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PROCESS FOR EVALUATING AND REMEDIATING BURN DUMP SITES

To All Local Enforcement Agencies:

This Local Enforcement Agency (LEA) Advisory covers the process for evaluating and remediating burn dump sites. The purpose of this LEA Advisory is to:

- Provide guidance on the appropriate procedures to follow in evaluating the risks to public health and safety and the environment posed by burn ash dump (burn dump) sites that contain non-Resource Conservation and Recovery Act (RCRA)[1] waste.
- Identify the steps to take to control these risks.
- Describe the roles of other regulatory agencies in burn dump regulation.
- Address burn dump issues raised at the November 1997 Partnership 2000 Conference at Asilomar.

What Is a Burn Dump?

A burn dump is a site where solid waste has been burned at low temperature and the residual burn ash and debris have been landfilled or stockpiled. The burn ash referred to in this document is the residual ash that results from the low temperature combustion of solid waste. Ash from controlled incineration at a permitted facility, such as a waste-to-energy plant, is not included in this advisory.

Burn dumps typically contain little biodegradable organic material because of the combustion of waste materials and the age of the sites. Therefore, typically little or no landfill gas is being generated at burn dump sites.

Burn dumps were phased out in the early 1970s in response to federal and state air quality legislation. Most burn dumps are considered closed sites as their operations ceased prior to the development of regulations addressing the closure of disposal sites, provided that these sites were operated under applicable permits at the time. If these sites were not operated under applicable permits at the time they would be considered illegal disposal sites.

What Are the Problems and Hazards Associated with Burn Dumps?

An increasing number of burn dumps are identified in site assessments conducted by the LEAs and the California Integrated Waste Management Board (IWMB). Laboratory tests of ash from a number of

[1] Hazardous Waste is categorized as either a federal hazardous waste (RCRA hazardous waste) or a California hazardous waste. Wastes that meet or exceed federal RCRA standards are classified as a RCRA hazardous waste. California has additional hazardous waste standards that are more stringent than the federal standards. Wastes that are not a RCRA hazardous waste but meet or exceed the California hazardous waste standards are classified as California hazardous wastes.

burn dump sites show that the burning of nonhazardous household or municipal waste tends to concentrate certain metals to levels that are hazardous under California regulations and, on occasion, federal regulation. The potential threat from burn ash to public health and safety and the environment may be minimal if the sites are located in remote, less populated areas of the state where public contact is limited or nonexistent. However, in heavily developed areas where land is scarce and expensive there is increasing interest in developing burn dump sites. Before a burn dump site is developed the associated health and environmental risks should be addressed through a waste characterization study as described in Attachment 1.

Test results indicate the predominant metals of concern in burn ash (i.e., arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, lead, and zinc) are not readily soluble in water; therefore, not readily leachable into ground water. However, burn ash does pose a risk if it becomes airborne, is eroded into surface water, or comes in contact with skin. The potential routes for human exposure to the contaminants in burn ash are inhalation, ingestion, and direct skin contact. Exposure to contaminants via any of these routes may result in adverse health effects. Attachment 2 briefly describes the adverse health effects of the metals most commonly found in burn ash. Burn dump problems and potential hazards result primarily from:

1. Improper cover contributing to hazardous burn ash becoming airborne and being inhaled by humans or animals.
2. Inadequate erosion protection contributing to transport of hazardous burn ash into surface waters and being ingested by humans and animals.
3. Improper site security allowing human or animal access to areas of hazardous waste and hazards from direct contact, inhalation, and ingestion.
4. Burn dumps not recorded at the local level allowing construction or other improper land use on or adjacent to hazardous burn ash and long term threats to public health and safety and the environment.

Burn Ash Characterization

The main concern when evaluating a burn dump is determining whether or not the burn ash and residues are hazardous. To determine whether or not a burn ash is hazardous a burn ash characterization study (i.e., waste characterization study) is performed. In a waste characterization study burn ash samples are taken and analyzed using a specified sampling methodology and set of test protocols. Each test protocol produces its own specific type of information for a given range of conditions. The waste characterization study is described in Attachment 1.

Who Regulates Burn Dumps?

LEA/IWMB Authority

The authority that allows LEAs and the IWMB to investigate and inspect burn dumps is contained in Public Resources Code (PRC) section 44100. This section states in part that:

> (t)he enforcement agency, in issuing or reviewing any solid waste facilities permit or in connection with any action relating thereto or authorized by this division, may investigate the operation by any person of a ...disposal site...

"Disposal site" is defined in PRC section 40122 which states in part:

> "Disposal site" or "site" includes the place, location, tract of land, area, or premises in use, intended to be used, or which has been used, for the landfill disposal of solid wastes.

Solid waste is defined in PRC section 40191, which states that solid waste does not include hazardous waste or low level radioactive waste regulated under Chapter 7.6 of the Health and Safety Code. When burn ash is classified as a RCRA hazardous waste the IWMB and LEA do not have the authority to, and will not, regulate the site, even if the waste was derived from solid waste. However, when burn ash is classified as a California hazardous waste there are circumstances where the IWMB and LEA may regulate the burn dump site.

The burn ash at most burn dump sites in California meets the criteria to be classified as a California hazardous waste. However, because of the limited solubility of burn ash metals in water, the risk posed by these sites is effectively controlled when a few straightforward precautions are taken. To acknowledge this reduced risk under specified conditions IWMB and Department of Toxic Substances Control (DTSC) jointly developed a streamlined, coordinated regulatory approach for burn dump sites outlined in a memorandum dated March 3, 1995 (Attachment 5). Under this streamlined, coordinated regulatory approach the LEA and IWMB are given the responsibility to regulate burn dump sites, with limited DTSC involvement. Out of four scenarios in this streamlined approach DTSC involvement in required in only the fourth scenario. The approach is described in Attachment 3 and graphically represented in Figures A, B, C, and D.

Also, under some conditions the owner[2] of a burn dump site may request from DTSC a nonhazardous determination or a blanket variance for closure. Under this scenario the IWMB and LEA may replace DTSC as the regulating agency. This is explained in more detail in following sections and attachments.

In the event that the waste characterization study demonstrates that the ash does not meet the criteria for being classified as a California or RCRA hazardous waste, DTSC involvement in any site activity, including removal of ash, would not be necessary. If the waste characterization study demonstrates that the ash contains a non-ash California hazardous waste fraction DTSC should be contacted to determine how to proceed. However, regardless of whether the ash is hazardous or not, the LEA should coordinate with the Regional Water Quality Control Board (RWQCB).

Also, California Code of Regulations, Title 27 (27 CCR) section 21100(d) allows the enforcement agency to apply closure regulations, on an as needed basis, to closed sites not having approved closure plans and to illegal or abandoned disposal sites. Section 21100(d) states that:

> Closed sites for which closure plans were not approved pursuant to §20164 or §21099, and illegal or abandoned disposal sites which pose a threat to public health and safety or the environment shall implement the provisions of these regulations as required by the EA.

DTSC Authority

If burn ash is classified as a RCRA hazardous waste DTSC is the lead agency and regulates the site in accordance with California Code of Regulations, Title 22 (22 CCR). If burn ash is classified as a California hazardous waste DTSC would normally be the lead agency and would regulate the site in

[2] Note that the term "owner" is used throughout this document to refer to the entity(ies) responsible for the burn ash. This term was chosen because most burn dump sites do not have an operator and are closed disposal sites. If the operator of a burn dump site can be identified, the operator is included in the processes described in this LEA Advisory.

accordance with 22 CCR. However, as discussed above, under some circumstances the authority to regulate burn dump sites is given to the LEA and IWMB.

Regional Water Quality Control Board Authority

The RWQCB has authority to regulate burn dumps regardless of whether the waste has been determined to be hazardous or non-hazardous. Regulations that the RWQCB use to govern burn dump sites are contained in 27 CCR.

Proposed Changes to Hazardous Waste Regulations

Currently, DTSC is proposing changes to 22 CCR through a process termed the "Regulatory Structure Update" (RSU). Where most hazardous wastes are now subject to the same management standards DTSC is proposing to create two hazardous waste tiers based on risk, fully regulated hazardous waste and special waste. The first tier is for the higher risk waste streams, which are fully regulated hazardous wastes. This tier is subject to all hazardous waste regulatory requirements. These Tier 1 wastes would be regulated in the same way all hazardous waste is currently regulated in California. The second lower-risk tier would be special wastes. Tier 2 will be a more comprehensively defined waste category that includes a broader range of wastes. These Tier 2 wastes are lower-risk wastes than those in Tier 1 and have fewer regulatory requirements. Although special wastes would have fewer requirements there would be no reduction in protection of public health and safety and the environment. One possible result of DTSC's RSU on the regulation of burn dump sites may be that some of these sites will fall into a lower category of risk; therefore, regulated at a lower level. Once DTSC completes the RSU process this advisory will be reviewed to determine if a revised/updated advisory is necessary.

What Procedures Should Be Followed to Regulate Burn Dumps?

Since most burn dumps can be classified as closed, illegal, or abandoned sites their identification and initial assessment should be accomplished using the Site Identification Process (SIP) or similar procedure. The guidance for the SIP is contained in LEA Advisory Numbers 3 and 9. The assessment in the SIP would determine whether there is an imminent threat to the environment or public health and safety. It is important that at a minimum the investigator evaluates the following:

1. Degree of burn ash exposure.
2. Adequacy of erosion control.
3. Site security including fencing and signage.
4. Whether the condition of the property is recorded showing the location of the burn dump, possible hazardous constituents present, excluded postclosure land uses (PCLU), and procedures for the development of the property for excluded land uses.

Additional areas of concern might include burning waste and underground fires.

Once this initial assessment has been completed, refer to Attachment 3 to determine the appropriate procedure to follow for the specific site. These procedures are intended to provide guidance for properly remediating burn dump sites.

Because site conditions will vary, some or part of the procedures or the level of detail may not be applicable in all cases. For example, in rural areas where there may be fewer sensitive receptors and a lower risk to human health and safety a less rigorous waste characterization may be appropriate. In urban

areas, because of the higher concentration of sensitive receptors and higher human health and safety risks, a more rigorous waste characterization may be necessary. **However, it is important that coordination occurs between all regulatory agencies to assure that the appropriate mitigation measures are implemented.**

If you should have any questions regarding the regulation of burn dumps please contact the Remediation, Closure and Technical Services Branch staff person assigned to assist your jurisdiction.

Sincerely,

Julie Nauman, Acting Deputy Director
Permitting and Enforcement Division

Attachments

Back copies of LEA Advisories can be obtained by calling (916) 255-2298 or visiting the CIWMB's LEA Central Web site at http://www.ciwmb.ca.gov/pe/advisory. Following is a list of the 10 most recent advisories.

LEA Advisory #55, October 22, 1998, *Alternative Frequencies for Daily Cover and Explosive Gas Monitoring for Small Municipal Solid Waste Landfills*, Pub. #231-98-018

LEA Advisory #54, October 22, 1998, *1998 Inspection Guidance for Solid Waste Landfills* (Replaces Advisory #20), Pub. #231-98-016

LEA Advisory #53, August 12, 1998, *Impact of AB 1220 on Solid Waste Facility Permit Conditions*, Pub. #231-98-014

LEA Advisory #52, August 5, 1998, *Procedures for Processing Solid Waste Facility Permits Upon Determinations of No Change During Permit Reviews*, Pub. #231-98-012

LEA Advisory #51, July 22, 1998, *Disposal Site Postclosure Land Use*, Pub. #231-98-011

LEA Advisory #50, July 10, 1998, *Waste Diversion Activities at Solid Waste Landfills and Closed or Closing Disposal Sites*, Pub. #231-98-010

LEA Advisory #49, March 12, 1998, *Implementation of Permanent Regulations for Storage and Chipping and Grinding Activities*, Pub. #231-98-005

LEA Advisory #48 Amendment, March 2, 1998, *Disposal Site Daily and Intermediate Cover Regulations*, Pub. #231-98-004

LEA Advisory #9, January 30, 1998, *Revised Solid Waste Ranking System User's Guide*, Pub. #231-98-003

LEA Advisory #48, December 10, 1997, *Disposal Site Daily and Intermediate Cover Regulations* (Replaces Advisories #10 and #19), Pub. # 232-97-023

Attachment 1

CHARACTERIZING BURN DUMPS IN CALIFORNIA

Background

Based on several burn dump investigations California Integrated Waste Management Board (IWMB) staff have determined that there may be elevated levels or hazardous levels of arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, and zinc in the soil/ash. Also, low levels of total recoverable petroleum hydrocarbons and/or low to nondetectable levels of semivolatile organic compounds, polychlorinated biphenyls (PCB), dioxins, and furans may be present in burn ash. The pH in the burn ash is expected to range from 6.0 to 9.0. When waste characterization of a burn dump is necessary an investigation must be performed to delineate the nature and extent of the waste and to determine if the burn ash is a Resource Conservation and Recovery Act (RCRA) hazardous waste, a non-RCRA hazardous waste (designated California hazardous waste), or a nonhazardous solid waste. Once the waste classification is established, the appropriate and effective remediation measures can be determined. To accomplish this objective the burn ash should be sampled and analyzed using one or more of the testing protocols describe below.

The IWMB's Solid Waste Cleanup Program (SWCP) has developed a waste characterization methodology and actively evaluated burn dumps throughout California. The SWCP considers a variety of factors in assessing burn dumps and recommends the following procedures for the waste characterization. The components of the waste characterization include:

1. Developing a sampling plan.
2. Performing discrete sampling following a recommended sampling procedure.
3. Analyzing samples using recommended analytical procedures and testing methodologies.
4. Comparing sampling results with regulatory limits.

The use of SWCP's waste characterization methodology is only a recommendation. Depending on site conditions other city, county, State, or federal agencies may require additional sampling, analyses, and assessments.

Waste Characterization Methodology

Sampling Plan

A sampling plan is necessary to document the procedural and analytical requirements to collect soil samples to characterize areas of potential contamination from a burn dump. The intent of the plan is to provide the necessary documentation to characterize the burn dump ash. At a minimum the plan should discuss: site location and background, project purpose, project tasks, methodology, equipment, sampling procedures and locations, decontamination, sample containers and preservation, disposal of residual materials, analyses of concern, analytical procedures, quality control, chain of custody, and health and safety issues. The number of samples will vary depending on the size, location, and site conditions.

Sampling Methodology

The SWCP staff use authoritative discrete sampling to assess the burn ash and surrounding soils. Authoritative sampling is based on the subjective judgement of the investigator regarding the location of potential contamination and serves as a valuable investigative tool in ascertaining if a hazardous substance is or is not present.

Sampling Procedures

The SWCP uses appropriate sampling, collecting, decontamination, and storage techniques. All environmental samples are sent to a state-certified hazardous waste laboratory for analyses using chain-of-custody protocols.

Testing Protocols

In a waste characterization study burn ash samples are analyzed using one or more test protocols. Each test protocol produces its own specific type of information for a given range of conditions.

Four test protocols that are widely used are:

Protocol 1: Totals Test. The "totals test" is a chemical digestion test developed by the Department of Toxic Substances Control (DTSC) to determine the total amount of a specific constituent in the soil. A sample is digested chemically to obtain its soluble and insoluble fractions. The total of the soluble and insoluble fractions of the sample is then compared to the total threshold limit concentration (TTLC). The results of the Totals Test are reported in milligrams per kilogram of sample (mg/kg).

Protocol 2: Waste Extraction Test (WET). The WET is a leaching test developed by DTSC. Results of the WET are compared to the Soluble Threshold Limit Concentration (STLC). The WET determines the amount of a specific constituent that can be leached from the soil using a solution designed to simulate landfill leaching. It is therefore a useful test for situations where a soil would be exposed to landfill leachate, such as disposal of ash together with uncombusted organic wastes in a solid waste landfill. However, the WET may not be very representative of the conditions at a site where all organic material has been completely burned. Because of the aggressive nature of the leaching in this test samples may exceed the STLC. The results of the WET are reported in milligrams per liter (mg/l).

Protocol 3: Toxicity Characteristic Leaching Procedure (TCLP). The TCLP was developed by the federal Environmental Protection Agency (U.S. EPA) to determine if a waste is a RCRA waste subject to regulation under Subtitle C. The TCLP is a leaching procedure that uses a slightly less aggressive leaching agent than is used by the WET. The TCLP ensures that any volatile constituents present in the sample are collected and measured. However, few volatile constituents are likely to be found in completely combusted burn ash. Therefore, when compared to the WET results it is likely that TCLP results will indicate lower metals concentrations and less elevated levels of volatile constituents. Chromium is one of the few constituents that may be present in higher concentrations in TCLP results than in WET results. Chromium concentrations are higher because the TCLP results do not differentiate between the 3+ and 6+ chrome species, but report the two species combined. In contrast, the WET reports the 3+ and 6+ species separately. The results of the TCLP are reported in milligrams per liter (mg/l). Temperatures reached during open burning are usually not high enough to completely combust all waste materials in the burn ash. Therefore, in a worst case situation, incomplete combustion may create dioxins and other organic compounds.

Protocol 4: Deionized Water Waste Extraction Test (DI WET). The DI WET is used to characterize the amount of metals that would leach from ash under the conditions most likely to be encountered at burn dump sites. This test is essentially the same test as the WET, but uses deionized water as the

leaching agent. At most burn dump sites the primary liquid that will come in contact with burn ash is water, not landfill leachate. Results of tests done on samples of burn ash from a variety of burn dump sites indicate that very few samples release any metals when tested under the DI WET protocol.

Analytical Procedures

Typically, all samples are analyzed for California Assessment Manual (CAM) 17 metals using the Totals Test procedure by EPA Method 6010/7000 and pH by EPA Method 9040. Samples (i.e., at least three) with the highest concentration of lead based on the Totals Test are also analyzed for CAM-5 metals using the WET procedure and RCRA Eight Metals using the TCLP. Also, if the WET results for any other metal not in the CAM-5 analysis exceeds 10 times the STLC regulatory level a separate WET analysis for that metal must be performed. In addition, the IWMB use the highest lead samples and analyze again for lead using the DI WET extraction procedure. Sampling for PCBs, total recoverable petroleum hydrocarbons (TRPH), and semi-volatile organic compounds may be necessary if visual observation or records indicate possible contamination.

At minimum the SWCP staff recommends all soil/ash samples be analyzed for:

- *CAM 17 Metals (Sb, As, Ba, Be, Ce, Cr, Co, Cu, Pb, Hg, Mo, Ni, Se, Ag, Tl, V, Zn) Totals Test, EPA Method 6010/7471*
- *pH, EPA Method 9040*

And the three samples containing the highest lead be analyzed for:

- *CAM 5 Metals (Cd, Cr, Ni, Pb, Zn), WET, EPA Method 6010*
- *TCLP RCRA Metals (Ag, As, Ba, Cd, Cr, Hg, Pb, Se), EPA Method 1311*

Additionally, the LEA may request the following sampling procedures:

- *PCBs, EPA Method 8080*
- *Total Recoverable Petroleum Hydrocarbons (TRPH), EPA Method 418.1*
- *Semi-Volatile Organic Compounds, EPA Method 8270*
- *Lead DI-WET, WET, EPA Method 6010*

In addition, testing for dioxins and furans may be appropriate if evidence suggests that these constituents would likely be present from the type of waste combusted, and/or the site is located in an urban area with a number of sensitive receptors nearby and where there is a higher risk to human health and safety.

Regulatory Limits

To characterize the ash, SWCP staff use regulatory limits established from the California Code of Regulations, Title 22, section 66261.10 et seq. and the Code of Federal Regulations, Title 40, Section 261.24. The sample results are compared to the TTLC and STLC, and the federal RCRA Standards. This comparison provides the basis for classifying the burn ash as either a RCRA hazardous waste, a non-RCRA hazardous waste (designated California hazardous waste), or a non-hazardous solid waste. Burn ash that contains concentrations of metals that exceed the TTLC or STLC limits, or established health based levels that the DTSC has determined to be protective of human health and the environment, may be considered hazardous waste as defined in Title 14, California Code of Regulations, section 17225.32. In addition, wastes that exceed the TCLP concentration limits would be considered a RCRA hazardous waste.

Examples of Burn Ash Analytical Test Results in California

Table 1 shows the highest concentrations from the totals test data of nine common metals found in ash sampled at 12 sites throughout California. These numbers represent the total amount of certain metals that are present in the soil. These results show that ash commonly contains lead in excess of the California standard for hazardous waste, with nickel and zinc also found at elevated levels. Some of the tested sites also showed elevated levels of arsenic and chromium.

Table 2 compares the results of testing of a single sample using the Totals Test, WET, TCLP, and DI WET test protocols. Samples tested under the Totals Test protocol that exceed the TTLC hazardous threshold for lead also will likely exceed the STLC hazardous threshold for lead. However, a sample tested under the TCLP protocol, with its less aggressive leaching agent, will probably not exceed the hazardous threshold concentration associated with the TCLP test. If the sample is tested under the DI WET protocol the sample again probably will not exceed the STLC hazardous threshold concentration limits.

Table 1

Summary of Highest Totals Test Values of Selected Metals at Burn Dump Sites within California Compared to TTLC Limits

(Concentrations in excess of DTSC hazardous waste levels shown in bold italics)

(NA = Not Available; ND = Non Detected)

Site Name	**As (mg/kg)**	**Be (mg/kg)**	**Cd (mg/kg)**	**Cu (mg/kg)**	**Cr (mg/kg)**	**Hg (mg/kg)**	**Ni (mg/kg)**	**Pb (mg/kg)**	**Zn (mg/kg)**
Amador City Burn Dump	220	0.77	7.9	1260	101	1.2	102	***2180***	2240
Davenport Burn Dump	18	0.41	24	502	81	1.42	104	***1310***	1970
Drum Canyon Burn Dump	204	***240***	22	670	53	3.6	81	***2830***	2620
(Old)Grass Valley Burn Dump	16		19		2300	ND	***2100***	***4900***	200
Humboldt Road Disposal Site	NA		NA		NA	NA	NA	***4920***	NA
Los Banos Bottle Dump/Mercey Springs Road Burn Dump Site	19.6		7.8		96.8	NA	NA	***3750***	2200
Morro Bay Burn Dump	14	0.73	16	504	115	0.20	217	***6080***	1790
Mountain Meadows Illegal Disposal Site	17.5		3.9		85.6	1.5	83.7	***1110***	3320
Nevada City Burn Dump (A)	NA		12		73	NA	20	***2200***	***5500***
Nevada City Burn Dump (B)	ND		11.1		7.08	0.61	39.9	***1904***	3040
Tehachapi Burn Dump #2	7.1		NA		26.9	<0.1	11.9	16.7	NA
Wilder Ranch Burn Dump	***1420***	0.32	12.0	496	96	0.09	196	779	***5410***
Hazardous Waste Level TTLC	**500**	**75**	**75**	**2500**	**2500**	**20**	**2000**	**1000**	**5000**

Table 1 References:

Amador City Burn Dump—IWMB, Project Specifications for the Amador County Burn Dump, 2136 Cleanup Program, August 1997

Davenport Burn Dump—IWMB, Sampling Report for the Davenport Burn Dump, July 1998

Drum Canyon Burn Dump—IWMB, Site Investigation Report for the Santa Barbara Illegal Disposal Sites, 2136 Cleanup Program, May 27, 1997

(Old) Grass Valley Burn Dump—Analytical testing Old Grass Valley Burn Dump, Vector Engineering, December 17, 1991

Humboldt Road Disposal Site—Remedial Action Strategy Plan, Metcalf & Eddy, October 1993

Los Banos Bottle Dump—Table 3, Removal Plan, Mercey Springs Road Burn Dump Site, Kleinfelder, October 22, 1993

Morro Bay Burn Dump—IWMB, Sampling Memorandum for Morro Bay Burn Dump, San Luis Obispo County, 2136 Cleanup Program, June 5, 1997

Mountain Meadows Illegal Disposal Site—IWMB, Site Investigation Report, Mountain Meadows Illegal Disposal Site, 2136 Cleanup Program, September 26, 1995

Nevada City Burn Dump (A)—IWMB, Site Investigation Report, Nevada City Burn Dump, 2136 Cleanup Program, June 20, 1995

Nevada City Burn Dump (B)—BAS Soil Sampling Results, Nevada City Burn Dump, Nevada County, 2136 Cleanup Program, October 20, 1994

Proposed Management Standards for Special Waste (Regulatory Structure Update)—DTSC, Hazardous Waste Management Program, May 5, 1998

Tehachapi Burn Dump #2—IWMB, Site Investigation Report, Tehachapi Burn Dump #2, 2136 Cleanup Program, June 30, 1995

Wilder Ranch Burn Dump—IWMB, Sampling Report for the Wilder Ranch Burn Dump, July 1998

Attachment 2

HEALTH EFFECTS OF SEVEN METALS COMMONLY FOUND IN BURN ASH[1]

Arsenic (As)

Arsenic is listed by the Environmental Protection Agency (EPA) as one of 129 priority pollutants. Arsenic is also listed among the 25 hazardous substances thought to pose the most significant potential threat to human health at priority superfund sites.

Potential Hazards to Fish, Wildlife, and Other Non-Human Biota: Plants can take up arsenic in a variety of ways, including from fly ash, sludge, and by manure dumped on the land. However, it has been found that the edible portions of plants grown on contaminated sources seldom accumulate dangerous levels of arsenic. Animals are generally less sensitive to arsenic than plants. Arsenic is one of the most toxic elements to fish.

Potential Hazards to Humans: Arsenic has long been a concern to man because small amounts can be toxic to humans. Relatively high doses of arsenic have been reported to cause bone marrow suppression in humans. Inorganic arsenic in high amounts has been known for centuries as a fast acting human poison.

Brief Summary of Carcinogenicity/Cancer Information: Arsenic is often thought of as a carcinogenic priority pollutant. Recent reviews indicate arsenic has been implicated in numerous types of cancer, including skin, bladder, kidney, liver, prostate, and nasal cavity.

Brief Summary of Developmental, Reproductive, Endocrine, and Genotoxicity Information: Recent reviews indicate arsenic has been associated with genotoxic, fetotoxic, mutagenic, and teratogenic impacts. Arsenic does not seem to directly impact DNA but may inhibit some DNA repair.

Beryllium (Be)

Beryllium is listed by the EPA as one of 129 priority pollutants, and is considered one of the 14 most noxious heavy metals.

General Hazard/Toxicity Summary: All beryllium compounds are potentially harmful or toxic. However, the probability of beryllium occurring at significantly toxic levels in ambient natural waters is minimal.

Potential Hazards to Fish, Wildlife, and Other Non-Human Biota: In those cases in which it is elevated in water beryllium is extremely toxic to warm water fish in soft water.

Potential Effects of Beryllium Upon Humans: Human impacts of beryllium include severe lung inflammation. Acute exposure to high concentrations of the more soluble compounds of beryllium can cause chemical pneumonitis, the symptoms of which include cough, substernal burning, shortness of breath, anorexia, and increasing fatigue.

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[1] Information in Attachment 2 was compiled from the following document taken from web site address: www.aqd.nps.gov/toxic/list.html: *Environmental Contaminants Encyclopedia*, July 1, 1997, Roy J. Irwin, National Park Service

Brief Summary of Carcinogenicity/Cancer Information: Beryllium is a Class B2 carcinogen, (i.e., a probable human carcinogen). Beryllium has been shown to induce lung cancer via inhalation in rats and monkeys and to induce osteosarcomas in rabbits.

Brief Summary of Developmental, Reproductive, Endocrine and Genotoxicity Information: Beryllium has been shown to be teratogenic in snails, and to cause developmental problems in salamanders. Impacts on humans are unknown.

Cadmium (Cd)

Cadmium is listed by the EPA as one of 129 priority pollutants. Cadmium is also listed among the 25 hazardous substances thought to pose the most significant potential threat to human health at priority superfund sites.

General Hazard/Toxicity Summary: Cadmium ions are extremely poisonous; their action is similar to those of mercury. Cadmium acts as a cumulative poison. All cadmium compounds are potentially harmful or toxic.

Potential Hazards to Fish, Wildlife, and Other Non-Human Biota: Cadmium is very toxic to a variety of species of fish and wildlife. Cadmium causes behavior, growth, and physiological problems in aquatic life at sublethal concentrations. Cadmium is the only metal that clearly accumulates with increasing age of the animal, and the kidneys are the preferred site of cadmium accumulation.

Potential Effects of Cadmium Upon Humans: All cadmium compounds are potentially harmful or toxic. It has been implicated as a cause of human deaths. Kidney and/or liver damage have followed respiratory exposures in industry. Inhalation of cadmium dusts, salts, and fumes over a number of years can cause kidney and bone marrow diseases and emphysema.

Brief Summary of Carcinogenicity/Cancer Information: Cadmium is listed by EPA as a Class B1 carcinogen (i.e., a probable human carcinogen by inhalation).

Brief Summary of Developmental, Reproductive, Endocrine and Genotoxicity Information: Cadmium is listed as having some endocrine disruptive activities. Cadmium has been shown to cause birth defects in mammals.

Chromium, General (Cr)

Chromium (Cr) is listed by the EPA as one of 129 priority pollutants. Chromium is considered one of the 14 most noxious heavy metals. Chromium is also listed among the 25 hazardous substances thought to pose the most significant potential threat to human health at priority superfund sites.

General Hazard/Toxicity Summary: The EPA regards all chromium compounds as toxic. Hexavalent chromium causes cellular damage via its role as a strong oxidizing agent, whereas trivalent chromium can inhibit various enzyme systems or react with organic molecules.

Potential Hazards to Fish, Wildlife, and Other Non-Human Biota: In plants chromium interferes with uptake translocation and accumulation by plant tops of calcium, potassium, magnesium, phosphorus, boron, copper, and aggravates iron deficiency chlorosis by interfering with iron metabolism. In mammalian species chromium is considered one of the least toxic trace elements, as normal stomach pH converts hexavalent chromium to trivalent chromium.

Potential Hazards to Humans: Hexavalent chromium is associated with cancer risk and kidney damage. Certain hexavalent chromium compounds when administered via inhalation at high doses have the

potential to induce lung tumors in humans and experimental animals. However, at low levels of exposure hexavalent chromium ions are reduced in humans bodily.

Brief Summary of Carcinogenicity/Cancer Information: Chromium in general is listed by EPA as a Class A human carcinogen. Some salts of chromium are carcinogenic and humans exposed to chromium fumes have an increased risk for lung cancer.

Brief Summary of Developmental, Reproductive, Endocrine, and Genotoxicity Information: Hexavalent chromium is associated with cancer risk and kidney damage, and may cause damage to DNA and many other tissue structures.

Copper (Cu)

Copper is listed by the EPA as one of 129 priority pollutants.

General Hazard/Toxicity Summary: Although copper in water is a hazard to many aquatic organisms minute amounts of copper in the diet are needed for human, plant, and animal enzymes.

Potential Hazards to Fish, Wildlife, and Other Non-Human Biota: Elevated concentrations of copper in water are particularly toxic to many species of algae, bacilli, fungi, crustaceans, annelids, cyprinids, and salmonids. Most adult fish are able to tolerate relatively high concentrations of copper for short periods of time. The critical effect of copper is its greater toxicity to younger fish.

Potential Hazards to Humans: Copper poisoning or deficiency problems are rare in humans.

Brief Summary of Carcinogenicity/Cancer Information: Copper is not classifiable as to human carcinogenicity. There is inadequate animal carcinogenicity data on copper.

Brief Summary of Developmental, Reproductive, Endocrine, and Genotoxicity Information*:* Reproductive effects on animals are noted at low levels of copper. Incubation of human spermatozoa with metallic copper is found to bring about a significant fall in the percentage of motile sperm in humans.

Lead (Pb)

Lead is listed by the EPA as one of 129 priority pollutants. Lead is also listed among the 25 hazardous substances thought to pose the most significant potential threat to human health at priority superfund sites.

General Hazard/Toxicity Summary: All measured effects of lead on living organisms are adverse, including those related to survival, growth, learning, reproduction, development, behavior, and metabolism.

Potential Hazards to Fish, Wildlife, and Other Non-Human Biota: Lead is a heavy metal that is very toxic to aquatic organisms, especially fish. In fish lead deposits in active calcification areas such as scales, fin rays, vertebrae, and opercula. In vertebrates sublethal lead poisoning is characterized by neurological problems, kidney dysfunction, enzyme inhibition, and anemia.

Potential Hazards to Humans*:* Lead poisoning is particularly dangerous in young children (who may ingest lead by eating lead-containing chips of paint); it may result in anorexia and--in severe cases--permanent brain damage. Women in the workplace are more likely to experience adverse effects from lead exposure than men because their hematopoietic system is more lead sensitive than men's.

Brief Summary of Carcinogenicity/Cancer Information: Lead is listed by EPA as a Class B2 carcinogen. There is sufficient evidence to be classed as an animal carcinogen.

Brief Summary of Developmental, Reproductive, Endocrine, and Genotoxicity Information: Adverse effects of lead on living organisms include those negatively affecting reproduction and development. Effects of sublethal concentrations of lead include delayed embryonic development, suppressed reproduction, inhibition of growth, and fin erosion.

Mercury (Hg)

Mercury is listed by the EPA as one of 129 priority pollutants.

General Hazard/Toxicity Summary: Major sources to atmosphere include incineration of municipal waste, landfills, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) sites, sewage sludge burning, and medical waste incinerators.

Potential Hazards to Fish, Wildlife, Invertebrates, Plants, and Other Non-Human Biota: Mercury is one of the few metals which strongly bioconcentrates and biomagnifies and has only harmful effects with no useful physiological functions when present in fish and wildlife. The most sensitive target of low-level exposure to metallic or organic mercury following short- or long-term exposures appear to be the nervous system. The most sensitive target of low-level exposure to inorganic mercury appears to be the kidneys.

Potential Hazards to Humans: Human exposure to methyl mercury is almost entirely due to consumption of fish. Potential impacts to human health are real and potentially great. Mercury deposits in human kidneys may lead to renal failure. Children and persons with a history of allergies or known sensitization to mercury, chronic respiratory disease, nervous system disorders, or kidney disorders are at increased risk to mercury poisoning. Many mercury compounds are irritating to skin and may produce dermatitis with or without vesication. Contact with eyes cause ulceration of conjunctiva and cornea. Mercury deposits in the brain cause many disorders and sometimes dementia in humans.

Brief Summary of Carcinogenicity/Cancer Information: Mercury is not classifiable as to human carcinogenicity, based on inadequate human and animal data.

Brief Summary of Developmental, Reproductive, Endocrine, and Genotoxicity Information: Methyl mercury can denature DNA and can otherwise interact with both DNA and RNA to alter their structures.

Nickel (Ni)

Nickel is listed by the EPA as one of 129 priority pollutants, and is considered to be one of the 14 most noxious heavy metals. Nickel is also listed among the 25 hazardous substances thought to pose the most significant potential threat to human health at priority superfund sites.

General Hazard/Toxicity Summary: Low absorption from the GI tract causes nickel compounds to be essentially nontoxic after ingestion.

Potential Hazards to Fish, Wildlife, Invertebrates, Plants, or Other Non-Human Biota: Mixtures of nickel, copper, and zinc produced additive toxicity effects on rainbow trout.

Potential Hazards to Humans: Nickel is toxic to humans as a dust or powder. The organs that are affected by exposure to nickel, metal, and soluble compounds (as Ni) are nasal cavities, lungs, and skin.

Brief Summary of Carcinogenicity/Cancer Information: Nickel, in general, is not considered a carcinogen.

Brief Summary of Developmental, Reproductive, Endocrine, and Genotoxicity Information: Study results indicate that nickel is a developmental toxicant in animals, but it is not known whether occupational or environmental exposure to nickel could result in developmental effects in humans.

Zinc (Zn)

Zinc is listed by the EPA as one of 129 priority pollutants.

General Hazard/Toxicity Summary: Zinc in low to moderate amounts is of very low toxicity in its ordinary compounds and in low concentrations is an essential element in plant and animal life.

Potential Hazards to Fish, Wildlife, Invertebrates, Plants, or Other Non-Human Biota: Elevated concentrations of zinc in water are particularly toxic to many species of algae, crustaceans, and salmonids. In mammals excess zinc can cause copper deficiencies, affect iron metabolism, and interact with the chemical dynamics of lead and drugs.

Potential Hazards to Humans: In humans, prolonged excessive dietary intake of zinc can lead to deficiencies in iron and copper, nausea, vomiting, fever, headache, tiredness, and abdominal pain. Zinc is a human skin irritant.

Brief Summary of Carcinogenicity/Cancer Information: There are no reports on the possible carcinogenicity of zinc and compounds per se in humans.

Brief Summary of Developmental, Reproductive, Endocrine, and Genotoxicity Information: The risk associated with maternal ingestion of large amounts of zinc in human pregnancy is unknown.

Attachment 3

PROCEDURES TO FOLLOW WHEN REMEDIATING BURN DUMPS

The four scenarios that will typically be encountered when regulating burn dumps are:

1. Minimal action required.
2. Leave burn ash in place and cap.
3. Consolidate burn ash on site or on another adjacent parcel that already contains burn ash and cap.
4. Clean closure of the burn dump site.

Scenario 1, Minimal Action Required

(Refer to Figure A, "Leave Ash in Place with Minimal Action Required")

Under this scenario a determination is made through the Site Investigation Process (SIP) that at the site in question there is no exposed burn ash, no proposed postclosure land use (PCLU), and that the current land use does not pose an immediate threat to public health and safety and the environment. If the site is located in an area that is accessible to the public the owner may be required to fence and post the site to limit access and to warn the public that a burn dump is present. For sites that fit this scenario there would likely be no other mitigation measures or actions proposed for managing the burn ash at the site. The procedure shown on Figure A would then be followed.

Generally, waste characterization will not be required for sites under this scenario because there are no proposed actions at the site. In the future, if site conditions were to change (e.g., erosion of the cover or PCLU), waste characterization may be warranted.

The primary concerns for sites that fit this scenario are changes in site conditions that might pose a threat to public health and safety and the environment or changes in land use. The following actions can be taken to identify and minimize the risk of such changes:

- A determination should be made of whether erosion control is needed to protect the cover at the site.
- If it has not already been done the Local Enforcement Agency (LEA) should determine whether the owner should provide site security and limit public access by fencing the site and posting a sign warning the public that a burn dump is present. This determination should be based on current relative risk to human health and safety and the environment (e.g., increase in adjacent population).
- The owner should be notified in writing by the LEA that future development of the property will be subject to the PCLU requirements contained in California Code of
- Regulations, Title 27 (27 CCR), section 21190 and that any proposed change in land use must be approved by the appropriate regulatory agencies.
- A deed notification or restriction should be placed on the title of the property to limit the types of PCLU that are allowed on the site and to also notify the appropriate agencies when a PCLU is being proposed for construction on the site. A deed restriction will also notify prospective buyers that the property contains a burn dump and the buyer will assume all responsibility for managing it should they purchase the property. Lastly, it would require that the owner notify the LEA of changes in ownership. The procedure to follow in recording a typical deed restriction for a burn dump is contained in Attachment 4.

Scenario 2, Leave Burn Ash in Place and Cap

(Refer to Figure B, "Leave Ash in Place and Cap")

Under this scenario it has been determined through the SIP process that there is exposed burn ash or potential exposure of burn ash at the site in question but no proposed PCLU. The primary human health threat associated with burn dump sites under this scenario is exposure through direct contact with the burn ash or exposure to windblown particulates that have been contaminated with burn ash. Therefore, the best mitigation might be to simply cap the exposed burn ash. The procedure shown on Figure B should be followed to mitigate the sites that fit this scenario.

The first step under this scenario is to determine whether the site poses an immediate threat to public health and safety and the environment. To determine the immediate threat to public health and safety and the environment the owner is required to perform waste characterization on the burn ash material. To ensure a proper waste characterization the owner should submit a waste characterization workplan to the LEA for approval. Waste characterization is necessary to define the limits of the waste and to determine whether the waste is hazardous. This information will ensure that all exposed burn ash is properly capped and that appropriate measures are incorporated into the site health and safety plan and properly implemented during the capping activities.

A waste characterization of the burn ash will likely show that it is a hazardous waste and would therefore be subject to the hazardous waste regulations and Department of Toxic Substances Control (DTSC) oversight and approval. However, in a memorandum dated March 3, 1995, DTSC states that if there is no active management of the burn ash material (i.e., the burn ash will be left in place and capped) the "...regulations regarding the management of hazardous waste do not apply". In other words, DTSC does not require that the owner of the burn dump site obtain DTSC approval of on-site activities to consolidate and cover the ash, nor is the owner required to obtain a DTSC variance in order for the LEA to oversee these capping activities.

It should be noted that even though DTSC has made the policy decision that the burn ash does not need to be managed as a hazardous waste under this scenario, the LEA must still make the necessary notifications as required under the Safe Drinking Water & Toxic Enforcement Act of 1986 (Proposition 65), Health and Safety Code sections 25249.5 et. seq.

In the event that the analyses show that the burn ash cannot be classified as a hazardous waste DTSC coordination would not be necessary. Regardless of whether the waste is hazardous or not, the LEA should coordinate with the Regional Water Quality Control Board (RWQCB).

After the burn dump site is capped (e.g., covered with two feet of compacted earthen material) the owner should provide site security (e.g., fencing and posting the area where burn ash remains). This will limit public access to the site.

Next, a deed notification or restriction should be placed on the title of the property to limit the types of PCLU that can be constructed on the site and to also notify the appropriate agencies when a PCLU is being proposed for construction on the site. It will also notify any prospective buyers that the property contains a burn dump and the buyer will assume all responsibility for managing it should they purchase the property. Lastly, it would require that the owner notify the LEA of changes in ownership. The procedure to follow in recording a typical deed restriction for a burn dump is contained in Attachment 4.

Lastly, the LEA should notify DTSC of the location and actions taken at the burn dump site and should also continue to monitor the site for illegal dumping, PCLU, or erosion of the cap.

Scenario 3, Consolidate Burn Ash on Site or on a Contiguous Parcel That Already Contains Burn Ash

(Refer to Figure C, "Consolidate Ash, Either On Site or on a Contiguous Parcel that Already Contains Ash")

Under this scenario there are multiple burn dump sites on one property or the burn ash is shallow and spread over a large area. There may or may not be exposed burn ash on the site. There is no existing or proposed PCLU that would pose a threat to public health and safety and environment. Under these conditions one possible mitigation would be to consolidate these sites into fewer sites or even one site.

The primary human health threat associated with burn dump sites is exposure through direct contact with the burn ash or exposure to windblown particulates that have been contaminated with burn ash. Therefore, appropriate health and safety measures should be implemented during excavation and movement of the burn ash material. If the owner does not want to develop the property the site can be remediated in place and maintained by the owner. The procedure shown on Figure C should be followed.

Because the burn ash will be excavated and moved under this scenario a waste characterization is necessary to define the limits of the waste and to determine whether the waste is hazardous. This information will ensure that 1) all exposed burn ash is identified and properly capped, and 2) appropriate measures are incorporated into the site health and safety plan and are properly implemented.

A waste characterization of the burn ash will likely show that it is a hazardous waste. However, as long as the burn ash material is only moved and consolidated on site or onto a contiguous pre-contaminated parcel DTSC would not consider this active management of hazardous waste. Therefore, the hazardous waste regulations would not apply under this scenario and the LEA could use 27 CCR regulations to regulate these sites. As stated previously in Scenario 2 the LEA must still make the necessary notifications as required under Proposition 65.

Since excavation of the burn ash will occur during the consolidation of the burn dump sites, the excavation activities should follow guidance contained in LEA Advisory Number 26, Excavation Permit.

Lastly, the purpose of consolidation of one or more burn dumps is clean closure of the portions of the site from which burn ash is removed. Therefore, guidance contained in LEA Advisory Number 16, Clean Closure, is recommended to be followed to ensure that the clean closure is complete and documented.

Once the consolidation activities are complete the burn ash can be covered with at least two feet of earthen material and graded to drain. If the finished grades are relatively steep the owner should provide erosion protection. In many cases more than two feet of cover material are necessary. The owner should also provide confirmation sampling of the "clean closed" areas to verify all burn ash materials have been removed.

After the burn ash is capped the owner should provide site security to limit public access (e.g., fencing and posting the area where burn ash remains).

Next, a deed notification or restriction should be placed on the title of the property to limit the types of PCLU that can be constructed on the site and to also notify the appropriate agencies when a PCLU is being proposed for construction on the site. The deed notification or restriction will also notify any prospective buyers that the property contains a burn dump and the buyer will assume all responsibility for managing it should they purchase the property. It would require that the owner notify the LEA of changes in ownership. The procedure to follow in recording a typical deed restriction for a burn dump is contained in Attachment 4.

Lastly, the LEA should notify DTSC of the location and actions taken at the site and they should also continue to monitor the site for illegal dumping, PCLU, or erosion of the cap.

Scenario 4, Clean Closure

(Refer to Figure D, "Clean Closure for a Site that Contains Ash")

Under this scenario the burn dump site, or a portion of the site if consolidation has occurred, will be clean closed. This means that all the burn ash at the site is removed and transported off-site to an appropriate disposal site.

The primary human health threat associated with burn dump sites is exposure through direct contact with the burn ash or exposure to windblown particulates that have been contaminated with burn ash. Therefore, appropriate health and safety measures should be implemented during excavation of the ash material. The procedure shown on Figure D should be followed for sites that fit this scenario.

Since the burn ash will be excavated and moved waste characterization is necessary to determine the proper disposal site for the burn ash and to also ensure that appropriate measures are incorporated into a health and safety plan and properly implemented during the excavation of the burn ash material.

A waste characterization of the burn ash will likely show that it is a hazardous waste. But as long as the waste is not a Resource Conservation and Recovery Act (RCRA) hazardous waste and passes the Deionized Water Waste Extraction Test (DI WET) it can be regulated using 27 CCR regulations. However, the LEA must still make the necessary notifications as required under Proposition 65. Also, as stated in a memorandum dated March 3, 1995, DTSC must first issue a variance for the burn ash before it is allowed to be disposed of at a non-Class I disposal facility.

Guidance contained in LEA Advisory Number 16, Clean Closure, should be followed to ensure clean closure is complete and documented.

Also, once clean closure of the burn dump site is achieved and certified clean by the LEA, DTSC, and the RWQCB the owner would be free to develop the site without any additional land use restrictions or postclosure maintenance requirements.

Attachment 4

RECORDING DEED RESTRICTIONS FOR BURN DUMPS REMEDIATED IN PLACE

Section 25220 of the Health and Safety Code is used by the Department of Toxic Substances Control (DTSC) for recording restrictions for hazardous waste sites and section 21170 of Title 27 of the California Code of Regulations (27 CCR) is used by Local Enforcement Agencies (LEA) for recording deed restrictions for landfills. Based on procedures in these sections and the procedures contained in this advisory the following guidelines have been developed for remediation of burn dumps in place and recording deed restrictions.

Site Investigation

- Obtain the assessor's parcel number, address, legal description of the parcel, owner's name and address, and a boundary survey map.
- Determine the extent, thickness, and constituents of the burn ash. (Use existing investigations and/or perform field surveying, drilling, sampling and analysis.)
- Prepare a record map that includes boundary survey information (or modify the existing boundary survey map). Map scale should not be more than 1"=200'. Show the existing areas of burn ash tied to property boundaries and provide topographical/drainage information on and around the site needed to estimate grading and construction permit requirements.
- Note the assessor's parcel number on the record map.
- Incorporate the above information and map in the Site Investigation Report.

Construction Completion

- Update the Record Map to show the as-built location of the burn ash tied to property boundaries, type and thickness of the soil cover, final topography and drainage (including new/modified drainage structures), fencing plan and type, and other pertinent details.
- Include on the Record Map the date of remediation and a brief summary of remediation performed (e.g., tons of solid waste recycled or landfilled, description of burn dump remediation, erosion control, and fencing).
- Make known on the Record Map the hazardous properties of the burn ash and the postclosure land use (PCLU) restrictions necessary to maintain the integrity of the soil cover. For example, the following language might be used if the burn ash is classified as a hazardous waste:

> The covered burn ash contains metal substances classified as hazardous in California Code of Regulations, Title 22 (see [*fill in the name of the Report*] dated [*fill in the date*] for laboratory analysis of burn ash). Postclosure land use shall be restricted to activities that will not result in penetration of the soil cover or exposure of the burn ash (e.g., non-irrigated open space), and shall exclude construction of buildings and structures over the burn dump area. Proposed land uses that violate these restrictions shall require the proponent to apply to the [*fill in the name of the Local Enforcement Agency*] for removal of land use restrictions, and to the Department of Toxic Substances Control for a variance or removal of land use restrictions pursuant to section 25233 or 25234 of the California Health and Safety Code.

If the burn ash is classified as a non-hazardous waste the following language might be used:

> The covered burn ash contains metal substances classified as non-hazardous in California Code of Regulations, Title 22 (see [fill in the name of the Report] dated [fill in the date] for laboratory analysis of burn ash). Postclosure land use shall be restricted to activities that will not result in penetration of the soil cover or exposure of the burn ash (e.g., non-irrigated open space), and shall exclude construction of buildings and structures over the burn dump area. Proposed land uses that violate these restrictions shall require the proponent to apply to the [fill in the name of the Local Enforcement Agency] for a removal of land use restrictions.

- Notify the appropriate city/county planning and building department to file the Record Map and require any proponent requesting a land use differing from the filed PCLU to apply to DTSC.
- Include a copy of the notification to the Planning and Building Department and the Record Map in the Construction Completion Report.

Attachment 5 of this document is a picture file of a memorandum from the Deputy Director of the Hazardous Waste Management Program for the Department of Toxic Substances Control (DTSC) to the Deputy Director of the Permitting and Enforcement Division for the California Integrated Waste Management Board (CIWMB) dated March 3, 1995. In the memorandum, DTSC responds to questions asked by CIWMB regarding several options for managing the cleanup of burn ash and when DTSC needs to be involved. The contents of this memorandum are summarized in Attachment 3 of this document.

Attachment 5

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
(916) 324-7191

MEMORANDUM

TO: Doug Okumura, Deputy Director
Permitting and Enforcement Division
California Integrated Waste Management Board
8800 Cal Center Drive
Sacramento E-10

FROM: [illegible] Kaur, Deputy Director
Hazardous Waste Management Program

DATE: March 3, 1995

SUBJECT: REGULATION OF BURN DUMP ASH

This memo is in response to your memo concerning the regulation of burn dump ash. In your memo, you outline two categories of problems that you anticipate encountering when dealing with burn dump ash during remediation under the AB 2136 program: remediation of sites known to contain burn dump ash and remediation of ash found unexpectedly during clean-up of a site. In your memo, you express uncertainty regarding the position of the Department of Toxic Substances Control (DTSC) relative to regulation of burn ash sites. We hope that our response to your memo will clearly lay out options for the California Integrated Waste Management Board (CIWMB) during remediation of burn ash sites.

Your memo includes three flow charts that DTSC understands are meant to represent how CIWMB thinks coordination between DTSC and CIWMB for various waste management scenarios should be accomplished in order to keep the CIWMB burn dump ash projects on schedule. The first flow chart addresses leaving the ash in place and capping the burn ash area. Since no active management of the burn ash will occur under this scenario, the regulations regarding the management of hazardous waste do not apply. No permitting action from DTSC is necessary; however, in order to provide some assurance that the remaining ash does not pose a threat, we recommend that incompatible land uses be precluded from areas containing ash. For example, your flow chart shows a one-foot compacted earthen cap, fencing, and posting, plus deed restrictions. One foot of cap, depending on its design, may not be adequate. Restrictions prohibiting vegetable gardens, swimming pools, or other land uses should be in place. Roadways,

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open areas, parking, or commercial land uses are preferred over residential uses for these reasons. Generally, with these precautions in place, DTSC involvement should not be necessary.

The second flow chart addresses consolidating ash, either on site or on a contiguous parcel that already contains ash. Burn ash that is moved within an area that is considered an area of contamination does not constitute active management; therefore, hazardous waste management requirements do not apply. For clarification, an area of contamination is an area of contiguously contaminated soil. The contaminants and the concentrations of the contaminants may vary. A variance from DTSC is not required for movement of burn ash within the area of contamination.

The third flow chart addresses clean closure for a site that contains ash. This flow chart would also apply for sites where the ash cannot be maintained within the area of contamination. CIWMB will not need to obtain a variance from DTSC if the ash does not fail the Total Threshold Limit Concentration (TTLC) or the Soluble Threshold Limit Concentration (STLC) using the Waste Extraction Test (WET), assuming the ash does not fail any other hazardous waste criteria. DTSC needs to issue a variance for ash that must be removed from the area of contamination that fails either the STLC or the TTLC using the WET if (1) CIWMB wishes to use de-ionized water as the extracting solution in order to determine if the ash is nonhazardous and may be disposed in a monofill, or (2) CIWMB wishes to dispose the ash that fails the hazardous waste criteria using the WET in a non-Class I disposal facility. DTSC cannot issue a "blanket variance"; however, CIWMB can request a variance from DTSC for multiple sites where it is known that the ash will need to be removed from the area of contamination. DTSC staff can work with CIWMB to structure a variance that meets the needs of CIWMB to the extent possible.

In your memo you state that there has been no evidence of any burn dump ash exceeding the RCRA hazardous waste criteria. The above discussion assumes that the burn dump ash is not a RCRA hazardous waste. DTSC does not have the jurisdiction to issue a variance from the RCRA hazardous waste requirements.

DTSC suggests, as you note in your flow charts, that a deed restriction and monitoring of post-closure land use be implemented for any ash left in place and capped. One alternative might be that, based on a characterization of the burn dump ash, DTSC can perform a health risk assessment of the

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burn dump ash. Depending on the results of the health risk assessment, disposal or leaving in place of the ash that doesn't exceed the health-based concentrations could be allowed without a deed restriction or monitoring of post-closure land use.

For your information, a copy of the Interagency Agreement between DTSC and Caltrans is attached. The intent of this interagency agreement is to establish a mechanism for Caltrans to provide funding to DTSC for DTSC to provide professional staff services to Caltrans.

Please feel free to call either Watson Gin, Chief of the Permitting Division, at 322-3501 or Peggy Harris, Chief of the Standardized Permitting Section, at 324-7663 if you have any questions.

Attachment

cc: Paul Blaie
Special Assistant to the Secretary
California Environmental Protection Agency

Stan Phillippe
Acting Deputy Director
Site Mitigation Program

Watson Gin, P.E., Chief
Permitting Division
Hazardous Waste Management Program

Peggy Harris, P.E., Chief
Standardized Permitting Section
Permitting Division
Hazardous Waste Management Program

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