

J. Daily Access/Security Logs:

- | | | |
|--|-------------------------------------|------------------------------|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|--|-------------------------------------|------------------------------|

Remarks:

IV. ACCESS AND INSTITUTIONAL CONTROLS

A. FENCING:

- | | | | |
|--|---|--------------------------------|------------------------------|
| <input type="checkbox"/> Fencing Damaged | <input type="checkbox"/> Location shown on site map | <input type="checkbox"/> Gates | <input type="checkbox"/> N/A |
|--|---|--------------------------------|------------------------------|

Remarks:

The EATS treatment area was fenced with a locked gate. Building 191 was also fenced with a locked gate. Fencing was in good condition.

3. Land use changes off-site N/A

Remarks:

No land use changes were observed off site.

V. O&M COSTS

A. O&M Organization

- State in-house Contractor for State
 PRP in-house Contractor for PRP
 Federal Facility in-house Contractor for Federal Facility
 Other _____

Remarks:

EATS was turned off in 2003. O&M consists of groundwater monitoring.

B. O&M Cost Records

- Readily available Up to date
 Funding mechanism/agreement in place

Original O&M cost estimate: Not Available Breakdown attached

Total annual cost by year for review period:

From	<u>1/1/04</u> Date	To	<u>12/31/04</u> Date	<u>\$100,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/05</u> Date	To	<u>12/31/05</u> Date	<u>\$100,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/06</u> Date	To	<u>12/31/06</u> Date	<u>\$100,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/07</u> Date	To	<u>12/31/07</u> Date	<u>\$50,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/08</u> Date	To	<u>12/31/08</u> Date	<u>\$50,000</u> Total cost	<input type="checkbox"/> Breakdown attached

C. Unanticipated or Unusually High O&M Costs During Review Period

Describe costs and reasons:

N/A

VI. GENERAL SITE CONDITIONS

A. Roads

Applicable N/A

1. Road Damaged Location shown on site map Roads Adequate N/A

Remarks:

Roads leading to the site were in good condition.

B. Other Site Conditions:

VII. GROUNDWATER/SURFACE WATER REMEDIES

Applicable N/A

A. Monitoring Wells

Properly Secured/Locked Functioning Routinely sampled Good Condition
 All Required Wells Located Needs Maintenance N/A

Remarks:

Monitoring wells were in good condition and properly secured. Additionally, they are routinely sampled as part of the remedy.

B. Groundwater Extraction Wells, Pumps, and Pipelines

Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical

Good condition All required wells properly operating Needs Maintenance N/A

Remarks:

EATS was turned off in July 2003.

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances

Good condition Needs Maintenance

Remarks:

N/A

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks:

N/A

C. Treatment System

Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation
 Air stripping Carbon adsorbents
 Filters _____
 Additive (e.g., chelation agent, flocculent) _____

- Others: _____
- Good Condition Needs Maintenance
- Sampling ports properly marked and functional
- Sampling/maintenance log displayed and up to date
- Equipment properly identified
- Quantity of groundwater treated annually _____
- Quantity of surface water treated annually _____

Remarks:

2. Electrical Enclosures and Panels (properly rated and functional)

- N/A Good condition Needs Maintenance

Remarks:

3. Tanks, Vaults, Storage Vessels

- N/A Good condition Proper secondary containment Needs Maintenance

Remarks:

4. Discharge Structure and Appurtenances

- N/A Good condition Needs Maintenance

Remarks:

5. Treatment Building(s)

- N/A Good condition (esp. roof and doorways) Needs repair
- Chemicals and equipment properly stored

Remarks:

VIII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

- 1. Settlement (Low spots)** Location shown on site map Settlement not evident

Areal extent _____ Depth _____

Remarks:

N/A

<p>2. Cracks <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Cracking not evident</p> <p>Lengths _____ Widths _____ Depths _____</p> <p>Remarks: N/A</p>												
<p>3. Erosion <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident</p> <p>Areal extent _____ Depth _____</p> <p>Remarks: N/A</p>												
<p>4. Holes <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Holes not evident</p> <p>Areal extent _____ Depth _____</p> <p>Remarks: N/A</p>												
<p>5. Vegetative Cover <input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress</p> <p><input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)</p> <p>Remarks: N/A</p>												
<p>6. Alternative Cover (armored rock, concrete, etc.) <input checked="" type="checkbox"/> N/A</p> <p>Remarks:</p>												
<p>7. Bulges <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Bulges not evident</p> <p>Areal extent _____ Height _____</p> <p>Remarks: N/A</p>												
<p>8. Wet Areas/Water Damage <input type="checkbox"/> Wet areas/water damage not evident</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> Wet areas</td> <td style="width: 33%;"><input type="checkbox"/> Location shown on site map</td> <td style="width: 33%;">Areal extent _____</td> </tr> <tr> <td><input type="checkbox"/> Ponding</td> <td><input type="checkbox"/> Location shown on site map</td> <td>Areal extent _____</td> </tr> <tr> <td><input type="checkbox"/> Seeps</td> <td><input type="checkbox"/> Location shown on site map</td> <td>Areal extent _____</td> </tr> <tr> <td><input type="checkbox"/> Soft subgrade</td> <td><input type="checkbox"/> Location shown on site map</td> <td>Areal extent _____</td> </tr> </table> <p>Remarks: N/A</p>	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Areal extent _____	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Areal extent _____	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____
<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Areal extent _____										
<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Areal extent _____										
<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____										
<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____										
<p>9. Slope Instability <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability</p> <p>Areal extent _____</p> <p>Remarks: N/A</p>												
<p>B. Cover Penetrations <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A</p>												

- 1. Gas Vents** Active Passive
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 2. Gas Monitoring Probes**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 3. Monitoring Wells** (within surface area of landfill)
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 4. Leachate Extraction Wells**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 5. Settlement Monuments** Located Routinely surveyed N/A

Remarks:

- C. Gas Collection and Treatment** Applicable N/A

- 1. Gas Treatment Facilities**
 Flaring Thermal destruction Collection for reuse
 Good condition Needs Maintenance

Remarks:

- 2. Gas Collection Wells, Manifolds and Piping**
 Good condition Needs Maintenance

Remarks:

- 3. Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
 Good condition Needs Maintenance N/A

Remarks:

IX. OVERALL OBSERVATIONS

A. IMPLEMENTATION OF THE REMEDY

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

The remedy was intended to treat contaminated groundwater to drinking water standards and limit exposure to contaminated groundwater. EATS was turned off in July 2003 because it was ineffective and inefficient in cleaning VOCs. Other treatment methods are being evaluated.

B. ADEQUACY OF O&M (Including pre-construction communications)

Describe issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long term protectiveness of the remedy.

EATS was not in operation during the review period. No issues were observed with regard to the current groundwater monitoring program.

C. EARLY INDICATORS OF POTENTIAL REMEDY PROBLEMS

Describe issues and observations such as unexpected changes in the cost of scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

There are no issues or early indicators of potential remedy problems. Even though EATS has been turned off, the contaminant plume has not migrated.

D. OPPORTUNITIES FOR OPTIMIZATION

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Opportunities for optimization are currently being studied by the Navy.



Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site Name: IR Site 28		Date of Inspection: 5/7/09
Location and Region: Former NAS Moffett Field, CA; Region 9		EPA ID: CA2170090078
Agency, office or company leading the five-year review:	DON	Weather/ Temperature: Sunny, calm winds, mid 60s

Remedy Includes: (Check all that apply)

- | | | |
|--|---|--|
| <input type="checkbox"/> Landfill Cover/Containment | <input type="checkbox"/> Monitored Natural Attenuation | <input checked="" type="checkbox"/> Institutional Controls |
| <input checked="" type="checkbox"/> Access Controls | <input checked="" type="checkbox"/> Groundwater Containment | <input type="checkbox"/> Vertical Barrier Walls |
| <input checked="" type="checkbox"/> Groundwater Pump and Treatment | <input type="checkbox"/> Surface water Collection and Treatment | <input checked="" type="checkbox"/> Groundwater Monitoring |
| <input type="checkbox"/> Other | | |

II. INTERVIEWS

Agency: Tetra Tech EC, Inc.

Contact: <u>Duane Harrison</u>	<u>System Operator</u>	<u>5/7/09</u>
Name	Title	Date

Interview: at site at office by phone phone no. (650) 564-9868

Report attached: _____

Problems, regulations or policy changes, suggestions:

Mr. Harrison gave a tour of the WATS facility and extraction wells. He provided NPDES reports, Accident Prevention Plans, Inspection Records, Daily Production Reports, a spare parts list, non-scheduled inspection records, and a maintenance summary/schedule for review. Spare parts are stored on-site. The air-stripper was capped and converted to a tank.

Agency: _____

Contact: _____	_____	_____
Name	Title	Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, regulations or policy changes, suggestions:

O&M site manager

Duane Harrison

System Operator

5/7/09

Name

Title

Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, suggestions:

see page 1

O&M site staff

Name

Name

Title

Date

Interview: at site at office by phone phone no. _____

Report attached: _____

Problems, suggestions:

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

A. O&M Documents

- | | | | |
|---|---|-------------------------------------|------------------------------|
| <input checked="" type="checkbox"/> O&M manual | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> As-built drawings | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Maintenance logs | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |

Remarks:

B. Site-Specific Health and Safety Plan

- | | | |
|--|---|-------------------------------------|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Contingency plan/emergency response plan | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date |
| | | <input type="checkbox"/> N/A |

Remarks:

C. O&M and OSHA Training Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

D. Permits and Service Agreements:

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Air discharge permit | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Effluent discharge | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
| <input type="checkbox"/> Waste disposal, POTW | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other permits | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |

Remarks:

E. Gas Generation Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

F. Settlement Monument Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

G. Groundwater Monitoring Records:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

H. Leachate Extraction Records:

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks:

I. Discharge Compliance Records:

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Air | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up-to-date | <input checked="" type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Water (effluent) | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |

Remarks:

J. Daily Access/Security Logs:

- | | | |
|---|--|------------------------------|
| <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up-to-date | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks:

IV. ACCESS AND INSTITUTIONAL CONTROLS**A. FENCING:**

- | | | | |
|--|---|--------------------------------|------------------------------|
| <input type="checkbox"/> Fencing Damaged | <input type="checkbox"/> Location shown on site map | <input type="checkbox"/> Gates | <input type="checkbox"/> N/A |
|--|---|--------------------------------|------------------------------|

Remarks:

This treatment area of WATS was completely fenced and locked. Fence was in good condition.

B. OTHER ACCESS RESTRICTIONS:

Signs and other security measures Location shown on site map N/A

Remarks:

Security around this federal facility is provided 24 hour/day, 7 days/week, with gated and controlled access roads.

C. INSTITUTIONAL CONTROLS (ICs):

1. Implementation and Enforcement:

Site Conditions Imply ICs Not Properly Implemented Yes No N/A

Site Conditions Imply ICs Not Being Fully Enforced Yes No N/A

Type of Monitoring (e.g., self-reporting, drive-by): _____

Frequency: _____

Responsible party/agency: _____

Contact:

Name	Title	Date	Phone no.
------	-------	------	-----------

Reporting is up-to-date Yes No N/A

Reports are verified by the lead agency Yes No N/A

Specific requirements in deed or decision documents have been met Yes No N/A

Violations have been reported Yes No N/A

Other Problems or Suggestions: Report Attached

2. Adequacy: ICs are Adequate ICs are Inadequate N/A

Remarks:

D. GENERAL

1. Vandalism/Trespassing Location shown on site map No Vandalism evident

Remarks:

2. Land use changes on-site N/A

Remarks:

There were no land use changes on site.

3. Land use changes off-site N/A

Remarks:

No land use changes were observed off site.

V. O&M COSTS

A. O&M Organization

- State in-house Contractor for State
 PRP in-house Contractor for PRP
 Federal Facility in-house Contractor for Federal Facility
 Other _____

Remarks:

Tetra Tech EC, Inc. is the current O&M contractor.

B. O&M Cost Records

- Readily available Up to date
 Funding mechanism/agreement in place

Original O&M cost estimate: Not Available Breakdown attached

Total annual cost by year for review period:

From	<u>1/1/04</u> Date	To	<u>12/31/04</u> Date	<u>\$428,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/05</u> Date	To	<u>12/31/05</u> Date	<u>\$308,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/06</u> Date	To	<u>12/31/06</u> Date	<u>\$753,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/07</u> Date	To	<u>12/31/07</u> Date	<u>\$761,000</u> Total cost	<input type="checkbox"/> Breakdown attached
From	<u>1/1/08</u> Date	To	<u>12/31/08</u> Date	<u>\$761,000</u> Total cost	<input type="checkbox"/> Breakdown attached

C. Unanticipated or Unusually High O&M Costs During Review Period

Describe costs and reasons:

VI. GENERAL SITE CONDITIONS

A. Roads

Applicable N/A

1. Road Damaged

Location shown on site map Roads Adequate N/A

Remarks:

Roads leading to the site were in good condition

B. Other Site Conditions:

VII. GROUNDWATER/SURFACE WATER REMEDIES

Applicable N/A

A. Monitoring Wells

Properly Secured/Locked Functioning Routinely sampled Good Condition
 All Required Wells Located Needs Maintenance N/A

Remarks:

Due to the high number of GWM wells and the fact that they are routinely sampled, locating all wells was beyond the scope of work. Wells that were inspected were in good condition and properly secured.

B. Groundwater Extraction Wells, Pumps, and Pipelines

Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical

Good condition All required wells properly operating Needs Maintenance N/A

Remarks:

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances

Good condition Needs Maintenance

Remarks:

N/A

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks:

Spare parts are located on site.

C. Treatment System

Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

Air stripping Carbon adsorbents

Filters _____

Additive (e.g., chelation agent, flocculent) _____

- Others: Advanced oxidation process (AOP) - ozone and peroxide oxidation system
- Good Condition Needs Maintenance
- Sampling ports properly marked and functional
- Sampling/maintenance log displayed and up to date
- Equipment properly identified
- Quantity of groundwater treated annually 36 million gallons
- Quantity of surface water treated annually _____

Remarks:

2. Electrical Enclosures and Panels (properly rated and functional)

- N/A Good condition Needs Maintenance

Remarks:

3. Tanks, Vaults, Storage Vessels

- N/A Good condition Proper secondary containment Needs Maintenance

Remarks:

4. Discharge Structure and Appurtenances

- N/A Good condition Needs Maintenance

Remarks:

5. Treatment Building(s)

- N/A Good condition (esp. roof and doorways) Needs repair
- Chemicals and equipment properly stored

Remarks:

VIII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

- 1. Settlement (Low spots)** Location shown on site map Settlement not evident

Areal extent _____ Depth _____

Remarks:

N/A

2. Cracks Location shown on site map Cracking not evident
 Lengths _____ Widths _____ Depths _____
 Remarks:
 N/A

3. Erosion Location shown on site map Erosion not evident
 Areal extent _____ Depth _____
 Remarks:
 N/A

4. Holes Location shown on site map Holes not evident
 Areal extent _____ Depth _____
 Remarks:
 N/A

5. Vegetative Cover Grass Cover properly established No signs of stress
 Trees/Shrubs (indicate size and locations on a diagram)
 Remarks:
 N/A

6. Alternative Cover (armored rock, concrete, etc.) N/A
 Remarks:

7. Bulges Location shown on site map Bulges not evident
 Areal extent _____ Height _____
 Remarks:
 N/A

8. Wet Areas/Water Damage Wet areas/water damage not evident
 Wet areas Location shown on site map Areal extent _____
 Ponding Location shown on site map Areal extent _____
 Seeps Location shown on site map Areal extent _____
 Soft subgrade Location shown on site map Areal extent _____
 Remarks:
 N/A

9. Slope Instability Slides Location shown on site map No evidence of slope instability
 Areal extent _____
 Remarks:
 N/A

B. Cover Penetrations Applicable N/A

- 1. Gas Vents** Active Passive
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 2. Gas Monitoring Probes**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 3. Monitoring Wells** (within surface area of landfill)
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

All monitoring wells were located off site just past the boundary.

- 4. Leachate Extraction Wells**
 Properly secured/locked Functioning Routinely sampled Good condition
 Evidence of leakage at penetration Needs Maintenance N/A

Remarks:

- 5. Settlement Monuments** Located Routinely surveyed N/A

Remarks:

- C. Gas Collection and Treatment** Applicable N/A

- 1. Gas Treatment Facilities**
 Flaring Thermal destruction Collection for reuse
 Good condition Needs Maintenance

Remarks:

- 2. Gas Collection Wells, Manifolds and Piping**
 Good condition Needs Maintenance

Remarks:

- 3. Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
 Good condition Needs Maintenance N/A

Remarks:

IX. OVERALL OBSERVATIONS

A. IMPLEMENTATION OF THE REMEDY

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

The purpose of the remedy is to treat contaminated groundwater from the regional plume and prevention exposure to and ingestion of contaminated groundwater. WATS is very effective and functioning as designed, however, with the influx of contamination from off-site sources, it is unlikely that WATS will attain its goals.

B. ADEQUACY OF O&M (Including pre-construction communications)

Describe issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long term protectiveness of the remedy.

The implementation and scope of the O&M are adequate. O&M procedures include pump and treat and groundwater monitoring. O&M staff are on site 5 days a week and the system contains electronic instrumentation with computer control that provides automatic shutdown and alarming off site if necessary. No issues were noted.

C. EARLY INDICATORS OF POTENTIAL REMEDY PROBLEMS

Describe issues and observations such as unexpected changes in the cost of scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

There are no issues or early indicators of potential remedy problems.

D. OPPORTUNITIES FOR OPTIMIZATION

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

The Navy, MEW companies, and NASA should continue to coordinate efforts to develop the regional Focused Feasibility Study. In the interim, however, the existing WATS should be optimized to perform more efficiently. Additionally, pilot testing of alternative remedial options should be considered in the WATS area, in coordination with pilot testing by the MEW companies and NASA.