Regional Board Workshop

Stormwater Expert Panel
Progress Report
Santa Susana Field Laboratory
Outfalls 008 and 009

June 5, 2008
Meeting Agenda

• SSFL Stormwater Expert Panel
  – Panel members, scope, & schedule
  – Overview of ENTS & design storm

• Public Outreach Summary

• ENTS conceptual designs

• Site Specific Design Storm Recommendation

• Future Efforts
Expert Panel Members

- Dr. Robert Gearheart, P.E.
- Dr. Richard Horner (prior commitment today)
- Jonathan Jones, P.E.
- Dr. Michael Josselyn
- Dr. Robert Pitt, P.E. (prior commitment today)
- Dr. Michael Stenstrom, P.E.
Expert Panel’s Scope of Work

• For outfalls 008 and 009 review site data and recommend natural Engineered Natural Treatment Systems (ENTS) capable of providing the required treatment to meet the final effluent limits

• Recommend to the Board a site-wide design storm

• Public Involvement
## Expert Panel Work Plan Schedule

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Proposed Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Storm Recommendation</td>
<td>Complete</td>
</tr>
<tr>
<td>ENTS Conceptual Designs</td>
<td>Complete</td>
</tr>
<tr>
<td>ENTS Final Designs</td>
<td>July 15, 2008</td>
</tr>
<tr>
<td>White Papers on Background/ENTS</td>
<td>July 31, 2008</td>
</tr>
<tr>
<td>Effluent Quality and Monitoring</td>
<td></td>
</tr>
<tr>
<td>ENTS Permitting</td>
<td>August 15, 2008</td>
</tr>
<tr>
<td>ENTS Construction Begins</td>
<td>October 31, 2008</td>
</tr>
<tr>
<td>Final Permit Limits Become Effective</td>
<td>June 10, 2009</td>
</tr>
</tbody>
</table>
Meeting Agenda

• SSFL Stormwater Expert Panel
  – Panel members, scope, & schedule
  – Overview of ENTS & design storm
• Public Outreach Summary
• ENTS conceptual designs
• Site Specific Design Storm Recommendation
• Future Efforts
Public Involvement Component

• Public Participation Meetings
• Periodic reports to RWQCB on project status
• Project information posted on the Internet:
• Public Field Trips
## Expert Panel Public Meetings

<table>
<thead>
<tr>
<th>Proposed Scope</th>
<th>Proposed Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel introduction/Overview</td>
<td>Complete, January 22</td>
</tr>
<tr>
<td>Progress on design storm and ENTS selection &amp; conceptual design</td>
<td>Complete, March 17</td>
</tr>
<tr>
<td>Recommended design storm and conceptual ENTS designs</td>
<td>Complete, April 17</td>
</tr>
<tr>
<td>Progress on ENTS implementation</td>
<td>July 17 &amp; Nov. (was September, 2008)</td>
</tr>
<tr>
<td>Initial ENTS Performance Monitoring Results</td>
<td>Summer 2009</td>
</tr>
</tbody>
</table>
Board Presentations

• March 6\(^{th}\) – Brief report on progress

• April 3\(^{rd}\) – Longer update and discussion of ENTS and Design Storm

• June 5\(^{th}\) (today) – ENTS/Design Storm Workshop
Meeting Agenda

• SSFL Stormwater Expert Panel
  – Panel members, scope, & schedule
  – Overview of ENTS & design storm

• Public Outreach Summary

• ENTS conceptual designs

• Site Specific Design Storm Recommendation

• Future Efforts
### Extensive Agency Coordination (Examples)

<table>
<thead>
<tr>
<th>Agency/Group</th>
<th>Action</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARWQCB</td>
<td>Progress reports at Board hearings</td>
<td>Dr Stenstrom spoke at March &amp; April hearings; Panel workshop at June hearing</td>
</tr>
<tr>
<td></td>
<td>Permit reopener to incorporate design storm</td>
<td>Tentatively planned for Sept ‘08</td>
</tr>
<tr>
<td></td>
<td>401 Certification</td>
<td>Pending</td>
</tr>
<tr>
<td></td>
<td>Review of the ENTS soil management plan</td>
<td>Pending submittal</td>
</tr>
<tr>
<td>DTSC</td>
<td>Review of the ENTS soil management plan</td>
<td>Held initial site visit; DTSC staff have also attended public meetings; SMP review pending submittal</td>
</tr>
<tr>
<td>Ventura County</td>
<td>CEQA lead agency; CUP modification &amp; zoning clearance; grading permit; oak tree permits</td>
<td>Held initial meetings to discuss application/submittal process; developing application &amp; CEQA documentation now</td>
</tr>
<tr>
<td>SM Mountains Conservancy</td>
<td>Approval for ENTS projects on Sage Ranch</td>
<td>Held initial meeting to discuss proposed plans; final conceptual design package submitted</td>
</tr>
<tr>
<td>NASA</td>
<td>Approval for ENTS projects on NASA property</td>
<td>Held initial meetings to discuss conceptual ENTS designs; NASA reps participated in Panel calls; submitted final conceptual design package end of May</td>
</tr>
<tr>
<td>CDFG</td>
<td>Approval/SAA for projects in jurisdictional drainages</td>
<td>Held initial meeting &amp; site visit April 10; follow-up call May 28; Approved SAA pending submittal</td>
</tr>
<tr>
<td>ACOE</td>
<td>Jurisdictional Determination</td>
<td>Submitted application package May 27</td>
</tr>
</tbody>
</table>
ENTS “Treatment Train” Concept

- Combine controls in series to treat runoff for multiple constituents and protect downstream controls
- Reduce peak flows to optimize treatment
- Include “polishing” enhancements (media additions, BMP soils amendments, etc.)
- Optimize unit processes and overall system design
  - Redundancy and complementary processes
- Detain and slow runoff from watershed to maximize space-limited treatment at outfall 009
ENTS Treatment Train - Components

1: Site Controls
(reduce runoff volume)

E.g., restore un-used impervious surface to natural state

2: Extended Detention

3: Bio-Filter
Treatment Train Flow Attenuation Example

- Runoff
- Runoff post Site Controls
- Flow Out of Process 1
- Flow Out of Process 2+

Flow Rate vs Time graph showing the attenuation of runoff and flow rates through different processes.
ENTS Treatment Train - Example

- Detention Basin
- Bioretention Filter
ENTS Treatment Train - Example
008 and 009 Watersheds Guiding Principle

• The Panel recommends control and treatment occur throughout the Outfall 008 and 009 watersheds, including off-site areas, such that
  – All feasible areas that can be used for volume reduction and treatment are used to help ensure compliance at the outfall
  – Treat runoff at sub-regional scale and at critical source locations, as large as possible
  – Also include source controls
Phase I - Stormwater Maintenance and Asphalt Removal Projects – Immediate Implementation
Phase II – Larger ENTS – Implementation Following Agency Permits

Area Twice Treated
Draft ENTS
Conceptual Designs

• Conceptual Designs include the following:
  – Treatment system footprint
  – Basic structures and concepts
  – Plan and profile views

• All proposed controls located off Boeing property are subject to landowner approval (pending)

• Later design phases are in progress
G1 - 009 West (NASA Property)

Additional area being planned for ENTS treatment based on rocketdyne.org input.
G2 - 009 West Center
(Partial NASA Property)
G3 – 009 LOX (NASA & Sage Ranch Properties)
G4 – 009 East
(Partial Sage Ranch Property)
G5 – 008 Watershed
Asphalt Removal Detail

Incidental infiltration allowed

No infiltration allowed
Culvert Maintenance Detail
Culvert Maintenance Detail
Sedimentation Basin Detail
Draft LOX Concept

Subject to NASA approval
Public Recommendations to Panel

• ENTS recommendations received from CleanupRocketdyne.org in early April

• Expert Panel appreciates all input and has reviewed these recommendations

• General responses provided at April 17 public meeting:
  – Additional ELV drainage will be routed to helipad ENTS (see G1)
  – (Clarification) Skyline, SPA, Alfa, Bravo RFI areas do not drain to outfall 009, but receive treatment at outfall 018
  – Proposed ENTS locations have been strategically located near or downstream of areas of historic activity or known surface soil contamination as suggested
  – Public recommendations in many cases are consistent with the strategic ENTS locations proposed by the Panel
Preliminary Plan for ENTS Construction at or Near Cleanup Areas

• Some ENTS construction will be done in contaminated areas
• Construction will require:
  – Pre construction sampling to fill data gaps
  – Construction sampling to inform clean/impacted soil segregation & management
  – Removal of contaminated soils below and adjacent to ENTS footprints
  – Installing underdrains or liners to minimize infiltration from ENTS to groundwater plumes
  – Consider possible need for future vapor treatment at/beneath ENTS locations
Existing soil characterization data -- Additional characterization has been proposed by panel to fill data gaps in areas of ENTS construction.
ENTS Construction Overlying Areas of Known Groundwater Contamination
Meeting Agenda

• SSFL Stormwater Expert Panel
  – Panel members, scope, & schedule
  – Overview of ENTS & design storm

• Public Outreach Summary

• ENTS conceptual designs

• Site Specific Design Storm Recommendation

• Future Efforts
What is a Site-Specific Design Storm?

- Storm depth or rain intensity to use for assessing compliance and therefore driving selection and design/sizing of controls:
  - Natural treatment systems for outfalls 008 and 009
  - In-place and enlarged (as needed) engineered treatment systems for other outfalls
The Panel’s Goal is a system of ENTS and other controls and a design storm that:

- Maximize the probability of attaining numeric effluent limits
- Minimize the potential impacts to downstream residents and the environment
- Protect the natural site conditions and is feasible given the site’s constraints
Site Specific Design Storm Preliminary Recommendation

• The Panel recommends that the 1-year return interval storm event be used as the single site-wide design storm:
  – Either a 24-hour storm (2.5 inches) or
  – 0.6 inches per hour
  as measured at an onsite rain gage

• About 95 percent of all storms would be smaller
Drawbacks outweigh benefits for designing treatment systems for all or larger storm events.
If numeric effluent limits are exceeded, Boeing will be subject to enforcement and will propose remedies.

If numeric effluent limits are exceeded, Boeing will assess sources and put in more management measures as required by Regional Board.
Sizing curve for a hypothetical volume-based ENTS at Outfall 008

Recommended Design Storm
Panel Future Efforts

• Review preliminary & final ENTS designs
• Review ENTS operations and maintenance plan
• Review ENTS effectiveness & impact monitoring program:
  – Pollutant removal
  – Maintenance/cleanout triggers
• White paper on background stormwater pollutant concentrations and BMP effluent quality performance (e.g., dioxins)
• White paper on grab vs composite sampling methods
Next public meeting scheduled for July 17 in Simi Valley

For more information contact:
Brandon Steets
805-455-9591
bsteets@geosyntec.com