



Los Angeles Regional Water Quality Control Board

September 15, 2016

Mr. Paul Costa
SSFL — Safety, Health & Environmental Affairs
The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, CA 91304-1148

Response to Comments and Approval of Revised Human Health Risk Assessment Work Plan for Surface Water Runoff, Santa Susana Field Laboratory (SSFL), Ventura County, CA (Order Pursuant to California Water Code Section 13383; CA0001309, CI No. 6027)

Dear Mr. Costa:

The Regional Board on June 24, 2015, issued a letter requiring Boeing to perform a Human Health Risk Assessment (HHRA) at Outfalls 001, 002, 008, 009, 011, 018, 019, and 020 under the requirements included in Section 13383 of the California Water Code. California Water Code section 13383 provides the Regional Board the authority to require a permittee to monitor, report, and provide other information that the Regional Board requires. On September 17, 2015, the Boeing Company submitted a HHRA Work Plan for Surface Water Runoff Exiting the Santa Susana Field Laboratory via these outfalls.

The Office of Environmental Health Hazard Assessment (OEHHA) and Regional Board staff reviewed and commented on the HHRA Work Plan submitted. On January 28, 2016, OEHHA and Regional Board comments were submitted to Boeing including directions to revise the Work Plan. On March 31, 2016, Geosyntec on behalf of Boeing submitted the revised Work Plan incorporating the requested revisions.

In a letter dated April 21, 2016, the Regional Board solicited public comments on the revised HHRA Work Plan. The deadline for submitting comments was May 31, 2016. Comments were received from Ms. Christina Walsh, Ms. Christine Rowe, Heal the Bay, and Rocketdyne Cleanup Coalition, Physicians for Social Responsibility-Los Angeles, Southern California Federation of Scientists, Committee to Bridge the Gap, Teens Against Toxins, and the Aerospace Contamination Museum of Education. Attached are Responses to Comments. The revised HHRA Work Plan, comments and Response to Comments are posted on the Regional Board web site.

The Regional Board approves the revised HHRA Work Plan including any changes reflected in the Response to Comments. Boeing shall implement the revised HHRA Work Plan immediately with input and oversight by the SSFL Storm Water Expert Panel. By April 30, 2017, Boeing will submit the complete HHRA to the Regional Board.

The Regional Board and OEHHA staff will review the completed HHRA and determine if additional work is required. When the HHRA is deemed complete by the Regional Board, Boeing, along with the Expert Panel, will present the results of the HHRA to the Regional Board at a public meeting. The HHRA will also be made available to the public via the Boeing website, as well as the Regional Board's website.

If you have any questions, please contact Cassandra Owens at (213) 576-6750 or Cassandra.Owens@waterboards.ca.gov or Mazhar Ali at (213) 576-6652 or Mazhar.Ali@waterboards.ca.gov

Sincerely,



Samuel Unger, P.E.
Executive Officer

Attachment: Response to Comments
Revised HHRA Work Plan

cc: Mr. David Smith, Environmental Protection Agency, Region 9, Permits Branch (WTR-5)
Ms. Robyn Stuber, Environmental Protection Agency, Region 9, Permits Branch (WTR-5)
Ms. Becky Mitschele, Environmental Protection Agency, Region 9, Permits Branch (WTR-5)
Mr. Kenneth Wong, U.S. Army Corps of Engineers
Mr. Bryant Chesney, NOAA, National Marine Fisheries Service
Mr. Jeff Phillips, Department of Interior, U.S. Fish and Wildlife Service
Mr. William Paznokas, Department of Fish and Wildlife, Region 5
Department of Public Health, Sanitary Engineering Section
Ms. Teresa Henry, California Coastal Commission, South Coast Region
South Coast Air Quality Management District
Mr. Theodore Johnson, Water Replenishment District of Southern California
Los Angeles County, Department of Public Works, Waste Management Division
Ms. Sutida Bergguist, State Water Resources Control Board, Division of Drinking Water
Ms. Rita Kampalath, Heal the Bay
Mr. Bruce Reznik, Los Angeles WaterKeeper
Ms. Johanna Dryer, Natural Resources Defense Council
Mr. Mark Malinowski, Department of Toxic Substances Control
Mr. Roger Paulson, Department of Toxic Substances Control
Mr. Tom Seckington, Department of Toxic Substances Control
Mr. Daniel Cooper, Lawyers for Clean Water
Mr. Pete Zobra, National Aeronautics and Space Administration
Mr. John Jones, United States Department of Energy
Mr. Michael Bubman, c/o Bell Creek Homeowners Association
Mr. Paul Carpenter, Department of Toxic Substances Control
Ms. Mary Meyer, California Department of Fish and Wild Life
Ms. Christine Found-Jackson, California Department of Fish and Wild Life
Mr. Jeff Humble, California Department of Fish and Wild Life
Environmental Protection Agency, Region 9, Office of Radiation Programs

Ms. Jennifer Fordyce, Office of Chief Counsel, State Water Resources Control Board
NPDES Wastewater Unit, Div. of Water Quality, State Water Resources Control Board
Ms. Jeannie Chan
Mr. David W. Dassler, Boeing
Ms. Elizabeth Crawford
Ms. Nicole Dollen Ventura County Planning Division
Ms. Ginn Doose
Mr. John Farrow, M. R. Wolfe Si Associates, P.C.
Mr. Matt Flagemann, Soil/Water/Air Protection Enterprise
Mr. Dan Hirsch, Committee to Bridge the Gap
Ms. Barbara Johnson, Susana Knolls Homeowners, Inc.
Dr. Michael Josselyn, WRA, Inc.
Mr. Daniel Maccabee, Brandeis-Bardin Institute
Mr. Sheldon Plotkin, Southern California Federation of Scientists'
Ms. Bunny Raskin
Ms. Chris Rowe
Mr. Adam Salkin
Mr. Mathew Sanders, Paul, Hastings, Janofsky & Walker LLP
Ms. Lorraine Scott
Dr. Michael Stenstrom, SSFL Stormwater Expert Panel
Ms. Rebecca Tadesse, Branch Chief of Materials Decommissioning, U.S. Nuclear Regulatory
Commission
Mr. Rick Verguitz, Water & Environmental Resources Section, Ventura County Watershed
Protection District
Mr. Mati Waiya, Wishtoyo Foundation
Ms. Christina Walsh, SaveSantaSusana.org
Dr. Daniel Wiseman, West Hills Neighborhood Council-Santa Monica Mountains Area
Committee
California State University, Northridge
City of Los Angeles, Bureau of Engineering, Wastewater Systems Engineering Division
Friends of the Los Angeles River Los Angeles and San Gabriel Rivers Watershed Council Los
Angeles County, Department of Health Services
Los Angeles County, Department of Public Works, Environmental Programs Division
Masry & Vititoe Law Offices
Simi Valley Library
U.S. Army Corps of Engineers
ULARA Watermaster
Ventura County Air Pollution Control District
Ventura County Environmental Health Division
Ventura County Public Works
Mr. Alec Uzemeck, GAG Chair
Dr. Ronald Ziman
Mr. A. J. Greenstein
Ms. Teresa Jordan
Mr. Wayne Lee
Mr. John Luker
Ms. Carissa Marsh, The Simi Valley Acorn
Ms. Marie Mason
Mr. Jack M. Wallace
Ms. Marge Weems

Ms. Mary Wiesbrock
Mr. Anthony Zepeda
Mr. Cybil Zeppieri
Mr. Lori Zinkan
Ms. Elizabeth Zlotnik
Mr. Peter Weiner, Paul, Hastings, Janofsky & Walker LLP
City Manager, Simi Valley
Mr. Greg Smith
Mr. Richard Mathews
Ms. Caroline Aslanian
Ms. Cristine Peterson
Mr. Isaac Levy
Mr. William Preston Bowling
Ms. Bonnie Klea
Ms. Deena Parry
Ms. Cindi Gortner
Ms. Margery Brown
Rocketdyne Cleanup Coalition
Mr. Ben Carrier
Ms. Rubin Marcia, Department of Toxic Substances Control
Ms. Kamara Sams, Boeing
Mr. Russ Edmonson, Department of Toxic Substances Control
Ms. Susana Lagudis, Los Angeles Regional Water Quality Control Board
Mr. Kip Drabeck, Chatsworth Lake Manor Citizens Committee

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
1a	<p>I believe that I read a document many years ago that was a sampling report by the Water Board from 1947. This was probably (my assumption) just to test the groundwater for its properties so that the owners / operators would know what was in the water that they would be using for various purposes. Can you please find that sampling report, or any other sampling reports from that time frame so that we can determine what was sampled for before the site was active?</p>	<p>Comment isn't related to changes in technical content of the HHRA Work Plan.</p>
2a	<p>When did the Water Board begin sampling the water from the SSFL site for chemicals of concern and radionuclides?</p>	<p>The NPDES permit issued in 1998 (Order 98-051) included requirements to monitor priority pollutants and radionuclides at Outfalls 001 – 007. The remaining Outfalls 008 – 020 were established in later permits. Surface water sampling results from the issuance of the 2009 NPDES permit and later are reflective of the current site conditions, and consist of only stormwater and treated groundwater releases. The HHRA will use this data to reflect current and future conditions to evaluate long-term exposure scenarios; this is considered a conservative approach given that future conditions following remediation are anticipated to be improved relative to current conditions.</p>
3a	<p>Some people believe that cleaning the site to Background or the Minimal Detectable Concentrations found in a lab will restore the SSFL site to their pre North American Aviation history. What reports do we have from back then? Since this was previously a farm, it is my assumption that there would have been more bacteria, there would have been pesticides and herbicides, chemicals from atmospheric deposition from cars and other sources as well as fallout radionuclides?</p>	<p>Comment isn't related to changes in technical content of the HHRA Work Plan.</p>
4a	<p>Was this sampling by the Waterboard for contaminants only after the Clean Water Act was expanded 1972? (1)</p>	<p>Sampling requirements along with methodologies and detection limits have changed over time. Surface water sampling results from the issuance of the 2009 NPDES permit and later are reflective of current site conditions and consist of treated stormwater and groundwater releases at the NPDES compliance monitoring outfalls. The HHRA Work Plan will use this data to reflect current and future conditions.</p>
5a	<p>Is it possible to see the first year's annual report or the first report that would have been used by Boeing's predecessors to show what was sampled for leaving the SSFL site?</p>	<p>Boeing's website has annual reports dating back to 2004. Annual reports prior this date, including those of prior landowners, may be requested from the Regional Board. Since they are not available</p>

**Revised Human Health Risk Assessment Work Plan for
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		electronically, you would need to make a file review request and stipulate which reports you are requesting. Staff will be directed to search the files to see if they are available.
6a	Why is no risk assessment being required for outfalls 3-7 and 10 when there is tremendous concern regarding what runs off to the Brandeis Bardin camp and to Runkle Canyon?	The main tributary to the north leaving the property is outfall 009 and will be included in the HHRA. The storm water from smaller watersheds (3-7, and 10) are currently captured and brought into Silvernale pond and they are treated prior to release to outfall 018. As such all run-off from the outfalls in question will be part of the HHRA evaluation to outfall 018.
7a	Is the Water Board considering the contaminants that the Federal EPA found within and beneath these outfalls?	The focus of the risk assessment is to evaluate surface water that is leaving the site. The data being used to conduct the evaluation are data that are relevant to the water quality of the surface water discharges. However as noted in response to comment #11a, constituents found in sediment in the drainages are being addressed under the oversight of the Cal-EPA Department of Toxic Substances Control (DTSC).
8a	How do we distinguish the Dioxins at the SSFL site made by anthropogenic activities v from the natural fires that have occurred here over the decades?	It is acknowledged that there may be dioxins from both anthropogenic and natural sources such as the wildfires at the site. Because the permit limits do not distinguish between the source types of the constituents measured, the HHRA does not include a quantitative evaluation of the contribution from different sources.
9a	How do we know if the lead at the site is from natural occurring sources v anthropogenic uses v atmospheric deposition?	Because the permit limits do not distinguish between the source types of the constituents measured in surface water discharges, the HHRA does not include a quantitative evaluation of the contribution from different sources.
10a	How much of the lead at the site is from the shooting ranges such as the one that has been remediated over the years in the Northern Drainage?	Because the permit limits do not distinguish between the source types of the constituents measured, the HHRA does not include a quantitative evaluation of the contribution from different sources. The Discharger (Boeing) is required to control the discharge of contaminants offsite. The contaminant concentrations detected in the discharge is what will be used to evaluate risk in the HHRA.
11a	Several years ago, in comments I believe on Boeing's fines, I recommended that their fines be used to sample the unlined drainages beyond the outfalls and before the lined channel of the Los Angeles River was reached. I wanted to understand if the Chemicals of Potential Concern (COPC) are falling out in the sediment of the creek offsite, or if they are making their way to the lined channel of the Los Angeles River. Have the various creek's leaving the site sediment been sampled so	Sediment in the drainages, including areas near the outfalls, are being addressed as part of Site cleanup activities in accordance with three regulatory orders under oversight of the DTSC.

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

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	that if there is a rain event, we would know what is there that can be caught in a rain event?	
12a	Has the Water Board staff looked at the most recent Background Studies for chemicals (DTSC) and Radionuclides (Federal EPA)? A report that compares chemicals and radionuclides found in background and their ranges in background soils would greatly serve to identify what are naturally occurring COPCs v COPCs which are only anthropogenic.	The Water Board staff are familiar with the background studies referenced in the comment. The background studies are useful in evaluating constituent concentrations in soil as compared to background concentrations. The HHRA will evaluate contaminant concentrations in surface water discharges, not soil.
13a	Your HHRA does not discuss a dust pathway. Around 1989, I was sent a letter that stated that I was in the prevailing winds area of the SSFL site. As you know, when they dig the soil for remediation, it is supposed to be watered down. But I have still seen dust blowing in the parking lot area that tells me that sediment is blowing.	The HHRA will evaluate exposures to surface water and therefore exposure to dust is not directly considered. However, if dust has settled into the drainages and is picked up by surface water it will be measured as a part of the surface water testing program and included in the risk assessment dataset. The dust inhalation pathway is being addressed in the HRAs currently being conducted as part of Site cleanup activities in accordance with three regulatory orders under oversight of the DTSC.
14a	Is this HHRA only for people at the SSFL site or in its drainages, or is it supposed to reflect the dust that may blow from the SSFL site when the drainages are dry? Do we have any way to measure the dust pathway?	Sediment in the drainages, including areas near the outfalls, are being addressed as part of Site closure activities in accordance with three regulatory orders under oversight of the DTSC. This HHRA conducted with oversight from the California Water Resources Control Board, Los Angeles Region will evaluate the surface water data collected at the outfalls.
15a	On page 5, it states that soil remediation will begin in 2017. The Water Board has required cleanup measures for I believe, at least two decades?	Comment noted. The soil remediation activities referenced refer to cleanup activities that are proceeding with oversight from the DTSC.
16a	According to the 2007 Consent Order and the 2010 Administrative Orders on Consent the soil remediation is supposed to be COMPLETE by 2017.	Comment isn't related to the HHRA Work Plan for Surface Water Runoff.
17a	From page 6 – Do Boeing and NASA have documented soil volumes to show how much soil has been removed under the Water Board's Orders for ISRA and for the Imminent and Substantial Endangerment Order by DTSC around 2009?	Comment isn't related to the HHRA Work Plan for Surface Water Runoff.

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

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18a	Wouldn't it be important to know when these soil volumes were removed from each outfall area so that the COPCs that were of concern in the past no longer pose a danger today?	This is an important point that is addressed in the time period that is being proposed for evaluation in the HHRA. A time period was selected to address changes in site conditions that have occurred over time, including stormwater BMPs, interim remediation and ISRA, and demolition. A balancing consideration was to have sufficient data to conduct the evaluation. To accommodate these data needs, the sampling period from February 19, 2009 through the most recent sampling event in March 2016 will be used.
19a	From page 6, am I correct in understanding that Outfall 19 has been in place and has been used for discharges of GETS treated water, but Outfall 20 is yet to be constructed?	The HHRA will include any data during the time period noted in the Work Plan for 019. Outfall 020 has not been constructed, and there has been no treated groundwater discharges since its addition to the permit in 2015.
20a	Isn't it a violation of State Water Policy to take clean water and recontaminate it by sending it down Bell Creek which has not been remediated and to the Los Angeles River where it will also become further contaminated?	Comment isn't related to the HHRA Work Plan.
21a	Doesn't it make more sense to keep the remediated water on site for use for dust mitigation, revegetation, and for ponds for animal life to get water?	The HHRA will address data collected during historical discharges from February 19, 2009, through March 2016. Decisions regarding the disposition of the remediated water are outside of the scope of the HHRA addressed here.
22a	Page 8 – I thought that the EPA was constantly updating their guidelines. Why are we using guidelines from 1989?	The 1989 guidance for risk assessment is one of the primary sources for conducting risk assessments and presents the underlying principles and equations used in risk assessment. The principles in the 1989 guidance haven't changed. Updated information on chemical specific toxicity or changes in assumptions used to reflect human exposure are addressed in newer documents that are updated periodically and are referenced in Section 3 and Section 4 of the Work Plan.
23a	Page 10 – Potential Exposure Routes – I am again concerned that VOCs are referenced for inhalation, but that dust is not referenced for a potential inhalation pathway	Please see response to comment #14a.
24a	At a meeting with Bell Canyon residents with Water Board staff, these residents stated that they used to fish in Bell Creek. Again, I am concerned about whether the creek has been sampled from the SSFL site to this area where there used to be enough water for fishing and potentially for swimming. Can we get the creek sediment sampled?	The focus of the HHRA is on surface water leaving the site. The NPDES permit and the associated HHRA targets discharges of surface water only. The Regional Board has not sampled the surface water in Bell Creek, downstream of discharges from the SSFL site. As stated previously, the RCRA site assessment and cleanup which is ongoing with DTSC oversight is evaluating soil contamination.

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

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		There are sufficient surface water data available to conduct HHRA for stormwater discharges from the site.
25a	You discuss the wading exposure, but if water is deep enough to wade in, then children are very likely to fall in and splash in it. This scenario needs to be considered for the Bell Canyon area.	Both child and adult exposures are included in the HHRA. (Section 3.1.3)
26a	Page 12 – Exposure Point Concentrations (EPC) – Does the EPC risk imply an estimate based upon future risk after remediation or past risks from 2009 forward?	The EPC will be based on data from February 19, 2009 to March 2016, and therefore reflect exposures during this time period. As remediation of surficial media (including soil and sediment) is completed and the remediation areas restored, constituent concentrations in surface water should decrease. Therefore, the HHRA will reflect a conservative estimate.
27a	As I look at these EPCs, this method would require you to go to every quarterly monitoring report since 2009, and to determine what COPCs were found at each outfall and at what levels to combine them to develop a health risk for each outfall at each time there was a rain event and there was water in the drainages?	The EPC is derived to reflect a conservative yet realistic estimate of the average concentration a person may be exposed to over the assumed exposure duration. Therefore, all of the data over the time period will be combined for each outfall and used to derive an average concentration for each outfall. The 95 percent Upper Confidence Limit of the average concentration (95UCL) will be used when sufficient data are available to address the uncertainty in the data. This is standard risk assessment practice and is considered health protective. This will be more clearly described in Section 3.2 of the Work Plan.
28a	In reference to the discussion on EPCs, it is not made clear that a onetime acute exposure may be different from chronic exposures to COPCs which is how the cancer 1 per million is calculated – exposure over time. However, there are acute doses, for example for radionuclides – both in the industry and in medical applications – that do increase the lifetime risk of cancer. See the DOE Ionizing Radiation Dose Ranges Chart. On this chart, it states under Cancer Epidemiology that there is: “Evidence for small lifetime increases in human cancer above 10 rem acute exposure, 20 rem chronic exposure.” An example of 1.5- 10 rem is a Spiral CT scan – full body.	Due to the relatively low concentrations of constituents found in the surface water samples, acute exposures and risk are not expected. It is acknowledged that acute one-time exposures to constituents such as to radioactive COPCs could result in a small increase in cancer risk. While it is believed that concentrations are not high enough to be an issue, this will be discussed in the uncertainty section of the HHRA and detected levels of these contaminants will be used to evaluate human health risk.
29a	Page 13 – Are Preliminary Remediation Goals (PRGs) the	For HHRAs, several sources from regulatory documents and

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

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	only screening criteria? I thought that PRGs were not clean up values but rather just a tool to use for sampling purposes?	databases are used to identify values used in assessing the toxicity of chemicals such as an allowable average daily dose. This information may be taken from the PRG tables if needed.
30a	You are screening water for risk. How can we compare the surface water PRGs with the PRGs for soil Background Values found by the EPA for Radionuclides and DTSC for chemicals?	The soil background values cannot be used to compare to the surface water data.
31a	Which screening values for PRGs are you using when the end use is open space / parkland?	Please see response to Comment #29a. Screening values or PRGs are not being used in the HHRA. A site-specific evaluation is being conducted evaluating recreational use of the drainages.
32a	How do you compare PRGs to MCLs?	The HHRA will not compare PRGs to Maximum Contaminant Levels (MCLs). A site-specific evaluation will be conducted assuming incidental ingestion and dermal contact occurs if someone enters the drainages near the outfalls and encounters stormwater or treated wastewater discharges.
33a	Page 13 – Would it be possible to hold a meeting with Water Board staff, the Boeing Expert Storm Water Panel, OEHHA staff, and the US EPA to explain the various methods for Toxicity Assessment at the level that the average stakeholder will understand? Ideally this location would be at Corporate Pointe in West Hills which is centrally located for most stakeholders.	Comment isn't related to changes in the technical content of the HHRA Work Plan.
34a	Page 13 – #6 – Why is the Health Effects Assessment Summary Table from 1997 – isn't that old?	This is a reference that is still used in some instances to identify toxicity criteria that do not have more recent references. It reflects the current methodologies used by USEPA and the Office of Environmental Health Hazard Assessment (OEHHA).
35a	Page 13 - #7 – Why are we using a "National Center for Environmental Assessment (NCEA) document from 2004 – isn't there an updated document for this?	This is a reference that is still used in some instances to identify toxicity criteria that do not have more recent references.
36a	Page 15 – References to other documents not incorporated in this document from Geosyntec such as the SRAM requires the reader to be familiar with each of these documents and to be able to comprehend documents that are highly technical in nature. I do not believe that the majority of the SSFL stakeholders have this technical expertise to read these documents let alone to interpret them unless they have a science background in risk and remediation.	The Standardized Risk Assessment Methodology (SRAM) is one of the many reference documents that outlines the methodology DTSC is using to complete HHRA at the SSFL. The protocol outlined in the SRAM is based on the current methodologies for HHRA used by USEPA. Indeed, the content of these regulatory documents is technical in nature. The review of these documents will provide the basis for the assessments and selected criteria used in the HHRA. Hence, the reference is appropriate.

**Revised Human Health Risk Assessment Work Plan for
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37a	Page 15 – Paragraph 2 – At which screening level are you considering – Backyard garden, Suburban residential, open space?	<p>The screening levels will be based on the water recreator scenario while accounting for the limited number of days per year that stormwater flows will occur at the outfalls. The scenarios listed in the comment are soil exposure scenarios, therefore they are not applicable.</p> <p>The proposed exposure scenario assumes that a recreator may visit the drainages for recreational activities regardless of the adjacent future land use or development condition.</p>
38a	Page 15 – Paragraph 3 – Does this mean that our drinking water in California is blended to a 1 in 10,000 risk range? Are these screening levels based on an adult male's exposure?	<p>The reference to Proposition 65 is to present the different risk levels that are deemed acceptable to regulatory agencies as a point of context to the risk ranges that may be considered for the HHRA results.</p>
39a	Page 16 – American Cancer Society risk of cancer – I believe this is old data. I think it also requires clarification.	<p>The values referenced are the latest reported by the American Cancer Society. http://www.cancer.org/research/cancerfactsfigures/cancerfactsfigures/</p>
40a	Cancer risk is correlated based upon exposure to the chemicals or radionuclides over time to the best of my understanding except as where I referenced earlier acute toxicity such as in high levels of radiation exposure or high doses of some chemical.	<p>Comment acknowledged.</p>
41a	Many of the COPCs could have been caused by natural fires that have burned through the SSFL site over the decades of site history. Many local residents who lived in the Chatsworth area to the SSFL and beyond could have been exposed to the ash from the 2005 fire which burned 70 – 80 % of the SSFL site and to other fires. How do we know which of the contaminants were the result of the 2005 fire?	<p>It is acknowledged that constituents at the site can include those caused by natural wildfires, as well as general anthropogenic regional atmospheric sources (e.g., vehicle emissions, household wood fires, barbecue grills). While the HHRA is focused on evaluating constituents found in SSFL's surface water discharges, background concentrations of naturally occurring constituents will be considered in evaluating the risk assessment results.</p>
42a	Can we please see the list of the chemicals that were found at each outfall prior to the 2005 fire and after the 2005 fire to potentially identify COPCs that may be the result of a new burn?	<p>All data used for the HHRA will be post-2005 Topanga Fire. A summary of the data will be included in the final HHRA.</p>
43a	I was at NASA SSFL both prior to the ISRA remediation in an oak grove with both NASA and Water Board personnel. I have before and after photos of these trees that clearly show evidence of being burned in an area that was known to have	<p>Historical activities at the Boeing SSFL have resulted in elevated pollutant concentrations in the soil and groundwater. Historical activities onsite included burning of waste which may have resulted in elevated concentrations of dioxin at the site. Boeing SSFL is</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

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	<p>Dioxins. While I do recognize that Dioxins are a potential carcinogen, why is the SSFL site required to remove Dioxins to MCLs or risk based levels when the adjacent properties such as Sage Ranch and Ahmanson Ranch would not be subject to this cleanup?</p>	<p>permitted because historical data indicated that the facility had elevated pollutant levels in wastewater and storm water discharges from the site. The NPDES permit regulates the discharge of pollutants such that the beneficial uses of the receiving water are protected. The NPDES permit requires the Discharger to control the discharge of pollutants off site. The HHRA will evaluate the risk and/or hazard associated with the pollutant concentrations discharged from the site. Sage and Ahmanson Ranch, which are largely recreational areas, do not have an NPDES permit.</p>
44a	<p>After remediation to the levels necessary to comply with Boeing's NPDES permit, what happens if the COPCs from other properties which are elevated above the SSFL site drain onto the SSFL site?</p>	<p>Comment isn't related to changes in the technical content of the HHRA Work Plan.</p>
45a	<p>These lists of COPCs by Outfall number do not tell the reader in what year they were found, at what level over the MCL that they were found, and therefore, we do not know when they were found in place and time.</p>	<p>Comment acknowledged. The HHRA report will include the full dataset used in the evaluation including location and sample date. However, comparisons to MCLs are not a part of the HHRA. MCLs do not address the relevant exposure pathways that will be evaluated in the HHRA.</p>
46a	<p>For a more accurate document to show risk, you would need to show how many rain periods there were per year that were sampled, what the number of exceedances were at each outfall and which COPCs were exceedances at each outfall. We should probably know the number of inches of rainfall during each event to understand if this water is just being absorbed into the soil, or if there was a large enough volume to run off of the site.</p>	<p>Comment acknowledged. The HHRA report will include information on number of runoff-producing rain events and amount of rainfall for various years and the number of wastewater discharges.</p>
47a	<p>We do know that the number of rain events has decreased over the last five years, and that as a result of remediation and Best Management Practices (BMPs) (hopefully) under ISRA that the COPCs have reduced in numbers and in their levels of toxicity.</p>	<p>Comment acknowledged.</p>
<p align="center">Steven Johnson, Heal the Bay – Letter dated June 10, 2016</p>		
1b	<p>...the most conservative approach should be used with regard to receptors considered, as well as the dataset used for the evaluation, for instance. The Work Plan mentions "not including data that are clearly not representative of current conditions" (p. 6). While it's important that the dataset used</p>	<p>The HHRA Work Plan outlines the rationale for the data range that will be evaluated. An important consideration in evaluating the data for the HHRA is the change in site conditions that has occurred over time, including Stormwater Pollution Prevention Plan (SWPPPs) Best Management Practices (BMPs), interim remediation and Interim</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

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	<p>accurately represents site conditions, criteria for determining what is and is not representative should be clearly laid out.</p>	<p>Source Removal Action (ISRA), and demolition. An additional consideration was to have sufficient samples to evaluate potential exposures to constituents detected in surface water leaving the Site. To accommodate these data needs the sampling period from February 19, 2009 to the most recent sampling event in March 2016 will be used. In addition, this sampling period provides at least 5 sampling events for each outfall. Staff will use all data available during the specified time period.</p> <p>Bell Creek, the downstream receiving water for discharges from the SSFL site, has an intermittent beneficial use of groundwater recharge (GWR), warm freshwater habitat (WARM), contact (REC-1) and noncontact recreation (REC-2). There is also an existing beneficial use of wildlife habitat (WILD). The HHRA will evaluate the data to determine the potential risk associated with recreational exposure to discharges from the facility.</p> <p>The Work Plan specifies the potential receptors and exposure pathways in Section 3.1.2 of the HHRA Work Plan. Exposure to young children, from two years of age to sixteen as well as potential exposures to adults will be evaluated. The Work Plan in Section 3.2 includes a discussion of how the exposure point concentrations will be developed.</p>
2b	<p>...given the past few years of drought, there should be an evaluation of how representative the flows associated with the proposed dataset are of long-term conditions, and how risk may change with higher flows from outfalls.</p>	<p>Flow conditions used for the analysis will be selected based on long-term representativeness, not limited to discharge frequencies from the recent drought period. Also, an evaluation of changes in flow conditions and the impact on the risk assessment will be addressed in the uncertainty assessment. Also see Response to Comment 1b.</p>
3b	<p>Given that many of the constituents of concern at this site are likely to remain bound to soils long-term, perhaps until impacted soils are physically removed, it is critical that a range of hydrologic conditions be considered so that future conditions are taken into account.</p>	<p>See response to comments #1b and 2b above.</p>
4b	<p>...given that monitoring is ongoing at the site, there should be periodic reevaluation of how well the dataset used for the HHRA captures most recent data, and a mechanism included for incorporating any new data into the HHRA that could result in a higher risk.</p>	<p>Water quality data collected through March 2016 will be evaluated in the HHRA. However, Boeing staff, consultants, and the Storm Water Expert Panel members annually review the storm events, the data collected, exceedances, and trends. This information is reported in the Expert Panel's Annual Report.</p>
5b	<p>...we noticed within "Table 1: Number of Samples for</p>	<p>As noted in the comment, data are not available for Outfall 020 since</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	<p>Constituents Detected”, that “Outfall 020” is not present within the data grid. This is most likely due to the fact that it has not yet been constructed (according to page 6 of the main document). To make it more convenient and clear for users of the work plan, a note should be added within the chart that “Outfall 020” is currently under construction and clarifying when values will be available in the future, and the timeline for conducting a risk assessment on discharges from that outfall.</p>	<p>it has not been constructed nor has any discharges ever occurred here. A note will be added to the table as requested.</p>
6b	<p>A final recommendation... is that the HHRA Work Plan includes a larger, easier to read map of the Santa Susana site for “Figure 1.” ...We would recommend both enlarging the map and perhaps adding color to help clarify the positioning of contaminated water bodies and key locations for monitoring within the HHRA Work Plan.</p>	<p>Comment acknowledged. Figure 1 will be revised with a larger, easier to read basemap with surface water features more clearly shown.</p>
<p align="center">Rocketdyne Cleanup Coalition, Southern California Federation of Scientists, Physicians for Social Responsibility – Los Angeles, Teens Against Toxins, Committee to Bridge the Gap, Aerospace Contamination Museum of Education, Consumer Watchdog – Letter dated May 31, 2016</p>		
1c	<p>We do not believe that any HHRA put forth by Boeing, as the party responsible for the pollution at SSFL and its migration offsite at illegal levels, can be viewed as credible.</p>	<p>Comment isn’t related to changes in technical content of the HHRA Work Plan. The HHRA Work plan has been reviewed by staff at the California Office of Environmental Health Hazard Assessment (OEHHA). The comments provided by OEHHA have been addressed in the plan submitted for public comment. Hence, Regional Board believes the plan when implemented will provide an evaluation of potential risk and hazards associated with the recreational use of the stream during previous discharges from the SSFL. Staff from OEHHA will also review and comment on the completed assessment.</p>
2c	<p>...we no longer have any confidence in the Los Angeles Regional Water Quality Control Board (LARWQCB) due to years of lax enforcement of Boeing’s ongoing pollution violations, conflicts of interest at high levels of the LARWQCB, and the Board’s dismissal of detailed concerns such as those we expressed in a January 9, 2015 letter (see attached) regarding Boeing’s new NPDES permit.</p>	<p>Comment isn’t related to the HHRA Work Plan.</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
3c	...if the Board were truly concerned about health impacts from exposure to SSFL contaminants, it would not have approved the weakening of Boeing's already lax NPDES permit...	The NPDES permit for Boeing SSFL is as restrictive as the regulations allow. The NPDES permit has with each renewal added new effluent limitations, compliance points and/or reporting requirements. The more stringent permits have yielded the selection and use of the Storm Water Expert Panel, an evaluation of historical activities and data to locate areas with elevated contaminant concentrations, and interim actions by both DTSC and the Regional Board to remove contaminated soils that may have been transported offsite by stormwater runoff. These activities have resulted in a decrease in the amount of permit violations reported. However, the facility continues to work towards 100 % compliance.
4c	... Our review of Boeing's proposal (e.g., considering only recreational exposures to their polluted water, limiting data to primarily drought years, etc.) demonstrates that they have indeed skewed the proposed review radically so as to guarantee a pre-determined outcome, trying to let themselves off the hook for the harm they have done and continue to do from releasing contaminated water at levels in excess of their permits limits and benchmarks.	The purpose of the HHRA is to utilize the data available to provide a quantitative assessment of risk and hazards associated with discharges from SSFL to receptors in Bell Creek. The HHRA was required by the Regional Board in response to public concerns regarding exposure to the discharges.
5c	We have reluctantly concluded that we have no confidence whatsoever in the Board, that it is largely captured by and serves the interests of the polluter Boeing. As we noted last year, there is a conflict of interest...	The Regional Board is committed to protecting ground and surface water quality in the Los Angeles Region. To that end, we have consistently issued the most restrictive permits possible using the regulations and policies available. Board members who are employed at firms or have any association with the permittee have routinely recused themselves from deliberating those issues.
6c	We urged in January 2015 that Boeing's new NPDES permit be rejected and replaced with one that is representative of the board's duty of regulating the polluter. Instead, the Board approved the weakened permit and simultaneously announced that it would order an HHRA, as if that would alleviate our concerns. It should come as no surprise to the board that we reject Boeing's HHRA...	The public has repeatedly requested that the Regional Board protect the children who play in the stream and adjacent to the stream. In an effort to address this concern the Board has required Boeing to complete the analysis providing the Regional Board with a framework for the HHRA in the work plan. Regional Board staff and staff from OEHHA have reviewed the work plan along with your comments. Including the responses to your comments will ensure that final product is more comprehensive and that it adequately addresses the issue of risk associated with exposure to surface water discharges exiting the Boeing SSFL property.
7c	...we have no confidence in Boeing's HHRA. If the Board	The Boeing NPDES permit utilizes the regulation to provide

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	<p>truly wanted to respond to public concern, it would have taken into consideration the many weaknesses of Boeing's new NPDES permit that we outlined, and denied the permit. Instead, it ordered Boeing, which has long rebuffed health impacts from SSFL, to produce another report that is certain to repeat these claims. The LARWQCB should require that Boeing stop pollution from leaving SSFL – not ask them to produce a report denying that that pollution causes harm.</p>	<p>protection of human health and the environment from elevated pollutant concentrations in surface water discharges from the facility. The Discharger's failure to comply with the permit results in fines which are assessed per the Consent Judgement. The permit limitations have served as the basis for the Discharger implementing some of the most innovative and technologically advanced BMPs used in the region. The Discharger has developed media designed to target and remove specific pollutants, installed two state-of-the-art water treatment systems and installed a biofilter used to treat storm water discharges from the site. The Regional Board continues to utilize the regulations, plans and policies to the extent possible to ensure that discharges from SSFL comply with the permit.</p>
1d	<p>Christina Walsh, cleanuprocketdyme.org – Letter dated June 5, 2016</p> <p>...I have...[articulated] concern about groundwater pumping at SSFL for the purpose of “drawing down” the groundwater elevations so that seeps cease to discharge. ... observations supported my theory that this was exacerbating the biological condition of the downstream riparian habitats. The act of groundwater pumping during drought without properly replacing the water removed exacerbate the impacts from the prolonged drought – causing widespread impacts to local ephemeral creeks as well as year-round Bell Creek, down-gradient to outfall 2 and headwaters to the L.A. River. ...By pumping above the Outfall 2 location but discharging below the Outfall 1 location, this was causing displacement of perched groundwater, bank storage where the down-stream implications were severe.</p>	<p>Comment isn't related to the HHRA Work Plan. The groundwater cleanup is directed by staff at DTSC.</p>
2d	<p>I support the addition of Outfall 20...</p>	<p>Comment noted.</p>
3d	<p>Boeing has asserted “open space standards” which cannot be known when future use is not known.</p>	<p>The HHRA of Surface Water Runoff will be based on recreational use of the drainages which is an appropriate land use assumption for the drainages.</p>
4d	<p>I remain concerned about Outfall 2, where... discharges account for a predominant portion of the site's overall discharges since the construction for Outfall 20 has not yet begun. I have asked for sampling data at this outfall following rain events and even during multi-day rain events, I have been told that no water flowed during the event that was</p>	<p>The full dataset reflected in Table 1 will be provided in the HHRA report.</p> <p>The climate in southern California (hot and dry during much of the summer months) results in some cases in very dry soils prior to the beginning of the rainy season. In these cases, the soil is so dry until</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
5d	<p>adequate to sample. I was also told that auto-sampling techniques are employed at Outfall 2, so it is difficult for me to understand how 20 samples could have detections where we are told repeatedly that no sampling took place during rain events during the most recent drought years. I therefore request an audit of the sample concentrations included. ...Please provide a list of the 20 detects mentioned for TCE at Outfall 2 and the dates and concentrations of each of these detections...</p> <p>Using data limited to the last five years is problematic for several reasons: - The highest concentrations were historic, so using only data from the last five years when no operations were taking place gives a falsely low picture.</p>	<p>it soaks up water generated during rain events until the soil becomes saturated. Once the soil is saturated, runoff is generated from the storm events. Upstream of Outfall 002 is Outfall 018 and the Silvernale Pond. The Silvernale Pond is used to collect the storm water runoff from the upstream areas along the drainage and runoff from Outfalls 003, 004, 005, 006, 007, and 010 is collected and pumped over to the Silvernale Pond. When sufficient water is available in the pond, the Storm Water Treatment System is turned on and used to provide advanced treatment of the collected storm water prior to it being discharged. The capacity of the Silvernale Pond is 5.7 million gallons. Hence, the pond has the ability to contain a number of storms prior to discharge. If there are no discharges from the pond it is unlikely that there will be a discharge at Outfall 002.</p> <p>The purpose of the HHRA is to evaluate current and potential future conditions in the context of long-term surface water exposure scenarios. As discussed in the Work Plan, the data should reflect current conditions (following termination of industrial operations) as well as those that are expected to occur in the future (following remediation). An important consideration in evaluating the data for the HHRA are the changes in site conditions that have occurred over time, including stormwater BMPs, interim remediation and ISRA, and demolition as well as the termination of industrial activities, including rocket engine testing and the operation of the package type sewage treatment plants. As a result, older historic data do not reflect actual current conditions.</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
6d	<p>Using data limited to the last five years is problematic for several reasons:</p> <ul style="list-style-type: none"> - In the last five years, there was very little data because of the drought, and the program to “Pump Down” the groundwater was specific to lower groundwater elevation by 25 feet so that the seep area [890a/b] would not emerge. That result would also falsely ‘lower’ the results because the normal mix from multiple fracture/flow areas would instead be limited to treated water, which...would not reflect the conditions experienced by [downstream] receptors in a wet year...where more surface runoff sediment would erode and be carried with the water, potentially freeing previously secure contaminants [...trapped in the bedrock] 	<p>An additional consideration was to have sufficient samples to evaluate potential exposures to the primary constituents detected in surface water leaving the Site, while not including data that are clearly not representative of current conditions. To accommodate these data needs, the sampling period from February 19, 2009 to the most recent sampling event in March 2016 will be used. This sampling period provides at least 5 sampling events for each outfall.</p> <p>Also, discharge frequency used for the analysis will reflect long-term rainfall conditions, not solely the recent drought period.</p>
7d	<p>Using data limited to the last five years is problematic for several reasons:</p> <ul style="list-style-type: none"> - By limiting the data to years where very few samples were taken, the data population for meaningful statistics will be too small when millions of reports documenting the operable past are available. It seems that there is an unwarranted focus on the current condition being “non-operable” when all the contaminated soil largely remains at the site. 	<p>See responses to comments #5d and #6d above.</p>
8d	<p>The cleanup plan for how the cleanup will be handled has not even been presented to the public.</p>	<p>Comment isn't related to the HHRA Work Plan.</p>
9d	<p>There seems to be a continued effort to look at the past accomplishments as if they have solved the problem, when the primary cleanup has not yet begun. ...it has been used by Boeing surrogates such as SSFLCAG to claim that no more work is needed and that people should be satisfied with leaving the remaining contamination in place. With the continued violations of the NPDES permit levels on a year-by-year basis...the work is not finished...</p>	<p>It should be noted that the purpose of the HHRA of Surface Water Runoff is to evaluate the risks of exposure to surface water flows from the SSFL outfalls. Given that future, post-remediation surface water quality is unknown but is expected to be improved relative to current conditions, recent water quality data from the outfalls were conservatively chosen to represent this long-term period, and to thus allow for a conservative HHRA analysis.</p>
10d	<p>Meaningful understanding by the public of the site conditions has also been damaged by the site lead regulator [DTSC], who has deferred communication to the public to polluter surrogates and has failed to uphold requirements under the law to protect the process...</p>	<p>Comment isn't related to the HHRA Work Plan.</p>
11d	<p>Reducing the dataset to non-operational years provides</p>	<p>The purpose of the HHRA is to evaluate current and potential future</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	<p>another basis for special interest groups to misuse data to claim that nothing happened at the site, the contamination is somehow “not real” and therefore cleanup is not needed.</p>	<p>conditions in the context of long-term stormwater exposure scenarios. As discussed in the Work Plan, the data reflects current conditions following the termination of industrial operations, as well as what may be occurring in the future (e.g., following remediation). An important consideration in evaluating the data for the HHRA are the changes in site conditions that have occurred over time, including stormwater BMPs, interim remediation and ISRA, and demolition. The operation of the onsite package type sewage treatment plants was terminated in late 2004 and the rocket engine testing operations terminated in 2006. As a result, older historic data do not reflect actual current conditions.</p>
12d	<p>Dangerous and false rhetoric has been aggressive and all views to the contrary have been pushed out, and are not allowed to be presented. In fact, the LA Regional Water Control Board is the only resource we have in this process that is NOT biased and works to solve the problems to protect for the future.</p>	<p>Comment noted.</p>
13d	<p>If this limited data set is used, then it is imperative that limitations on the data be applied so that these falsely lower concentration estimates are not used to rewrite history as we have seen by both extreme sides of the issue.</p>	<p>An evaluation of the data set and the impact on the risk assessment will be addressed in the uncertainty assessment. The final document will also clearly enumerate the historical site activities that had stopped prior to the time period when the data was collected for the HHRA. It will also enumerate the activities that were ongoing during the sampling period and when ISRA or other interim actions were performed.</p>
14d	<p>Making people more afraid of trucks than of the radiological and chemical contamination, which this board has acknowledged to be massive in nature, is a disservice to the surrounding affected public and more importantly, does not serve the purpose of a CAG which is to help inform the community about a corrective action to be taken, not to cover it up...</p>	<p>Comment isn't related to the HHRA Work Plan.</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
15d	<p>This health risk assessment assumes a land use scenario of open-space, when Boeing has repeatedly said in public, "Suburban - There has been no formal or written promise or guarantee of open-space designation for future use. - Boeing can only speak for their portion of the site since the portions owned by the Federal government... do not have a known future use..., and until those decisions are made, no consideration for a lesser level of cleanup should be considered.</p>	<p>Comment isn't related to the HHRA Work Plan for Surface Water Discharges</p>
16d	<p>The Boeing Company has insisted that it doesn't have to adhere to the assumption of backyard gardens, which is truly absurd considering the likely home values...</p>	<p>Comment isn't related to the HHRA Work Plan for Surface Water Runoff.</p>
17d	<p>Risk assessments done on surface water flow exiting the site need to consider the historic use of these drainages and potential erosion of bank sediments carrying historically higher contaminant concentrations. The purpose of needing this risk assessment is NOT because of activities during remediation years—this is about the severe burden of impacts over a 60-year period of rocket development and testing.</p>	<p>The HHRA for surface water runoff will utilize the surface water data collected from February 2009 through March 2016. The NPDES permit does not address soil or sediment on the SSFL site. However, sediment in the drainages, including areas near the outfalls, is being addressed as part of site cleanup activities in accordance with three regulatory orders with oversight by the DTSC.</p>
18d	<p>To only include non-operational years would fail the purpose of having a risk assessment. Excluding rocket tests where millions of gallons of TCE and other offspec fuel chemicals were used and discharged directly into the drainage, as a matter of procedure for decades is ludicrous. ...Operational years, where historical detection levels were often thousands of times higher than that which flows today, should be included for the purpose of identifying potential risks, which may not be as apparent using non-operational data.</p>	<p>See response to #11d. TCE and other fuel chemicals have not been detected or detected at elevated concentrations in storm water runoff from the site. Historical elevated detection levels have been addressed by stipulating the analytical methods and corresponding minimum levels to be used when analyzing the samples for a particular pollutant.</p>
19d	<p>Annual rainfall fluctuates greatly, so high impact years of discharges and transport mechanisms that define and complete exposure pathways will affect the impact of those concentrations. If a later year results in two times or more rainfall, it can be expected that previously stable impacts could potentially be displaced downstream. ...By including wet and dry years, a more representative depiction of the</p>	<p>We agree that the amount of rainfall may change the concentrations of pollutants noted in the discharge. However this effect is somewhat mitigated by the use of backup stormwater media filters which treat the water prior to discharge. When storm runoff volumes exceed storage capacity at the ponds in watersheds 011 and 018 and runoff flowrates exceed treatment capacity at the Storm Water Treatment Systems, then backup flow-through media filters at Outfalls 011 and</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	potential conditions at the site can be postulated...	018 are used to treat overflows. Data collected from February 19, 2009 through March 2016 will be included in the HHRA. Therefore, the discharge events used for the exposure analysis will reflect long-term rainfall conditions, not solely the recent drought period.
20d	Changing groundwater elevations alter the flow pathways taken by water depending on flow, duration of flow and quantity per hour of flow.	Comment isn't related to changes in technical content of the HHRA Work Plan as it is only addressing surface water discharges from the site.
21d	...10 year and above storms are documented where berms failed and contaminants held at the Area 1 Burnpit as well as other areas washed downstream. The entire burn pit area continues to be tarped to this day.	The Area 1 Burn Pit may have been the source of pollutants in historical discharges. However, as you mentioned it is currently covered, thus prohibiting rainfall runoff from contacting pollutants in the area. Also any runoff from the area will exit the property via Outfall 11 and subsequently Outfall 001. Data collected at these outfalls will include contributions from Area 1 Burn Pit that from February 19, 2009 to March 2016.
22d	Since future land use has not been resolved, we have been seeking designation as a National Monument for the purpose of protecting and honoring the Native American artifacts as well as the significant national space history that took place at the site. We believe this will provide assurances of a proper cleanup, a reasonable cleanup, and a known outcome which allows for a smart cleanup which ensures that there will NEVER be houses built at the site. The only way residential development of the property can be avoided is by such designation that ensures an enduring and known future such as a National Monument...	Comment noted however it isn't related to changes in the technical content of the HHRA Work Plan for Surface Water Runoff.
23d	Since all of the remaining test stands are on NASA federal property, as well as R2 detention pond complex, it is not reasonable to apply the lesser standard between the "Boeing cleanup plan based on future land use, and that of the Federal Government where the future land use is not known.	Comment isn't related to changes in the HHRA Work Plan for Surface Water Runoff.
24d	The assertion that less regulation is okay because site operations have ceased is inappropriate, especially when massive grading of these contaminated areas is being planned for the next year. Historic concentrations have not always been reduced over time, so this continued assumption can be problematic for areas where persistent	Regional Board staff has not asserted that less regulation is "okay" at the Boeing SSFL. In fact, the Regional Board has used existing regulation to the full extent to control the discharge of pollutants in surface water and to protect human health and the environment. The HHRA Risk Assessment for Surface Water Runoff from the site is one tool used to evaluate the potential effects of discharges from

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	impacts are resurfacing and are not fully understood, such as the WS9a seep cluster, north of Outfall 2.	the site.
25d	While site operations have ceased, massive grading is planned for the excavation and soil removal for the cleanup of the site, which will potentially create erosion control challenges, especially if an El Niño year happens.	The HHRA report will provide additional discussion on the changing conditions of the site and how that may affect surface water quality. Soil remediation projects will be conducted under Stormwater Pollution Prevention Plans (SWPPPs) that will control and minimize offsite migration of pollutants in storm water runoff.
26d	Reducing accountability on numeric limits or the breadth of data is inappropriate and inadequate to protect the local populations.	There has been no reduction in the accountability on numeric effluent limits or in the breadth of data required to complete an analysis. The HHRA Work Plan does not modify the current permit in any way. The NPDES permit is effective for five years as per the regulation. The Work Plan for the HHRA of Surface Water Runoff actually captures in excess of the five years of data, from February 2009 – March 2016.
27d	The effort to “not look” has been used at an alarming level by the responsible parties, where samples and monitoring is resisted and avoided.	Comment isn’t related the HHRA Work Plan for Surface Water Runoff.
28d	...Boeing has proposed “monitored attenuation” as a solution to the problem. This does not adequately address the problem....	Comment isn’t related to the HHRA Work Plan.
29d	It is important to compare areas where interim measures have vastly improved the conditions to those where no interim measures have occurred.	Since this HHRA Work Plan addresses surface water runoff, that runoff will in some cases traverse areas that have had interim actions and areas that have not. Once the runoff is mixed in the ponds it is impossible to distinguish where the runoff has come from. The purpose of the HHRA for Surface Water Discharges is to evaluate the potential risk associated with the discharges that occurred during the targeted time period (February 2009 – March 2016).
30d	While Outfalls 8 and 9 have improved from the extraordinary work done on the outfalls and careful modification to all tributary drainages contributing to the flow of surface water..., the other portions of the site have not received the same level of attention where focus has instead remained on collecting and containerizing contaminated water and managing discharges through the use of pond-capacity management.	Comment noted, however it isn’t related to changes in the technical content of the HHRA Work Plan.
31d	For five-year storm events and larger, the area where the	Comment noted, however it isn’t related to the HHRA Work Plan.

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	<p>majority of surface water flow exists (60%—Outfall 2), is not being adequately addressed considering the known emergence of contaminants upstream of the outfall. This will not adequately protect the public without addressing the similar challenges to the other watersheds. The same hard work done...for 8 and 9 should be applied to the other external outfalls, especially 1, 2 to the south, and 3, 4, and 5 to the north.</p>	
32d	<p>The long-term planned work to improve these steep drainages to “wear the water out” by meandering flow channels, modifying culverts and stone work has vastly improved the water quality leaving the site both to the north and to the east. This is what works and has made people living near the site SAFER thanks to the work of this Board. Looking to solve problems for the long term, even with their interim measure approach, is crucial and what I feel is still needed here...</p>	<p>Comment noted, however it isn't related to the HHRA Work Plan.</p>
33d	<p>“..The periodic burning of off-spec fuels in ponds may have produced polychlorinated dibenzodioxins and dibenzofurans. Special attention to TCDD 2378 congeners is appreciated as they generally implicate site-operationally generated dioxin versus those from local brush fires, which has historically been used by the discharger as an excuse to avoid this issue. We can tell the difference through this analysis approach, and we should pay special attention to these congeners providing that indication, especially because of the much higher toxicity quotient.</p>	<p>Comment acknowledged. The HHRA will evaluate all detected dioxin congeners.</p>
34d	<p>In this report, it describes the percentage of runoff that travels to the south via Outfalls 1 and 2 to be 60%. I appreciate this modification. In early NPDES permit data, this number was altered to reflect 90% (leaving only 10% traveling to the north). I have emphasized the importance of properly locating the actual outfall where samples are collected to an area where water flows during rain events. This is currently not the case at Outfall 2 based on the information I've been provided during my inquiries following rain events.</p>	<p>Comment noted.</p>
35d	<p>While I appreciate the addition of Outfall 20 and the</p>	<p>Comment isn't related to changes in the technical content of the</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	<p>construction necessary to proper discharge of water to the TWO drainages in a balanced way that supports both drainages, I think it's crucial that we emphasize that the seep discharge near 890 which has traditionally been problematic at levels over 1000 µg/l in chlorinated solvents and should be included specifically in this risk assessment process... A localized treatment-train system that wears the water out locally using UV solutions similar to the GETS would be helpful in preventing further damage to the ecosystem.</p>	<p>HHRA Work Plan. This issue is being addressed under DTSC oversight.</p>
36d	<p>Instead of worsening drought conditions by pumping down water elevations, water quality can be improved without negatively impacting downstream receptors by installing local treatment train solar powered system to address impacted seeps.</p>	<p>Comment isn't related to the HHRA Work Plan.</p>
37d	<p>Bell Creek was always year-round, and with the exception of the compounded drought conditions with pumping activities, the creek hasn't been dry in 20 years. Downstream receptors should be considered based on flowing years, as that is more protective and the purpose of the HHRS.</p>	<p>The focus of the HHRA is on surface water leaving the site and current and planned future uses of the drainage areas immediately adjacent to the SSFL. The data collected from flows exiting the site will be used in the HHRA evaluation. This data represents the discharges that have occurred.</p>
38d	<p>The purpose is to assess the nature and probability of adverse health effects in humans resulting from exposure to constituents in environmental media. It is therefore critical to properly assess exposure pathways to sensitive receptors downstream.</p>	<p>Please see response to comment #37d.</p>
39d	<p>While it is acknowledged that there are active treatment systems since 2011 at Outfalls 11 and 18 respectively, there have been gaps of months and even years where the system was not operable. ...it cannot be effective if it isn't operational. At one point, they had a program where they turned all pumping systems OFF for a multi-year period in order to observe the effects in groundwater elevation...</p>	<p>Comment isn't related to the HHRA Work Plan.</p>
40d	<p>The 2007 Consent Order for Corrective Action mandated that elevation monitoring FLUTE lined wells be installed across the site in order to better understand the impact of groundwater treatment and better understand potential migration patterns. The liners were installed for that</p>	<p>Comment isn't related to the HHRA Work Plan. The Resource Conservation and Recovery Act assessment and clean up at SSFL is proceeding with DTSC oversight. Groundwater contamination, assessment and cleanup will be addressed via that program.</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
41d	<p>purpose... and earlier this year, we learned that “all” of the FLUTE liners were inoperable and had been inoperable since December, 2013. ...penalties for failing to comply with the requirements of the 2007 order...should be collected from all three parties...</p> <p>It's important to accurately describe the current conditions in place for surface water runoff management. It also indicates that these outfalls receive discharge from undeveloped buffer zones, but it is also true that waters discharging from these outfalls include operational areas such as the R2 pond, which is one of the most impacted areas, in that no matter where surface water begins at Santa Susana, it ends at the R2 pond and discharging to the south as long as precipitation levels remain at a manageable level.</p>	<p>The time periods selected for the HHRA will use all of the monitoring data collected from the targeted outfalls during that period. Effluent concentrations at Outfall 18 included discharges from the R2 pond.</p>
42d	<p>Edible aquatic plants and fish are present downstream from the outfalls in Bell Canyon and therefore should be considered “complete” as part of a risk-based pathway to aquatic organisms. In order to properly measure the completeness of this pathway, please be certain to evaluate the entirety of the Bell Canyon drainage down gradient from outfalls 1 and 2, 19, and the future 20.</p>	<p>The completeness of this pathway will be evaluated in the HHRA and if determined to be complete will be included in the risk assessment. This analysis will be included in the final HHRA report.</p>
43d	<p>[At] SRE Outfall 4, ...the sampling is done in a location that misses all surface water flow that comes down the concrete swale which was expressly built to carry contaminants down to the former SRE pond...”</p>	<p>The location of the sampling point for Outfall 004 was modified to capture the runoff from the concrete swale which transported contaminants down from the SRE pond. However, in most instances instead of allowing the runoff to discharge via Outfall 004, the runoff is collected and pumped to the Silvernale Pond where it is mixed with other runoff from around the site prior to being treated by the Storm Water Treatment System and discharged via Outfall 018.</p>
44d	<p>It is stated that changes to site conditions over time and reduction of impervious surfaces should assure us that fewer violations of contaminant concentration action levels will occur because of significant changes and BMPs. While the conditions of the site have significantly improved for Outfalls 8 and 9..., it does not acknowledge that the other outfalls have received very little improvement. ...The bulk of the soil volume required to cleanup...has not even begun, so it is incorrect to state that conditions in water quality are assured</p>	<p>The HHRA report will provide additional discussion on the changing conditions of the site and how that may affect surface water quality. Interim actions addressing soil impacts at a number of locations throughout the site have been completed. This HHRA for Surface Water Discharges however, only addresses the surface water discharges from the site. It will not address pollutant concentrations in the soil or sediment.</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
45d	<p>to be improved over time. Throughout the course of cleanup at all outfalls, it is expected that increases in erosion and contaminant release on a temporary basis will occur. ...Risk assessment...must include estimates of likely exposure, not hopeful exposure levels. Assessment assumptions must include both dry and wet years.</p> <p>...upstream from outfall 2, but south of the operational border is a seep cluster south of WS9a, where average concentrations of VOCs such as TCE in excess of 1000 µg/l, and pond storage capacity has been well managed, but not free of violations on a fairly regular basis. Since this area is expected to be contaminated, it cannot be assumed that the outfall down-drainage from this location will be free from contaminants. The lacking sampling data for Outfall 2 is indicative of misplacement of the actual sampling collector... Perhaps during the design and installation of Outfall 20, a more appropriate location for Outfall 2/20 can be considered to ensure that regular flow that we observe daily is captured in the monitoring program.</p>	<p>Data collected from groundwater wells and seeps are being addressed under DTSC oversight. Sampling of discharges from Outfall 002 have not yielded exceedances of the limitation included in the permit for TCE. However, all of the data available for the targeted period, February 19, 2009 through March 2016, will be used for the assessment.</p>
46d	<p>...It is recommended that data include the years 2002 thru 2015....</p>	<p>Please see response to comment #5d.</p>
47d	<p>Since specific wells were installed to gain a better understanding of water quality for the Outfall 2 watershed, ...it is recommended to include these seep wells as the flow matrix for the fractured bedrock lacks data given the historic high concentrations.</p>	<p>Data collected from groundwater wells and seeps are being addressed under DTSC oversight.</p>
48d	<p>...It is...reasoned that [historical] high contamination levels... have been captured and remain sequestered in the bedrock. ...high-concentration clusters... would potentially later be released and carried along with surface water flow during times of high precipitation and water flow...</p>	<p>We are aware of the quoted assertion regarding the transport of contaminants that may be present in bedrock. This issue and other concerns regarding groundwater wells and seeps are being addressed under DTSC oversight. The HHRA Work Plan for Surface Water Runoff will only address data collected during surface water discharges from the facility for the targeted monitoring period.</p>
49d	<p>It is suggested that no exposure pathways are complete despite children playing in the drainage of Bell Canyon just below the site on a daily basis. Homes line the creek for more than two miles on both sides, so it cannot be stated that there are no human receptors, especially considering</p>	<p>Young child, child and adult exposures are being evaluated in the HHRA. The dataset being used is for surface water leaving the site at the outfalls. As a result it will reflect the contribution from the site that may be present at areas farther downstream.</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	<p>dermal contact and the requirement of crossing the creek multiple times in order to follow the hiking trails designed throughout. They are utilized daily and so it cannot be stated that these crossings by humans and horses do not matter when the known impacts of 1000 µg/l are just upstream. ... one hike [along the "Pressman Trail" would include potential dermal contact at 14 different crossing activities [in Bell Creek]... The well-known "Waterfall Trail" is less than 1/4 mile downstream from the property line to Santa Susana and this trail, because it includes a year-round waterfall, is very popular with families with children of all ages, so there cannot be exclusion of "young children" in the assumptions used here.</p>	
50d	<p>It is stated that flow is intermittent at the other outfalls (excluding 19 and 20) when indeed, the Waterfall Trail includes a year-round waterfall that is fed by seeps leading from Santa Susana. Since this flows every day all year long, ...it should not be assumed here that flow is intermittent...</p>	<p>Comment acknowledged. Assumptions of this nature will be documented in the final analysis.</p>
51d	<p>Use of calibrated hydrologic models seem to have been faulty in their assumptions. Since there is data available for high precipitation years, that data should be used.</p>	<p>Flow information will be evaluated and presented in the HHRA. Discharge data used for the analysis will reflect the rainfall conditions from February 2009 through March 2016, not solely the recent drought period.</p>
52d	<p>Assumptions include a statement that all water comes from groundwater treatment system at Outfall 2, but the seeps run 24/7 365 days per year, and therefore indicate groundwater seep emergence as the source (just 10 meters south of Outfall 2, but still on Boeing property)...</p>	<p>Seeps are being addressed under DTSC oversight. If the seeps are discharging continuously the discharge may be seeping back into the ground and the amount of water has not been sufficient to result in discharges from Outfall 002. Discharges south of Outfall 002 will not be included in the HHRA.</p>
53d	<p>...the severity of the topographical slope present in Bell Canyon... means that during multi-day heavier rain events, a much larger volume can be expected... [and] bank storage impacts can easily be released...</p>	<p>Comment noted; however it isn't related to the HHRA Work Plan.</p>
54d	<p>The incidental dermal ingestion estimates seem to be underestimated and should be modified to adequately consider those heavy five and ten year storm releases, of which we have had many in the last three years throughout the State.</p>	<p>Data collected from February 2009 to March 2016 will be included in the HHRA. The factors used to estimate exposure will be based on the recommendations included in regulatory guidance from USEPA and presented in the Work Plan.</p>
55d	<p>... what is not discussed or adequately acknowledged is the</p>	<p>Recent flow monitoring data from the outfalls, combined with output</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
	<p>full-year nature of Bell Creek. To describe this creek as ephemeral when it runs every day for decades is inappropriate and even inaccurate. As a result, the repeated nature of exposures due to residential living habits in the canyon where dedicated trails with signage are used for exercise by the residents should be addressed. This potentially increases the exposure rate due to increased metabolic rates during times of exercise or exertion. ...It is therefore recommended that this higher level of recreation... should be considered during risk assessment evaluation.</p>	<p>data from calibrated hydrologic models where available (e.g., Outfalls 008 and 009), will be used to estimate annual discharge frequency, and may be adjusted where necessary to reflect an average rainfall year. This information will be used to estimate the days per year (exposure frequency) that exposure to surface water may occur for each outfall. The discharge frequency used for the analysis will reflect long-term rainfall conditions, not solely the recent drought period.</p>
56d	<p>I am deeply troubled by the preference to model this information when there is data from previous years...</p>	<p>Please see response to comment #55d.</p>
57d	<p>... February of 2005 had record rainfall, and therefore would be important to include in the data. ...It is recommended that annual precipitation data, along with historic violation data, be compared in order to assess potential association between precipitation levels with water quality violations. It's important that the health risk assessment be designed to consider years of potential violation is it is associated with risk. ...it is critical to include representative data of what future flow might look like considering fluctuations...</p>	<p>Site conditions have changed dramatically since 2005 due to the institution of stormwater BMPs, interim remediation and ISRA, and demolition. SSFL no longer operates the package type sewage treatment plants onsite and rocket engine test operations have since been terminated. These changes have resulted in significant changes on the site due to the removal of contaminants, structural improvements in stormwater management, and reduction in impervious surfaces. Therefore data from 2005 do not reflect current conditions. The data included from February 2009 through March 2016 is reflective of current site conditions and activities.</p>
58d	<p>There are never water violations if the water isn't flowing. This fact needs to be balanced with making sure that water is not deprived from receptors that rely on it, i.e. wildlife and plant life receptors, including riparian and benthic environments.</p>	<p>Comment noted. However, it isn't related to the HHRA Work Plan.</p>
59d	<p>The idea of averaging for the purpose of attaining an EPC is yet another step to assert that no people are potentially in harms way.</p>	<p>The EPC is derived to reflect a conservative yet realistic estimate of the average concentration a person may be exposed to over the assumed exposure duration. Therefore, all of the data over the time period will be combined for each outfall and used to derive an average concentration for each outfall. The 95 percent Upper Confidence Limit of the average concentration (95UCL) will be used when sufficient data are available to address the uncertainty in the data.</p>

**Revised Human Health Risk Assessment Work Plan for
Santa Susana Field Laboratory Ventura County, CA**

#	Comment Summary	Response
60d	<p>The map attached [Figure 1] doesn't even include the context of the surrounding houses that are right up against the property border, and the outfall numbers on the map are indeed illegible. How can any decisions be made or understood when the map doesn't properly indicate these primary details?...</p>	<p>Comment acknowledged. A revised figure will be prepared.</p>
61d	<p>Assumptions of likely cancer rates of one in three for women and one in two for men should emphasize the importance of NOT adding incremental risk to the surrounding human receptors as well as wildlife who are also reduced to seeking water where there is limited water access. The impairment of water quality in Bell Creek has particularly high potential impacts to the surrounding wildlife because it is often the ONLY water source in the region as it is the only year-round creek.</p>	<p>Comment noted.</p>
62d	<p>Removal of COPCs based on fewer than 5 detections: This is inappropriate, especially when purposefully using non - operational and drought years. I request an audit comparison of rainfall and sampling for the last ten regulatory years to ensure that the actions taken here are used to address the problem and improve the conditions, and not to explain away discharges that potentially cause harm... Examples like the "pure product" concentration levels found deep within Core Hole 6 indicate that massive concentrations remain sequestered by various means, that in no way guaranteed to continue. Any change in groundwater elevation can change sub-surface flow significantly over time, with changing elevation conditions, and these cannot necessarily be controlled in the future.</p>	<p>All chemicals detected in at least one sample will be included in the HHRA (see Section 2.2 of the Work Plan).</p>