DEMOLITION OF RADIOACTIVE STRUCTURES AND THE DISPOSAL AND RECYCLING OF THE DEBRIS FROM THE SANTA SUSANA FIELD LABORATORY NUCLEAR AREA AND THE ROLE PLAYED BY THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL AND THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

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EXECUTIVE SUMMARY

This report examines questions regarding the actions of the California Department of Toxic Substances Control (DTSC) and the California Department of Public Health (DPH) approving a project to demolish Boeing nuclear buildings at the Los Angeles-area Santa Susana Field Laboratory (SSFL). SSFL, in the Santa Susana Mountains/Simi Hills overlooking the western San Fernando Valley and Simi Valley, is the site of a partial nuclear meltdown and numerous other radioactive accidents and releases.

Boeing has recently begun tearing down buildings and other contaminated structures from the nuclear area and disposing of the wastes, not in licensed Low-Level Radioactive Waste (LLRW) disposal facilities, but in municipal and hazardous waste landfills not licensed or designed for radioactive wastes. They have also been recycling metals and other materials. Boeing's own data analyzed in this report indicate that those structures were radioactively contaminated.

DTSC and DPH are about to approve, and Boeing is about to commence, demolition and disposal of the **plutonium fuel fabrication facility**. Plutonium is one of the most toxic substances on earth; a few millionths of an ounce, if inhaled, will cause lung cancer with a virtual 100% statistical certainty.

Four other former nuclear facilities are set to soon be torn down as well. The remnants of a sixth reactor building have been approved recently for release. The debris from all of these radiological facilities is to be disposed of in landfills neither licensed nor designed to safely handle radioactive waste.

The radioactive work took place in Area IV, which housed ten nuclear reactors, a plutonium fuel fabrication facility, a "hot lab" for cutting apart irradiated nuclear fuel and manufacturing radioactive sources, an accelerator, various "criticality" facilities, a burn pit in which radioactively contaminated wastes were burned in the open air, and numerous other radioactive operations.

One of the reactors suffered a partial meltdown in which a third of the fuel experienced melting; radioactive material was exhausted into the atmosphere for weeks. At least three others suffered accidents as well. None had containment structures. Decades of accidents, spills, and other releases led to widespread radioactive and hazardous chemical contamination of soil, groundwater, surface water, and structures at the site, as well as migration offsite. The work involving radioactive materials was conducted in part under California Radioactive Materials Licenses issued by the state to Boeing and its predecessors pursuant to delegation of regulatory authority by the Atomic Energy Commission under the "Agreement State" provisions of the Atomic Energy Act.

In April of this year, at DTSC's request, Boeing amended its procedures for building demolition to include its radiological facilities in Area IV and to allow for the disposal of the waste in sites not licensed for LLRW. DTSC approved these revisions. There was no opportunity for comment and no environmental review. Under these amendments, Boeing submits proposals to the state for review and approval of the teardown and disposal of particular radiological buildings. Again, no formal public notice or opportunity for comment is provided, and there has been no environmental review pursuant to the California Environmental Quality Act (CEQA).

DTSC has initiated a site-wide Environmental Impact Report (EIR) for the cleanup of SSFL, but it is not expected to be completed before 2015. The CEQA review of the cleanup of SSFL thus is still a couple of years off in the future, but the cleanup actions associated with the buildings and other structures are occurring now, naked of CEQA coverage. CEQA, obviously, is premised on performing the environmental review *before* taking action that could affect the environment.

Six structures characterized as "non-radiological" have recently been demolished and their debris disposed of in landfills not permitted to take LLRW and by recycling. A review of the radiation measurements for those structures, however, indicates that most if not all were in fact radioactively contaminated. Of the waste from those structures:

- **493 tons of metal were recycled into the commercial metal supply**
- **2432 tons of asphalt and concrete were sent for recycling**
- **1153 tons were disposed of in Class I landfills designed only for chemical, not radioactive wastes**
- **568 tons were disposed of in Class II landfills, designed for industrial, not radioactive waste, and**
- **242 tons were disposed of in Class III landfills, regular municipal trash dumps**

The California Disposal Destinations for the Waste Were:

Class I Landfill:	**Buttonwillow**
Class II Landfill:	**McKittrick**
Class III Landfills:	**Azusa, and Lancaster**

Not one of these is a licensed Low Level Radioactive Waste disposal facility.

The material sent from the nuclear area for recycling went to:

Metal Recycling	**Concrete/Asphalt Recycling**
Kimco—Sun Valley, CA	
Standard Industries—Ventura, CA	**Gillibrand—Simi Valley, CA**

A careful review of the measurements submitted by Boeing to DTSC and DPH demonstrates that much of the material which it has shipped off to unlicensed disposal and recycling facilities, and material which it now proposes to similarly ship off, is radioactively contaminated. Boeing itself admits in its submissions that a number of its reported measurements showed radioactivity levels above what is found in background (i.e., were contaminated), and even above the levels it describes as the limits of "acceptable" amounts of contamination.

Furthermore, the generic standards being applied by DTSC and DPH to approve the demolition and off-site disposal in unlicensed facilities have no health or risk basis and amount to underground regulations, having never been adopted by rulemaking or with an Environmental Impact Report, despite a judicial order and an executive order so requiring. And they are at variance with existing statutes and regulations that bar disposal of any radioactive waste in other than a licensed disposal facility.

Additionally, Boeing employed questionable procedures in making the measurements, asserting background levels that appear markedly inflated, using such short count times that detection limits were incapable of catching a large fraction of actual exceedances, and failing to follow established protocols requiring reporting hundreds of measurements that exceeded the critical level for identifying contamination. Nonetheless, Boeing's own reported radiation readings show that the material is contaminated, yet it has been sent out to recyclers, municipal landfills and other facilities not licensed or designed to handle radioactive waste.

Now DTSC and DPH are on the verge of approving the demolition of structures they concede were radiological facilities, including a plutonium facility, and allowing the waste to be sent to landfills that are not licensed LLRW disposal sites, without any prior environmental review as required by CEQA. The environmental and public health impacts could be significant. State and federal laws and regulations require that radioactive waste be disposed of in licensed LLRW sites for a reason. Placing such waste in facilities not designed for it can result in radioactive contamination of groundwater and exposure to the public through ingestion of water and the crops grown with it. Airborne radioactive particulates can be inhaled and lodge in the lung. Exposure to radiation from contaminated metals can produce direct radiation doses. All such radiation doses increases the risk of cancer, leukemia, and genetic effects.

The fundamental principle of environmental review is to assess the potential impacts *before* taking irreversible actions that could significantly affect the environment. DTSC and DPH should immediately cease approving the demolition and disposal of structures from the nuclear area of SSFL, and suspend any pending demolition and disposal, until they have conducted the required environmental review under CEQA.

Area IV, Santa Susana Field Laboratory

June 22, 2013 by William Preston Bowling

INTRODUCTION

The California Department of Toxic Substances Control (DTSC) and the California Department of Public Health (DPH) have been quietly approving proposals by the Boeing Company to tear down its buildings in the nuclear area (Area IV) of the Santa Susana Field Laboratory (SSFL) and dispose of the radioactively contaminated materials in landfills neither licensed nor designed for radioactive waste. They have also been approving the recycling of radioactively contaminated materials from these structures by shipment to metal and other recyclers. Numerous laws, regulations, court and executive orders, and other requirements bar disposal of radioactive waste in other than licensed radioactive waste facilities. Moreover, these project approvals have been issued by DTSC and DPH without any prior environmental review pursuant to the California Environmental Quality Act (CEQA).

As this report is being completed, DTSC and DPH are poised to approve the demolition of the **plutonium** building and the disposal of its debris in an unlicensed facility. Plutonium-239 is one of the most dangerous substances on earth. A few millionths of an ounce, if inhaled, will result in cancer with a virtual 100% statistical certainty.[1] Other radioactive former nuclear structures are in the queue, awaiting agency approval, with all of Boeing's radiological buildings apparently planned to be demolished and similarly disposed of in the near future.

These actions follow from DTSC approval of an April 2013 amendment to the Standard Operating Procedures (SOP) for demolition of buildings at SSFL to, for the first time, allow demolition and disposal of the Boeing radiological buildings in Area IV under the SOP and sets questionable radiation standards for such release. This critical SOP amendment was also approved without formal notice, opportunity for comment, or any CEQA review.

And yet, the state's Program Environmental Impact Report (PEIR) for site-wide cleanup of SSFL will not be completed until 2015, and indeed, has not yet even commenced. There has been no prior environmental review under the California Environmental Quality Act (CEQA) for this demolition and disposal project and any review under the state's planned PEIR would obviously be too late. All of the radioactive buildings would be down and their radioactive debris recycled or off in regular garbage dumps and other landfills not designed to safely handle such materials long before the PEIR is issued. Additionally, there has been no CEQA review nor Administrative Procedure Act (APA) rulemaking for the adoption of the generic standards DPH and DTSC are utilizing in allowing this release of radioactively-contaminated structures.

CEQA, of course, is premised on agencies analyzing environmental impacts, and the public being able to comment on those analyses, *before* the agencies act. There can be significant environmental impacts from disposal of wastes contaminated with these dangerous radioactive materials in facilities not designed or authorized for them and by recycling them. Plutonium-239, strontium-90, cesium-137, and the other radionuclides at issue here increase the risk of cancer, leukemia, and genetic effects if people are exposed to them. Groundwater, surface water, and soil can be polluted if these wastes are not properly isolated. The public can be exposed to radiation from contact with or other exposure to recycled materials like contaminated metals. Significant environmental harm can result if DTSC and CEQA do not stop these activities.

Some review of the site history, past efforts to dispose of materials in unlicensed sites, and the restrictions against such action may be useful before one turns to an analysis of the Boeing requests and the agency approvals of this dismantlement and disposal project and how they are at variance with CEQA and numerous other laws, regulations, court orders, executive orders, administrative orders, and other requirements.

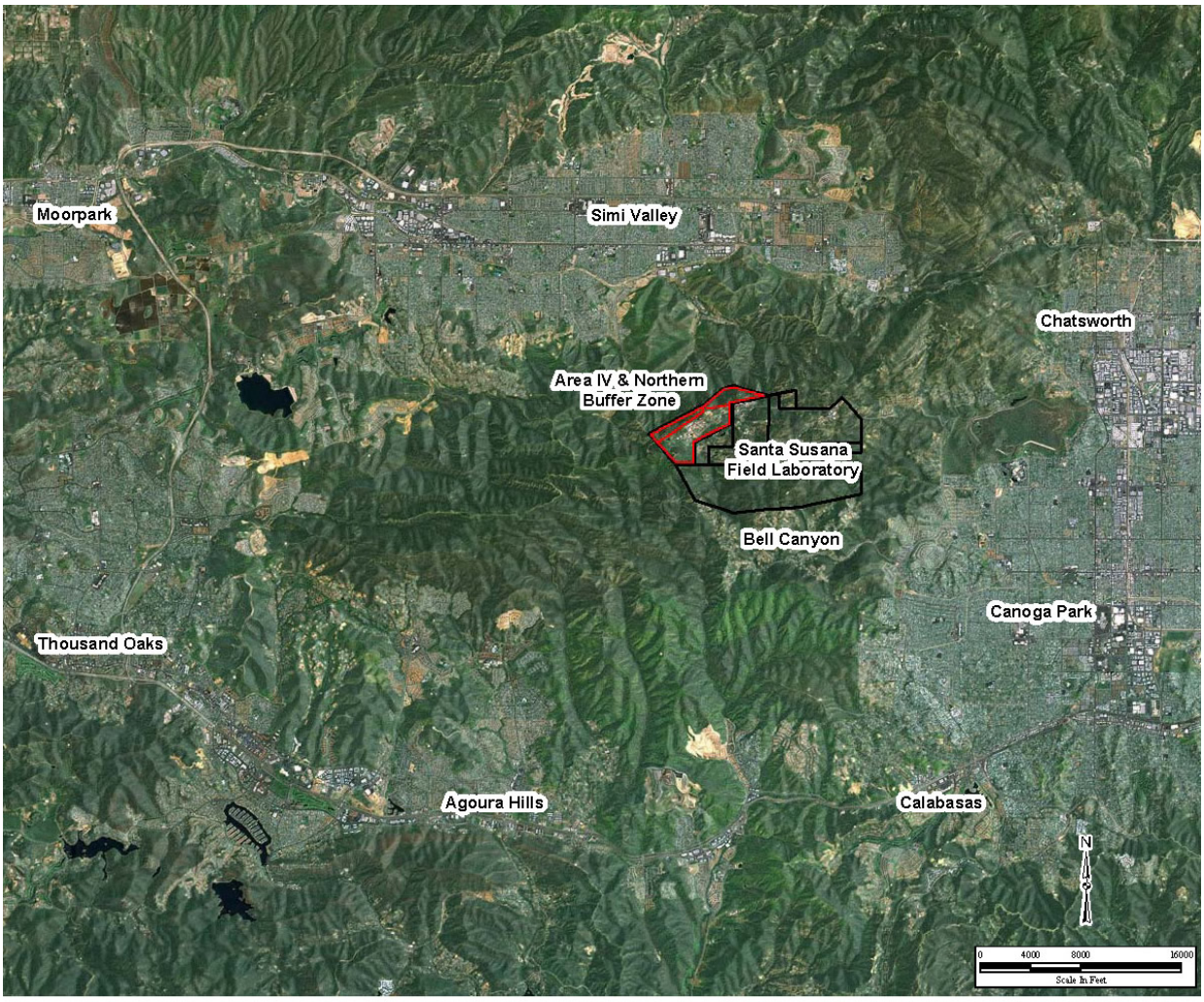
Site History

The Santa Susana Field Laboratory is a former nuclear facility, site of a partial reactor meltdown, located in the Simi Hills of Ventura County, about 30 miles from downtown Los Angeles. Beginning in the 1940s, it was initially developed by North American Aviation (NAA) to test rocket engines. In the 1950s, NAA's Atomics International division commenced nuclear work in Area IV, the section of SSFL of concern here, which spans 290 of SSFL's 2,850 acres.[2] (Subsequent name and ownership changes, to Rocketdyne, Rockwell, and then Boeing, resulted in the Boeing Company being the owner of most of the SSFL facility today. Hereafter, "Boeing" shall refer to Boeing and its predecessor operators of the site.)

The nuclear work took place in Area IV (at times known as the Nuclear Development Field Laboratory) of SSFL; it is the portion of SSFL where radioactive materials were authorized to be used pursuant to Boeing's California Radioactive Materials License. The other portions of the property were used for rocket testing.

As EPA has summarized it, radioactive operations in Area IV "included 10 nuclear research reactors, including the Sodium Reactor Experiment (SRE), seven critical facilities, the Hot Laboratory, the Nuclear Materials Development Facility, the Radioactive Materials Handling Facility (RMHF), and various test and radioactive material storage areas."[3] Boeing conducted contract work in Area IV for various private customers as well as the Department of Energy (DOE) and its predecessor the Atomic Energy Commission (AEC).

The SSFL site was chosen because of its then-remote location, so that work could be performed there which was considered too dangerous to be undertaken in more populated areas. However, in its years of existence, the population around the site mushroomed, and today over half a million people live within 10 miles of it.[4]



Source: EPA Radiological Characterization of Soils in Area IV and NBZ, Santa Susana Field Laboratory

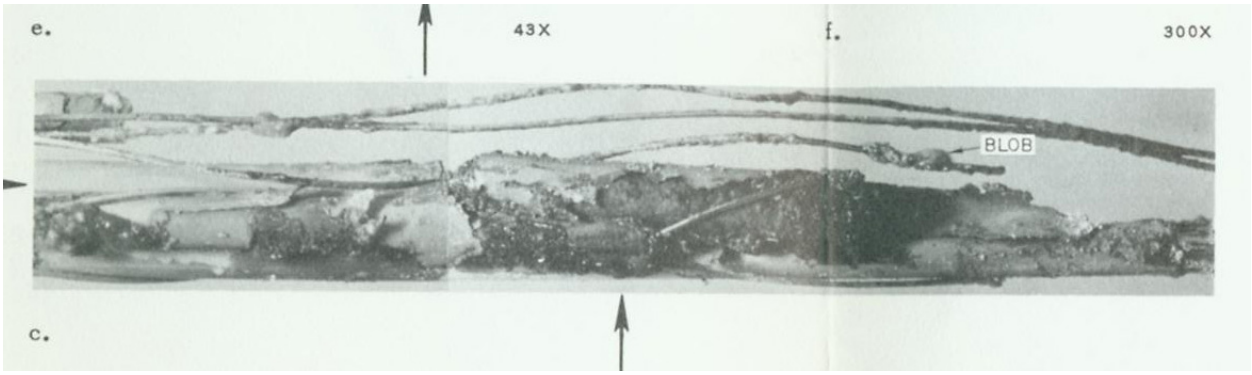
Widespread Radioactive and Chemical Contamination

Over the years of its operation, SSFL became heavily contaminated. Hundreds of thousands of gallons of trichloroethylene (TCE), for example, were released into the field laboratory's soils and groundwater.[5] There is also extensive contamination with PCBs, dioxins, heavy metals, perchlorate, and numerous other toxic materials.[6] Radiological contamination of soil, groundwater, and buildings and other structures in Area IV occurred as the result of decades of nuclear experiments, practices such as the onsite open-air burning of radioactive waste, and numerous documented nuclear accidents. These accidents and releases resulted in airborne deposition of radionuclides onto much of Area IV. Strontium-90, cesium-137, plutonium-239, tritium, and various other radionuclides pollute the site.[7]

The most significant of these accidents was a *partial nuclear meltdown*, which occurred in 1959 at the facility know as the Sodium Reactor Experiment, or SRE. The partial meltdown

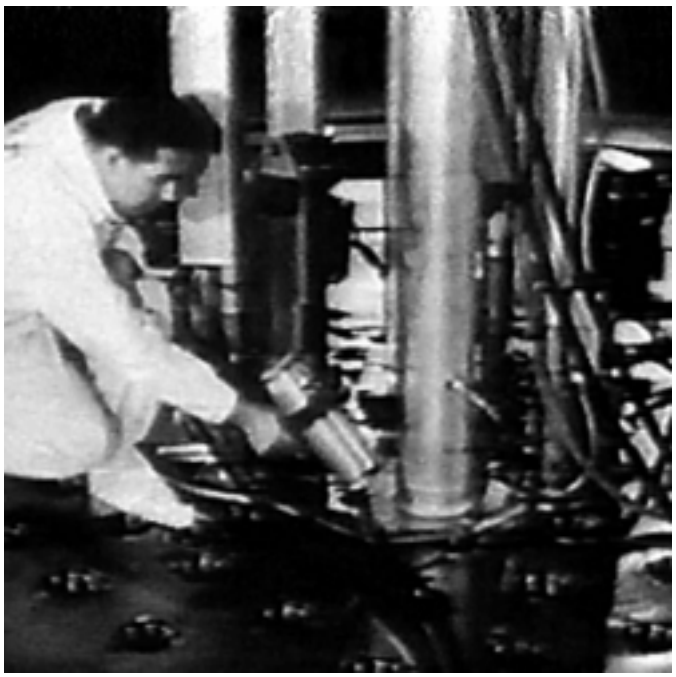
was not disclosed at the time,[8] and the public learned of it only twenty years later when UCLA students obtained and released to the news media documents detailing the accident.[9] The accident began with a power excursion, in which power ran out of control exponentially and the reactor could barely be shut down. Inexplicably, after just a few hours of trying unsuccessfully to figure out what had caused the incident, the operators started the reactor up again and kept it running for more than a week, in the face of off-scale radiation readings and other clear indications of problems.

When it was finally shut down, it was determined that thirteen of forty-three fuel elements had experienced melting. The reactor had no containment structure, the concrete dome surrounding modern reactors designed to keep radioactivity from entering the environment. For weeks during and after the accident, radioactivity released from the melted fuel was intentionally vented into the atmosphere. To this day, there remains debate as to how much radioactivity was released, in part because the radiation monitors went off-scale.[10]



Melted Fuel Rod[i] from SRE Accident[11]

[i] "blob" label in original government photo



Workers on Top of Reactor Core Engaged in Recovery Actions After Partial Meltdown

At least three other reactors at the site suffered accidents. The AE-6 (later called L-85) experienced a release of fission gases.[12] (As discussed later in this report, the remaining L-85 radioactive debris is, as this study is being finalized, about to be shipped for disposal at a landfill not licensed to receive low level radioactive waste.) Operation of the S8ER reactor, according to a company report, "was characterized by substantial release of fission products due to cladding failure occurring in about 80% of the fuel rods during the reactor's extended endurance run, and

by the uniquely high coolant temperature."[13] Another SNAP reactor, the S8DR, suffered similar damage to about a third of its fuel.[14]

In addition, there were scores of other incidents involving radioactive materials. There were numerous sodium fires that released radioactivity. Highly radioactive material was inadvertently dropped onto the floor from its shield cask when a wrong button was pushed, causing significant radioactive particulates to be released. Workers had to scrub walls for weeks with absorbent pads to try to reduce the radioactivity levels. Irradiated fuel exploded, lifting the shield plug and releasing radioactivity. Strontium-90 was dumped down drains that were supposed to be for non-radioactive material, contaminating a leach field. An open-air "burn pit" was dug to burn sodium-coated reactor components; no chemical or radioactive contamination was supposed to be put in it, but for more than a decade it was nonetheless, producing airborne fallout that deposited in the general area and contaminating the soil and groundwater. Contaminated water was dumped down ravines, polluting a nearby children's camp.[ii] Neutron irradiation of concrete buildings was the supposed source of a large plume of radioactive, tritium-contaminated groundwater. Airborne deposition from the decades of open-air burning of radioactive waste, accidents, and other releases created radioactive fallout that deposited on soil throughout Area IV.

A 1997 study by epidemiologists at the UCLA School of Public Health found that the more exposed workers at the site had significantly higher death rates from cancer of the lungs and blood and lymph systems than less exposed workers. Workers with the highest exposures had triple the death rate from these cancers as the lowest exposed workers, and cancer death rates increased monotonically with dose.[15] Other studies performed for the U.S. Agency for Toxic Substances and Disease Registry found that frequencies of various cancers in the offsite population increase with proximity to SSFL[16] and that releases of contaminants from SSFL exposed people residing in areas near the site to elevated levels of carcinogens and other toxic materials.[17] Additionally, a troubling cluster of retinoblastoma, a rare cancer of the eye affecting children a few months old and leading to chemotherapy and loss of one or both eyes, was reported in a neighborhood near the facility.[18]

History of Problems with Boeing Radiation Surveys

In 1989, a government report[19] identifying widespread radioactive and chemical contamination in Area IV was obtained and disclosed by the *Daily News.* The ensuing public concern resulted in a number of community groups coming together to oppose continued nuclear operation at SSFL, and a year or so thereafter the facility operators announced that all nuclear activity would cease and the focus thereafter would be on cleanup.

The public outcry also led then-Congressman Elton Gallegly to ask EPA to provide oversight of the site. EPA sent Gregg Dempsey, then Chief of the Field Studies Branch of the

[ii] A radiation survey overseen by EPA in the mid-1990s confirmed radioactive contamination of the camp. Litigation between the camp owners and Boeing resulted in a settlement and acquisition of part of the contaminated camp land, which became the Northern Buffer Zone of SSFL, adjacent to Area IV.

Office of Radiation Programs, to inspect the radiation monitoring program at SSFL. His report was very critical.[20] He found, for example, that vegetation samples were being washed before measuring radioactivity, which could wash off surface contamination, and then burned to ash, driving off the volatile radioactivity, so that the measurements potentially missed much of the radioactivity. Soil samples were similarly heated to temperatures that could drive off the volatile radionuclides. He concluded:

> The SSFL Radiological Lab needs updating very badly…. the SSFL sampling, placement of sample locations, and analyses cannot guarantee that past actions have not caused offsite impacts. If the environmental program stays uncorrected, SSFL cannot guarantee that unforseen [sic] or undetected problems onsite will not impact the offsite environment in the future.
>
> It is also clear to me that Rocketdyne does not have a good "handle" on where radiation has been inadvertently or intentionally dumped onsite. Most of the evidence on site spills is incompletely documented or anecdotal. DOE or Rocketdyne should conduct a complete survey of the site, specifically looking for other spill areas.

This criticism of the reliability of the company's radiation monitoring program was to continue for years, and in fact, to this day. In 1996, Boeing performed an Area IV radiological characterization survey (done by Phil Rutherford, the same individual responsible for the current Boeing radiation measurements and claims about the buildings being presently torn down which are the subject of this report.) In 1997, EPA issued a very critical review of the Boeing/Rutherford Area IV survey.[21] EPA found that the survey had used such short counting times and questionable detection limits that it could readily miss the radiation for which it was supposed to be searching. EPA also called into question the background radiation values Boeing was claiming. Similar problems related to counting times, poor detection limits, and questionable assumed background values associated with the 1996 soil survey are found now in the building surveys that form the basis for Boeing's current effort to demolish the buildings in Area IV and dispose of the debris in facilities not licensed for radioactive waste, as will be discussed later in this report.

The EPA 1989 call for a complete survey of the site and its criticism of the validity of Boeing's 1996 radiological characterization survey finally resulted in EPA being allowed to perform a multi-year radiation soil survey, released in December 2012, which, as will be discussed shortly, found hundreds of locations of elevated radioactivity, despite the fact that Boeing had claimed to have cleaned the site up twice before.

History of Controversies About Efforts to Dispose of Radioactive Wastes in Unlicensed Sites or Recycle Them Into Commerce Stream

In the early 1990s, SSFL shipped soil from initial efforts to clean up the contaminated Sodium Burn Pit to a Class I (chemical waste) landfill at Kettleman City. This is a facility not licensed to take low-level radioactive waste (LLRW); in recent years it has become quite controversial because of allegations that numerous birth defects in children born there may be related to the waste facility. Edgar Bailey, then Chief of the Radiologic Health Branch (RHB) of the California Department of Health Services (now Department of Public Health) wrote to DOE expressing concern about the shipments and reminding DOE that it or Boeing needed to get prior approval from his department in any such matter.[22]

DOE replied on August 12, 1993,[23] that in 1991, DOE establish a policy for "a more stringent set of procedures to demonstrate that hazardous waste generated in [areas where radioactive materials were handled] do [sic] not contain added radioactivity; if measurable radioactivity from DOE operations is found, then the wastes are to be managed as mixed wastes." (Mixed wastes are wastes mixed with hazardous and radioactive materials; they can be disposed of only in special mixed waste facilities.) Such procedures were approved for SSFL, requiring analysis for radioactivity: "Soil found to have *any* added radioactivity is segregated and *managed as low level radioactive waste* or mixed waste." (emphasis added). DOE stated further:

> **The DOE will not allow disposal of any soil or debris with DOE added radioactivity in any commercial (municipal) or hazardous waste landfill**, unless, pursuant to Title 17 CCR, Section 30104, DOE has submitted a request for exemption and that it is approved by the RHB.
>
> (emphasis added)

Note that DOE here commits to the state that no waste with *DOE added radioactivity* (i.e., nothing above background, as opposed to having DOE-added radioactivity but within some supposed limit of acceptable contamination) will be disposed of in a municipal or hazardous waste landfill. Moreover, it recognizes state authority, saying it will not breach that requirement unless it requests from the California Radiologic Health Branch a specified exemption under the California Code of Regulations and it is approved by RHB.[iii]

In 1999, low-level radioactive waste from a former Manhattan Project site in New York State was shipped to the Buttonwillow hazardous waste disposal facility in California's Central

[iii] 17CCR§30104 is a California regulation that allows for parties to apply for exemptions from particular state radiation regulations. No such 30104 exemption application has been filed by either DOE or Boeing regarding the current demolition program and disposal of debris from Area IV buildings. Furthermore, any decision to grant an exemption, even if Boeing were now to apply for one, would be a major agency action requiring CEQA review.

Valley.[24] Learning of the shipments only after they were nearly complete, RHB Chief Edgar Bailey issued a letter to the operators of the Buttonwillow facility,[25] stating:

> *Disposal of radioactive materials must be at a site that is licensed by this Department to dispose of radioactive waste or otherwise approved by this Department.* At the present time there is only one site in California licensed to dispose of radioactive wastes from other persons, and that site is not currently built or operating.
>
> *The Safety-Kleen (Buttonwillow), Inc., site is not licensed by RHB to dispose of any radioactive waste. In fact, this facility is not even licensed to receive or store radioactive material of any sort. For the facility to receive, store, or dispose of any radioactive waste, including the material described in your letter, would be a violation of California law* and would subject you to potential monetary penalties. Such a violation is also a misdemeanor.
>
> I hope that this letter unequivocally states this Department's position regarding the disposal of the wastes alluded to in your letter.
>
> (emphasis added)

Bailey also noted, "The status accorded to a material or waste by another legal jurisdiction has no bearing on this California determination" that it is subject to regulation and licensing as radioactive material in California."[iv]

Efforts to Recycle Contaminated Materials and the Suspension of that Practice

Nonetheless, efforts to dispose of radioactive waste in the state's primary hazardous waste landfills continued. Because of concern about the teardown of some buildings in Area IV, it was eventually agreed that an EPA contractor would be allowed to perform some measurements on buildings before they were torn down. However, after months of arrangements, when the EPA contractor and EPA regional personnel arrived at the site for the survey, in early January 2000, they found Boeing had already torn down half of the buildings that EPA was supposed to be checked had already been torn down, just weeks before, including SRE buildings. EPA expressed substantial displeasure at the demolition before the EPA confirmatory surveys could be conducted, but another troubling issue was also revealed.

[iv] The particular materials in question were former Manhattan Project wastes from a cleanup conducted by the Army Corps of Engineers. But to be disposed of in California, state approval and compliance with California disposal regulations were required.

Upon repeated inquiries as to where the debris from the demolished buildings had gone, it was eventually disclosed that hundreds of tons of metals had been shipped to the Hugo Neu-Proler metal recycler in San Pedro to be melted down into the commercial metal supply. Large quantities of other debris from the demolished reactor buildings had been sent to the Bradley Municipal Landfill in the North San Fernando Valley. The position of Boeing and DOE was not that the material was clean, but that contamination levels did not exceed certain arbitrary limits they were using. Senator Barbara Boxer and others expressed concern about these releases, calling on the Energy Secretary to assure that the practice would not recur. Senator Boxer wrote then-Secretary Bill Richardson[26] informing him "of a scandalous matter involving the release of potentially contaminated building debris and trailers from the Rocketdyne site....According to your staff, the debris from these buildings has been sent to municipal landfills not licensed to dispose of radioactive waste. Further, metal components have been sold to scrap dealers and metal recyclers, while other items have been sold to the public as surplus."[v]

In part because of the outcry over the metal recycling from SSFL, then-Energy Secretary Bill Richardson issued a series of directives that suspended the recycling of volumetrically contaminated metals, then in a subsequent directive, surface contaminated metals, and finally created a moratorium entirely on the recycling of metals from DOE nuclear facilities.[27] A DOE news release[28] of July 13, 2000 announced:

> Secretary of Energy Bill Richardson today suspended the release of potentially contaminated scrap metals for recycling from Department of Energy (DOE) nuclear facilities. The suspension is part of a new policy aimed at ensuring contaminated materials are not recycled into consumer products and at improving the department's management of scrap materials at its nuclear weapons production sites.
>
> "I am making this decision to ensure American consumers that scrap metal released from Energy Department facilities for recycling contains no detectable contamination from departmental activities," said Secretary Richardson. "The suspension will remain in effect until our sites can confirm that they meet this new more rigorous standard."

The suspension continues to this day.[29] Interestingly, in recognition of the potential significant environmental impacts were recycling of these metals to be allowed, Secretary Richardson directed that no lifting of the suspension could occur without an Environmental Impact Statement.

[v] The reference to trailers has to do with Boeing selling several trailers or modular buildings to a school district to use as classrooms without having checked them first for contamination. They eventually had to be removed from the school and disposed of in an authorized disposal facility.

Additional Controversies and Decisions About Efforts to Dispose of Contaminated Materials in Unlicensed Landfills

After the revelation that contaminated waste from tearing down nuclear buildings in Area IV at SSFL had been shipped to the Bradley Municipal Landfill, a regular trash dump obviously not licensed or designed for radioactive waste, Senator Boxer subsequently obtained information that SSFL wastes had similarly been disposed of at the Sunshine Canyon and Calabasas municipal landfills. And then, in January 2001, SSFL shipped more contaminated soil from the cleanup of the Sodium Burn Pit to the Buttonwillow Class 1 facility. This triggered a Tanner Act proceeding, state legislative hearings and legislation, a Governor's Executive Order, and litigation.

Buttonwillow is a hazardous waste disposal facility not licensed to take LLRW. The nearby population is disproportionately low-income and Latino. It is an impacted community from an environmental justice perspective. Under the Tanner Act (H&SC§25199, *et seq.*), permitting decisions for hazardous facilities can, when there is an environmental justice context, be appealed to a special Tanner Act panel. A local community association, PADRES HACIA UNA VIDA MEJOR, represented by the Center on Race, Poverty and the Environment, challenged Kern County and Safety-Kleen, the Buttonwillow operator, over the facility permit. The Tanner panel, which included a representative of the DTSC Director, heard weeks of expert witness testimony, particularly regarding the issue of radioactive waste disposal at Buttonwillow, with special focus on the New York State and SSFL waste shipments. In the end, the Tanner Act panel ruled that PADRES was likely to prevail on the merits on the issue that radioactive waste disposal at Buttonwillow was unsafe and unauthorized. Safety-Kleen settled with PADRES, and the Buttonwillow CUP was amended to bar any waste with radioactivity above background (with an exception for naturally occurring radium found in things like drilling muds and pipe scale).

The Writ Issued by the Sacramento Superior Court Against the Department of Health Services

In 2000, the California Department of Health Services (DHS) proposed to adopt cleanup standards for radioactively contaminated sites. Those standards were widely viewed as non-protective (e.g., allowing doses to the public from "clean up sites" equivalent to ten additional chest X-rays annually, and under certain situations, many times that). Additionally, although not disclosed in the rulemaking announcement, DHS subsequently indicated its intent to use the same standards as levels to deregulate radioactive waste, allowing contaminated materials to be shipped to unlicensed municipal landfills or metal recyclers. DHS failed to consider alternatives to its proposed action or to comply with CEQA, and so three organizations filed suit in Sacramento Superior Court in 2001. *Committee to Bridge the Gap, Southern California Federation of Scientists, Physicians for Social Responsibility, Los Angeles Chapter v. Diana Bonta, Director, DHS; State of California; Case 01CS01445.*[30]

Then-Superior Court Judge Gail Ohanesian in 2002 ruled that DHS had violated the Administrative Procedure Act's requirements for notice-and-comment rulemaking and CEQA's

requirements for environmental review, struck down the DHS regulation and ordered that it not be readopted, nor could DHS adopt any similar rule related to radiological criteria for cleanup and release from license controls without completion of an EIR. More than a decade later, DHS (now DPH) still has not prepared any such EIR. As we shall see below, however, DPH is relying on underground regulations setting such radiological release criteria, without having gone through either an APA-compliant rulemaking or preparing the required EIR. The only cleanup regulation that remains on the books is 17CCR§30256(k)(1)and (2), which requires that the operators of the site being cleaned up must make reasonable effort to "*eliminate* residual contamination, if present," (emphasis added) and that DPH must assure that all "radioactive material is properly disposed." Note that the regulation does not permit a cleanup standard that allows residual contamination to remain if it can be reasonably removed and does not allow radioactive waste to be disposed of in any fashion the site owner wishes.

Executive Order D-62-02 Directs a CEQA-Compliant Rulemaking and Imposes a Moratorium on Disposal of Decommissioning Wastes in Class I Landfills

The California Legislature became concerned about the issue of lax cleanup standards and their inappropriate use as a way of attempting to deregulate radioactive waste to allow it to be disposed of in municipal and other unlicensed disposal sites. The Senate Select Committee on Urban Landfills held a special hearing on the matter on March 19, 2002, and the Legislature passed legislation to address the matter. Then-Governor Gray Davis vetoed the legislation, but issued instead Executive Order D-62-02, noting that there were no such regulations now, ordering DHS as follows:

> IT IS ORDERED that the Department shall adopt regulations establishing dose standards for the decommissioning of radioactive materials by its licensees.
>
> IT IS FURTHER ORDERED that in adopting such regulations, the Department shall assess the public health and environmental safety risks associated with the disposal of decommissioned materials, and shall comply with all applicable laws, including the California Environmental Quality Act.

A decade later, the Department still has not complied.[31]

The Executive Order also directed that there be a moratorium on disposal of wastes from decommissioning nuclear sites in Class III landfills (i.e., municipal garbage facilities) and unclassified units, and directed the Water Board to issue Orders to that effect, which it did. Those Orders state:

> As a California Department of Health Services (CDHS) radioactive materials licensee, your facility may be decommissioned and released for unrestricted use by CDHS. If your radioactive materials license is terminated or modified through a decommissioning action to allow release of a site or materials for unrestricted use, it is imperative that you not dispose of any decommissioned materials with *residual radiation above background levels* at Class III landfills or unclassified

> waste management units during this moratorium. If there is a violation of the moratorium, the Water Boards will consider enforcement actions against the owner and/or operator of the facility from which the decommissioned materials originated.
>
> emphasis added[32]

The moratorium directed by the Executive Order and the Water Board Order remains in place until DPH complies with the directive to, in compliance with CEQA, adopt new regulations. DPH has not done so; the Executive Order and Water Board Order remain in effect.

Delegation of Radiation Regulatory Authority to "Agreement States" Such as California, and California's Regulation of Boeing's Radioactive Activities at SSFL

Under section 254 of the Atomic Energy Act of 1954, as amended, the Atomic Energy Commission, now the Nuclear Regulatory Commission, can discontinue much of its regulatory authority over radioactive materials in a state and delegate it, by agreement, to the state. California and the Commission entered into such an agreement in 1962, and it remains in force to this day.[33] Exercising that delegated power, California has issued Radioactive Materials Licenses to Boeing since the early 1960s regulating radioactive materials at SSFL, and continues to regulate Boeing radioactive materials activity there via California Radioactive Materials License 0015-19. These licenses over the years have been for very large amounts of radioactive material.[34]

The History of Failed Attempts to Create a "Below Regulatory Concern" Level for Radioactive Waste Disposal

Agreement States like California must meet the minimum NRC requirements for radioactive cleanup and disposal regulations, but may have more protective standards if they choose.[35] California law (H&SC§115261 and the sections preceding it) requires that radioactive waste be disposed of in a licensed site that at a minimum meets 10CFR61 requirements.[vi] 10 CFR61.3 requires offsite disposal must be in a licensed site, and other provision of 10CFR61 specify requirements about waste form, land ownership having to be federal or state, institutional control periods, etc. H&SC 115261 adds to those requirements by banning shallow land burial of radioactive waste in California, and requiring multiple, engineered barriers capable of lasting 500 years minimum, the capability of visual inspection or remote monitoring, and a number of other requirements. Radioactive waste to be disposed of in California thus must go to a licensed LLRW disposal site meeting those requirements.

[vi] The code refers to "regulated radioactive waste." As discussed here, efforts to created a de-regulated or "below regulatory concern" level of radioactive waste have been struck down by Congress at the federal level and by the Sacramento Superior Court at the state level, and no below regulatory concern rules have subsequently been adopted by either jurisdiction.

There is no lower level of radioactive contamination which exempts waste from those requirements. 10 CFR 61.55, adopted by California at 17CCFR30470, defines the classes of "low-level radioactive waste," Classes A, B, and C. If waste is more concentrated than the limit for Class A, it is Class B; if more concentrated than Class B limits, it is Class C. But there is no lower limit at which waste is not Class A and requires disposal in a licensed site.

There have been efforts over the years to create a "below regulatory concern" level that would deregulate part of the low-level radioactive waste stream and allow it to be disposed of in other than a licensed LLRW site. All such efforts have failed.

In 1986 and 1990, the NRC adopted "Below Regulatory Concern" policy statements that would have allowed some radioactive wastes to not have to be disposed of in licensed LLRW sites. However, Congress, in the Energy Policy Act of 1992, struck down the NRC's BRC policy, while making clear that if NRC subsequently exempted any radioactive waste from regulation, the states had authority to regulate that material if they wished. See the new §275 added by the Energy Policy Act to the Atomic Energy Act, entitled "State Authority To Regulate Radiation Below Level Of Regulatory Concern Of Nuclear Regulatory Commission."

In the middle of the last decade, NRC considered and then rejected commencing a rulemaking to allow clearance of radioactively contaminated materials. So the situation remains as it has long been—all "low-level radioactive waste" must go to a licensed LLRW site. And since California has adopted 10CFR61 as its minimum standards, plus has its own considerably stronger standards on top in H&SC§115261, that remains the situation in California. Efforts by DHS a decade ago to adopt regulations otherwise were, as discussed above, struck down by Judge Ohanesian, and no new regulations, adopted with an EIR, have been promulgated.

Proposed Release Standards for SSFL Struck Down by U.S. District Court

In the late 1990s, Boeing proposed "Sitewide Release Criteria for the Remediation of Radiological Facilities at the SSFL." DOE and DHS purported to approve them, without either NEPA or CEQA compliance. The proposed standards were very weak, the equivalent of dozens of unnecessary chest X-rays over decades of exposure. The standards were orders of magnitude weaker than EPA's Preliminary Remediation Goals.[36] EPA opposed the standards,[37] saying they were not protective of public health and the environment.[38]

The Natural Resources Defense Council, the City of Los Angeles, and the Committee to Bridge the Gap jointly filed suit against DOE alleging violations of NEPA. In 2007, District Court Judge Samuel Conti ruled in the Plaintiff's favor, and required DOE conduct a full EIS for the cleanup.[39] That EIS is in an early stage and will not be completed for a couple of years. Additionally, as will be discussed later, the state committed to a site-wide EIR, which also has not commenced.

Although Boeing has asserted elsewhere that its primary role is that of a DOE contractor, that virtually all of the contamination in Area IV is DOE's, and that DOE has committed to being responsible for all Area IV contamination,[40] in its requests to DTSC and DPH for approval to

tear down the buildings it owns in Area IV it takes the opposite stance and asserts Boeing and contamination of its buildings are separate from DOE and thus purportedly exempt from the DOE-DTSC Administrative Order on Consent. (See discussion below.) Presumably it asserts it is similarly not bound by Judge Conti's Order.

Administrative Order on Consent for Cleanup of All of Area IV and the Northern Buffer Zone and Disposal of all Waste Above Background at Licensed Disposal Sites

In December 2010, a legally binding cleanup agreement for Area IV was reached between the DTSC and the DOE. This agreement, called the Administrative Order on Consent (AOC)[41], covers *all* of Area IV and the Northern Buffer Zone, §1.2; covers all soil, debris, structures, and anthropogenic materials, §1.8.4; binds not just DOE but its contractors, e.g. Boeing, §7.23 ("Parties Bound"); requires cleanup to background, §2.1 and AIP p.1 (p.44 of AOC), i.e., not allowing contamination above background; mandates that US EPA, not Boeing, is to do the measurements to determine what background is and what on site is above background (i.e., contaminated), which is then to be cleaned up, AIP p.2-4, AOC pp. 45-47; bars any waste with contamination above background from going to other than a licensed low level radioactive waste site or authorized disposal site at a DOE facility, §AIP p.3, p. 46 of AOC; gives to DTSC the authority to regulate all that is done in the cleanup of Area IV, e.g., §1.3, 2.9,2.10, 2.137.3, 7.18, 7.19.1; and requires DTSC perform a CEQA analysis, §4.0.[vii]

In short, the AOC mandates that all of Area IV and the Northern Buffer Zone (NBZ) be returned to background–i.e., to the levels of radionuclides present before nuclear activity began on the property. It specifies that EPA is to determine what is background and what is above background, and that any contamination above background is to be cleaned up and any waste above background must go to a licensed LLRW site or authorized radioactive waste disposal site at a DOE facility. It covers soil, debris, structures, and anthropogenic materials, and says it bi nds DOE and its contractors. Nonetheless, despite being a prime DOE contractor for SSFL, Boeing claims it is exempt from the AOC.[42]

Boeing can't have it both ways. It cannot claim, as it has in the past, that the contamination in all of Area IV, including the buildings it owns, is essentially all DOE's radioactivity, that virtually all of the contamination associated with its buildings is from work done as a contractor for DOE, that Boeing is a prime contractor for DOE for the cleanup of Area IV, and that DOE has agreed to clean up all of Area IV, including any contamination that might be from Boeing non-DOE work, and then claim that its contamination is exempt from the DOE AOC and the Conti order. On the other hand, if the contamination in its buildings is not DOE contamination but Boeing contamination, it cannot claim it is exempt from getting state approval and complying with CEQA. Indeed, Boeing recognizes it needs state approval and must comply with the requirements of its state Radioactive Materials License, and requests approval from the

[vii] §§2.3.2 and 2.3.3 state that DOE will not be in violation of the AOC's 2017 deadline if Boeing doesn't want its Area IV buildings to be removed in time for DOE to meet that deadline, but that whenever they come down, DOE's obligation to clean up any contamination subsequently found at those locations remains. The provisions do not exempt the demolition and disposal of those buildings, when it occurs, from being done according to the AOC requirements, but just affects timing.

state for the building tear-downs and disposal. Yet there has been no CEQA review for these state actions.

In this report, we have taken at face value Boeing's current claims that it is exempt from the DOE cleanup order and the Conti ruling on the cleanup of Area IV and that it must obtain the state's approval for the demolition of its structures. But then there must be CEQA compliance.

EPA Soil Survey

EPA performed a multi-year, $40+ million radiological characterization of soil in Area IV and the NBZ, as well as determination of background levels for comparable soils offsite. Released in late 2012, 500 of the 3,735 soil samples collected contained concentrations of radioactive materials exceeding background levels.[43] This was despite Boeing's prior claims to having twice cleaned up the site. Strontium-90, cesium-137, plutonium-238 and 239/240, cobalt-60, europium-152 and -154, curium-243/244, and tritium were among the carcinogenic radionuclides found in the soil at levels beyond what would have been there had SSFL not released them into the soil by the decades of spills and accidents. We have charted in the next two figures just a few of those samples for cesium-137 and strontium-90 in comparison to background. Levels as high as one thousand times background were found by EPA. Again, these two charts are for only a few of the 500 samples with radioactivity above background identified by EPA.

Figure 1[44]

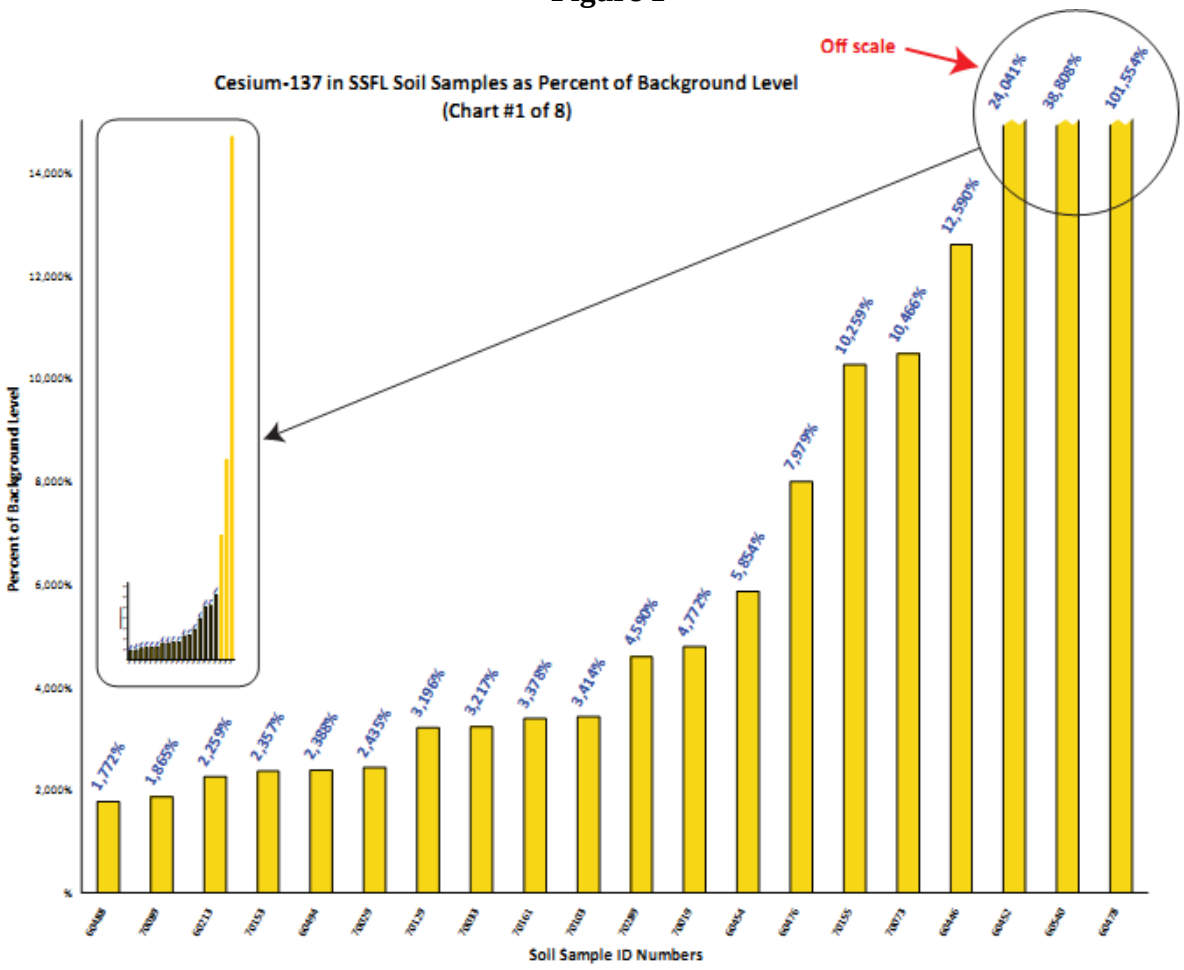
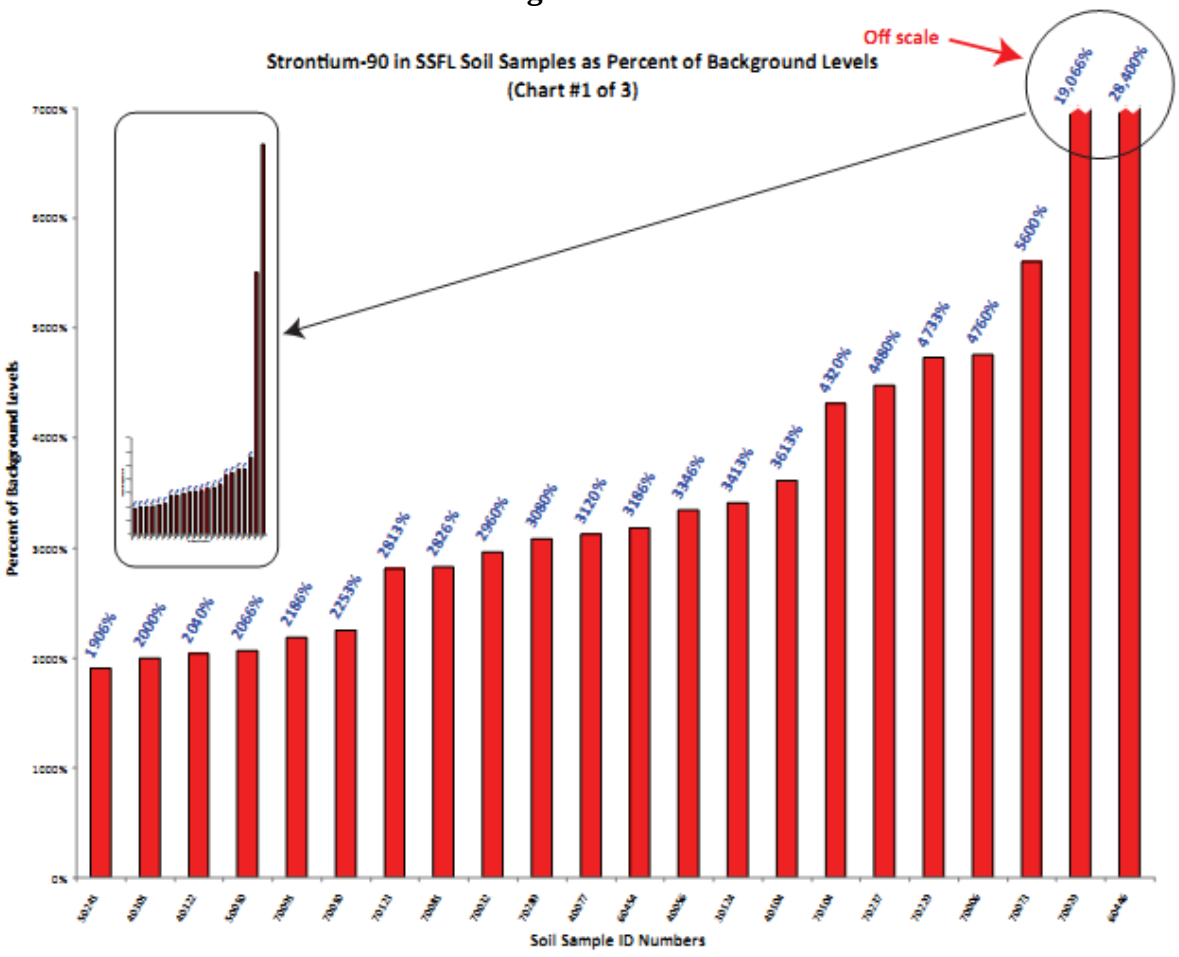

Off scale
Cesium-137 in SSFL Soil Samples as Percent of Background Level
(Chart #1 of 8)
Percent of Background Level
14,000%
12,000%
10,000%
8,000%
6,000%
4,000%
2,000%
%
1,772%
1,865%
2,259%
2,357%
2,388%
2,435%
3,196%
3,217%
3,378%
3,414%
4,590%
4,772%
5,854%
7,979%
10,259%
10,466%
12,590%
24,041%
38,808%
101,554%
Soil Sample ID Numbers

Figure 2[45]


Strontium-90 in SSFL Soil Samples as Percent of Background Levels
(Chart #1 of 3)
Off scale
19,066%
28,400%
Percent of Background Levels
7000%
6000%
5000%
4000%
3000%
2000%
1000%
0%
1906%
2000%
2040%
2066%
2186%
2253%
2813%
2826%
2960%
3080%
3120%
3186%
3346%
3413%
3613%
4320%
4480%
4733%
4760%
5600%
Soil Sample ID Numbers

RECENT DEVELOPMENTS

What DTSC and DPH are Approving and What Boeing is Doing and Why It Matters

Despite all the laws, regulations, court orders, executive orders, administrative orders, and other requirements summarized above, in recent months, Boeing has been requesting, and DTSC and DPH granting, approval to tear down its facilities in Area IV and **dump the debris -- waste that its own measurements show is radioactively contaminated -- into unlicensed disposal sites, and to ship contaminated metals from these demolitions to be melted down at metal recycling facilities**. DTSC and DPH have been approving each Boeing request for this project.

Boeing has, with DTSC approval, recently demolished and disposed of debris from six structures in Area IV that it asserts were "non-radiological" facilities. As shall be seen further in this report, in fact Boeing's own measurements indicate most of those structures contained radioactive contamination.

However, Boeing, DTSC, and DPH are now on the verge of crossing a major line, to demolition and disposal of the six structures that they concede are indeed *radiological facilities*. The contaminated debris from those radiological facilities, including the *plutonium* fuel fabrication facility, would be allowed to be disposed of in landfills not licensed to receive low level radioactive waste.

The very troubled actions to date indicate that if they are now allowed to cross the line into disposal in unlicensed sites of the waste from Area IV facilities they acknowledge are radiological, significant environmental harm may result. Yet there has been no environmental review whatsoever, no CEQA compliance.

Radioactive waste is being disposed of in municipal garbage landfills

In 2002, then-Governor Gray Davis signed into effect a moratorium banning the disposal of radioactive waste from decommissioned nuclear sites into Class III (municipal) landfills in California. D-62-02, or the "Governor's Moratorium," imposes

> "a moratorium on the disposal of decommissioned materials into Class III landfills and unclassified waste management units."[46]

The moratorium originated from concerns over the release of contaminated materials originating from SSFL itself. It remains in place today.

Nevertheless, at least 242 tons of Boeing's radioactive demolition waste have so far been disposed of in Class III municipal landfills at Lancaster and Asuza, CA,[47] in defiance of the

Governor's Moratorium. Lest there be any confusion, the moratorium applies even to that waste which Boeing claims is uncontaminated, due to the extreme difficulty which would come with having to verify such claims. All of the waste in question here originated from SSFL, a decommissioned nuclear site with an extensive history of nuclear activity, and so is considered decommissioned material subject to the moratorium. But more importantly, Boeing's own measurements show the material to be contaminated, i.e., above background, despite the Water Board order barring any decommissioning waste above background from going to municipal landfills. An example manifest of Area IV waste sent to Asuza is attached as Appendix B.3.

Boeing is sending such waste to unlicensed dumps despite detecting widespread radioactivity within. It continues to do so with approval from DTSC and DPH, approval given without any EIR or other CEQA review. This is significant not simply for its legal dimension, but also for its potential public health effects. Disposal facilities are classified according to the waste they are able to accept. None of the places that have received Boeing's waste are licensed or equipped to handle radioactive waste, and thus this can pose a safety hazard to the surrounding communities (such as from radioactive groundwater leaching or airborne dust).

Waste is being taken to Buttonwillow, barred from accepting radioactive waste

More of Boeing's demolition waste has been sent to a Class I landfill at Buttonwillow, CA[48], owned by Clean Harbors, Inc. This was the site of a drawn out environmental justice legal battle over the disposal there of radioactive material in an area with a predominantly low-income Latino population. Much of the waste at issue in the Tanner Act proceeding was low-level radioactive waste from Boeing's SSFL holdings.

In 2003, the Buttonwillow legal dispute concluded in a settlement under the Tanner Act[viii] barring the disposal facility from accepting any more such waste from SSFL. By allow Boeing to ship waste to the facility, DTSC and DPH now aid in breaching this settlement. This represents another example of Boeing's failure to comply with the rules, as well as DTSC's and DPH's approval and thus failure to enforce them. Sample manifests for waste from the ESADA site and Area IV Water Tanks sent to Buttonwillow are attached as Appendix B.1 and B.2. Note that the zinc contamination of the gravel from corrosion off the Water Tanks may have also resulted in radioactive contamination of the gravel that went to Buttonwillow, because the Boeing data show the Water Tanks were radioactively contaminated.

[viii] The Tanner Act gives DTSC authority over the approval of countywide hazardous waste management plans in California (see DTSC's "Public Participation Manual, Chapter 4: Hazardous Waste Management Processes. The Tanner Act").

Figure 3: California Disposal Destinations for Boeing Area IV Waste from Building Demolitions

Class I Landfill:	**Buttonwillow**
Class II Landfill:	**McKittrick**
Class III Landfills:	**Azusa, and Lancaster**

Not one of these is a licensed Low Level Radioactive Waste disposal facility.

Radioactive metal is being recycled into the commercial metal supply

Similar permissiveness on the part of DTSC and DPH has enabled Boeing to release at least 493 tons of radioactive Area IV metal to be melted down at metal recycling facilities. A list of these facilities is seen in Figure 4 below, and example recycle invoices for two of these facilities are attached as Appendix B.4 and B.5. **By now, this radioactive metal could have been turned into numerous products to which the public could be exposed.** This not only conflicts with the AOC's requirement that contaminated waste be taken to a licensed LLRW site; it also poses an obvious health risk to the general public.

Figure 4: Where Boeing sent Area IV materials to be recycled[49]

Area IV building	Recycling destination	
	Metal	Concrete/Asphalt
Building 4015	Kimco – Sun Valley, CA	Gillibrand – Simi Valley, CA
Water Tanks	Kimco – Sun Valley, CA	Gillibrand – Simi Valley, CA
Weather Station structures	Kimco – Sun Valley, CA	Gillibrand – Simi Valley, CA
Building 4011 High Bay	Standard Industries – Ventura, CA	Gillibrand – Simi Valley, CA
Building 4006 Liquid Sodium Laboratory	Kimco – Sun Valley, CA	Gillibrand – Simi Valley, CA

Recycling metal with measurable contamination flouts the requirements for disposal in a LLRW site, the overturning of past BRC efforts, and a DOE ban on the recycle of scrap metal originating from radiological areas within DOE nuclear sites.[50]

Figure 5: Radioactivity detections and waste disposition of Boeing buildings confirmed to have already been demolished as of April 2013

	Boeing's stated number of detections of radioactivity above background[51]	**Boeing's reports' actual number of detections of radioactivity above background**[52]	**Waste disposition**[53]
Building 4015	1	48	**39** tons metal recycled, **84** tons asphalt/concrete recycled, **140** tons waste to Class III landfill
Water Tanks	1	30	**64** tons metal recycled, **168** tons asphalt/concrete recycled, **81** tons waste to Class I landfill
Weather Station structures	5	55	**4** tons metal recycled, **220** tons asphalt/concrete recycled
Building 4011 High Bay	7	117	**196** tons metal recycled, **1,060** tons asphalt/concrete recycled, **123** tons waste to Class I landfill, **349** tons to Class II landfill, **82** tons to Class III landfill
Building 4006 Liquid Sodium Laboratory	0	0	**190** tons metal recycled, **900** tons asphalt/concrete recycled, **139** tons waste to Class I landfill, **219** tons to Class II landfill, **20** tons to Class III landfill
ESADA structures	0	4	**810** tons waste to Class I landfill
Total	**17**	**259**	**-493 tons metal recycled,** **-2432 tons asphalt/concrete recycled** **-1153 tons waste in Class I landfills,** **-568 tons waste in Class II landfills,** **-242 tons in Class III landfills**

Note: the demolition status of numerous Area IV buildings, including the L85 site structures, Building 4011 Low Bay, and Building 4005 structures, has not yet been made publicly available by the DTSC. These structures may have already been demolished, but since no demolition information pertaining to them is available, they were not included in the above chart.

In April 2013, DTSC Approved Revisions to the Boeing Procedures So As to Allow Tear-Down and Disposal of the "Radiological" Facilities

In 2010, DTSC issued a formal notice of and opportunity to comment on proposed Standard Operating Procedures (SOP) for tearing down non-radioactive buildings in the Areas of SSFL where rocket-testing, not nuclear work, occurred.[54] The SOP had been established at DTSC's insistence to provide a mechanism whereby "DTSC's oversight and approval" will be obtained for the demolitions and to assure that no buildings are demolished "where radiological materials were handled" or "radiological-related activities were carried out."[55]

The 2010 draft SOP was issued by DTSC for a thirty day public comment period expiring April 10, 2010, with a decision by DTSC whether to approve the SOP to made after receipt of the public comments.[56] The public notice expressly stated that the SOP did not apply to buildings in Area IV, the nuclear area: **"The SOP is not applicable to building demolitions at SSFL in areas where known radiological contaminant releases are documented or suspected (such as Area IV). Demolition in these areas is not planned."[57]** (emphasis added)

The April 2013 SOP Revision—Crossing the Rubicon

Recently, however, without any formal public notice, Boeing started tearing down its buildings in Area IV and disposing of the debris in unlicensed sites, with DTSC and DPH quietly approving each request, and with no opportunity for public comment and no CEQA review. It now appears that in November 2012, Boeing amended, and DTSC approved, Amendment 1 to the SOP, allowing structures in Area IV that Boeing claimed were "non-radiological" to be torn down and disposed of in unlicensed locations, reversing the public commitments made in the 2010 SOP comment solicitation. *The November 2012 amendment was done entirely in secret, behind closed doors between DTSC and Boeing. There was no public notice, opportunity for comment, or CEQA analysis. Indeed, the very existence of the November amendment was kept secret,* as it was not even posted on the DTSC website.[ix] As shall be seen below, it appears that structures claimed by Boeing to be "non-radiological" were in fact radiological, and contaminated material sent off to places it shouldn't have gone.

In April 2013, at DTSC direction and insistence, Boeing amended the SOP again, adding Amendment 2, this time to cover all of its *avowedly radiological* structures in Area IV.[58] Unlike the approval of the 2010 SOP, for these extraordinarily important revisions there was no formal announcement of the proposal and the proposed revisions were were not made available for

[ix] It first appears on the DTSC website half a year later in the April 2013 SOP revision, as Amendment 1, pp. 23-4 in the PDF.

formal public review and comment. The approval of the new SOP to cover Area IV radiological buildings was done not only with no public notice or opportunity to comment, but with no CEQA review at all.

Furthermore, the SOP amendments apply dangerous and irrelevant generic standards to the building demolitions and disposal, standards claimed to be of general applicability but which have never been adopted by APA-rulemaking or with CEQA coverage and which contradict existing regulations and laws. These standards are critical to public safety and the environment, as they deem arbitrary levels of radioactive contamination "acceptable," adopting a Below Regulatory Concern limit for disposal in unlicensed facilities and recyclers, in violation of numerous laws and orders and without any EIR or even opportunity for public comment.

Furthermore, the revised SOP asserts that DTSC has OK'd disposing of the waste from the radiological structures being disposed of in a Class I chemical waste facility (e.g., Buttonwillow). Such facilities are not licensed or designed for LLRW site. The SOP amendment claims this permission was given in an email by DTSC to Boeing.[59]

The April 2013 SOP amendment marks a major turning point. Now the buildings admitted to be radiological facilities are to all be torn down and the debris disposed of in landfills that are not licensed LLRW sites. Standards of "allowable" contamination have been employed in secret. No environmental review has been conducted, and no public input allowed.

The SOP Process

Under the SOP as amended, the approval process for demolition/disposal projects works as follows: One by one, Boeing submits a proposal to DTSC and DPH to dismantle a structure in Area IV and dispose of the waste in an unlicensed landfill or by recycling. DTSC and DPH review the proposal and approve it. The building comes down; the waste goes out. And the public receives no formal notice of the pending agency action; has no formal opportunity to comment; and there is absolutely no CEQA review prior to the agency approval. There is no Environmental Impact Report; there is no Initial Study and Negative Declaration. Nothing.

The communities are at risk in which these disposal sites are located, facilities neither designed nor licensed for radioactive waste. Others in the public are also at risk, who use or are exposed to the products into which potentially radioactive metals and other materials are being recycled. But there is no review of the environmental impacts.

Demolition Project in the Context of CEQA

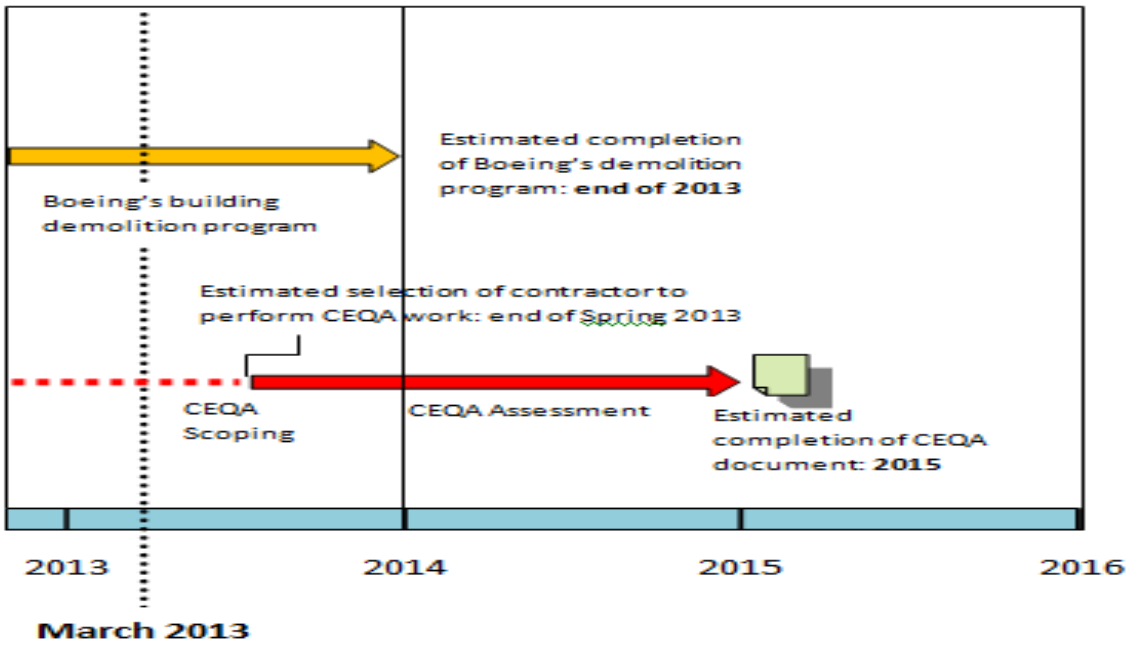
The California Environmental Quality Act (CEQA) requires that an Environmental Impact Report (EIR) be prepared for any major agency action that could significantly affect the environment. If it is not clear whether there can be a significant environmental impact, an Initial Study must be performed, and if it concludes that there is no need to perform an EIR, then a Negative Declaration is issued.

All parties involved concede that an EIR for the site cleanup is required. The 2007 Consent Order, to which Boeing and DTSC are signators, for example, requires a Facility-Wide EIR for the cleanup of SSFL.[60] Currently, DTSC reports that it is working on selecting a contractor in order to perform the sitewide Program EIR that CEQA requires. In July 2013, it issued a Request for Qualifications for a contractor to perform a Program EIR for the SSFL cleanup.[61] DTSC has stated that it anticipates the EIR being completed in 2015.[62] (see Figure 6).

However, six purportedly "non-radiological" Boeing Area IV structures (that appear in fact to have been contaminated) have already been demolished in recent months, and, with the April 2013 SOP amendment, six more structures, acknowledged to be "radiological" facilities, are soon to be torn down, well before the completion—or perhaps even commencement-- of the CEQA review.

Considering that the central purpose of CEQA is to assure that the possible impacts of a proposed project are thoroughly assessed *before* that a decision to approve the project is implemented, it seems that demolition project, in conducting the project *before* completion of the required EIR, violates the core purpose of CEQA. See Figure 5, showing all the buildings are to be torn down and their debris disposed of as part of the supposed cleanup of the site prior to the EIR on the site cleanup being completed.

Figure 6: Timeline comparing Boeing's demolition schedule against DTSC's schedule for completion of CEQA review[63]



There is no question that the approval by DTSC and DPH of Boeing's requests to be permitted to tear down these structures and dispose of them in other than licensed LLRW

disposal sites constitutes agency action. DTSC characterizes the Boeing submissions as "proposals."[64] It acknowledges that it and DPH are making agency actions, i.e. granting approvals of these proposals. See e.g., the July 22, 2013, DTSC and DPH review of survey data submitted by Boeing and the agencies' approval of the dismantlement of the L-85 reactor remnants and disposal in a facility not licensed for LLRW, which states: "The surveys were conducted at the request of *DTSC and the California Department of Public Health (CDPH), as a condition of approval* for the demolition of the remnant features at the L-85 site and Class I Hazardous Waste Landfill disposal of the resulting debris."[65] (emphasis added) Boeing states that it is required to submit the building demolition/disposal proposals to the state agencies for review and approval: "Following DTSC review and *concurrence*, these facilities will be demolished." (emphasis added)[66]

DTSC and DPH have artificially segmented the cleanup decisions by making, every few weeks, approvals for more buildings to be dismantled and disposed of, without any CEQA coverage. At the same time, DTSC recognizes that a Program EIR for the cleanup of the site is necessary and has issued a Request for Qualifications for a contractor to produce the Programmatic EIR. However, absent some action to come into compliance with CEQA's requirement that CEQA review *precede* agency action, all the Boeing buildings in the nuclear area will have been demolished and disposed of at metal and concrete and asphalt recyclers and municipal and hazardous waste landfills long before any CEQA review will occur.

DTSC and DPH may attempt to argue that the buildings need to come down in order to make measurements beneath them that will be useful for the EIR. There is no evidence that that is in the works; EPA's contract to do the soil measurements is over and hasn't been renewed; and given the EIR schedule, such measurements don't seem likely to be available before the Draft EIR is issued anyway. But the argument is irrelevant anyway. CEQA of course provides a mechanism where the building demolition and disposal must be subject to a CEQA review, which can occur prior to the final EIR being produced.

DTSC and DPH have simply ignored the law in approving, behind closed doors, these demolitions and disposals without conducting a prior CEQA review and allowing formal public notice and formal opportunity to comment on the proposed action and the agencies' CEQA analyses. The heart of CEQA is the requirement for agencies to behave in the inverse of the old "shoot first and ask questions later" approach. One is required to ask the environmental questions first –what are the potential impacts, what are the alternatives, what mitigation measures might be considered—*before* making a decision. The agencies have gotten it backwards, and appear to be grossly violating CEQA, indeed, ignoring it.

The Use of Underground Regulations, not Adopted through Rulemaking and Without an EIR, for Release Standards Violates APA and CEQA and the Sacramento Superior Court Writ of Mandate and Executive Order D-62-02

DTSC and DPH are approving Boeing's proposals by use of standards they assert are of general applicability but which have not been adopted via rulemaking and with an EIR. They say they are utilizing two DPH standards, DECON-1 and IPM-88-2 (the standards in each are

basically identical), as well as choosing to use similar guidelines (not regulations) that they say NRC and DOE allow, Reg. Guide 1.86 and DOE Order 5400.5. These standards are all designed to declare certain levels of radioactive contamination acceptable for cleaning up buildings to release them from their licenses and permit their reuse. DTSC and DPH, furthermore, are trying to extend this even further, into a "below regulatory concern" (BRC) standard for allowing radioactive waste at certain levels to be disposed of in landfills and at recyclers not licensed for radioactive waste, despite the absence of any BRC policy in regulations and in contradiction of statutory and regulatory requirements to the contrary.

However, neither DTSC nor DPH has adopted regulations allowing such contamination or setting standards for it. DPH tried a decade ago to adopt cleanup regulations for license termination, and to extend their use to deregulating a portion of radioactive waste so it could be disposed of in unlicensed landfills. Then-Sacramento Superior Court Judge Ohanesian struck down those regulations and issued a writ[67] barring DPH from adopting those or any other regulations with a similar purpose without first conducting an EIR. The use of DPH standards DECON-1 and IPM-88-2 for the very purpose blocked by Judge Ohanesian's writ, without doing a notice-and-comment rulemaking and without completing an EIR on such a proposed rule, violates both the writ and the Governor's Executive Order D-62-02, which ordered that any such new standard be promulgated in compliance with CEQA. Finally, the use of these underground regulations violates both APA and CEQA themselves.

The Standards DTSC and DPH Are Purporting to Use

As set forth earlier, state and federal law require disposal of all low-level radioactive waste in a licensed LLRW disposal site. No Below Regulatory Concern level exists; prior efforts to establish a level below which LLRW is deregulated have been overturned and no new BRC adopted. Additionally, DPH's efforts to establish an "acceptable level" of contamination for cleaning up sites for unrestricted release from their license have been overturned by the Sacramento Superior Court and no new regulation has since been adopted. This leaves as the only state cleanup regulation 17CCR§30256(k)(1)and (2), which requires reasonable efforts to "eliminate residual radioactivity," and mandating he disposal of all radioactive wastes from that effort to eliminate contamination to be properly disposed of, defined in H&SC§115261 as a licensed LLRW site meeting that statute's prohibition on shallow land burial and following the other requirements specified therein.

DTSC and DPH, however, ignore all these statutory and regulatory restrictions and declare that even if radiologically contaminated, the waste should be allowed to be disposed of in unlicensed sites or recycled. They employ a generic standard they assert is of statewide application and which supposedly specifies an "acceptable" level of contamination —i.e., the amount above background—from arbitrary levels in a certain decades-old table never intended for this purpose and never adopted by rulemaking. DTSC, DPH, and Boeing are relying on a table found in two old DPH documents (DECON-1 and IPM-88-2), which in turn reproduce a table found in an old AEC guidance document (REG Guide 1.86) dating back decades. The guidance was never intended for the purpose for which DTSC and DPH are employing them and

their use by the state as rules of general applicability has not been established via APA rulemaking or with CEQA coverage.

The table is entitled "*Acceptable* Surface *Contamination* Levels." (emphasis added). Note that it is not designed to help determine when a structure is clean, i.e. showing compliance with the 17 CCR §30256(k)(2) regulatory standard of "eliminating residual radioactivity." Instead, the generic standard they are claiming to use would to the contrary allow residual radioactivity to remain and purports to establish an "acceptable" level of contamination. They also assert they can use it as a Below Regulatory Concern rule for allowing radioactive waste to be disposed of in other than LLRW licensed sites.

Note also that it only applies to *surface* contamination, not *volumetric* contamination (i.e., radioactivity on the surface of material, not within it.) There is no standard for volumetric contamination, yet DTSC and DPH are allowing Boeing to tear down and dispose of in unlicensed sites material that is volumetrically contaminated (e.g., with radioactivity inside the material induced by irradiation by neutrons, as the measurements for the L-85 reactor debris shows is the case with it.) *DTSC and DPH have no standard to use for allowing volumetrically contaminated waste to be released, yet they are nonetheless approving such release.*

The guidance documents on which they purport to rely for the "acceptable" level of surface contamination were never intended to be used as a "below regulatory concern" (BRC) level for sending radioactive waste to other than licensed LLRW disposal sites. As indicated above, no BRC regulations exist; the only past BRC policies were struck down long ago and nothing readopted in their place. The guidance documents DPH and DTSC are using were only intended for determining when a contaminated nuclear building could be rehabitated for some other purpose, i.e., a room sufficiently cleaned up "for reuse." They were not designed for declaring radioactive waste "below regulatory concern" and acceptable for disposal in unlicensed sites, and as indicated above, no BRC regulation exists and all radioactive waste must be disposed of in licensed sites.

Furthermore, the values in the table go back to a four-decades-old guidance document from the now-defunct Atomic Energy Commission, and were never based on risk or health or even radiation dose but rather merely on the capability of radiation detectors back then to readily detect radiation at certain levels. These devices, of course, have gotten far more capable since. As Oak Ridge Associated Universities put it these guidelines "are largely based on instrument detection capabilities at that time (early 1970s), as opposed to being dose- or risk-based." [68] The National Academy of Sciences stated, "Table I guidance had been in informal *use for some time before 1974 and apparently was based on the detection limits of the instruments available at that time, not on an assessment of risk*."[69] (emphasis added)

Indeed, assessments of the dose or risk from contamination at the levels in the Table vary widely, depending in part on the radionuclide. EPA, for example, estimates doses of up to 45 millirem per year effective dose equivalent for a typical reuse scenario of a building contaminated at these levels.[70] That is the equivalent of approximately 22 chest X-rays each year, or one a week, allowed to continue over many years. This would exceed regulatory limits

for public exposure from nuclear facilities (see, e.g., 40 CFR 190.10) and far exceed EPA's acceptable risk range. 45 millirem per year over 30 years of exposure, the standard EPA assumption, would yield a risk for an adult 16 times higher than the upper limit of EPA's acceptable 10^{-6} to 10^{-4} range, using EPA's conversion figure of 1.16×10^{-3} cancers per rem.[71] The risk would be considerably higher for children, for females than for males, and if one assumed not a worker reusing the building but unrestricted reuse. The risk could be even higher than that if the contamination were not simply in a building being reused, the purpose of DECON-1, Reg. Guide 1.86 etc, but the guidance were misused as a BRC level to allow unlicensed disposal or recycle, whereby groundwater could get contaminated or people could be exposed to radiation from intimate bodily contact.

As indicated above, it is inappropriate to use these underground regs to allow "acceptable contamination" instead of "eliminate residual radioactivity" as required by the operable regulations and to utilize these contamination levels as a BRC deregulation of radioactive waste despite the statutory and regulatory requirement that all LLRW go to a licensed LLRW site. The requirement is that the waste needs to be not radioactively contaminated if it is to go to recycling, a municipal or hazardous waste landfill not licensed for LLRW. In the sections that follow, we will examine some of Boeing's radiation data for these structures from its submissions to DTSC and DPH and in the agencies' responses thereto. We will see that the materials were contaminated, as shown by Boeing's own measurements, and should not go to unlicensed sites. But even with the use of the DECON-1/Reg Guide 1.86 "standards," Boeing's own measurements show contamination even above those levels. First, let us look briefly at Boeing's claims that some of the structures were "non-radiological" and thus their waste, even if contaminated, could be disposed of in municipal landfills and recycled.

Structures Boeing Called "Non-Radiological" Were in Fact Radiological, and Contaminated, and Disposing of their Waste in Municipal Landfills Violates Executive Order D-62-02 and the Associated Water Board Order

Boeing has characterized several of the structures it has been dismantling as "non-radiological" and therefore supposedly exempt from Executive Order D-62-02 and the associated Water Board Order. This misrepresents both Orders. The term "radiological facility" does not appear in either document. They merely refer to decommissioning a licensed site. The Water Board Order states, for example, "If your radioactive materials license is terminated or modified through a decommissioning action to allow release of a site or materials for unrestricted use, it is imperative that you not dispose of any decommissioned materials with residual radiation above background levels at Class III landfills or unclassified waste management units during this moratorium." Boeing's California Radioactive Materials License does not license individual buildings; it authorized radioactive materials throughout Area IV. Wastes from decommissioning Area IV, the licensed area, thus must not go to municipal landfills, but Boeing has sent them there anyway.

However, structures deemed "non-radiological" by Boeing are, by its own records, former radiological facilities themselves. See Figure 5, which identifies some of the structures deemed "non-radiological" and the actual radionuclides of concern in those structures identified

by the record. Furthermore, structures claimed to be non-radiological neighbored facilities Boeing concedes are radiological, and accidents and releases at those facilities have released radioactivity that has contaminated much of Area IV. The operational histories of these facilities abound with incidents involving nuclear leaks, spills, and other mishaps, such as at former structures in the L-85 Research Reactor site, where releases of nuclear material occurred, at the former Uranium Carbide Manufacturing Building, where a uranium fire took place, and at other various locations (again see Figure 5).

This mischaracterization of structures as "non-radiological" when the records indicate they were is troubling because Boeing has claimed that structures it declares "non-radiological" are exempt from Executive Order D-62-02 and can be disposed of in regular, municipal landfills, and their metals, concrete, and asphalt can be recycled. Indeed, that is precisely what Boeing has done with the materials from these structures. This would seem to violate D-62-02 for several reasons: (1) the facilities are in fact radiological, and additionally show clear signs of radiological contamination, (2) SSFL's Area IV, the nuclear area, had so many radioactive releases that everything in the Area was at risk of contamination, and indeed, EPA found contamination in hundreds of samples taken throughout the entire area, and (3) as indicated above, there actually is nothing in D-62-02 that creates an exemption from its requirements for facilities at a nuclear facility that the operator tries to call "non-radioactive." Those terms don't appear in the Executive Order. It requires wastes from decommissioning to not go to a municipal landfill, and the Water Board Order is even more direct, barring any such wastes above background. Boeing's own measurements, as we shall see below, show that the structures it declared "non-radiological" were in fact radiologically contaminated above background, and indeed, even above the DECON-1 levels they are claiming as "acceptable contamination." Sending that waste to municipal landfills and recyclers would appear at variance with the Executive Order and the Water Board Order and is clear evidence of the harm that may result if DTSC and DPH employ, as they appear to be doing, the same approach to the radiological buildings which have not yet been shipped out to places where they shouldn't go.

Figure 7: Boeing Area IV buildings with known radiological activities already demolished or planned for demolition

Building name	**Boeing classification**[72]	**Radiological activities documented**[x]
Liquid Sodium Laboratory (No. 4006)	"Non-radiological"	Uses of radioactive materials including UO_2, Mn-54, H-3; accident involving release of radioactive materials[73]
Bldg 4011 (High Bay)	"Non-radiological"	Detections of uranium or mixed fission products; adjoins Instrument Calibration Laboratory (radiological facility)[74]

[x] Note that identification of constituents of concern doesn't mean other radionuclides weren't present, merely that special attention should be given to the identified radionuclides. In EPA's recent radiation survey, a general suite of measurements were made, including such radionuclides as plutonium-239 and strontium-90, and then in certain locations, additional measurements for others were made.

Empire State Atomic Development Associates (ESADA) Large Leak Injector Device structures (4314, 4730, 4814)	"Non-radiological"	Testing of zirconium-hydride (ZrH2) fuel pellets containing U-234, U-235, U-238, Pa-231, Th-230, Ac-227, Ra-226, Pb-210, H-3, K-40, Mn-54, Co-60, Eu-152, and Eu-154; possible uses of Cs-137[75]
Former Uranium Carbide Manufacturing Building remaining wall (4005)	Radiological	Fabrication of uranium carbide reactor fuel Accident involving uranium fire and subsequent release of contaminated smoke into building Accident involving minor leakage of contaminated oil[76]
Organic Moderated Reactor (OMR), Sodium Graphite Reactor (SGR) (4009)	Radiological	OMR – low-power critical experiment facility for testing reactor geometries and fuel elements in a reactor moderated and cooled by organic liquids SGR – experimental reactor facility for testing fuel and sodium configurations Handling of high-enriched uranium; storage of 800 lbs depleted uranium[77]
Bldg 4011 (Low Bay)	Radiological	Calibration laboratory for radiation instrumentation[78]
Nuclear Materials Development Facility (4055 and 4155)	Radiological	Uranium-plutonium scrap pellet recycling research Uranium-plutonium fuel research Uranium-plutonium oxide fabrication At least six separate accidents involving release of contamination into building[79]
L-85 (AE-6) Research Reactor remaining walls (4074, 4083, 4453, 4523)	Radiological	Housed Water Boiler Neutron Source Reactor and Kinetics Experiment Water Boiler Reactor Accident involving release of fission gas Accident involving small spill of high-enriched uranium[80]
Fast Critical Experiment Laboratory/Advanced Epithermal Thorium Reactor (4100)	Radiological	Operation using twenty different reactor core configurations, originally thorium or uranium fueled, later tests of reactors with high-energy neutrons Incident involving possible release of contamination[81]

Boeing's own data show contamination in structures it is demolishing and disposing of in excess of the questionable standards it proposes

A review of Boeing's own pre-demolition reports and measurements of the Area IV structures it has already demolished reveal that essentially every one of them was contaminated. Boeing is not very candid about this: it generally says that the waste is "acceptable" for disposal in the unlicensed sites. But what Boeing is in fact doing is not declaring the debris "clean" but rather "acceptably dirty." It does this by comparing its measurements against the radiation levels for "acceptable surface contamination" set forth in the long-defunct Atomic Energy Commission's Regulatory Guide 1.86[82] and guidance from DPH never adopted by rulemaking or with CEQA coverage, limits which are much less protective than the California law and regulations, the AOC, and many other restrictions, are nearly forty years old, and were never based on health considerations to begin with.

To be clear: hundreds of Boeing's own measurements report values in excess of background, i.e., showing added radioactivity or contamination. But what Boeing does is instead of demonstrating that the debris from its structures in the nuclear area is clean, which its measurements fail to do, it declares the contamination levels to be "acceptably dirty" and sends the waste off to facilities not allowed to take any radioactive waste at all.

Even so, 17 of its measurements from the buildings it has already demolished exceed even these questionable R.G. 1.86/DECON-1 levels of "acceptable contamination"[xi]:

1 exceedance from Bldg 4015
5 from Bldg 4011
3 from Weather Station
7 from Water Tanks
1 from ESADA

For screenshots of these detections, see Appendix C attached.

Boeing also admits a total of 14 detections above background radiation and its minimum detectible activity levels in these buildings:[xii]

1 exceedance from Bldg 4015
7 from Bldg 4011
5 from Weather Station
1 from Water Tanks

[xi] There were 5 additional exceedances from the Bldg 4011 High Bay that were from a sink that was segregated off for further investigation. We do not know the outcome of that review and where it was disposed of, so we have reduced the total to 17.

[xii] Again, because of the uncertainty as to the final disposition of the 4011 sink, we have reduced the total to 14.

For screenshots of these detections, see Appendix D attached. In fact, the numbers of measurements that show contamination are far higher than Boeing concedes, but in some fashion, that does not matter: **Boeing's own submissions concede the structures exceed both background and the questionable "acceptable contamination" levels it tries to use.**

The Boeing demolition proposals, transmitting its radiation measurements for those structures, are replete with concessions that some of its own measurements exceed the very release criteria it is using. For example:

> *The majority (118 of 124 or 95.2%) of surface activity measurements meet the most restrictive regulatory surface activity limits* for release/clearance of equipment and material for unrestricted use from former radiological facilities.[83]
>
> (emphasis added)

Thus, approximately 5% of the measurements DID NOT meet the "most restrictive regulatory surface activity limits," by Boeing's own admission. Again, the limits it is using are inappropriate. There is supposed to be no contamination. But, nonetheless, by Boeing's own concession, in report after report, it admits that some parts of the facilities it is tearing down and shipping out to unlicensed disposal sites and recyclers exceed even the limits it purports to be using. In the case of the example above, that contaminated material was sent out to a metal recycler and is now part of the commercial metal supply.

DTSC also admits that some of the measurements exceed the standard they are supposedly using. For example, DTSC states

> The *majority* of surface activity measurements met the most restrictive regulatory surface activity limits for release/clearance of equipment and materials for unrestricted use from former radiological facilities. The *majority* of surface activity measurements met the general surface activity limits for release/clearance of equipment and material for unrestricted use from former radiological facilities and was below US NRC Regulatory Guide 1.86, USDOE Order 5400.5 and CDPH guidance DECON-1 and IPM-88-2 action levels.[84]
>
> (emphasis added)

So, DTSC concedes that some of the parts of this building (and other structures) exceeded even the questionable BRC limits they were employing. But DTSC and DPH nonetheless approved the demolition and disposal.

The Boeing Measurements Demonstrate the Structures are Contaminated

To understand how Boeing's own measurements indicate contamination, let us take as an example its measurements of the Water Tanks that it demolished and sent off for metal recycling and to unlicensed landfills for disposal. Boeing declared the Water Tanks non-radiological, but did not disclose what they had been used for. Were they radioactive wastewater tanks? Were they used for storing contaminated industrial process water? SSFL had an extensive system for storing process water that had become contaminated and pumping it up to tanks high up on hills to be used to quench rocket test engines. And even the site water system for potable water had to be abandoned from drinking use in the mid-1980s when it was discovered to be contaminated because of contamination of the groundwater from which it was derived. Furthermore, with all the airborne releases of radioactivity at the site, from the nuclear accidents and the open-air sodium burn pit, much of Area IV had been dusted by radioactive fallout. Indeed, EPA found 500 soil samples through virtually all subareas of Area IV that were contaminated. So the water tanks could have been contaminated through any number of means.

Let us then take a careful look at one table of Boeing measurements of radioactivity on the water tanks. There are 31 samples measured. Begin with the measurements of alpha radiation in the left half of the table. The third column of numbers represents the measured value of gross (total) alpha radiation for each sample in counts per minute (cpm). The next column is Boeing's claimed value for background radiation for alpha, also in cpm. This is how much radiation Boeing asserts would be there if there were no added contamination. The next column is the net count rate, also in cpm. It is obviously the net amount of radiation above background. The next column is the net activity, converted into disintegrations per minute per 100 cm^2. Because radiation detectors are inefficient and can only see something like a tenth of the actual radiation disintegrations, one converts cpm into dpm by dividing cpm by the instrument's efficiency. The net activity is the net amount of radioactivity over background.

One readily sees that Boeing is reporting seventeen parts of the water tanks as having net alpha radioactivity over background. The yellow highlighted numbers show contamination that is less than 100 dpm over background. The orange highlighted numbers show radiation levels that are more than 100 dpm over background—which is Boeing's "preferred" release criterion for alpha activity, i.e., it is not just above background, it is even above the release limit of "acceptable surface contamination" from Reg. Guide 1.86/DECON-1 that Boeing purports is applicable. And the red highlighted number, 313, is above Boeing's preferred limit, and above the maximum concentration limit of 300, and even above Boeing's grossly inflated MDA. The MDA is supposed to be the value at which one has only a 5% chance of missing a reading that is in fact above background. We will discuss that further in a moment. One also notes that there are a dozen additional measurements, for beta radiation, that Boeing reports above background.

And this is just one set of measurements, for the Water Tanks. Unfortunately, they have been torn down and the metal sent off to a metal recycler, and the other materials sent to landfills not licensed for radioactive materials. Based on Boeing's own measurements, some portions of those tanks were contaminated, some were contaminated even above the release limits Boeing was (improperly) using, and a portion even over the maximum release limit and the MDA.

Sample Area Measurements

				Alpha								Beta							
				Sample Count Time	Gross Sample Count	Gross Count Rate	Bkgd Count Rate	Net Count Rate	Net Activity	MDA	> MDA or < MDA ?	Sample Count Time	Gross Sample Count	Gross Count Rate	Bkgd Count Rate	Net Count Rate	Net Activity	MDA	> MDA or < MDA ?
Sample	Date	Description (Location, Object)	Material Type	(min)		(cpm)	(cpm)	(cpm)	(dpm/ 100 cm^2)	(dpm/ 100 cm^2)		(min)		(cpm)	(cpm)	(cpm)	(dpm/ 100 cm^2)	(dpm/ 100 cm^2)	
1	5/3/2012	side of small water tank	Construction	1	6	6	10	-4	0	308	<MDA	1	224	224	231	-7	0	687	<MDA
2	5/3/2012		Construction	1	11	11	10	1	30	308	<MDA	1	236	236	231	5	64	687	<MDA
3	5/3/2012		Construction	1	6	6	10	-4	0	308	<MDA	1	265	265	231	34	410	687	<MDA
4	5/3/2012		Construction	1	15	15	10	5	117	308	<MDA	1	281	281	231	50	600	687	<MDA
5	5/3/2012	↓	Construction	1	4	4	10	-6	0	308	<MDA	1	236	236	231	5	64	687	<MDA
6	5/3/2012	top of pipe tee	Construction	1	7	7	10	-3	0	308	<MDA	1	257	257	231	26	314	687	<MDA
7	5/3/2012	inside pipe-cut from small tank	Construction	1	2	2	10	-8	0	308	<MDA	1	209	209	231	-22	0	687	<MDA
8	5/3/2012	on support	Concrete	1	14	14	8	6	135	284	<MDA	1	430	430	490	-60	0	986	<MDA
9	5/3/2012	outside pipe from large water tank	Construction	1	13	13	10	3	74	308	<MDA	1	267	267	231	36	433	687	<MDA
10	5/3/2012	outside pipe from large water tank	Construction	1	5	5	10	-5	0	308	<MDA	1	245	245	231	14	171	687	<MDA
11	5/3/2012	on support	Concrete	1	5	5	8	-3	0	284	<MDA	1	498	498	490	8	90	986	<MDA
12	5/3/2012	on support	Concrete	1	16	16	8	8	178	284	<MDA	1	511	511	490	21	245	986	<MDA
13	5/3/2012	outside pipe from large water tank	Construction	1	13	13	10	3	74	308	<MDA	1	228	228	231	-3	0	687	<MDA
14	5/3/2012	outside pipe from large water tank	Construction	1	11	11	10	1	30	308	<MDA	1	253	253	231	22	287	687	<MDA
15	5/3/2012	on support	Concrete	1	11	11	8	3	70	284	<MDA	1	536	536	490	46	543	986	<MDA
16	5/3/2012	on support	Concrete	1	12	12	8	4	91	284	<MDA	1	454	454	490	-36	0	986	<MDA
17	5/3/2012	rusty pipe at large water tank	Construction	1	24	24	10	14	313	308	>MDA	1	275	275	231	44	529	687	<MDA
18	5/3/2012	brace pad - rusty	Construction	1	9	9	10	-1	0	308	<MDA	1	221	221	231	-10	0	687	<MDA
19	5/3/2012	on support	Concrete	1	14	14	8	6	135	284	<MDA	1	490	490	490	0	0	986	<MDA
20	5/3/2012	rusty pipe at large water tank	Construction	1	23	23	10	13	291	308	<MDA	1	247	247	231	16	195	687	<MDA
21	5/3/2012	side of gate valve	Construction	1	7	7	10	-3	0	308	<MDA	1	139	139	231	-92	0	687	<MDA
22	5/3/2012	large water tank berm basin	Asphalt	1	5	5	5	0	4	237	<MDA	1	498	498	572	-74	0	1062	<MDA
23	5/3/2012	near storm drain grate	Asphalt	1	6	6	5	1	26	237	<MDA	1	511	511	572	-61	0	1062	<MDA
24	5/3/2012	large water tank berm basin	Asphalt	1	6	6	5	1	26	237	<MDA	1	458	458	572	-114	0	1062	<MDA
25	5/3/2012		Asphalt	1	8	8	5	3	70	237	<MDA	1	467	467	572	-105	0	1062	<MDA
26	5/3/2012		Asphalt	1	2	2	5	-3	0	237	<MDA	1	498	498	572	-74	0	1062	<MDA
27	5/3/2012		Asphalt	1	10	10	5	5	113	237	<MDA	1	479	479	572	-93	0	1062	<MDA
28	5/3/2012		Asphalt	1	4	4	5	-1	0	237	<MDA	1	504	504	572	-68	0	1062	<MDA
29	5/3/2012	↓	Asphalt	1	2	2	5	-3	0	237	<MDA	1	524	524	572	-48	0	1062	<MDA
30	5/3/2012	side of small water tank	Construction	1	7	7	10	-3	0	308	<MDA	1	210	210	231	-21	0	687	<MDA
31	5/3/2012	side of pipe on large water tank	Construction	1	9	9	10	-1	0	308	<MDA	1	215	215	231	-16	0	687	<MDA

That Boeing's own measurements show numerous indications of contamination, and indeed over its own questionable release limits for "acceptable contamination." Boeing summarizes the Water Tank measurements in the following table, showing net contamination above background. You will note under Alpha Total numerous entries for contamination, i.e., net radiation above background, and that numerous of the readings exceed even the level Boeing proposes for "acceptable contamination," <100 dpm/cm2 (less than 100 dpm). Yet this material didn't go to a licensed LLRW disposal site as required. The metal has now been melted down into the commercial metal supply. Other portions of the debris went to a regular garbage dump and other portions to Buttonwillow.

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV

LOCATION: Site water tanks - exterior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	5/3/2012	5/3/2012	side of small water tank		< 20	< 100	0	0	6
2	5/3/2012	5/3/2012			< 20	< 100	30	64	7
3	5/3/2012	5/3/2012			< 20	< 100	0	410	6
4	5/3/2012	5/3/2012			< 20	< 100	117	600	7
5	5/3/2012	5/3/2012			< 20	< 100	0	64	5
6	5/3/2012	5/3/2012	top of pipe tee		< 20	< 100	0	314	5
7	5/3/2012	5/3/2012	inside pipe-cut from small tank		< 20	< 100	0	0	5
8	5/3/2012	5/3/2012	on support		< 20	< 100	135	0	8
9	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	74	433	6
10	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	0	171	6
11	5/3/2012	5/3/2012	on support		< 20	< 100	0	90	7
12	5/3/2012	5/3/2012	on support		< 20	< 100	178	245	7
13	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	74	0	6
14	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	30	267	5
15	5/3/2012	5/3/2012	on support		< 20	< 100	70	543	6
16	5/3/2012	5/3/2012	on support		< 20	< 100	91	0	6
17	5/3/2012	5/3/2012	rusty pipe at large water tank		< 20	< 100	313	529	6
18	5/3/2012	5/3/2012	brace pad - rusty		< 20	< 100	0	0	6
19	5/3/2012	5/3/2012	on support		< 20	< 100	135	0	6
20	5/3/2012	5/3/2012	rusty pipe at large water tank		< 20	< 100	291	195	6

COMMENTS: MDA = minimum detectable activity	INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
[1]Tennelec (MDA = 10 dpm/100 cm^2 α and 27 dpm/100 cm^2 β)	IDENTIFICATION	NR007137		275211		EX041002
[2]Ludlum 2224 with 43-89 dual alpha beta probe	CALIBRATION DUE	Daily		8/23/2012		1/24/2013
(MDA 237 - 308 dpm/100 cm^2 α and 667 - 1062 dpm/100 cm^2 β)	BACKGROUND (cpm)	0	3.7	5 to 10	231 to 572	4 to 10 µrem/h
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)	INSTR. EFFICIENCY	30.12%	36.57%	18.4%	16.8%	NA
SAMPLED BY: E. Serrato DATE: 5/3/2012	COUNT TIME	1 min.		1 min		Scan
REVIEWED BY: Phil Rutherford DATE: 8/6/2012	Page 1 of 7					

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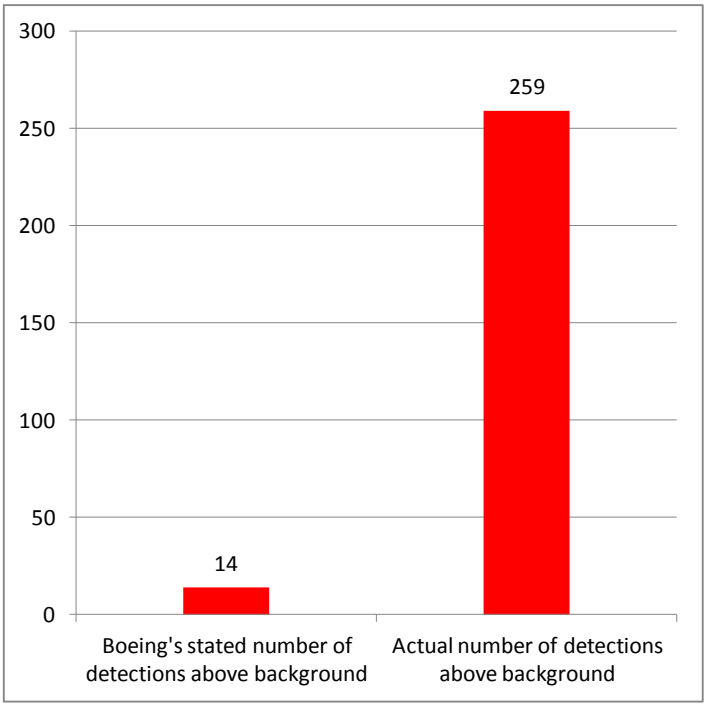
If one counts Boeing's own measurements of exceedances of background, its data for the structures in question show at least 254 detections of radiation above background[xiii] (see Figure 8

[xiii] Note: the values presented within each report's Radiation Survey Report tables ***describe values from which background levels of radiation have already been subtracted***. Because of this, every value within these tables which is greater than zero signifies a sample exceeding background radiation. The total number of samples exceeding background is thus the total number of samples from the Radiation Survey Reports which are greater than zero.

below). Thus, by Boeing's own measurements, if not consistently by Boeing's own admission, the buildings are contaminated. Screenshots from Boeing reports showing these scores of detections are shown in Appendix E attached.

Figure 8: Boeing's stated number of radiation detections above background levels versus actual number of detections above background in Area IV buildings it has recently demolished[85]



Hundreds of Exceedances of the Critical Level (L_C), which Boeing's Documents Define as the Statistical Measure of What One Has Confidence Exceeds Background

Boeing might argue that one shouldn't compare its actual readings with what it claims is background to determine what is above background, even though it itself reports these measurements as net of background. Its own submissions indicate that anything over what is called the "critical level," or L_C, above background should be reported as in excess of background. The TetraTek study for EPA included in the Boeing submissions states, "For the purposes of reporting individual measurement results, *any response above the instrument L_C will be considered to be above background (or a net positive result)*."[86] (emphasis added) The Multi-

Agency Radiation Survey and Site Investigation Manual (MARSSIM), created by EPA, NRC, and other agencies, which is repeatedly cited in the Boeing submissions, defines L_C as "the net response level, in counts, at which the detector output can be considered 'above background.'" p. 6-33. It goes on to say any reading above L_C "*should be considered as above background,* i.e., a net positive result." p. 6-35, emphasis added.[87]

So, even if one ignores Boeing's own listings of readings that are net of background, and uses instead any Boeing reading that is above background plus the critical level L_c, as Boeing's own submissions insist, there are still large numbers of readings that must then be reported as "above background." For example, for the structures tabulated in the graph above, there were 62 readings that exceed the critical level above background and which Boeing's own documents say "should be considered as above background":

BUILDING	**# of Measurements over Critical Level (L_C)**
4015	**12**
Water Tanks	**10**
Weather Station Structures	**7**
4011 High Bay	**29**
ESADA	**4**

Below we have here tabulated the decade-old measurements conducted by EPA's contrator TetraTek for Building 4055, the plutonium building, that Boeing notified DTSC and DPH in early July that it intended to demolish and dispose of as early as August. One will note that, out of measurements in the plutonium building, TetraTek reported 88 as in excess of background and 87 in excess of background plus the critical level. One also notes that TetraTek report 87 readings exceeding both background and its detection limit.

EPA/Tetra-Tek Measurements of Contamination in the Plutonium Building (Bldg 4055) Submitted to DTSC/DPH by Boeing

Sample #	Bkgd Rate - cpm	Sample Rate - cpm	Net Above Background	Critical Level Lc (cpm)	Net Above (Background + Critical Level)	Reported Activity (dpm/100 cm2)
1	0	0	0	0	0	#<Ld
2	99	188	89	1.2697795	87.7302205	1202.7+/-348.7
3	0	0	0	0	0	#<Ld
4	99	198	99	1.2697795	97.7302205	1337.84+/-358.7
5	0	0	0	0	0	#<Ld
6	99	220	121	6.0692475	114.9307525	1635.14+/-391.3
7	0	1	1	0	1	7.87+/-0.0
8	99	110	11	1.2697795	9.7302205	148.65+/-258.7
9	0	0	0	0	0	#<Ld
10	99	144	45	6.0692475	38.9307525	608.11+/-315.9
11	0	1.5	1.5	0	1.5	11.81+/-0.0
12	99	123	24	1.2697795	22.7302205	324.32+/-275.7
13	0	1	1	0	1	7.87+/-0.0
14	99	118	19	6.0692475	12.9307525	256.76+/-285.5
15	0	1	1	0	1	7.87+/-0.0
16	99	195	96	1.2697795	94.7302205	1297.30+/-355.7
17	0	0	0	0	0	#<Ld
18	99	181	82	6.0692475	75.9307525	1108.11+/-354.6
19	0	1	1	0	1	7.87+/-0.0
20	99	222	123	1.2697795	121.7302205	1662.16+/-381.4
21	0	2	2	0	2	15.75+/-0.0
22	99	199	100	6.0692475	93.9307525	1351.35+/-372.0
23	0	1	1	0	1	7.87+/-0.0
24	99	202	103	1.2697795	101.7302205	1391.89+/-362.5
25	0	0	0	0	0	#<Ld
26	99	214	115	6.0692475	108.9307525	1554.05+/-385.8
27	1	2	1	0.1276176	0.8723824	7.41+/-0.0
28	139	176	37	1.5045898	35.4954102	486.84+/-329.1
29	1	2	1	0.1276176	0.8723824	7.41+/-0.0
30	139	165	26	1.5045898	24.4954102	342.11+/-317.8
31	1	0	-1	0.1276176	-1.1276176	#<Ld
32	139	171	32	1.5045898	30.4954102	421.05+/-324.0
33	1	2	1	0.1276176	0.8723824	7.41+/-0.0
34	139	162	23	1.5045898	21.4954102	302.63+/-314.7
35	1	1	0	0.1276176	-0.1276176	#<Ld
36	139	238	99	1.5045898	97.4954102	1302.63+/-386.7
37	1	2.5	1.5	0.6099823	0.8900177	11.11+/-0.0
38	139	242	103	7.1915856	95.8084144	1355.26+/-399.9
39	1	3	2	0.1276176	1.8723824	14.81+/-0.0
40	139	168	29	1.5045898	27.4954102	381.58+/-320.9
41	1	1.5	0.5	0.6099823	-0.1099823	#<Ld
42	139	163	24	7.1915856	16.8084144	315.79+/-327.7
43	1	2	1	0.1276176	0.8723824	741+/-0.0
44	139	167	28	1.5045898	26.4954102	368.42/-319.9
45	1	3	2	0.1276176	1.8723824	14.81+/-0.0
46	139	178	39	1.5045898	37.4954102	513.16+/-331.1
47	1	2.5	1.5	0.6099823	0.8900177	11.11+/-0.0
48	139	180	41	7.1915856	33.8084144	539.475+/-344.5
49	0	0	0	0	0	#<Ld
50	208	263	55	2.3724527	52.6275473	345.91+/-198.4
51	0	0	0	0	0	#<Ld
52	208	257	49	2.3724527	46.6275473	308.18+/-196.1
53	0	0	0	0	0	#<Ld
54	208	238	30	2.3724527	27.6275473	188.68+/-188.5
55	0	1	1	0	1	5.81+/-0.0
56	208	371	163	2.3724527	160.6275473	1025.16+/-236.1
57	0	2	2	0	2	11.63+/-0.0
58	208	276	68	2.3724527	65.6275473	427.67+/-203.3
59	0	2	2	0	2	11.63+/-0.0
60	208	261	53	8.7972902	44.2027098	333.33+/-198.9
61	0	1	1	0	1	5.81+/-0.0
62	208	281	73	2.3724527	70.6275473	459.12+/-205.1
63	0	0	0	0	0	#<Ld
64	208	258	50	2.3724527	47.6275473	314.47+/-196.4
65	0	1	1	0	1	5.81+/-0.0
66	208	285	77	2.3724527	74.6275473	484.28+/-206.6
67	0	2	2	0	2	11.63+/-0.0
68	208	282	74	2.3724527	71.6275473	465.41+/-205.5
69	0	1	1	0	1	5.81+/-0.0
70	208	278	70	2.3724527	67.6275473	440.25+/-204.0
71	0	0	0	0	0	#<Ld
72	208	292	84	2.3724527	81.6275473	528.30+/-209.2
73	0	2	2	0	2	11.63+/-0.0
74	208	277	69	2.3724527	66.6275473	433.96+/-203.7

EPA/Tetra-Tek Measurements of Contamination in the Plutonium Building (Bldg 4055) Submitted to DTSC/DPH by Boeing

Sample #	Bkgd Rate - cpm	Sample Rate - cpm	Net Above Background	Critical Level Lc (cpm)	Net Above (Background + Critical Level)	Reported Activity (dpm/100 cm2)
75	0	0	0	0	0	#<Ld
76	208	263	55	8.7972902	46.2027098	345.91+/-199.7
77	0	1	1	0	1	6.29+/-0.0
78	208	279	71	2.3724527	68.6275473	412.79+/-189.1
79	0	0	0	0	0	#<Ld
80	208	251	43	2.3724527	40.6275473	250.00+/-179/2
81	0	1	1	0	1	6.29+/-0.0
82	208	268	60	2.3724527	57.6275473	444.44+/-235.5
83	1	1	0	0.1276176	-0.1276176	#<Ld
84	139	162	23	1.5045898	21.4954102	133.72+/-142.4
85	0	1	1	0	1	6.29+/-0.0
86	208	273	65	2.3724527	62.6275473	377.91+/-187.0
87	0	1	1	0	1	6.29+/-0.0
88	208	255	47	2.3724527	44.6275473	273.26+/-180.6
89	0	2	2	0	2	12.58+/-0.0
90	208	193	-15	2.3724527	-17.3724527	#<Ld
91	1	2	1	0.1276176	0.8723824	13.16+/-0.0
92	139	138	-1	1.5045898	-2.5045898	#<Ld
93	1	2	1	0.6099823	0.3900177	13.16+/-0.0
94	139	145	6	7.1915856	-1.1915856	34.88+/-136.9
95	0	0	0	0	0	#<Ld
96	208	417	209	2.3724527	206.6275473	1215.12+/-231.6
97	0	1	1	0	1	6.29+/-0.0
98	208	419	211	2.3724527	208.6275473	1226.74+/-232.2
99	0	0	0	0	0	#<Ld
100	208	385	177	2.3724527	174.6275473	1311.11+/-283.1
101	1	1	0	0.1276176	-0.1276176	#<Ld
102	139	160	21	1.5045898	19.4954102	155.56+/-179.4
103	1	1.5	0.5	0.1276176	0.3723824	6.58+/-0.0
104	139	165	26	1.5045898	24.4954102	192.59+/-182.3
105	1	2	1	0.1276176	0.8723824	13.16+/-0.0
106	139	174	35	1.5045898	33.4954102	259.26+/-187.4
107	1	2	1	0.1276176	0.8723824	13.16+/-0.0
108	139	138	-1	1.5045898	-2.5045898	#<Ld
			Exceedances of Background		**Exceedances of Background Plus Critical Level (Lc)**	**Reported Exceedances of Background and Detection Limits**
			88		**87**	**87**

Flaws in Boeing's Methodology Mean Actual Contamination May Be Much Higher: Inflate, Shifting, and Otherwise Questionable Background Values

Actual contamination of the buildings being demolished or awaiting demolition may in fact be greater still. Boeing's reports are riddled with questionable sampling techniques, among them comparing samples against a dubious measure of background radiation. Boeing does not use the EPA's background values, but instead obtained its own from other buildings within SSFL which may also be contaminated[88]. This alone is sufficient to invalidate all of Boeing's findings.

One notes, for example, from the table above, that TetraTek reported a far lower value for background than does Boeing. For alpha, it reported background of 0-1 counts per minute (cpm). Yet Boeing reports alpha background as far higher –anything from 8 cpm to 38 or higher. TetraTek reports beta radiation background at roughly 100-200 cpm. Boeing claims it at as much as 800 or more. There is a serious question whether Boeing's background values are significantly inflated.

Boeing does not describe how it got its background figures. There is no way a reviewer—at DTSC, DPH, or in the public—can determine if Boeing inflated the background values. And its background claims vary all over the place with subsequent demolition reports, going far higher. This is important because if Boeing's background numbers are inflated, then far more of the readings at the buildings in Area IV should be reported as contaminated, and by larger amounts, and more would be likely to even exceed the "acceptable contamination" levels that Boeing inappropriately uses.

Both a DPH and EPA commenter have noted the questionable background values employed. In their reviews of the L-85 supplemental measurements, they note that the measured values for the L-85 debris are far below the values Boeing is claiming for background. This of course can't be, unless the background values are inflated. The EPA commenter recommended a review of whether there are problems with the lab, which could, he said, result in several of the readings being not only above background but even above the DECON-1/Reg. Guide 1.86 levels. His recommendations were rejected by DTSC.[89]

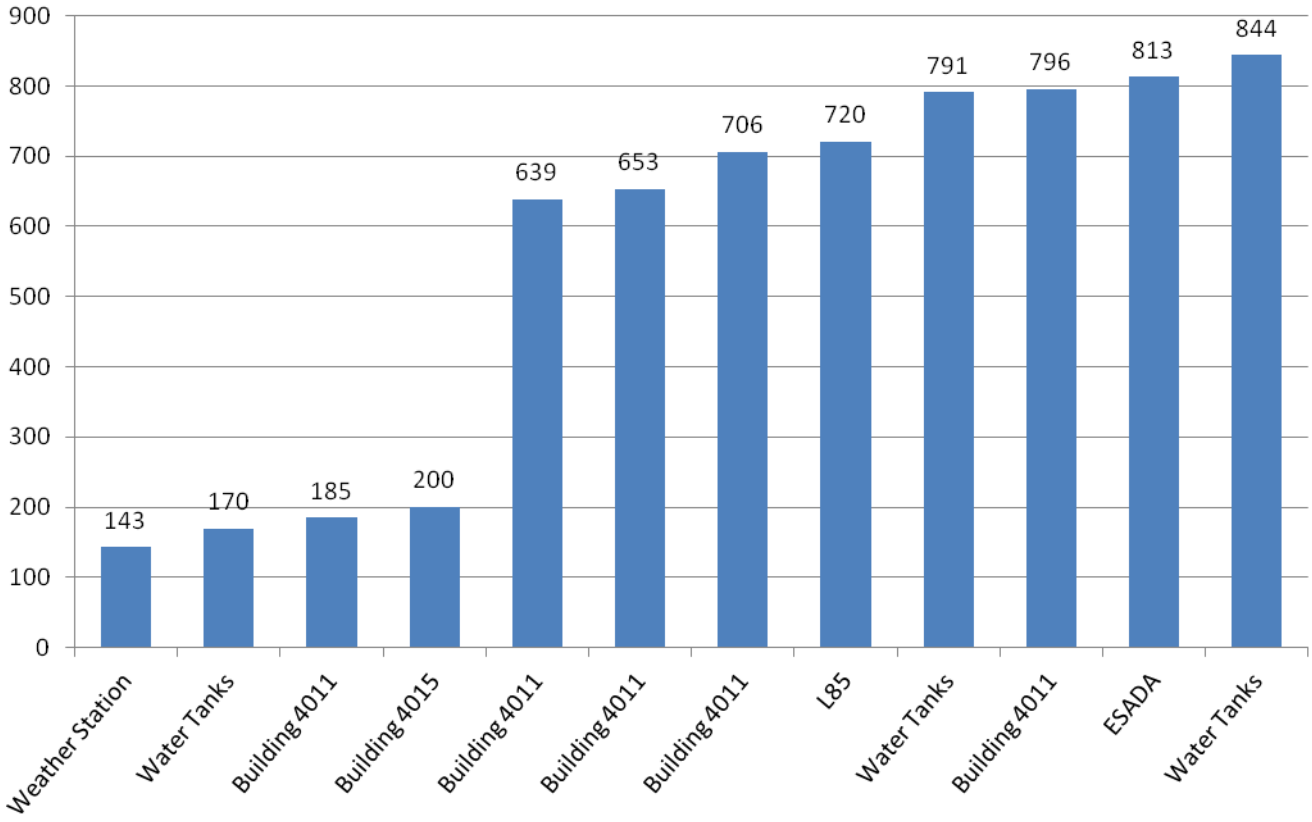
Furthermore, the background values Boeing uses are wildly inconsistent. The range of background alpha radiation levels against which Boeing compares its pre-demolition radiation measurements is displayed in 9, 10, and 11 below. Figure 9 displays the range of alpha radiation background values used by Boeing to compare with concrete in Boeing Area IV buildings, Figure 10 displays the range of background values for asphalt, and Figure 11 displays the range of background values for construction materials. This is done in the same way that Boeing, in its pre-demolition reports, classifies sample areas into different categories according to material type (concrete, asphalt, and construction) and uses a separate background value to measure sample areas of each type. The values are given in disintegrations per minute (dpm), not cpm. (Counts per minute are divided by the instrument efficiency to get disintegrations per minute.) We are using Boeing's dpm values. Yet even within the same building material category, Boeing's background values vary widely.

Furthermore, Boeing's background values range suspiciously within the same building material category *even for background comparisons for the same building*. For example, the background values Boeing uses for comparing with sample areas of concrete *just within Building 4011* ranges from 185 dpm/100cm^2 to 813 dpm/100cm^2. In another example, background used for sample areas of asphalt for the Water Tanks ranges from 104 dpm/100cm^2 to 286 dpm/100cm^2. Additionally, Boeing generally uses far higher background values for its post-demolition surveys than for the pre-demolition survey—for the same structure and same materials. This results in the same level of radiation in the post-demolition survey being declared below background when it would be declared above background if the background value used in the original survey were employed. It also results in many reported values that are highly negative, supposedly far below background, which is questionable.

The variation in Boeing's background levels has significant implications. For example, a sample exhibiting alpha radiation at a level of 500 dpm/100cm^2, when measured against a background level of 100 dpm/100cm^2, would be seen as having significant contamination. However, this same contaminated sample, if compared against a high background value such as 480 dpm/100cm^2, could then be dismissed as insignificant. We must be clear; there should be a single value for concrete that is similar to the concrete in a particular building being investigated. That background value for concrete should come from a building far from Area IV that couldn't have been contaminated by its activities. And the background value should then be stable, not jumping all over the place as Boeing's reported background values do.

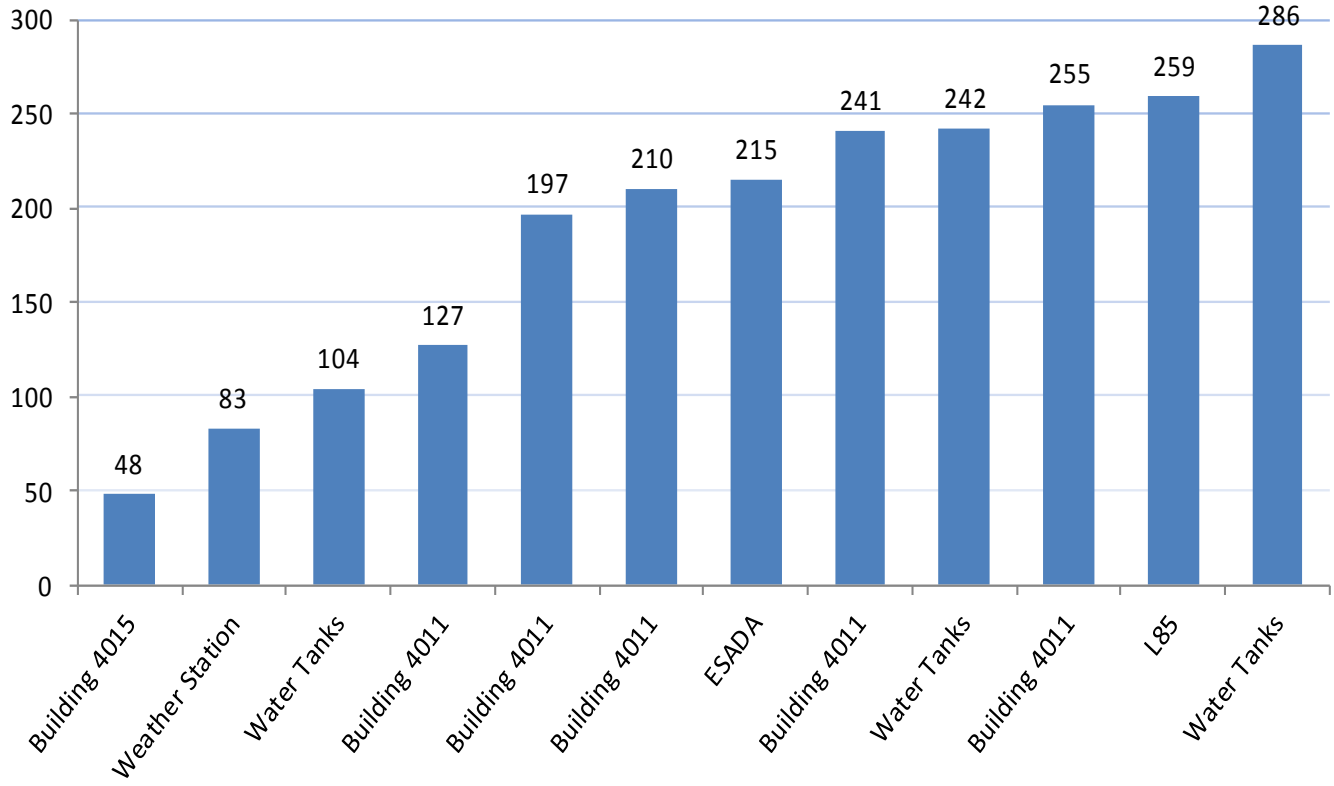
All measurements shown are in disintegrations per minute / 100cm^2 (dpm/100cm^2)^{90}

Figure 9: Range of alpha radiation background values used by Boeing to compare with concrete in Boeing Area IV buildings



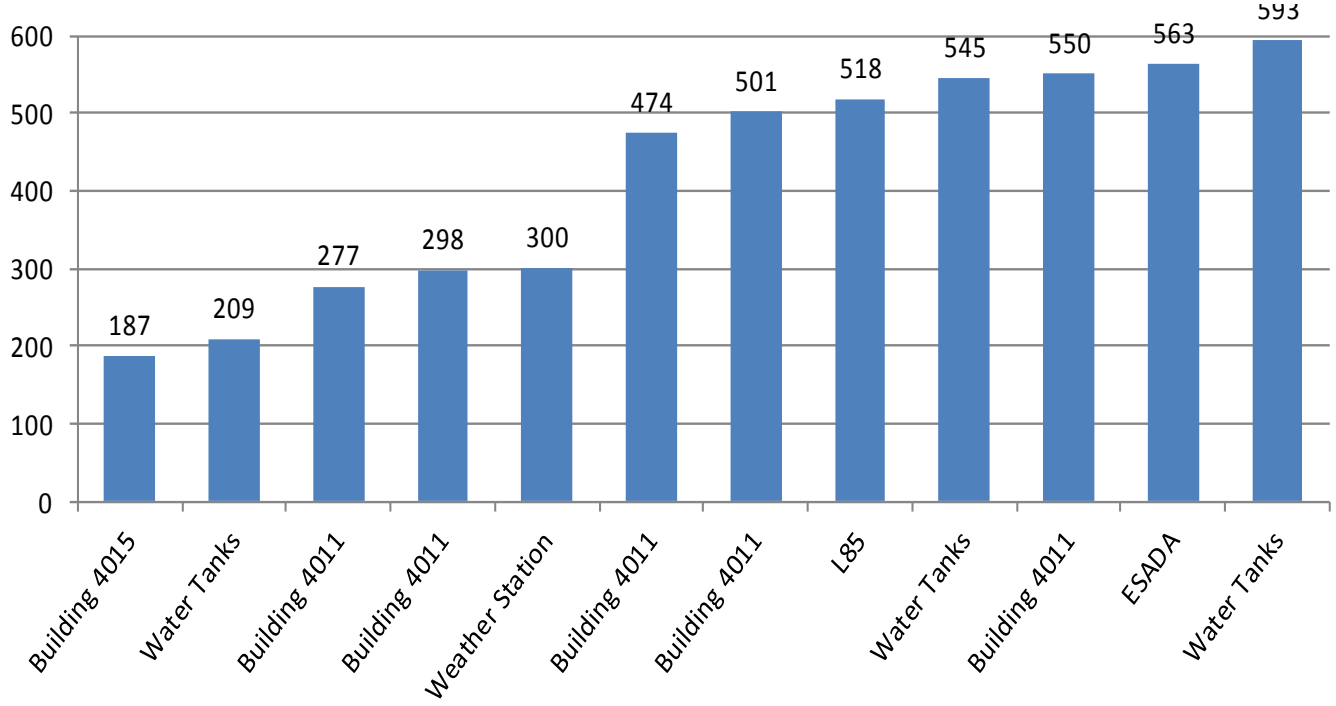
The background values Boeing uses for concrete in its Area IV buildings vary from a low of **143 dpm/100cm^2** to a high of **844 dpm/100cm^2**

Figure 10: Range of alpha radiation background values used by Boeing to compare with Asphalt in Boeing Area IV buildings



The background values Boeing uses for asphalt in its Area IV buildings vary from a low of 48 **dpm/100cm^2** to a high of **286 dpm/100cm^2**

Figure 11: Range of alpha radiation background values used by Boeing to compare with construction materials in Boeing Area IV buildings



The background values Boeing uses for construction materials in its Area IV buildings vary from a low of **187 dpm/100cm2** to a high of **593 dpm/100cm2**.

Thus, the values Boeing asserts for background appear unreliable and potentially significantly inflated. This would significantly understate the number of measurements that exceed background and even exceed the "acceptable contamination" limits DTSC, DPH, and Boeing are inappropriately applying, and the magnitude of the exceedances above background and those release levels.

Use of Poor Quality Detection Limits

As indicated earlier in this report, reviews by EPA in the late 1980s and mid-1990s's found substandard practices in the Boeing radiation program and questionable practices by Boeing radiation analyst Philip Rutherford. Indeed, it was EPA's criticisms of Rutherford's Area IV survey that led in part to the AOC requirement that EPA perform all the measurements itself. Some of those problems were too short a counting time, leading to inability to detect contamination at the levels of concern. As discussed below, that is precisely a key problem of the current Boeing/Rutherford work.

Rutherford frequently, in the Boeing submissions to DPH and DTSC, states that "surface activity measurements and wipe-tests were non-detect (i.e., less than the MDA) and are therefore

indistinguishable from background. The dose from any resulting solid debris would therefore be zero mrem per year."[91] It is an extraordinary statement, because the MDA—the minimum detectible activity—that Rutherford uses is so high **that it not only can't reliably see all contamination above background, it can't even reliably detect levels above the release criteria Boeing employs**.

The function of the MDA, according to MARSSIM, is to protect against Type II statistical errors (false negatives), meaning that it is supposed to be miss a reading that is actually above background (or the critical level) only 5% of the time.[92] The device will still see contamination below that level (so the readings Boeing reported above the critical level should be reported as above background), but will miss increasing number of such measurements. So readings below the MDA can be real, but real readings below the MDA and above background can be missed with an increasing frequency.

Boeing declares any reading below its MDA to be "indistinguishable from background." But it has set its MDA so high that *it can't reliably distinguish contamination from background.* Nor can it even reliably distinguish contamination from its release standards above background. For example, Boeing's "preferred" limit for alpha non-removable contamination is 100 dpm/cm^2 above background. As seen below in a screenshot from Boeing's own table comparing its detection limit with its cleanup standard, its detectors generally can't detect contamination at those levels:

Figure 12: Boeing's measuring devices incapable of reliably detecting background or Boeing's own radiation limits

Units are in disintegrations per minute / 100cm^2. The image is of Boeing's own comparison of its purported maximum permissible limit for direct readings of alpha radiation compared to its Minimum Detectable Activities.[93]

Preferred Boeing Limit	100

Typical Minimum Detectable Activities	250 - 400

Boeing's MDA is thus 2.5 to 4 times higher than what it needs to see, even if you were to accept the legitimacy of allowing contamination rather than requiring it to be at or below background. But Rutherford claims his readings are "indistinguishable from background." However, his MDA can't possibly reliably distinguish anything from background. His device can only see radioactivity 250-400 dpm/cm^2 *above background.* So to say his readings are frequently (though not always) "indistinguishable from background" when his device can't reliably distinguish anything even hundreds of dpm above background is problematic.

One is supposed to set one's MDA to a level capable of seeing that which you are trying to detect. One does that primarily by adjusting the counting time. The longer the counting time, the lower the MDA. Rutherford set his counting time for samples at 1 minute, a very short period if one wants to have any reasonable MDA. By using such a short counting time, Boeing set up a situation where its MDA is far too high to reliably detect that which it is supposed to be looking for.

One can see the effect of a longer counting time on MDAs by looking at the TetraTek work for EPA included in the Boeing plutonium building demolition request. TetraTek's MDA, with a longer count time than the single minute Boeing employed, is 14.65 for alpha.[94] Boeing's, by contrast, is 17 to 27 times higher. And TetraTek's critical level (L_C) is similarly lower, because it too depends on counting time.

Even TetraTek's wasn't good enough, as it was merely trying to check the contamination levels against Reg Guide 1.86/DECON-1 level, rather than against background as required by the AOC and other requirements. But it shows that Boeing's count times were so low, and their detection limits so high, that Boeing couldn't have confidence that it wasn't missing significant numbers of samples that were contaminated.

Furthermore, many of the older surveys Boeing has submitted had major inadequacies as well. Many of them, such as the survey of the plutonium building of special concern, only measured 11% of the building. Even so, they found significant numbers of readings that were above even the questionable release values being used. But rather then go and measure the remaining 89% of the building, which must be presumed to likewise have had contamination, they did not do that. The subsequent minimal "confirmatory" survey by ORAU nonetheless found contamination Boeing had missed, above even the release limits; and yet, again, there was no requirement to go back and measure the great majority of the building that had not been examined. Sampling is just that—a statistical sample that should give an indication of what may be going on with the portion not sampled. Here, the plutonium building measurements found contamination in the areas examined, even after one cleanup, and yet there was no effort to go back and check the areas not surveyed. And Boeing has insisted, and DTSC and DHS have acquiesced, that buildings for which there are decades-old outdated measurements should be permitted to be torn down and disposed of without any new measurements.

Nevertheless, the fundamental fact is that virtually every building which has been demolished and those pending showed detections above background. Given the abundance of radiation which Boeing's reports show to exist in the buildings *in spite of* these procedural deficiencies, the actual scope of the contamination, and health risk therein, remains unknown. Still, DTSC and DPH continue to issue approvals of Boeing's demolition plans.

What Is About To Happen, If DTSC and DPH Do Not Start Complying With CEQA—Teardown of the Plutonium Building, Disposal of the Radioactive Debris from the L-85 Reactor Facility, and Demolition and Disposal in Unlicensed Facilities of Four More Radiological Structures

The secretly approved Amendment 1 to the SOP brought about the demolition and disposal of six facilities Boeing, DTSC, and DPH described as "non-radiological," even though the measurements submitted clearly indicate contamination. The contaminated debris from those facilities ended up at recyclers and in Class I, II, and III landfills—none being a licensed LLRW disposal facility.

The April 2013 Amendment 2 to the SOP crosses the threshold to now allowing the demolition and disposal of six facilities at SSFL's Area IV that Boeing, DTSC and DPH admit are radiological facilities. It is time-urgent to stop this process and bring it into compliance with CEQA and other laws and regulations.

The L-85 Nuclear Facility Debris

In the days before the issuance of this report, DTSC and DPH approved the disposal of the remaining structures from the L-85 reactor facility. That waste may have already been shipped to a Class I landfill not licensed for LLRW waste, presumably Buttonwillow, or the shipments may be imminent.

The data for the L-85 clearly show its debris is contaminated. Neutron bombardment of the neighboring concrete induced radioactivity in it, "byproduct" radioactivity regulated by DPH. The direct gamma readings were so high that they exceeded even the woefully non-protective standards employed decades ago in determining whether the facility could be reused for non-nuclear occupancy. Those long-disavowed standards were 5 micro-rem per hour, or 44 millirem/year, the equivalent of 22 chest Xrays annually.

The measurements of radiation from the concrete exceeded even those standards, so it was decided to pour some additional concrete on top of the contaminated concrete in the hopes of dropping the dose down enough that the building could be reoccupied.[95] That supposedly permitted reuse of the building for other occupancy, but means that the debris is volumetrically contaminated and breaking it up and disposing of it in other than a licensed LLRW site in impermissible. As indicated earlier, there are no standards for volumetric contamination. If any of the L-85 radioactive debris remains at SSFL, it should not be allowed to be disposed of in anything other than a licensed radioactive waste disposal facility.

Recommendations by a reviewer for EPA noted Boeing's background values were considerably higher than the L-85 measurements, which shouldn't be. He recommended the potential for lab or other errors be resolved, indicating that three measurements could well be over even the Reg Guide 1.86/DECON-1 levels due to the potential errors. His recommendations were rejected by DTSC.[96]

Similarly, DPH noted that many of the old measurements were close to the 1.86/DECON-1 limits and recommended a detailed new survey. Boeing refused to do so.[97] There is no question that the debris is contaminated. It should be disposed of in a site licensed to handle such material.

Approval of the Tear-Down and Disposal of the Plutonium Building

Building 4055 housed a plutonium fuel fabrication facility, making plutonium fuels for the breeder reactor program. Very large quantities of plutonium, much in powdered form, was handled there. At least three incidents are documented in which plutonium was accidentally released.[98]

The first attempt to decontaminate the building found contamination in numerous locations and resulted in over 17,000 cubic feet of radioactive waste. Only ~11% of the facility was surveyed, and a subsequent confirmatory survey again found contamination after it had been supposedly cleaned up. But still the great majority of the facility was not surveyed, even when the portion that was measured found contamination.

As demonstrated in the table earlier in this report summarizing TetraTek measurements a decade ago, that EPA contractor found a large number of samples that were above background.

Plutonium is an alpha-emitter. It cannot penetrate a layer of paint. Alpha-detectors looking for surface contamination will not see it if it is under paint. It was common practice to paint over contamination so as to be able to continue to use a building. But tearing it down and disposing of plutonium-contaminated debris could be very injurious to the environment. Disposed of in a site not designed for such waste can result in plutonium going off as particulate, whereby it can be inhaled and lodge in the lung; or can contaminate groundwater and be ingested by drinking or concentrate in foodstuffs and be consumed.

The old measurements submitted by Boeing clearly show potential plutonium contamination in that plutonium building. No new measurements have been made. The risks associated with improper disposal of plutonium-contaminated materials are substantial. Boeing proposes to ship the waste to a facility like Buttonwillow not licensed or designed to take it.

Boeing submitted to DTSC and DPH its proposal to tear down the plutonium facility on July 3, 2013, saying it intended to start demolition if it got their approval as early as a month thereafter. Time is of the essence to prevent that from occurring and to assure a full CEQA review of the potential environmental impacts.

Four More Former Nuclear Facilities Next in Line to Be Torn Down and Disposed Of

Boeing has requested DTSC/DPH approval to teardown and dispose of the debris from the Building 4011 Radiation Calibration Facility and the Building 4005 reactor facility.[99] The DTSC website does not show approvals yet.

Boeing indicates that remaining on their demolition and disposal program are Buildiong 4009, the Organic Moderated Reactor and Sodium Graphite Reactor facility, and Building 4100, the Fast Critical Experiment Laboratory/Advanced Epithermal Thorium Reactor facility.[100]

Therefore, absent some change of heart at DTSC and DPH, or some intervention by some other entity to bring them into compliance with CEQA and other requirements, FIVE facilities they admit to be radiological will be torn down in the near future and the debris disposed of in facilities not licensed to dispose of LLRW. The consequences could be significant.

The Potential Environmental Impacts of These Actions, if Not Stopped

Exposure to ionizing radiation increases the risk of cancer and leukemia in the persons exposed and genetic defects in their offspring. The National Academy of Sciences and California and federal agencies agree that there is no "safe" level, i.e., no amount of radiation that will not increase the risk of cancer, leukemia, and genetic effects.[101] Radiation protection regulations are premised on the lack of a threshold below which there is no harm and risk increases linearly with dose.[xiv]

Radioactive waste must be disposed of carefully so as to isolate it from the environment. California and federal laws and regulations require that radioactive waste be disposed of in a licensed facility meeting numerous safety requirements designed to keep it contained, in order to protect the environment and public health.

These radioactive materials are very dangerous. Plutonium-239, the material with which Building 4055 is contaminated, is among the most toxic materials on earth. A millionth of an ounce or so, if inhaled, will cause cancer with a virtual 100% statistical certainty.[102] It has a half-life of 24,000 years. Strontium-90 mimics calcium and concentrates in the bone, where it can cause bone cancer and leukemia. Cesium-137 is a powerful gamma emitter, capable of causing cancer in many organs.

Detailed requirements in statute and regulation mandate special measures that must be taken for disposing of radioactive waste, measures that are not in place at municipal and hazardous waste landfills. An LLRW site must, for example, once closed, be on land owned by the federal or state government, given the long-life of the wastes and the short-life of companies. California law bars shallow land burial for LLRW and requires multiple redundant barriers and the ability to inspect the waste and take action if containers are leaking. There must be trained health physics personnel, and detailed, sensitive radionuclide monitoring of air and groundwater. None of these requirements exists for municipal landfills, which, after all, are designed for regular household garbage. And none exist for hazardous waste disposal facilities like Buttonwillow. Municipal landfills furthermore are not required to undergo the site characterization efforts LLRW sites must to demonstrate appropriate hydrologic and geologic features to reduce migration potential.

[xiv] This is known as the Linear No-Threshold (LNT) model.

Failure to dispose of radioactive waste appropriately can result in contamination of groundwater, and though it, exposure to members of the public in drinking water or through uptake and bioaccumulation in agricultural crops irrigated with that water. Radioactive particulates can become airborne and result in inhalation exposures to radiation and fallout on land that can further expose people or concentrate in crops.

10 CFR 61 requires plans for assuring that disposing of LLRW in the presence of more than a tiny amount of chemicals called chelating compounds are appropriately dealt with. These materials, however, may be present in very large quantities in chemical waste disposal facilities. Chelating compounds cause radioactive materials to migrate very much faster than they would if chelating compounds weren't present.[103] In this fashion, disposing of radioactive materials with chemicals can have an environmentally synergistic damaging effect, causing far more rapid migration in the environment.

Disposal of radioactive waste in non-LLRW disposal facilities can have other impacts as well. Regular garbage dumps from time to time catch fire because of all the combustible materials and the generation of flammable methane gas. Right now, the West Lake landfill in Missouri is on fire, a slow, smoldering fire that is advancing toward a large amount of radioactive waste that was improperly disposed of in that landfill long ago. If the fire reaches the radioactive waste, it can be a driving force pushing the radioactive materials and gases into the environment.

Recycling contaminated materials into the commercial metal supply, or otherwise recycling asphalt and concrete that is contaminated, can have significant environmental and health impacts. Commercial products simply should not be made out of radioactive waste. One should not have to worry that a baby is exposed to radiation because of metal products nearby; adults should not have to worry about the dose that could be received by close proximity or even intimate bodily contact with contaminated metals that got recycled. Concrete or asphalt that has radioactive contamination can, when recycled, result in the contaminants leaching into water supplies or being resuspended and breathed in. Radioactive waste, in order to avoid environmental impacts, needs to be isolated from the environment, as required by law, not recycled or dumped into the environment.

The very reason SSFL is facing an extensive cleanup is because Boeing and its predecessors, which operated the facility, and the agencies that regulate it, were not environmentally careful. Spills, accidents, releases of many kinds resulted in widespread contamination, for which the environment and the public are paying a price. Similar failure to dispose of the radioactive waste appropriately can repeat the mistake, and have major environmental impacts.

At minimum, CEQA requires that an Environmental Impact Report be conducted before making these decisions that could significantly affect the environment. DTSC and DPH should comply with the state's environmental law, and in so doing, be agents of protecting the

environment and public health and not, as they appear to be at present, agents of circumventing the state's environmental laws and placing the environment and public at risk.

The risk to the environment is time urgent. As this report is being completed, Boeing is on the verge of tearing down the plutonium building and disposing of its waste in a Class I facility like Buttonwillow, as opposed to a licensed LLRW site. In recent days, DTSC and DPH have approved the disposal in an unlicensed Class I facility for the debris from the L-85 reactor, the measurements for which show it is clearly contaminated. And the remaining Boeing buildings from the nuclear area are scheduled to soon come down and be shipped out, barring some intervention. The environmental damage could be significant, and irreversible.

ENDNOTES

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[78] "Notification of Demolition for Former Radiological Building 4011 Low Bay (Area IV)," Regulatory Release of Building 4011 (Low Bay) and Disposal of Decommissioned Material: Operations. March, 2013. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65980_SSFL_Area_4_Bldg__4011_Lowbay_demo_notice.pdf

[79] "Site Summary – Building 4055." May, 2005. http://www.etec.energy.gov/library/main/4055_HSA.pdf

[80] "Site Summary – Building 4093." May, 2005. http://www.etec.energy.gov/Library/Main/4093_HSA.pdf

[81] "Site Summary – Building 4100." May, 2005. http://www.etec.energy.gov/Library/Main/4100_HSA.pdf

[82] "Regulatory Guide 1.86: Termination of Operating Licenses for Nuclear Reactors." June, 1974. http://pbadupws.nrc.gov/docs/ML0036/ML003676463.pdf

[83] "Water Tanks Waste Certification, Rev. 1," Boeing, November 12, 2012, http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65796_Water_Tanks_Waste_Certification_Rev_1.pdf

[84] DTSC Review of Notification Package for Planned Demolition of Building 011 Phase 1, Boeing, Santa Susana Field Laboratory, Ventura County, California, December 11, 2012, http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/Correspondence/65781_B4011Comments.pdf p. 7, last acessed August 2, 2013

[85] **Stated number - s**ources:

Notification of Planned Demolition for Building 4015 (Area 4).” June, 2012. Page 46. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

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“Notification of Planned Removal of Minor Structures.” October, 2012. Pages 40, 41, 44. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

“Notification of Planned Demolition for a Portion of Boeing Building 4011.” November, 2012. Pages 103, 104, 127, 129. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

Actual number – sources:

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“Updated Waste Survey for Water Tanks (Area IV).” Pages 8, 9.

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“Notification of Demolition for ESADA Minor Features (Boeing Area IV).” February, 2013. Pages 19-22. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65872_113127_ESADA_Demo_Notification.pdf

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[87] “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), by EPA, NRC, and other agencies, December 1997,http://www.epa.gov/radiation/marssim/obtain.html

[88] “Notification of Planned Demolition for Building 4015 (Area 4),” Daily Background Measurements. June, 2012. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

“Notification of Planned Demolition for Water Tanks (Area 4),” Daily Background Measurements. October, 2012. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65711_WaterTank-DEMO.pdf

“Notification of Planned Removal of Minor Structures,” Daily Background Measurements. October, 2012. http://www.dtsc-

ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

"Notification of Planned Demolition for a Portion of Boeing Building 4011," Daily Background Measurements. November, 2012. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

[89] "DTSC Review of Supplemental Radiological Survey Data from L-85," July 22, 2013; DPH and EPA commenters reviews attached thereto; Sources:

Notification of Planned Demolition for Building 4015 (Area 4)." June, 2012. Page 34. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

"Updated Waste Survey for Water Tanks (Area IV)." November, 2012. Pages 10, 20, 39. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65796_Water_Tanks_Waste_Certification_Rev_1.pdf

"Notification of Planned Removal of Minor Structures." October, 2012. Page 38. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

"Notification of Planned Demolition for a Portion of Boeing Building 4011." November, 2012. Pages 101, 127, 136, 145, 146. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

"Notification of Demolition for ESADA Minor Features (Boeing Area IV)." February, 2013. Page 25. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65872_113127_ESADA_Demo_Notification.pdf

"Boeing Demolition Notification for Former Radiological L85 Area (Area IV)." February, 2013. Page 188. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65921_113161-Notification_of_Planned_Removal,_L85_Area.pdf

[90] Sources:

Notification of Planned Demolition for Building 4015 (Area 4)." June, 2012. Page 34. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

"Updated Waste Survey for Water Tanks (Area IV)." November, 2012. Pages 10, 20, 39. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65796_Water_Tanks_Waste_Certification_Rev_1.pdf

"Notification of Planned Removal of Minor Structures." October, 2012. Page 38. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

"Notification of Planned Demolition for a Portion of Boeing Building 4011." November, 2012. Pages 101, 127, 136, 145, 146. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

"Notification of Demolition for ESADA Minor Features (Boeing Area IV)." February, 2013. Page 25. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65872_113127_ESADA_Demo_Notification.pdf

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[91] "Notification of Planned Removal L-85 Area," p. 179, http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65921_113161-Notification_of_Planned_Removal,_L85_Area.pdf

[92] MARSSIM, *supra*

[93] "Notification of Demolition for ESADA Minor Features (Boeing Area IV)," February, 2013. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65872_113127_ESADA_Demo_Notification.pdf Page 17.

[94] Notification of Planned Demolition for Building 4055, Parts 1B and 2B" http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66093_B4055DemoNotificationPart-1B.pdf and http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66094_B4055DemoNotificationPart-2B.pdf

[95] ""Boeing Demolition Notification for Former Radiological L85 Area (Area IV)," http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65921_113161-Notification_of_Planned_Removal,_L85_Area.pdf

[96] "DTSC Review of Supplemental Radiological Survey Data from Concrete and Piping Debris, Former L-85 Area (Area IV), Boeing—Santa Susana Field Laboratory, Ventura County, California," July 22, 2013, http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/Correspondence/66126_L85-SUPPLEMENTAL-22JUL2013-mm.pdf

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[98] http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66094_B4055DemoNotificationPart-2B.pdf

[99] "Boeing Demolition Table, April update," http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66061_Boeing_SSFL_Full_Demo_Table_4_14_2013.pdf

[100] See SOP, April 2013 revision, Amendment 2.

[101] See, e.g., *Health Risks from Exposure to Low Levels of Ionizing Radiation* (BEIR VII Phase 2) by the National Research Council of the National Academy of Sciences, National Academies Press, 2006, p. 10, available at https://download.nap.edu/login.php?record_id=11340&page=/download.php?record_id=11340 (note: the National

Academy will allow one to download for free. report can be downloaded for free as a guest) and *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population*, US Environmental Protection Agency, EPA 402-R-11-001, April 2011, p. 1, http://epa.gov/radiation/docs/bluebook/bbfinalversion.pdf

[102] *Plutonium: Deadly Gold of the Nuclear Age*, by a special commission of International Physicians for the Prevention of Nuclear War and The Institute for Energy and Environmental Research, 1992, p. 14

[103] Chelation and K_d Values: The Effect on Radionuclide Migration," in The Proposed Radioactive Waste Facility: Papers Submitted to the National Academy of Sciences, October 12, 1994, by Southern California Federation of Scientists and the Committee to Bridge the Gap, http://www.committeetobridgethegap.org/ssfldocs/ChelationRadMigration.pdf

Note: All URLs last accessed August 4, 2013.

APPENDIX A

Discrepancies between Boeing statements and the actual EPA data for Area IV:

EPA: *The EPA, in its "Final Radiological Characterization of Soils: Area IV and the Northern Buffer Zone," reported the following findings:*	**Boeing:** *Boeing, citing the EPA's "Final Radiological Characterization of Soils: Area IV and the Northern Buffer Zone," reported the following as the EPA's findings:*
• 2 surface Europium-152 soil samples in the Building 4005 area[1]	"the USEPA radiation exposure data at, and in the surrounds of the 4005 slab & lot does not exceed background"[6]
• 2 surface Strontium-90 soil samples in the Building 4006 area[2]	"the USEPA radiation data at, and in the surrounds of building 4006 does not exceed background."[7]
• 1 surface Plutonium-239/240 soil sample in the Building 4015 area[3]	No mention in its pre-demolition report of Building 4015[8]
• 2 subsurface Strontium-90 samples in the former L85 reactor area[4]	"the USEPA radiation exposure data at, and in the surrounds of the L-85 site…does not exceed background"[9]
• 6 surface Strontium-90 soil samples, 5 subsurface Strontium-90 samples, and 1 surface Cesium-137 soil sample in the ESADA area[5]	"the USEPA radiation exposure data at, and in the surrounds of, the 4314, 4814 & 4730 [ESADA] site does not exceed background."[10]

[1] "Final Radiological Characterization of Soils Area IV and the Northern Buffer Zone." December, 2012. http://www.dtsc-ssfl.com/files/lib_doe_area_iv/epaareaivsurvey/techdocs/65789_Final_Radiological_Characterization_of_Soils_122112.pdf Page 72.

[2] "Final Radiological Characterization of Soils Area IV and the Northern Buffer Zone." Page 73.

[3] "Final Radiological Characterization of Soils Area IV and the Northern Buffer Zone." Page 72.

[4] "Final Radiological Characterization of Soils Area IV and the Northern Buffer Zone." Page 88.

[5] "Final Radiological Characterization of Soils Area IV and the Northern Buffer Zone." Page 85.

[6] "Notification of Planned Removal of former Building 4005 Slab (Area IV) Part 2," February, 2013. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65976_B4005-B.pdf Page 87.

[7] "Building 4006 (Area IV) Demolition Notification Part 2," December, 2012. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65801_B4006-DEMO-SSFL-Pt__2.pdf Page 4.

[8] "Notification of Planned Demolition for Building 4015 (Area 4)," June, 2012. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

[9] "Boeing Demolition Notification for Former Radiological L85 Area (Area IV)," February, 2013. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65921_113161-Notification_of_Planned_Removal,_L85_Area.pdf Page 201.

[10] "Notification of Demolition for ESADA Minor Features (Boeing Area IV)," February, 2013. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65872_113127_ESADA_Demo_Notification.pdf Page 35.

APPENDIX B

Appendix B.1: Sample manifests for ESADA waste sent to Buttonwillow, CA

Below: List from Boeing report showing manifest numbers for all shipments of ESADA waste sent to Buttonwillow, CA

Empire State Atomic Development Authority (ESADA) Demolition Debris - Waste Sample Results and Manifests

The following demolition debris wastes were generated during demolition of the former ESADA site. Waste characterization based on laboratory analytical results was conducted in advance of demolition and included in the initial ESADA demolition notification package sent to California EPA DTSC prior to the start of demolition. Each waste description and the associated manifest numbers are listed below. Copies of the referenced manifests may be found attached.

Waste Description	Receiving Facility or Landfill	Manifest or Bill of Lading Numbers
Non-Hazardous Asphalt, Concrete, and Roadbase	Clean Harbors – Buttonwillow, CA	S12320, S12321, S12322, S12323, S12324, S12325, S12326, S12327, S12328, S12329, S12330, S12331, S12332, S12333, S12334, S12335, S12336, S12337, S12338, S12339, S12340, S12341, S12342, S12343, S12344, S12345, S12346, S12347, S12348, S12349, S12350, S12352, S12354, S12355, S12356, S12357, S12358

Appendix B.1: **Sample manifests for ESADA waste sent to Buttonwillow, CA**

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number: CAD093365435
2. Page 1 of 1
3. Emergency Response Phone: 800-424-9300
4. Waste Tracking Number: X893S

5. Generator's Name and Mailing Address:
THE BOEING CO.
5800 WOOLSEY CANYON ROAD
SIMI VALLEY, CA 93063

Generator's Site Address (if different than mailing address):
5800 WOOLSEY CANYON ROAD (MC T487)
CANOGA PARK, CA 91304-1148

Generator's Phone: 818-466-8089

6. Transporter 1 Company Name: MP ENVIRONMENTAL SERVICES — U.S. EPA ID Number: CAT000624247

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address:
CLEAN HARBORS
2500 WEST LOCKERN ROAD
BUTTONWILLOW, CA 93206
Facility's Phone: (805) 762-7372
U.S. EPA ID Number: CAD980675276

9. Waste Shipping Name and Description	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.
1. NON HAZARDOUS, NON D.O.T. REGULATED MATERIAL (SMF00318-00)	1	DT	43920	P
2.				
3.				
4.				

13. Special Handling Instructions and Additional Information
, Site Manifest# S12320 1. SMF00318-00/TSD# SMF4009188:, CHEMTREC# CCN22116 Handle as decommissioned waste per SMP : dispose of in Class I cell. Esada
22.34 per Kevin ...
...

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: KEVIN RUDDICK — Signature: [signature] — Month 3 Day 19 Year 13

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: JUAN Zepeda — Signature: [signature] — Month 3 Day 19 Year 13
Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator) — U.S. EPA ID Number:
Facility's Phone:
17c. Signature of Alternate Facility (or Generator) — Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name: Dennis Berta — Signature: [signature] — Month 03 Day 19 Year 13

69-BLC-O 5 11977 (Rev. 9/09) — 71 of 143 — APR 09 2013 — TRANSPORTER #1

Appendix B.1: Sample manifests for ESADA waste sent to Buttonwillow, CA

Appendix B.1 Source: "ESADA Post-Demolition Summary Report." May, 2013. Pages 70-72. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66035_ESADA_post_demo_final.pdf

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NO. 253952

CLEANHARBORS BUTTONWILLOW, LLC
WEIGHMASTER CERTIFICATE

THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed in Chapter 7 (commencing with Section12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agiculture.

11:36 am 03/19/13
REG. (52)
INBOUND 77100 lb

5:34 pm 03/19/13
REG. (52)
77100 lb GROSS
32420 lb TARE
44680 lb NET

WEIGHMASTER CLEANHARBORS BUTTONWILLOW, LLC

PROFILE NO. SMF 4003183	GROSS WT. BY:	DEPUTY	DATE 03/19/13
DISPOSAL LOCATION 7-3,10.5-20	TARE WT. BY:	DEPUTY	DATE 03/19/13
DRIVER'S NAME PRINTED Juan Zepeda	WEIGHING LOCATION:	2500 W. LOKERN ROAD BUTTONWILLOW, CA 93206	
DRIVER'S NAME SIGNATURE Juan Zepeda	GENERATOR	The Boeing CO.	
TRACTOR NO. 85	TRANSPORTER	MPE	
TRACTOR LIC. NO. 5P94877	MANIFEST NO.	Y0939	
TRAILER LIC. NO. 4C6764	SERVICE ORDER NO.	TWS0751172	
BIN NUMBERS:	BIN TRACKING		

☑ END DUMP ☐ TRANSFER ☐ VACUUM ☐ VAN
☐ ROLL OFF - _____ ☐ FLAT BED ☐ _____

VIS	pH	SUL	CYA	OX	FL	FLASH	20%	
+	7.19	-			N			
OTHER:								

IC	CR	PR	B.W. W.B.	LAB	SOLID BULK	WORK SHEET	LAND TRACK	W.T. SCAN	MAN-SCAN	RE-SCAN

DRUM NUMBER:
COMMENTS: LAS NCVCC
SMF 4003183-00
BIN DROP FULL:
MOVE BIN TO: DATE: BY:

REVISED 03/10

Appendix B.2: Sample manifests for Water Tanks waste sent to Class I landfill in Buttonwillow, CA

Below: List from Boeing report showing manifest numbers for all shipments of Water Tanks waste sent to recycling and disposal facilities

Area 4 Water Tanks Demolition Debris

Waste Sample Results and Manifests

The following demolition debris wastes were generated during demolition of Area 4 Water Tanks. Waste characterization based on laboratory analytical results was conducted in advance of demolition and included in the initial Area 4 Water Tanks demolition notification package sent to California EPA DTSC prior to the start of demolition. Each waste description and the associated manifest numbers are listed below. Copies of the referenced manifests may be found attached.

Waste Description	Receiving Facility or Landfill	Manifest or Bill of Lading Numbers
Asphalt: Non-Hazardous	Recycled	N/A
Metal: Scrap	Recycled	N/A
Gravel: California-only Hazardous (Class 1)	Clean Harbors – Buttonwillow, CA	006093326FLE
Base Material: California-only Hazardous (Class 1)	Clean Harbors – Buttonwillow, CA	005641247FLE, 005641248FLE, 005641249FLE, 005641150FLE, 006093174FLE, 006093177FLE

The Area 4 tank demolition project included removal of proximate pipe and valves. The removed pipe flanges and valves were accompanied by gasket material that was determined to be Asbestos containing based on age and appearance. The gaskets were verified to be non-friable. Pipe was also removed that included an anti-corrosion wrapping. A sample of the wrapping material was collected, with results reported in Test America reports 440-30780-1, released 12/7/12. The wrapping was found to contain 75% Asbestos and was determined to be California-Only Hazardous.

Waste Description	Receiving Facility or Landfill	Manifest or Bill of Lading Numbers
Flanges and Valves with ACM Gaskets: Non-Hazardous (Class 3)	WM – Azusa, CA	S12312
Wrapped Pipe: California-only Hazardous (Class 1)	Clean Harbors – Wilmington, CA	005641149FLE

Appendix B.2: Sample manifests for Water Tanks waste sent to Class I landfill in Buttonwillow, CA

NO. 249259

CLEANHARBORS BUTTONWILLOW, LLC
WEIGHMASTER CERTIFICATE

THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster whose signature is on this certificate, who is a recognized authority of accuracy, as described in Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture.

WEIGHMASTER CLEANHARBORS BUTTONWILLOW, LLC

4:40 PM 01/09/13
REG. (60)
INBOUND 75460 lb

5:38 PM 01/09/13
REG. (60)
75460 lb GROSS
39680 lb TARE
35780 lb NET

☐ END DUMP ☐ TRANSFER ☐ VACUUM ☐ VAN
☒ ROLL OFF - Cal ☐ FLAT BED ☐ _____
1-7041

PROFILE NO. SMF0022 8B	GROSS WT. BY:	DEPUTY	DATE 01/09/13
DISPOSAL LOCATION 35-3 19-T-17	TARE WT. BY:	DEPUTY	DATE 01/15/13
DRIVER'S NAME PRINTED Eric MUMBY	WEIGHING LOCATION:	2500 W. LOKERN ROAD BUTTONWILLOW, CA 93206	
DRIVER'S NAME SIGNATURE Eric Mumby	GENERATOR	Boeing Company	
TRACTOR NO. 402403	TRANSPORTER	C.H.E.S	
TRACTOR LIC. NO. P709813	MANIFEST NO.	006043177 FLE	
TRAILER LIC. NO. T462213	SERVICE ORDER NO.	7w4893115	
BIN NUMBERS: 251509	SIN TRACKING	YES	

VIS	pH	SUL	CYA	OX	FL	FLASH	20%	
+	7.91	-	-	-	N	N		
OTHER:								

IC	CR	PR	B.W. W.B.	LAB	SOLID BULK	WORK SHEET	LAND TRACK	W.T. SCAN	MAN-SCAN	RE-SCAN

DRUM NUMBER:

COMMENTS:

BIN DROP FULL:

MOVE BIN TO: DATE: BY:

REVISED 2/10

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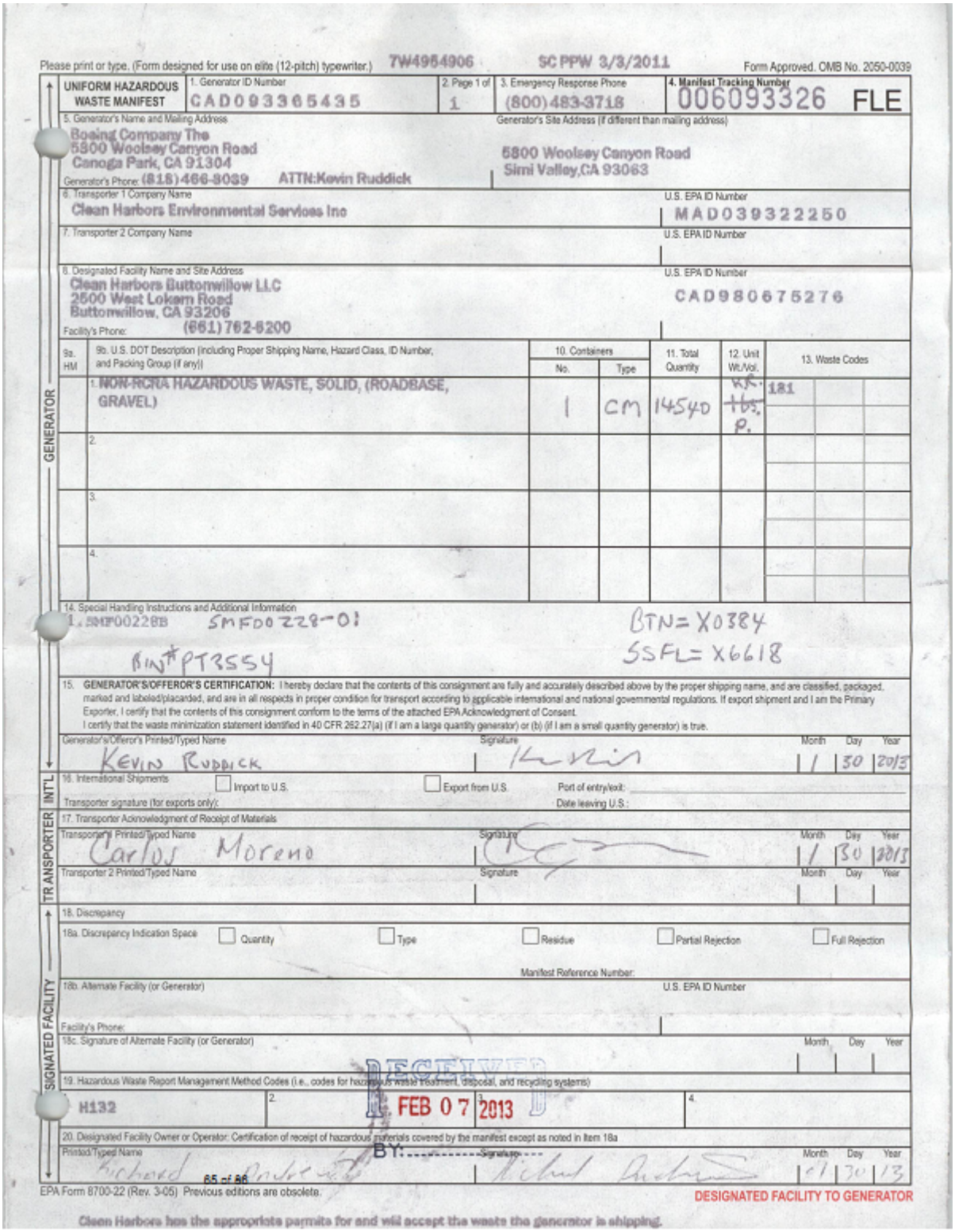
Appendix B.2: Sample manifests for Water Tanks waste sent to Class I landfill in Buttonwillow, CA



Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 7W4954906 SC PPW 3/3/2011 Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST | 1. Generator ID Number: CAD093365435 | 2. Page 1 of: 1 | 3. Emergency Response Phone: (800) 483-3718 | 4. Manifest Tracking Number: 006093326 FLE

5. Generator's Name and Mailing Address
Boeing Company The
6800 Woolsey Canyon Road
Canoga Park, CA 91304
Generator's Phone: (818) 466-9039 ATTN:Kevin Ruddick

Generator's Site Address (if different than mailing address)
6800 Woolsey Canyon Road
Simi Valley,CA 93063

6. Transporter 1 Company Name: Clean Harbors Environmental Services Inc — U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors Buttonwillow LLC
2500 West Lokern Road
Buttonwillow, CA 93206
Facility's Phone: (661) 762-6200
U.S. EPA ID Number: CAD980675276

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON-RCRA HAZARDOUS WASTE, SOLID, (ROADBASE, GRAVEL)	1	CM	14540	~~Lbs.~~ P.	181
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.SMF00228B SMF00228-01 BTN=X0384 SSFL=X6618
BIN#PT3554

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.
Generator's/Offeror's Printed/Typed Name: KEVIN RUDDICK — Signature — Month: 1 Day: 30 Year: 2013

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Carlos Moreno — Signature — Month: 1 Day: 30 Year: 2013
Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

RECEIVED FEB 07 2013

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H132 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Richard Andrews — BY: Signature — Month: 01 Day: 30 Year: 13

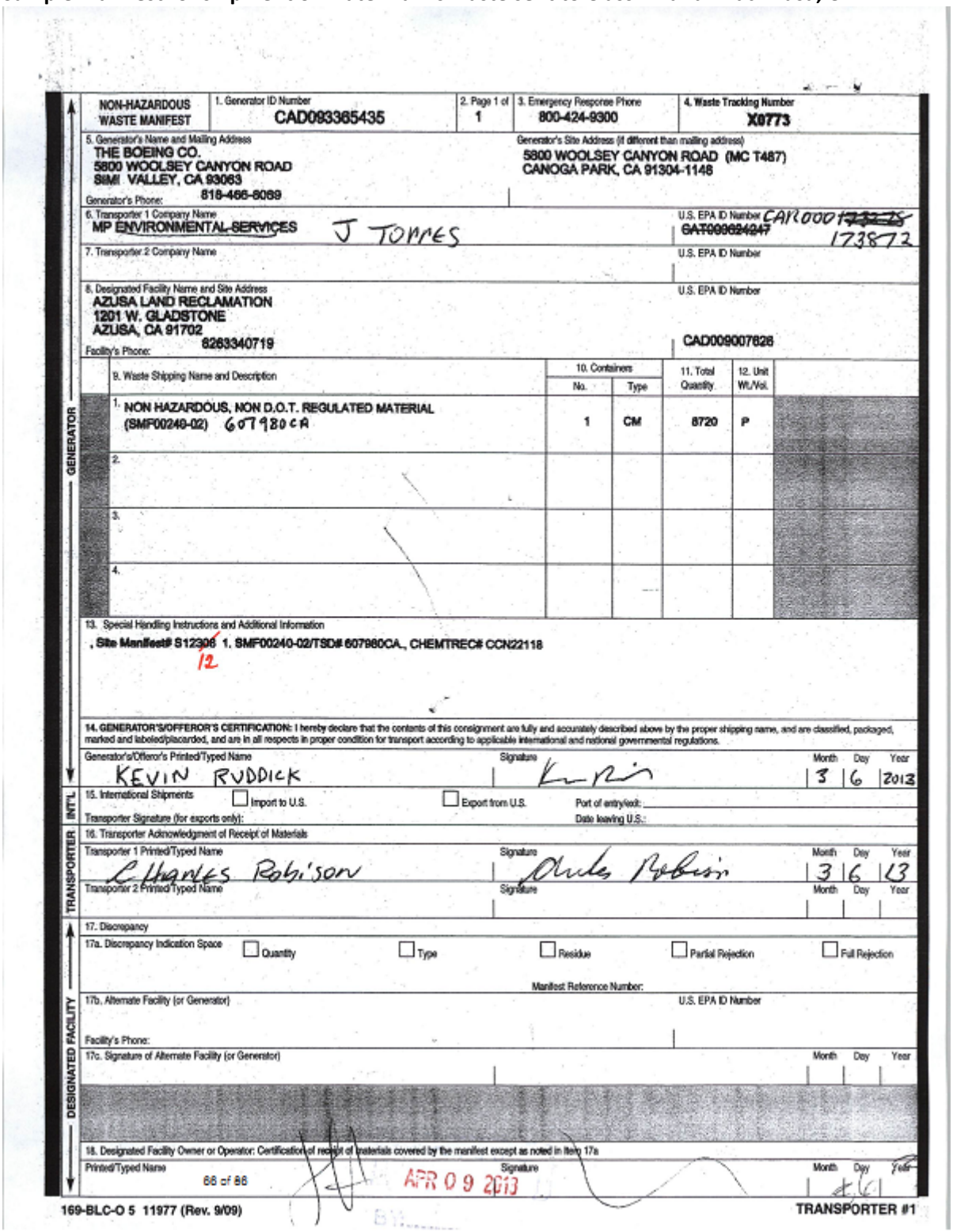
EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

Appendix B.2 Source: "Area IV Water Tanks Post-Demolition Summary Report" May, 2013. Pages 52, 64-65. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66041_water_tank_attachments-final.pdf

Appendix B.3:

Sample manifest for shipment of Water Tanks waste sent to Class III landfill at Azusa, CA



NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number: CAD083365435
2. Page 1 of: 1
3. Emergency Response Phone: 800-424-9300
4. Waste Tracking Number: X8773

5. Generator's Name and Mailing Address
THE BOEING CO.
5800 WOOLSEY CANYON ROAD
SIMI VALLEY, CA 93063
Generator's Phone: 818-466-8089

Generator's Site Address (if different than mailing address)
5800 WOOLSEY CANYON ROAD (MC T487)
CANOGA PARK, CA 91304-1148

6. Transporter 1 Company Name: MP ENVIRONMENTAL SERVICES J TORRES
U.S. EPA ID Number: CAR000~~173872~~ GAT~~000624247~~ 173872

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
AZUSA LAND RECLAMATION
1201 W. GLADSTONE
AZUSA, CA 91702
Facility's Phone: 8263340719
U.S. EPA ID Number: CAD009007626

9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1. NON HAZARDOUS, NON D.O.T. REGULATED MATERIAL (SMF00240-02) 607980CA	1	CM	8720	P
2.				
3.				
4.				

13. Special Handling Instructions and Additional Information
, Site Manifest# S12306 12 1. SMF00240-02/TSD# 607980CA., CHEMTREC# CCN22118

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.
Generator's/Offeror's Printed/Typed Name: KEVIN RUDDICK
Signature:
Month: 3 Day: 6 Year: 2013

INT'L
15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER
16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: C HARLES ROBISON
Signature:
Month: 3 Day: 6 Year: 13
Transporter 2 Printed/Typed Name
Signature
Month Day Year

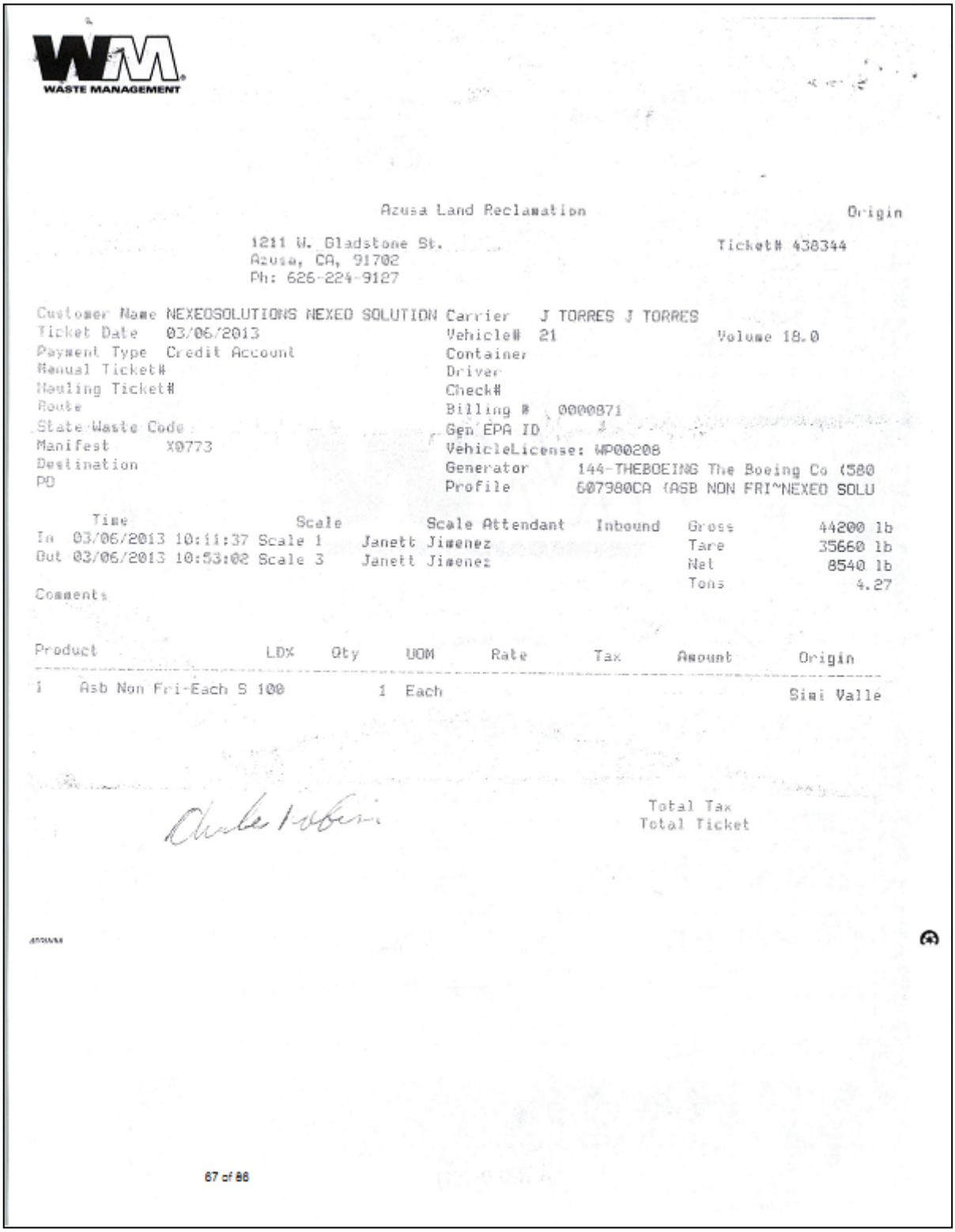
DESIGNATED FACILITY
17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator)
Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name: 66 of 86
Signature: APR 09 2013
Month Day Year

169-BLC-O 5 11977 (Rev. 9/09) TRANSPORTER #1

Appendix B.3:

Sample manifest for shipment of Water Tanks waste sent to Class III landfill at Azusa, CA



WASTE MANAGEMENT

Azusa Land Reclamation — Origin

1211 W. Gladstone St.
Azusa, CA, 91702
Ph: 626-224-9127

Ticket# 438344

Customer Name NEXEOSOLUTIONS NEXEO SOLUTION
Ticket Date 03/06/2013
Payment Type Credit Account
Manual Ticket#
Hauling Ticket#
Route
State Waste Code
Manifest X0773
Destination
PO

Carrier J TORRES J TORRES
Vehicle# 21
Container
Driver
Check#
Billing # 0000871
Gen EPA ID
VehicleLicense: WP00208
Generator 144-THEBOEING The Boeing Co (580
Profile 607380CA (ASB NON FRI^NEXEO SOLU

Volume 18.0

	Time	Scale	Scale Attendant	Inbound
In	03/06/2013 10:11:37	Scale 1	Janett Jimenez	
Out	03/06/2013 10:53:02	Scale 3	Janett Jimenez	

Gross	44200 lb
Tare	35660 lb
Net	8540 lb
Tons	4.27

Comments

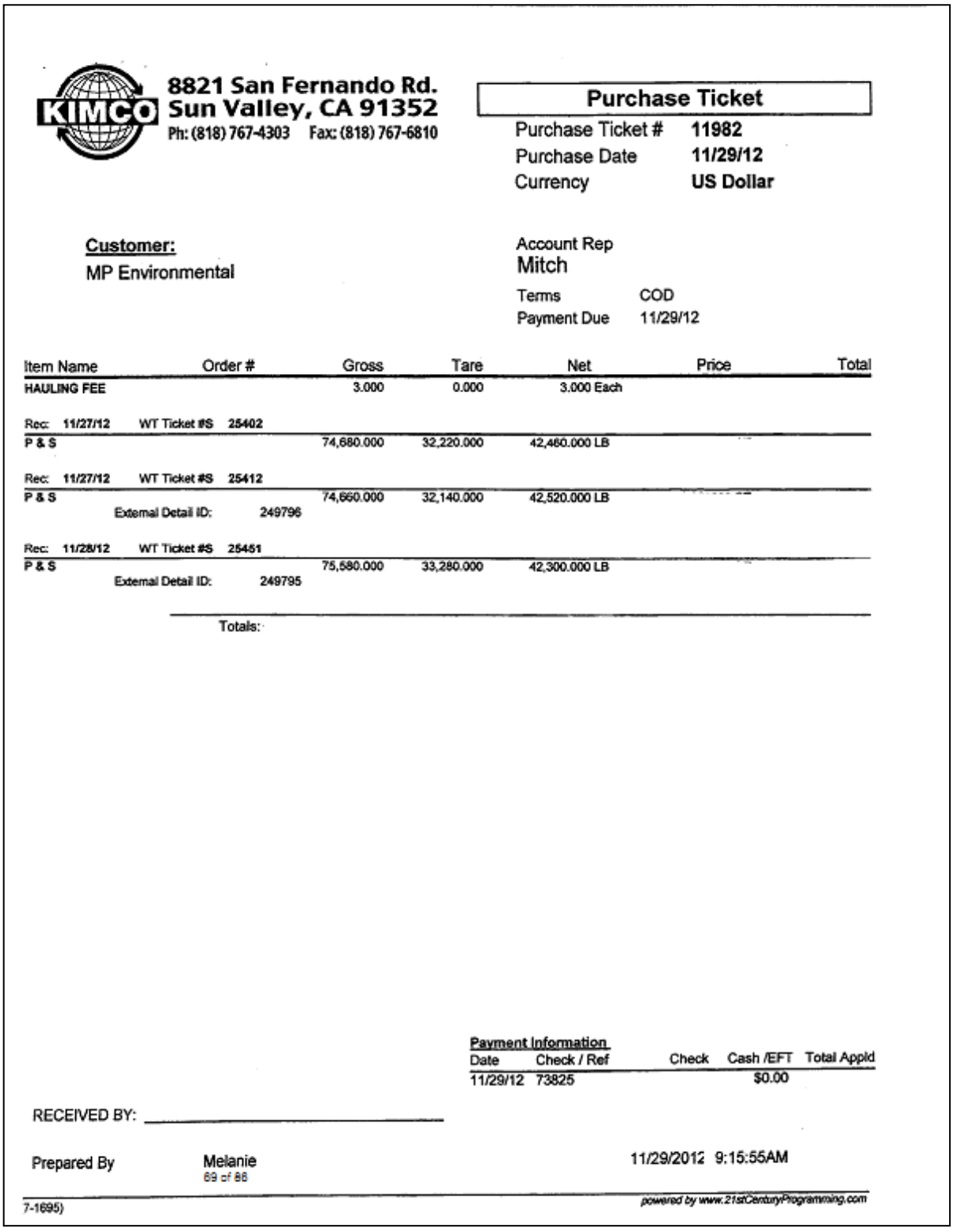
	Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1	Asb Non Fri-Each S 100		1	Each				Simi Valle

Total Tax
Total Ticket

67 of 88

Appendix B.3 Source: "Area IV Water Tanks Post-Demolition Summary Report" May, 2013. Pages 66-67. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66041_water_tank_attachments-final.pdf

Appendix B.4: Sample demolition debris recycle invoice for Water Tanks waste sent to Kimco recycling facility at Sun Valley, CA



KIMCO
8821 San Fernando Rd.
Sun Valley, CA 91352
Ph: (818) 767-4303 Fax: (818) 767-6810

Purchase Ticket

Purchase Ticket # 11982
Purchase Date 11/29/12
Currency US Dollar

Customer:
MP Environmental

Account Rep
Mitch
Terms COD
Payment Due 11/29/12

Item Name	Order #	Gross	Tare	Net	Price	Total
HAULING FEE		3.000	0.000	3.000 Each		
Rec: 11/27/12 WT Ticket #S 25402						
P & S		74,680.000	32,220.000	42,460.000 LB		
Rec: 11/27/12 WT Ticket #S 25412						
P & S		74,660.000	32,140.000	42,520.000 LB		
External Detail ID:	249796					
Rec: 11/28/12 WT Ticket #S 25451						
P & S		75,580.000	33,280.000	42,300.000 LB		
External Detail ID:	249795					
Totals:						

Payment Information

Date	Check / Ref	Check	Cash /EFT	Total Appld
11/29/12	73825		$0.00	

RECEIVED BY: _____

Prepared By Melanie
69 of 86

11/29/2012 9:15:55AM

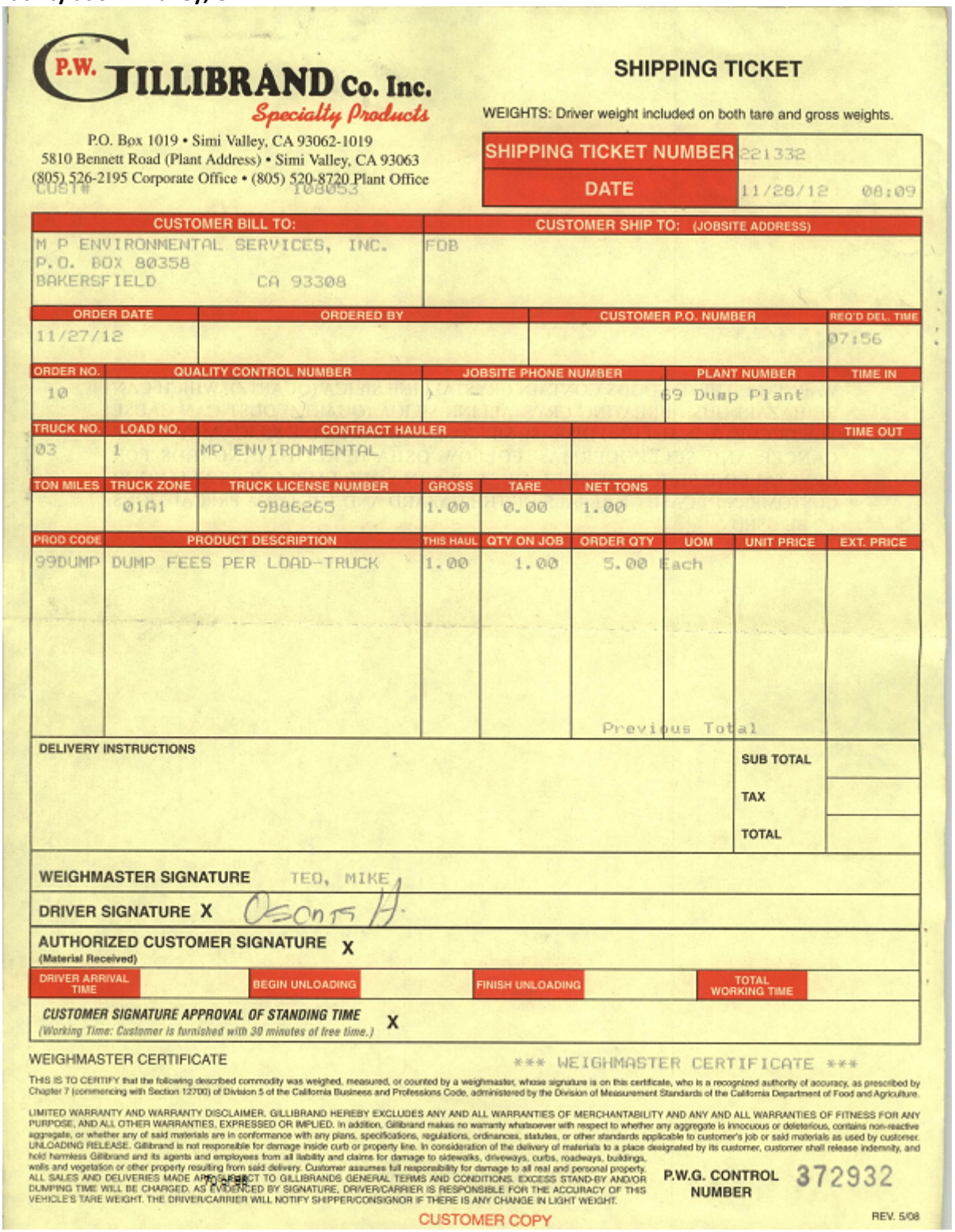
7-1695)

powered by www.21stCenturyProgramming.com

Appendix B.4 Source: "Area IV Water Tanks Post-Demolition Summary Report" May, 2013. Page 69. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66041_water_tank_attachments-final.pdf

APPENDIX B.5

Sample demolition debris recycle invoice for Water Tanks waste sent to Gillibrand Co. Inc. recycling facility at Simi Valley, CA



P.W. GILLIBRAND Co. Inc.
Specialty Products

P.O. Box 1019 • Simi Valley, CA 93062-1019
5810 Bennett Road (Plant Address) • Simi Valley, CA 93063
(805) 526-2195 Corporate Office • (805) 520-8720 Plant Office

CUST# 108053

SHIPPING TICKET

WEIGHTS: Driver weight included on both tare and gross weights.

SHIPPING TICKET NUMBER	221332
DATE	11/28/12 08:09

CUSTOMER BILL TO:	CUSTOMER SHIP TO: (JOBSITE ADDRESS)
M P ENVIRONMENTAL SERVICES, INC. P.O. BOX 80358 BAKERSFIELD CA 93308	FOB

ORDER DATE	ORDERED BY	CUSTOMER P.O. NUMBER	REQ'D DEL. TIME
11/27/12			07:56

ORDER NO.	QUALITY CONTROL NUMBER	JOBSITE PHONE NUMBER	PLANT NUMBER	TIME IN
10		( ) -	69 Dump Plant	

TRUCK NO.	LOAD NO.	CONTRACT HAULER		TIME OUT
03	1	MP ENVIRONMENTAL		

TON MILES	TRUCK ZONE	TRUCK LICENSE NUMBER	GROSS	TARE	NET TONS	
	01A1	9B86265	1.00	0.00	1.00	

PROD CODE	PRODUCT DESCRIPTION	THIS HAUL	QTY ON JOB	ORDER QTY	UOM	UNIT PRICE	EXT. PRICE
99DUMP	DUMP FEES PER LOAD-TRUCK	1.00	1.00	5.00	Each		
				Previous Total			

DELIVERY INSTRUCTIONS

SUB TOTAL
TAX
TOTAL

WEIGHMASTER SIGNATURE TED, MIKE

DRIVER SIGNATURE X

AUTHORIZED CUSTOMER SIGNATURE X
(Material Received)

DRIVER ARRIVAL TIME		BEGIN UNLOADING		FINISH UNLOADING		TOTAL WORKING TIME	

CUSTOMER SIGNATURE APPROVAL OF STANDING TIME X
(Working Time: Customer is furnished with 30 minutes of free time.)

WEIGHMASTER CERTIFICATE *** WEIGHMASTER CERTIFICATE ***

THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster, whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture.

LIMITED WARRANTY AND WARRANTY DISCLAIMER. GILLIBRAND HEREBY EXCLUDES ANY AND ALL WARRANTIES OF MERCHANTABILITY AND ANY AND ALL WARRANTIES OF FITNESS FOR ANY PURPOSE, AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. In addition, Gillibrand makes no warranty whatsoever with respect to whether any aggregate is innocuous or deleterious, contains non-reactive aggregate, or whether any of said materials are in conformance with any plans, specifications, regulations, ordinances, statutes, or other standards applicable to customer's job or said materials as used by customer. UNLOADING RELEASE. Gillibrand is not responsible for damage inside curb or property line. In consideration of the delivery of materials to a place designated by its customer, customer shall release indemnity, and hold harmless Gillibrand and its agents and employees from all liability and claims for damage to sidewalks, driveways, curbs, roadways, buildings, walls and vegetation or other property resulting from said delivery. Customer assumes full responsibility for damage to all real and personal property. ALL SALES AND DELIVERIES MADE ARE SUBJECT TO GILLIBRANDS GENERAL TERMS AND CONDITIONS. EXCESS STAND-BY AND/OR DUMPING TIME WILL BE CHARGED. AS EVIDENCED BY SIGNATURE, DRIVER/CARRIER IS RESPONSIBLE FOR THE ACCURACY OF THIS VEHICLE'S TARE WEIGHT. THE DRIVER/CARRIER WILL NOTIFY SHIPPER/CONSIGNOR IF THERE IS ANY CHANGE IN LIGHT WEIGHT.

P.W.G. CONTROL NUMBER 372932

CUSTOMER COPY

REV. 5/08

Appendix B.5 Source: "Area IV Water Tanks Post-Demolition Summary Report" May, 2013. Page 70. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66041_water_tank_attachments-final.pdf

APPENDIX B.6

Sample manifest for shipment of Building 4015 Tanks waste sent to Class III landfill at Lancaster, CA

Bldg. 4015 Demolition Debris - Waste Sample Results and Manifests

The following demolition debris wastes were generated during demolition of Bldg. 4015. Waste characterization based on laboratory analytical results was conducted in advance of demolition and included in the initial Bldg. 4015 demolition notification package sent to California EPA DTSC prior to the start of demolition. Each waste description and the associated manifest numbers are listed below. Copies of the referenced manifests may be found attached. No unexpected demolition-related wastes were discovered at the Bldg. 4015 site.

Waste Description	Receiving Facility or Landfill	Manifest or Bill of Lading Numbers
Asphalt: Non-Hazardous	Recycled	N/A
Concrete: Non-Hazardous	Recycled	N/A
Concrete: Non-Hazardous (Class 3)	WM – Lancaster, CA	S12161, S12162, S12164, S12165, S12166, S12167
Road-Base:	Insignificant volume encountered	N/A

APPENDIX B.6

Sample manifest for shipment of Building 4015 Tanks waste sent to Class III landfill at Lancaster, CA

NON-HAZARDOUS WASTE MANIFEST

9B86265 - 74920

3/2/60

M P Environmental Services, Inc.
P.O. Box 80358 • Bakersfield, CA 93380 • (661) 393-1151

83021

☐ AZ ☐ BK ☐ LA ☐ OKLA
☐ UT ☐ WA ☐ YOLO ☐ _____

PROFILE NO. 611219CA

STN=W310 SSFL=12160

NOTE: This form to be in lieu of the Toxic Substance Controls hazardous waste manifest. To be used for NON-HAZARDOUS WASTES only.

TO BE COMPLETED BY GENERATOR

Name : BOEING COMPANY SSFL - AREA 1,2,3, & 4

Mailing Address : 5800 WOOSLEY CANYON ROAD

City / State / Zip : SIMI VALLEY CA 93063

Phone No : 818 466 8069 Contact : KEVIN RUDDICK

Signature: X _____ Date: 10 / 22 / 12

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS

Waste Description : NON HAZARDOUS SOIL, CONCRETE

Generating Location : BUILDING 4015, CA

Handling Instructions : WEAR PROPER PPE

Quantity : 41,680 Pounds [ ]BBL [ ]GLS [ ]YDS [ ]TONS

CONTAINER TYPE: [ ]TANK TRUCK [X]DUMP TRUCK [ ]DRUMS [ ]BINS [ ]OTHER:

DESIGNATED FACILITY :

NAME : LANCASTER LANDFILL AND HAULING ADDRESS : 600 EAST AVENUE F

CITY/STATE/ZIP: LANCASTER CA 93535 PHONE # : _____

TRANSPORTER

MP ENVIRONMENTAL SERVICES, INC.
3400 Manor Street
Bakersfield, CA 93308
661 / 393-1151

TICKET# _____ TRACT/TRLR# 03 / 98

Bin No's _____

Signature: OSCAR HIGUERA

Date _____

P/U DATE: 10-22-12 Job # _____

ISD FACILITY

Name : LANCASTER LANDFILL AND HAULING

Address : 600 EAST AVENUE F

City/State/Zip : LANCASTER CA 93535

Phone No : _____

Discrepancy : _____

Disposal Method :

☐ Landfill Other _____

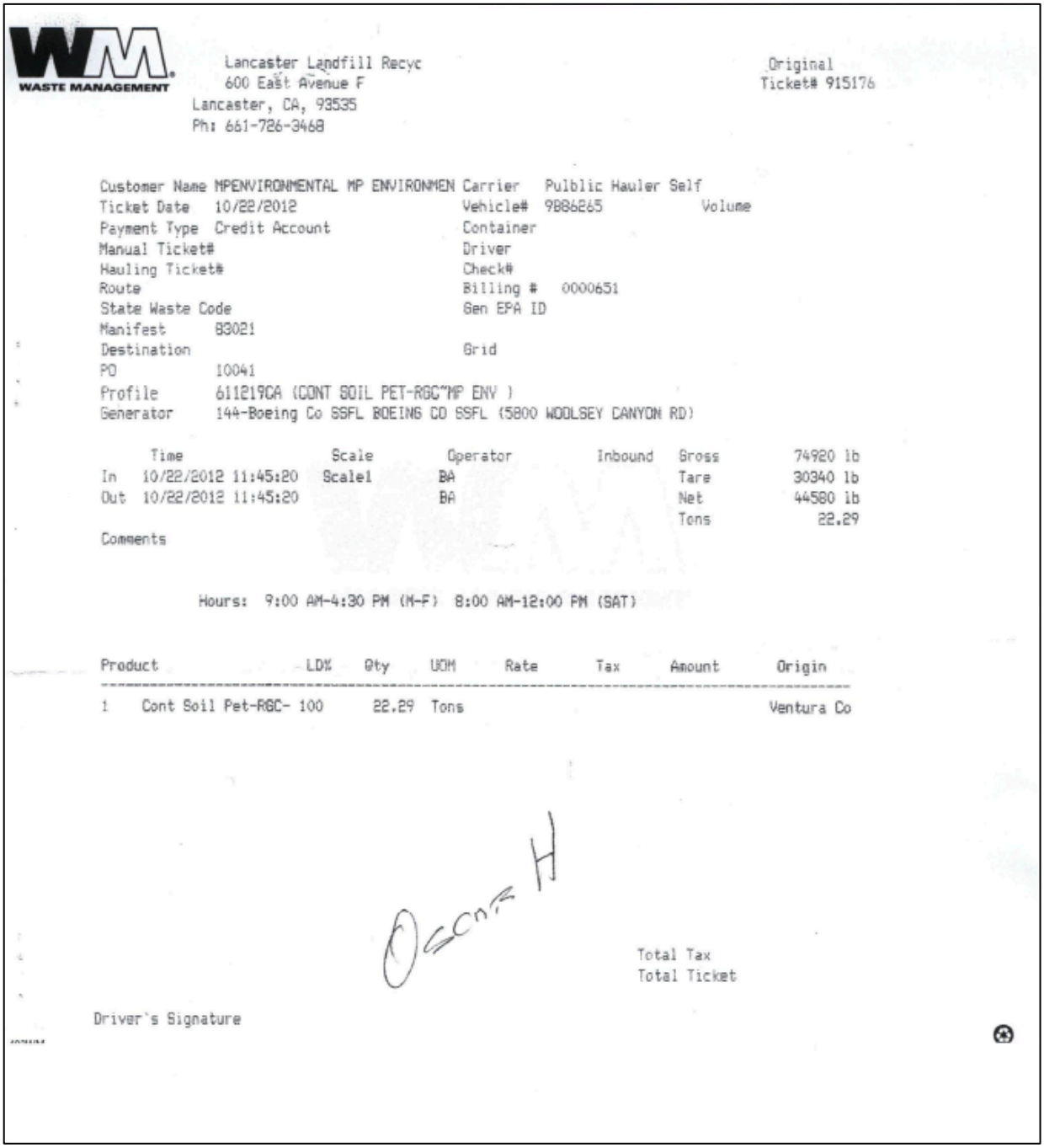
Time : _____ am pm

RECEIVED
NOV 20 2012
BY: _____

Signature : _____ Date : 10 / 22 / 12

APPENDIX B.6

Sample manifest for shipment of Building 4015 Tanks waste sent to Class III landfill at Lancaster, CA



WASTE MANAGEMENT

Lancaster Landfill Recyc
600 East Avenue F
Lancaster, CA, 93535
Ph: 661-726-3468

Original
Ticket# 915176

Customer Name MPENVIRONMENTAL MP ENVIRONMEN Carrier Pulblic Hauler Self
Ticket Date 10/22/2012 Vehicle# 9886265 Volume
Payment Type Credit Account Container
Manual Ticket# Driver
Hauling Ticket# Check#
Route Billing # 0000651
State Waste Code Gen EPA ID
Manifest 83021
Destination Grid
PO 10041
Profile 611219CA (CONT SOIL PET-RGC"MP ENV)
Generator 144-Boeing Co SSFL BOEING CO SSFL (5800 WOOLSEY CANYON RD)

	Time	Scale	Operator	Inbound	Gross	74920 lb
In	10/22/2012 11:45:20	Scale1	BA		Tare	30340 lb
Out	10/22/2012 11:45:20		BA		Net	44580 lb
					Tons	22.29

Comments

Hours: 9:00 AM-4:30 PM (M-F) 8:00 AM-12:00 PM (SAT)

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	Cont Soil Pet-RGC-	100	22.29	Tons				Ventura Co

Total Tax
Total Ticket

Driver's Signature

Appendix B.6 Source: "Former Building 4015 Post-Demolition Summary Report" April, 2013. Pages 29-31. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/66036_4015_post_demo_summary_attachments_final.pdf

APPENDIX C

Screenshots from Boeing reports show radiation above Boeing's standards in its buildings.

A total of **22 sample radiation measurements** from **20 different sample areas** failed Boeing's own Regulatory Guide 1.86/ DPH DECON-1 standards for maximum permissible radiation.[1]

Highlighting added to show sample measurements exceeding Boeing's standards for alpha radiation (maximum 100 dpm/100cm^2) and beta radiation (maximum 1000 dpm/100cm^2)

Water Tanks (7 exceedances from 7 different sample areas)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Site water tanks - exterior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	5/3/2012	5/3/2012	side of small water tank		< 20	< 100	0	0	6
2	5/3/2012	5/3/2012			< 20	< 100	30	64	7
3	5/3/2012	5/3/2012			< 20	< 100	0	410	6
4	5/3/2012	5/3/2012			< 20	< 100	117	600	7
5	5/3/2012	5/3/2012			< 20	< 100	0	64	5
6	5/3/2012	5/3/2012	top of pipe tee		< 20	< 100	0	314	5
7	5/3/2012	5/3/2012	inside pipe-cut from small tank		< 20	< 100	0	0	5
8	5/3/2012	5/3/2012	on support		< 20	< 100	135	0	8
9	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	74	433	6
10	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	0	171	6
11	5/3/2012	5/3/2012	on support		< 20	< 100	0	90	7
12	5/3/2012	5/3/2012	on support		< 20	< 100	178	245	7
13	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	74	0	6
14	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	30	267	5
15	5/3/2012	5/3/2012	on support		< 20	< 100	70	543	6
16	5/3/2012	5/3/2012	on support		< 20	< 100	91	0	6
17	5/3/2012	5/3/2012	rusty pipe at large water tank		< 20	< 100	313	529	6
18	5/3/2012	5/3/2012	brace pad - rusty		< 20	< 100	0	0	6
19	5/3/2012	5/3/2012	on support		< 20	< 100	135	0	6
20	5/3/2012	5/3/2012	rusty pipe at large water tank		< 20	< 100	291	195	6
COMMENTS: MDA = minimum detectable activity				INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Site water tanks - exterior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	5/3/2012	5/3/2012	side of gate valve		< 20	< 100	0	0	5
22	5/3/2012	5/3/2012	large water tank berm basin		< 20	< 100	4	0	6
23	5/3/2012	5/3/2012	near storm drain grate		< 20	< 100	26	0	7
24	5/3/2012	5/3/2012	large water tank berm basin		< 20	< 100	26	0	7
25	5/3/2012	5/3/2012			< 20	< 100	70	0	8
26	5/3/2012	5/3/2012			< 20	< 100	0	0	7
27	5/3/2012	5/3/2012			< 20	< 100	113	0	7
28	5/3/2012	5/3/2012			< 20	< 100	0	0	7
29	5/3/2012	5/3/2012			< 20	< 100	0	0	6
30	5/3/2012	5/3/2012	side of small water tank		< 20	< 100	0	0	5
31	5/3/2012	5/3/2012	side of pipe on large water tank		< 20	< 100	0	0	6

Source: "Updated Waste Survey for Water Tanks (Area IV)." November, 2012. Pages 8, 9. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65796_Water_Tanks_Waste_Certification_Rev_1.pdf

[1] Because of the uncertainty of the final disposition of the 4011 sink with elevated readings, we have reduced the total by 5 to 17.

Building 4015 (1 exceedance from 1 sample area)

RADIATION SURVEY REPORT

FACILITY: Area IV B4015
LOCATION: Exterior & structures

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	5/9/2012	5/11/2012	wall		< 20	< 100	0	260	8
22	5/9/2012	5/11/2012	walk		< 20	< 100	30	74	8
23	5/9/2012	5/11/2012	driveway		< 20	< 100	39	0	9
24	5/9/2012	5/11/2012			< 20	< 100	9	0	10
25	5/9/2012	5/11/2012			< 20	< 100	52	0	10
26	5/9/2012	5/11/2012			< 20	< 100	0	0	10
27	5/9/2012	5/11/2012			< 20	< 100	0	0	8
28	5/9/2012	5/11/2012			< 20	< 100	83	0	9
29	5/9/2012	5/11/2012			< 20	< 100	0	0	10
30	5/9/2012	5/11/2012	walk		< 20	< 100	0	0	9
31	5/9/2012	5/11/2012	walk		< 20	< 100	52	0	9
32	5/9/2012	5/11/2012	pad		< 20	< 100	30	0	10
33	5/9/2012	5/11/2012			< 20	< 100	0	0	10
34	5/9/2012	5/11/2012			< 20	< 100	0	0	10
35	5/9/2012	5/11/2012			< 20	< 100	52	0	9
36	5/9/2012	5/11/2012			< 20	< 100	0	0	11
37	5/9/2012	5/11/2012			< 20	< 100	117	0	10
38	5/9/2012	5/11/2012			< 20	< 100	0	0	10
39	5/9/2012	5/11/2012	drainage		< 20	< 100	0	74	10

Source: Notification of Planned Demolition for Building 4015 (Area 4)." June, 2012. Page 43. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

Weather Station (3 exceedances from 3 different sample areas)

RADIATION SURVEY REPORT

FACILITY: Area IV
LOCATION: Weather station

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
59	6/14/2012	6/15/2012	transformer		< 20	< 100	0	0	8
60	6/14/2012	6/15/2012	controller		< 20	< 100	0	19	7
61	6/14/2012	6/15/2012	controller		< 20	< 100	0	0	8
62	6/14/2012	6/15/2012	transformer		< 20	< 100	0	210	7
63	6/14/2012	6/15/2012	shed wall		< 20	< 100	0	0	7
64	6/14/2012	6/15/2012			< 20	< 100	0	7	10
65	6/14/2012	6/15/2012			< 20	< 100	0	340	8
66	6/14/2012	6/15/2012			< 20	< 100	0	0	8
67	6/14/2012	6/15/2012	shed roof		< 20	< 100	0	293	8
68	6/14/2012	6/15/2012	shed floor		< 20	< 100	0	376	9
69	6/14/2012	6/15/2012	pad		< 20	< 100	104	0	10
70	6/14/2012	6/15/2012			< 20	< 100	39	0	9
71	6/14/2012	6/15/2012			< 20	< 100	39	21	9
72	6/14/2012	6/15/2012			< 20	< 100	39	164	9
73	6/14/2012	6/15/2012			< 20	< 100	0	0	7
74	6/14/2012	6/15/2012	equipment stand		< 20	< 100	100	983	9
75	6/14/2012	6/15/2012	pad		< 20	< 100	0	0	9
76	6/14/2012	6/15/2012			< 20	< 100	17	0	9
77	6/14/2012	6/15/2012			< 20	< 100	104	0	8
78	6/14/2012	6/15/2012			< 20	< 100	17	0	8

Source: "Notification of Planned Removal of Minor Structures." October, 2012. Page 36. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

Building 4011 (10 exceedances from 8 different sample areas)

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: building interior walls, racks, deep sink

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)
56	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0
57	8/16/2012	8/17/2012	wall		< 20	< 100	0	922
58	8/16/2012	8/17/2012			< 20	< 100	0	879
59	8/16/2012	8/17/2012			< 20	< 100	0	540
60	8/16/2012	8/17/2012			< 20	< 100	0	868
61	8/16/2012	8/17/2012			< 20	< 100	0	518
62	8/16/2012	8/17/2012			< 20	< 100	0	398
63	8/16/2012	8/17/2012			< 20	< 100	0	474
64	8/16/2012	8/17/2012			< 20	< 100	0	704
65	8/16/2012	8/17/2012	breaker box		< 20	< 100	0	26
66	8/16/2012	8/17/2012	fire extinguisher mount		< 20	< 100	0	168
67	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0
68	8/16/2012	8/17/2012	inside bottom of deep sink		< 20	< 100	0	5698
69	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0
70	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	114

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: building interior deep sink

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey, investigation survey of deep sink LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)
115	8/17/2012	8/17/2012	front of deep sink outside		< 20	< 100	185	5119
116	8/17/2012	8/17/2012	back wall of deep sink inside		< 20	< 100	140	5666
The deep sink material will be sampled and sent to an off-site laboratory for evaluation.								
Laboratory results will be used to determine the disposition of the deep sink.								

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: lot, drives & pads #1

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)
21	8/31/2012	8/31/2012	loading dock - rusty		< 20	< 100	0	111
22	8/31/2012	8/31/2012			< 20	< 100	0	176
23	8/31/2012	8/31/2012			< 20	< 100	0	296
24	8/31/2012	8/31/2012	wood table		< 20	< 100	0	1059
25	8/31/2012	8/31/2012	lot		< 20	< 100	0	0
26	8/31/2012	8/31/2012	flat table float basin		< 20	< 100	36	385
27	8/31/2012	8/31/2012	dock edge		< 20	< 100	0	428
28	8/31/2012	8/31/2012	lot		< 20	< 100	0	202

Building 4011 (10 exceedances from 8 different sample areas, continued)

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: Lot, drives & pads #4

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	d < 1,
1	9/14/2012	9/17/2012	pad		< 20	< 100	67	
2	9/14/2012	9/17/2012	drive		< 20	< 100	0	
3	9/14/2012	9/17/2012	walk		< 20	< 100	0	
4	9/14/2012	9/17/2012	↓		< 20	< 100	268	
5	9/14/2012	9/17/2012	↓		< 20	< 100	45	
6	9/14/2012	9/17/2012	gutter drain block		< 20	< 100	0	
7	9/14/2012	9/17/2012	walk		< 20	< 100	0	
8	9/14/2012	9/17/2012	↓		< 20	< 100	0	
9	9/14/2012	9/17/2012	↓		< 20	< 100	0	
10	9/14/2012	9/17/2012	lot		< 20	< 100	0	

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: Lot, drives & pads #4

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	C
21	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	
22	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	
23	9/14/2012	9/17/2012	↓		< 20	< 100	22	0	
24	9/14/2012	9/17/2012	↓		< 20	< 100	22	0	
25	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	
26	9/14/2012	9/17/2012	pad		< 20	< 100	0	0	
27	9/14/2012	9/17/2012	lot		< 20	< 100	112	0	
28	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	
29	9/14/2012	9/17/2012	↓		< 20	< 100	112	0	
30	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	
31	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	
32	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: Lot, drives & pads #4

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)
41	9/14/2012	9/17/2012	drive		< 20	< 100	45	0
42	9/14/2012	9/17/2012	↓		< 20	< 100	0	0
43	9/14/2012	9/17/2012	↓		< 20	< 100	0	0
44	9/14/2012	9/17/2012	culvert drain box		< 20	< 100	0	2
45	9/14/2012	9/17/2012	ditch		< 20	< 100	0	0
46	9/14/2012	9/17/2012	ditch		< 20	< 100	0	0
47	9/14/2012	9/17/2012	lot		< 20	< 100	0	0
48	9/14/2012	9/17/2012	↓		< 20	< 100	112	0
49	9/14/2012	9/17/2012	↓		< 20	< 100	0	0
50	9/14/2012	9/17/2012	↓		< 20	< 100	0	0
51	9/14/2012	9/17/2012	↓		< 20	< 100	22	0
52	9/14/2012	9/17/2012	↓		< 20	< 100	0	0
53	9/14/2012	9/17/2012	walk		< 20	< 100	0	0
54	9/14/2012	9/17/2012	gutter drain block		< 20	< 100	0	0

Source: "Notification of Planned Demolition for a Portion of Boeing Building 4011." November, 2012. Pages 95, 98, 125, 150, 151, 152. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

ESADA (1 exceedance from 1 sample area)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4314, B4814, B4730

LOCATION: slabs, pads, drive & lot

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	<
21	10/10/2012	10/12/2012	drive		< 20	< 100	0	
22	10/10/2012	10/12/2012			< 20	< 100	0	
23	10/10/2012	10/12/2012			< 20	< 100	0	
24	10/10/2012	10/12/2012			< 20	< 100	0	
25	10/10/2012	10/12/2012			< 20	< 100	0	
26	10/10/2012	10/12/2012	pad		< 20	< 100	0	
27	10/10/2012	10/12/2012			< 20	< 100	0	
28	10/10/2012	10/12/2012			< 20	< 100	0	
29	10/10/2012	10/12/2012			< 20	< 100	0	
30	10/10/2012	10/12/2012			< 20	< 100	0	
31	10/10/2012	10/12/2012			< 20	< 100	0	
32	10/10/2012	10/12/2012	bed plate		< 20	< 100	286	
33	10/10/2012	10/12/2012	pad		< 20	< 100	0	
34	10/10/2012	10/12/2012	pad		< 20	< 100	0	
35	10/10/2012	10/12/2012	walk		< 20	< 100	0	

Source: “Notification of Demolition for ESADA Minor Features (Boeing Area IV).” February, 2013. Page 20. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65872_113127_ESADA_Demo_Notification.pdf

APPENDIX D

Screenshots from Boeing reports showing sample radiation measurements in Boeing buildings, 17 of which – by its own admission – are above background levels

By Boeing's own admission, a total of **17 sample radiation measurements** from **17 different sample areas** in its buildings exceed background levels of radiation. [1]

Highlighting added to show sample measurements of alpha and beta radiation which Boeing admits to being above background levels

Building 4015 (1 detection from 1 sample area)

Sample Area Measurements

				Alpha								Beta							
Sample	Date	Description (Location, Object)	Material Type	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?
1	5/11/2012	wall	Construction	1	7	7	12	-5	0	337	<MDA	1	251	251	230	21	248	687	<MDA
2	5/11/2012	truck door	Construction	1	8	8	12	-4	0	337	<MDA	1	246	246	230	16	188	687	<MDA
3	5/11/2012	wall	Construction	1	1	1	12	-11	0	337	<MDA	1	242	242	230	12	140	687	<MDA
4	5/11/2012		Construction	1	2	2	12	-10	0	337	<MDA	1	253	253	230	23	271	687	<MDA
5	5/11/2012		Construction	1	4	4	12	-8	0	337	<MDA	1	231	231	230	1	10	687	<MDA
6	5/11/2012		Construction	1	6	6	12	-6	0	337	<MDA	1	253	253	230	23	271	687	<MDA
7	5/11/2012		Construction	1	2	2	12	-10	0	337	<MDA	1	233	233	230	3	33	687	<MDA
8	5/11/2012		Construction	1	5	5	12	-7	0	337	<MDA	1	260	260	230	30	355	687	<MDA
9	5/11/2012		Construction	1	6	6	12	-6	0	337	<MDA	1	251	251	230	21	248	687	<MDA
10	5/11/2012		Construction	1	7	7	12	-5	0	337	<MDA	1	261	261	230	31	367	687	<MDA
11	5/11/2012		Construction	1	7	7	12	-5	0	337	<MDA	1	259	259	230	29	343	687	<MDA
12	5/11/2012		Construction	1	7	7	12	-5	0	337	<MDA	1	252	252	230	22	260	687	<MDA
13	5/11/2012		Construction	1	7	7	12	-5	0	337	<MDA	1	241	241	230	11	129	687	<MDA
14	5/11/2012		Construction	1	4	4	12	-8	0	337	<MDA	1	243	243	230	13	152	687	<MDA
15	5/11/2012	fire main header pipe	Construction	1	2	2	12	-10	0	337	<MDA	1	308	308	230	78	926	687	>MDA
16	5/11/2012	wall	Construction	1	6	6	12	-6	0	337	<MDA	1	264	264	230	34	402	687	<MDA
17	5/11/2012		Construction	1	4	4	12	-8	0	337	<MDA	1	262	262	230	32	379	687	<MDA
18	5/11/2012		Construction	1	4	4	12	-8	0	337	<MDA	1	266	266	230	36	426	687	<MDA
19	5/11/2012		Construction	1	7	7	12	-5	0	337	<MDA	1	263	263	230	33	390	687	<MDA
20	5/11/2012		Construction	1	7	7	12	-5	0	337	<MDA	1	253	253	230	23	271	687	<MDA
21	5/11/2012		Construction	1	8	8	12	-4	0	337	<MDA	1	252	252	230	22	260	687	<MDA
22	5/11/2012	walk	Asphalt	1	7	7	6	1	30	251	<MDA	1	538	538	532	6	74	1025	<MDA
23	5/11/2012	driveway	Concrete	1	11	11	9	2	39	303	<MDA	1	455	455	477	-22	0	973	<MDA
24	5/11/2012		Asphalt	1	6	6	6	0	9	251	<MDA	1	510	510	532	-22	0	1025	<MDA
25	5/11/2012		Asphalt	1	8	8	6	2	52	251	<MDA	1	525	525	532	-7	0	1025	<MDA
26	5/11/2012		Concrete	1	6	6	9	-3	0	303	<MDA	1	403	403	477	-74	0	973	<MDA
27	5/11/2012		Concrete	1	4	4	9	-5	0	303	<MDA	1	450	450	477	-27	0	973	<MDA
28	5/11/2012		Concrete	1	13	13	9	4	83	303	<MDA	1	458	458	477	-19	0	973	<MDA
29	5/11/2012		Concrete	1	8	8	9	-1	0	303	<MDA	1	426	426	477	-51	0	973	<MDA

Source: "Notification of Planned Demolition for Building 4015 (Area 4)." June, 2012. Page 46. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

[1] Because of the uncertain final disposition of the sink with elevated readings, we have reduced the total to 14.

Water Tanks (1 detection from 1 sample area)

Sample Area Measurements

				Alpha								Beta							
Sample	Date	Description (Location, Object)	Material Type	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?
1	5/3/2012	side of small water tank	Construction	1	6	6	10	-4	0	308	<MDA	1	224	224	231	-7	0	687	<MDA
2	5/3/2012		Construction	1	11	11	10	1	30	308	<MDA	1	236	236	231	5	64	687	<MDA
3	5/3/2012		Construction	1	6	6	10	-4	0	308	<MDA	1	265	265	231	34	410	687	<MDA
4	5/3/2012		Construction	1	15	15	10	5	117	308	<MDA	1	281	281	231	50	600	687	<MDA
5	5/3/2012	↓	Construction	1	4	4	10	-6	0	308	<MDA	1	236	236	231	5	64	687	<MDA
6	5/3/2012	top of pipe tee	Construction	1	7	7	10	-3	0	308	<MDA	1	257	257	231	26	314	687	<MDA
7	5/3/2012	inside pipe-cut from small tank	Construction	1	2	2	10	-8	0	308	<MDA	1	209	209	231	-22	0	687	<MDA
8	5/3/2012	on support	Concrete	1	14	14	8	6	135	284	<MDA	1	430	430	490	-60	0	986	<MDA
9	5/3/2012	outside pipe from large water tank	Construction	1	13	13	10	3	74	308	<MDA	1	267	267	231	36	433	687	<MDA
10	5/3/2012	outside pipe from large water tank	Construction	1	5	5	10	-5	0	308	<MDA	1	245	245	231	14	171	687	<MDA
11	5/3/2012	on support	Concrete	1	5	5	8	-3	0	284	<MDA	1	498	498	490	8	90	986	<MDA
12	5/3/2012	on support	Concrete	1	16	16	8	8	178	284	<MDA	1	511	511	490	21	245	986	<MDA
13	5/3/2012	outside pipe from large water tank	Construction	1	13	13	10	3	74	308	<MDA	1	228	228	231	-3	0	687	<MDA
14	5/3/2012	outside pipe from large water tank	Construction	1	11	11	10	1	30	308	<MDA	1	253	253	231	22	267	687	<MDA
15	5/3/2012	on support	Concrete	1	11	11	8	3	70	284	<MDA	1	536	536	490	46	543	986	<MDA
16	5/3/2012	on support	Concrete	1	12	12	8	4	91	284	<MDA	1	454	454	490	-36	0	986	<MDA
17	5/3/2012	rusty pipe at large water tank	Construction	1	24	24	10	14	313	308	>MDA	1	275	275	231	44	529	687	<MDA
18	5/3/2012	brace pad - rusty	Construction	1	9	9	10	-1	0	308	<MDA	1	221	221	231	-10	0	687	<MDA
19	5/3/2012	on support	Concrete	1	14	14	8	6	135	284	<MDA	1	490	490	490	0	0	986	<MDA
20	5/3/2012	rusty pipe at large water tank	Construction	1	23	23	10	13	291	308	<MDA	1	247	247	231	16	195	687	<MDA
21	5/3/2012	side of gate valve	Construction	1	7	7	10	-3	0	308	<MDA	1	139	139	231	-92	0	687	<MDA
22	5/3/2012	large water tank berm basin	Asphalt	1	5	5	5	0	4	237	<MDA	1	498	498	572	-74	0	1062	<MDA
23	5/3/2012	near storm drain grate	Asphalt	1	6	6	5	1	26	237	<MDA	1	511	511	572	-61	0	1062	<MDA
24	5/3/2012	large water tank berm basin	Asphalt	1	6	6	5	1	26	237	<MDA	1	458	458	572	-114	0	1062	<MDA
25	5/3/2012		Asphalt	1	8	8	5	3	70	237	<MDA	1	467	467	572	-105	0	1062	<MDA
26	5/3/2012		Asphalt	1	2	2	5	-3	0	237	<MDA	1	498	498	572	-74	0	1062	<MDA
27	5/3/2012		Asphalt	1	10	10	5	5	113	237	<MDA	1	479	479	572	-93	0	1062	<MDA
28	5/3/2012		Asphalt	1	4	4	5	-1	0	237	<MDA	1	504	504	572	-68	0	1062	<MDA
29	5/3/2012	↓	Asphalt	1	2	2	5	-3	0	237	<MDA	1	524	524	572	-48	0	1062	<MDA
30	5/3/2012	side of small water tank	Construction	1	7	7	10	-3	0	308	<MDA	1	210	210	231	-21	0	687	<MDA
31	5/3/2012	side of pipe on large water tank	Construction	1	9	9	10	-1	0	308	<MDA	1	215	215	231	-16	0	687	<MDA

Source: "Updated Waste Survey for Water Tanks (Area IV)." November, 2012. Page 10. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65796_Water_Tanks_Waste_Certification_Rev_1.pdf

Weather Station (5 detections from 5 different sample areas)

Sample Area Measurements

				Alpha								Beta							
Sample	Date	Description (Location, Object)	Material Type	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?
39	6/15/2012	driveway	Asphalt	1	6	6	8	-2	0	290	<MDA	1	466	466	539	-73	0	1031	<MDA
40	6/15/2012	↓	Asphalt	1	3	3	8	-5	0	290	<MDA	1	525	525	539	-14	0	1031	<MDA
41	6/15/2012	↓	Asphalt	1	5	5	8	-3	0	290	<MDA	1	509	509	539	-30	0	1031	<MDA
42	6/15/2012	walk	Asphalt	1	5	5	8	-3	0	290	<MDA	1	480	480	539	-59	0	1031	<MDA
43	6/15/2012	↓	Asphalt	1	4	4	8	-4	0	290	<MDA	1	499	499	539	-40	0	1031	<MDA
44	6/15/2012	↓	Asphalt	1	6	6	8	-2	0	290	<MDA	1	530	530	539	-9	0	1031	<MDA
45	6/15/2012	propane tank pad	Concrete	1	14	14	10	4	83	315	<MDA	1	466	466	483	-17	0	979	<MDA
46	6/15/2012	walk	Concrete	1	7	7	10	-3	0	315	<MDA	1	475	475	483	-8	0	979	<MDA
47	6/15/2012	pad	Concrete	1	14	14	10	4	83	315	<MDA	1	444	444	483	-39	0	979	<MDA
48	6/15/2012	↓	Concrete	1	5	5	10	-5	0	315	<MDA	1	470	470	483	-13	0	979	<MDA
49	6/15/2012	↓	Concrete	1	9	9	10	-1	0	315	<MDA	1	501	501	483	18	212	979	<MDA
50	6/15/2012	shed wall	Construction	1	6	6	19	-13	0	410	<MDA	1	248	248	225	23	269	680	<MDA
51	6/15/2012	shed wall	Construction	1	3	3	19	-16	0	410	<MDA	1	251	251	225	26	305	680	<MDA
52	6/15/2012	shed door	Construction	1	1	1	19	-18	0	410	<MDA	1	258	258	225	33	388	680	<MDA
53	6/15/2012	shed wall	Construction	1	2	2	19	-17	0	410	<MDA	1	269	269	225	44	519	680	<MDA
54	6/15/2012	shed wall	Construction	1	0	0	19	-19	0	410	<MDA	1	247	247	225	22	257	680	<MDA
55	6/15/2012	shed floor	Construction	1	1	1	19	-18	0	410	<MDA	1	283	283	225	58	686	680	>MDA
56	6/15/2012	shed floor	Construction	1	1	1	19	-18	0	410	<MDA	1	309	309	225	84	995	680	>MDA
57	6/15/2012	footer	Concrete	1	4	4	10	-6	0	315	<MDA	1	492	492	483	9	105	979	<MDA
58	6/15/2012	junction box	Construction	1	5	5	19	-14	0	410	<MDA	1	253	253	225	28	329	680	<MDA
59	6/15/2012	transformer	Construction	1	6	6	19	-13	0	410	<MDA	1	223	223	225	-2	0	680	<MDA
60	6/15/2012	controller	Construction	1	3	3	19	-16	0	410	<MDA	1	227	227	225	2	19	680	<MDA
61	6/15/2012	controller	Construction	1	8	8	19	-11	0	410	<MDA	1	219	219	225	-6	0	680	<MDA
62	6/15/2012	transformer	Construction	1	6	6	19	-13	0	410	<MDA	1	243	243	225	18	210	680	<MDA
63	6/15/2012	shed wall	Construction	1	3	3	19	-16	0	410	<MDA	1	220	220	225	-5	0	680	<MDA
64	6/15/2012	↓	Construction	1	2	2	19	-17	0	410	<MDA	1	226	226	225	1	7	680	<MDA
65	6/15/2012	↓	Construction	1	2	2	19	-17	0	410	<MDA	1	254	254	225	29	340	680	<MDA
66	6/15/2012	↓	Construction	1	0	0	19	-19	0	410	<MDA	1	217	217	225	-8	0	680	<MDA
67	6/15/2012	shed roof	Construction	1	11	11	19	-8	0	410	<MDA	1	250	250	225	25	293	680	<MDA
68	6/15/2012	shed floor	Construction	1	3	3	19	-16	0	410	<MDA	1	257	257	225	32	376	680	<MDA

Sample Area Measurements

				Alpha								Beta							
Sample	Date	Description (Location, Object)	Material Type	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?
69	6/15/2012	pad	Concrete	1	15	15	10	5	104	315	<MDA	1	417	417	483	-66	0	979	<MDA
70	6/15/2012	↓	Concrete	1	12	12	10	2	39	315	<MDA	1	434	434	483	-49	0	979	<MDA
71	6/15/2012	↓	Concrete	1	12	12	10	2	39	315	<MDA	1	485	485	483	2	21	979	<MDA
72	6/15/2012	↓	Concrete	1	12	12	10	2	39	315	<MDA	1	497	497	483	14	164	979	<MDA
73	6/15/2012	↓	Concrete	1	8	8	10	-2	0	315	<MDA	1	397	397	483	-86	0	979	<MDA
74	6/15/2012	equipment stand	Construction	1	24	24	19	5	100	410	<MDA	1	308	308	225	83	983	680	>MDA
75	6/15/2012	pad	Concrete	1	7	7	10	-3	0	315	<MDA	1	425	425	483	-58	0	979	<MDA
76	6/15/2012	↓	Concrete	1	11	11	10	1	17	315	<MDA	1	416	416	483	-67	0	979	<MDA
77	6/15/2012	↓	Concrete	1	15	15	10	5	104	315	<MDA	1	428	428	483	-55	0	979	<MDA
78	6/15/2012	↓	Concrete	1	11	11	10	1	17	315	<MDA	1	423	423	483	-60	0	979	<MDA
79	6/15/2012	↓	Concrete	1	10	10	10	0	0	315	<MDA	1	439	439	483	-44	0	979	<MDA
80	6/15/2012	↓	Concrete	1	4	4	10	-6	0	315	<MDA	1	368	368	483	-115	0	979	<MDA
81	6/15/2012	↓	Concrete	1	3	3	10	-7	0	315	<MDA	1	386	386	483	-97	0	979	<MDA
82	6/15/2012	dome exterior	Construction	1	2	2	19	-17	0	410	<MDA	1	237	237	225	12	138	680	<MDA
83	6/15/2012	↓	Construction	1	11	11	19	-8	0	410	<MDA	1	244	244	225	19	221	680	<MDA
84	6/15/2012	↓	Construction	1	0	0	19	-19	0	410	<MDA	1	234	234	225	9	102	680	<MDA
85	6/15/2012	dome interior	Construction	1	2	2	19	-17	0	410	<MDA	1	274	274	225	49	579	680	<MDA
86	6/15/2012	dome interior	Construction	1	0	0	19	-19	0	410	<MDA	1	305	305	225	80	948	680	>MDA

Source: "Notification of Planned Removal of Minor Structures." October, 2012. Pages 40-41. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

Sample Report

Batch ID:	Smears 1 Minute Count - 201206141302	**Count Date:**	6/14/2012 1:02:40PM
Group:	D	**Count Minutes:**	1.00
Device:	RMHF Tennelec (NR 007137)	**Count Mode:**	Simultaneous
Batch Key:	2800	**Operating Volts:**	1455
Selected	Swipe/Smear	**Comments:**	Area IV weather station last smear

Background (cpm)		Efficiency (%)	
Alpha Rate:	0.10 ± 0.10	**Alpha:**	29.93 ± 0.89
Beta Rate:	3.90 ± 0.62	**Beta:**	36.62 ± 0.93

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)
45	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
46	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
47	Unknown	-0.33	0.33	14.00	-5.19	4.22	27.00
48	Unknown	-0.33	0.33	14.00	-10.65	1.73	27.00
49	Unknown	-0.33	0.33	14.00	11.20	7.91	27.00
50	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
51	Unknown	3.01	3.36	14.00	3.00	6.34	27.00
52	Unknown	-0.33	0.33	14.00	11.20	7.91	27.00
53	Unknown	3.01	3.36	14.00	3.00	6.34	27.00
54	Unknown	3.01	3.36	14.00	-5.19	4.22	27.00
55	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
56	Unknown	-0.33	0.33	14.00	-5.19	4.22	27.00
57	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
58	Unknown	3.01	3.36	14.00	5.73	6.90	27.00
59	Unknown	-0.33	0.33	14.00	-2.46	5.03	27.00
60	Unknown	9.69	5.80	14.00	13.93	8.37	27.00
61	Unknown	-0.33	0.33	14.00	33.04	11.09	27.00
62	Unknown	3.01	3.36	14.00	0.27	5.72	27.00
63	Unknown	-0.33	0.33	14.00	5.73	6.90	27.00
64	Unknown	-0.33	0.33	14.00	-5.19	4.22	27.00
65	Unknown	3.01	3.36	14.00	-5.19	4.22	27.00
66	Unknown	-0.33	0.33	14.00	3.00	6.34	27.00

Source: "Notification of Planned Removal of Minor Structures." October, 2012. Page 44. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

Building 4011 (10 detections from 10 different sample areas)

Sample Area Measurements

				Alpha								Beta							
Sample	Date	Description (Location, Object)	Material Type	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?
56	8/17/2012	I-Beam	Construction	1	1	1	14	-13	0	370	<MDA	1	242	242	252	-10	0	658	<MDA
57	8/17/2012	wall	Construction	1	1	1	14	-13	0	370	<MDA	1	336	336	252	84	922	658	>MDA
58	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	332	332	252	80	879	658	>MDA
59	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	301	301	252	49	540	658	<MDA
60	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	331	331	252	79	868	658	>MDA
61	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	299	299	252	47	518	658	<MDA
62	8/17/2012	↓	Construction	1	2	2	14	-12	0	370	<MDA	1	288	288	252	36	398	658	<MDA
63	8/17/2012	↓	Construction	1	3	3	14	-11	0	370	<MDA	1	295	295	252	43	474	658	<MDA
64	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	316	316	252	64	704	658	>MDA
65	8/17/2012	breaker box	Construction	1	0	0	14	-14	0	370	<MDA	1	254	254	252	2	26	658	<MDA
66	8/17/2012	fire extinguisher mount	Construction	1	1	1	14	-13	0	370	<MDA	1	267	267	252	15	168	658	<MDA
67	8/17/2012	I-Beam	Construction	1	1	1	14	-13	0	370	<MDA	1	236	236	252	-16	0	658	<MDA
68	8/17/2012	inside bottom of deep sink	Construction	1	1	1	14	-13	0	370	<MDA	1	773	773	252	521	5698	658	>MDA
69	8/17/2012	I-Beam	Construction	1	0	0	14	-14	0	370	<MDA	1	235	235	252	-17	0	658	<MDA
70	8/17/2012	I-Beam	Construction	1	1	1	14	-13	0	370	<MDA	1	262	262	252	10	114	658	<MDA
71	8/17/2012	plywood wall	Construction	1	0	0	14	-14	0	370	<MDA	1	275	275	252	23	256	658	<MDA
72	8/17/2012	I-Beam	Construction	1	0	0	14	-14	0	370	<MDA	1	235	235	252	-17	0	658	<MDA

Sample Area Measurements

				Alpha								Beta							
Sample	Date	Description (Location, Object)	Material Type	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?
86	8/17/2012	door	Construction	1	2	2	14	-12	0	370	<MDA	1	234	234	252	-18	0	658	<MDA
87	8/17/2012	plywood wall	Construction	1	2	2	14	-12	0	370	<MDA	1	292	292	252	40	442	658	<MDA
88	8/17/2012	rack rail	Construction	1	1	1	14	-13	0	370	<MDA	1	242	242	252	-10	0	658	<MDA
89	8/17/2012	↓	Construction	1	2	2	14	-12	0	370	<MDA	1	277	277	252	25	278	658	<MDA
90	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	258	258	252	6	70	658	<MDA
91	8/17/2012	↓	Construction	1	2	2	14	-12	0	370	<MDA	1	280	280	252	28	310	658	<MDA
92	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	298	298	252	46	507	658	<MDA
93	8/17/2012	↓	Construction	1	1	1	14	-13	0	370	<MDA	1	244	244	252	-8	0	658	<MDA
94	8/17/2012	↓	Construction	1	1	1	14	-13	0	370	<MDA	1	252	252	252	0	4	658	<MDA
95	8/17/2012	↓	Construction	1	0	0	14	-14	0	370	<MDA	1	250	250	252	-2	0	658	<MDA
96	8/17/2012	↓	Construction	1	1	1	14	-13	0	370	<MDA	1	245	245	252	-7	0	658	<MDA
97	8/17/2012	↓	Construction	1	1	1	14	-13	0	370	<MDA	1	247	247	252	-5	0	658	<MDA
98	8/17/2012	rack post	Construction	1	3	3	14	-11	0	370	<MDA	1	219	219	252	-33	0	658	<MDA
99	8/17/2012	rack rail	Construction	1	2	2	14	-12	0	370	<MDA	1	204	204	252	-48	0	658	<MDA
100	8/17/2012	rack rail	Construction	1	0	0	14	-14	0	370	<MDA	1	211	211	252	-41	0	658	<MDA
101	8/17/2012	rack post	Construction	1	1	1	14	-13	0	370	<MDA	1	242	242	252	-10	0	658	<MDA
102	8/17/2012	rack rail	Construction	1	1	1	14	-13	0	370	<MDA	1	216	216	252	-36	0	658	<MDA
103	8/17/2012	rack rail	Construction	1	0	0	14	-14	0	370	<MDA	1	233	233	252	-19	0	658	<MDA
104	8/17/2012	rack post	Construction	1	2	2	14	-12	0	370	<MDA	1	233	233	252	-19	0	658	<MDA
105	8/17/2012	rack base	Construction	1	1	1	14	-13	0	370	<MDA	1	289	289	252	37	409	658	<MDA
106	8/17/2012	rack rail	Construction	1	1	1	14	-13	0	370	<MDA	1	232	232	252	-20	0	658	<MDA
107	8/17/2012	rack base	Construction	1	2	2	14	-12	0	370	<MDA	1	244	244	252	-8	0	658	<MDA
108	8/17/2012	rack rail	Construction	1	0	0	14	-14	0	370	<MDA	1	234	234	252	-18	0	658	<MDA
109	8/17/2012	rack base	Construction	1	4	4	14	-10	0	370	<MDA	1	271	271	252	19	212	658	<MDA
110	8/17/2012	rack rail	Construction	1	0	0	14	-14	0	370	<MDA	1	204	204	252	-48	0	658	<MDA
111	8/17/2012	I-Beam	Construction	1	1	1	14	-13	0	370	<MDA	1	225	225	252	-27	0	658	<MDA
112	8/17/2012	rack rail	Construction	1	2	2	14	-12	0	370	<MDA	1	232	232	252	-20	0	658	<MDA
113	8/17/2012	rack base	Construction	1	1	1	14	-13	0	370	<MDA	1	319	319	252	67	737	658	>MDA
114	8/17/2012	rack base	Construction	1	2	2	14	-12	0	370	<MDA	1	305	305	252	53	584	658	<MDA
115	8/17/2012	front of deep sink outside	Construction	1	22	22	14	8	185	370	<MDA	1	720	720	252	468	5119	658	>MDA
116	8/17/2012	back wall of deep sink inside	Construction	1	20	20	14	6	140	370	<MDA	1	770	770	252	518	5666	658	>MDA

Sample Area Measurements

				Alpha								Beta							
Sample	Date	Description (Location, Object)	Material Type	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?	Sample Count Time (min)	Gross Sample Count	Gross Count Rate (cpm)	Bkgd Count Rate (cpm)	Net Count Rate (cpm)	Net Activity (dpm/ 100 cm^2)	MDA (dpm/ 100 cm^2)	> MDA or < MDA ?
1	8/31/2012	run-off ditch	Asphalt	1	5	5	11	-6	0	332	<MDA	1	571	571	541	30	322	944	<MDA
2	8/31/2012	run-off ditch	Asphalt	1	3	3	11	-8	0	332	<MDA	1	472	472	541	-69	0	944	<MDA
3	8/31/2012	driveway	Asphalt	1	4	4	11	-7	0	332	<MDA	1	493	493	541	-48	0	944	<MDA
4	8/31/2012	↓	Asphalt	1	5	5	11	-6	0	332	<MDA	1	459	459	541	-82	0	944	<MDA
5	8/31/2012	↓	Asphalt	1	7	7	11	-4	0	332	<MDA	1	536	536	541	-5	0	944	<MDA
6	8/31/2012	lot	Asphalt	1	7	7	11	-4	0	332	<MDA	1	537	537	541	-4	0	944	<MDA
7	8/31/2012	↓	Asphalt	1	3	3	11	-8	0	332	<MDA	1	524	524	541	-17	0	944	<MDA
8	8/31/2012	↓	Asphalt	1	3	3	11	-8	0	332	<MDA	1	500	500	541	-41	0	944	<MDA
9	8/31/2012	↓	Asphalt	1	3	3	11	-8	0	332	<MDA	1	526	526	541	-15	0	944	<MDA
10	8/31/2012	↓	Asphalt	1	3	3	11	-8	0	332	<MDA	1	552	552	541	11	115	944	<MDA
11	8/31/2012	↓	Asphalt	1	5	5	11	-6	0	332	<MDA	1	553	553	541	12	126	944	<MDA
12	8/31/2012	↓	Asphalt	1	11	11	11	0	4	332	<MDA	1	595	595	541	54	583	944	<MDA
13	8/31/2012	↓	Asphalt	1	8	8	11	-3	0	332	<MDA	1	567	567	541	26	278	944	<MDA
14	8/31/2012	↓	Asphalt	1	2	2	11	-9	0	332	<MDA	1	531	531	541	-10	0	944	<MDA
15	8/31/2012	pad	Concrete	1	5	5	29	-24	0	498	<MDA	1	465	465	491	-26	0	900	<MDA
16	8/31/2012	lot	Asphalt	1	3	3	11	-8	0	332	<MDA	1	549	549	541	8	83	944	<MDA
17	8/31/2012	lot	Asphalt	1	8	8	11	-3	0	332	<MDA	1	568	568	541	27	289	944	<MDA
18	8/31/2012	ramp - rusty	Concrete	1	14	14	29	-15	0	498	<MDA	1	527	527	491	36	393	900	<MDA
19	8/31/2012	loading dock - rusty	Concrete	1	17	17	29	-12	0	498	<MDA	1	521	521	491	30	328	900	<MDA
20	8/31/2012	↓	Concrete	1	26	26	29	-3	0	498	<MDA	1	565	565	491	74	807	900	<MDA
21	8/31/2012	↓	Concrete	1	12	12	29	-17	0	498	<MDA	1	501	501	491	10	111	900	<MDA
22	8/31/2012	↓	Concrete	1	24	24	29	-5	0	498	<MDA	1	507	507	491	16	176	900	<MDA
23	8/31/2012	↓	Concrete	1	28	28	29	-1	0	498	<MDA	1	518	518	491	27	296	900	<MDA
24	8/31/2012	wood table	Construction	1	6	6	12	-6	0	351	<MDA	1	350	350	253	97	1059	655	>MDA
25	8/31/2012	lot	Asphalt	1	3	3	11	-8	0	332	<MDA	1	535	535	541	-6	0	944	<MDA
26	8/31/2012	flat table float basin	Construction	1	14	14	12	2	36	351	<MDA	1	288	288	253	35	385	655	<MDA
27	8/31/2012	dock edge	Construction	1	10	10	12	-2	0	351	<MDA	1	292	292	253	39	428	655	<MDA
28	8/31/2012	lot	Asphalt	1	5	5	11	-6	0	332	<MDA	1	560	560	541	19	202	944	<MDA
29	8/31/2012	↓	Asphalt	1	3	3	11	-8	0	332	<MDA	1	531	531	541	-10	0	944	<MDA

Source: "Notification of Planned Demolition for a Portion of Boeing Building 4011." November, 2012. Pages 103, 104, 127. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

Sample Report

Batch ID:	Smears 1 Minute Count - 201208311718	**Count Date:**	8/31/2012 5:18:52PM
Group:	D	**Count Minutes:**	1.00
Device:	RMHF Tennelec (NR 007137)	**Count Mode:**	Simultaneous
Batch Key:	2936	**Operating Volts:**	1455
Selected	Swipe/Smear	**Comments:**	Area IV B4011 lot, drives & pads #1 smear

Background (cpm)		Efficiency (%)	
Alpha Rate:	0.00 ± 0.00	**Alpha:**	30.71 ± 0.92
Beta Rate:	3.30 ± 0.57	**Beta:**	36.91 ± 0.93

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)
1	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
2	Unknown	0.00	0.00	10.00	1.90	5.64	25.00
3	Unknown	0.00	0.00	10.00	4.61	6.26	25.00
4	Unknown	0.00	0.00	10.00	-6.23	3.13	25.00
5	Unknown	0.00	0.00	10.00	4.61	6.26	25.00
6	Unknown	0.00	0.00	10.00	1.90	5.64	25.00
7	Unknown	0.00	0.00	10.00	-3.52	4.14	25.00
8	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
9	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
10	Unknown	0.00	0.00	10.00	1.90	5.64	25.00
11	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
12	Unknown	0.00	0.00	10.00	4.61	6.26	25.00
13	Unknown	3.26	3.26	10.00	1.90	5.64	25.00
14	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
15	Unknown	0.00	0.00	10.00	1.90	5.64	25.00
16	Unknown	0.00	0.00	10.00	4.61	6.26	25.00
17	Unknown	0.00	0.00	10.00	-3.52	4.14	25.00
18	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
19	Unknown	3.26	3.26	10.00	-0.81	4.94	25.00
20	Unknown	3.26	3.26	10.00	7.32	6.82	25.00
21	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
22	Unknown	0.00	0.00	10.00	-3.52	4.14	25.00
23	Unknown	0.00	0.00	10.00	31.70	10.64	25.00
24	Unknown	0.00	0.00	10.00	10.03	7.34	25.00
25	Unknown	0.00	0.00	10.00	-0.81	4.94	25.00

Source: "Notification of Planned Demolition for a Portion of Boeing Building 4011." November, 2012. Page 129.
http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

APPENDIX E

Screenshots from Boeing reports showing all detections of radiation above background levels in already demolished Boeing structures

A total of **254 radiation measurements** (not counting the 4011 sink) from **237 different sample areas** in Area IV structures which Boeing is known to have demolished exhibited radiation above background levels. The waste from these structures has been sent to recycling facilities and to landfills which are unqualified to receive radioactive materials.

A further 17 radiation measurements from 15 different sample areas at the former L85 reactor site exceeded background. These metrics are included separately, at the bottom of this document, since the DTSC has not made the L85 site's demolition status publicly available, so it is unknown whether the L85 site structures have been demolished yet.

Highlighting added to show sample measurements which exceed background levels of radiation

Building 4015 (48 detections from 47 different sample areas)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4015

LOCATION: Exterior & structures

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	5/9/2012	5/11/2012	wall		< 20	< 100	0	248	9
2	5/9/2012	5/11/2012	truck door		< 20	< 100	0	188	7
3	5/9/2012	5/11/2012	wall		< 20	< 100	0	140	8
4	5/9/2012	5/11/2012			< 20	< 100	0	271	6
5	5/9/2012	5/11/2012			< 20	< 100	0	10	7
6	5/9/2012	5/11/2012			< 20	< 100	0	271	7
7	5/9/2012	5/11/2012			< 20	< 100	0	33	7
8	5/9/2012	5/11/2012			< 20	< 100	0	355	7
9	5/9/2012	5/11/2012			< 20	< 100	0	248	7
10	5/9/2012	5/11/2012			< 20	< 100	0	367	7
11	5/9/2012	5/11/2012			< 20	< 100	0	343	7
12	5/9/2012	5/11/2012			< 20	< 100	0	260	7
13	5/9/2012	5/11/2012			< 20	< 100	0	129	7
14	5/9/2012	5/11/2012			< 20	< 100	0	152	7
15	5/9/2012	5/11/2012	fire main header pipe		< 20	< 100	0	926	8
16	5/9/2012	5/11/2012	wall		< 20	< 100	0	402	8
17	5/9/2012	5/11/2012			< 20	< 100	0	379	7
18	5/9/2012	5/11/2012			< 20	< 100	0	426	8
19	5/9/2012	5/11/2012			< 20	< 100	0	390	7
20	5/9/2012	5/11/2012			< 20	< 100	0	271	9

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 17 dpm/100 cm^2 α and 26 dpm/100 cm^2 β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 251 - 337 dpm/100 cm^2 α and 687 - 1025 dpm/100 cm^2 β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		275211		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.4	3.4	6 to 12	230 to 532	5 to 12 µrem/h
INSTR. EFFICIENCY	30.43%	36.91%	18.4%	16.8%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 5/11/2012

REVIEWED BY: Phil Rutherford DATE: 5/21/2012

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FORM 732-A REV 2012-01-31

Building 4015 (48 detections from 47 different sample areas, continued)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4015
LOCATION: Exterior & structures

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	5/9/2012	5/11/2012	wall		< 20	< 100	0	260	8
22	5/9/2012	5/11/2012	walk		< 20	< 100	30	74	8
23	5/9/2012	5/11/2012	driveway		< 20	< 100	39	0	9
24	5/9/2012	5/11/2012			< 20	< 100	9	0	10
25	5/9/2012	5/11/2012			< 20	< 100	52	0	10
26	5/9/2012	5/11/2012			< 20	< 100	0	0	10
27	5/9/2012	5/11/2012			< 20	< 100	0	0	8
28	5/9/2012	5/11/2012			< 20	< 100	83	0	9
29	5/9/2012	5/11/2012			< 20	< 100	0	0	10
30	5/9/2012	5/11/2012	walk		< 20	< 100	0	0	9
31	5/9/2012	5/11/2012	walk		< 20	< 100	52	0	9
32	5/9/2012	5/11/2012	pad		< 20	< 100	30	0	10
33	5/9/2012	5/11/2012			< 20	< 100	0	0	10
34	5/9/2012	5/11/2012			< 20	< 100	0	0	10
35	5/9/2012	5/11/2012			< 20	< 100	52	0	9
36	5/9/2012	5/11/2012			< 20	< 100	0	0	11
37	5/9/2012	5/11/2012			< 20	< 100	117	0	10
38	5/9/2012	5/11/2012			< 20	< 100	0	0	10
39	5/9/2012	5/11/2012	drainage		< 20	< 100	0	74	10
40	5/9/2012	5/11/2012	drainage		< 20	< 100	0	0	10

COMMENTS: MDA = minimum detectable activity
[1]Tennelec (MDA = 17 dpm/100 cm² α and 26 dpm/100 cm² β)
[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 251 - 337 dpm/100 cm² α and 687 - 1025 dpm/100 cm² β)
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		275211		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.4	3.4	6 to 12	230 to 532	5 to 12 µrem/h
INSTR. EFFICIENCY	30.43%	36.91%	18.4%	16.8%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 5/11/2012
REVIEWED BY: Phil Rutherford DATE: 5/21/2012

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FORM 732-A REV 2013-01-31

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4015
LOCATION: Exterior & structures

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
41	5/9/2012	5/11/2012	drainage		< 20	< 100	74	0	10
42	5/9/2012	5/11/2012	concrete debris		< 20	< 100	0	0	10
43	5/9/2012	5/11/2012			< 20	< 100	0	0	9
44	5/9/2012	5/11/2012			< 20	< 100	0	0	9

Source: Notification of Planned Demolition for Building 4015 (Area 4)." June, 2012. Pages 29-32, 42-45. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65327_Notification_of_Planned_Demolition_Building_4015_Area_4.pdf

Water Tanks (30 detections from 22 different sample areas)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Site water tanks - exterior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	5/3/2012	5/3/2012	side of gate valve		< 20	< 100	0	0	5
22	5/3/2012	5/3/2012	large water tank berm basin		< 20	< 100	4	0	6
23	5/3/2012	5/3/2012	near storm drain grate		< 20	< 100	26	0	7
24	5/3/2012	5/3/2012	large water tank berm basin		< 20	< 100	26	0	7
25	5/3/2012	5/3/2012	↓		< 20	< 100	70	0	8
26	5/3/2012	5/3/2012			< 20	< 100	0	0	7
27	5/3/2012	5/3/2012			< 20	< 100	113	0	7
28	5/3/2012	5/3/2012			< 20	< 100	0	0	7
29	5/3/2012	5/3/2012			< 20	< 100	0	0	6
30	5/3/2012	5/3/2012	side of small water tank		< 20	< 100	0	0	5
31	5/3/2012	5/3/2012	side of pipe on large water tank		< 20	< 100	0	0	6

COMMENTS: MDA = minimum detectable activity
[1]Tennelec (MDA = 10 dpm/100 cm² α and 27 dpm/100 cm² β)
[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 237 - 308 dpm/100 cm² α and 687 - 1062 dpm/100 cm² β)
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
IDENTIFICATION	NR007137		275211	EX041002
CALIBRATION DUE	Daily		8/23/2012	1/24/2013
BACKGROUND (cpm)	0	3.7	5 to 10 / 231 to 572	4 to 10 µrem/h
INSTR. EFFICIENCY	30.12%	36.57%	18.4% / 16.8%	NA
COUNT TIME	1 min.		1 min	Scan

SAMPLED BY: E. Sorrels DATE: 5/3/2012
REVIEWED BY: Phil Rutherford DATE: 8/6/2012
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BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Site water tanks - exterior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: Pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	5/3/2012	5/3/2012	side of small water tank		< 20	< 100	0	0	6
2	5/3/2012	5/3/2012	↓		< 20	< 100	30	64	7
3	5/3/2012	5/3/2012			< 20	< 100	0	410	6
4	5/3/2012	5/3/2012			< 20	< 100	117	600	7
5	5/3/2012	5/3/2012			< 20	< 100	0	64	5
6	5/3/2012	5/3/2012	top of pipe tee		< 20	< 100	0	314	5
7	5/3/2012	5/3/2012	inside pipe-cut from small tank		< 20	< 100	0	0	5
8	5/3/2012	5/3/2012	on support		< 20	< 100	135	0	8
9	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	74	433	6
10	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	0	171	6
11	5/3/2012	5/3/2012	on support		< 20	< 100	0	90	7
12	5/3/2012	5/3/2012	on support		< 20	< 100	178	245	7
13	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	74	0	6
14	5/3/2012	5/3/2012	outside pipe from large water tank		< 20	< 100	30	267	5
15	5/3/2012	5/3/2012	on support		< 20	< 100	70	543	6
16	5/3/2012	5/3/2012	on support		< 20	< 100	91	0	6
17	5/3/2012	5/3/2012	rusty pipe at large water tank		< 20	< 100	313	529	6
18	5/3/2012	5/3/2012	brace pad - rusty		< 20	< 100	0	0	6
19	5/3/2012	5/3/2012	on support		< 20	< 100	135	0	6
20	5/3/2012	5/3/2012	rusty pipe at large water tank		< 20	< 100	291	195	6

COMMENTS: MDA = minimum detectable activity
[1]Tennelec (MDA = 10 dpm/100 cm² α and 27 dpm/100 cm² β)
[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 237 - 308 dpm/100 cm² α and 687 - 1062 dpm/100 cm² β)
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
IDENTIFICATION	NR007137		275211	EX041002
CALIBRATION DUE	Daily		8/23/2012	1/24/2013
BACKGROUND (cpm)	0	3.7	5 to 10 / 231 to 572	4 to 10 µrem/h
INSTR. EFFICIENCY	30.12%	36.57%	18.4% / 16.8%	NA
COUNT TIME	1 min.		1 min	Scan

SAMPLED BY: E. Sorrels DATE: 5/3/2012
REVIEWED BY: Phil Rutherford DATE: 8/6/2012
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Source: "Updated Waste Survey for Water Tanks (Area IV)." November, 2012. Pages 8, 9. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65796_Water_Tanks_Waste_Certification_Rev_1.pdf

Weather Station (55 detections from 52 different sample areas)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Weather station

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	6/14/2012	6/14/2012	runoff ditch		< 20	< 100	0	0	10
2	6/14/2012	6/14/2012			< 20	< 100	0	0	9
3	6/14/2012	6/14/2012			< 20	< 100	0	2	9
4	6/14/2012	6/14/2012			< 20	< 100	0	0	10
5	6/14/2012	6/14/2012			< 20	< 100	0	0	9
6	6/14/2012	6/14/2012			< 20	< 100	0	0	10
7	6/14/2012	6/14/2012			< 20	< 100	74	0	8
8	6/14/2012	6/14/2012			< 20	< 100	74	0	10
9	6/14/2012	6/14/2012			< 20	< 100	96	0	9
10	6/14/2012	6/14/2012			< 20	< 100	0	26	11
11	6/14/2012	6/14/2012			< 20	< 100	0	0	9
12	6/14/2012	6/14/2012			< 20	< 100	74	0	10
13	6/14/2012	6/14/2012			< 20	< 100	0	0	9
14	6/14/2012	6/14/2012			< 20	< 100	0	0	9
15	6/14/2012	6/14/2012			< 20	< 100	74	0	10
16	6/14/2012	6/14/2012			< 20	< 100	0	0	11
17	6/14/2012	6/14/2012			< 20	< 100	0	0	10
18	6/14/2012	6/14/2012			< 20	< 100	30	0	10
19	6/14/2012	6/14/2012			< 20	< 100	0	0	10
20	6/14/2012	6/14/2012			< 20	< 100	0	0	10

COMMENTS: MDA = minimum detectable activity	INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
[1]Tennelec (MDA = 14 dpm/100 cm² α and 27 dpm/100 cm² β)	IDENTIFICATION	NR007137		275211	EX041002
[2]Ludlum 2224 with 43-89 dual alpha beta probe	CALIBRATION DUE	Daily		8/23/2012	1/24/2013
(MDA 218 - 266 dpm/100 cm² α and 969 - 1028 dpm/100 cm² β)	BACKGROUND (cpm)	0.1	3.9	4 to 7	473 to 534	7 to 13 µrem/h
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)	INSTR. EFFICIENCY	29.93%	36.62%	18.4%	16.8%	NA
SAMPLED BY: E. Sorrels DATE: 6/15/2012	COUNT TIME	1 min.		1 min		Scan
REVIEWED BY: Phil Rutherford DATE: 6/20/2012	Page 1 of 17					

FORM 732-A REV 2013-01-31

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Weather station

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	6/14/2012	6/14/2012	runoff ditch		< 20	< 100	0	0	10
22	6/14/2012	6/14/2012			< 20	< 100	30	0	10
23	6/14/2012	6/14/2012			< 20	< 100	74	0	10
24	6/14/2012	6/14/2012			< 20	< 100	0	86	9
25	6/14/2012	6/14/2012			< 20	< 100	30	0	9
26	6/14/2012	6/14/2012	driveway		< 20	< 100	4	0	9
27	6/14/2012	6/14/2012			< 20	< 100	0	0	9
28	6/14/2012	6/14/2012			< 20	< 100	4	0	10
29	6/14/2012	6/14/2012			< 20	< 100	0	0	10
30	6/14/2012	6/14/2012			< 20	< 100	0	0	10
31	6/14/2012	6/14/2012	lot		< 20	< 100	0	0	10
32	6/14/2012	6/14/2012			< 20	< 100	48	0	10
33	6/14/2012	6/14/2012			< 20	< 100	4	0	10
34	6/14/2012	6/14/2012			< 20	< 100	0	0	9
35	6/14/2012	6/14/2012			< 20	< 100	91	0	10
36	6/14/2012	6/14/2012			< 20	< 100	48	0	9
37	6/14/2012	6/14/2012			< 20	< 100	26	0	10
38	6/14/2012	6/14/2012			< 20	< 100	70	0	10

COMMENTS: MDA = minimum detectable activity	INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
[1]Tennelec (MDA = 14 dpm/100 cm² α and 27 dpm/100 cm² β)	IDENTIFICATION	NR007137		275211	EX041002
[2]Ludlum 2224 with 43-89 dual alpha beta probe	CALIBRATION DUE	Daily		8/23/2012	1/24/2013
(MDA 218 - 266 dpm/100 cm² α and 969 - 1028 dpm/100 cm² β)	BACKGROUND (cpm)	0.1	3.9	4 to 7	473 to 534	7 to 13 µrem/h
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)	INSTR. EFFICIENCY	29.93%	36.62%	18.4%	16.8%	NA
SAMPLED BY: E. Sorrels DATE: 6/15/2012	COUNT TIME	1 min.		1 min		Scan
REVIEWED BY: Phil Rutherford DATE: 6/20/2012	Page 2 of 17					

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Weather Station (55 detections from 52 different sample areas, continued)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Weather station

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
39	6/14/2012	6/15/2012	driveway		< 20	< 100	0	0	9
40	6/14/2012	6/15/2012	↓		< 20	< 100	0	0	7
41	6/14/2012	6/15/2012	↓		< 20	< 100	0	0	9
42	6/14/2012	6/15/2012	walk		< 20	< 100	0	0	9
43	6/14/2012	6/15/2012	↓		< 20	< 100	0	0	8
44	6/14/2012	6/15/2012	↓		< 20	< 100	0	0	8
45	6/14/2012	6/15/2012	propane tank pad		< 20	< 100	83	0	7
46	6/14/2012	6/15/2012	walk		< 20	< 100	0	0	8
47	6/14/2012	6/15/2012	pad		< 20	< 100	83	0	8
48	6/14/2012	6/15/2012	↓		< 20	< 100	0	0	8
49	6/14/2012	6/15/2012	↓		< 20	< 100	0	212	8
50	6/14/2012	6/15/2012	shed wall		< 20	< 100	0	269	7
51	6/14/2012	6/15/2012	shed wall		< 20	< 100	0	305	8
52	6/14/2012	6/15/2012	shed door		< 20	< 100	0	388	8
53	6/14/2012	6/15/2012	shed wall		< 20	< 100	0	519	8
54	6/14/2012	6/15/2012	shed wall		< 20	< 100	0	257	8
55	6/14/2012	6/15/2012	shed floor		< 20	< 100	0	686	8
56	6/14/2012	6/15/2012	shed floor		< 20	< 100	0	995	8
57	6/14/2012	6/15/2012	footer		< 20	< 100	0	105	8
58	6/14/2012	6/15/2012	junction box		< 20	< 100	0	329	8

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
IDENTIFICATION	NR007137		275211	EX041002
CALIBRATION DUE	Daily		8/23/2012	1/24/2013
BACKGROUND (cpm)	0.1	3.9	8 to 19	225 to 539	6 to 12 µrem/h
INSTR. EFFICIENCY	29.93%	36.62%	18.4%	16.8%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity
[1]Tennelec (MDA = 14 dpm/100 cm^2 α and 27 dpm/100 cm^2 β)
[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 290 - 410 dpm/100 cm^2 α and 680 - 1031 dpm/100 cm^2 β)
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 6/15/2012
REVIEWED BY: Phil Rutherford DATE: 6/20/2012

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BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Weather station

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
59	6/14/2012	6/15/2012	transformer		< 20	< 100	0	0	8
60	6/14/2012	6/15/2012	controller		< 20	< 100	0	19	7
61	6/14/2012	6/15/2012	controller		< 20	< 100	0	0	8
62	6/14/2012	6/15/2012	transformer		< 20	< 100	0	210	7
63	6/14/2012	6/15/2012	shed wall		< 20	< 100	0	0	7
64	6/14/2012	6/15/2012	↓		< 20	< 100	0	7	10
65	6/14/2012	6/15/2012	↓		< 20	< 100	0	340	8
66	6/14/2012	6/15/2012	↓		< 20	< 100	0	0	8
67	6/14/2012	6/15/2012	shed roof		< 20	< 100	0	293	8
68	6/14/2012	6/15/2012	shed floor		< 20	< 100	0	376	9
69	6/14/2012	6/15/2012	pad		< 20	< 100	104	0	10
70	6/14/2012	6/15/2012	↓		< 20	< 100	39	0	9
71	6/14/2012	6/15/2012	↓		< 20	< 100	39	21	9
72	6/14/2012	6/15/2012	↓		< 20	< 100	39	164	9
73	6/14/2012	6/15/2012	↓		< 20	< 100	0	0	7
74	6/14/2012	6/15/2012	equipment stand		< 20	< 100	100	983	9
75	6/14/2012	6/15/2012	pad		< 20	< 100	0	0	9
76	6/14/2012	6/15/2012	↓		< 20	< 100	17	0	9
77	6/14/2012	6/15/2012	↓		< 20	< 100	104	0	8
78	6/14/2012	6/15/2012	↓		< 20	< 100	17	0	8

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
IDENTIFICATION	NR007137		275211	EX041002
CALIBRATION DUE	Daily		8/23/2012	1/24/2013
BACKGROUND (cpm)	0.1	3.9	8 to 19	225 to 539	6 to 12 µrem/h
INSTR. EFFICIENCY	29.93%	36.62%	18.4%	16.8%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity
[1]Tennelec (MDA = 14 dpm/100 cm^2 α and 27 dpm/100 cm^2 β)
[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 290 - 410 dpm/100 cm^2 α and 680 - 1031 dpm/100 cm^2 β)
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 6/15/2012
REVIEWED BY: Phil Rutherford DATE: 6/20/2012

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Weather Station (55 detections from 52 different sample areas, continued)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV
LOCATION: Weather station

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
79	6/14/2012	6/15/2012	pad		< 20	< 100	0	0	9
80	6/14/2012	6/15/2012			< 20	< 100	0	0	9
81	6/14/2012	6/15/2012			< 20	< 100	0	0	9
82	6/14/2012	6/15/2012	dome exterior		< 20	< 100	0	138	7
83	6/14/2012	6/15/2012			< 20	< 100	0	221	8
84	6/14/2012	6/15/2012			< 20	< 100	0	102	7
85	6/14/2012	6/15/2012	dome interior		< 20	< 100	0	579	9
86	6/14/2012	6/15/2012	dome interior		< 20	< 100	0	948	9

Sample Report

Batch ID: Smears 1 Minute Count - 201206141302 **Count Date:** 6/14/2012 1:02:40PM
Group: D **Count Minutes:** 1.00
Device: RMHF Tennelec (NR 007137) **Count Mode:** Simultaneous
Batch Key: 2800 **Operating Volts:** 1455
Selected Swipe/Smear **Comments:** Area IV weather station last smear

Background (cpm) **Efficiency (%)**
Alpha Rate: 0.10 ± 0.10 **Alpha:** 29.93 ± 0.89
Beta Rate: 3.90 ± 0.62 **Beta:** 38.82 ± 0.93

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)
45	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
46	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
47	Unknown	-0.33	0.33	14.00	-5.19	4.22	27.00
48	Unknown	-0.33	0.33	14.00	-10.65	1.73	27.00
49	Unknown	-0.33	0.33	14.00	11.20	7.91	27.00
50	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
51	Unknown	3.01	3.36	14.00	3.00	6.34	27.00
52	Unknown	-0.33	0.33	14.00	11.20	7.91	27.00
53	Unknown	3.01	3.36	14.00	3.00	6.34	27.00
54	Unknown	3.01	3.36	14.00	-5.19	4.22	27.00
55	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
56	Unknown	-0.33	0.33	14.00	-5.19	4.22	27.00
57	Unknown	-0.33	0.33	14.00	0.27	5.72	27.00
58	Unknown	3.01	3.36	14.00	5.73	6.90	27.00
59	Unknown	-0.33	0.33	14.00	-2.46	5.03	27.00
60	Unknown	9.69	5.80	14.00	13.93	8.37	27.00
61	Unknown	-0.33	0.33	14.00	33.04	11.09	27.00
62	Unknown	3.01	3.36	14.00	0.27	5.72	27.00
63	Unknown	-0.33	0.33	14.00	5.73	6.90	27.00
64	Unknown	-0.33	0.33	14.00	-5.19	4.22	27.00
65	Unknown	3.01	3.36	14.00	-5.19	4.22	27.00
66	Unknown	-0.33	0.33	14.00	3.00	6.34	27.00

Source: "Notification of Planned Removal of Minor Structures." October, 2012. Pages 33-37, 44. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65736_Notification_of_Planned_Removal_Minor_Structures-112565.pdf

Building 4011 (122 detections from 113 different sample areas)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: building exterior walls; telecommunications room interior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	8/10/2012	8/16/2012	transite panel		< 20	< 100	0	0	8
2	8/10/2012	8/16/2012	door		< 20	< 100	0	0	8
3	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	0	8
4	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	264	8
5	8/10/2012	8/16/2012	door		< 20	< 100	0	90	9
6	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	330	9
7	8/10/2012	8/16/2012	door		< 20	< 100	0	0	8
8	8/10/2012	8/16/2012	door		< 20	< 100	0	254	8
9	8/10/2012	8/16/2012	fiber wall panel		< 20	< 100	0	0	8
10	8/10/2012	8/16/2012			< 20	< 100	0	177	9
11	8/10/2012	8/16/2012			< 20	< 100	0	46	8
12	8/10/2012	8/16/2012			< 20	< 100	0	308	8
13	8/10/2012	8/16/2012			< 20	< 100	0	494	8
14	8/10/2012	8/16/2012			< 20	< 100	0	428	8
15	8/10/2012	8/16/2012			< 20	< 100	0	319	8
16	8/10/2012	8/16/2012			< 20	< 100	0	363	8
17	8/10/2012	8/16/2012	junction box		< 20	< 100	0	0	8
18	8/10/2012	8/16/2012	base; conduit		< 20	< 100	0	0	9
19	8/10/2012	8/16/2012	ladder cover		< 20	< 100	0	188	8
20	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	0	7

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.1	3.6	8 to 13	277 to 530	5 to 11 µrem/h
INSTR. EFFICIENCY	30.50%	36.46%	17.7%	18.3%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 13 dpm/100 cm² α and 26 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 301 - 364 dpm/100 cm² α and 688 - 939 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 8/20/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: building exterior walls; telecommunications room interior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	8/10/2012	8/16/2012	garage door		< 20	< 100	0	0	8
22	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	2	8
23	8/10/2012	8/16/2012	door		< 20	< 100	0	0	7
24	8/10/2012	8/16/2012	garage door frame		< 20	< 100	0	0	6
25	8/10/2012	8/16/2012	wood dock bumper		< 20	< 100	0	527	7
26	8/10/2012	8/16/2012	steel dock edge		< 20	< 100	0	352	8
27	8/10/2012	8/16/2012	footer		< 20	< 100	0	0	8
28	8/10/2012	8/16/2012	footer		< 20	< 100	0	0	8
29	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	0	8
30	8/10/2012	8/16/2012	footer		< 20	< 100	0	0	8
31	8/10/2012	8/16/2012	down spout		< 20	< 100	0	461	6
32	8/10/2012	8/16/2012	metal wall		< 20	< 100	41	560	8
33	8/10/2012	8/16/2012	footer		< 20	< 100	63	0	8
34	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	352	8
35	8/10/2012	8/16/2012	footer		< 20	< 100	0	0	9
36	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	461	9
37	8/10/2012	8/16/2012	metal wall		< 20	< 100	0	90	9
38	8/10/2012	8/16/2012	junction box		< 20	< 100	0	155	9
39	8/10/2012	8/16/2012	base; conduit		< 20	< 100	41	0	9
40	8/10/2012	8/16/2012	conduit		< 20	< 100	0	0	8

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.1	3.6	8 to 13	277 to 530	5 to 11 µrem/h
INSTR. EFFICIENCY	30.50%	36.46%	17.7%	18.3%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 13 dpm/100 cm² α and 26 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 301 - 364 dpm/100 cm² α and 688 - 939 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 8/20/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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Building 4011 (122 detections from 113 different sample areas, continued)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4011

LOCATION: building exterior walls; telecommunications room interior

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
41	8/15/2012	8/16/2012	wall		< 20	< 100	0	0	9
42	8/15/2012	8/16/2012	wall		< 20	< 100	0	0	8
43	8/15/2012	8/16/2012	transformer		< 20	< 100	0	0	8
44	8/15/2012	8/16/2012	wall		< 20	< 100	0	0	8
45	8/15/2012	8/16/2012			< 20	< 100	0	0	8
46	8/15/2012	8/16/2012			< 20	< 100	0	0	8
47	8/15/2012	8/16/2012			< 20	< 100	0	0	8
48	8/15/2012	8/16/2012			< 20	< 100	0	0	8
49	8/15/2012	8/16/2012			< 20	< 100	0	450	7
50	8/15/2012	8/16/2012			< 20	< 100	0	0	8
51	8/15/2012	8/16/2012	floor		< 20	< 100	0	450	8
52	8/15/2012	8/16/2012			< 20	< 100	0	122	8
53	8/15/2012	8/16/2012			< 20	< 100	0	385	8
54	8/15/2012	8/16/2012			< 20	< 100	0	417	8
55	8/15/2012	8/16/2012			< 20	< 100	0	461	8

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 14 dpm/100 cm² α and 25 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe

(MDA 301 - 364 dpm/100 cm² α and 688 - 939 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.1	3.2	8 to 13	277 to 530	5 to 11 µrem/h
INSTR. EFFICIENCY	29.75%	37.29%	17.7%	18.3%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 8/20/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4011

LOCATION: building interior walls, racks, deep sink

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
56	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	8
57	8/16/2012	8/17/2012	wall		< 20	< 100	0	922	7
58	8/16/2012	8/17/2012			< 20	< 100	0	879	8
59	8/16/2012	8/17/2012			< 20	< 100	0	540	8
60	8/16/2012	8/17/2012			< 20	< 100	0	868	8
61	8/16/2012	8/17/2012			< 20	< 100	0	518	8
62	8/16/2012	8/17/2012			< 20	< 100	0	398	8
63	8/16/2012	8/17/2012			< 20	< 100	0	474	8
64	8/16/2012	8/17/2012			< 20	< 100	0	704	8
65	8/16/2012	8/17/2012	breaker box		< 20	< 100	0	26	8
66	8/16/2012	8/17/2012	fire extinguisher mount		< 20	< 100	0	168	7
67	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	7
68	8/16/2012	8/17/2012	inside bottom of deep sink		< 20	< 100	0	5698	8
69	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	7
70	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	114	7
71	8/16/2012	8/17/2012	plywood wall		< 20	< 100	0	256	8
72	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	7
73	8/16/2012	8/17/2012	wall joist		< 20	< 100	0	212	8
74	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	8
75	8/16/2012	8/17/2012	wall joist		< 20	< 100	0	310	8

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 14 dpm/100 cm² α and 23 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe

(MDA 370 dpm/100 cm² α and 658 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.1	2.6	14	252	5 to 11 µrem/h
INSTR. EFFICIENCY	30.15%	36.87%	17.7%	18.3%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 8/20/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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Building 4011 (122 detections from 113 different sample areas, continued)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: building interior walls, racks, deep sink

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
76	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	8
77	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	8
78	8/16/2012	8/17/2012	wall joist		< 20	< 100	0	332	7
79	8/16/2012	8/17/2012	plywood wall		< 20	< 100	0	0	7
80	8/16/2012	8/17/2012	plywood wall		< 20	< 100	0	103	7
81	8/16/2012	8/17/2012	plywood wall		< 20	< 100	0	125	7
82	8/16/2012	8/17/2012	wood stair step		< 20	< 100	0	507	7
83	8/16/2012	8/17/2012	plywood wall		< 20	< 100	0	0	7
84	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	7
85	8/16/2012	8/17/2012	rollup door track		< 20	< 100	0	0	8
86	8/16/2012	8/17/2012	door		< 20	< 100	0	0	8
87	8/16/2012	8/17/2012	plywood wall		< 20	< 100	0	442	8
88	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	8
89	8/16/2012	8/17/2012			< 20	< 100	0	278	8
90	8/16/2012	8/17/2012			< 20	< 100	0	70	7
91	8/16/2012	8/17/2012			< 20	< 100	0	310	7
92	8/16/2012	8/17/2012			< 20	< 100	0	507	7
93	8/16/2012	8/17/2012			< 20	< 100	0	0	8
94	8/16/2012	8/17/2012			< 20	< 100	0	4	8
95	8/16/2012	8/17/2012			< 20	< 100	0	0	8

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.1	2.6	14	252	5 to 11 µrem/h
INSTR. EFFICIENCY	30.15%	36.87%	17.7%	18.3%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 14 dpm/100 cm² α and 23 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 370 dpm/100 cm² α and 658 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 8/20/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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FORM 733-A REV 2012-01-31

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: building interior walls, racks, deep sink

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
96	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	7
97	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	8
98	8/16/2012	8/17/2012	rack post		< 20	< 100	0	0	8
99	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	7
100	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	7
101	8/16/2012	8/17/2012	rack post		< 20	< 100	0	0	7
102	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	7
103	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	7
104	8/16/2012	8/17/2012	rack post		< 20	< 100	0	0	7
105	8/16/2012	8/17/2012	rack base		< 20	< 100	0	409	8
106	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	7
107	8/16/2012	8/17/2012	rack base		< 20	< 100	0	0	8
108	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	8
109	8/16/2012	8/17/2012	rack base		< 20	< 100	0	212	7
110	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	8
111	8/16/2012	8/17/2012	I-Beam		< 20	< 100	0	0	8
112	8/16/2012	8/17/2012	rack rail		< 20	< 100	0	0	8
113	8/16/2012	8/17/2012	rack base		< 20	< 100	0	737	7
114	8/16/2012	8/17/2012	rack base		< 20	< 100	0	584	8

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/23/2012		1/24/2013
BACKGROUND (cpm)	0.1	2.6	14	252	5 to 11 µrem/h
INSTR. EFFICIENCY	30.15%	36.87%	17.7%	18.3%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 14 dpm/100 cm² α and 23 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 370 dpm/100 cm² α and 658 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 8/20/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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FORM 733-A REV 2012-01-31

Building 4011 (122 detections from 113 different sample areas, continued)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: building interior deep sink

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey, investigation survey of deep sink	UNITS	Alpha Removable dpm/100 cm²	Beta Removable dpm/100 cm²	Alpha Total dpm/100 cm²	Beta Total dpm/100 cm²	Gamma µrem/h
			LOCATON/OBJECT DESCRIPTION	LIMITS	< 20	< 100	< 100 (< 5,000)	< 1,000 (< 5,000)	< MDA
115	8/17/2012	8/17/2012	front of deep sink outside		< 20	< 100	185	5119	8
116	8/17/2012	8/17/2012	back wall of deep sink inside		< 20	< 100	140	5666	8

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: building interior floors

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey	UNITS	Alpha Removable dpm/100 cm²	Beta Removable dpm/100 cm²	Alpha Total dpm/100 cm²	Beta Total dpm/100 cm²	Gamma µrem/h
			LOCATON/OBJECT DESCRIPTION	LIMITS	< 20	< 100	< 100 (< 5,000)	< 1,000 (< 5,000)	< MDA
137	8/17/2012	8/20/2012	floor		< 20	< 100	0	0	8
138	8/17/2012	8/20/2012			< 20	< 100	0	0	8
139	8/17/2012	8/20/2012			< 20	< 100	0	0	8
140	8/17/2012	8/20/2012			< 20	< 100	0	0	8
141	8/17/2012	8/20/2012			< 20	< 100	0	0	8
142	8/17/2012	8/20/2012			< 20	< 100	0	0	8
143	8/17/2012	8/20/2012			< 20	< 100	0	0	8
144	8/17/2012	8/20/2012	step		< 20	< 100	0	68	7
145	8/17/2012	8/20/2012	floor over telecom room		< 20	< 100	0	0	7
146	8/17/2012	8/20/2012			< 20	< 100	0	0	7
147	8/17/2012	8/20/2012			< 20	< 100	0	0	7

Building 4011 (122 detections from 113 different sample areas, continued)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4011
LOCATION: lot, drives & pads #1

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey	UNITS	Alpha Removable dpm/100 cm²	Beta Removable dpm/100 cm²	Alpha Total dpm/100 cm²	Beta Total dpm/100 cm²	Gamma µrem/h
			LOCATON/OBJECT DESCRIPTION	LIMITS	< 20	< 100	< 100 (< 5,000)	< 1,000 (< 5,000)	< MDA
1	8/31/2012	8/31/2012	run-off ditch		< 20	< 100	0	322	8
2	8/31/2012	8/31/2012	run-off ditch		< 20	< 100	0	0	9
3	8/31/2012	8/31/2012	driveway		< 20	< 100	0	0	9
4	8/31/2012	8/31/2012			< 20	< 100	0	0	8
5	8/31/2012	8/31/2012			< 20	< 100	0	0	7
6	8/31/2012	8/31/2012	lot		< 20	< 100	0	0	8
7	8/31/2012	8/31/2012			< 20	< 100	0	0	9
8	8/31/2012	8/31/2012			< 20	< 100	0	0	9
9	8/31/2012	8/31/2012			< 20	< 100	0	0	8
10	8/31/2012	8/31/2012			< 20	< 100	0	115	9
11	8/31/2012	8/31/2012			< 20	< 100	0	126	9
12	8/31/2012	8/31/2012			< 20	< 100	4	583	9
13	8/31/2012	8/31/2012			< 20	< 100	0	278	9
14	8/31/2012	8/31/2012			< 20	< 100	0	0	9
15	8/31/2012	8/31/2012	pad		< 20	< 100	0	0	9
16	8/31/2012	8/31/2012	lot		< 20	< 100	0	83	9
17	8/31/2012	8/31/2012	lot		< 20	< 100	0	289	9
18	8/31/2012	8/31/2012	ramp - rusty		< 20	< 100	0	393	8
19	8/31/2012	8/31/2012	loading dock - rusty		< 20	< 100	0	328	7
20	8/31/2012	8/31/2012	loading dock - rusty		< 20	< 100	0	807	8

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 10 dpm/100 cm² α and 25 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 332 - 498 dpm/100 cm² α and 655 - 944 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/22/2013		8/22/2013
BACKGROUND (cpm)	0	3.3	11 to 29	253 to 544	6 to 12 µrem/h
INSTR. EFFICIENCY	30.71%	36.91%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 8/31/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

FORM 732-A REV 2013-01-31

Building 4011 (122 detections from 113 different sample areas, continued)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: lot, drives & pads #1

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	8/31/2012	8/31/2012	loading dock - rusty		< 20	< 100	0	111	8
22	8/31/2012	8/31/2012	↓		< 20	< 100	0	176	8
23	8/31/2012	8/31/2012	↓		< 20	< 100	0	296	8
24	8/31/2012	8/31/2012	wood table		< 20	< 100	0	1059	8
25	8/31/2012	8/31/2012	lot		< 20	< 100	0	0	9
26	8/31/2012	8/31/2012	flat table float basin		< 20	< 100	36	385	7
27	8/31/2012	8/31/2012	dock edge		< 20	< 100	0	428	8
28	8/31/2012	8/31/2012	lot		< 20	< 100	0	202	9
29	8/31/2012	8/31/2012	↓		< 20	< 100	0	0	9
30	8/31/2012	8/31/2012	↓		< 20	< 100	0	0	9
31	8/31/2012	8/31/2012	↓		< 20	< 100	0	398	10
32	8/31/2012	8/31/2012	↓		< 20	< 100	27	0	9
33	8/31/2012	8/31/2012	↓		< 20	< 100	0	0	9
34	8/31/2012	8/31/2012	ramp		< 20	< 100	0	0	9
35	8/31/2012	8/31/2012	lot		< 20	< 100	0	322	9
36	8/31/2012	8/31/2012	↓		< 20	< 100	0	0	9
37	8/31/2012	8/31/2012	↓		< 20	< 100	0	0	9
38	8/31/2012	8/31/2012	↓		< 20	< 100	0	0	9
39	8/31/2012	8/31/2012	↓		< 20	< 100	4	224	9
40	8/31/2012	8/31/2012	lot - stained		< 20	< 100	27	778	9

COMMENTS: MDA = minimum detectable activity	INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
[1]Tennelec (MDA = 10 dpm/100 cm^2 α and 25 dpm/100 cm^2 β)	IDENTIFICATION	NR007137		ZO257835	EX041002
[2]Ludlum 2224 with 43-89 dual alpha beta probe	CALIBRATION DUE	Daily		8/22/2013	8/22/2013
(MDA 332 - 498 dpm/100 cm^2 α and 655 - 944 dpm/100 cm^2 β)	BACKGROUND (cpm)	0	3.3	11 to 29	253 to 544	6 to 12 µrem/h
[3]Bicron microrem meter (MDA ≤ 4 µrem/h)	INSTR. EFFICIENCY	30.71%	36.91%	17.9%	18.4%	NA
SAMPLED BY: E. Sorrels DATE: 8/31/2012	COUNT TIME	1 min.		1 min		Scan
REVIEWED BY: Phil Rutherford DATE: 9/17/2012	Page 2 of 9				

FORM 732-A REV 2012-01-31

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: lot, drives & pads #1

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
41	8/31/2012	8/31/2012	ramp		< 20	< 100	0	0	9
42	8/31/2012	8/31/2012	pad - rusty		< 20	< 100	0	133	8
43	8/31/2012	8/31/2012	↓		< 20	< 100	0	89	8
44	8/31/2012	8/31/2012	↓		< 20	< 100	0	328	9
45	8/31/2012	8/31/2012	drive		< 20	< 100	0	887	9
46	8/31/2012	8/31/2012	drive - stained		< 20	< 100	72	865	9

Building 4011 (122 detections from 113 different sample areas, continued)

Sample Report

Batch ID:	Smears 1 Minute Count - 201208311718	**Count Date:**	8/31/2012 5:18:52PM
Group:	D	**Count Minutes:**	1.00
Device:	RMHF Tennelec (NR 007137)	**Count Mode:**	Simultaneous
Batch Key:	2936	**Operating Volts:**	1455
Selected	Swipe/Smear	**Comments:**	Area IV B4011 lot, drives & pads #1 smear

Background (cpm)		Efficiency (%)	
Alpha Rate:	0.00 ± 0.00	**Alpha:**	30.71 ± 0.92
Beta Rate:	3.30 ± 0.57	**Beta:**	36.91 ± 0.93

	Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)
1		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
2		Unknown	0.00	0.00	10.00	1.90	5.64	25.00
3		Unknown	0.00	0.00	10.00	4.61	6.26	25.00
4		Unknown	0.00	0.00	10.00	-6.23	3.13	25.00
5		Unknown	0.00	0.00	10.00	4.61	6.26	25.00
6		Unknown	0.00	0.00	10.00	1.90	5.64	25.00
7		Unknown	0.00	0.00	10.00	-3.52	4.14	25.00
8		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
9		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
10		Unknown	0.00	0.00	10.00	1.90	5.64	25.00
11		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
12		Unknown	0.00	0.00	10.00	4.61	6.26	25.00
13		Unknown	3.26	3.26	10.00	1.90	5.64	25.00
14		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
15		Unknown	0.00	0.00	10.00	1.90	5.64	25.00
16		Unknown	0.00	0.00	10.00	4.61	6.26	25.00
17		Unknown	0.00	0.00	10.00	-3.52	4.14	25.00
18		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
19		Unknown	3.26	3.26	10.00	-0.81	4.94	25.00
20		Unknown	3.26	3.26	10.00	7.32	6.82	25.00
21		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00
22		Unknown	0.00	0.00	10.00	-3.52	4.14	25.00
23		Unknown	0.00	0.00	10.00	31.70	10.64	25.00
24		Unknown	0.00	0.00	10.00	10.03	7.34	25.00
25		Unknown	0.00	0.00	10.00	-0.81	4.94	25.00

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4011

LOCATION: lot, drives & pads #2

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	9/12/2012	9/12/2012	drive		< 20	< 100	0	0	9
2	9/12/2012	9/12/2012			< 20	< 100	0	0	8
3	9/12/2012	9/12/2012			< 20	< 100	0	0	9
4	9/12/2012	9/12/2012			< 20	< 100	0	0	9
5	9/12/2012	9/12/2012			< 20	< 100	0	0	10
6	9/12/2012	9/12/2012			< 20	< 100	0	0	9
7	9/12/2012	9/12/2012			< 20	< 100	0	0	10
8	9/12/2012	9/12/2012			< 20	< 100	0	0	9
9	9/12/2012	9/12/2012			< 20	< 100	0	52	9
10	9/12/2012	9/12/2012			< 20	< 100	0	0	9
11	9/12/2012	9/12/2012			< 20	< 100	0	0	8
12	9/12/2012	9/12/2012			< 20	< 100	0	0	9
13	9/12/2012	9/12/2012			< 20	< 100	0	0	9
14	9/12/2012	9/12/2012			< 20	< 100	0	0	9
15	9/12/2012	9/12/2012	lot		< 20	< 100	0	0	10
16	9/12/2012	9/12/2012			< 20	< 100	0	0	10
17	9/12/2012	9/12/2012			< 20	< 100	0	0	10
18	9/12/2012	9/12/2012			< 20	< 100	0	0	10
19	9/12/2012	9/12/2012			< 20	< 100	0	0	10
20	9/12/2012	9/12/2012			< 20	< 100	0	0	10

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/22/2013		8/22/2013
BACKGROUND (cpm)	0.3	3.7	11 to 29	548 to 608	6 to 12 µrem/h
INSTR. EFFICIENCY	29.86%	36.65%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 16 dpm/100 cm^2 α and 26 dpm/100 cm^2 β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 339 - 502 dpm/100 cm^2 α and 949 - 999 dpm/100 cm^2 β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 9/12/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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Building 4011 (122 detections from 113 different sample areas, continued)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: lot, drives & pads #2

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	9/12/2012	9/12/2012	drive		< 20	< 100	0	0	9
22	9/12/2012	9/12/2012	drive		< 20	< 100	0	0	10
23	9/12/2012	9/12/2012	lot		< 20	< 100	0	0	9
24	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	10
25	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	9
26	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	9
27	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	9
28	9/12/2012	9/12/2012	↓		< 20	< 100	0	574	9
29	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	9
30	9/12/2012	9/12/2012	pad		< 20	< 100	0	0	9
31	9/12/2012	9/12/2012	drive		< 20	< 100	0	0	9
32	9/12/2012	9/12/2012	↓		< 20	< 100	13	0	10
33	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	9
34	9/12/2012	9/12/2012	↓		< 20	< 100	0	280	10
35	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	8
36	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	10
37	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	8
38	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	8
39	9/12/2012	9/12/2012	↓		< 20	< 100	0	0	9
40	9/12/2012	9/12/2012	curb		< 20	< 100	0	0	9

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
IDENTIFICATION	NR007137		ZO257835	EX041002
CALIBRATION DUE	Daily		8/22/2013	8/22/2013
BACKGROUND (cpm)	0.3	3.7	11 to 29 / 548 to 608	6 to 12 µrem/h
INSTR. EFFICIENCY	29.86%	36.65%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min	Scan

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 16 dpm/100 cm² α and 26 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 339 - 502 dpm/100 cm² α and 949 - 999 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 9/12/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: lot, drives & pads #3

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	9/12/2012	9/13/2012	drive		< 20	< 100	0	0	9
2	9/12/2012	9/13/2012	lot		< 20	< 100	0	0	9
3	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	9
4	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	9
5	9/12/2012	9/13/2012	basin - lot drainage		< 20	< 100	0	0	9
6	9/12/2012	9/13/2012	drive		< 20	< 100	0	0	11
7	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	11
8	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	11
9	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	11
10	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	11
11	9/12/2012	9/13/2012	↓		< 20	< 100	4	0	10
12	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	9
13	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	11
14	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	11
15	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	10
16	9/12/2012	9/13/2012	lot		< 20	< 100	0	0	10
17	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	9
18	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	9
19	9/12/2012	9/13/2012	↓		< 20	< 100	0	0	10
20	9/12/2012	9/13/2012	drive		< 20	< 100	0	0	10

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]	Bicron[3]
IDENTIFICATION	NR007137		ZO257835	EX041002
CALIBRATION DUE	Daily		8/22/2013	8/22/2013
BACKGROUND (cpm)	0.3	3.7	9 to 36 / 544 to 619	7 to 12 µrem/h
INSTR. EFFICIENCY	29.86%	36.65%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min	Scan

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 16 dpm/100 cm² α and 26 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 306 - 548 dpm/100 cm² α and 946 - 1,007 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

SAMPLED BY: E. Sorrels DATE: 9/14/2012

REVIEWED BY: Phil Rutherford DATE: 9/17/2012

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Building 4011 (122 detections from 113 different sample areas, continued)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: lot, drives & pads #3

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	9/12/2012	9/14/2012	curb		< 20	< 100	0	0	10
22	9/12/2012	9/14/2012	drive		< 20	< 100	0	0	8
23	9/12/2012	9/14/2012	↓		< 20	< 100	13	0	8
24	9/12/2012	9/14/2012	↓		< 20	< 100	0	0	8
25	9/12/2012	9/14/2012	↓		< 20	< 100	0	0	9
26	9/12/2012	9/14/2012	curb		< 20	< 100	13	0	9
27	9/12/2012	9/14/2012	drive		< 20	< 100	0	0	9
28	9/12/2012	9/14/2012	↓		< 20	< 100	0	0	9
29	9/12/2012	9/14/2012	↓		< 20	< 100	0	172	10
30	9/12/2012	9/14/2012	↓		< 20	< 100	0	0	10
31	9/12/2012	9/14/2012	↓		< 20	< 100	0	0	9
32	9/12/2012	9/14/2012	↓		< 20	< 100	0	0	9
33	9/12/2012	9/14/2012	↓		< 20	< 100	13	0	9

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: Lot, drives & pads #4

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
1	9/14/2012	9/17/2012	pad		< 20	< 100	67	0	9
2	9/14/2012	9/17/2012	drive		< 20	< 100	0	0	9
3	9/14/2012	9/17/2012	walk		< 20	< 100	0	0	9
4	9/14/2012	9/17/2012	↓		< 20	< 100	268	0	8
5	9/14/2012	9/17/2012	↓		< 20	< 100	45	0	9
6	9/14/2012	9/17/2012	gutter drain block		< 20	< 100	0	0	10
7	9/14/2012	9/17/2012	walk		< 20	< 100	0	0	10
8	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	10
9	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	10
10	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	9
11	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	8
12	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	6
13	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	8
14	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	9
15	9/14/2012	9/17/2012	↓		< 20	< 100	22	0	8
16	9/14/2012	9/17/2012	pad		< 20	< 100	0	0	8
17	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	9
18	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	9
19	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	9
20	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	10

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 15 dpm/100 cm^2 α and 27 dpm/100 cm^2 β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe

(MDA 280 - 554 dpm/100 cm^2 α and 770 - 996 dpm/100 cm^2 β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/22/2013		8/22/2013
BACKGROUND (cpm)	0.2	4	7 to 35	354 to 605	5 to 12 µrem/h
INSTR. EFFICIENCY	30.46%	36.72%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 9/17/2012

REVIEWED BY: Phil Rutherford DATE: 9/18/2012

FORM 732-A REV 2012-01-31

Building 4011 (122 detections from 113 different sample areas, continued)

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: Lot, drives & pads #4

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
21	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	8
22	9/14/2012	9/17/2012			< 20	< 100	0	0	9
23	9/14/2012	9/17/2012			< 20	< 100	22	0	9
24	9/14/2012	9/17/2012			< 20	< 100	22	0	9
25	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	9
26	9/14/2012	9/17/2012	pad		< 20	< 100	0	0	8
27	9/14/2012	9/17/2012	lot		< 20	< 100	112	0	9
28	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	9
29	9/14/2012	9/17/2012			< 20	< 100	112	0	9
30	9/14/2012	9/17/2012			< 20	< 100	0	0	10
31	9/14/2012	9/17/2012			< 20	< 100	0	0	9
32	9/14/2012	9/17/2012			< 20	< 100	0	0	9
33	9/14/2012	9/17/2012			< 20	< 100	0	0	9
34	9/14/2012	9/17/2012	↓		< 20	< 100	89	0	8
35	9/14/2012	9/17/2012	pad		< 20	< 100	0	0	7
36	9/14/2012	9/17/2012	pad		< 20	< 100	0	0	8
37	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	8
38	9/14/2012	9/17/2012			< 20	< 100	67	0	9
39	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	7
40	9/14/2012	9/17/2012	drive		< 20	< 100	0	0	8

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 15 dpm/100 cm² α and 27 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 280 - 554 dpm/100 cm² α and 770 - 996 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/22/2013		8/22/2013
BACKGROUND (cpm)	0.2	4	7 to 35	354 to 605	5 to 12 µrem/h
INSTR. EFFICIENCY	30.46%	36.72%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 9/17/2012

REVIEWED BY: Phil Rutherford DATE: 9/18/2012

FORM 732-A REV 2012-01-31

BOEING **RADIATION SURVEY REPORT**

FACILITY: Area IV B4011

LOCATION: Lot, drives & pads #4

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable dpm/100 cm² < 20	Beta Removable dpm/100 cm² < 100	Alpha Total dpm/100 cm² < 100 (< 5,000)	Beta Total dpm/100 cm² < 1,000 (< 5,000)	Gamma µrem/h < MDA
41	9/14/2012	9/17/2012	drive		< 20	< 100	45	0	9
42	9/14/2012	9/17/2012			< 20	< 100	0	0	9
43	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	9
44	9/14/2012	9/17/2012	culvert drain box		< 20	< 100	0	2	10
45	9/14/2012	9/17/2012	ditch		< 20	< 100	0	0	9
46	9/14/2012	9/17/2012	ditch		< 20	< 100	0	0	9
47	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	9
48	9/14/2012	9/17/2012			< 20	< 100	112	0	9
49	9/14/2012	9/17/2012			< 20	< 100	0	0	9
50	9/14/2012	9/17/2012			< 20	< 100	0	0	9
51	9/14/2012	9/17/2012			< 20	< 100	22	0	9
52	9/14/2012	9/17/2012	↓		< 20	< 100	0	0	8
53	9/14/2012	9/17/2012	walk		< 20	< 100	0	0	9
54	9/14/2012	9/17/2012	gutter drain block		< 20	< 100	0	0	8
55	9/14/2012	9/17/2012	walk		< 20	< 100	0	0	9
56	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	9
57	9/14/2012	9/17/2012			< 20	< 100	0	0	10
58	9/14/2012	9/17/2012			< 20	< 100	0	0	10
59	9/14/2012	9/17/2012			< 20	< 100	0	0	9
60	9/14/2012	9/17/2012	pad		< 20	< 100	0	230	9

COMMENTS: MDA = minimum detectable activity

[1]Tennelec (MDA = 15 dpm/100 cm² α and 27 dpm/100 cm² β)

[2]Ludlum 2224 with 43-89 dual alpha beta probe (MDA 280 - 554 dpm/100 cm² α and 770 - 996 dpm/100 cm² β)

[3]Bicron microrem meter (MDA ≤ 4 µrem/h)

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/22/2013		8/22/2013
BACKGROUND (cpm)	0.2	4	7 to 35	354 to 605	5 to 12 µrem/h
INSTR. EFFICIENCY	30.46%	36.72%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min		Scan

SAMPLED BY: E. Sorrels DATE: 9/17/2012

REVIEWED BY: Phil Rutherford DATE: 9/18/2012

FORM 732-A REV 2012-01-31

Building 4011 (122 detections from 113 different sample areas, continued)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4011

LOCATION: Lot, drives & pads #4

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)	Gamma µrem/h < MDA
61	9/14/2012	9/17/2012	stair frame		< 20	< 100	0	172	9
62	9/14/2012	9/17/2012	lot		< 20	< 100	0	0	9

Source: "Notification of Planned Demolition for a Portion of Boeing Building 4011." November, 2012. Pages 92-100, 124-126, 129, 133-135, 143-144, 150-153. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65774_112657-B4011_demo_notification.pdf

ESADA (4 detections from 3 different sample areas)

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4314, B4814, B4730

LOCATION: slabs, pads, drive & lot

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)
21	10/10/2012	10/12/2012	drive		< 20	< 100	0	0
22	10/10/2012	10/12/2012			< 20	< 100	0	0
23	10/10/2012	10/12/2012			< 20	< 100	0	0
24	10/10/2012	10/12/2012			< 20	< 100	0	0
25	10/10/2012	10/12/2012			< 20	< 100	0	0
26	10/10/2012	10/12/2012	pad		< 20	< 100	0	0
27	10/10/2012	10/12/2012			< 20	< 100	0	0
28	10/10/2012	10/12/2012			< 20	< 100	0	0
29	10/10/2012	10/12/2012			< 20	< 100	0	115
30	10/10/2012	10/12/2012			< 20	< 100	0	0
31	10/10/2012	10/12/2012			< 20	< 100	0	0
32	10/10/2012	10/12/2012	bed plate		< 20	< 100	286	52
33	10/10/2012	10/12/2012	pad		< 20	< 100	0	0
34	10/10/2012	10/12/2012	pad		< 20	< 100	0	0

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV B4314, B4814, B4730

LOCATION: slabs, pads, drive & lot

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable dpm/100 cm^2 < 20	Beta Removable dpm/100 cm^2 < 100	Alpha Total dpm/100 cm^2 < 100 (< 5,000)	Beta Total dpm/100 cm^2 < 1,000 (< 5,000)
41	10/10/2012	10/12/2012	lot		< 20	< 100	0	0
42	10/10/2012	10/12/2012			< 20	< 100	0	0
43	10/10/2012	10/12/2012			< 20	< 100	0	0
44	10/10/2012	10/12/2012	pad		< 20	< 100	0	115
45	10/10/2012	10/12/2012			< 20	< 100	0	0
46	10/10/2012	10/12/2012			< 20	< 100	0	0
47	10/10/2012	10/12/2012	drive		< 20	< 100	0	0
48	10/10/2012	10/12/2012			< 20	< 100	0	0
49	10/10/2012	10/12/2012			< 20	< 100	0	0

Source: "Notification of Demolition for ESADA Minor Features (Boeing Area IV)." February, 2013. Pages 19-22. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65872_113127_ESADA_Demo_Notification.pdf

L85 (17 detections from 15 different sample areas)
Information on demolition status not currently available from DTSC

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV 11th Street
LOCATION: road & lots

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable (Net) dpm/100 cm²	Beta Removable (Net) dpm/100 cm²	Alpha Total (Net) dpm/100 cm²	Beta Total (Net) dpm/100 cm²	Gamma (Gross) µrem/h
					< 20	< 100	< 100 (< 5,000)	< 1,000 (< 5,000)	< MDA
1	10/17/2012	10/26/2012	road		< 20	< 100	0	0	9
2	10/17/2012	10/26/2012			< 20	< 100	0	389	9
3	10/17/2012	10/26/2012			< 20	< 100	0	0	9
4	10/17/2012	10/26/2012			< 20	< 100	0	0	9
5	10/17/2012	10/26/2012			< 20	< 100	0	0	8
6	10/17/2012	10/26/2012			< 20	< 100	0	0	9
7	10/17/2012	10/26/2012			< 20	< 100	0	270	9
8	10/17/2012	10/26/2012			< 20	< 100	0	0	9
9	10/17/2012	10/26/2012			< 20	< 100	0	0	8
10	10/17/2012	10/26/2012			< 20	< 100	0	117	9
11	10/17/2012	10/26/2012			< 20	< 100	0	107	8
12	10/17/2012	10/26/2012			< 20	< 100	31	291	9
13	10/17/2012	10/26/2012			< 20	< 100	0	367	9
14	10/17/2012	10/26/2012			< 20	< 100	0	30	9
15	10/17/2012	10/26/2012			< 20	< 100	0	0	9
16	10/17/2012	10/26/2012			< 20	< 100	0	259	9
17	10/17/2012	10/26/2012			< 20	< 100	0	0	9
18	10/17/2012	10/26/2012			< 20	< 100	0	0	8
19	10/17/2012	10/26/2012			< 20	< 100	0	0	8
20	10/17/2012	10/26/2012			< 20	< 100	0	0	9

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		ZO257835		EX041002
CALIBRATION DUE	Daily		8/22/2013		8/22/2013
BACKGROUND (cpm)	0.2	2.6	12	618	6 to 11 µrem/h
INSTR. EFFICIENCY	30.57%	36.82%	17.9%	18.4%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity
[1]Tennelec (MDA = 15 dpm/100 cm² α and 23 dpm/100 cm² β)
[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 341 dpm/100 cm² α and 1007 dpm/100 cm² β)
[3]Bicron microrem meter (MDA < 4 µrem/h above background)

SAMPLED BY: E. Sorrels DATE: 11/19/2012
REVIEWED BY: Phil Rutherford DATE: 11/20/2012

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BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV 11th Street
LOCATION: road & lots

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey / LOCATON/OBJECT DESCRIPTION	UNITS / LIMITS	Alpha Removable (Net) dpm/100 cm²	Beta Removable (Net) dpm/100 cm²	Alpha Total (Net) dpm/100 cm²	Beta Total (Net) dpm/100 cm²	Gamma (Gross) µrem/h
					< 20	< 100	< 100 (< 5,000)	< 1,000 (< 5,000)	< MDA
21	10/17/2012	11/19/2012	road		< 20	< 100	0	0	7
22	10/17/2012	11/19/2012			< 20	< 100	0	0	8
23	10/17/2012	11/19/2012			< 20	< 100	0	0	8
24	10/17/2012	11/19/2012			< 20	< 100	0	88	8
25	10/17/2012	11/19/2012			< 20	< 100	0	0	7
26	10/17/2012	11/19/2012			< 20	< 100	0	0	8
27	10/17/2012	11/19/2012			< 20	< 100	0	0	7
28	10/17/2012	11/19/2012	runoff ditch		< 20	< 100	0	0	7
29	10/17/2012	11/19/2012	runoff ditch		< 20	< 100	0	53	7
30	10/17/2012	11/19/2012	road		< 20	< 100	0	0	7
31	10/17/2012	11/19/2012	road		< 20	< 100	0	0	7
32	10/17/2012	11/19/2012	lot		< 20	< 100	0	0	7
33	10/17/2012	11/19/2012			< 20	< 100	0	0	8
34	10/17/2012	11/19/2012			< 20	< 100	0	0	8
35	10/17/2012	11/19/2012			< 20	< 100	0	55	7
36	10/17/2012	11/19/2012			< 20	< 100	0	0	8
37	10/17/2012	11/19/2012			< 20	< 100	0	0	7
38	10/17/2012	11/19/2012	road		< 20	< 100	0	0	8
39	10/17/2012	11/19/2012			< 20	< 100	9	0	8
40	10/17/2012	11/19/2012			< 20	< 100	0	0	7

INSTRUMENT	Tennelec[1]		Ludlum 2224 & 43-89[2]		Bicron[3]
IDENTIFICATION	NR007137		275211		EX041002
CALIBRATION DUE	Daily		8/22/2013		8/22/2013
BACKGROUND (cpm)	0.2	2.6	9 to 38	490 to 558	5 to 11 µrem/h
INSTR. EFFICIENCY	30.57%	36.82%	18.2%	18.1%	NA
COUNT TIME	1 min.		1 min		Scan

COMMENTS: MDA = minimum detectable activity
[1]Tennelec (MDA = 15 dpm/100 cm² α and 23 dpm/100 cm² β)
[2]Ludlum 2224 with 43-89 dual alpha beta probe
(MDA 298 - 555 dpm/100 cm² α and 915 - 974 dpm/100 cm² β)
[3]Bicron microrem meter (MDA < 4 µrem/h above background)

SAMPLED BY: E. Sorrels DATE: 11/19/2012
REVIEWED BY: Phil Rutherford DATE: 11/20/2012

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L85 (17 detections from 15 different sample areas, continued)
Information on demolition status not currently available from DTSC

BOEING

RADIATION SURVEY REPORT

FACILITY: Area IV 11th Street
LOCATION: road & lots

LOCATION NUMBER	DATE SAMPLED	DATE MONITORED	PURPOSE: pre-demolition survey LOCATON/OBJECT DESCRIPTION	UNITS LIMITS	Alpha Removable (Net) dpm/100 cm^2 < 20	Beta Removable (Net) dpm/100 cm^2 < 100	Alpha Total (Net) dpm/100 cm^2 < 100 (< 5,000)	Beta Total (Net) dpm/100 cm^2 < 1,000 (< 5,000)	Gamma (Gross) µrem/h < MDA
41	10/17/2012	11/19/2012	road		< 20	< 100	0	0	7
42	10/17/2012	11/19/2012			< 20	< 100	0	66	7
43	10/17/2012	11/19/2012			< 20	< 100	0	0	7
44	10/17/2012	11/19/2012			< 20	< 100	0	0	8
45	10/17/2012	11/19/2012			< 20	< 100	0	144	8
46	10/17/2012	11/19/2012	lot		< 20	< 100	0	110	7
47	10/17/2012	11/19/2012	road		< 20	< 100	0	0	8
48	10/17/2012	11/19/2012			< 20	< 100	0	0	7
49	10/17/2012	11/19/2012			< 20	< 100	9	155	7
50	10/17/2012	11/19/2012			< 20	< 100	0	0	7
51	10/17/2012	11/19/2012			< 20	< 100	0	0	8

Source: “Boeing Demolition Notification for Former Radiological L85 Area (Area IV).” February, 2013. Pages 185-187. http://www.dtsc-ssfl.com/files/lib_rcra_soils/BuildingDemo/buildingdemolition/65921_113161-Notification_of_Planned_Removal,_L85_Area.pdf

About the Authors

Daniel Hirsch is the President of the Committee to Bridge the Gap, a 43-year-old non-profit nuclear policy organization. He is also a Lecturer on Nuclear Policy and on Environmental Policy at the University of California, Santa Cruz. He is a former Director of the Stevenson Program on Nuclear Policy, which was an interdisciplinary research and teaching program on nuclear matters at UCSC. He is a former Energy and Environment Fellow at the Federation of American Scientists in Washington, D.C.

Before teaching at UCSC, he taught at UCLA, where students working with him in 1979 uncovered documents about the partial meltdown at SSFL, the release of which resulted in the first general disclosure to the public about the accident. He has been involved in efforts related to the cleanup of the site ever since. Hirsch co-chaired the SSFL Advisory Panel, which oversaw the work of a team of UCLA epidemiologists studying the impacts of radiation and chemical exposures on the SSFL workers. Since the early 1990s he has served on the SSFL Inter-Agency Work Group which helps coordinate cleanup activities across agencies and keep the public informed of cleanup developments.

Hirsch provided technical assistance to then-Assembly Speaker pro Tem Fred Keeley and his staff in the drafting of what became California's low-level radioactive waste disposal law. He has provided invited testimony on nuclear matters before the U.S. Nuclear Regulatory Commissioners, the U.S. Senate Environment and Public Works, and various Congressional and California Legislative Committees. He was an expert witness in the Tanner Act proceeding regarding radioactive waste disposal at Buttonwillow, and was an expert witness in three Nuclear Regulatory Commission licensing proceedings. One of these dealt with SSFL and a second with a plutonium project transferred from SSFL to Missouri.

Ethan Miska is a research assistant with the Committee to Bridge the Gap.