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Ser 1832.3/L6161
28 Mar 1996

U.S. Environmental Protection Agency
Region IX
Attn: Ms. Anna-Marie Cook
75 Hawthorne Street (H-9-2)
San Francisco, CA 94105

Subj: SUBMISSION OF THE RESPONSE TO COMMENTS ON THE FIELD
DEMONSTRATION REPORT AND TECHNOLOGY TRANSFER REPORT ON
SANDBLAST GRIT RECYCLING PROJECT, ENGINEERING FIELD ACTIVITY,
WEST, NAVAL FACILITIES ENGINEERING COMMAND, HUNTERS POINT
ANNEX, SAN FRANCISCO, CALIFORNIA

Dear Ms. Cook:

Enclosure (1) is forwarded for your consideration. If there are no further comments, the responses will be incorporated into the Final documents. Due to the time constraint of the contract, it is requested that if there are comments, that they be submitted in writing by April 12, 1996, to the:

Commanding Officer
Attn: Mr. Dave Song, Code 1832.3
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, CA 94066-5006

If you have any questions, the point of contact is Mr. Dave Song at (415) 244-2561.

Sincerely,

~~original signed by~~

RICHARD E. POWELL
Lead Remedial Program Manager for HPS/TI
By direction of
the Commanding Officer

Encl:

(1) Response to Comments from U.S. Environmental Protection Agency on the Draft Field Demonstration Report (Vol I) and Technology Transfer Report (Vol II) on Recycling Sandblast Grit into Asphaltic Concrete, Hunters Point Annex, San Francisco, California

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Copies to:

U.S. Environmental Protection Agency (Attn: Sheryl Lauth)
Roy F. Weston, Inc. (Attn: Karla Brasaemle)
California Department of Toxic Substances Control (Attn: Cyrus Shabahari)
California Regional Water Quality Control Board (Attn: Richard Hiatt)
San Francisco City Attorney (Attn: John Cooper)
City and County of San Francisco Dept. of Public Health, Bureau of Toxics
(Attn: Amy Brownell)
National Oceanic & Atmospheric Administration (Attn: Laurie Sullivan)
U.S. Department of the Interior (Attn: Nancy Goodson)
U.S. Fish & Wildlife (Attn: Jim Haas)
ATSDR (Attn: Diane Johnson)
California Department of Fish & Game (Attn: Mike Martin)
California Office of Environmental Health (Attn: Margy Gassel)
California Department of Health Services (Attn: Alyce Ujihara)
Bay Area Air Quality Management District (Attn: Catherine Fortney)
NAVBASE San Francisco (Bay Area Base Transition Coordinator, Attn: CDR Al Elkins)
RAB Member: ARC Ecology (Attn: Saul Bloom)
PRC Environmental (Attn: Jim Sickles)
Harding Lawson Associates (Attn: David Leland)

Blind copies to:

62.3, 1832, 1832.3, 09CMN, 1822, HPS CSO 62C (Eddie Sarmiento)
Admin Records (3 Copies, w/encl)
Chron, Green
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Response to Comments from U.S. Environmental Protection Agency Region IX
on the
Draft Field Demonstration Report (Volume I) and Technology Transfer Report (Volume II)
on
Recycling Sandblast Grit into Asphaltic Concrete,
Hunters Point Annex, San Francisco, California

February 27, 1996

General Comments

Comment 1

A description of the asphalt composition should be provided. This is important because if the tests prove acceptable, restrictions can be placed on the allowable types of asphalt to be used in this process.

Response

Section 7.1 will be changed to indicate that the target formulation for the asphaltic concrete in the full-scale demonstration was 5.2% bitumen (as weight of total mix) using Shell AR-4000 bitumen. However, general restrictions should not be developed based on this field demonstration. The raw materials composition is variable from plant to plant, so data about one plant's formulation is not particularly useful in developing restrictions on allowable types of asphalt. The important restrictions are performance-based requirements such as leaching resistance and physical property standards.

As noted in Volume I (Section 9.2) and Volume II (Section 4.0 and Volume II Section 8.2) it is advisable to conduct treatability tests with the bitumen and aggregate to be used due to variability of the materials. Volume I (Section) 9.2 and Volume II (Section 8.2) will be revised to clarify and emphasize the need to preform treatability tests.

Comment 2

It appears that the tests performed on the test strips were only done on core samples. Asphalt wears over time generating fine particles due to tire friction, weathering, etc. These fine particles end up being transported by wind or in the road ditch carried by runoff. Long-term wearing of the road surface may release the grit and its metal contaminants back into the environment. These fine particles will likely have leachability characteristics different than the core samples due to the finer particle size and increased surface area. Address this concern in the document.

Response

Pavement failure typically occurs due to frost heave mechanisms that liberate sand- to gravel-size particulates. Both the TCLP and California WET extractions require size reduction prior to the leaching. The size reduction should result in smaller average particle size than are liberated by frost heave damage.

Pavement grinding is the activity that is most likely to generate fine particulate. Dust generation during pavement grinding was tested as described in Volume I (Section 6.4).

Specific Comments

Volume I:

Comment 1 Tables 2-3, 2-4, and 2-5

The regulatory citation for TTLC and STLC is obsolete. The current equivalent is CCR, Title 22, 66262.24(a)(2)(A).

Response

The regulatory citation will be corrected.

Comment 2 Section 2.3.1, Table 2-7, p. 2-12

Using data presented in Appendix B, it appears that tabulated results for mean concentrations include analytical results for both field and laboratory duplicate analyses (i.e., 28 samples are used, not 24). These are not independent samples and should not be included in the calculations.

Response

Each of the 28 samples (26 samples and 2 field duplicates) was given full weight in the calculation of the mean and standard deviation. The duplicates were two small subsamples taken in the field from a larger volume of grit, therefore, these are not subsamples formed by splitting a small sample in the laboratory. Due to the large spatial variation typical of environmental media, the scientist who did the calculation believed it would be valid to include the field duplicate samples as independent results. In light of your comment, we agree that this assumption is debatable. However, the scientist who designed the experiment and analyzed the data was closest to the problem and we do not feel warranted in changing the approach at this late date. Also note that deleting the duplicates from the calculation gives only a small change in the mean and standard deviation and would not change the final conclusion.

Comment 3 Section 2.3.1, Table 2-8, p. 2-13

Using data presented in Appendix B, it appears that tabulated results for mean, standard deviation, and upper confidence limit include analytical results for both field and laboratory duplicate analyses. These are not independent samples and should not be included in the calculations. As presented, the number of samples used in the calculation of the above statistics is one greater than listed in the "Number of Samples" column.

Response

As discussed above, the duplicates were included when calculating the statistics. The number of samples column is incorrect and should read 10, 10, and 8 for the 0-3 ft, 3-6 ft, and 6-9 ft layers, respectively. The number of samples column will be corrected.

Comment 4 Table 2-16, p. 2-25

The standard deviation and number of measurements should be included in this table.

Response

The reported results are based on analysis of single samples for each test condition. For more information see the response to Comment 8 on Volume I.

Comment 5 Table 2-20, p. 2-26

The sieve sizes used in this table do not correspond to the sieve sizes described elsewhere in the text, nor to any known sieve size system.

Response

The sieve sizes are shown in Table 2-21. A note will be added to Table 2-20 to refer the reader to Table 2-21 for sieve size designation.

Comment 6 Page 4-1, third paragraph

The references to the 46% and 7% mixes are unclear. Please clarify by specifying the composition of the 46% and 7% mixtures.

Response

A sentence will be added to clarify that the percent composition specifies the weight of grit in the final mixture.

Comment 7 Section 4.3.1, Table 4-2, p. 4-3

The TTLC and STLC concentrations for lead and copper in untreated and treated grit do not match concentrations presented in Tables 2-4, 2-5, and 2-7 in Section 2. See comments 2 and 3 above.

Response

The data are for the subsample used in the treatability test, not for the entire pile.

Comment 8 Section 4.4, p. 4-5

The actual butyltin species in used sandblast grit cannot be assumed to be the chloride species. The most common compound used as an antifoulant was bis-tributyltin oxide. However, a wide range of butyltin species have been historically used in paints including the chloride, fluoride, hydroxide, acrylate, methacrylate, etc. The actual species present would have a marked influence on physical-chemical properties such as solubility and volatility. The gas chromatographic method used to determine butyltins uses a derivitization to convert all organotin species (MBT, DBT, TBT) to a form which can be analyzed and does not determine the original anion. Results are often expressed as the chloride because laboratories typically use the chlorides as standards.

The statement that dibutyltin chloride does not appear to be degraded or volatilized is not supported. Insufficient data have been provided to determine which, if any, mechanisms may be occurring for any of the organotin species.

The fact that DBT concentrations in the heated material is higher than in the starting material either implies that TBT is being decomposed to DBT or that analytical results are questionable.

Since TBT and MBT concentrations decrease upon heating (assuming analytical results are correct), they must be degraded, or, more likely, volatilized from the samples. If volatilized, this may present air quality or air emissions concerns during production of asphaltic concrete at an asphalt batch plant.

Response

We agree that it is essential to fully characterize the grit before selecting recycling as an option. A caution will be added to Volume I (Section 9.3) and Volume II (Section 8.3) to emphasize the importance of analyzing spent grit to determine the concentrations of metals from pigments or antifouling ingredients.

The analysis of butyltin compounds for the field demonstration described in this report was not intended as an exhaustive study. Due to the low concentration and low volatility of organotin compounds, a detailed characterization of the fate of butyltin compounds was not warranted. The concentrations of butyltin compounds in the spent grit are in the ppm range and the concentrations in the TCLP leachate are in the ppb range. Organotin biocides are not highly volatile. For example, the vapor pressure of *bis*(tri-*n*-butyltin)oxide is 9.75 mm Hg at 215°C (Volume 16, Table 3 of the *Kirk-Othmer Encyclopedia of Chemical Technology*, third edition). The section will be revised to clarify that the concentrations of DBT before and after heating appear similar and that the values for MBT and TBT appear to decrease without speculating about the mechanisms.

Comment 9 Section 4.4, Table 4-5, p. 4-5

The standard deviation and number of measurements should be included in this table.

Response

The reported results are based on analysis of one sample. For more information, see the response to Comment 8 on Volume I.

Comment 10 Page 5-1, fifth paragraph

Washing the asphalt sample may actually wash out the contaminants that could leach from the mixture. Since there are control samples that are also exposed to the same local soils, the effect of these soils can be accounted for in the analysis.

Response

Washing the core samples is unlikely to remove significant contaminants. Note, as shown in Volume I (Photo 5-7), the cores are cut by wet drilling. Samples for analysis are taken from the inner portion of the core to avoid the effects of disturbed surface of the core.

Comment 11 Section 6.2.1, Tables 6-9 through 6-12, pp. 6-11 and 6-12

The concentrations for lead and copper in untreated and treated grit do not match concentrations presented in Tables 2-4, 2-5, and 2-7 in Section 2. See comments 2 and 3 above.

Response

The mean total and mean WET extractable lead and copper concentrations in Table 6-9 through 6-12 are taken from Table 2-4 (total) and Table 2-5 (WET-soluble). The other data are specific to the leaching tests performed on the core samples.

Comment 12 Section 6.4.2.1, p. 6-14

The air sampling and monitoring employed should be referenced throughout the document. A complete reference should follow the first citation and an abbreviation should follow each subsequent citation.

Response

A reference will be added to the report that gives a detailed description of the air sampling methods.

Comment 13 Section 6.4.2.2, p. 6-19

A Gaussian plume dispersion model is referenced. Please indicate which model was actually used. If an EPA model was used, it must be cited. Alternatively, if the equation provided in the text was used, the text should indicate how the equation is used.

Response

A reference will be added to the report that gives a detailed description of the data analysis methods.

Volume II:

Comment 1 Table 2-2

The regulatory citation for TTLC and STLC is obsolete. The current equivalent is CCR, Title 22, 66262.24(a)(2)(A).

Response

The regulatory citation will be corrected.

Comment 2 Section 4.3, Table 4-2, p. 4-3

Total and WET lead concentrations do not match concentrations presented in Table 4-12 (page 4-3 of Volume I). See comments 2 and 3 for Volume I.

Response

The mean total and mean WET extractable lead and copper concentrations in Table 4-12 are taken from Table 2-4 (total) and Table 2-5 (WET-soluble). The other data are specific to the leaching tests performed on the core samples.