



**ANALYSIS OF THE POTENTIAL FOR USE
OF DREDGED MATERIAL AT LANDFILLS**



August 9, 1995

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION
Thirty Van Ness Avenue • Suite 2011 • San Francisco, California 94102 • (415) 557-3686

Analysis of the Potential for Use of Dredged Material at Landfills

August 9, 1995

San Francisco Bay Conservation and Development Commission
30 Van Ness, Suite 2011
San Francisco, CA 94102-6080

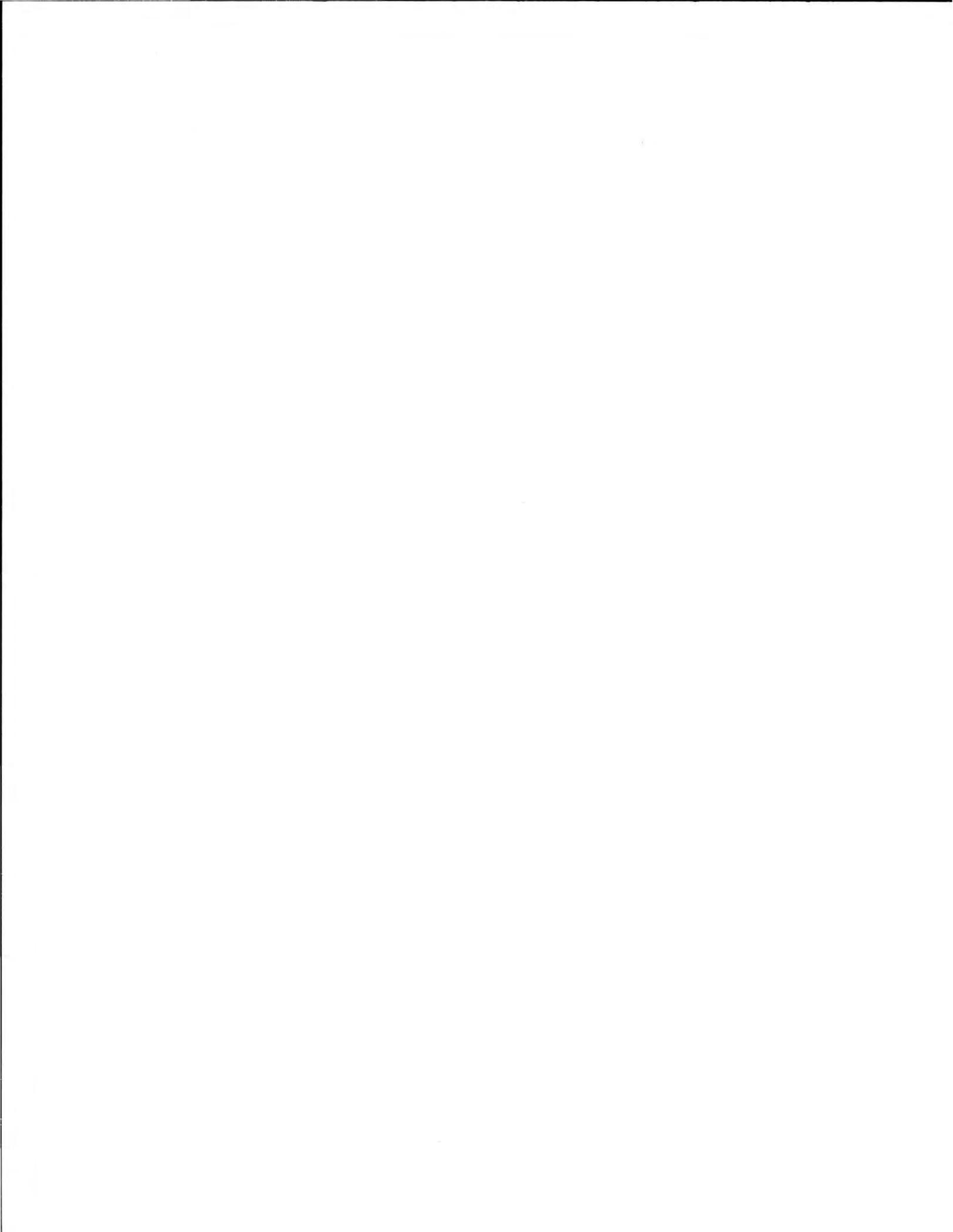
TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
CHAPTER 1 INTRODUCTION	3
1.1 Overview of Study	3
1.2 In-Bay Disposal Problems	3
1.3 The Long Term Management Strategy	4
1.4 Benefits of Dredged Material Use in Landfills	5
1.5 Obstacles to Using Dredged Material in Landfills	5
1.6 Previous Studies	6
CHAPTER 2 LANDFILL ANALYSIS	9
2.1 Landfill Site Screening	9
2.2 Landfill Acceptance of Dredged Material	13
CHAPTER 3 CLASSIFICATION OF WASTE TYPES AND LANDFILLS	15
3.1 Hazardous Waste	15
3.2 Designated Waste	15
3.3 Nonhazardous Solid Waste	15
3.4 Inert Waste	15
3.5 Waste Management Units	16
CHAPTER 4 WASTE ACCEPTANCE PERMITS	17
4.1 Solid Waste Facility Permit	17
4.2 Waste Discharge Requirements	17
CHAPTER 5 WASTE CLASSIFICATION DETERMINATIONS	19
5.1 Non-Hazardous Waste Determination	19
5.2 Non-Designated Waste Determination	19

CHAPTER 6	DREDGED MATERIAL USES AND REQUIREMENTS	23
6.1	Uses for Dredged Material	23
6.2	Permeability Requirements	23
6.3	Moisture Requirements	24
6.4	Transport and Disposal Costs	24
6.5	Lack of Rehandling Facilities	27
CHAPTER 7	TESTING AND REGULATORY REQUIREMENTS	29
7.1	Subtitle D	29
7.2	Testing Considerations	29
7.3	Daily Waste Tonnage and State Surcharge	33
7.4	Alternative Daily Cover	34
7.5	Waste Diversion Goals	34
CHAPTER 8	CONCLUSIONS AND RECOMMENDATIONS	35
8.1	Potential for Use of Dredged Material in Landfills	35
8.2	Landfills Rated Highly Feasible for Using Dredged Material	35
8.3	Rehandling Dredged Material	36
8.4	Permeability of Dredged Sediment	36
8.5	Landfill Disposal Costs	36
8.6	Engineered Controls at Waste Facilities	37
8.7	Testing Considerations	37
8.8	Daily Waste Tonnage and State Surcharge	37
8.9	Landfill Acceptance Criteria	38
APPENDIX A		
APPENDIX B		
APPENDIX C		
APPENDIX D		

ABBREVIATIONS USED

AB	Assembly Bill
ADC	Alternative Daily Cover
Basin Plans	Regional Water Quality Control Plans
BCDC	San Francisco Bay Conservation and Development Commission
BOE	Board of Equalization
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
cy	cubic yards
EPA	U.S. Environmental Protection Agency
IWMB	Integrated Waste Management Board
LEA	Local Enforcement Agency
LTMS	Long Term Management Strategy
RCRA	Resource Conservation and Recovery Act
Regional Board	California Regional Water Quality Control Board
State Board	State Water Resources Control Board
SWF	Solid Waste Facility
WDRs	Waste Discharge Requirements
WET	Waste Extraction Test



EXECUTIVE SUMMARY

In order to maintain navigation and flood control channels for maritime trade, recreational boating, and other purposes, approximately five million cubic yards (cy) of sediment must be dredged annually from San Francisco Bay. Historically, the majority of dredged material has been disposed at in-Bay sites. However, in recent years, dredging and disposal in the Bay have become increasingly controversial. In 1982, it was discovered that sediments disposed at the principal in-Bay disposal site off Alcatraz Island were not dispersing as expected and were forming a mound of increasing size. This mounding problem raised concerns about the capacity of in-Bay disposal sites. Additionally, there have been growing concerns about the potential effects of in-Bay disposal of dredged material on fisheries, water quality, and wildlife. Due to these concerns, the need for feasible alternatives to in-Bay disposal has become apparent, and interest has been growing in utilizing dredged material as a resource. This can be accomplished in part by substituting dredged material for traditional sources of cover, construction, capping or lining material at sanitary landfills.

Although use of dredged material at landfills presents several obstacles, projects undertaken at several Bay Area landfills have demonstrated that reuse of dredged material is feasible. These projects have also shown that because landfills are designed and managed to isolate wastes from the surrounding environment, landfills are particularly promising sites for reuse of materials which are unsuitable for unconfined aquatic disposal due to elevated contaminant levels and/or toxicity. After initial scoping studies contracted through the Long Term Management Strategy (LTMS) program, the San Francisco Bay Conservation and Development Commission (BCDC) determined that further investigation into the untapped potential of using dredged material at landfills was warranted.

BCDC conducted a survey of Bay and Delta Area landfills to determine the potential for using dredged material at each facility. Based on the information gathered from an initial pool of 127 landfills, facilities were tested against a series of criteria such as site capacity, disposal costs, and distance from major dredging sources in order to determine the most feasible sites. Sixteen of these facilities were judged to be highly feasible for use of dredged material. They have a combined capacity to accept over five million cubic yards of dredged material for use landfill operations.

The study concludes that there are several practical obstacles to reuse of dredged material at landfills. Chief among these are a shortage of rehandling facilities and, in some cases, the need to transport material a significant distance from the dredging site. The inconsistency of testing requirements and waste acceptance criteria among different landfills is another significant obstacle; these are currently determined on a case by case basis by the landfill operator. This difficulty is compounded by the lack of guidance available to dredgers; currently, each dredger bears the responsibility of investigating the acceptance criteria and the potential for reuse of their material at each landfill. The permeability of dredged materials tends to be heterogeneous; this could pose engineering problems if dredged sediments are to be used as cell liner material. Finally, there are some regulatory gray areas with regard to whether or not dredged material used as daily cover is exempt from the daily tonnage limits imposed by Solid Waste Facility Permits. These logistical and regulatory considerations increase the cost of landfill disposal over aquatic disposal. Cost is the ultimate obstacle to use of dredged material in landfills, as dredgers will generally choose the least expensive disposal option available. However, very few alternatives exist for disposal of material which fails testing for aquatic disposal; reuse at landfills may be the most cost effective means of disposal for this type of material.

The report recommends a number of policy changes to minimize the difficulties involved in reusing dredged material at landfills. Several of these are linked to LTMS implementation. The report recommends that the LTMS implementation plan should include guidance to dredgers and landfill operators to familiarize them with dredged material, and a programmatic means of matching the characteristics of dredged material with the acceptance criteria of different landfills. The report also recommends that LTMS implementation should include the establishment of rehandling facilities adequate to supply landfills with enough dried sediment to meet their needs for cover material. Rehandling sites have the capability to separate material by grain size, and the report suggests that they should be designed with this in mind in order to provide landfills with sediments of relatively uniform permeability. The report further suggests that the Integrated Waste Management Board (IWMB) should expand its current policy on the use of contaminated soil as daily cover to include dredged material, and that the Regional Water Quality Control Boards should encourage the construction of Class II landfill units over the less stringent Class III units.

This report examines the various steps involved in getting dredged material to landfill sites. The first part of the report explains the landfill survey that was conducted by BCDC including: the methodology, criteria evaluated, initial feasibility determination, ranking criteria, and final ranking. The second part of the report focuses on regulatory considerations: agencies involved; steps in accepting dredged material at landfills; testing requirements; and permits/authorizations required. Conclusions and recommendations follow. The objective is to provide dredgers, landfill operators, regulating agencies, legislative bodies and other interested parties with sufficient information to guide them in expanding opportunities for reusing dredged material at landfills in the Bay and Delta regions.

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW OF STUDY

This study identifies and evaluates factors involved with using dredged material as a resource in Bay and Delta Area landfills. This report examines the various steps involved in getting dredged material to landfill sites for use as a resource. The first part of the report explains the landfill survey and analysis that were undertaken including: methodology, criteria evaluated, initial feasibility determinations, ranking criteria, and final rankings. The second part of the report focuses on regulatory considerations including: agencies involved; steps in accepting dredged material at landfills; testing requirements; and authorizations required. The objective is to provide dredgers, landfill operators, regulatory agencies, legislative bodies and other interested parties with sufficient information to guide them in expanding opportunities for reusing dredged material at landfills in the Bay and Delta regions.

1.2 IN-BAY DISPOSAL PROBLEMS

The San Francisco Bay, covering an area of 480 square miles, is the largest embayment on the Pacific coast of the United States.¹ It is an estuary of international importance inhabited by anadromous and marine fish, and freshwater species, including several threatened and endangered species, that contribute significantly to the ecological and economic value of the region. The Bay is home to \$1.5 billion in yearly earnings from maritime jobs and related employment² and more than \$5.4 billion of economic activity per year is directly dependent on ship navigational channels and berthing areas in the region.³ In order to maintain the Bay's navigation and flood control channels in the face of high sedimentation rates, approximately five million cy of sediment must be dredged annually.⁴ While most dredged material is currently disposed at four sites located within the waters of the San Francisco Bay, site capacity and potential environmental impacts from dredging and disposal of dredged material have raised concerns regarding the viability of in-Bay disposal as the primary disposal option.⁵

The most frequently cited environmental concerns regarding Bay disposal are the potential release of pollutants to the water column, and the toxic effects of pollutants on marine organisms. Concern is also expressed about the redistribution of sediments and pollutants throughout the Bay and subsequent effects on benthic organisms, physical effects of suspended sediments on fish (e.g.,

¹*Long-Term Management Strategy for Dredged Material Disposal in the San Francisco Bay Region Phase I: Evaluation of Existing Management Options*, U.S. Army Corps of Engineers San Francisco District/LTMS, December 1990, p. 38.

²Gretchen Grover, Pacific Merchant Shipping. Personal Communication, 8/2/94. Figure based on the approximately 40,000 jobs directly related to maritime shipping industry.

³*An Analysis of the Beneficial Uses of Dredged Material at Upland Sites in the San Francisco Estuary*, San Francisco Bay Conservation and Development Commission, June 1994, p. 15.

⁴Gahagan and Bryant Associates. Future Appendix to the LTMS EIR/EIS, "Analysis of San Francisco Regional Dredging Quantities." 8/1/94, Draft, p.1.

⁵*Dredging and Disposal Road Map*, BCDC/LTMS, April 21, 1994, p.1.

abrasion, clogged gills and avoidance of turbid Bay waters), and the burial of sand and rocky habitat with fine-grained sediments.⁶ Fishermen have expressed concern that in-Bay disposal adversely impacts commercial and sport fisheries. They are concerned that high turbidity due to disposal impairs fish species ability to find prey and reproduce.

In 1982, it was discovered that material disposed at the principal in-Bay disposal site off Alcatraz Island was not dispersing as expected, thereby forming a mound. The 80-foot-high underwater mound posed an imminent navigational hazard that would only worsen with unrestricted disposal at the site.

Although in-Bay disposal has become increasingly controversial because of possible environmental and navigational impacts, presently there are few available alternatives to in-Bay disposal. However, capacity at in-Bay disposal sites is limited and will likely not be able to accommodate the continuous future dredging and disposal needs essential to maritime commerce, national security, and recreational use of the Bay. In September, 1994, an ocean site was designated by the U.S. Environmental Protection Agency (EPA), but it has strict limitations on the quality of material that can be disposed there. By itself, it cannot accommodate future disposal needs, particularly in regard to disposal of material with elevated pollutant levels. There has been wide agreement that a range of feasible disposal options are therefore needed. This is especially true for non-hazardous dredged material found to be unsuitable for either unconfined in-Bay or ocean disposal since no alternative disposal sites are available to handle material unsuitable for unconfined aquatic disposal.⁷ Upland disposal alternatives that can accept material with various levels of pollutants are therefore actively being sought, and there is growing interest in the Bay region in treating dredged material not simply as a waste, but in utilizing its as a resource.

1.3 THE LONG TERM MANAGEMENT STRATEGY

In July 1990, the U.S. Army Corps of Engineers (Corps), the EPA, the San Francisco Regional Board, and BCDC formed a consensus-based program to develop the LTMS to guide the dredging and disposal of materials from San Francisco Bay in an economic and environmentally sensitive manner. Responsibilities under LTMS are divided among the cooperating agencies: the Corps oversees the overall management of the program; the EPA is responsible for ocean studies geared to designating an acceptable ocean disposal site; the San Francisco Regional Board is responsible for recommending and overseeing studies evaluating disposal of dredged materials in the Bay; and BCDC is evaluating the potential for using dredged materials as a resource at non-tidal locations around the Bay and Delta. Based upon this and other information, a comprehensive management plan will be prepared. A policy Environmental Impact Statement/Report (EIS/EIR) is under preparation to evaluate the potential impacts of proposed dredging policies. The EPA is the federal lead, while the fifth agency involved in the LTMS, the State Water Resources Control Board (State Board) is the state lead for preparing the EIS/EIR.

⁶Generally, effects associated with dredging sites have not been a major concern except during periods of herring spawning. *Long-Term Management Strategy for Dredged Material Disposal*, p. 102.

⁷Testing guidelines to determine suitability for unconfined in-Bay disposal are described in US Army Corps of Engineers Public Notice No. 93-2, issued February 1, 1993. Testing guidelines for ocean disposal are found in the USEPA and USCOE *Evaluation of Dredged Material Proposed for Ocean Disposal* (the "Green Book"), February 1991.

1.4 BENEFITS OF DREDGED MATERIAL USE IN LANDFILLS

This landfill study was designed to determine the potential for reusing dredged material at landfills in the San Francisco Bay and Delta regions. For the purposes of this study, a "landfill" is defined as a solid waste management facility, or sanitary landfill, which is in conformance with all state and federal waste management facility regulations and has a IWMB permit.

Although only a few landfills around the Bay Area have used dredged material, the clays and fine silts that comprise most dredged materials from the Bay are often suitable at landfill sites (once dried) for use as cover, on-site construction, capping, or lining material.

Landfills possess several qualities which are ideal for the reuse of dredged material. Daily operations and closure procedures require substantial amounts of cover and capping material, and therefore have the potential for utilizing a significant portion of material dredged annually from the San Francisco Bay. Because landfills are designed to contain pollutants and manage runoff, they have the added benefit of being able to accept certain materials deemed infeasible for unconfined aquatic disposal. And while liability is a potential concern for disposal of material at any site, landfills provide greater protection against liability, since thorough waste testing and gate controls are required and enforced. Additionally, in most cases dredged material will replace the need to use clean soil or another non-waste source. Finally, because landfills are typically highly disturbed sites with limited natural resource values, the use of dredged materials at landfills is likely to impact few existing natural resources.⁸

The Redwood Landfill in Marin County and the Tri-Cities Landfill in Alameda County are two facilities which have incorporated the use of dredged material in their closure plans. Tri-Cities Landfill is planning to use 180,000 cy of dredged material from the San Leandro Marina as capping material for eventual closure of the landfill.⁹ The material is currently stockpiled at Roberts Landing adjacent to the Marina.

To date, Redwood Landfill has accepted approximately 500,000 cy of dredged material from the Petaluma River, Gallinas Creek, and Port Sonoma-Marin. The material has been used as daily cover, on-site construction and liner material. Redwood Landfill has also proposed using dredged material to construct a two-foot liner for a sludge processing area and for levee construction and repair.¹⁰ See Appendix A for a case study of reuse of dredged material at Redwood Landfill.

1.5 OBSTACLES TO USING DREDGED MATERIAL IN LANDFILLS

With the success encountered at Redwood and Tri-Cities Landfills, it would seem that reuse of dredged material would be more common in landfills throughout the Bay region. However several factors have prevented widespread use. For one, dredged material carries a stigma: it is not perceived as a resource, but as a polluted waste. Additionally, the cost of unconfined aquatic disposal has been less expensive than disposing dredged material in landfills, and the effort to seriously look at disposal alternatives outside of the Bay is relatively new.

There are several substantial obstacles to use of dredged material at landfills. Landfills cannot, by law, accept material for disposal with a moisture content above 50 percent. Therefore, dredged material must be dried at rehandling facilities before it can be accepted at most landfills. However, there is a dearth of rehandling facilities, and those sites that have been used have limited capacity and/or are available only for material from specific dredging projects. Additionally, most landfills are not accessible by water. Direct transport of material from the dredging source to the facility is therefore not possible and material must be transported via rail or truck. However, the landfills

⁸*An Analysis of the Beneficial Uses of Dredged Material at Upland Sites in the San Francisco Estuary*, p.71.

⁹Mike Cosetti, Vice President of Operations Tri-Cities Landfill. Personal Communication, 3/31/93 & 3/10/94.

¹⁰*An Analysis of the Beneficial Uses of Dredged Material at Upland Sites in the San Francisco Estuary*, p.71.

most interested in dredged material for use in their operations are the sites which are lacking sufficient on-site material for such uses. Therefore, no added traffic congestion or air pollution will be associated with hauling dredged material to the landfills, since some type of material has been and will continue to be transported to the facility to supply material for daily operations.

Disposal at open water sites has historically been logistically simple and relatively inexpensive, ranging from four to six dollars per cy for in-Bay sites and approximately nine dollars per cy for disposal in the recently designated ocean site.¹¹ The added expense of rehandling material, transporting the material to landfills and/or rehandling facilities, sediment testing requirements (to be discussed later), and the possible incorporation of tipping fees, often make the cost of using dredged material in landfills significantly higher than that of aquatic disposal. For example, compared with the approximately \$4 per cy for disposal at the federally designated Alcatraz site, the Port of Oakland paid \$18 per cy and the Port of San Francisco \$22.50 per cy to dispose dredged material at Redwood Landfill.¹² In comparing costs, however, it must be noted that the dredged material from both Ports contained pollutant levels unacceptable for unconfined aquatic disposal. Additionally, these projects were essentially experimental in nature and the costs reflect this fact. Aside from landfills, disposal options for material that does not pass testing requirements for unconfined aquatic disposal are limited and expensive.¹³

Despite the above stated obstacles, the projects undertaken at Redwood and Tri-Cities Landfills demonstrate that beneficial reuse of dredged material in landfills is feasible. Based on these examples it is apparent that dredged material could be used in landfills throughout the Bay Region on a regular basis. Reuse potential is of special interest for the 10-20 percent of all material dredged from the San Francisco Bay that is estimated to be unsuitable for unconfined aquatic disposal in the Bay or Pacific Ocean.¹⁴ It is estimated that approximately five million cy of material dredged from the San Francisco Bay over the next ten years, or 1 million cy per year, will be unsuitable for unconfined aquatic disposal.¹⁵ Consequently as part of the LTMS, studies have been undertaken to fully explore the options and logistics of reusing dredged material in Bay and Delta Area landfills.

1.6 PREVIOUS STUDIES

In March 1994, the "Beneficial Reuse and Nonaquatic Disposal" analysis, conducted as part of the LTMS Upland/Reuse Work Group Technical Studies, was completed. The purpose of the study was to identify opportunities and constraints for the disposal and beneficial reuse of dredged material at upland sites in the Bay and Delta Region.¹⁶

As part of this study, sites were tested iteratively against a variety of land use, engineering, environmental, and regulatory criteria and grouped in three levels of importance. The sites that "scored" well or received relatively high scores for the criteria at the primary level proceeded to the secondary level and so on. In the end, those sites which made it through all three levels and received the highest scores were targeted as having the greatest reuse potential. The sites with lower scores which were not tested beyond the primary or secondary levels were found to have low or moderate reuse potential.

¹¹LTMS, Work Element E, Study 1, Reuse/Upland Site Analysis and Documentation, Task 7, page 2. 8/25/94.

¹²*An Analysis of the Beneficial Uses of Dredged Material at Upland Sites in the San Francisco Estuary*, p.74.

¹³No cost estimates are currently available.

¹⁴"Analysis of San Francisco Regional Dredging Quantities," Gahagan & Bryant Associates. August, 1994.

¹⁵LTMS Implementation Work Group — Containment Site Task Committee.

¹⁶*Beneficial Reuse and/or Nonaquatic Disposal for Material Dredged from San Francisco Bay Stage III Final Report*. Moffatt & Nichol, Engineers. March 23, 1994.

Fifteen landfills were included as part of the study. Of the fifteen, only one, Redwood Landfill, was ranked as highly feasible for its reuse potential. Six landfills ranked as having moderate feasibility, three ranked as having low feasibility, and five were ranked infeasible.¹⁷ While the results were consistent with the methodology employed in the study, the LTMS agencies, particularly the BCDC and the EPA, concluded that landfill disposal of dredged material deserved further study. Due to concerns that the unpromising results might have been influenced by a lack of familiarity with this disposal option, the LTMS agencies felt that the potential for reuse of dredged material at landfills was greater than the study projected, especially considering the lack of disposal alternatives for dredged material determined unsuitable for unconfined aquatic disposal. Therefore, the BCDC and the EPA contacted various landfills in the region to provide additional information on dredged material and to gather information as to the interest and capability of landfills to reuse dredged material. Based on the information gathered through the joint inquiry, BCDC and the EPA determined that the unique characteristics of reusing dredged material at landfills warranted a more thorough study.

¹⁷Ibid. Table 1.

CHAPTER 2

LANDFILL ANALYSIS

2.1 LANDFILL SITE SCREENING

The landfill survey identified all existing landfills in the Bay Area and Delta Region and determined their potential for using dredged material as daily cover, intermediate cover, final cover, construction material, liner and/or capping material in the landfill's operations. The initial pool of 105 Bay Area sites was gathered from information provided by the IWMB.¹⁸ The BCDC staff evaluated landfills in eight Bay Area counties: Alameda; Contra Costa; Marin; Napa; San Mateo; Santa Clara; Solano; and Sonoma. Redwood Sanitary Landfill was not included in the survey since it has an active reuse program for dredged material underway. The Central Valley Regional Board cooperated in this effort by conducting an independent survey of twenty-two Delta sites identified in the Region 5 Landfill Waste Acceptance List. [For a list of the 127 facilities initially screened, see Table 1.]

Landfill operators were contacted and interviewed in regard to each facility's interest and potential to accept dredged material for reuse purposes. Information was gathered regarding: the willingness of the landfill operator to accept dredged material; the need for material at the landfill; the amount of material required and projected uses; the capacity of the landfill (closure year); the estimated cost charged for material; the potential for on-site drying and/or stockpiling; restrictions on the origin of material; permeability requirements; and available access (road, rail, and/or barge) to the facility. Preliminary feasibility assessments were made for each landfill based on the information gathered through the interviews and a ranking of the facilities' distance to the Bay.

All facilities were given a preliminary feasibility rating unless: (1) there was no response to repeated phone messages/no existing contact number; (2) the facility was inappropriate for the use of dredged material (e.g., waste water treatment plant, pet cemetery, illegal dump site, etc.); (3) the facility completed the closure process and did not require any more material; (4) there was no interest to use dredged material due to sufficient on-site material, or other reasons; or (5) bidding for closure material was to occur before completion of this analysis (in Summer, 1994) and no further material would be required.

Out of the initial pool of 127 landfills in the Bay and Delta Area, thirty-nine received an initial feasibility ranking. Due to time constraints, only the information on the twenty-eight Bay Area sites researched by BCDC was given to Gahagan and Bryant Associates for further evaluation. Gahagan and Bryant, under contract to the LTMS, is conducting an analysis on using dredged material for various reuse options around the Bay Area. The facilities were run through a series of criteria screens. [See Appendix B.] If the landfills failed to meet any of the criteria in the initial site screen, they were deemed infeasible. These criteria were: capacity less than 40,000 cy per year; site located beyond San Francisco Bay Basin; site more than 80 miles from Pinole Point, the "centroid" of the Bay in relation to the major dredging sites; and site more than one hour road travel time from existing or potential reprocessing sites.

Eighteen landfills failed the initial site screening. The remaining ten facilities were run through the primary, secondary, and tertiary criteria screens and ranked accordingly. The criterion of distance from Pinole Point was later eliminated from the initial site screen because it automatically, and seemingly inappropriately, eliminated the majority of Delta landfills. The capacity criterion was also eliminated because BCDC staff determined that smaller capacity projects are still feasible, especially for use of material not meeting testing requirements for other uses. With the elimination of these criteria, three additional Bay Area landfills were deemed feasible. Unfortunately, their

¹⁸ IWMB, *Active Landfills and Inactive & Closed Landfills*, 3/1/93.

TABLE 1

Delta and Bay Area Landfills Initially Screened

- | | | |
|---|--|--|
| 1. Acme LF | 46. East Lake LF | 93. Pescadero Solid Waste Disposal |
| 2. Advanced Course LF | 47. El Dorado LF (Union Mine) | 94. Pittsburg DS |
| 3. Albany LF | 48. Fink Road LF | 95. Pleasanton Waste DS |
| 4. All Purpose LF | 49. Florin-Perkins Road LF | 96. Potrero Hills LF |
| 5. Altamont Sanitary LF | 50. Foothill Sanitary LF | 97. Priest Ranch Refuse Dump |
| 6. Aqua Clear Farms Inc. | 51. Forward Incorporated | 98. Redwood Ag Management |
| 7. American Canyon Sanitary LF | 52. Freeway Embankment Dump Site | 99. Rio Vista LF |
| 8. Annapolis LF | 53. French Camp LF | 100. Robert Maddocks Site |
| 9. Austin Road LF | 54. Frontierland Park LF | 101. Roberts Avenue LF |
| 10. B & J Drop Box | 55. Group Environmental Services, Inc. | 102. Rock Creek LF |
| 11. Bar 49 Ranch - Solid Waste DS | 56. Guadalupe Sanitary LF | 103. San Jose Municipal Disposal Grounds |
| 12. Bayview Business Park | 57. Guerneville LF | 104. San Mateo Compost |
| 13. Bellam Boulevard LF | 58. Guisti Ranch DS | 105. San Quentin DS |
| 14. Belmont Island Park LF | 59. Hamilton AFB LF | 106. Santa Fe Pacific Berkeley LF |
| 15. Berkeley LF | 60. Harbor Tug & Barge Company | 107. Shoreline Regional Park Sanitary LF |
| 16. Berryessa Garbage Service DS | 61. Healdsburg DS | 108. Sierra Point DS (a.k.a., Brisbane/Bayshore LF) |
| 17. Binford Land Illegal DS | 62. Hillside LF | 109. Smith Ranch Road LF |
| 18. Bisso Brothers DS | 63. Hurst DS | 110. Solano County Sanitary LF |
| 19. Brisbane LF | 64. IT Corp. Panoche LF | 111. Solano Garbage Company |
| 20. Buena Vista SWDS | 65. IT Vine Hill LF | 112. Sonoma LF |
| 21. Burlingame Refuse | 66. Jackson Road LF | 113. South San Francisco Municipal Dump |
| 22. California Asbestos Monofill | 67. Junipero Serra Solid Waste DS | 114. Story Road LF |
| 23. California Medical Facility | 68. Keifer LF | 115. Sunnyvale LF, City of |
| 24. C and H Sugar DS | 69. Keller Canyon LF | 116. Tri-Cities Recycling & Disposal Facility (aka Durham Rd.) |
| 25. Casa Grande Site | 70. Kirby Canyon Sanitary LF | 117. Tubbs Island Sludge DS |
| 26. Catholic Youth Camp DS | 71. Korbel Maintenance DS | 118. Tubbs Island II |
| 27. Central LF | 72. Lake Berryessa Estates DS | 119. Turk Island Solid Waste DS |
| 28. CERRS | 73. L & D LF | 120. US Steel-Pittsburg DS/USS Posco Industries |
| 29. Chabot Golf Course | 74. Mare Island Naval Shipyard Sanitary LF | 121. Vasco Road Sanitary LF |
| 30. Circle Bar Ranch Illegal D.S. | 75. Marshland Solid Waste Facility | 122. Veteran's Home DS |
| 31. City of Alameda SW II-2 DS | 76. Marsh Road Sanitary LF | 123. West Beach Sanitary LF |
| 32. Cloverdale Wood Waste LF #1 | 77. Marsh Road Sanitary LF, South | 124. West Contra Costa LF |
| 33. Cloverdale Wood Waste LF #2 | 78. Martin Park LF | 125. West Marin Sanitary LF |
| 34. Clover Flat LF | 79. Mont La Salle Vineyard | 126. Yolo County Central LF |
| 35. Colliss Ranch Site Illegal Dump | 80. Moraga Avenue DS | 127. Zanker Road Sanitary LF |
| 36. Colusa County No. 1 (Evans Rd.) | 81. Mt. Diablo State Park DS | |
| 37. Colusa County No. 2 | 82. Mussel Rock Diposal Site | |
| 38. Connor's Ranch Illegal Dump Site | 83. Napa Sanitation District LF | |
| 39. Contra Costa Solid Waste Inc & Garbage Disposal | 84. Napa State Hospital DS | |
| 40. Corral Hollow LF | 85. NAS Moffett Field Sanitary LF | |
| 41. Crittenden Site | 86. Newby Island LF | |
| 42. Coyote-Hellyer Park LF | 87. North County LF | |
| 43. Davis Street Sanitary LF/Oyster Bay Regional Shoreline Park | 88. Old UC Davis LF (LEHR) | |
| 44. Dixon Pit | 89. Owens Fiberglas Co | |
| 45. Easterly Wastewater Treatment Plant | 90. Ox Mountain LF | |
| | 91. Pacheco Pass Sanitary LF | |
| | 92. Palo Alto LF | |

LF = Landfill

DS = Disposal Site

inclusion came after the ranking was completed by Gahagan and Bryant and they have not been formally ranked. Information on the Delta landfills, as well as updated information on Sonoma County landfills, was also submitted subsequent to Gahagan and Bryant's ranking of the Bay Area landfills. Two Delta landfills and one Sonoma County landfill passed the amended, initial site screen, but have not been formally ranked. The landfills that passed the initial site screening are considered "highly feasible" for using dredged material.

The sixteen landfills deemed highly feasible for using dredged material are listed in Table 2 along with their annual capacity to accept dredged material for reuse, and the amount charged per cy to accept material for reuse. This includes the ten sites that were ranked by Gahagan and Bryant with their respective ranking, and the six additional sites that were not ranked. [For the location of these landfills, see Map 1.]

TABLE 2
Feasible Landfill Sites

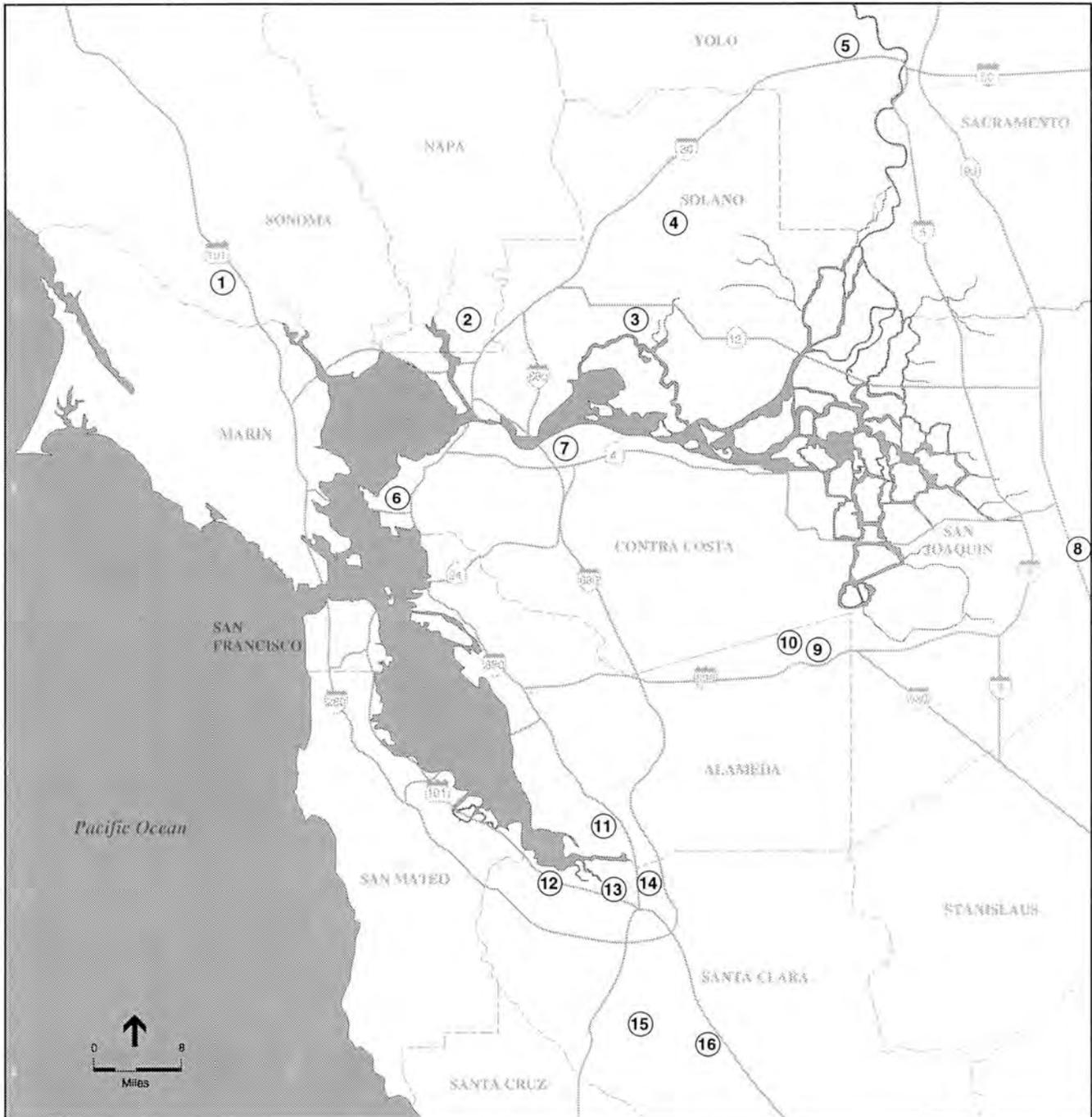
Rank	Solid Waste Facility	County	Charge if D.M. reused	D.M. Reuse Capacity (cy per yr)
1	Potrero Hills Landfill	Solano	\$0-\$29.10/cy	2,000,000
2	West Contra Costa Landfill	Contra Costa	No Charge	790,000
3	American Canyon Sanitary Landfill	Napa	Variable	250,000
4	Altamont Sanitary Landfill	Alameda	\$11.50/cy	548,000
5	Newby Island Landfill	Santa Clara	\$10-15.00/cy	312,000
6	Shoreline Regional Park	Santa Clara	No Charge	100,000
7	Marshland Solid Waste Facility	Santa Clara	No Charge	200,000
8	Acme Landfill	Contra Costa	\$0-\$85.00/cy	250,000
9	Tri-Cities Recycling Landfill	Alameda	No Charge	200,000
10	Vasco Road Sanitary Landfill	Alameda	\$9-17.00/cy	146,000
n.r.	Forward Sanitary Landfill	San Joaquin	\$5-12.00/ton	72,000
n.r.	Guadalupe Sanitary Landfill	Santa Clara	\$6.50/cy	35,000
n.r.	Kirby Canyon Sanitary Landfill	Santa Clara	≤ \$44.75/cy	280,000
n.r.	B & J Landfill	Solano	\$0-\$20.00/cy	36,000
n.r.	Central Landfill	Sonoma	No Charge	150,000
n.r.	Yolo County Sanitary Landfill	Yolo	No Charge	77,000
TOTAL:				5,446,000

n.r. = not ranked

These sixteen feasible landfill sites, located in eight different counties, have a total annual capacity to accept over five million cy of dredged material for use in the landfills' operations, and have a mean average life expectancy of more than nineteen years. All sixteen facilities are Class III landfills (defined later), however three (Kirby Canyon, Yolo County and Forward) have Class II units, and four (Vasco Road, Newby Island, Zanker Road, and Guadalupe) have received variances from the San Francisco Regional Board to accept wastes not typically disposed at Class

Landfills Identified as Highly Feasible for Using Dredged Material

- | | |
|-------------------------------------|-----------------------------------|
| 1 Central Landfill | 9 Altamont Sanitary Landfill |
| 2 American Canyon Sanitary Landfill | 10 Vasco Road Sanitary Landfill |
| 3 Potrero Hills Landfill | 11 Tri-Cities Recycling Landfill |
| 4 B & J Landfill | 12 Shoreline Regional Park |
| 5 Yolo County Sanitary Landfill | 13 Marshland Solid Waste Facility |
| 6 West Contra Costa Landfill | 14 Newby Island Landfill |
| 7 ACME Landfill | 15 Guadalupe Sanitary Landfill |
| 8 Forward Sanitary Landfill | 16 Kirby Canyon Sanitary Landfill |



III landfills. Because they provide greater isolation of wastes from waters of the State, Class II landfill units and Class III units with variances possess greater flexibility for receiving materials with higher levels of pollutants than do typical Class III landfill units. Such flexibility may play a crucial role in the ultimate success of using dredged material in landfills. This will prove especially true for sediment unsuitable for unconfined aquatic disposal, since more disposal options will be available for such material.

2.2 LANDFILL ACCEPTANCE OF DREDGED MATERIAL

In order for dredged material to be used at landfills, arrangements must be made on a case-by-case basis with the landfill operator. Currently it is the burden of the dredger to contact individual landfills in order to determine where dredged material is appropriate for disposal. This can prove to be a time consuming task and an impediment to reusing dredged material in landfills. Dredged material must meet the facility's waste acceptance criteria, as well as meet any physical characteristics required for a particular use. The attached landfill survey forms in Appendix C provide contact names and phone numbers for the sixteen highly feasible landfills. The forms also give specific information as to the quantity, types of use and physical characteristics required for utilizing dredged material at the landfill. More detailed information can be obtained directly from the landfill operator and by consulting the facility's Waste Discharge Requirements (WDRs) (to be discussed later).

Gahagan and Bryant Associates numerically ranked the landfills by feasibility of the individual sites to accept dredged material. It should be recognized, however, that the determination of which solid waste facility is most appropriate for material from a specific dredging project should be done on a case-by-case basis in order to match up the sediments' material characteristics with a facility's requirements and logistics, including distance from the dredging site and/or rehandling facility and the amount needed by the facility compared to the amount dredged. Therefore, while Gahagan and Bryant's ranking provides some insight as to the probability of using dredged material at specific facilities, this ranking should not be considered definitive. The landfill survey forms in Appendix C should be referenced in order to determine the most appropriate facility to accept material for a specific dredging project.

CHAPTER 3

CLASSIFICATION OF WASTE TYPES AND LANDFILLS

The acceptance of dredged material at landfills, whether for disposal or reuse, is regulated as the disposal of waste material to land by the California Code of Regulations (CCR), Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land). Chapter 15 separates wastes into four different categories: (1) hazardous waste; (2) designated waste; (3) nonhazardous solid waste; and (4) inert waste.

3.1 HAZARDOUS WASTE

Detailed criteria are contained in Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3, for determining whether a waste falls into the hazardous category. Article 3 lists specific concentrations for certain hazardous waste constituents. A waste is hazardous if it has hazardous constituents in excess of specified concentrations. Because hazardous waste concentration levels have been established for relatively few constituents, most hazardous waste must be assessed based on evaluation of toxicity, reactivity, flammability and corrosivity of the material. Of all material dredged from the San Francisco Bay less than 2 percent is estimated to be hazardous.¹⁹ The focus of this analysis is therefore on dredged material that is not hazardous.

3.2 DESIGNATED WASTE

Designated waste [Section 2522(a)] is nonhazardous waste which consists of, or contains pollutants which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives or could cause degradation of waters of the State. Hazardous waste which has been granted a variance from hazardous waste management requirements pursuant to Section 66260.210 of Title 22 is also classified as designated waste.

3.3 NONHAZARDOUS SOLID WASTE

Nonhazardous solid waste, defined in Section 2523(a), is all putrescible and non-putrescible solid, semi-solid, and liquid wastes that do not contain wastes which must be managed as hazardous wastes or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives or could cause degradation of waters of the State.

3.4 INERT WASTE

Waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste is defined in Section 2524(a) as inert waste.

¹⁹“Analysis of San Francisco Regional Dredging Quantities.”

3.5 WASTE MANAGEMENT UNITS

The State Board has established three categories of waste management units to handle the separate disposal requirements for each category of waste. Unit classification is based on standards for the protection of water quality, adopted by the State Board, including site characteristics that promote the isolation of wastes from waters of the State, liner system requirements, surface drainage requirements, and cover standards.²⁰

Class I waste management units must provide the most protective conditions for the isolation of wastes from waters of the State. They can accept all types of wastes and are the only units that can accept hazardous waste. Class II units must also isolate waste from waters of the State. However, due to more lenient standards, they only can accept designated, nonhazardous solid, and inert wastes. Because Class III solid waste management units need only provide adequate separation between nonhazardous solid waste and waters of the State, they can only accept nonhazardous solid and inert wastes. While all landfills can accept inert wastes, these wastes do not have to be discharged at a classified waste management unit (23 CCR).

TABLE 3

Waste Acceptance at Waste Management Unit Classifications

	Class III	Class II	Class I
Inert Waste	Yes	Yes	Yes
Nonhazardous Solid Waste	Yes	Yes	Yes
Designated Waste	No	Yes	Yes
Hazardous Waste	No	No	Yes

Presently, the majority of landfills within the state of California are Class III facilities. Of the 127 landfills researched for this study, only one, Keller Canyon, is a Class II facility. Seven of the landfills (Rock Creek, Buena Vista, Fink Road, Yolo County, Forward, Altamont, and Kirby Canyon) have one or more Class II units (see Appendix C). The 119 remaining facilities are Class III landfills which are only permitted to accept nonhazardous solid wastes. As discussed in the next chapter, classification of dredged material depends upon the pollutant levels in the material. The predominance of Class III landfill units affects the potential to reuse dredged material in that only dredged material with lower levels of pollutants can be accepted at these units.

²⁰Application for Determination of Municipal Solid Waste Landfill Permit Program Adequacy, IWMB, p. 13.

CHAPTER 4

WASTE ACCEPTANCE PERMITS

In order for a waste to be accepted at a solid waste facility (SWF), it must be referenced, or listed, either specifically or conditionally, in the facility's solid waste permit and Waste Discharge Requirements.

4.1 SOLID WASTE FACILITY PERMIT

Regulations for permitting solid waste facilities are contained in Title 14, Division 7, Chapter 5 of the CCR. Each SWF permit lists wastes that are acceptable for disposal at the specific landfill, taking into consideration nuisance and safety factors addressed in Title 14.²¹ The IWMB is the government agency responsible for the permitting, regulating, monitoring and enforcement at solid waste disposal facilities. The IWMB's primary means of inspection, permitting and enforcement is performed by local enforcement agencies (LEA's), which are city, county, or local district environmental health agencies that legally function as agents of the state. It is the LEA's, with the concurrence of the IWMB, that issue permits for new facilities, for expansions of existing facilities, or for any other activities requiring the revision of a SWF permit.²²

Before the IWMB may either concur or object to the issuance, modification, or revision of a SWF permit, all regulatory and environmental reviews must be satisfied.²³ State law requires that planning, regulatory, and enforcement action relating to discharges of solid waste be consistent with all applicable water quality control plans adopted by the State Board or appropriate Regional Boards, as well as the State policies for water quality control [P.R.C. 40055 (C)]. Therefore for the discharge of a waste to a landfill, the SWF permit issued by the IWMB through the LEA must incorporate the WDRs issued by the Regional Board.

4.2 WASTE DISCHARGE REQUIREMENTS

The Regional Boards are the government agencies responsible for the classification of waste types and waste management units. The Regional Boards make pollutant and permeability acceptability determinations for specific landfills based on information submitted by landfill operators. The appropriate Regional Board, with the concurrence of the State Board, issues WDRs to landfills which list and prohibit discharges of certain wastes that could affect the quality of the waters of the State.²⁴ WDR limits are determined by the Water Quality Objectives which were established to maintain the beneficial uses of ground and surface waters within each region. The Water Quality Objectives are contained in the Regional Water Quality Control Plans (Basin Plans). WDRs must ensure compliance with water quality standards contained in the applicable Basin Plan.

WDRs specify the types of waste that are acceptable and unacceptable for discharge to a landfill's various waste management units. Any waste disposed within a landfill must be identified in the WDRs or meet the conditions listed in the WDRs that make a waste acceptable for the particular waste disposal unit. (Inert wastes are not required to be included as acceptable in the WDRs.)

²¹Jon Marshack, Central Valley Regional Board. Personal Communication, 8/10/94.

²²*Application for Determination of Municipal Solid Waste Landfill Permit Program Adequacy*, p. 3.

²³*Ibid.* p. 7 & 12.

²⁴*Ibid.* p. 11.

CHAPTER 5

WASTE CLASSIFICATION DETERMINATIONS

For dredged material to be utilized in landfills it must be classified as a waste appropriate for the waste management unit intending to accept the material. In general, any waste which is specifically permitted by a facility's WDRs may be accepted. Additionally, if the waste appears to fit the descriptions in "Typical Wastes Acceptable at Class III Landfills" [see Appendix D], it may be classified as nonhazardous solid or inert waste and may be accepted at a Class III landfill. This report was developed by the Central Valley Regional Board and sent out to all Regions by the State Board in order to facilitate waste acceptance at Class III landfill units throughout the state. To determine classification for wastes that are not referenced in either of these sources, Chapter 15 of Title 23 and Chapter 30 of Title 22 of the CCR should be consulted.

Because the disposal of dredged material at landfills is still relatively uncommon, dredged material is not listed in the Central Valley's "Typical Wastes Acceptable at Class III Landfills," and it will most likely not be referenced in a facility's permit nor WDRs. Due to the varied composition of the sediment dredged from the San Francisco Bay, if dredged material were to be referenced it would likely be accompanied by conditions requiring compliance with the facility's waste acceptance criteria.²⁵ Therefore, acceptance of dredged material at landfills must be determined on a case-by-case basis based on an evaluation of the potential for the material's constituents to impact both water quality and potential beneficial uses of receiving waters at the vicinity of the landfill.

5.1 NON-HAZARDOUS WASTE DETERMINATION

If landfill operators wish to accept non-referenced wastes (e.g., dredged material) for discharge at their landfill unit(s), operators must demonstrate to the Regional Board that the discharge of such waste is consistent with the facility's WDRs and with Chapter 15, including the prohibition against the discharge of "hazardous waste" and "designated waste" to Class III landfill units and the demonstration of the waste's soluble constituent concentrations.²⁶ Waste generators (e.g. dredgers) are required to provide sufficient representative analytical data for landfill operators to make a waste classification determination. The waste must be determined not "hazardous" pursuant to Title 22 (CCR), or else it must go to a Class I hazardous waste disposal facility. A formal determination by the California Department of Health Services that the waste is not hazardous may be used in place of the required analytical data.

5.2 NON-DESIGNATED WASTE DETERMINATION

For wastes classified as non-hazardous under Title 22, additional information must be acquired to establish whether the waste is a "designated waste" under 15 CCR 2522. A waste that is not hazardous is considered a "designated waste" if it "consists of or contains pollutants which, under ambient environmental conditions at the permitted waste management unit, could be released at concentrations in excess of applicable water quality objectives, or which could cause degradation of waters of the State." In order to determine whether or not a waste is a "designated waste" several factors must be evaluated.

²⁵Greg Bartow, San Francisco Regional Board. Personal Communication, 8/31/94.

²⁶"Wastes Allowed for Discharge at Chapter 15 Disposal Facilities", 9/10/93. To all Interested Parties from Elizabeth Babcock, Chapter 15 Program Manager, Division of Clean Water Programs, State Board.

The determination of whether dredged material poses a threat to water quality must take into account material characteristics and the environment of the disposal site. The bodies of water which may be affected by the waste management activity in question; the existing and probable future beneficial uses of these waters, as defined by the appropriate Basin Plan; and the water quality objectives which protect the beneficial uses of these waters; must all be identified. Next, the extractable concentrations of the dredged material which could pose a water quality threat if released to waters of the State must be determined using the Waste Extraction Test (WET) [Title 22 CCR, Section 66700]. If the dredged material is to be disposed in a potentially acidic environment or is capable of generating acid, the extract should be performed with the standard citrate buffer. If not, deionized water can be used.²⁷ For non-hazardous material, results of the WET are not compared to the Soluble and Total Threshold Limit Concentrations (STLC and TTLC) used to determine a hazardous waste, but are compared to various water quality objectives and standards in order to determine the water quality impact of the waste.

If the soluble or extractable constituent concentrations, determined by the WET, of the dredged material are all below the identified water quality objectives and criteria, then the dredged material is not a designated waste and can be discharged at a Class III landfill.

Unfortunately, the majority of material dredged from the San Francisco Bay has high concentrations of leachable salt and would exceed the determined water quality objectives and criteria where receiving waters are fresh rather than saline, such as at landfills not adjacent to the Bay or that are sited in the Delta. In such cases dredged material may be classified as "designated waste" destined for a Class II landfill.²⁸

Due to the limited number of Class II waste management units statewide, as well as the need to properly dispose of contaminated soil, various industrial/sewage/water treatment sludges, miscellaneous industrial wastes and dredged materials, the acceptance of "designated wastes" at Class III landfills has become a significant issue in the San Francisco Bay and Delta Region.²⁹ Acceptance at a Class III landfill is still possible, even if soluble or extractable concentrations of waste constituents exceed the water quality objectives and criteria, through further justification that the constituents will be sufficiently attenuated so as to not adversely affect receiving waters.

Justification of attenuation can be accomplished by the Designated Level Methodology.³⁰ "Designated Levels" are concentrations of waste constituents which provide a site-specific indication of a waste's potential for water quality impairment, based on the natural ability of the site to prevent migration of wastes to waters of the state, excluding any engineered containment systems.³¹ Designated Levels are calculated by multiplying the most limiting of the water quality goals by factors which account for the magnitude of environmental attenuation expected to occur under reasonable worst-case conditions at the proposed site of discharge. Because of the site-specific nature of the determination, the same waste may be classified as "designated" in one location, but not in another location. This provides protection for water quality and a greater degree

²⁷ Acidic conditions are assumed if the waste will be discharged with other putrescible wastes in the Class III landfill or if the waste is itself putrescible or otherwise capable of generating acid. One measure of putrescibility is the determination of the total organic carbon (TOC) content of the waste. If the TOC is at a significant level, usually considered to be 5% or more, the waste is considered putrescible and a citrate buffer should be used in the WET. (*Wastes Acceptable for Discharge to Class III Landfills*, 11/3/99 (revised 3/30/89), Central Valley Regional Board.)

²⁸ Jon Marshack, Central Valley Regional Board. Personal Communication, 1/10/94.

²⁹ Regional Water Quality Control Board Region 2, San Francisco Bay Internal Memorandum from Curtis Scott to Richard McMurtry, Subject: "Designated" Waste Acceptance at Class III Landfills, Recommendation for Four Landfills in Region 2, p.1.

³⁰ *The Designated Level Methodology for Waste Classification and Cleanup Level Determination*, October 1986 (updated June 1989), was developed by Jon Marshack at the California Regional Water Quality Control Board Central Valley Region. Copies are available for review and photocopying (10¢ per page) at that office.

³¹ Jon Marshack, Central Valley Regional Board. Personal Communication, 9/1/94.

of flexibility in the disposal of wastes. Although it needs to be determined on an individual basis, it appears that the most dredged material will likely be acceptable for disposal at Class III waste management units.

Requests for discharge of wastes to a Class III landfill unit which are not specifically permitted by WDRs or specified in the list of acceptable "nonhazardous solid" and "inert" wastes for Class III landfills, must be submitted to the appropriate Regional Board office 30 days prior to discharge. If the waste disposal facility wishes to routinely accept a waste not specifically authorized by its WDRs or not listed in "Typical Wastes Acceptable at Class III Landfills", the landfill may need to apply to the appropriate Regional Board for a revision of its WDRs.³²

³²*Wastes Acceptable for Discharge to Class III Landfills.*

CHAPTER 6

DREDGED MATERIAL USES AND REQUIREMENTS

6.1 USES FOR DREDGED MATERIAL

Dredged material can be used in solid waste facilities for cover, on-site construction, capping, or lining material. Cover is separated into three categories: (1) daily, (2) intermediate, and (3) final. Daily Cover (14 CCR 17682) has a minimum thickness of 6" of compacted material, spread and compacted over the active face of the sanitary landfill at least by the end of each operating day. Intermediate Cover (14 CCR 17684) is a compacted layer of at least 12" of material placed on all surfaces of the fill area where no additional refuse will be deposited within 180 days. Final Cover (14 CCR 17773) is a compacted layer of minimum thickness and quality meeting the standards of 23 CCR Chapter 15, to be placed within 15 months after placement of the final lift.³³

6.2 PERMEABILITY REQUIREMENTS

Presently there are no regulations concerning permeability requirements for daily and intermediate cover. In the absence of permeability requirements, all dredged material that is acceptable for disposal at a SWF is suitable for such use. Permeability requirements may be imposed, however, especially for intermediate cover, in individual WDRs issued by the Regional Boards. For final cover, depending on the interpretation of Subtitle D (see below) and on the design of the liner, an earthen barrier liner and final cover require a layer with a permeability ranging between 10^{-5} through 10^{-7} cm/sec. Sediments with low permeability (less than 10^{-6} cm/sec) may be used to cap a sanitary landfill pursuant to Regional Board requirements.

Sediments with low permeability may also be used as cell lining material.³⁴ Permeability is a key parameter used to assess the ability of a liner to contain waste. For Class II landfills a clay liner of $\leq 1 \times 10^{-6}$ cm/sec is required unless the waste management unit is underlain by a substantial thickness of natural geologic materials with permeability of 1×10^{-6} cm/sec or less. Under Subtitle D, Class III landfills are required to have a clay liner regardless of the underlying geology.

Permeability tests are not required for aquatic disposal and thus have not been routinely performed on dredged material. However in a recent study for the LTMS Reuse/Upland Workgroup, Gahagan and Bryant Associates collected permeability information on dredged material. They performed permeability tests on several samples of dredged material from each of six project sites: (1) San Leandro Marina, (2) the City of Petaluma, (3) Bahia, (4) Las Gallinas, (5) Petaluma Dredged Disposal, and (6) the Port of Oakland; in order to estimate the physical properties of dredged sediment found within the San Francisco Bay. Several of the samples had a significant clay content, with a laboratory permeability of less than the 1×10^{-6} cm/sec standard required for sanitary landfills, and some were even lower: on the order of magnitude of 10^{-8} .³⁵ Such low permeability indicates that material dredged from San Francisco Bay may be useful for the construction of landfill liners, final cover, and capping material. However at most of the project sites, permeability levels varied considerably from sample to sample. While the lower permeability readings met the standard landfill criteria, other samples at the same project site exhibited higher

³³IWMB Policy, Research and Technical Assistance Committee. Agenda Item 1: "Consideration of Quantification and Fee Assessment for Materials Uses as Alternative Daily Cover," 5/5/93.

³⁴Phase I Initial Upland Disposal Site Study Final, prepared by Tetra Tech, Incorporated, 9/14/90, p. 4.

³⁵"Summary of Requirements for 3 Categories of Material Use." Gahagan & Bryant Associates, Task 7.

permeability levels exceeding the standard criteria. The observed heterogeneity of dredged material may prove to be one of the primary drawbacks in using it at landfills for those uses with set permeability requirements: liner, final cover, and capping material. Due to the heterogeneity of dredged sediment, no characterizations can be applied to all material and composition will have to be determined on an individual basis. However, the high percentage of clay material found in the sediments is promising and may more than offset the variations in permeability found throughout the material. Additionally, permeability requirements do not affect material to be disposed as waste or to be used for daily or intermediate cover. The majority of dredged material disposed at landfills will likely be used for daily cover, and therefore no permeability limits will apply. Further, as discussed below, material can be separated by grain size at rehandling facilities to obtain materials with low permeability.

6.3 MOISTURE REQUIREMENTS

Most dredged material contains over 50 percent water and can be over 80 percent water. In order to be accepted at a facility, all material, either for disposal or reuse, must contain at least 50 percent solids and must not contain moisture in excess of the moisture-holding capacity of the landfill, either initially or as a result of waste management operations, compaction, or settlement.³⁶ The moisture requirement, however, does not affect the possible acceptance of dredged material at landfill sites with rehandling and stockpiling capabilities. Although currently no landfills have dewatering capability, a few landfills indicated that they may have the ability and the interest to develop such capability.

6.4 TRANSPORT AND DISPOSAL COSTS

Unless a landfill has potential for on-site rehandling and stockpiling, moisture limitations will require dredged material to be dried at a rehandling facility before use at a landfill. None of the sixteen landfills deemed highly feasible for using dredged material have experience in rehandling material, and due to the lack of water access, only the following four facilities have the potential for on-site rehandling: American Canyon Sanitary Landfill, Yolo County Central Landfill, Potrero Hills Landfill, and West Contra Costa Landfill (see Appendix C). These facilities have not only expressed possible willingness to rehandle dredged material, but are in proximity to waterways where dredged material has the potential to be directly transported to the landfill. For the remaining twelve highly feasible landfills to accept dredged material (and possibly for all sixteen), the sediment must first be processed at a rehandling facility. Rehandling as an intermediary step increases the transport cost to dispose dredged material at landfills.

Although only a general estimate, since it is uniformly measured from the centroid of the San Francisco Bay, the transport cost of hauling dredged material to one of the six active or potential rehandling facilities evaluated by the LTMS (Petaluma River Drying Ponds, Cargill Salt Division, Montezuma Wetlands, Leonard Ranch, Port Sonoma, San Leandro Marina), ranges from \$1.45 - \$10.13 per cy, with an average of \$3.61 per cy of material (see Table 4).³⁷ The cost for transporting dredged material from any of these rehandling facilities to one of the sixteen feasible landfills, ranges from \$1.71 - \$6.77 per cy, with an average of \$4.85 per cy (see Table 5).³⁸ Table 6 shows the total cost associated with transporting dredged material from the centroid of the Bay to a proposed rehandling facility and from the proposed rehandling facility to a landfill site. Total costs range from \$7.33 - \$19.12 per cy, with an average of \$13.95 per cy.³⁹ These transport costs

³⁶*Typical Wastes Acceptable at Class III Landfills*

³⁷Work Element E, Table 4.

³⁸Ibid.

³⁹Ibid.

do not reflect the tipping fees that many landfills charge to accept material at their facility (see Table 2). Tipping fees vary from facility to facility and are higher for Class II units than for Class III units. However, volume discounts are often given, but will vary in amount. Depending on the composition of the material and the need of the landfill to acquire such material, landfills will either pay, waive or charge a discounted fee for dredged material to be used in their operations. Even with the incorporation of the tipping fee, as previously illustrated in the cases of the Port of Oakland and the Port of San Francisco, the cost to dispose material unsuitable for unconfined aquatic disposal at landfills can be less than other options for such materials.

TABLE 4

Transport Costs From Dredge Source To Rehandling Facilities

Rehandling Facility	Dist. from Centroid of SF Bay (naut mi.)	Unit Transport Cost (\$/cy/nm)	Transport Cost (\$/cy)
Petaluma River Drying Ponds	20.06	0.145	\$2.91
Cargill Salt Division	17.27	0.075	\$1.30
Montezuma Wetlands	29.24	0.075	\$2.19
Leonard Ranch	9.97	0.145	\$1.45
Port Sonoma	9.97	0.37	\$3.69
San Leandro Marina	27.39	0.37	\$10.13

TABLE 5

Transport From Landfill To Closest Rehandling Facility

Rehandling Facility	Closest Landfills	Transport Time (hr)	Unit Transport Cost (\$/cy/hr)	Transport Cost (\$/cy)
Petaluma	Am. Canyon	1.35	\$3.50	\$4.74
Cargill	Am. Canyon	0.49	\$3.50	\$1.71
Cargill	Acme	1.25	\$3.50	\$4.36
Cargill	Potrero Hills	1.40	\$3.50	\$4.92
Cargill	West CC	1.77	\$3.50	\$6.19
Montezuma	Potrero Hills	1.14	\$3.50	\$3.99
Montezuma	Am. Canyon	1.83	\$3.50	\$6.39
Leonard Ranch	Am. Canyon	1.03	\$3.50	\$3.61
Leonard Ranch	Acme	1.17	\$3.50	\$4.10
Leonard Ranch	Potrero Hills	1.33	\$3.50	\$4.65
Port Sonoma	Am. Canyon	1.03	\$3.50	\$3.61
Port Sonoma	Acme	1.17	\$3.50	\$4.10
Port Sonoma	Potrero Hills	1.33	\$3.50	\$4.65
San Leandro Marina	Tri-Cities	1.21	\$3.50	\$4.24
San Leandro Marina	Altamont	1.59	\$3.50	\$5.58
San Leandro Marina	Vasco Road	1.63	\$3.50	\$5.69
San Leandro Marina	Newby Island	1.76	\$3.50	\$6.15
San Leandro Marina	Shoreline	1.91	\$3.50	\$6.69
San Leandro Marina	Marshland	1.93	\$3.50	\$6.77

TABLE 6

Transport Costs From Rehandling Facilities To Landfills

Rehandling Site	Landfill Site	Dredge & Offload Fee (\$/cy)	Transport Wet D.M. (\$/cy)	Transport Dry D.M. (\$/cy)	*Total Transport Cost (\$/cy)
Cargill	Am. Canyon	5.00	1.30	1.72	7.33
Petaluma	Healdsburg	5.00	2.91	6.65	11.90
Leonard R	Acme	5.00	1.45	4.10	8.91
Montezuma	Potrero	5.00	2.19	3.99	9.59
Cargill	West CC	5.00	1.30	6.20	10.02
San Leandro	Tri-Cities	5.00	10.13	4.24	17.67
San Leandro	Altamont	5.00	10.13	5.57	18.47
San Leandro	Vasco Road	5.00	10.13	5.71	18.56
San Leandro	Newby Isl.	5.00	10.13	6.16	18.83
San Leandro	Shoreline	5.00	10.13	6.65	19.12
San Leandro	Marshland	5.00	10.13	6.76	19.19
Leonard R	Redwood	5.00	1.45	2.24	7.79

* Total \$/cy Cost is calculated with 60 percent of the \$/cy Transport Cost of Dry Material in order to account for the 60 percent volume reduction assumed to occur from the in situ volume after placement of material at the rehandling site due to drying.

6.5 LACK OF REHANDLING FACILITIES

The need to dry dredged material before it can be accepted at a landfill presents an additional obstacle: in order to dry material, rehandling facilities must be available. However, there is a dearth of rehandling facilities and the sites that have been used have limited capacity and/or are reserved for specific dredging projects. Currently, there are drying ponds at the Port Sonoma-Marin (Sonoma County), a site adjacent to the San Leandro Marina (Alameda County), the Mare Island (Solano County), the City of Petaluma (Sonoma County), and a handful of small sites around the Bay, such as the one near Gallinas Creek in Marin County, which rehandle on a "as-needed" basis for specific dredging projects. In fact, except for the Port Sonoma-Marin facility, which has accepted material from the Ports of San Francisco and Oakland, all the drying ponds are currently reserved for project-specific use.

The LTMS is exploring opportunities for the establishment of rehandling facilities with greater capacity than existing operations and which would be available for sediments from a variety of dredging sources. Sites currently under examination include the Leonard Ranch site in Sonoma County, the Cargill Crystallizer Ponds in Napa County, the Praxis-Pacheco Site in Contra Costa County, the Montezuma Wetlands in Solano County, the Rio Vista Airport Borrow Pit Site in Solano County, and the Mare Island Ponds in Solano County. The establishment of one or more of these rehandling facilities will greatly facilitate the process of bringing dredged material to landfills.

Aside from drying dredged sediment, rehandling facilities have the capability to segregate material by grain size. Hydraulically placed dredged material will generally segregate by grain size with the coarser material settling closer to the discharge pipeline outlet and the finer grained materials settling out further from the discharge pipe outlet and closer to the effluent water weir.⁴⁰ These segregation characteristics should be a priority in consideration of the final design of rehandling sites and during dredged material placement operations in order to obtain the low permeability material useful for liner, final cover, and capping material in landfill operations.

⁴⁰LTMS "Engineering Elements of Dredged Material Rehandling Facilities," Final Conceptual Level Design Report - Cargill & Leonard Ranch Sites, Volume 1, November 1993. p. 10.

CHAPTER 7

TESTING AND REGULATORY REQUIREMENTS

7.1 SUBTITLE D

The federal EPA has determined that municipal solid waste has a greater impact on water quality than originally believed. Stricter federal regulations were therefore enacted to better isolate municipal solid waste from waters from the State. New regulations for landfills are contained in Parts 257 and 258 of Volume 40 of the Code of Federal Regulations (CFR). The new regulations establish minimum national criteria under the Resource Conservation and Recovery Act (RCRA), as amended, for all solid waste landfill units. These regulations took effect on October 9, 1993 for all solid waste facilities accepting waste on or after this date. Subtitle D of Part 258 requires that new solid waste units and lateral expansions of existing facilities be constructed with composite liners and leachate collection systems or other comparable, approved designs in order to prevent certain levels (Table 1, Sub-Part D) of pollutants from entering the waters of the State.

Although Class III Units constructed under Subtitle D regulations have composite liners and leachate collection systems, they are still Class III and, except in certain limited situations, cannot accept designated waste. In order for Subtitle D Class III units to be classified as Class II, they are required to have more stringent precipitation and drainage control, and a more stringent seismic design. They must also go through the California Environmental Quality Act (CEQA) process in order to receive a Class II classification, which includes the provision of an environmental impact report and requires public review.

While Subtitle D in itself does not require the construction of more Class II landfill units, this will more than likely be the result since liners and leachate collection systems are already being required. And because Class II units must only determine that a waste is not hazardous in order to be accepted, Class II upgrades are being actively encouraged by the Regional Boards in order to simplify the waste acceptance process.⁴¹

Furthermore, the State Water Resources Control Board is currently revising Chapter 15 to address Subtitle D regulations. The proposed revisions would eliminate the terms "designated waste" and "non-hazardous solid waste" from the classification system. Waste currently classified as "designated" or "non-hazardous solid" would be encompassed by the broader term "solid waste". The revised regulations would require Subtitle D containment (i.e., composite liners and leachate collection systems) for all solid waste. Landfill units not up to Subtitle D standards would, except in certain limited situations, be able to accept only benign waste (e.g., wood waste) and inert waste. Currently, the majority of landfill units in the Bay area are not up to Subtitle D standards, but many of the non-Subtitle D units are either low capacity, or old and nearing closure, and therefore accept a relatively small percentage the total amount of waste generated.

The proposed elimination of the term "designated waste" should simplify the decision making process for waste disposal. If the proposed changes are enacted, all Subtitle D or higher units could accept any non-hazardous waste. Non-Subtitle D landfill units wishing to accept waste other than inert waste would have to obtain site specific waste acceptance limits.

The increased number of Class II landfill units resulting from Subtitle D, and the simplified waste acceptance process in the proposed Chapter 15 revisions should greatly expand the opportunities for landfills to accept dredged material for use in their operations. Class II units are able to accept materials with higher levels of pollutants. Furthermore, if the proposed Chapter 15 revisions are

⁴¹Jon Marshack, 9/1/94.

enacted and the designated waste classification is eliminated, dredged material that is not hazardous will be classified as solid waste, and thus will be acceptable at any landfill permitted to accept solid waste. As previously noted, only an estimated 2 percent of all material dredged from the Bay is hazardous. Testing costs will also be reduced, since dredged material will only have to be determined non-hazardous in order to be acceptable at a solid waste landfill.

7.2 TESTING CONSIDERATIONS

Interim Testing Requirements for in-Bay disposal are contained in the Army Corps of Engineers Public Notice 93-2 jointly issued February 1, 1993, by the four agencies involved in the regulation of in-Bay disposal: the Corps, the EPA, the San Francisco Regional Board, and the BCDC. Testing guidelines for ocean disposal are found in the EPA/Corps *Evaluation of Dredged Material Proposed for Ocean Disposal*, or the "Green Book," issued February 1, 1993. In accordance with these guidelines, dredged material proposed for aquatic disposal must undergo elutriate analysis and be evaluated for water-column toxicity. The tests required for aquatic disposal are distinct from the bulk chemical and WET analyses required for disposal at a landfill.

The different testing requirements for aquatic and landfill disposal may prove to be an impediment to using dredged material in landfills. Because the direct costs to dredgers of aquatic disposal are usually lower, dredged material will most likely be tested for to aquatic disposal, and will only undergo testing for upland disposal if material has already been found to be unsuitable for unconfined aquatic disposal. This repetitive testing adds to the total disposal cost for the dredger. However, relative to the overall cost for testing for aquatic disposal, the tests required for landfill disposal are moderate. It would therefore seem advantageous for dredgers to perform these tests at the outset, particularly if there is already reason to believe that the material may not pass tests for aquatic disposal. Even if only aquatic disposal tests are run, archiving sampled material may save the cost to resample if further tests are necessary.

The minimum sampling and testing for in-Bay disposal under current in-Bay PN 93-2 protocol includes a control, a reference, and one "site." A "site" consists of one composite sample made from 4-5 core samples taken with a drop core device. The cost for sampling and testing is approximately \$9,000.⁴² If two testing sites are required, the cost is approximately \$12-13,000 and increases by \$3-4000 for each additional site. Table 7 outlines the minimum sediment sampling guidelines outlined in PN 93-2, including the number of testing sites required for varying volumes of dredged material.

⁴²Current ABT Laboratories prices, 7/19/94. Add an additional \$3000 – \$3500 for vibracore sampling.

TABLE 7

PN 93-2 Minimum Sediment Sampling Guidelines

Dredge Volume* (cy)	Total # Samples	# Samples Per Composite	Total # Tests (# sites)
5,000 - 20,000	4	4	1
20,000 - 100,000	8	4	2
100,000 - 200,000	12	4	3
200,000 - 300,000	16	4	4
300,000 - 400,000	20	4	5
400,000 - 500,000	24	4	6

* For project volumes less than 5,000 cy or greater than 500,000 cubic yards, the total number of tests and corresponding samples will be determined on a case-by-case basis.

Compared to the \$9000 for a single testing sample for in-Bay disposal, the cost for the Port of Oakland to test material to bring to Redwood Landfill was \$2525 per sample (includes barge costs and analytical sampling).⁴³ While upland testing is inexpensive when compared sample to sample with in-Bay testing, actual upland testing costs become exorbitant when multiplied by the number of testing samples per volume of material that have been required by individual landfills and the Regional Boards.

When the Port of Oakland brought 50,000 cy to Redwood Landfill, the San Francisco Regional Board and Redwood landfill required several cycles of testing to be performed on the material, resulting in a total of 25 samples, or one sample per 2000 cy of material (1:2000). Therefore the total testing cost for the 50,000 cy of material was \$63,125, as compared to the \$12-13,000 price tag for testing that volume of material for in-Bay disposal.

⁴³Jon Amdur, Port of Oakland. Personal Communication, 11/9/94.

TABLE 8

Comparison of Upland and In -Bay Testing Costs *

Dredge Volume (cy)	In-Bay Testing Cost**	Upland Testing Cost***
15,000	\$9,000	\$18,938
50,000	\$12,500	\$63,125
150,000	\$16,000	\$189,375

* All costs are approximate.

** Add an additional \$3-5,000 per site if a vibracore sampling is needed.

*** Amounts are based on the cost of the Port of Oakland to bring dredged material to Redwood Landfill.

An additional problem to testing material at the outset for upland disposal is that there are no uniform acceptance criteria between landfills. Partly because the Regional Board bases pollutant acceptance levels on the natural geology of the landfill site, but partly due to the individual concerns and/or unfamiliarity of landfill operator in accepting dredged material; required testing differs from landfill to landfill. Therefore, unless a specific landfill was chosen before testing was performed, so that testing could address all requirements for that particular landfill; incorporating upland testing requirements for all dredging projects would be costly and futile.

Certain regulations and revisions of existing regulations should facilitate coordination and uniform acceptance criteria at landfills throughout the Bay and Delta regions. Implementation of Subtitle D will provide uniformity in the construction of engineered controls at landfills. Assembly Bill (AB) 1220 of October 1, 1993 is another regulatory undertaking which will aid in the conformance of landfill standards and criteria. AB 1220 mandates landfill regulations of the State and Regional Board (Chapter 15) and the IWMB (Title 14) to be consolidated under Title 27. Title 27, which is presently being written, is designed to reduce overlap and conflict of landfill regulations between the two agencies. Regulations of Chapter 15 and Title 14 are being revised, updated, and incorporated into Title 27. While the State Board and the IWMB are working together, the Administrative Procedures Act limits their individual authority, and provisions must be adopted separately by the individual agencies. An AB 1220 group is working on deciding which agency will implement which regulations. A draft of Title 27 should be available in March.⁴⁴ The consolidation and clarifying of landfill regulations should facilitate the disposal of all material, and should aid in the development of programmatic acceptance of dredged material at landfills.

⁴⁴Bill Marshall, Central Valley Regional Board. Personal Communication, 11/28/94.

7.3 DAILY WASTE TONNAGE AND STATE SURCHARGE

The Solid Waste Facility permit limits the daily tonnage of waste that a landfill can accept. All waste, upon arrival, is weighed and subjected to a state disposal surcharge. The Board of Equalization (BOE) collects the state surcharge, currently \$1.20 per ton, for the IWMB from landfill operators based on daily tonnage reported. All material accepted at a landfill is included in the permitted daily tonnage of the facility and is subjected to the state surcharge, except for soil, either clean or contaminated, used for daily cover, or approved Alternative Daily Cover (ADC).⁴⁵ The exemption of contaminated soil from the state surcharge and daily tonnage is outlined in *LEA Advisory No. 5 "Use of Non-Hazardous Contaminated Soil as Daily Cover,"* issued by the IWMB on December 15, 1993. *LEA Advisory No. 5* states the following policies:

1. The use of non-hazardous contaminated soil as daily cover does not require a demonstration project pursuant to the Board's Alternative Daily Cover Policy of 1990 (discussed below).
2. Soil (clean or contaminated) used as daily cover will not be included in the permitted daily tonnage of the facility.
3. Soil (clean or contaminated) used as daily cover will not be subject to the landfill disposal surcharge.
4. The use of non-hazardous contaminated soil as daily cover must meet all required Air and Water Board rules and regulations.⁴⁶

Landfills interested in using dredged material in their operations have expressed concern that it would be included in the permitted tonnage and be subjected to the state surcharge. Subjecting dredged material to these requirements would discourage its use in a landfill's operations. A facility will be reluctant to accept a cover source if it will displace a volume of profitable, landfillable waste. If dredged material used at a facility is counted towards the tonnage limits, tonnage limits would need to be increased to incorporate such material in order not to reduce the landfillable waste volume. However, a change in daily tonnage limits would require a change in the SWF permit, and this could trigger a CEQA review. If such an extensive process is required, then the reuse of dredged material at landfills would not be feasible. Additionally, if dredged material is subject to the state surcharge, it will not make reuse infeasible, but will add to the already elevated costs of upland disposal at landfills.

Fortunately, dredged material appears to be considered in the same category as contaminated soil, and therefore if it were to be used for daily cover, would be exempt from counting towards tonnage or being subject to the state surcharge. However, the IWMB policy outlined in *LEA Advisory No. 5* specifically exempts contaminated soil used only as daily cover. While it would be reasonable to assume that this policy should incorporate dredged material and would be applied to any reuse option, this is not explicitly stated and therefore cannot be guaranteed until it is reflected in the policy.⁴⁷

⁴⁵Scott Walker, IWMB. Personal Communication, 1/7/94.

⁴⁶*LEA Advisory No. 5 "Use of Non-Hazardous Contaminated Soil as Daily Cover,"* 12/15/93.

⁴⁷Material accepted at landfills are also subject to local taxes. Regardless of exemption of reuse material from the state surcharge, local taxes may still be imposed. This is a policy decision of the local authority.

7.4 ALTERNATIVE DAILY COVER

The function of cover material in landfills is to minimize breeding areas for "vectors" (rats, mosquitoes, etc.) and animal attraction, control water movement to minimize moisture infiltration and erosion, minimize fire hazard potential, and control site aesthetics by controlling litter from blowing and by minimizing noxious odors. As long as these factors are controlled, the California Code of Regulations allows the IWMB to consider use of suitable cover material other than soil for use as daily cover.

Alternative Daily Cover (ADC) is cover material from generated wastes (green material, sludge, etc.) that were at least 0.001 percent of the jurisdiction's baseline disposed waste stream in 1990.⁴⁸ To be considered ADC, the material must also be referenced in the landfill's WDRs and the Solid Waste Facilities Permit. Landfill operators may be interested in using ADC to save disposal space in the landfill, and to save costs on having to import cover material.⁴⁹ In 1990, the IWMB adopted the Alternative Daily Cover Policy, which requires an operator intending to use ADC to submit a proposal to the IWMB for consideration of a one-year demonstration project. The use of dredged material as landfill cover would not be considered ADC, since dredged material is considered sediment and not a generated waste. Therefore dredged material does not require a demonstration project.⁵⁰ Instead dredged material used as daily cover would be subject to the IWMB Policy outlined in *LEA Advisory No. 5*.

7.5 WASTE DIVERSION GOALS

Assembly Bill 939 mandates that each incorporated city, and jointly all unincorporated areas of a county, in the state of California must reduce their "normally disposed of" waste stream from 1990 levels by 25 percent by the year 1995 and 50 percent by the year 2000.⁵¹ The term "normally disposed of" refers to waste types that were disposed in a permitted landfill, subsequent to any recycling or composting at that facility, at a level of 0.001 percent of the jurisdiction's baseline disposed waste stream [14 CCR 198720 (44)].⁵² Only reductions in waste types which are "normally disposed of" can be counted towards a jurisdiction's achievement of the 25-50 percent diversion mandates (PRC 41781).

Material used as ADC can be used towards the reduction goals until December 31, 1997, thereby contributing towards the AB 939 25 percent goal. This may have a negative effect on the use of dredged material as cover since it is not considered ADC and therefore cannot contribute to waste reduction goals. However, since only 7 percent of ADC can be used towards reduction goals, the result on the effect of promoting the use of dredged material in landfill operations will probably be minimal.⁵³

⁴⁸Tracy Harper, IWMB. Personal Communication, 1/7/94.

⁴⁹Scott Walker, IWMB. Personal Communication, 8/22/94.

⁵⁰Scott Walker, IWMB Personal Communication 1/18/94.

⁵¹Tracy Harper, 1/7/94.

⁵²IWMB Policy, Research and Technical Assistance Committee. Agenda Item: "Consideration of Staff Recommendations Concerning the Use of Waste Derived Material for Alternative Daily Cover," 7/7/93, p. 2.

⁵³Tracy Harper, 1/7/94.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 POTENTIAL FOR USE OF DREDGED MATERIAL IN LANDFILLS

8.1.1 Conclusions

Based on the information gathered in this analysis it is evident that dredged material can be used as a resource at Bay and Delta area landfills for use as cover, liner, capping, and on-site construction material. Landfills are safely able to use dredged material unsuitable for unconfined aquatic disposal, which makes them a promising disposal option for such material. However, using dredged sediment at Bay and Delta area landfills is largely an untapped resource.

8.1.2 Recommendations

The Corps, the EPA, the BCDC, the State Board, and the San Francisco Regional Board, the agencies involved in the LTMS and in regulating dredging operations, should actively promote the use of dredged material in landfills. The LTMS implementation plan should provide guidance to dredgers and should include a program to appropriately route dredged material to landfills.

The IWMB and/or state legislature should consider promulgating guidelines to require an increase in the proportion of waste (normally disposed waste, dredged material, sludge, etc.) used for cover material and other uses at landfills, taking into account environmental and economic considerations.

8.2 LANDFILLS RATED HIGHLY FEASIBLE FOR USING DREDGED MATERIAL

8.2.1 Conclusions

Sixteen of the 127 Bay and Delta area landfills that were studied have been identified as highly feasible for accepting dredged material for reuse purposes. (This does not include Redwood Landfill in Marin County which is already accepting dredged material for use as daily cover.)

The sixteen highly feasible landfill sites are located in eight different counties. They have a total capacity to accept over five million cy of dredged material for use in the landfills' operations, with individual site acceptance ranging from 35,000 cy to 2 million cy per year. The life expectancy for these sixteen landfills ranges from one to more than fifty years, with the mean average being nineteen years.

8.2.1 Recommendations

Landfills requiring smaller quantities of material, or those with short-term needs (e.g., for closure or temporary, on-site cover shortage) should not be discounted. Such smaller-scale opportunities may actually be more appropriate for individual dredging projects than landfills that have been ranked "more feasible" through this study.

8.3 REHANDLING DREDGED MATERIAL

8.3.1 Conclusions

Landfills cannot accept dredged material with greater than a 50 percent moisture content. Therefore, dredged material needs to be dried at a rehandling facility prior to being used in a waste management unit at a landfill site.

In order for it to become a common practice to use dredged material at landfills, facilities to dry and rehandle sediment must be available. Few rehandling sites currently exist. Reuse of dredged material will not become widespread until more rehandling facilities are established.

8.3.2 Recommendations

LTMS implementation should include establishment of rehandling facilities with capacity to supply landfills with enough dried sediment to satisfy their needs. Government should either construct and operate the rehandling facilities or provide incentives to private parties to do so.

8.4 PERMEABILITY OF DREDGED SEDIMENT

8.4.1 Conclusions

Dredged material is typically heterogeneous in composition with variations in permeability found throughout the material. The heterogeneity of the material may prove a drawback for its use in landfills for uses that have specified permeability requirements.

Rehandling facilities have the capability to segregate material by grain size .

8.4.2 Recommendations

Segregation by grain size to obtain low permeability material, should be a priority in consideration of the final design of the rehandling site and during dredged material placement operations.

8.5 LANDFILL DISPOSAL COSTS

8.5.1 Conclusions

Rehandling as an intermediary step significantly increases transport costs in the disposal of dredged material at landfills. The average transport cost to bring dredged material to a landfill is significantly higher than the cost associated with transport for disposal at aquatic sites.

Landfills charge a tipping fee for accepting waste at their facility. Fees vary from facility to facility. Tipping fees for landfill units with greater engineering controls (Class II) are higher than for units with less stringent controls (Class III). Volume discounts are often given, but vary in amount. Landfills will pay for dredged material to be used in their operations (e.g., for daily cover), depending on the composition of the waste and the need of the landfill to acquire such material. Otherwise landfills will discount or waive fees to accept waste to be used in their operations.

Dredgers will choose less expensive disposal options, such as aquatic disposal, unless these alternatives are not available to them (e.g., when material fails testing for aquatic disposal).

There are few alternatives available for disposal of dredged material that fails testing for aquatic disposal.

8.6 ENGINEERED CONTROLS AT WASTE FACILITIES

8.6.1 Conclusions

The proposed elimination of the designated waste classification and more stringent federal requirements for landfill liners and leachate collection systems should result in an increase in the construction of landfill units with greater engineered controls to separate wastes from the surrounding environment. This will greatly expand the opportunity and flexibility for landfills to accept dredged material for use in their operations.

8.6.2 Recommendations

The Regional Boards should continue to encourage the construction of Class II landfill units over the less stringent Class III units, and should enact the proposed Chapter 15 revisions. This would simplify the waste acceptance process and reduce sediment testing requirements, since under the proposed system, material would only need to be determined "non-hazardous" as opposed to "non-designated" in order to be acceptable at the majority of landfills.

8.7 TESTING CONSIDERATIONS

8.7.1 Conclusions

Presently, there are separate tests for aquatic and landfill disposal. Tests for aquatic disposal are helpful but cannot substitute for the tests needed to dispose material at landfills.

Relative to the overall cost for testing for aquatic disposal, the addition of the Waste Extraction Test and permeability analyses required for landfill disposal are inexpensive.

While upland testing is inexpensive when compared sample to sample with in-Bay testing, actual upland testing costs become exorbitant when multiplied by the number of testing samples per volume of material that have been required by individual landfills and the Regional Boards due to their unfamiliarity with the characteristics of dredged material.

8.7.2 Recommendations

The LTMS implementation should include outreach to landfill operators to better familiarize them with dredged material.

The Regional Boards should provide guidance to landfills on appropriate sampling plans for dredged material which would reasonably represent the material's composition.

As part of the LTMS agencies' revision of testing guidelines to dredgers, tests required by landfills should be specified and recommended particularly for sites suspected or known not to pass aquatic testing.

As part of the revision of testing guidelines to dredgers, the LTMS should also recommend archiving sampled material in order to save costs of resampling if further tests are needed.

8.8 DAILY WASTE TONNAGE AND STATE SURCHARGE

8.8.1 Conclusions

The SWF permit limits the daily tonnage of waste that a landfill can accept. All waste upon arrival at a landfill is weighed and subject to a state disposal surcharge. The Board Of Equalization collects the surcharge for the IWMB from the landfill operators based on daily tonnage reported.

IWMB policy exempts contaminated soil used as daily cover from inclusion in the permitted daily tonnage and from the state surcharge.

If dredged material used at a facility is counted toward the tonnage limits, a facility will be reluctant to accept it as a cover source if it will displace a volume of profitable, landfillable waste.

If dredged material used at a facility is subject to the state surcharge it will add to the already elevated costs of upland disposal at landfills.

8.8.2 Recommendations

As part of the LTMS implementation, the IWMB should expand their current policy on the use of contaminated soil as daily cover to include dredged material used at landfills, and to expand the exemption for any productive use at the landfill.

8.9 LANDFILL ACCEPTANCE CRITERIA

8.9.1 Conclusions

Currently it is the burden of the dredger to determine all the requirements applicable to landfills and to contact landfills on a case-by-case basis to determine which facilities will accept material from their project.

8.9.2 Recommendations

As part of the LTMS implementation, a programmatic process should be established to match characteristics of dredged material with disposal requirements at landfills in order to simplify the placement of dredged material in an appropriate facility.

The LTMS agencies should consider what further actions can be taken to integrate the regulatory process for landfill use of dredged material into the revised LTMS process for processing dredging and disposal permits.

APPENDIX A



REDWOOD LANDFILL CASE STUDY

Dredged Material Use at Redwood Landfill

1. Project Overview and Goals

In 1991 and 1992, BCDC helped coordinate projects with the Ports of San Francisco and Oakland where dredged materials will be used at Redwood Landfill in Marin County.

2. Environmental Setting

Redwood Landfill Inc. (Redwood), a wholly owned subsidiary of Sanifill, Inc., is located four miles north of Novato, along San Antonio Creek, a tributary of the Petaluma River (see Figure 15). The landfill is located on former Bay tidal marsh and has been in operation since 1958, receiving about 95 percent of all Marin County municipal solid waste, about 1,350 tons daily. The landfill uses approximately 350 cy of earth material daily for cover, or roughly 125,000 cy annually.

In July 1993, Marin County issued a Draft Environmental Impact Report (Draft EIR) for a proposed vertical expansion and other changes to the landfill. Under the proposal, the landfill would have an operating life of approximately 48 years. The Draft EIR proposes using dredged materials from a variety of sources (including Port Sonoma-Marín and the Ports of San Francisco and Oakland) to construct a two-foot thick liner for a sludge processing area and for levee construction and repair.

A network of artificial channels and natural sloughs nearly encircle the site. San Antonio Creek, the largest of these waterways, is not currently deep or wide enough to accommodate deep draft barge traffic. It would cost \$420,000 to \$480,000 to dredge San Antonio Creek to provide barge access to the site; any proposal to dredge the creek would likely involve a lengthy and difficult environmental review and permit process due to the potential impacts of dredging on existing wetlands.

3. Project Details

a. **Background.** Since 1990, Redwood has accepted approximately 500,000 cy of dredged materials from the Petaluma River, Gallinas Creek, and Port Sonoma-Marín, which have been incorporated into the landfill as waste or used for on-site construction material and liners. Since Redwood is one of the few Bay Area landfills that has demonstrated an interest in accepting and using dredged material, it was selected as a potential site for using dredged material from two projects which BCDC helped facilitate and coordinate.

The two projects involve using 12,000 cy of dredged material from the Port of San Francisco and 21,000 cy of material from the Port of Oakland at Redwood (see section on the Rehandling Facility at Port Sonoma-Marín for a complete discussion of these two dredging projects). In both cases, the material was determined to have contaminant levels too high for Bay disposal but low enough for use at the landfill. Because of the lack of barge access to Redwood, dredged material from the Port of San Francisco and the Port of Oakland was initially taken to the Port Sonoma-Marín rehandling facility in November 1991 and October 1992, respectively, where it is currently drying. Once dry, the material will be trucked to the landfill and used where needed.

b. **Project Design.** There is no specific plan for use of the dredged material at the landfill; the material will simply be incorporated into the facility when and where it is needed.

c. **Permits and Contracts.** Zoned for agricultural use, Redwood has operated at its current site pursuant to a County Use Permit issued in 1958. Since 1978, Redwood's operations have been governed by a Solid Waste Facilities permit issued by Marin County Environmental Health Services with the concurrence of the California Integrated Waste Management Board. The landfill is outside BCDC's jurisdiction, and only two very small wetlands along the edge of the 460-acre landfill are subject to wetland regulatory authority. These wetlands are not affected by current disposal operations.

Redwood, in conjunction with the Regional Board, determined that the dredged material from both the Port of San Francisco and the Port of Oakland were non-hazardous, consistent with the site's WDR, and suitable for use as daily cover.

The Port of San Francisco entered into a contract with Port-Sonoma Marin to rehandle 12,000 cy of the Port's material. Redwood has an existing agreement with Port Sonoma-Marin whereby Port Sonoma-Marin pays \$0.25 per cy to Redwood to excavate and haul dried dredged material from its rehandling ponds. Approximately 4,000 cy of the Port of San Francisco's material has been hauled to the landfill for use. Port Sonoma-Marin is currently looking for other users to excavate and haul the remaining material at no charge to avoid the \$0.25 per cy charged by Redwood for material taken to the landfill.

For the Port of Oakland material, Port Sonoma-Marin was concerned that the notoriety surrounding the material's contaminant levels would deter potential users from accepting the material. To ensure that the Port of Oakland's material would not permanently reside at its rehandling ponds thereby reducing capacity for other potential customers, Port Sonoma-Marin insisted that the Port of Oakland first secure a user for its material before agreeing to accept it. It was for this reason that Redwood was included in the contractual agreement between the Port of Oakland and Port Sonoma-Marin for the disposal of the Port's material.

d. **Issues, Project Results and Current Status.** To date, the material from both dredging projects continues to dry at Port Sonoma-Marin's rehandling ponds, with the exception of approximately 4,000 cy of the Port of San Francisco's material which has been taken to Redwood Landfill. It is anticipated that the Port of Oakland's material will be dry enough for transport to Redwood by the spring of 1994.

e. **Costs.** The Port of San Francisco ultimately paid approximately \$22.50 per cy or a total of about \$270,000 to dredge, barge, and off-load 12,000 cy of material. The Port of Oakland paid about \$18 per cy or a total of \$378,000 for dredging, hauling, and off-loading 21,000 cy of material.

4. **Conclusions**

- Dredged materials, including these deemed unsuitable for open-water disposal, can be used at landfills for daily cover, capping material, liners, and levee construction.
- The higher cost is the major drawback of disposing dredged materials at landfills. It cost the Port of Oakland \$18 per cy and the Port of San Francisco \$22.50 per cy to dispose of dredged materials at Redwood Landfill, compared with approximately \$4 per cy for disposal at the federally designated Bay Alcatraz disposal site. In evaluating disposal costs, however, it is important to remember that the contaminant levels of the dredged materials taken to Redwood were too high for Bay disposal. The availability of an upland disposal site, despite the higher costs, enabled both dredging projects to proceed in a timely manner, thereby benefiting both Ports by allowing their facilities to remain open to shipping.
- The two factors most responsible for the higher costs associated with disposal of dredged material at landfills are: (1) the extra handling needed to off-load barges, "work" the dredged material to promote drying, load trucks and transport the materials to landfills; and

(2) increased transportation costs due to longer distances traveled. The experimental nature of the projects and the relatively small volumes of material disposed also contributed to higher costs.

- Higher costs are also linked to the characteristics of the disposed material. Finer-grained materials with lower water permeability can be used for capping and lining wastes and thus are more valuable to landfills which would charge less for their disposal. According to Redwood, the material from both dredging projects was fairly permeable and useful only as daily cover.
- Redwood will likely continue to accept and use dredged material in the future, particularly if its plans to expand and improve existing operations are approved.



APPENDIX B



INITIAL SITE SCREEN PAGE 1

INITIAL SITE SCREEN/ DISPOSAL OPTIONS SCREEN								
				DISPOSAL OPTIONS				
CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE
SC_1 SUBSTANTIAL DEVELOPMENT ON SITE	Y/N	1 0	X	X	X	X	X	X
SC_2 SITE RESERVED FOR RECREATION	Y/N	1 0	X	X	X	X	X	X
SC_3 DISPOSAL CAPACITY REACHED	Y/N	1 0	X	X	X	X	X	X
SC_5 CAPACITY < 40KCY/Yr	Y/N	1 0	X	X	X	X	X	X
SC_6 SITE LOCATED BEYOND SF BAY BASIN	Y/N	1 0	X	X	X	X	X	X
CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE

INITIAL SITE SCREEN PAGE 2

SC_7 SITE MORE THAN 60 MILES FROM PINOLE POINT	Y/N	1 0	X	X	X	X	X	X
DC_1 SITE AREA > = 15 ACRES	Y/N	1 0	X			X		
DC_2 SITE AREA > = 15 ACRES	Y/N	1 0		X				
DC_3 AN EXISTING LANDFILL	Y/N	1 0			X			
DC_4 LEVEE LENGTH > 1 MILE	Y/N	1 0					X	
DC_5 CAPACITY > 40KCY/Yr.	Y/N	1 0						X
CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEVEE REHABILITATION	ULTIMATE USE

INITIAL SITE SCREEN PAGE 3

WD_1 ADJACENT TO NAVIGABLE (>8 FT. MLLW) CHANNEL OR CAN DREDGE (0 FT. MLLW WIDTH > 150 FT.)	Y/N	1 0					X	
WD_2 LESS THAN 10 MILES FROM NAVIGABLE CHANNEL > 8 FT. MLLW	Y/N	1 0	X	X		X		X
WD_4 GRADIENT < 6%	Y/N	1 0	X	X				
WD_6 SITE ELEVATION 1 FT. BELOW MHW	Y/N	1 0			NO WET DISPOSAL	X		
WD_7 EXISTING LEVEE HEIGHTS > 6 FT.	Y/N	1 0	X	X				
DD_1 LESS THAN 1 Hr (1 WAY TRUCK TRAVEL TIME) FROM EXISTING OR POTENTIAL REPROCESSING SITE	Y/N	1 0	X	WET DISPOSAL ONLY	X	WET DISPOSAL ONLY	X	X

PRIMARY SCREEN PAGE 1

PRIMARY SCREEN			DISPOSAL OPTIONS						
	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE
LAND USE	1.1 COMPATIBLE USE	VACANT = 10 ACTIVE AGRICULTURE = 7 DEVELOPED = 2	10, 7, 2	X	X		X		
	1.2 INCOMPATIBLE DEVELOPMENT PROPOSAL	NONE = 10 PROPOSED = 7 UNDER REVIEW = 5 APPROVED = 2	10, 7, 5, 2	X	X		X		
ENGINEERING	3.1.1 A/B DISPOSAL AREA	AREA > 500 AC. = 20 15 < AREA < 500; .0392 * (AREA - 15) + 1 AREA < 15 AC. = 1	ACRES	X	X				
	3.1.1 C VOLUME CAPACITY (LANDFILL)	VOLUME > 1000 KCY = 20 40 KCY < VOL. < 1000 KCY: 2.2192E-5 * VOL ² - 2.3288E-3 * VOL + 1.096 VOLUME < 40 KCY = 1	VOLUME (KCY)			X			
	3.1.1 D & F VOLUME CAPACITY	VOLUME > 5000 KCY = 20 40 KCY < VOL < 5000 KCY; .003831 * (VOL - 40) + 1 VOLUME < 40 KCY = 1	VOLUME (KCY)				X		X
	3.1.1 E VOLUME CAPACITY	VOLUME > 3000 KCY = 20 600 KCY < VOLUME < 3000 KCY; 7.817E-3 * (VOL - 600) + 1 VOLUME < 300 KCY = 1	VOLUME (KCY)					X	

PRIMARY SCREEN PAGE 2

	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE
	3.2.1 DISTANCE FROM ACCESS CHANNEL	ADJACENT = 10 < 1.5 MILES = 9 1.5 TO 2.8 MILES = 8 2.8 TO 5 MILES = 3 5-10 MILES = 2	DISTANCE X.XX MILES	X	X		X	X	
	3.2.1c PERCENTAGE OF LEVEES ADJACENT TO NAVIGABLE ACCESS CHANNEL	100% = 10 0 < PERCENT < 100; SCORE = 0.08 * (PERCENT) + 2 0% = 2	0 TO 100%					X	
	3.2.1.c.i MATERIAL REQUIRED PER LEEVE MILE	100KCY = 10 50KCY = 8	10, 8					X	
	3.3.1 TRAVEL TIME FROM REPROCESSING SITE	0 < TIME < 1; -6 * TIME + 10	TIME IN 0.XX HRS	X		X		X	X
	3.5.1 RECEIVING WATER QUALITY (ENGINEERING)	NONE EXPOSED = 8 SALINE = 5 BRACKISH = 3 FRESH = 2 DRINKING WATER AQUIFER = 1	8, 5, 3, 2, 1	X					
ENVIRONMENTAL	4.1.1 RECEIVING WATER QUALITY (ENVIRONMENTAL)	SALINE = 8 BRACKISH = 6 FRESH = 2	8, 6, 2	X	X		X	X	

PRIMARY SCREEN PAGE 3

	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE
	4.2.1 PRESENCE OF SENSITIVE SPECIES OR HABITATS	NO = 10 UNLIKELY = 7 LIKELY = 3 YES = 1	1, 3, 7, 10	X	X		X	X	
	4.2.2 PRESENCE OF WETLANDS OR RIPARIAN AREAS	NO = 10 UNLIKELY = 8 LIKELY = 4 YES = 2	2, 4, 8, 10	X	X		X	X	
POTENTIAL BENEFITS OF D.M.	5.1.1 TOTAL POTENTIAL NEED FOR DREDGED MATERIAL WITHIN 1 HOUR TRUCK TIME (ONE WAY)	VOL > 1000KCY = 10 40KCY < VOL < 1000KCY; .009375 * (VOL-40) + 1 VOL < 40KCY = 1	VOLUME (KCY)		X				
USE AT SITE	5.1.2 NUMBER OF NEEDS WITHIN 10 MILES	MORE THAN 4 = 10 THREE = 9 TWO = 8 ONE = 6 NONE = 5	NUMBER OF NEEDS		X				

PRIMARY SCREEN PAGE 4

	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEVEE REHABILITATION	ULTIMATE USE
	5.2 NEED FOR SOIL FOR USE AS COVER OR LINER ON SITE	NEED SEDIMENT = 10 ALTERNATE AVAILABLE = 7 NONE = 1	10, 7, 1			X			
	5.3 TIDAL AND OR SEASONAL WETLAND AREA TO BE CREATED	> 1000 ACRES = 8 5ACRES < AREA < 1000ACRES; .007 * (AREA-5) + 1 < 5ACRES = 1	AREA IN ACRES				X		
	5.4 DETERIORATED LEVEES REQUIRING SOIL ON SITE	NEED SEDIMENT = 10 ALTERNATE AVAILABLE = 7 NONE = 1	10, 7, 1					X	X
	5.5 OTHER NEED FOR SOIL ON SITE	NEED SEDIMENT = 10 ALTERNATE AVAILABLE = 7 NONE = 1	10, 7, 1						X

SECONDARY SCREEN PAGE 1

SECONDARY SCREEN			DISPOSAL OPTIONS						
	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEVEE REHABILITATION	ULTIMATE USE
LAND USE	1.3 A-F OWNERSHIP FOR DISPOSAL OPTION	AVAILABLE = 10 UNAVAILABLE = 1	10. 1	X	X		X		
	1.4 ZONE/ GENERAL PLAN	COMPATIBLE = 10 INCOMPATIBLE = 1	10. 1	X	X		X		
REGULATORY	2.1 ENDANGERED SPECIES	DOES NOT APPLY = 10 UNLIKELY = 8 LIKELY = 4 APPLIES = 1	10. 8. 4. 1	X	X		X	X	
PROCESS	2.2 HAZARDOUS MATERIAL	DOES NOT APPLY = 10 UNLIKELY = 8 LIKELY = 4 APPLIES = 1	10. 8. 4. 1	X	X		X	X	
ENGINEERING	3.2.2 DEPTH OF ACCESS CHANNEL	DEPTH > 16 FT. = 20 0 < DEPTH < 16 FT.; 1.3*(DEPTH) + 1 DEPTH < 0 FT. = 1	DEPTH IN FEET MLLW	X	X		X	X	X
	3.3.2 AVAILABILITY OF ROADS/ RAIL	EXISTS AT SITE = 10 < 1.0MILES OF CONSTRUCTION REQUIRED = 8 SIGNIFICANT GEOGRAPHIC BARRIERS = 1	10. 8. 1	X	X			X	X

SECONDARY SCREEN PAGE 2

	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE
	3.4.1 LEVEES EXIST; WITHSTAND 100 YR. EVENT FOR CD AND RR: AND 10YR. EVENT FOR HD	YES = 10 PARTIAL = 7 NONE = 1	10. 7. 1	X	X		X		
	3.4.2 ROADS OR UTILITIES CROSS THE SITE	NONE = 10 MINOR(RELOC. FEASIBLE) = 8 MAJOR(RELOC. INFEASIBLE) = 2	10. 8. 2	X	X		X		
	3.5.2 EARTHQUAKE PROTECTION; DISTANCE TO NEAREST HOLOCENE FAULT (FEET)	> 1000 FEET = 6 200 TO 1000 FEET = 5 100 TO 200 FEET = 2 < = 100 FEET = 1	6. 5. 2. 1	X					
	3.5.3 MAXIMUM FILL HEIGHT (SOIL BEARING > 1000 PSF)	> 10 FEET = 10 < 10 FEET = 2	10. 2	X					
ENVIRONMENTAL	4.3 IMPACT TO NEARBY SENSITIVE RECEPTOR	YES = 1 LIKELY = 3 UNLIKELY = 8 NO = 10	1, 3, 8, 10	X	X		X	X	X

TERTIARY SCREEN PAGE 1

TERTIARY SCREEN			DISPOSAL OPTIONS						
	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE
LAND USE	1.5 WILLIAMSON ACT	NONE = 10 IN-PLACE = 4	10, 4	X	X		X		X
	1.6 PROJECT SPONSOR FOR DISPOSAL OPTION	EXISTS = 10 NONE = 1	10, 1	X	X		X	X	X
REGULATORY	1.7 UTILITY EASEMENTS	NONE OR NON- RESTRICTIVE = 10 PARTIAL = 5 RESTRICTIVE = 1	10, 5, 1	X	X		X	X	X
PROCESS	2.3 NUMBER OF JURISDICTIONS OR PERMITS	ONE = 10 TWO OR THREE = 8 FOUR OR FIVE = 5 MORE THAN FIVE = 3	NUMBER OF PERMITS	X	X		X	X	X
ENGINEERING	3.1.3 GRADIENT	< 1.5% = 6 1.5% < GRADIENT < 6% = 0.833 * (1.5-GRAD) + 1 > 6% = 1	0.00%	X	X		X		
	3.2.4 OFFLOAD FACILITY FOR PUMPING	PRACTICAL = 10 FEASIBLE = 5 UNFEASIBLE = 1	10, 5, 1	X	X		X	X	

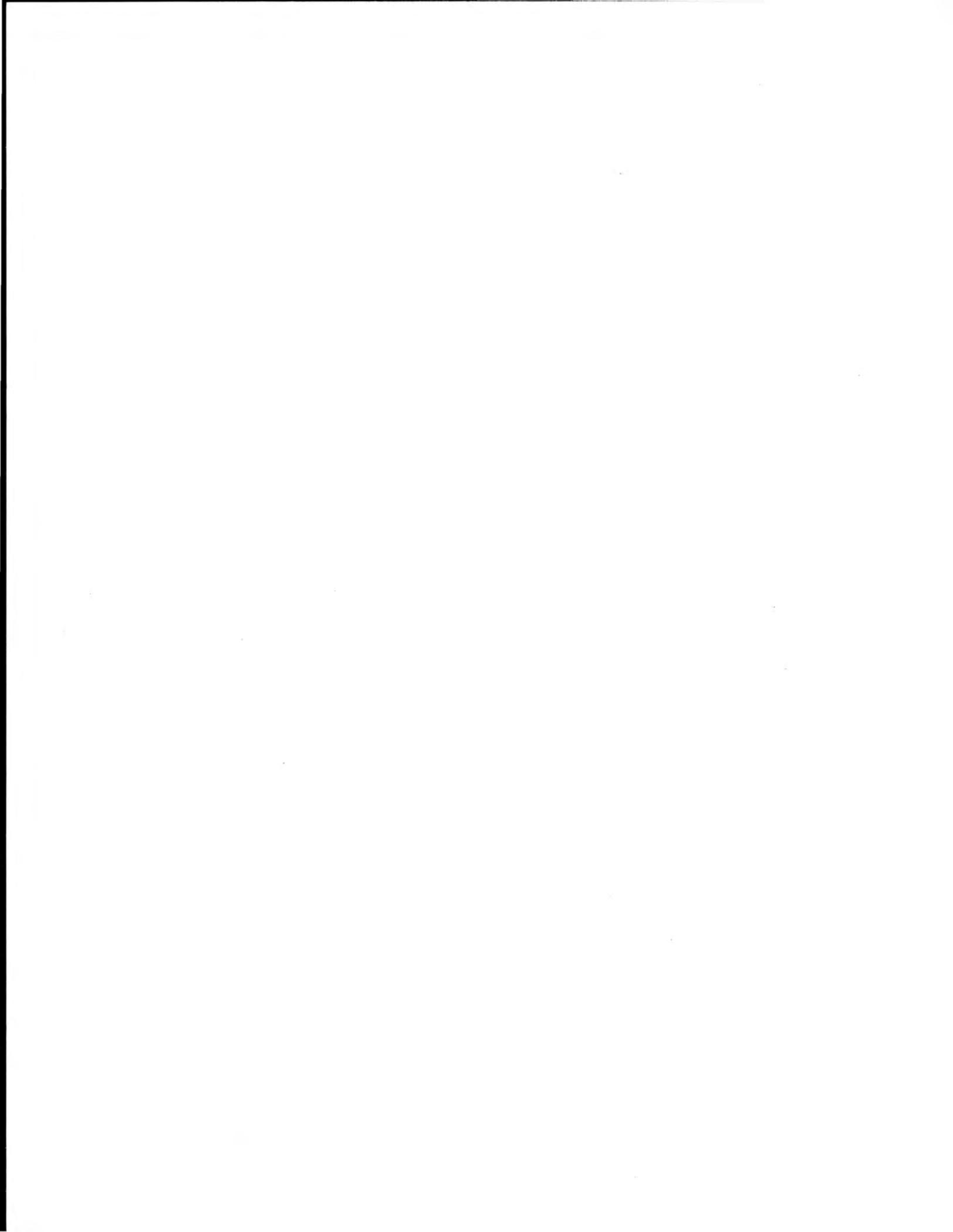
TERTIARY SCREEN PAGE 2

	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEEVE REHABILITATION	ULTIMATE USE
	3.2.5 PIPE EASEMENT	EASEMENT EXISTS = 10 NO SIGNIFICANT IMPEDIMENTS = 5 LOW FEASIBILITY = 1	10. 5. 1	X	X		X		
	3.2.6 OFFLOAD FACILITY FEASIBLE FOR CLAMSHELL	OFFLOADING SITE EXISTS = 8 LANDING AREA EXISTS = 6 INFEASIBLE = 1	8. 6. 1	X	X			X	X
	3.2.7 TRUCK ACCESS TO/ FROM OFFLOADING SITE	ROAD EXISTS = 8 SOME CONSTRUCTION REQ. = 6 NONE = 1	8. 6. 1					X	X
	3.4.4 SOIL STRENGTH SOIL BEARING PRESSURE (SBP)	SBP > 2000 = 10 1000 < SBP < 1500 = 22 * (SBP-1) ^ 2 1500 < SBP < 2000 = 14 * (SBP-2) ^ 2 + 10 SBP < 1000 PSF = 1	SBP IN 1000'S OF PSF (e.g. 2000 = 2)	X	X		X		X
	3.4.5 AVAILABILITY OF DIKING MATERIAL	BELIEVED PRESENT = 20 BELIEVED PRESENT OR NEARBY = 16 NOT EXPECTED ON SITE OR NEARBY = 1	20, 16, 1	X	X		X		
	3.4.6 GROUND WATER SALINITY	SALINE = 10 BRACKISH = 6 FRESH = 1	10. 5. 1	X	X		X	X	X
	3.4.7 DRAINAGE SYSTEM	OPEN CHANNEL/ GRAVITY = 10 PUMPED = 5	10. 5	X	X		X		

TERTIARY SCREEN PAGE 3

	CRITERIA	CATEGORY	DATA ENTRY CODE	CONFINED DISPOSAL	RECLAMATION REPROCESS	LANDFILL COVER	HABITAT DEVELOPMENT	LEVEE REHABILITATION	ULTIMATE USE
	3.5.4 FLOOD PROTECTION (RELATIVE TO 100 YEAR FLOODING EVENT)	NOT IN FLOOD PLAIN = 10 IN FLOOD PLAIN = 1	10. 1	X	X				
ENVIRONMENTAL	4.4 CULTURAL RESOURCE DEGRADATION	NO = 10 UNLIKELY = 8 LIKELY = 3 YES = 1	10. 8. 3. 1	X	X		X	X	

APPENDIX C



ACME LANDFILL

Preliminary Assessment

Interest: Moderate

Cost: \$0-85/cy (depends on various factors)

Distance: 2 miles from Suisun Bay; Contra Costa County Map, #2

Additional Advantages:

Additional Disadvantages: adjacent wetlands, closure (one time)

Overall: Low

FACILITY DATA

Name: ACME Landfill

Location: Waterbird WY: 1 Mi. S. Waterfront Rd

City/State: Martinez, CA

County: Contra Costa

Class: Class III, mainly a transfer station now.

Operational Status: Active

SUBTITLE D Compliance Schedule: As much as a 30yr old landfill can be.

Closure Year: 5-6 yrs left

CONTACT I.

Name: Michael Reed

Title: President

Phone Number: (510) 228-7099

Company: ACME Fill Corp.

Address: P.O. Box 1108

Place: Martinez, CA 94553

CONTACT II.

Name:

Title:

Phone Number: (510) 228-6525

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/7/94 and 3/12/94 phone conversations with Michael Reed

Interest: Some

Amount/Type: few hundred thousand yards of final cover and cap material

Cost (does not include transportation costs): Based on quantity, quality, and need, would charge anywhere from \$84.60 to \$0. Would not pay for material.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Title 22 regs

% Solids: minimum of 50% required, but they would only take drier material.

On-Site Drying/Stockpiling: No

Permeability: 10^{-5} or greater

Origin: no restrictions

ACCESS

Truck: Off Hwy 680, south of Carquinez Bridge and north of Junction 4

Rail: no

Barge: no

Additional Comments: wetland adjacent to site

ALTAMONT SANITARY LANDFILL

Preliminary Assessment

Interest: High

Cost: \$11.50/cyd

Distance: 30 miles from south Bay; Alameda County map, #12

Additional Advantages: 50+ years capacity, may have stockpile room

Additional Disadvantages:

Overall: Moderate

FACILITY DATA

Name: Altamont Sanitary Landfill

Location: 10840 Altamont Pass Road

City/State: Livermore, CA

County: Alameda

Class: Class III Landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: Have a Subtitle D compliant site ready. It will receive a Class II rating in June.

Closure Year: Currently going through expansion, will extend capacity for 50 years or more.

CONTACT I.

Name: Mr. Bob Peterson

Title: General Landfill Manager

Phone Number: (510) 449-6349

Company: Waste Management of Alameda County

Address: 10840 Altamont Pass Road

Place: Livermore, CA 94550

CONTACT II.

Name:

Title:

Phone Number:

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/7/94 and 3/29/94 phone conversations with Bob Peterson.

Interest: High

Amount/Type: 1500cyds/day cover material

Cost (does not include transportation costs): Current daily cover is stockpiled on site and the material is free, therefore they would not pay for dredged material. Price would depend on volume discount and moisture content. The gate rate for soil is \$11.50/cyd, sludge is more expensive.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels:

% Solids: 50%

On-Site Drying/Stockpiling: No on site drying potential, may have room to stockpile.

Permeability: None

Origin: Can receive from Alameda & SF counties, plus sludge from other counties.

ACCESS

Truck: 580 East past 680 go to Livermore. Exit at Greenville Road/Altamont Pass Road. Take a left on Greenville and a right on Altamont.

Rail: Possibility, rail goes right by the landfill.

Barge: None

Additional Comments: Referred to sister landfill Tri-Cities.

AMERICAN CANYON SANITARY LANDFILL

Preliminary Assessment

Interest: High, very interested

Cost: depending on material would either pay or charge

Distance: 6 miles from San Pablo Bay [Napa County map, #21]

Additional Advantages: can accept 125K cyds wet material with possible barge access

Additional Disadvantages: closure (one time)

Overall: High

FACILITY DATA

Name: American Canyon Sanitary Landfill

Location: Western Terminus of Eucalyptus Drive - 9 mi. south of Napa

City/State: Napa, CA

County: Napa

Class:

Operational Status: Active

SUBTITLE D Compliance Schedule: N/A

Closure Year: Nov./Dec. 1994

CONTACT I.

Name: Mr. Trent Cave

Title: Manager

Phone Number: (707) 253-4471

Company: S Napa Cnty Joint Powers Authority

Address:

Place:

CONTACT II.

Name: Ralph Hunter

Title: LEA

Phone Number: (707) 253-4269

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/16/94 phone conversation with Trent Cave and Ralph Hunter. (Peter Freisman 2/15 Operator (707) 552-3112.) 3/13/94 with Trent Cave

Interest: High. Very interested.

Amount/Type: Borrow source, do need final cover Final cap to be placed in dry season of 1995. Need final cover, plus have additional capacity for additional placement of material in a low lying area. Do have a leachate containment system. Need 250,000 cyds for both uses (split 50/50 between the two).

Cost (does not include transportation costs): Depends for the right material that is dry, would pay. Otherwise they would charge.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: In specs, lower requirements for low lying area.

% Solids: final cover: dry; low lying: can take wet and let it dry.

On-Site Drying/Stockpiling: Possible. Have a pond within the footprint of the landfill which is a possible place for dewatering.

Permeability: final cover: 10^{-6}

Origin: no restrictions

ACCESS

Truck: End of Eucalyptus Drive off of Hwy 29.

Rail: no

Barge: Possible. Right on the Napa River which is navigable, but mudflats between them and river

Additional Comments: Should contact the Napa Flood Control District. Mike Prtall or Bob Sorcen at (707) 253-4351. They have spoils ponds for flood control district, but not enough capacity, but may be interested.

B & J LANDFILL

Preliminary Assessment

Interest: willing

Cost: \$10-20/cyd

Distance: 20 miles from Suisun Bay [Solano County map, #20]

Additional Advantages: 50+ years capacity

Additional Disadvantages:

Overall: Low

FACILITY DATA

Name: B & J Landfill

Location: 6426 Hay Road; 1/4 Mi. W Hwy 113

City/State: Vacaville, CA

County: Solano

Class: Class III

Operational Status: Active

SUBTITLE D Compliance Schedule: In compliance

Closure Year: 2040

CONTACT I.

Name: Mr. Chris Choat

Title:

Phone Number: (916) 678-4718

Company: Vaca Fill

Address: 831 Davis Street

Place: Vacaville, CA 95687

CONTACT II.

Name: Tom Santini

Title: project marketing

Phone Number: (800) 794-2768

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/14/94 and 4/11/94 phone interviews with Chris Choat

Interest: Willing, but concerns about RWQCB acceptability, moisture, staging area, truck traffic, etc.

Amount/Type: For use as daily cover, use 36,000cyds/yr. Currently use soil on site and import soil contaminated soils with hydro carbons.

Cost (does not include transportation costs): \$10-20/cyd. Would not pay for material.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: listed in specs

% Solids: 50%

On-Site Drying/Stockpiling: Not too much room.

Permeability: 10^{-7}

Origin: No restrictions

ACCESS

Truck: Hwy 80 through Vacaville to south Leisuretown Road, go east on Fry, south on Lewis, and east on Hay rd.

Close to Hwy 80 and 5 miles from Montezuma.

Rail: no

Barge: no

Additional Comments:

CENTRAL LANDFILL

Preliminary Assessment

Interest: high interest

Cost: no charge

Distance: 18 miles from San Pablo Bay

Additional Advantages: close to potential rehandling facility in Petaluma; +150K cy

Additional Disadvantages:

Overall: High

FACILITY DATA

Name: Central Landfill

Location: 500 Mecham Road

City/State: Petaluma, CA

County: Sonoma

Class: Class III

Operational Status: Active

SUBTITLE D Compliance Schedule: currently upgrading

Closure Year: 2005 -- 2015 with expansion

CONTACT I.

Name: Ken Wells

Title: Sonoma County Integrated Waste Manager

Phone Number: (707) 527-2231/3788

Company: Sonoma County Dept. of Public Works

Address: 575 Administration Drive

Place: Santa Rosa, CA 95401

CONTACT II.

Name: Rich Doble

Title: Operations Manager

Phone Number: (707) 792-0547

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 9/23/94 phone interview with Ken Wells

Interest: high

Amount/Type: use approximately 150,000 cy of cover material per year. They are expected to be operating for approximately ten more years and have on-site material for approximately five of those years. May be undergoing expansion for another 10 years and could then use another 5 yrs. worth of cover material.

Cost (does not include transportation costs): Would not charge if would use the material if quantity greater than 200 cy

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: 100 ppm

% Solids: 50%

On-Site Drying/Stockpiling: could stockpile material

Permeability:

Origin: none if used for cover

ACCESS

Truck: From South take 101 N exit at Railroad Ave and turn left. 1/4 mile down take a right on Stry Point Road and a left on Mecham Road. 2 miles down on the right is the landfill.

Rail: none

Barge: none

Additional Comments:

FORWARD INC.

Preliminary Assessment

Interest: High

Cost: Class III material \$5-12/ton; Class II material \$ upper teens/ton

Distance: 80 miles from South Bay; See San Joaquin County map #4

Additional Advantages:

Additional Disadvantages:

Overall: High

FACILITY DATA

Name: Forward Inc.

Location: 9999 South Austin Road

City/State: Manteca, CA

County: San Joaquin

Class: II & III

Operational Status: Active

SUBTITLE D Compliance Schedule: Compliant with Subtitle D

Closure Year: estimated at 2006

CONTACT I.

Name: Carrie Fisher

Title: Environmental Compliance Manager

Phone Number: (209) 466-4482

Company: Forward Inc

Address: 1145 West Charter Way

Place: Stockton, CA 95206

CONTACT II.

Name: Ms. Pat McGrath

Title: Sales Manager

Phone Number: same

Company:

Address:

Place:

Interviewer: Shelly Hrepich, CVRWQCB Student Assistant; Leslie Mendez, BCDC Intern

Date of Interview: 6/10/94 phone interview with Carrie Fisher; 10/17/94 phone interview with Pat McGrath.

Interest: Very High

Amount/Type: Use is variable, but could stockpile approximately 5-6000 cyds of cover material per month.

Cost (does not include transportation costs): Cost for Class II material would range from \$5-12; Cost for Class II material would be in the upper teens.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Would require analytical test results for petroleum hydrocarbons as gas, deisel, and oil, and testing for metals. An EPA method 8260 and 8270 for volatiles and semi-volatiles would also be required.

A fish bioassay will be required if the EPA method 8260 and 8270 show high metal and oil concentration

% Solids: 50%

On-Site Drying/Stockpiling: They have an on-site drying pad

Permeability: Three existing class III WMU's required to meet 10^{-6} permeability, Three existing class II WMU's required to meet 10^{-7} permeability

Origin: No restrictions

ACCESS

Truck: Take 580 east to 205 east, to 120 east, to 99 north, exit Arch Rd., turn right, right on Newcastle Rd.

Rail: no direct access

Barge: no direct access

Additional Comments:

GUADALUPE SANITARY LANDFILL

Preliminary Assessment

Interest: willing

Cost: \$6.50/cyd or less

Distance: 23 miles from South Bay [Santa Clara map, #24]

Additional Advantages: 30+ years capacity

Additional Disadvantages:

Overall: Moderate

FACILITY DATA

Name: Guadalupe Sanitary Landfill

Location: 15999 Guadalupe Mines Road

City/State: San Jose, CA

County: Santa Clara

Class: Class III Landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: In compliance: one lined cell and currently building another.

Closure Year: at least 30 years left

CONTACT I.

Name: Mr. Jim Lord

Title: General Manager

Phone Number: (408) 268-1670

Company: Guadalupe Rubbish Disposal Co, Inc.

Address: P.O. Box 20957

Place: San Jose, CA 95160

CONTACT II.

Name:

Title:

Phone Number:

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/10/94 and 3/15/94 phone conversations with Jim Lord

Interest: Willing.

Amount/Type: 100 cyds/day for daily cover

Cost (does not include transportation costs): Depends on quantity/quality, probably around \$6.50/yd soil or less with quantity. Would not pay for material.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: RWQCB must accept

% Solids: 50%

On-Site Drying/Stockpiling: Not really

Permeability: no standards for cover

Origin:

ACCESS

Truck: Hwy 17 towards Santa Cruz, take Camden exit and go 5 miles until reach Guadalupe Mines Rd.

Rail: No

Barge: No

Additional Comments: will send RWQCB standards

KIRBY CANYON SANITARY LANDFILL

Preliminary Assessment

Interest: Potentially

Cost: \$44.75/ton for clean soil, would probably discount for cover

Distance: 26 miles from South Bay [Santa Clara County map, #28]

Additional Advantages: 30+ yrs capacity

Additional Disadvantages:

Overall: Low

FACILITY DATA

Name: Kirby Canyon Sanitary Landfill

Location: 910 Scheller Ave.

City/State: San Jose, CA

County: Santa Clara

Class: Class III Landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: new cell built to Subtitle D standards

Closure Year: 2022 over 30 years

CONTACT I.

Name: Ms. Carrie Austin

Title: Site Engineer

Phone Number: (408) 779-2206

Company: Waste Management of CA Inc.

Address: P.O. Box 1870

Place:

CONTACT II.

Name: Ms. Renee Yelding

Title: Engineer

Phone Number: (510) 657-2425

Company: Waste Management of CA, Inc.

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/10/94 and 3/2/94 with Carrie Austin; 4/15/94 with Renee Yelding

Interest: potentially interested. Need three approvals for daily cover: 1. Solid Waste Facility Permit - IWMB how dry it is 2. RWQCB permit 3. Air board permit

Amount/Type: approximately 800 cyds/day daily cover

Cost (does not include transportation costs): Very likely a discounted charge would be available if material used for cover. Price for clean soil is \$44.75/ton.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels:

% Solids: Would want pretty dry (?), but are able to take very wet (15% solid) with RWQCB approval. Would place at a 5:1 ratio

On-Site Drying/Stockpiling: None

Permeability: none for daily cover

Origin: permitted to take all non-hazardous waste, currently within county only (soon to be changed). Can't take material even with variance.

ACCESS

Truck: Tuck safe road is available.

Rail: none

Barge: none

Additional Comments: Carrie Austin no longer works for Kirby Canyon, new contact is Deborah

MARSHLAND SOLID WASTE FACILITY

Preliminary Assessment

Interest: Interested

Cost: even exchange

Distance: 4 miles from South Bay [Santa Clara map, #27]

Additional Advantages: have room to stockpile

Additional Disadvantages: one time closure

Overall: Moderate/High

FACILITY DATA

Name: Marshland Solid Waste Facility

Location: NW Hwy 237 and Gold Street Alviso

City/State: San Jose, CA

County: Santa Clara

Class: Class III

Operational Status: Closed

SUBTITLE D Compliance Schedule: N/A

Closure Year: 1980

CONTACT I.

Name: Ms. Barbara Ransom

Title: Environmental Manager

Phone Number: (510) 797-1820

Fax: (510) 790-8189

Company: Cargill

Address: P.O. Box 364

Place: Newark, CA 94560

CONTACT II.

Name:

Title:

Phone Number:

Fax:

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 3/16/94 phone interview with Barbara Ransom.

Interest: Would be interested if material made specs.

Amount/Type: Landfill is in the closure process. Need closure material. Would need 100,000 cyds of clay, and approximately 100,000 cyds or more of foundation material. Are currently doing foundation work as it becomes available.

Cost (does not include transportation costs): Wouldn't charge, but wouldn't pay either.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Must make specs requirements

% Solids:

On-Site Drying/Stockpiling: Not sure if the RWQCB would allow them to dry material on site, but they do have room for stockpiling.

Permeability:

Origin:

ACCESS

Truck: Right off of Hwy 237 in San Jose.

Rail: Southern Pacific has a rail line right by the perimeter of the landfill.

Barge: At Alviso slough, but this is pretty shallow so probably a no go.

Additional Comments:

NEWBY ISLAND LANDFILL

Preliminary Assessment

Interest: Interested

Cost: \$10-\$15/cyd

Distance: 2.5 miles from South Bay [Santa Clara County map, #1]

Additional Advantages: 20+ yrs lifespan

Additional Disadvantages: adjacent wetlands

Overall: Moderate

FACILITY DATA

Name: Newby Island Landfill

Location: 1601 Dixon Landing Road

City/State: Milpitas, CA

County: Santa Clara

Class: Class III Landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: In the process of constructing a Subtitle D cell. Should be completed in a few months.

Closure Year: 2016

CONTACT I.

Name: Mr. Mark Wolthausen

Title: Landfill Manager

Phone Number: (408) 262-1401

Company: International Disposal Corporation

Address: 1601 Dixon Landing Road

Place: Milpitas, CA 95035

CONTACT II.

Name: Mr. Jerry Murphy

Title: General Manager

Phone Number: (408) 298-1112

Company: Browning Ferris Industries

Address: 150 Almaden Blvd., Suite 900

Place: San Jose, CA 95113

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 3/15/94 phone interview with Mark Wolthausen.

Interest: Interested

Amount/Type: Use 6000 cyds/week cover material

Cost (does not include transportation costs): Don't want to buy cover material. They only receive 90,000 cyds tax free; anything more has to be taxed. Applies to waste as well as cover. Therefore dredger would need to cover the cost. \$15.15 cyd/ dirt. Volume discounts are available, at 53,700+ dry cyds/month the price is reduced by \$5/cyd. However, this may not apply to soil since it doesn't biodegrade.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Located near wetlands, so have more stringent requirements.

% Solids: 80%

On-Site Drying/Stockpiling: None

Permeability: Would need a permeability rating of 10^{-6} .

Origin: County ban has been pretty much lifted.

ACCESS

Truck: Take Hwy 880, exit at Dixon Landing and go West.

Rail: Closest rail is 1 mile from the perimeter.

Barge: The landfill is adjacent to Coyote Creek and mud slough, however these are very shallow waterways and waste has never been received via them.

Additional Comments:

POTRERO HILLS LANDFILL

Preliminary Assessment

Interest: Very interested

Cost: case by case basis, \$0-\$29.10

Distance: 6 miles from Suisun Bay [Solano County map, #23]

Additional Advantages: 50+ years capacity, stockpiling and drying potential, near Montezuma

Additional Disadvantages: cover rich site, adjacent marsh

Overall: High

FACILITY DATA

Name: Potrero Hills Landfill

Location: South End of Emmington Road

City/State: Fairfield, CA

County: Solano

Class: Class III Landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: In compliance. 2 parts one with composite liner, one without.

Closure Year: 50 years left

CONTACT I.

Name: Larry Burch

Title: P.E. Director of Env Management

Phone Number: (510) 262-1660

Fax: (510) 223-1591

Company: Potrero Hills Landfill, Inc.

Address: P.O. Box 68

Place: Fairfield, CA 94533

CONTACT II.

Name: Mr. Lee (?)

Title: Site Operations Manager

Phone Number: (707) 429-9600

Fax:

Company: Potrero Hills Landfill, Inc.

Address: P.O. Box 68

City/State: Fairfield, CA 94533

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/19/93 Interview with Larry Burch. 2/3/94 phone interview with Lee. 3/11/94 and 4/13/94 phone interviews with Larry Burch.

Interest: Interested

Amount/Type: This site is "cover rich," and there is no cost for the material currently used as daily cover because it is earth which has already been excavated and stored for these purposes. Although there is no cost for current daily cover, dredged material could be used as winter cover when weather constraints make it difficult to mine the earth for daily cover. Furthermore, dredged material could be blended with other clayish materials to deepen the closure cap already being considered. This would not require an amendment to the existing permit because it would actually be more desirable from the LEA's perspective because it would provide more protection from leachate and groundwater intrusion problems. Presently, the landfill may be able to use at least 2 mcyds for capping purposes as well as miscellaneous uses in addition to that amount. Could use dredged material for final cover, by drying and stockpiling. Closure is forthcoming for the oldest part of the landfill on-site, so there is immediate potential for the use of dredged material as well as long-term potential.

There are also plans to expand this landfill in light of the needs of surrounding cities who have no other disposal alternatives. Currently, Potrero Hills landfill is seeking permit approval from the IWMB, RWQCB, and LEA. An EIS/EIR was completed on the original 190 acre site of the landfill. A constraints analysis will be conducted on the 240 acre addition as well as another 400 acres they are currently trying to purchase from their neighbors. Expansion to the landfill will be cellular, with 600 feet of clay shales underneath, sophisticated leachate collection system and waste will be filled in, in strips within four units referred to as modules.

Cost (does not include transportation costs): Fee for using dredged material has not been determined.

Would have to be determined on a case by case basis. The current fee for disposal of these materials under the category of contaminated soil is \$29.10 per ton. By 1994 and 1995 the fee will probably increase. The current disposal fee for soils without any contaminants ranges from no charge to \$5.00 per ton. Volume discounts are available for certain materials, but cannot be quoted at this time. Furthermore there are costs for rehandling,

compacting, tipping fees, (Only if the material is handled as waste; if handled as recyclable, there is a price discount), and the county imposes a 42 cents per ton charge. Matter of local approval.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Maximum allowances for toxicity in most cases is 100 ppm, far greater than the levels of contaminants usually associated with dredged materials. The dredged material must have contaminant levels that are acceptable to Potrero Hills Landfill, Inc. and the regulatory agencies. Analytical test results should include heavy metals, oil and grease, total petroleum hydrocarbons, priority pollutants, and pesticides. The amount of testing be satisfactory to the RWQCB.

% Solids: The moisture content of the dredge spoil must not exceed 50 percent unless the RWQCB authorizes higher moisture content limits for these sediments. PHLF does have sufficient area to further dry sediments from 70% moisture to 50% moisture.

On-Site Drying/Stockpiling: There is potential to rehandle dredged material on-site. There is room to accommodate the drying process for the material as well as areas for storage. Could lay on hill slopes for drying. The 20 acres currently used for soil storage could be used for the drying and storing of dredged material, however, it would require stockpiling space to expand their current 20 acres. It is plausible that dredged material could be stockpiled now for expanding the current plans for capping.

Permeability: The mud permeability criteria for capping requirements is 10 (?). Dredged materials with high clay contents exceed this requirement.

Origin: No restrictions

ACCESS

Truck: Truck access is most feasible. Come through Vallejo. Take Hwy 80 to Fairfield then take Hwy 12 East to Scally Road. 50 ft down take Kildeer Road to Potrero Hills Lane (paved, all-weather access road). Located approximately four miles east of Suisun and one mile south of the Highway 12 and Scally Road intersection (take right on Scally). PHLF has established an unloading facility (Public Disposal Area) for pickup trucks, station wagons, etc., carrying small volumes of wastes.

Rail: No rail.

Barge: Approximately 1 mile to Montezuma Slough and 3 miles to Suisun Harbor. It is possible that dredged material could be transported by hydraulic pumping by barge.

Additional Comments: Because of the marsh area in close proximity to the landfill, PHLF must obtain special permits or amendments to existing ones with regard to land use.

SHORELINE REGIONAL PARK SANITARY LANDFILL

Preliminary Assessment

Interest: interested

Cost: no charge for clay material, only for cover (cost to process)

Distance: 2 miles from south Bay; Santa Clara County map, #16

Additional Advantages:

Additional Disadvantages: closure (one time)

Overall: Moderate/High

FACILITY DATA

Name: Shoreline Regional Park Sanitary Landfill

Location: North End Stierlin Road

City/State: Mountain View, CA

County: Santa Clara

Class: Class III

Operational Status: Inactive

SUBTITLE D Compliance Schedule: N/A

Closure Year: 1993 The landfill is being prepared for final closure.

CONTACT I.

Name: Mr. Terry Dill

Title:

Phone Number: (415) 903-6228

Company: City of Mountain View Public Works

Address: 500 Castro St. P.O. Box 7540

Place: Mountain View, CA 94039-7540

CONTACT II.

Name: Tim Raibley

Title:

Phone Number: (415) 903-6596

Company: City of Mountain View Public Works

Address: 500 Castro St. P.O. Box 7540

Place: Mountain View, CA 94039-7540

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/15/94 and 3/12/94 with Terry Dill.

Interest: Interested. Need dry material

Amount/Type: Need to place the material in 18 - 20 months. Have 1 million cy stockpiled on-site and can use an additional 250K if the material is dry and clean.

Cost (does not include transportation costs): Depends, more for trucking costs than for material. Will pay for clays and clean material.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: No contaminants

% Solids: Needs be dry

On-Site Drying/Stockpiling: NO

Permeability: 10^{-7} or better for clay

Origin: None

ACCESS

Truck: Hwy 101 exit at Shoreline Amphitheater Parkway, go 1/2 mile further.

Rail: None

Barge: None

Additional Comments:



TRI-CITIES RECYCLING & DISPOSAL FACILITY

Preliminary Assessment

Interest: Very interested

Cost: \$0 (clay material); otherwise costs for processing

Distance: 5 miles from Bay, Alameda County map, #10

Additional Advantages: site is cover poor, upcoming construction possibilities, stockpile area; used dredged material in past

Additional Disadvantages: adjacent wetlands

Overall: Moderate/High

FACILITY DATA

Name: Tri-Cities Recycling & Disposal Facility

Location: 7010 Auto Mall Parkway

City/State: Fremont, CA

County: Alameda

Class: Class III Landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: Engineered alternative worked out with the RWQCB in 1991. 78-acre expansion would conform with Subtitle D standards.

Closure Year: Existing landfill permitted through 4th quarter 1994. Site closure plan now at the state level, waiting to go through CEQA process. There are plans, however, for vertical expansion which would increase height by 50' (from 103 to 150'). To increase the cap height would require getting OKs on permits to increase vertical contours as well. CEQA process now underway. If allowed, site would operate through 1999. It is also possible that existing footprint will be horizontally expanded an additional 78 acres. An EIR for this was completed in early 1980s, but still needs approval from Regional Board to finalize. Site expansion is contingent on funds/economics. Expansion of the footprint was permitted in the original site plans but land has not been purchased for expansion purposes.

CONTACT I.

Name: Mr. Mike Cosetti

Title: V.P. of Operations

Phone Number: (510) 657-2425

Company: Oakland Scavenger Company

Address: 7010 Auto Mall Parkway

Place: Fremont, CA 94538

CONTACT II.

Name:

Title:

Phone Number:

Company:

Address:

Place:

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: March 31, 1993; March 10, 1994 phone interview with Mike Cosetti.

Interest: They are interested and have already received dredged material (180,000cyds) from San Leandro Bay for use for capping material for closing in 7 years. It was clay material and was stockpiled in Roberts Landing. They would be interested in obtaining more dredged material because the site is cover poor and must import all materials used in operations in advance. The landfill tries to get all material from one source so that it is homogeneous, because it is less costly to do chemical analysis on homogeneous material. However, they can blend materials from different sources if necessary. For dredged material to be a viable option for expansion plans, the material would have to be brought in on a timely basis, preferably during the construction phase. During 1994-1999 cellular construction will commence in a new area of the site.

Amount/Type: Need at least 200,000 cyds per year for landfill operations and usually do not pay for material from quarries or remediated soils from other sources. TriCities imports most of their daily cover; so they could use dredged material. Contracts for daily cover last one year, so could be changed to include dredged material. While currently using soil for daily cover, they have several ADC applications (tarp, auto fluff, green waste, bio-solids) which may compete with dredged material with the added benefit of receiving recycling credit. TriCities uses 130 tons = approximately 200 cyds of cover material/day. Could also use material for final cover

and cap. Need 50-75,000 cyds of clay and will need approximately 180,000 tons of additional material for the bottom 3 feet of the foundation layer.

Cost (does not include transportation costs): They are interested in breaking even. Would pay for clay material. For final/daily cover would charge perhaps 1/2 of the tipping fee (\$40/ton) unless special monitoring was required which would cost more (approximately \$5/ton extra). If the load is large enough, the landfill will give discounts.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Accepts material which meets Regional Board standards. Prefers material that's homogenous (e.g., all clay).

% Solids: The Regional Board will not allow material that is less than 50% solids, so Tri-Cities has that criteria written into contract.

On-Site Drying/Stockpiling: No on-site drying. Dredged material from San Leandro Marina was dried on the Marina's premises. Tri Cities landfill has 28 acres of stockpiling area on site. They have stockpiled up to 100,000 mcyds at one time. Possible stockpiling area exists at section of 78-acre potential expansion site.

Permeability: Require less than 10^{-6} permeability.

Origin: Restrictions on waste from outside of the Tri -Cities (Fremont, Newark, Union City) does not apply to cover. Have already received dredged material from San Leandro Harbor and some from Oakland as well.

ACCESS

Truck: Located off Hwy 880 at the Automall Pkwy Exit. 1.5 miles west of exit.

Rail: Possible, rail does run by the perimeter of the landfill, but cost prohibitive.

Barge: Although there is no barge access, the San Leandro Marina is located 20-30 miles from the landfill. In April 1993, the Marina was awarded a contract to haul 180,000 cyds of dredged material dried on-site to TriCities.

Additional Comments: There are wetlands surrounding the site.

VASCO ROAD SANITARY LANDFILL

Preliminary Assessment

Interest: Willing

Cost: up to \$22/cyd (\$12-\$17/ton)

Distance: 25 miles from Bay; Alameda County map, #7

Additional Advantages: 10+ yrs lifespan, room to stockpile

Additional Disadvantages:

Overall: Low/Moderate

FACILITY DATA

Name: Vasco Road Sanitary Landfill

Location: 4001 North Vasco Road

City/State: Livermore, CA

County: Alameda

Class: Class III landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: Have a Subtitle D cell

Closure Year: Permitted to operate through 2008

CONTACT I.

Name: Mike Caprio(?)

Title: Landfill Manager, Pacific Region

Phone Number: (510) 447-0491/(818) 504-9282

Company: Browning Ferris Industries (BFI)

Address: 150 Almaden Blvd., Suite 900

Place: San Jose, CA 95113

CONTACT II.

Name: Rick Craig

Title:

Phone Number: (510) 458-9800

Company: BFI

Address: 901 Bailey Road

Place: Pittsburg, CA 94565

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: March 31, 1993; March 10, 1994 phone interview with Mike Caprio(?); March 10, 1994 phone interview with Rick Craig.

Interest: Willing. Operator's interest in dredged material lies in not having to pay taxes on reusing/recycling material.

Amount/Type: Amount of cover material used varies. Could use approximately 400 cyd/day for cover. Dredged material could be accepted for intermediate cover or to create on-site berms on-site for visual protection BFI owns Area "Y" (86 acres) which is adjacent to existing landfill site and which BFI plans to expand operations (EIR currently underway; if permitted, which is expected, Area "Y" would begin accepting waste in 1994). Dredged material could be used for blending with hay for cover in certain areas. Also, dredged material could be used to build up berms surrounding the site to offset visual impacts to aesthetic quality. Three to four feet could be used for deepening the intermediate cap and another two feet with a mud permeability of 10^{-6} for the base liner requirements.

Cost (does not include transportation costs): Vasco Road is currently using contaminated soil for daily cover and are being paid to take it, so they would not pay for dredged material. Rates depend. Vasco Road Landfill will charge \$22 per yard (approximately \$17/ton) for soil (& dredged material). Rates go down from there depending on amount, etc.. For quantities over 20,000 tons, price would drop to \$12/ton. This figure is subject to change without notice and may be negotiable. (BFI quoted Port of Oakland about \$19/yard for direct disposal, \$18 if material re-used, and a \$1/yard discount for volumes greater than 20,000 cubic yards.)

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Testing must be done on a case by case basis. BFI uses a form entitled "Waste Characterization Data Sheet," for disclosure of all contaminants. Any California lab can provide this information to the landfill. To bring material to site, waste characterization data form must be completed, and

material must pass BFI's standards to be accepted. Dredged material would have to meet criteria cited on waste characterization form to be accepted. (Port of Oakland's test seemed to meet BFI's testing requirements.) Chemical testing done by the port authorities could be used on the WCD. The maximum contaminant threshold requirements for Vasco Road are dictated by the RWQCB. In most cases they can receive 100 ppm of contaminants. Sample collection and analyses must be performed in accordance with designated EPA procedures and methods. BFI prefers to receive analytical data which represents the contaminant in soluble concentrations (excluding TPH analyses). BFI will only accept material which is represented by analytical results indicating concentrations below the listed threshold values. In the event total thresholds are met and the soluble thresholds are exceeded, BFI will base landfill acceptability on soluble concentrations. Daily Cover acceptance criteria to be determined by the SFRWQCB.

% Solids: BFI Vasco Road will accept materials with a moisture content of up to 50%, no free liquids.

On-Site Drying/Stockpiling: No room to dry and not interested. A potential consideration for a rehandling site may be on land at the nearby Lawrence Livermore site. The site has a lot of land having no preemptive use. Further research is required to determine whether this land would indeed be a feasible option. There is 40-50 acres of on-site storage available to stockpile imported materials. Stockpiling of dry material possible at site directly adjacent to existing landfill.

Permeability: A mud permeability of 10^{-6} for the base liner requirement. As of October, 1993, cells must be lined 2' deep and with material (10^{-7}). Landfill accepts material which meets moisture and contaminant level criteria (under standards set by RWQCB).

Origin: There is an out of county surcharge of \$4.35/ton above the standard tipping fee. Currently this county has a restriction on importing waste from other counties but soils can be imported from other counties. BFI accepts wastes from inside county and takes oily soils from outside of county.

ACCESS

Truck: At 4001 Vasco Road off of 580 East. Possible to bring dredged material to site via highway which runs into Brentwood, Tracy, Stockton (industrialized sections). Highway 4 is also nearby.

Rail: The closest rail is three miles away from the site, next to Hwy. 580.

Barge: There is no barge access, but Suisun Bay is 2 miles away with accessible marinas.

Additional Comments: Contact Chris at Geogentech (510) 943-3034 for status of IWMB's study regarding alternative covers for landfills (projected to be issued Fall, 1993). Send copy of final report to Rick Craig.

WEST CONTRA COSTA LANDFILL

Preliminary Assessment

Interest: High

Cost: perhaps just processing cost, maybe more

Distance: On the Central Bay, 2.5 miles from Hwy 80 [Contra Costa map, #22]

Additional Advantages: various uses, drying potential and possible barge access

Additional Disadvantages:

Overall: High

FACILITY DATA

Name: West Contra Costa Landfill

Location: Parr Blvd. & Garden Tract Rd.

City/State: Richmond, CA

County: Contra Costa

Class: Class III Landfill

Operational Status: Active

SUBTITLE D Compliance Schedule: In compliance, not expanding.

Closure Year: Class I portion closure expected May 1993, capping expected 1996. Class III portion in use for 2 - 3 more years, then year long capping process. Afterwards would only need pretty dry material.

CONTACT I.

Name: Mr. Larry Burch

Title: Director of Environmental Management

Phone Number: (510) 262-1660

Company: West Contra Costa S.L.F.

Address: 3260 Blume Drive, Suite 330

Place: Richmond, CA 94806

CONTACT II.

Name: Mr. Richard Granzella

Title: President

Phone Number: (707) 429-9600

Company: Potrero Hills Landfill, Inc.

Address: P.O. Box 68

Place: Fairfield, CA 94533

Interviewer: Leslie Mendez, BCDC Intern

Date of Interview: 2/25/93 interview with Larry Burch; 3/11/94 and 4/13/94 phone interviews with Larry Burch.

Interest: High

Amount/Type: Amount and variations depend on the dredged material available. In terms of dry cubic yards, the hazardous waste site (Class I portion) could use approximately 90,000cyds for a final cap. Earliest possible disposal of dredged material in 1995, and capping could start in 1996 (closure and capping expected 1996). The regular refuse Class III landfill can take about 200,000 cyds, and the diked baylands need some material for habitat restoration. For the Class II portion capping material possibly needed. Could also take material for daily cover through 1995, but need capping material in 1996. Therefore, need capping and doming material at Class I and II landfills, and some for daily cover at Class II. Also need capping for foundation zone (blow top soil) of about 500,000 cyds (deficit of this amount on-site) for the foundation layer and topsoil as well. Possible to cap beyond minimum requirement for "insurance" for landfill operator. Closure plan specifies material needs.

Cost (does not include transportation costs): have not set the cost for dredged material, would be based on a case-by-case basis. Perhaps would just charge for the processing cost (for material needing to be dried), or for volumes exceeding what is needed.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: Maximum allowances for toxicity in most cases is 100 ppm, far greater than the levels of contaminants usually associated with dredged materials. The dredged material must have contaminant levels that are acceptable to West Contra Costa Landfill and the regulatory agencies. Analytical test results should include heavy metals, oil and grease, total petroleum hydrocarbons, priority pollutants, and pesticides. The amount of testing must be satisfactory to the RWQCB.

% Solids: 50%

On-Site Drying/Stockpiling: Drying potential by placing material on slopes to dry. In 1993, Burch thought that a degraded active marsh (Area B) on site could be used for reprocessing dredged material but seems unlikely in light of resources. It would need material for rehabilitation, but more analysis would be needed to use dredged material for such a purpose.

Permeability: The clay liner requires a mud permeability criteria of 10^{-6} to meet IWMB requirements. For the Class II portion a 10^{-7} permeability.

Origin: No restrictions

ACCESS

Truck: Truck access from the South from Berkeley: take Hwy 80 to Hwy 580. At the Chevron Refinery take Richmond Parkway and go north to Parr Blvd. From the North must take city streets through the City of Richmond until you come to Parr Blvd.

Rail:

Barge: Possible barge access adjacent to the landfill. The property contains a tidal area (Area C) which was created in mid-1960s by breaching levees and letting water enter. The site has been considered a small craft marina. At the west end of the landfill site, in the water's edge, there is a potential site for barge access, which is approximately 3-4' deep and would most likely require dredging to accommodate deep drafts. (Check Bay Plan to identify priority use for site.) Burch thought at south end of site near marsh was potential barge access site, but perhaps unlikely because of proximity to marsh.

Additional Comments: The City of Richmond is already looking to dispose of dredged material here. EIR Contra Costa is the lead agency for site closure. Site closure plan goes to IWMB, then to County Health Dept./DEA, and then to Regional Board for Review.

YOLO COUNTY CENTRAL LANDFILL

Preliminary Assessment

Interest: High

Cost: No charge

Distance: 45 miles from Suisun Bay; See Yolo County map #3

Additional Advantages:

Additional Disadvantages:

Overall: High

FACILITY DATA

Name: Yolo County Central Landfill

Location: Road 104 and 28H

City/State:

County: Yolo

Class: III

Operational Status: Active

SUBTITLE D Compliance Schedule: Subtitle D liner currently in place, awaiting formal approval by the Regional Board

Closure Year: 2021

CONTACT I.

Name: Thomas Mohr

Title: Senior Hydro Geologist

Phone Number: (916) 757-5577/5565 FAX x5570

Company: County of Yolo PWD

Address: 600 A Street, Room 158

Place: Davis, CA 95616

CONTACT II.

Name:

Title:

Phone Number:

Company:

Address:

Place:

Interviewer: Shelly Hrepich, CVRWQCB Student Assistant/ Leslie Mendez, BCDC Intern

Date of Interview: 6/13/94 & 9/26/94 phone interviews with Thomas Mohr

Interest: High. Have a great need for cover material.

Amount/Type: 220 yds/day cover material

Cost (does not include transportation costs): If the material can be used as a daily cover it will be taken at no cost; gate rate for in county waste \$36.00/ton, out of county waste \$42.00/ton. For extremely large quantities (hundreds of thousands) of suitable material, would even pay.

REQUIREMENTS/RESTRICTIONS

Contaminant Levels: They have a water source which could possibly be used to dilute any salty material; analytical results will be required before any waste will be accepted

% Solids:

On-Site Drying/Stockpiling: Have plenty of room to stockpile. Could possible dry material as well if the wet material could be transported to the landfill. Have to look into this.

Permeability: Class III landfill must meet 10^{-6} permeability requirement

Origin: No restrictions

ACCESS

Truck: Take 580 north, to Interstate 80 north, to highway 113, turn right on Covell Blvd., left on Road 105, left on 28H

Rail: 4 miles away

Barge: Willow Slough By-pass runs right along the landfill. Port of Sacramento is less than 10 miles away.

Additional Comments:



APPENDIX D



TYPICAL WASTES ACCEPTABLE AT CLASS III LANDFILLS

GENERAL DEFINITIONS:

'NONHAZARDOUS SOLID WASTE' is defined by Title 23, CCR, Chapter 3, Subchapter 15, Section 2523(a). "Nonhazardous solid waste means all putrescible and non-putrescible solid, semi-solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi-solid wastes and other discarded solid or semi-solid waste; *provided that* such wastes do not contain wastes which must be managed as hazardous wastes, or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives, or could cause degradation of waters of the state (i.e., designated waste)." [emphasis added]

NOTE: Moisture limits exist for wastes discharged to Class III landfills. See Section III below.

'INERT WASTE' is defined by Title 23, CCR, Chapter 3, Subchapter 15, Section 2524(a). "Inert waste does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste."

SPECIFIC WASTES — The following are lists of waste types which are commonly considered to fall under the above definitions:

I. 'NONHAZARDOUS SOLID WASTES'

A. Municipal and Industrial Origin:

1. Garbage from handling, preparation, processing or serving of food or food products (excluding grease trap pumpings and cannery wastes).
2. Rubbish such as paper, cardboard, tin cans (provided they are empty, opened, dry, and five gallons or less in volume), cloth (provided it is not oil or solvent soaked industrial cleanup rags) and glass.
3. Construction and demolition materials such as paper, cardboard, wood, scrap metal (provided it is not friable, finely divided, or powdered), glass, rubber products, roofing paper and shingles (provided they contain less than 1% friable asbestos) and wallpaper.
4. Street refuse such as sweepings, dirt (provided it is not from a roadside chemical spill or in any way contaminated), leaves, catch basin cleanings, litter, yard clippings, glass, paper, wood, and scrap metals.
5. Dead animals and portions thereof.
6. Abandoned vehicles.
7. Ashes from household burning (not from industrial or large municipal incinerators).
8. Infectious materials and hospital or laboratory wastes authorized for disposal to land by official agencies charged with control of plant, animal, or human disease provided the local Environmental Health Officer has approved and disposal is above the 100-year flood plain.

NOTE: Infectious wastes are actually classified as hazardous under CCR Title 22. Discharge of these wastes to Class III landfills must be approved by the local Environmental Health officer and must implement the applicable statutes and regulations.

B. Agricultural Origin:

1. Plant residues from the production of crops including, but not limited to stalks, vines, green drops, culls, stubble, hulls, lint, untreated seed, roots, stumps, prunings, and trimmings.
2. Dried manures.
3. Dead animals and portions thereof.
4. Adequately cleansed pesticide containers **provided that the following minimum criteria are met:**
 - a. Metal, plastic, and glass containers used for liquids or powders shall have been processed by rinsing and draining or some other approved decontamination technique. The processing procedure shall include or be equivalent to at least triple rinsing with thorough draining and puncturing of the containers. Rinse waters produced shall be placed in the spray tank or disposed of in accordance with requirements of the Regional Board.
 - b. Prior to any pesticide container disposal at the landfill the County Agricultural Commissioner must certify that such a processing program exists and is utilized by pesticide users in the county.
 - c. Paper or plastic sacks and bags used for pesticide dusts and wettable powders **are not to be disposed of at Class III landfills.**

II. 'INERT WASTES' — consist entirely of non-water soluble, non-decomposable inert solids.

- A. Construction and demolition wastes such as earth, rock (**provided the earth and/or rock materials are not from a chemical spill, leaking underground tank or similar excavation/cleanup**), concrete rubble, and asphalt paving fragments (**provided the pavement had been in place for at least two rainy seasons; not fresh asphalt**).
- B. Vehicle tires.
- C. Industrial wastes such as clay products from brick and pipe manufacturing, glass, and inert slags (**provided the wastes are blemishes, seconds or rejects of similar product manufacturing and were never used or came in contact with chemical processing**), inert tailings, inert rubber scrap, and inert plastics.

III. MOISTURE LIMITATIONS —

All wastes must contain at least 50% solids and must not contain moisture in excess of the moisture-holding capacity of the landfill, either initially or as a result of waste management operations, compaction, or settlement.