

SSFL CDO Expert Panel*

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October 6, 2008

To: Cassandra Owens, Los Angeles Regional Water Quality Control Board

Cc: Representatives of elected officials attending July 17 public meeting

Re: CDO Expert Panel Summary of July 17 public meeting

Dear Ms. Owens:

We understand that you and other Regional Board staff were unable to attend the 4th Public meeting of the SSFL Stormwater Expert Panel on July 17, 2008. Now that Regional Board staff are again able to work on this project, we are writing to provide a summary of highlights of the meeting as well as some post-public meeting discussion from the Panel that. Along with a copy in PDF format of the presentation materials, we have included screen shots of two computer animations displayed at the meeting: the first, a Google Earth “Fly-by-Video” of the site, and the second, a computer animation of how a hypothetical treatment train Engineered Natural Treatment System (ENTS) would operate during small and large storms. These materials can all be found in Attachment A.

In the July 17 meeting, we covered the following topics:

- Expert Panel Scope & Schedule
- Existing Conditions
- How ENTS Will Function
- ENTS Soil Management Plan
- ENTS Progress Report
- Clarifications on Comments Raised During June 5 Regional Board Workshop

* The Expert Panel members are acting as private consultants in order to assist the Regional Board and The Boeing Company develop and implement methods to meet the requirements of Cease and Desist Order R4-2007-0056, dated November 1, 2007. Their opinions and directives are not the opinions and directives of their respective employers.

The meeting was attended by roughly 50 people and included representatives from the offices of Senator Sheila Kuehl, Assembly Member Julia Brownley, and Supervisor Linda Parks.

In general, the Panel felt the meeting provided a good forum to present the progress on the ENTS and we appreciated the overall input we received and the opportunity to respond to the public comments more fully than at the Board workshop. We are especially pleased to report that multiple attendees expressed support for the concept of the ENTS as well as the planned ENTS locations and designs.

Impact of the proposed ENTS on infiltration and soil cleanup

The Panel's presentation included a discussion of the recommended size of the design storm and potential implications of a larger design storm on ENTS sizing. For example, we presented data regarding required detention dam sizes and volumes in the 009 subbasin for the 1-, 2-, 5- and 10-year storms. There were no comments from the attendees on the size of the recommended design storm during this part of the discussion.

The public did comment on whether the ENTS would increase infiltration that may cause impacts to the groundwater plumes. The Panel replied that the ENTS will be designed using features such as liners to limit infiltration above groundwater plumes. The Panel was also questioned about migration of pollutants from the ENTS into groundwater. Panel members noted that the ENTS have been designed to capture and hold pollutants in place, either in the media or as captured sediments, and that there will not be significant groundwater recharge from the ENTS as they are being specifically designed to limit recharge.

The Panel presented a brief overview of how contaminated soils would be addressed during construction of the ENTS. The point was made that the ENTS construction will not affect the RCRA clean-up process. The Panel described how the RCRA process will continue regardless of the soil concentration criteria utilized for assessing the fate of excavated or left in place soils (i.e., if later RCRA investigations find that additional clean-up is needed, that would occur regardless of the status or nature of the ENTS). A question was asked about whether radiological testing will be included in the ENTS Soil Management Plan (SMP). The Panel recommended that the SMP include radiological testing, and these changes have been incorporated into the plan.

Attendees asked about soil screening criteria that would be used for assessing whether soils need to be removed from the site. The response was that the plan is to first assess data gaps, then characterize soils within the ENTS using the site import soil screening criteria and characterize soils below the ENTS using risk based screening levels. It was noted that the SMP will be provided soon and that the Plan will be reviewed by DTSC and LARWQCB staff. It was reiterated that regardless of the soil screening criteria used for ENTS, the RCRA process would determine final screening criteria independently of the ENTS project.

A meeting attendee asked about the specific pollutants that the ENTS are being designed to remove. The Panel replied that the targeted pollutants include dioxin and metals (as these have been shown to have a higher potential to exceed permit limits based on historic monitoring data for Outfalls 008 and 009), but will also target other pollutants that are both attached to particulates as well as in dissolved form. The Panel discussed the ENTS filter media that is being considered to maximize pollutant removal. The Panel intends to more specifically identify the pollutants that will be addressed and the unit processes in the ENTS that would address them in future documents and public meetings.

Design Storm and the Panel's Previous Recommendations

There were a number of issues raised regarding the Panel's Design Storm White Paper and Response Letter. These were primarily related to the Panel's recommendation for a design storm and how the design storm would be applied to determine whether numeric limits apply as enforceable limits or benchmarks. There were also comments on the Panel's recommendations regarding specific pollutants where ENTS performance and/or the variability in stormwater runoff may impact the ability of ENTS to consistently achieve the numerical effluent limits.

As a panel, we feel the need to clarify our position regarding providing a recommendation for the design storm and commenting on its applicability to the enforceable limits. Many of these points were made at the meeting. First, the Panel members have significant experience advising federal, state, and local regulators as well as private entities on administrative aspects of stormwater NPDES permits. Panel members also have experience working with dischargers to implement permits that include design storms and associated enforcement/compliance measures. In addition, two of the Panel members served on the California State Water Resources Control Board "Blue Ribbon Panel" on whether numerical effluent limits are technically feasible in municipal, industrial, and construction NPDES permits (see: .

http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/numeric/swpanel_final_report.pdf)

Second, as a matter of clarification we offer the following reasons why the Panel recommended a design storm:

1. The Panel feels it was our responsibility to do so based on what is stated in in the NPDES permit and CDO, and discussions with Regional Board staff. Attachment B provides several relevant excerpts from the NPDES permit and Cease and Desist Order (CDO) where the design storm, ENTS, and Expert Panel are mentioned. Furthermore, Regional Board staff directly requested Boeing to task the Panel with providing a recommendation on the preliminary site-specific design storm.
2. The concept of a "design storm" is fundamental to the design of all storm drainage facilities, whether the facility is a culvert beneath a road, a drainage channel or an ENTS. It is simply not feasible to design structures for any and all precipitation events and circumstances—site-specific factors such as environmental impacts, availability of construction materials, costs,

neighborhood impacts, public risk/safety, available space, regulatory requirements and others combine to determine what the most appropriate design storm (or storms) should be for a given site. Stated another way, on virtually all stormwater planning/design assignments, including both flood control/conveyance facilities as well as water quality facilities that Panel members have worked on over their careers, it was necessary to establish a design storm for sizing facilities. More broadly, civil engineers commonly use “design events” which is a similar concept for structures (buildings, bridges, etc.)

3. Panel members have worked on projects around the United States where it was necessary for stormwater discharges to comply with numeric limits and/or where sensitive receiving water impact issues were involved. In these cases, design storms (or their equivalent) were defined for the stormwater management facilities.
4. There is considerable precedent for design storms, from both a regulatory perspective and relative to agreements between parties. Other regulatory examples with design storms (or similar events) include: other stormwater requirements/efforts in the Los Angeles region (such as the Santa Monica Bay Beaches wet-weather Bacteria TMDL which allows exceedance days based on a 90th percentile wet year, the Standard Urban Stormwater Mitigation Plan [SUSMP], the Board’s Design Storm Task force efforts, etc.), combined sewer overflow discharge permits around the United States, and stormwater discharge permits for certain classes of industry (such as mines, power generation facilities and feedlots). In addition, Panel members have worked on contractual agreements between parties where one property owner proposed to discharge stormwater onto the adjoining property, and numeric limits and a design storm were agreed to by both parties.
5. Conventional industrial and municipal treatment facilities are commonly designed on the basis of calculated acute and chronic low flows (i.e., design flows).
6. The California Toxics Rule (CTR) includes an allowed exceedance frequency for many heavy metals for both acute and chronic criteria

In summary, it is standard practice of Panel members to work with the design storm concept in our day-to-day business.

Why Did We Provide a Potential Regulatory Interpretation of the Design Storm?

Some individuals have expressed concern that the Panel overstepped its charge by providing a regulatory interpretation of the design storm. We assure you, other staff and members of the Board that we fully recognize that the Panel has no regulatory authority and that such authority rests with Board. However, we respectfully made a

recommendation for how to administer the design storm in the context of a permit containing numeric discharge limits for the following reasons:

1. Panel members frequently confer with federal, state and local regulators and private entities on the significance and implications of design storms.
2. Panel members have worked on projects where, once the design storm was exceeded, the expectation was that the numeric limits would not need to be met, provided that all treatment facilities were in good working condition at the time of the storm and that the runoff event demonstrably (with actual data) exceeded the design basis for the facilities.
3. Cases exist where conventional municipal and industrial treatment plants have permits that are based on a minimum flow rate in the receiving stream. When conditions are such that the actual flow is less than the calculated chronic or acute flows specified in the NPDES permit, enforcement action is generally not taken because regulatory staff recognize that the basis of the facility design was not satisfied.
4. Finally the Panel is aware that EPA has issued policy on this matter. The EPA's position is that, although wet weather conditions may not be used as an excuse for allowing a permit exceedance in cases where feasible alternatives could have prevented the problem, there will be circumstances where there is no feasible alternative, and permit exceedances should be allowed. In such cases, EPA encourages permitting authorities to include "enforcement discretion language" in their regulations (see Federal Register: December 22, 2005, Volume 70, No. 245, Draft Memorandum to EPA Regional Administrators from Benjamin H. Grumbles, USEPA Assistant Administrator Office of Water). Another example is EPA's acceptance of the California Toxics Rule (CTR) which includes allowed exceedances of acute and chronic criteria for many of the heavy metals.

Given this experience, as well as knowledge regarding stormwater quality variability and stormwater treatment control performance, the Panel believes it is qualified to provide input to the LARWQCB regarding the significance and implications of a design storm relative to permit implementation and to identify particular pollutants where numeric limits may not be consistently achievable.

It is the Panel's understanding that for an NPDES permit to be enforceable, the requirements of the permit must be technically achievable. In the Panel's Design Storm White Paper and in presentations to the public and to the Regional Board, we have stated that we do not believe that some of the numerical limits in the NPDES permit are consistently achievable, even in some cases for storms below the design storm size. The CDO required the Expert Panel to develop a design storm and to design an ENTS program in the 008 and 009 watersheds that will meet the Permit Limits and to develop a design storm. Therefore, while recognizing that the Regional Board has the regulatory authority regarding discharge from Outfalls 008 and 009, the Panel respectfully suggests

that we have a professional responsibility to identify the potential permit achievability issues and make technical suggestions on how to address them.

We do not want to provide incomplete recommendations that support a permit that could potentially be overturned due to unachievable conditions. Again, we assure you, other staff and members of the Board that we fully recognize that we have no regulatory authority and that such authority rests with Board.

Following the July 17 meeting, and based upon further reflection, the Panel has decided to clarify our Design Storm White Paper recommendations regarding the use of benchmarks for storm events smaller than the design storm by revising specific White Paper sections as follows:

Section 7. Last paragraph:

The Panel has identified that uncertainty exists regarding whether the permit limits for particular pollutants (including dioxin, mercury, lead, zinc, cadmium, iron, and copper) can be consistently achieved, even for storms less than the design storm. Until reliable performance monitoring data for the ENTS confirms their performance over a reasonable time period or number and types of storm events, this uncertainty will remain. The Panel has reviewed many summaries of BMP/ENTS effluent quality and background data to reach this conclusion. In addition, the Panel is developing a more detailed white paper specifically concerning the effluent quality that can potentially be achieved with the ENTS and other BMPs in the 008 and 009 watersheds, including information on “background” levels:

Section 8.

Exceedance Frequency. If the current enforceable numeric effluent limits remain in place for storms equal to or smaller than the design storm, the Panel is concerned that there will not be recognition of the variability of the effluent quality from ENTS and other BMPs included in the permit. Potential options for the Board to consider include allowable exceedance frequency, or comparison of discharge quality with one or more reference watersheds, or some other comparable mechanism in the NPDES permit.

ENTS Functions During Storms Exceeding the Design Storm

The Panel described at the meeting how the ENTS would function during storms both smaller and larger than the design storm and noted the amount of runoff that would be fully treated (100% of the runoff from a 1-year storm event and greater than 90% of the annual runoff at most ENTS locations) and that the remaining small fraction that would be still partially treated.

In the Design Storm White Paper, the Panel provided some suggested language on what could occur when storms exceed the recommended design storm, as follows:

“If the total precipitation depth from the on-site precipitation gauge is equal to or greater than 2.5 inches for the first 24-hours of the storm for which a NPDES compliance flow-weighted composite sample is required to be collected or if the precipitation total for any hour of that storm prior to the end of the composite sample period is greater than 0.6 inches, then the permit effluent limit values for those parameters which can be collected as flow-weighted composites will function as benchmarks (i.e., triggering BMP evaluation and upgrade, as necessary) rather than enforceable numeric limits (where exceedances would be subject to a notice of violation and enforcement penalty).”

Composite versus Grab Samples

Comments were made at the meeting questioning the Panel’s recommendations regarding flow-weighted composite sampling versus the current permit grab sampling requirements. The attendees questioned whether flow-weighted samples would result in “averaging” pollutant concentrations compared with the single manual grab samples that they believe would capture “maximum” concentrations if collected at the beginning of the event. The Panel cited a number of examples of scientific literature that concentrations are not necessarily highest at the start of the event (Pitt, International Stormwater Database, Stenstrom and colleagues), especially for large open space watersheds and in cases where BMPs with relatively large retention volume are constructed (the large volume will blend much of the runoff flows). The Panel also pointed out that we know of no NPDES permits for stormwater that require “pollutograph” sampling (e.g., multiple samples throughout an event with the largest single intra-event sample being utilized for compliance purposes), nor do we know of a way to reliably guess when to collect a sample of the highest concentration during an event. Finally, it was discussed that flow-weighted composite monitoring is significantly more representative of the pollutant concentrations and loadings leaving a site than grab sampling. The Panel noted that NRDC had pushed Caltrans (via litigation settlement discussions) to employ flow-weighted composite sampling in runoff and BMP monitoring. A sampling white paper is currently being developed by the Panel for submittal to Board staff .

The attendees asked about why some pollutants cannot be sampled with automated samplers. The Panel stated that pollutants such as oil and grease, bacteria, and VOCs are not appropriate for composite sampling for various reasons, including specific requirements for lab holding time and sample collection methodology. The Panel also stated that standard sampling programs can include collection of both flow-weighted composites and grab samples where the appropriate parameters are analyzed from each type of appropriate sample collection methodology.

Value of the Public Meetings

The Expert Panel has received considerable information during the course of four evening public meetings held to date (all of which involved extensive question-and-answer interaction), a site field inspection that included detailed examination of the 008 and 009 drainage areas, two presentations by Dr. Michael Stenstrom to the Los Angeles Region Water Quality Control Board and one workshop with the Board in which most of

the members of the Expert Panel participated. In addition, members of the Panel have received emails from various individuals representing particular interest groups or themselves. Members of the public have provided various documents to us that have proven to be quite useful. Valuable historical information regarding the site has been provided to the Panel. We have appreciated and will continue to appreciate all input of this kind—this is a point that we have emphasized at all public forums. We expect to hold additional meetings and we hope that Board and DTSC staff as well as representatives from elected officials will continue to attend.

Summary

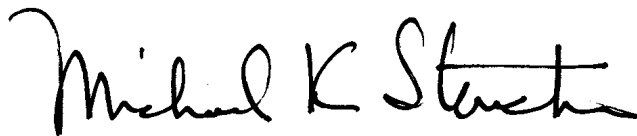
We regret that this letter has become so lengthy, and offer the following summary of this meeting:

1. Multiple attendees of the July 17, 2008 public meeting expressed support for the proposed ENTS.
2. One particularly vocal and outspoken activist expressed the opinion that the Panel was acting outside of its charge by recommending benchmarks for storms above the Design Storm, and by suggesting to the Board that some limits were unachievable. We have provided the basis for our making recommendations at the meeting and in this letter, and we do not intend to present this issue at future public meetings. We will be pleased to respond to questions from Board staff or from Board members, but believe that further debate on this topic at public meetings is unproductive.
3. The Panel presented information demonstrating that:
 - a. It is not practical or desirable to increase the sizes of the ENTS facilities beyond their existing designs, which are maximized based on site constraints but will capture, at a minimum, 100% of the runoff from the 1-year design storm event and below.
 - b. When located above contaminated soils or groundwater, the ENTS will be designed to restrict infiltration.
 - c. The ENTS have been designed to capture and hold pollutants in place, either in the filter media or as captured sediments (which will be removed through regular maintenance practices as needed). There will not be significant groundwater recharge from the ENTS.
 - d. The ENTS construction is independent of the RCRA clean-up process. The RCRA process will continue at the ENTS that are located within RFI areas regardless of the soil screening criteria utilized during ENTS construction for characterizing stockpiled soil as clean (for reuse) or contaminated (for off-site disposal). As a beneficial byproduct of the

ENTS project, cleanup (removal) of contaminated soils in some areas would be accelerated.

- e. The Soil Management Plan (SMP) for ENTS construction will include radiological monitoring.
- f. Flow-weighted composite monitoring that the Panel has recommended is significantly more representative of the pollutant concentrations and loads than grab sampling. Furthermore, given the characteristics of the SSFL outfall watersheds, it is not justified to expect grab samples collected at the beginning of the storm (as currently practiced) to consistently reflect maximum event concentrations (i.e., the “first flush” pollutant pattern is unlikely to exist at the SSFL’s large, primarily open space watersheds).
- g. The ENTS have been designed to specifically target dioxin and metals (as these are the pollutants that have most frequently exceed permit limits), but will also address other pollutants that are both attached to particulates as well as in dissolved form.

The Panel looks forward to working with you and other Board staff and members and continuing our dialog with the public and public officials.

A handwritten signature in black ink that reads "Michael K Stuechli". The signature is written in a cursive style with a large initial 'M' and a long horizontal stroke at the end.

**Attachment A:
Presentation Materials**

Public Information Meeting
(Public Meeting #4)

SSFL Stormwater Expert Panel
Progress Report
Outfalls 008 and 009

July 17, 2008

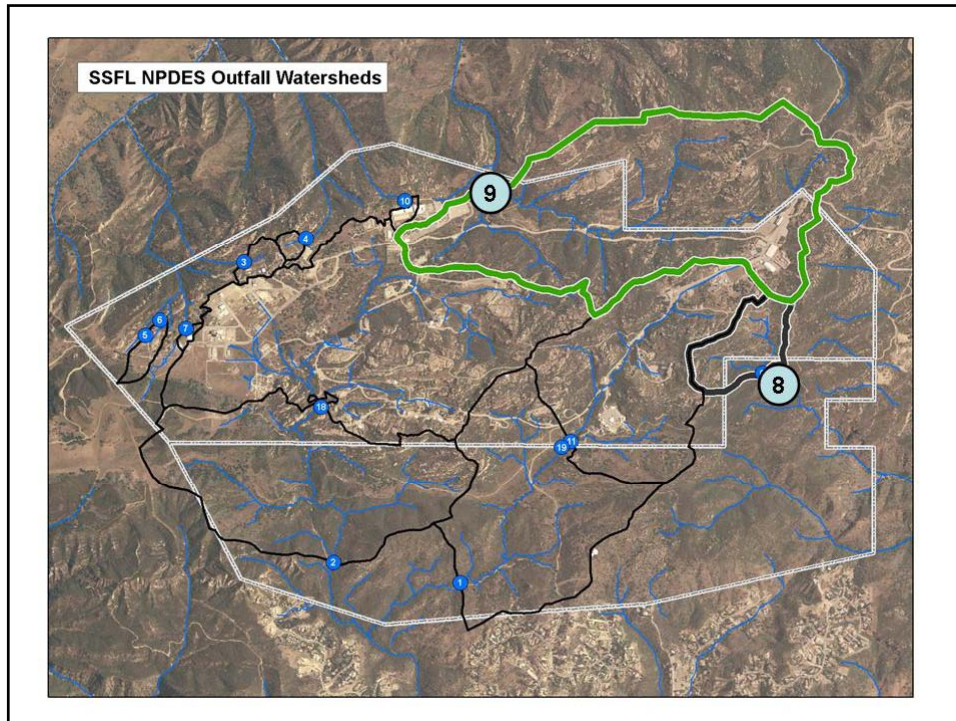
Agenda

- Expert Panel Scope & Schedule
- Existing Conditions
- How ENTS Will Function
- ENTS Soil Management Plan
- ENTS Progress Report
- Clarifications on Comments Raised During June 5 Regional Board Workshop

Expert Panel Scope & Schedule

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 Schedule

Tasks	Proposed Date
Design Storm Recommendation	Complete
ENTS Conceptual Designs	Complete
ENTS Final Designs	October 2008
White Papers: 1) Sampling Methods, 2) Background Concentrations	1) July 31, 2008 2) Sept 15, 2008
ENTS Permitting	May 2008 – Feb 2009
Start of ENTS Construction	Phase I – Aug 2008; Phase II – Feb 2009
Final Permit Limits Become Effective	June 10, 2009

Clarification on Purpose of ENTS

The ENTS that have been recommended for watersheds 008 and 009 are intended to provide long-term water quality protection to meet NPDES permit requirements while RCRA cleanup is ongoing.

The ENTS are not intended to facilitate, circumvent, or be a part of the RCRA cleanup process.

The cleanup process is continuing under DTSC oversight and according to the sitewide cleanup schedule.

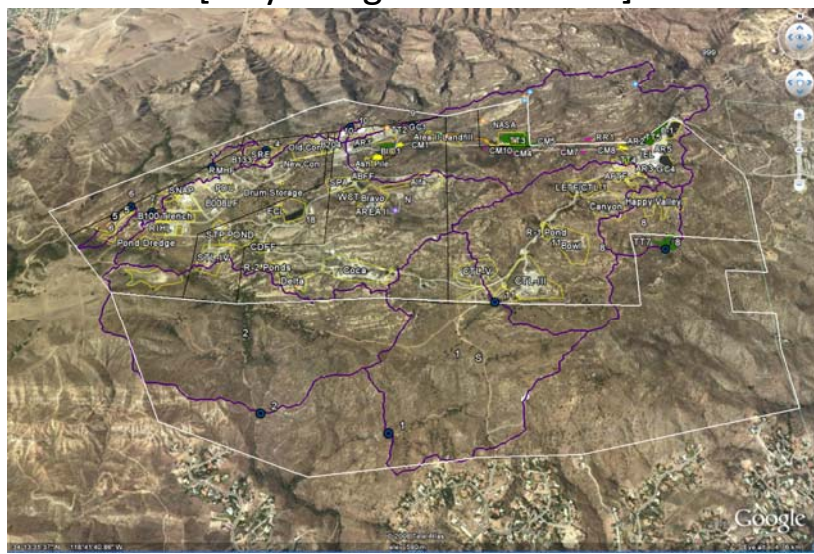
Existing Conditions –
Virtual Tour & Site Photos

Virtual Tour of Watersheds

- Google Earth-based 3D video to provide flying tour through watersheds
- Purpose:
 - Clarify where key RFI areas are relative to our watersheds of interest
 - Discuss ENTS opportunities (e.g., existing disturbed area at LOX) and constraints (e.g., steep slopes at Outfall 9) within watersheds 8 and 9
 - Describe how runoff – particularly from RFI areas – will proceed through ENTS in series

Virtual Tour of Watersheds

[Play Google Earth video]



Photos of Existing Conditions

- Photo tour of drainages to illustrate existing conditions
- Key points:
 - Significant sediment transport occurring through drainages during storms (and suspended sediments carry majority of load for NPDES pollutants)
 - Significant areas of erosion exist near the drainages, providing continuous source of sediment during storms
 - Challenging terrain for ENTS construction and maintenance
 - High quality riparian habitat in some cases, which limits areas for constructing instream facilities

LOX Area



LOX Area (cont'd)



LOX Area (cont'd)



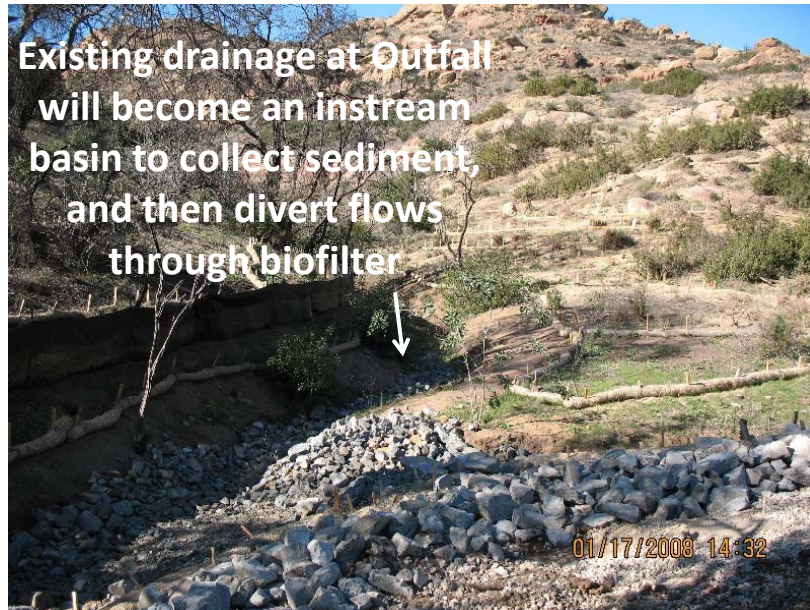
LOX Area (cont'd)



LOX Area (cont'd)



Outfall 008



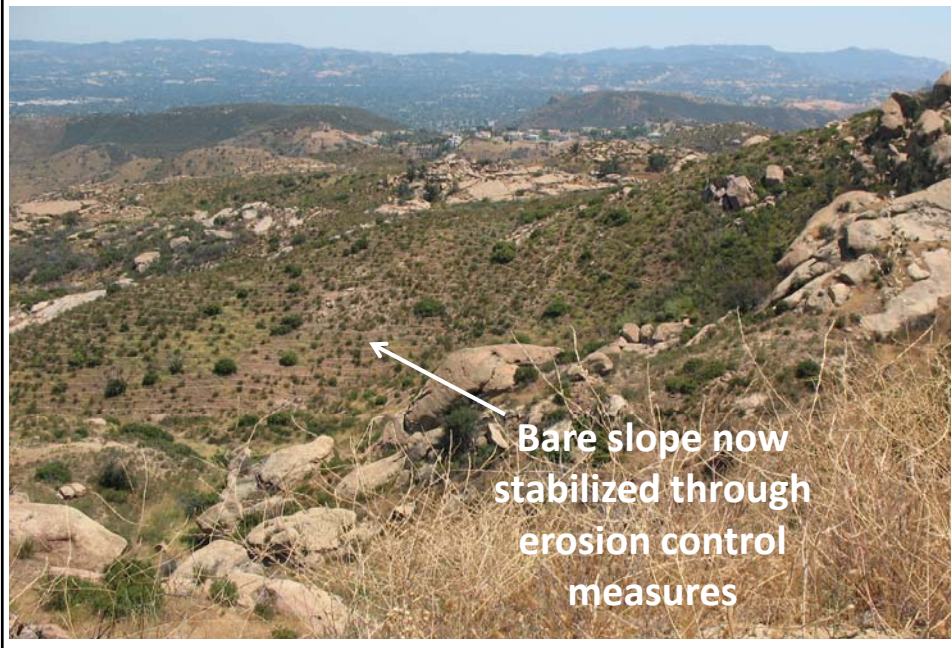
Outfall 008 (cont'd)



Outfall 008 (cont'd)



Outfall 008 (cont'd)



Area II



Area II (cont'd)



Sage Ranch



How ENTS Will Function

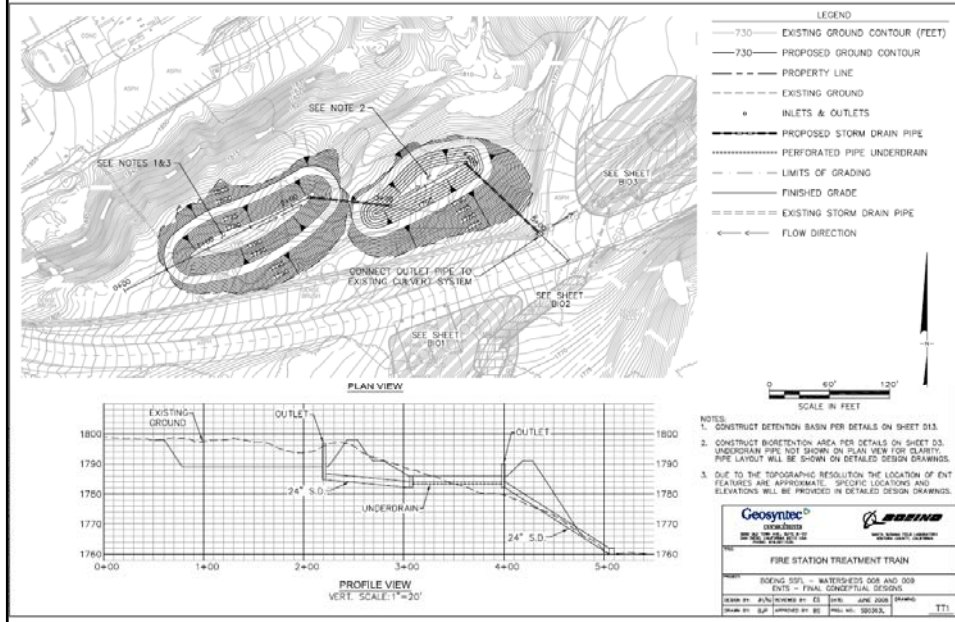
How ENTS Will Function During Storms

- Following simple animation is provided to demonstrate how the ENTS will function during both small and large rain events
- Key things to note:
 - Up to design flow/volume, storm flows are fully treated
 - Above design flow/volume, storm flows are partially treated (i.e., less residence time in sediment basins)

Area II Treatment Train Example - Aerial



Area II Treatment Train Example - Design



Area II Treatment Train Example - Animation



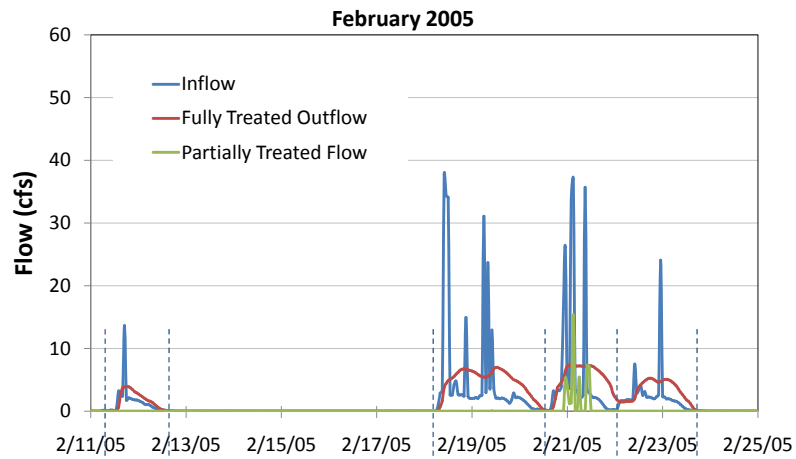
How ENTS Will Function During Storms

Play ENTS animation video

How ENTS Will Function During Storms

- Up to design flow/volume, storm flows are fully treated
- Above design flow/volume, storm flows are partially treated (i.e., less residence time in sediment basins)

Continuous simulation flow results for TT7 (Outfall 008) – Example shown for extremely wet period



Percent Fully Treated	100%	98%	80%	100%
Percent Partially Treated	0%	2%	20%	0%

QUESTIONS?

Addressing Contamination
at ENTS Locations

Boeing's Soil Management Plan

- A Soil Management Plan (SMP) is being completed to address how contamination will be dealt with during ENTS construction
- Ventura County is the lead agency for the project; the County will look to the LARWQCB and DTSC to review the SMP

Boeing's Soil Management Plan

- The approach for managing soils is consistent with all laws and regulations regarding the excavation, handling, and disposal of contaminated soils, with health and safety requirements for the construction personnel and community, and in a manner that is consistent with the anticipated final remedy for Boeing's SSFL facility.
- All soils within planned construction areas following construction will undergo Corrective Action evaluation as part of the RFI reporting process, and be subject to site closure requirements or assessments.

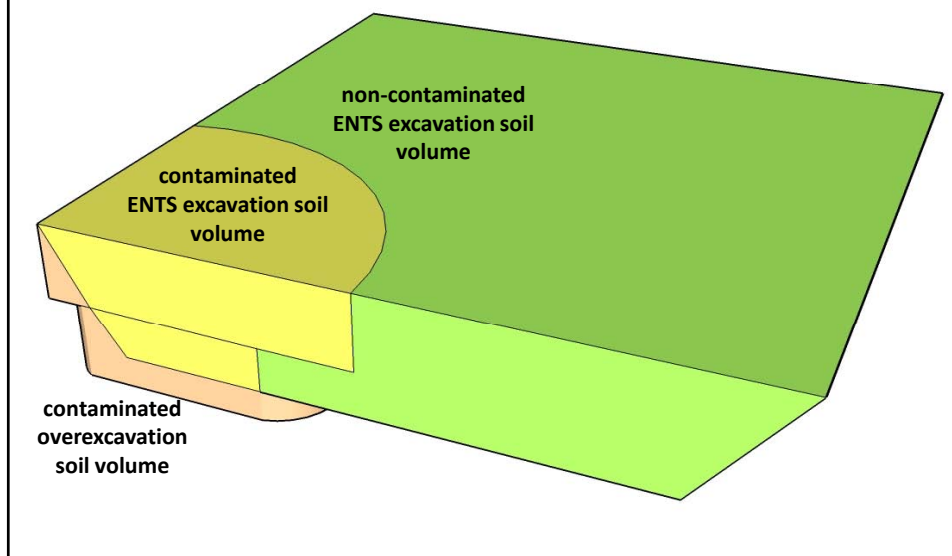
Boeing's Soil Management Plan

- Bottom line:
 - Agency-approved RCRA cleanup will continue to proceed at ENTS and other areas regardless of ENTS project (i.e., ENTS construction does not circumvent DTSC's approval process)
 - ENTS construction will accelerate the removal of significant volumes of contaminated soils well before RCRA cleanup is complete by 2017

ENTS Construction at or Near Cleanup Areas

- Pre-construction soil characterization sampling to fill data gaps
- Additional soil sampling during construction
- Removal of contaminated soils within and below ENTS footprints as necessary
- Proper disposal of contaminated soils off-site
- Restricting infiltration from ENTS to groundwater plumes (through use of a low permeability liner)
- Designs may not interfere with future vapor treatment plans at each ENTS area

ENTS Excavation Concept



QUESTIONS?

ENTS Progress Report

ENTS Planning/Permitting Schedule

ENTS Project Milestone	Status
Final site-wide design storm recommendation	Submitted to LARWQCB
Conceptual Design Package	Complete
Biological & cultural resources surveys	Complete
Construction plan	Draft under review
Geotechnical, hydrology, and water quality impacts reports	Drafts under review
Traffic, air quality, noise, biological, and cultural resources impacts reports	Drafts due late July
Ventura County CUP application, including CEQA documentation	To be submitted in August

ENTS Planning/Permitting Schedule

ENTS Project Milestone	Status
Culvert modification construction	Beginning in Aug/Sept (don't need to wait for grading permit like rest of ENTS)
Soil Management Plan	Draft under review; Final July 18 then submitted for LARWQCB/DTSC review
Alternatives analysis white paper	Submitted for NASA review
Sage Ranch approval	Draft conceptual design package submitted to SMMC; future discussion planned for August

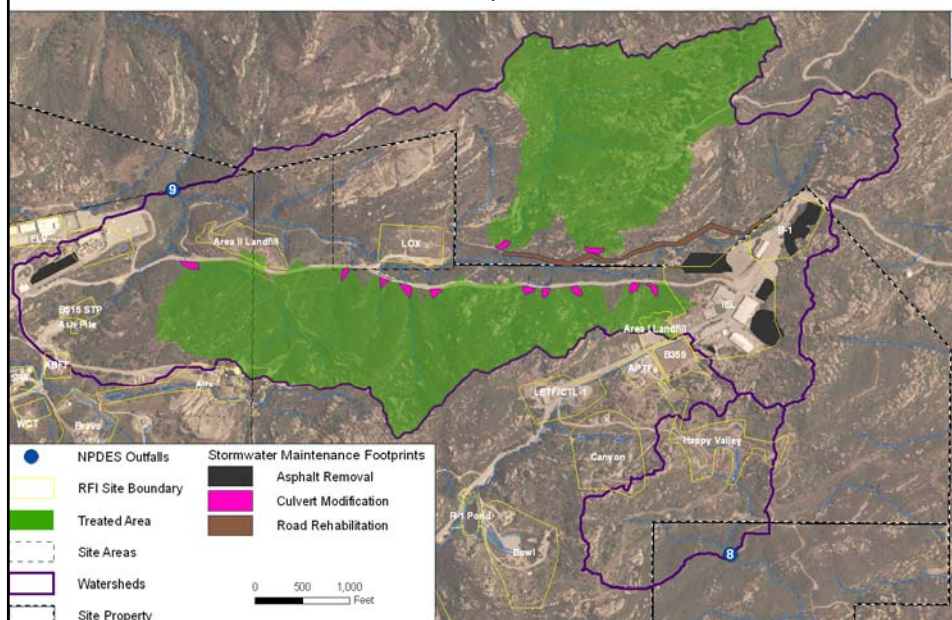
ENTS Planning/Permitting Schedule

ENTS Project Milestone	Status
CDFG Streambed Alteration Agreement	Application to be submitted in late July
ACOE Nationwide 404 Permit	Application to be submitted in late July
RWQCB 401 Cert.	Application to be submitted in late July

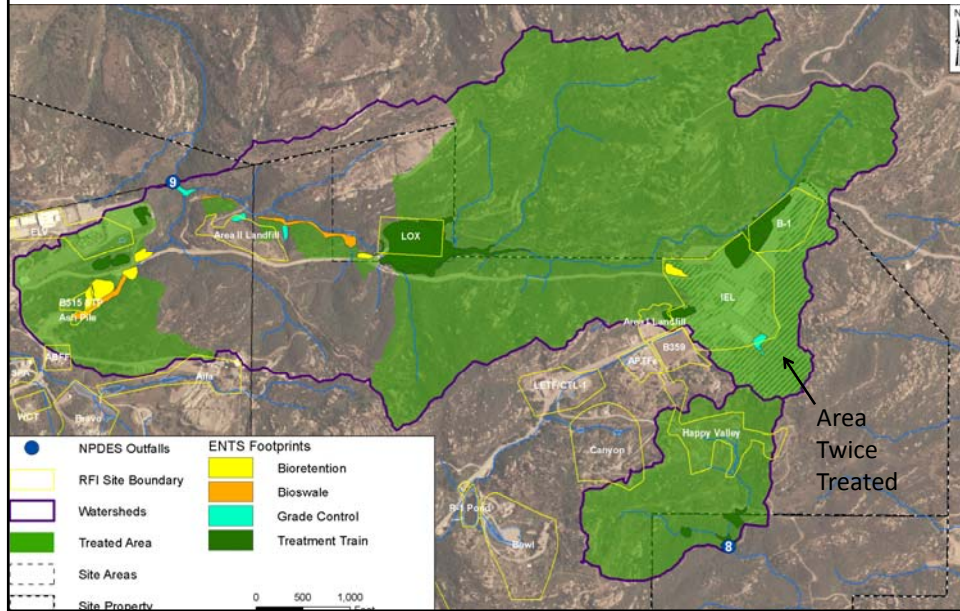
ENTS Construction Schedule

- Begin construction on Phase I ENTS prior to 2008/09 rain season
- Begin construction on Phase II ENTS in early 2009 after County and agency approvals

Phase I - Stormwater Maintenance and Asphalt Removal Projects – Immediate Implementation



Phase II – Larger ENTs – Implementation Following Agency Permits



Treatment Train Sedimentation Basins

Proposed Dominant species:



- Other species include mostly wetland and upland grasses

Species, common name	Container Size	Spacing (Feet On Center)
<i>Anemopsis californica</i> , yerba mansa	1 gallon	3 ft
<i>Carex praegracilis</i> , slender sedge	1 gallon	2 ft
<i>Encelia californica</i> , California encelia	1 gallon	3 ft
<i>Juncus patens</i> , rush	1 gallon, seed	2 ft 5 lbs/acre
<i>Leymus triticoides</i> , creeping wildrye	4" rose pot & seed	1.5 ft 8 lbs/acre
<i>Lotus scoparius</i> , deerweed	1 gallon & seed	2 ft 4 lbs/acre
<i>Bromus carinatus</i> , California brome	seed	6 lbs/ acre
<i>Deschampsia cespitosa</i> , tufted hairgrass	seed	2 lbs/acre
<i>Elymus trachycaulus</i> , slender wheatgrass	seed	4 lbs/ acre
<i>Vulpia microstachys</i> , small fescue	seed	8 lbs/ acre

Bioretention Basins

- May require media replacement after a number of years
- Slightly wetter than Media Filter & Sedimentation basins (Drains within 36-48 hours)
- Must be graded flat to spread storm water evenly over media filter surface



Bioretention Basins

- Proposed Dominant species



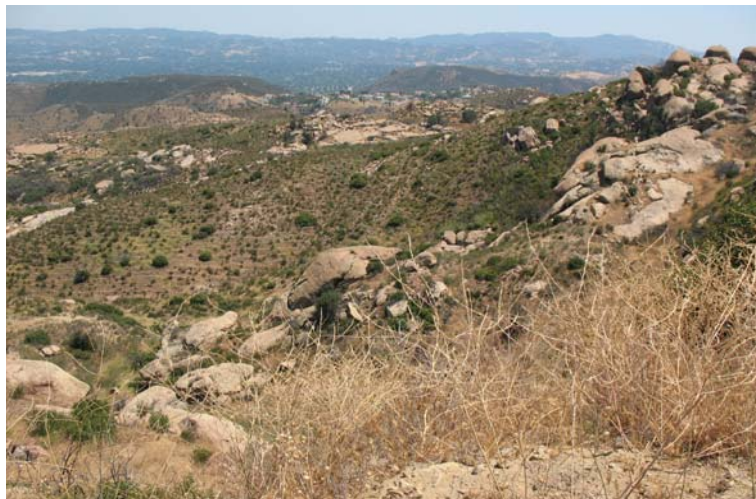
Riparian Areas

- Sediment basins can be graded to include islands and berms appropriate for riparian vegetation.
- Potential to grade benches adjacent to some basins.
- Include willows and live oak with mulefat and coyote brush



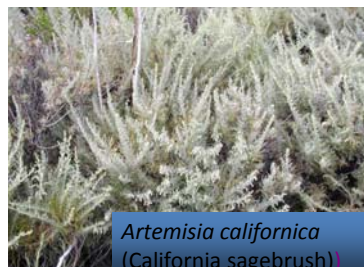
Upland ENTs

- Watershed 8:



Upland ENTs

- Selected species from seed mix



Clarifications to Comments Made at
June 5 Regional Board Hearing

June 10 Panel Letter to Board

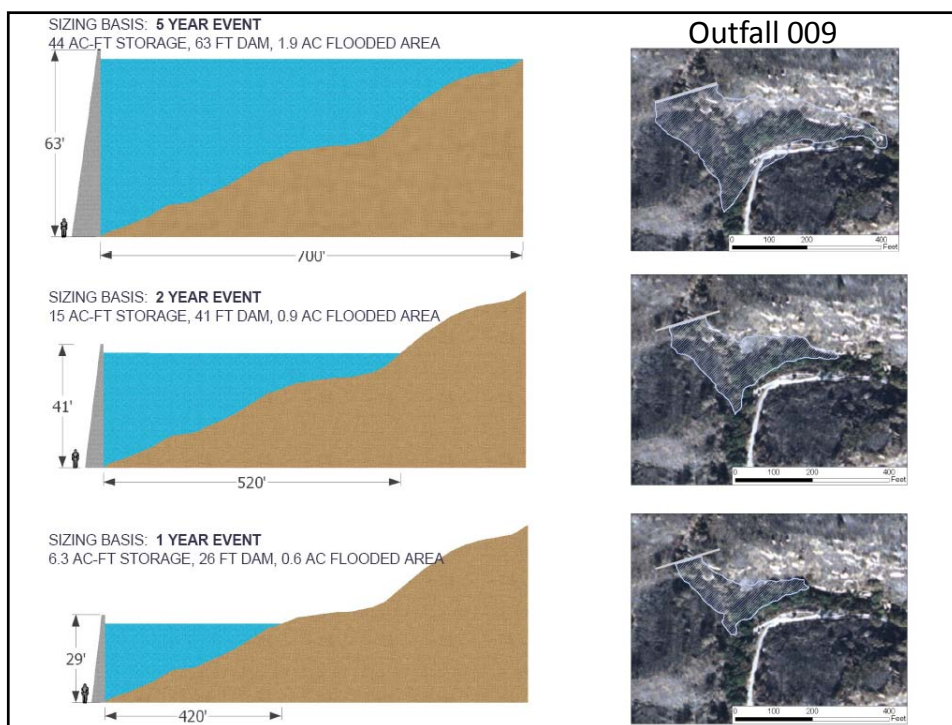
- **The Panel has not, is not, and will not recommend abandoning numeric limits**
- ENTS were located and sized to the maximum extent possible, while considering impacts to sensitive vegetation and valuable habitat, rather than to just the recommended design storm (which is just a regulatory mechanism)

Hydrologic Effectiveness of the Proposed ENTS: Volume Capture Summary

ENTS ID	ENTS Type	Location	Design Storm Percent Capture	Long-Term Percent Capture
TT1	Treatment Train	Fire Station	100	92.2
TT2	Treatment Train	Helipad	100	90.9
TT3	Treatment Train	LOX	100	87.4
TT4	Treatment Train	Area 1 landfill	100	96.0
TT5	Treatment Train	Lower Parking Lot	100	89.7
TT6	Treatment Train	Sage Ranch Trail Head	100	96.7
TT7 (008)	Treatment Train	Outfall 008	100	90.2
BIO1	Bioretention	Ashpile	100	98.9
BIO2	Bioswale	Ashpile	100	99.8
BIO3	Bioretention	Roadway ENT	100	99.5
BIO4	Bioswale	Area 2 Landfill	100	96.0
BIO5	Bioswale	Area 2 Landfill	100	92.2
BIO6	Bioretention	Roadway ENT	100	94.0
BIO7	Bioretention	Roadway ENT	100	94.1

June 10 Panel Letter to Board (cont'd)

- Storms greater than the design storm will still be partially treated
- Storms above design storm will still use numeric limits; exceedances will instead trigger investigation and BMP improvements
- Increasing the design storm size has only marginal benefits to water quality but significant impacts to the environment (e.g., heritage oaks, threatened & endangered species, riparian habitat, dam construction and safety, etc.)



June 10 Panel Letter to Board (cont'd)

- Larger design storm may require dams which would trigger EIR and permitting process would extend implementation significantly beyond CDO deadline of June '09
- Regarding issue of “allowable exceedances” for dioxin and some metals – concept of allowable permit limit exceedances has been applied in many other stormwater permits in the region and nation
 - e.g., Santa Monica Bay beaches have allowable wet weather exceedance days for bacteria
 - CSO permits nationwide

June 10 Panel Letter to Board (cont'd)

- Panel did not recommend removal of dioxin limits, however we have stated that even with perfectly designed ENTS, permit limits will not be met 100% of the time
 - These limits are extremely low (barely above lab detection capability) and stormwater quality is highly variable by nature
- Panel has recommended ENTS that are specifically designed to reduce dioxin concentrations in runoff, and they will perform and function similar to the existing flow-through filtration systems, but at a larger and more distributed scale

June 10 Panel Letter to Board (cont'd)

- Some ENTS are located at or near contaminated areas
 - These locations were selected because they are optimal for treating runoff from these and upstream areas
 - Many siting constraints exist at the SSFL limiting the areas possible for ENTS construction (it is a fact that most of the sites with lower grades suitable for ENTS were impacted)
 - Siting ENTS at contaminated areas will result in accelerated removal of contaminated soils

June 10 Panel Letter to Board (cont'd)

- Automated composite sampling was recommended over the current manual grab approach to more accurately characterize pollutant loads being discharged
 - Grab samples may still be collected to try to catch early storm instantaneous concentrations
 - Current sampling results in most grabs being taken after majority of flow has passed (morning after). Composite sampling would reduce this problem.

June 10 Panel Letter to Board (cont'd)

The proposed ENTS plan is:

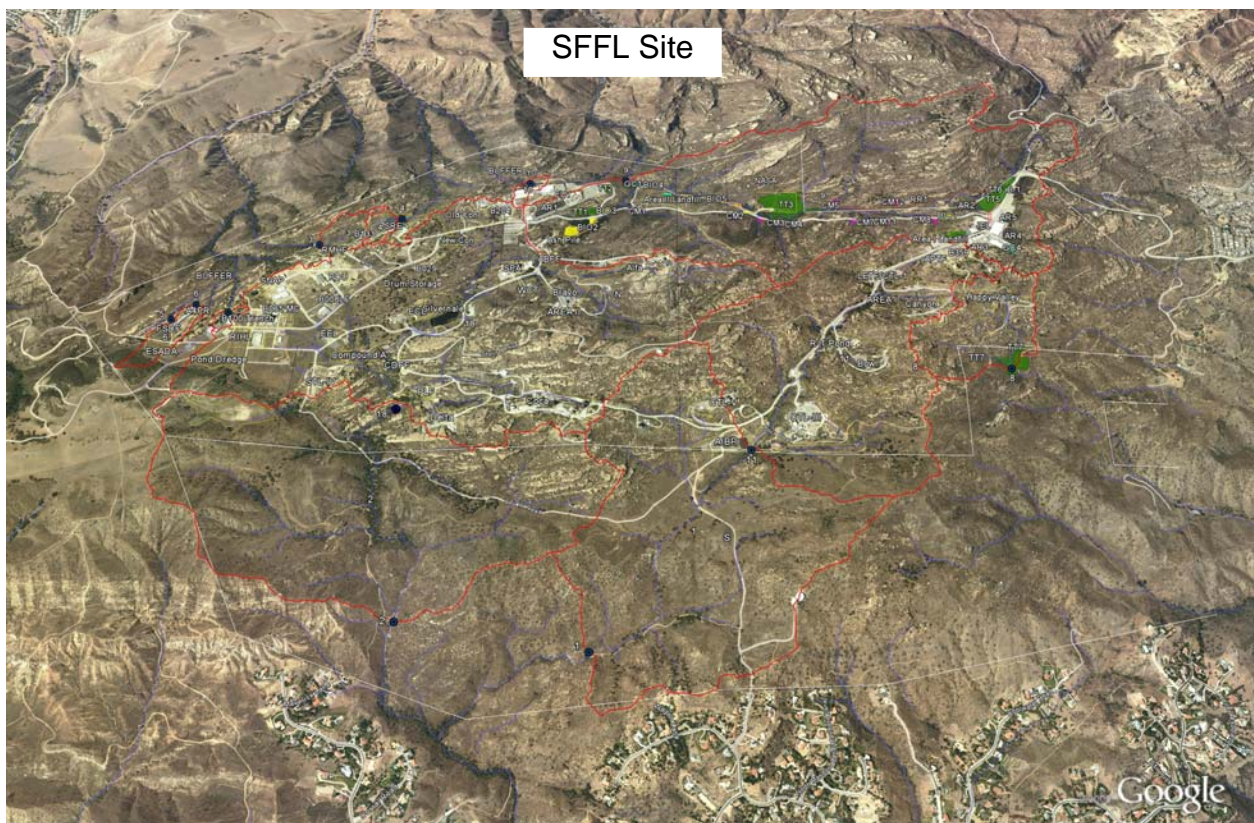
- extremely ambitious,
- has been maximized without consideration of cost,
- was developed based on maximizing pollutant reduction while limiting environmental impact, and
- will include substantial long-term monitoring

QUESTIONS?

THE END

Next Public Information Meeting - Fall/Winter

Google Earth ENTS Watershed Tour



Northern
Outfalls 3-10



18 Watershed



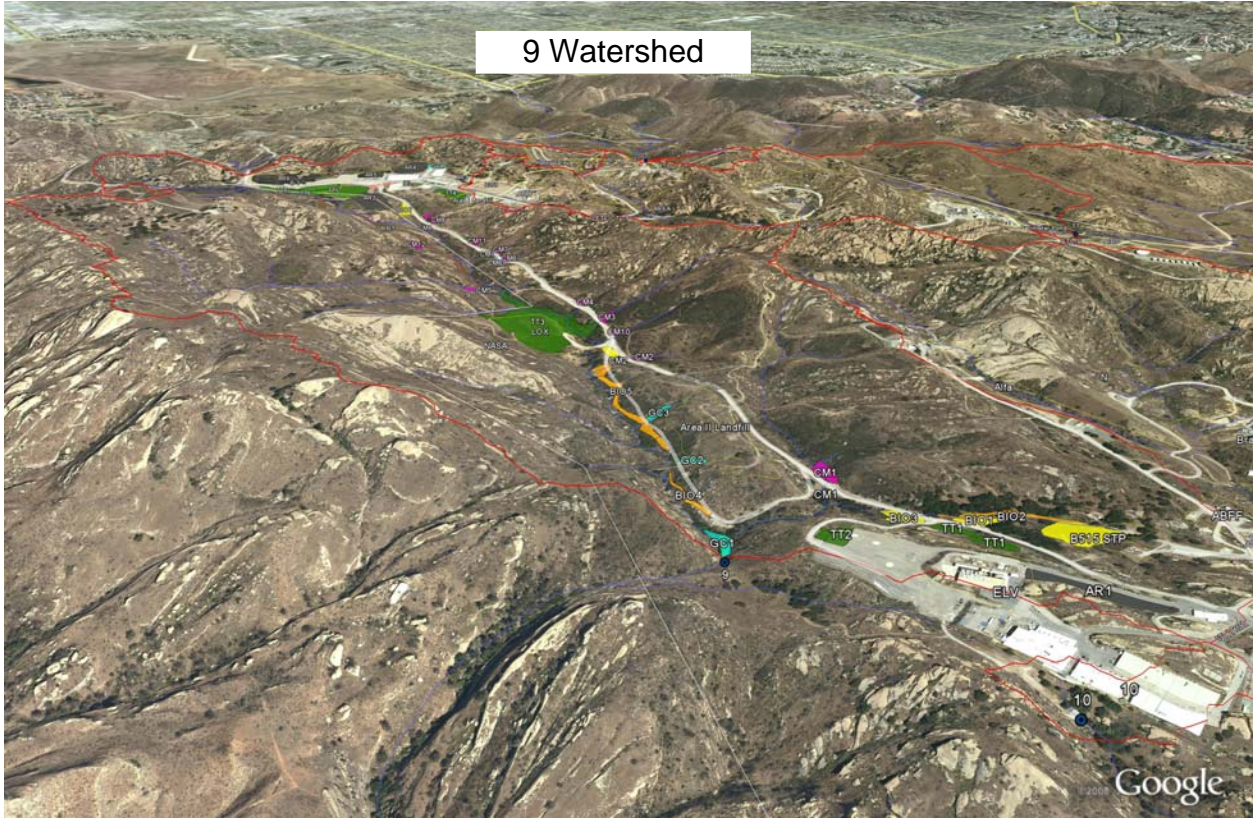
11 watershed



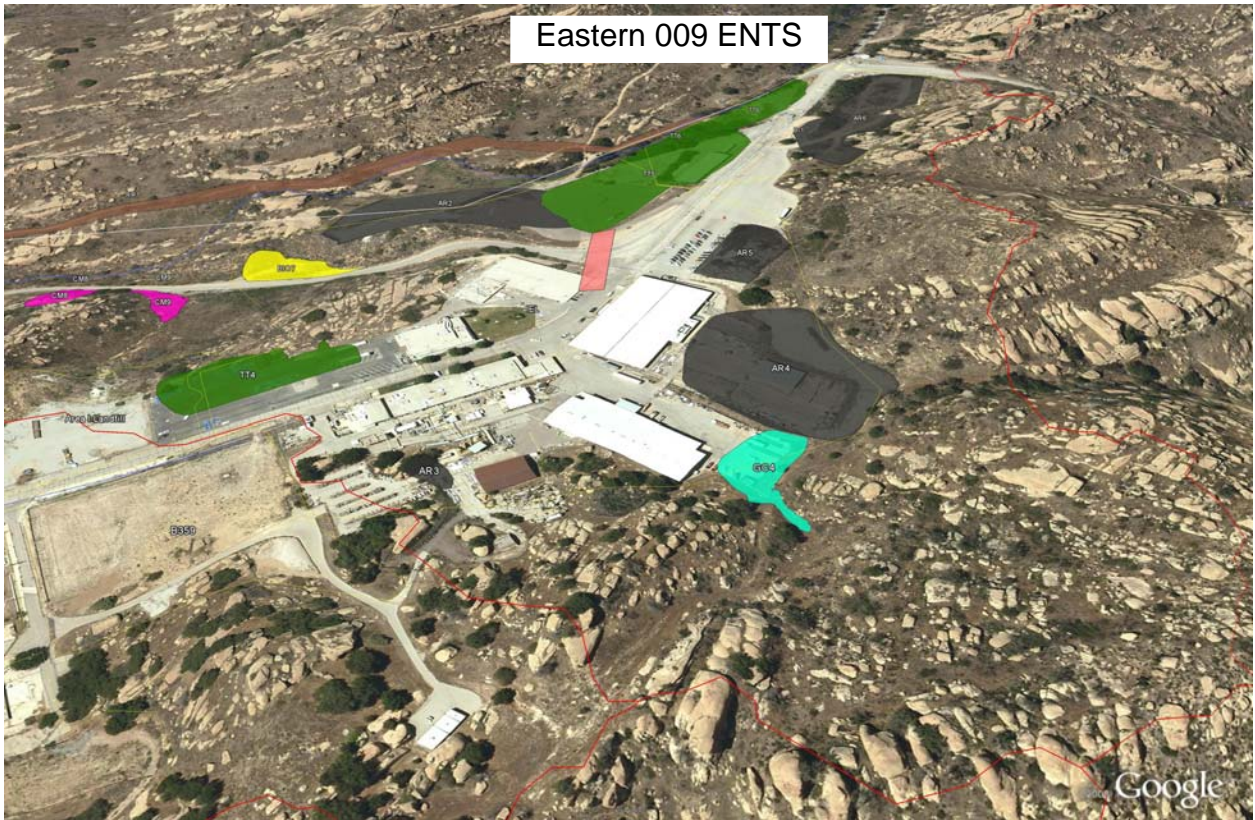
8 Watershed



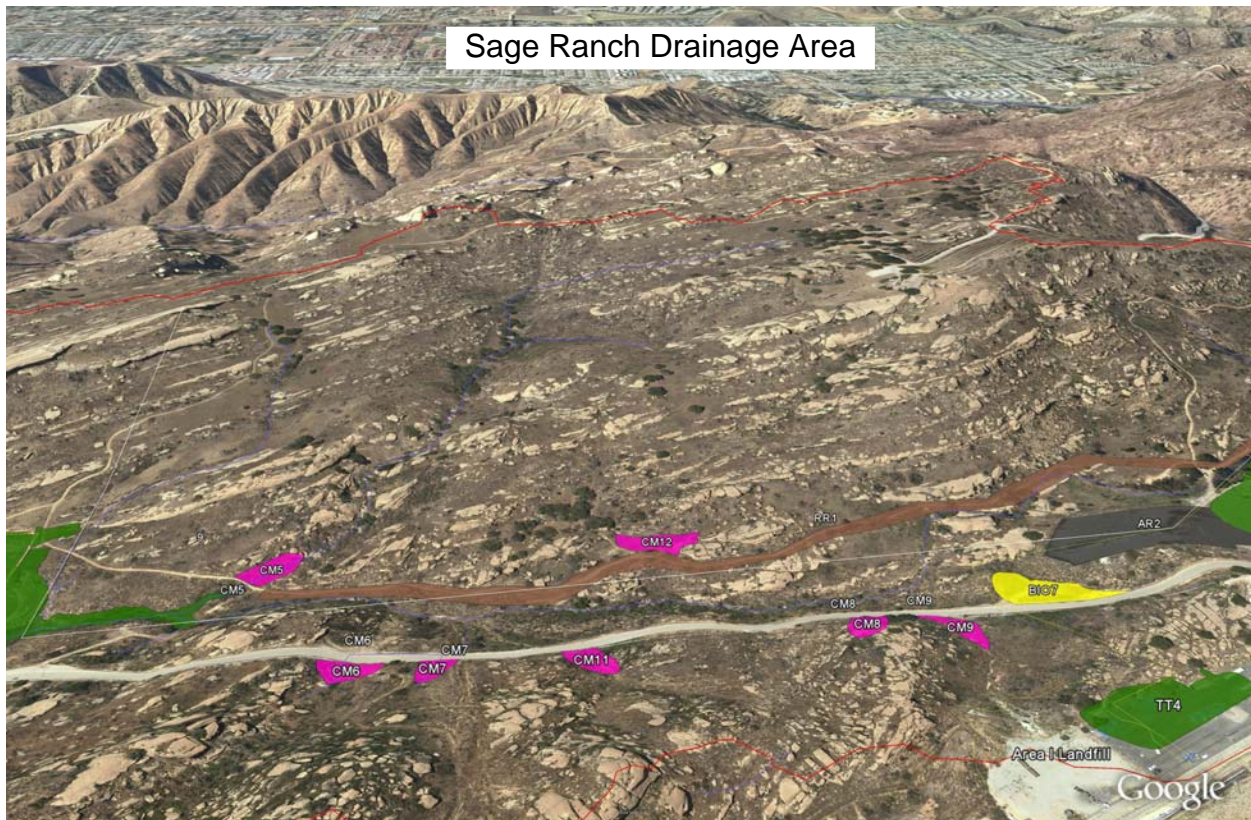
9 Watershed



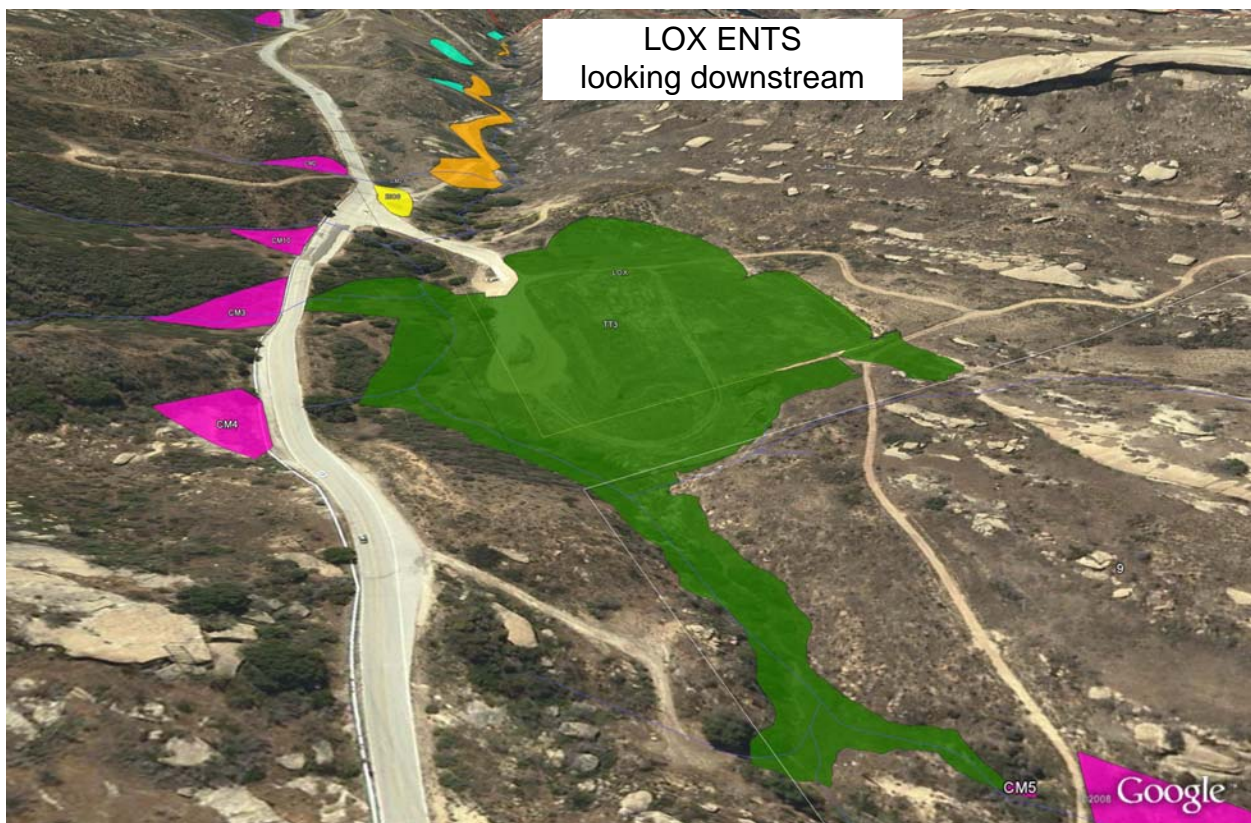
Eastern 009 ENTs

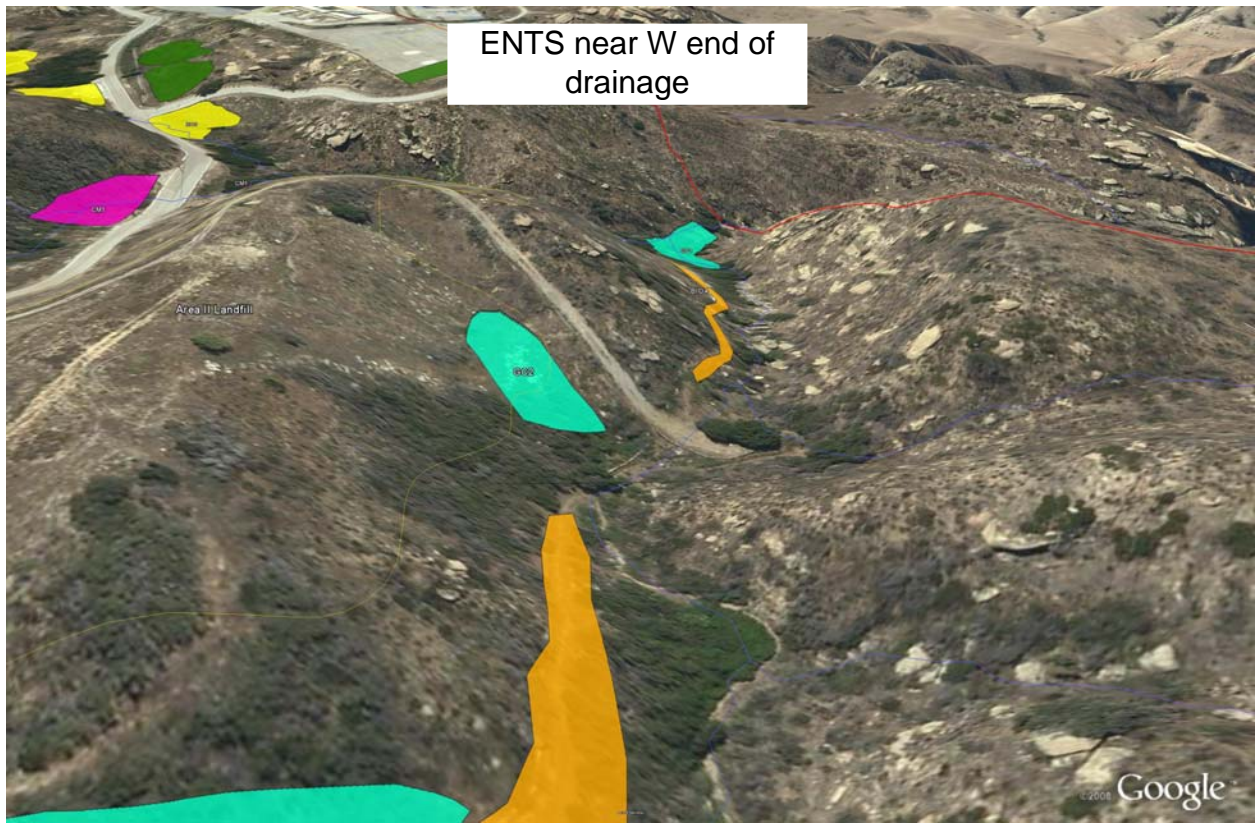


Sage Ranch Drainage Area

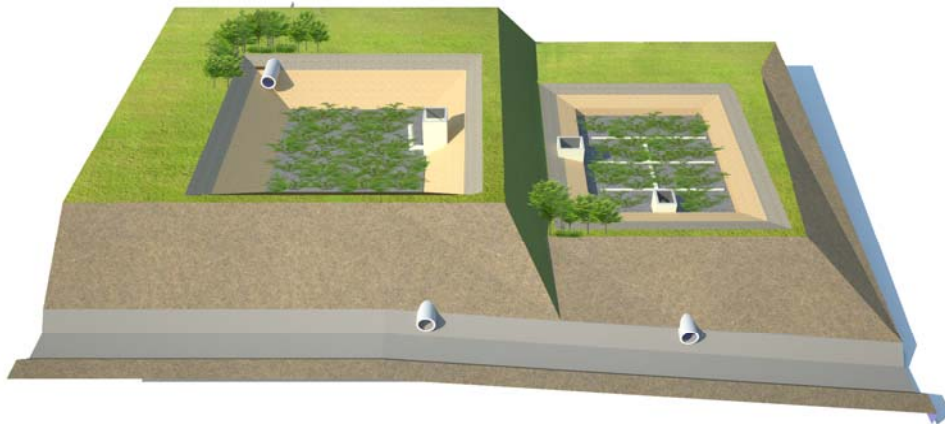


LOX ENTS
looking downstream

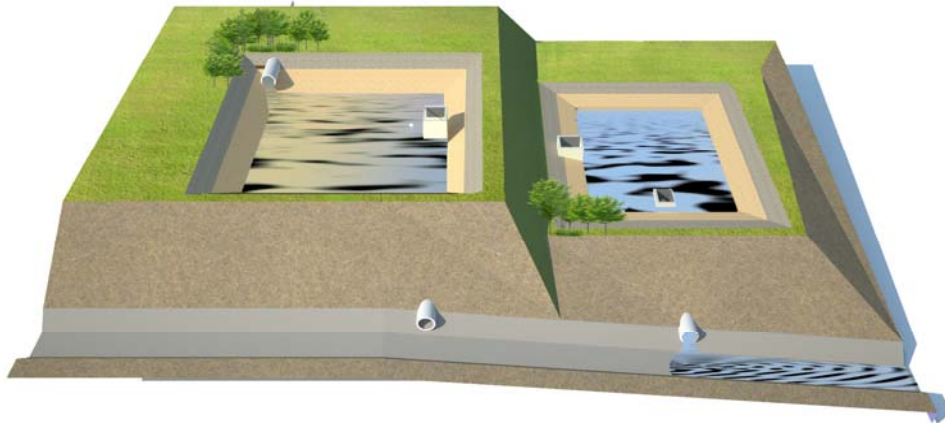




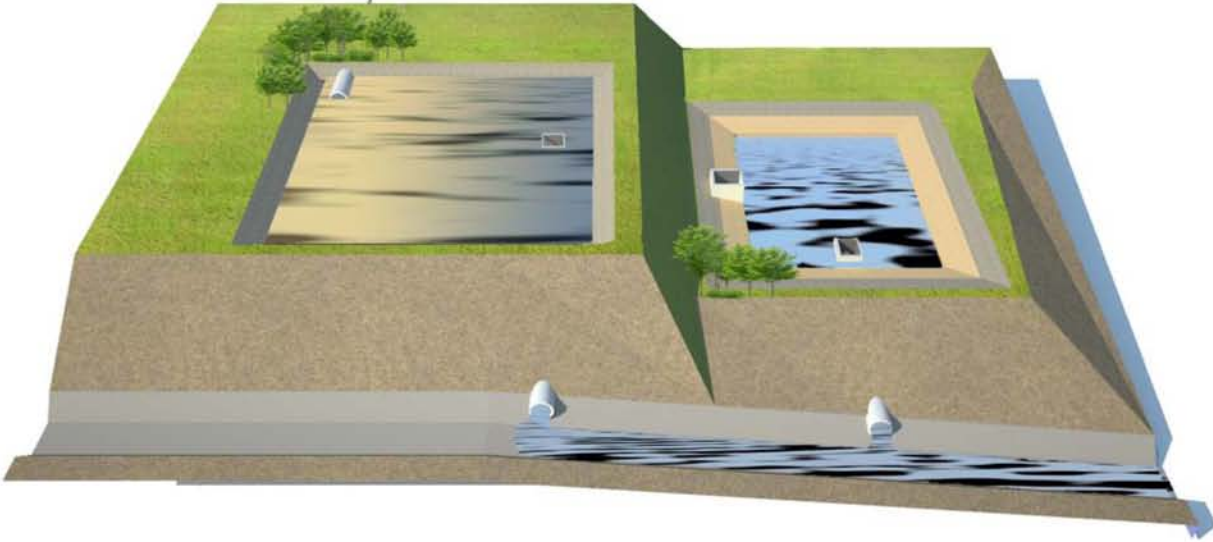
Animation of How ENTS Will Function



Normal non-storm condition



Storms Smaller than Design Event



Storms Larger than Design Event

Attachment B: Expert Panel Charge and Issues Raised by the Board in its Orders to Boeing

Cease and Desist Order R4-2007-0056: Page 10

[Boeing Company] to submit for approval to the Executive Officer....

“Assembly of a panel to review site conditions, modeled flow, contaminants of concern, and evaluate the BMPs capable of providing required treatment to meet the final effluent limits”

This charge states that Boeing is to propose a panel that will address the various site conditions; examine models to consider flow, assess contaminants of concern, and review the various ENTS that can be employed on the site.

NPDES Order R4-2007-055, Fact Sheet: Page 46

Regional Board staff anticipates that further work will be needed before proposing a regional design storm policy or any site-specific design storm in order to further explore these assumptions and generalizations; evaluate the efficacy of the design storm for different pollutants and land uses; refine the data used in the modeling the water quality outcomes of potential design storms and consider policy with regard to incorporating design storms into permits.

...this permit does not implement the 2.3 inches as the upper bound of the runoff that the discharger must treat for compliance with the final effluent limitations. When the Regional Board Design Storm Project, and associated policy considerations, are further developed along with an evaluation of acceptable assumptions and generalizations, the storm size developed by the Discharger may be considered by the Regional Board.

This statement clearly sets forth expectations that would be needed from experts on the panel (as well as other experts that the Board may engage or who may testify) that would assist the Regional Board staff in developing and incorporating a design storm consideration into the permit documents. It states that such a design storm will be further considered by the Board.

Order R4-2007-0055: Page 58

This Order may be reopened and modified to consider incorporation of a site specific or regional design storm.....

The Board staff recognized that the design storm would be a consideration that would come in front of the Board in the future for possible incorporation into Boeing's NPDES permit.

Order R4-2007-0055: Page 55

The BMP plan and its components shall be designed to achieve compliance with receiving water limitations. If exceedances [...] persist, the Discharger shall assure compliance [...] by complying with the following procedure [...] implement the revised BMP plan and its components and monitoring program according to the approved schedule.

The Panel has reviewed the proposed ENTS and made recommendations to Boeing on their design to meet the requirements set forth in the CDO. The Panel believes that the ENTS technology employed is the best available and is responsive to the Board's requirements; however, the Panel's White Paper outlined some of the exceedance conditions that might occur so that the Board may have some early indication of potential limitations of the ENTS performance including their ability to consistently achieve compliance with the numerical effluent limits. The Panel has recommended measures to improve the monitoring program to allow Boeing and the Board to determine if such exceedances actually occur and provides a more scientifically valid basis for the Board staff to evaluate ENTS performance.