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TREASURE ISLAND
SSIC NO. 5090.3.A



Arnold Schwarzenegger
Governor

February 8, 2005

Ms. La Rae Landers
Lead Remedial Project Manager
Southwest Division, Naval Facilities Engineering Command
BRAC Operations Office
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REVISED DRAFT FEASIBILITY STUDY, INSTALLATION RESTORATION SITE 27,
CLIPPER COVE SKEET RANGE, NAVAL STATION TREASURE ISLAND, SAN
FRANCISCO, CALIFORNIA

Dear Ms. Landers:

The Department of Toxic Substances Control (DTSC) staff have completed its review of the Revised Draft Feasibility Study (FS) for the Clipper Cove Skeet Range (Site 27) for Naval Station Treasure Island (NSTI), dated December 10, 2004. As a part of our review, Mr. Jim Polisini of DTSC's Human and Ecological Risk Division reviewed the revised FS and the Navy's responses to DTSC's comments that were originally submitted in a letter dated March 16, 2004. Enclosed with this letter, please find an additional comment memorandum from Mr. Polisini dated January 7, 2005. DTSC also conducted an engineering review of specific sections of the FS, including the detailed cost opinion for Alternatives 2 and 3 (Appendix B). Based on this review, please find an additional comment memorandum from Mr. Mark Berscheid, an Engineer in DTSC's Engineering Services Unit, dated February 8, 2005.

In presenting the three different alternatives for addressing the lead shot in sediment at Site 27, the Navy concluded that Alternative 2, consisting of a deed notice and restriction, provides overall protection of the environment, meets the threshold criteria for remedy selection, is cost effective and is therefore, the preferred alternative. While DTSC does not disagree with the Navy's conclusions about the associated costs of Alternative 2, that they are preferable in comparison to the range of costs presented in Alternative 3, we do however want to make clear that this is the case only when the

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Alternative 2 costs are compared to the Alternative 3 costs, which assume the complete removal of all lead impacted sediments within Site 27.

DTSC is aware that the City of San Francisco intends to expand the current marina, after transfer from the Navy, and will do so primarily along the shoreline areas. This future expansion will likely require some dredging to achieve the draft depths necessary for larger boats and will presumably be limited to the near shore areas along the northern edge of Site 27. Because it does not appear that dredging all of the impacted sediments will be required to allow for the future expansion of the marina, DTSC believes that an additional alternative needs to be presented that identifies the costs associated with limited dredging along the shoreline areas necessary for the future expansion of the marina. This additional alternative should also include an associated deed notice and restriction that will limit sediment disturbing activities for the remainder of the lead impacted areas in Site 27. By presenting an additional alternative that limits dredging activities to the northern shoreline areas, a more realistic comparison of total costs can be made between this new alternative and the alternatives that have already been proposed.

If you should have any questions regarding this letter, please contact me at (510) 540-3763.

Sincerely,



David Rist
Hazardous Substances Scientist
Office of Military Facilities

Enclosure

cc: See next page.

Ms. La Rae Landers
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Department of Toxic Substances Control

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Arnold Schwarzenegger
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MEMORANDUM

TO: David Rist, Project Manager
Office of Military Facilities -- Berkeley
700 Heinz Street, Building F, Second Floor
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FROM: James M. Polisini, Ph.D.
Staff Toxicologist
Human and Ecological Risk Division (HERD)

DATE: January 7, 2005

SUBJECT: REVISED DRAFT CLIPPER COVE (IR SITE 27) FEASIBILITY
STUDY
[PCA 18040, SITE 201209-18 H:24]

BACKGROUND

HERD reviewed the document titled *Revised Draft Feasibility Study Site 27, Clipper Cove Skeet Range, Naval Station Treasure Island, Treasure Island, San Francisco, California*, dated December 10, 2004. This document was prepared by SulTech of San Diego, California. SulTech is a joint venture of Sullivan Consulting Group and Tetra Tech EM, Inc. HERD previously reviewed the Draft Installation Restoration (IR) Site 27 Feasibility Study in a HERD memorandum dated March 18, 2004. HERD also previously reviewed the Draft, Draft Final and Final Remedial Investigation (RI) Reports for Clipper Cove and participated in numerous technical meetings and telephone conversations regarding Clipper Cove over the last 5 years.

Naval Station Treasure Island is in San Francisco Bay between the cities of Oakland, California and San Francisco, California. Naval Station Treasure Island consists of two contiguous islands, Treasure Island (TI) and Yerba Buena Island (YBI). YBI is a natural island in San Francisco Bay, while TI was constructed by placement of sediments on the former Yerba Buena Shoals by hydraulic dredging during the period of 1936 and 1937. The U.S. Army occupied YBI from 1866 to 1896. TI was leased to the Navy in 1941 and Navy operations continued until 1997. The City of San Francisco currently coordinates the reuse

of the property.

Clipper Cove is situated directly between TI and YBI. A portion of Clipper Cove was used as a naval skeet range between approximately 1979 and 1989. Lead from lead, both in sediment and as lead shot, and polycyclic aromatic hydrocarbons (PAHs) from clay targets are the Contaminants of Potential Ecological Concern (COPECs) identified in the Remedial Investigation (RI).

GENERAL COMMENTS

HERD reviewed the Draft Feasibility Study (FS) for IR Site 27 (Clipper Cove) in a HERD memorandum dated March 18, 2004. The same three remedial alternatives were presented in the Draft FS for IR Site 27 as are presented in this Revised Draft FS for IR Site 27. The 'revisions' in this Draft FS appear to focus mainly on the proposed toxicity of lead shot to waterfowl.

SPECIFIC COMMENTS

1. The three remedial alternatives outlined in this Revised Draft FS for IR Site 27 are the same three remedial alternatives outlined in the Draft FS for IR Site 27 reviewed in a HERD memorandum dated March 18, 2004. These remedial alternatives are:
 - a. No Further Action (NFA) Remedial Alternative 1. No monitoring is suggested as part of the NFA alternative.
 - b. Institutional Controls (ICs) as Remedial Alternative 2. This alternative action would be equally protective, given that no dredging or disturbance of the sediment occurs due to prop wash or construction activities along the north shore of Clipper Cove. Any ICs must be agreed to in perpetuity, regardless of future land owners or property lease holders. This would seem difficult to guarantee given the value of marina space and Bay-side property in the San Francisco region.
 - c. Dredging and off-site disposal as Alternative 3. This alternative would provide permanent elimination of any exposure of diving ducks, marine mammals or aquatic organisms to lead shot and remove the lead shot as a future source of lead to surface water.

The main focus of 'revisions' appears to be the toxicity of lead shot to waterfowl. This summary is provided for the DTSC Project Manager and the administrative record and no response is required from the Navy or Navy contractors to this comment.

2. A field soil screening criterion for human health of 0.62 mg/kg for polycyclic aromatic hydrocarbons (PAHs) is mentioned in several locations (e.g., Section 1.3.4, page 7 and Section 1.5.1, page 11). It should be made clear somewhere in the initial portions of the text that 0.62 mg/kg as benzo(a)pyrene equivalents represents an incremental cancer risk of 1×10^{-5} rather than 1×10^{-6} . Second, please provide a description in the text of the analytical methodology which provides a field concentration for each of the PAHs required to calculate the benzo(a)pyrene equivalent of a soil sample for the purposes of real-time field screening.

3. The National Oceanic and Atmospheric Administration (NOAA) has proposed a management concentration of 1,000 µg/kg (Johnson, 2000) for managing the potential ecological hazard to fish associated with polycyclic aromatic hydrocarbons (PAHs) in sediments. While, the binding of PAHs in skeet targets to the dolomite limestone used in the manufacturing process may limit the release (Section 1.4.3, page 9) and therefore the toxicity of the PAHs in skeet targets, this screening criteria should be included with other screening criteria (Table 1).
4. Please indicate in the text whether the seven samples collected in the Environmental Baseline Survey (EBS) Data Gaps Investigation which had lead levels below the EPA residential scenario Preliminary Remediation Goal (PRG) of 400 mg/kg (Section 1.5.1, page 11) were also below the 'Cal-modified' PRG. As contaminated soils were removed, this is only a point of clarification.
5. Based on the presentation of lead soil concentrations of a maximum of 516 mg/kg with a 95 percent upper confidence limit (95UCL) of 229 mg/kg HERD would agree with the Navy proposal for No Further Action (NFA) for soils based on human health at the terrestrial portions of IR27 with future use as industrial use.
6. In the event that dredging of Clipper Cove is considered now or in the future, exposure to lead shot currently buried three to four feet below the sediment water interface may become a complete exposure pathway. Waterfowl which probe the sediment in search of prey have been the receptor group most at risk in assessment of other skeet ranges. The toxicity of lead shot and the number of lead shot which could produce an adverse effect are critical in evaluating the risk to diving ducks (Section 2.1, page 13). HERD concluded, in a review of the Naval Air Station (NAS) Alameda Skeet Range Draft Final RI, dated March 28, 2003, that ingestion greater than approximately 2 lead shot per waterfowl constituted a dose likely to produce an adverse effect. A more detailed HERD analysis of the Navy contractor's application of Monte Carlo probabilistic methodology to the estimation of the number of lead shot likely to produce an adverse effect in diving ducks is contained in a December 8, 2003 HERD memorandum for the NAS Alameda Skeet Range. HERD concluded in that memorandum that "...given the difference in lead shot intake by a waterfowl in the environment (i.e., continuous) versus single dosing, in a toxicity experiment, the ingestion of 3 to 5 number 7 ^{1/2} - 9 shot is a more appropriate waterfowl NOAEL intake." HERD, therefore, does not agree with the proposed No Observable Adverse Effect Level (NOAEL) of 9 shot per bird in the 7 ^{1/2} to 9 shot size classes (Section 2.2, page 14). A copy of that December 8, 2003 HERD memorandum is attached. Potential exposure to the range of 3 to 5 lead shot pellets per bird of the 7 1/2 to 9 size class should be considered a screening criterion in evaluation of any potential dredging (Section 1.4.3, page 10) of the skeet range area of Clipper Cove.

7. The imposition of Institutional Controls (ICs) as outlined in Remedial Alternative 2 (Section 3.4.2, page 20) would be protective, given that no dredging or disturbance of the sediment occurs due to activities such as prop wash or construction activities along the north shore of Clipper Cove. Any ICs must be agreed to in perpetuity, regardless of future land owners or property lease holders. This would seem a difficult guarantee to provide given the value of marina space and Bay-side property in the San Francisco region and the position of the city of San Francisco on use restrictions for Clipper Cove stated at meetings attended by HERD.

CONCLUSIONS

Use of the NOAEL lead shot value of 3 to 5 shot per bird of the 7 ½ - 9 size class HERD supports would increase the volume and therefore the cost of Remedial Alternative 3 as presented using the NOAEL lead shot value of 9 shot per bird of the 7 ½ to 9 size class proposed by the Navy.

REFERENCES

Johnson, Lyndal. 2000. An analysis in support of sediment quality thresholds for polycyclic aromatic hydrocarbons (PAHs) to protect estuarine fish. National Oceanic and Atmospheric Administration, Environmental Conservation Division, Northwest Fisheries Science Center (NOAA/NMFS), 2725 Montlake Blvd E., Seattle, WA 98112.

HERD Internal Reviewer: Michael Anderson, Ph.D.
Staff Toxicologist, HERD



cc: Michael J. Wade, Ph.D., DABT
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Attachment – HERD December 8, 2003 NAS Alameda Skeet Range
memorandum on the following pages.



Terry Tamminen
Agency Secretary
CalEPA



Department of Toxic Substances Control

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Arnold Schwarzenegger
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TO: Marcia Liao, DTSC Project Manager
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FROM: James M. Polisini, Ph.D.
Staff Toxicologist, HERD
1011 North Grandview Avenue
Glendale, CA 91201

DATE: December 8, 2003

SUBJECT: NAVAL AIR STATION ALAMEDA (ALAMEDA POINT) SKEET
RANGE ESTIMATE OF LEAD SHOT HAZARD FOR
WATERFOWL
[SITE 201209-18 PCA 18040 H:24]

BACKGROUND

HERD previously reviewed the document titled *Draft Remedial Investigation Report, Skeet Range, Alameda Point, California*, dated January 28, 2003 in a HERD memorandum dated March 28, 2003. The document currently under review is the response to comments with additional Monte Carlo Analysis (MCA) material proposed to support the Navy conclusion that diving waterfowl are not at risk from ingestion of particulate lead shot at the former Skeet Range at Naval Air Station (NAS) Alameda. This document was prepared by Battelle offices in Duxbury, Massachusetts, Entrix Inc. offices in Walnut Creek, California and Neptune & Company offices in Los Alamos, New Mexico.

NAS Alameda was an active naval facility from 1940 to 1997. Operations included aircraft, engine, gun and avionics maintenance; fueling activities; and metal plating, stripping and painting. An unconfined landfill exists on the margin of San Francisco Bay in the western bayside area of NAS Alameda. In addition to skeet range activities, linked storm water and industrial wastewater lines discharged to the Seaplane Lagoon in the Northwest and Northeast corners, as well as the Oakland Inner Harbor Channel side of NAS Alameda. The skeet range is located on the northwestern boundary of Naval Air Station (NAS) Alameda and was developed offshore as two active shooting ranges

(northern and southern) and operated for approximately 30 to 40 years. The skeet range was closed in 1993. The Contaminants of Concern (COCs) are non-particulate lead in sediment and lead shot in addition to polycyclic aromatic hydrocarbons (PAHs) associated with clay targets and clay target fragments.

GENERAL COMMENTS

The ecological portions of this assessment deals only with waterfowl intake of lead from lead shot. Intake of lead by waterfowl from other sources must be combined to assess the total lead intake and risk associated with lead.

SPECIFIC COMMENTS

1. U.S. Fish and Wildlife Service (USFWS) requested that the ecological hazard for waterfowl ingesting lead shot be considered at the Skeet Range in addition to the hazard associated with lead (non-shot) in sediment. However, the Navy response to USFWS comments on the Draft document dated January 28, 2003 are not contained in the Response to Comments dated September 30, 2003. Please provide the Navy response to USFWS comments for HERD review.
2. Please provide the relative intake of lead from lead shot as compared to the lead intake from food items to substantiate the claim that intake of lead shot is the main exposure route for diving ducks (HERD comment number 3). Prey item intake should be readily available from the Remedial Investigation (RI) Report for the skeet range.
3. Please place the description of the fate of sample SK-39 and SK-56 (HERD comment number 4), relative to their exclusion from the analysis, in the text of this report.
4. The statement regarding previous Human Health Risk Assessment (HHRA) of the Western Bayside, indicating that direct and indirect exposure in the shoreline area (HERD comment number 20) should be included in this expanded evaluation of the skeet range.

SPECIFIC COMMENTS FOR ATTACHMENT A

5. HERD does not agree with the assessment of the toxicity experiments for waterfowl used to develop a No Observable Adverse Effect Level (NOAEL) for lead shot intake adjusted to shot-size number 7^{1/2} – 9 (Attachment A, Table 2). The most recent study (Sanderson, 2002) dosed the waterfowl with 5 number 4 shot in a single dose. This obviously does not model continuous intake by waterfowl probing the sediment at the skeet range. The other study (Koranda, et al., 1979), which indicates a lead shot size-adjusted NOAEL in the same range, employed differing doses (i.e., 1, 3, and 6 number 4 shot) apparently administered a single time. The study which would appear, at least, to approach multiple intake of lead shot (Rattner, et al., 1989), with two doses of lead shot, indicates a size-adjusted NOAEL of approximately 2 to 3 number 7^{1/2} – 9 shot. While understanding the uncertainty (i.e., variation) in these differing studies, HERD concludes that given the difference in lead shot intake by a waterfowl in the environment (i.e., continuous) versus single dosing, in a toxicity

experiment, the ingestion of 3 to 5 number 7^{1/2} – 9 shot is a more appropriate waterfowl NOAEL intake.

6. HERD agrees with the U.S. EPA Region 9 Specific Comment number 15 regarding the derivation of the Toxicity Reference Value (TRV) for waterfowl exposed to lead shot. Studies excluded from derivation of a lead shot intake TRV must indicate the rationale for excluding the study (i.e. in Attachment A, Table 2).
7. The evaluation of potential hazard associated with waterfowl ingestion of lead shot outlined in this document addresses only ingestion of lead shot from the former skeet range at NAS Alameda. As such, only the potential incremental intake of lead due to lead shot at NAS Alameda is considered. Potential hazard associated with non-shot lead in sediment at the NAS Alameda skeet range as well as lead intake from other nearby skeet ranges on San Francisco Bay should be included to allow risk managers to consider the importance of incremental lead shot intake from the NAS Alameda skeet range in comparison to other sources of lead intake. The Monte Carlo Analysis (MCA) sensitivity analysis indicates that Foraging Range is the most sensitive variable in the intake model (Attachment A, page 46). At a minimum a qualitative analysis should be performed outlining the skeet ranges and former skeet ranges which waterfowl at NAS Alameda might access given the mean Foraging Range of 168.59 km² (Attachment A, Table 1). Such a qualitative assessment should only include areas within the feeding depth used for the skeet range ecological assessment at NAS Alameda. The former skeet range at Treasure Island would appear to be one candidate for inclusion, along with any skeet ranges on the eastern shore of San Francisco Bay north and south of NAS Alameda.

CONCLUSIONS

HERD appreciates the effort the Navy has made to address the potential hazard to waterfowl associated with ingestion of lead shot at the former skeet range located at NAS Alameda. However, HERD has a professional difference of opinion regarding the proposed No Observable Adverse Effect Level (NOAEL) used in the Monte Carlo Analysis. The NOAEL dispute in terms of shot ingested can, most probably, be resolved in a discussion among the regulatory agencies, trustees and Navy consultants.

HERD recommends that this assessment not be proscribed by compartmentalizing waterfowl intake of lead shot at NAS Alameda or separating intake of lead pellets at NAS Alameda from other sources of lead pellet intake. The potential hazard associated with intake of lead pellets at NAS Alameda should be evaluated as an incremental intake associated with other sources of lead intake. Dietary intake of lead at NAS Alameda as well as lead pellet intake from other skeet ranges or former skeet ranges within the proposed Foraging Range should be presented.

References

Koranda, J., K. Moore, M. Stuart and C. Conrado. 1979. *Dietary Effects on Lead Uptake and Trace Element Distribution in Mallard Ducks Dosed with Lead Shot*. Lawrence Livermore Laboratory Report. 39 pp.

Rattner, B. A., W. J. Fleming and C. M. Bunck. 1989. *Comparative Toxicity of Lead Shot in Black Ducks (Anas rubripes) and Mallards (Anas Platyrhynchos)*. Jour. Wildlife Dis. 25(2): 175-183.

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Staff Toxicologist, HERD



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Terry Tamminen
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MEMORANDUM



Arnold Schwarzenegger
Governor

To: David Rist
Project Manager
Office of Military Facilities
Berkeley Office

Via: John Hart, P.E.
Chief, Engineering Services Unit

From: Mark Berscheid
Hazardous Substances Engineer
Engineering Services Unit

Date: February 8, 2005

Subject: REVISED DRAFT FEASIBILITY STUDY SITE 27, CLIPPER COVE
SKEET RANGE, NAVAL STATION TREASURE ISLAND, SAN
FRANCISCO, CALIFORNIA

This letter contains conclusions and recommendations regarding my review of the Revised Draft Feasibility Study (FS) for Site 27, Clipper Cove Skeet Range, Naval Station Treasure Island, San Francisco, California. The FS has been prepared for the U.S. Department of the Navy, Southwest Division, Naval Facilities Engineering Command, San Diego, California by SulTech, San Diego, California.

SUMMARY/ CONCLUSIONS

The Engineering Services Unit (ESU) concurs with the assessment provided in the FS indicating that the actions planned at this site relating to future required dredging activities would preclude the implementation of in situ treatment technologies associated with standard or thin layer capping. Based on this factor, the ESU concurs with the FS in evaluating only those treatment options that remove existing levels (i.e., Dredging) of sediment or do not increase the present level of sediment (i.e., Institutional Controls).

David Rist
February 8, 2005
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The ESU concurs with evaluation of the dredging treatment alternative and concurs with the choice of upland reclamation as a viable option of this treatment alternative provided the sediment contaminant level requirements can be met.

The ESU does not concur with the choice of institutional controls (ICs) as the chosen alternative in this analysis. The ESU recommends the chosen treatment at this site be capable of achieving the most beneficial use possible, in this case requiring the application of dredging activities to achieve removal of the risk to aquatic wild life.

However, should the IC alternative remain as the remedy recommended by the FS, the ESU recommends the inclusion of long-term sediment level monitoring in this treatment alternative to insure the present depth of sediment above the lead pellets does not change over time. Although the FS indicates this area is in an area of net deposition, the FS indicates this is a dynamic process with multiple contributing factors to deposition that may change suddenly.

SPECIFIC COMMENTS

1. The ESU concurs with the cost estimates provided in the FS based on a review of multiple line item activities for which ESU has cost references.

If there are any questions, please contact me at (916) 255-6672.