

6.0 RECOMMENDED REMOVAL ACTION ALTERNATIVES

6.0.0.0.1 This section presents the recommended removal action alternatives for Sectors 1 through 4 of East Elliott. For each sector, the preferred removal action alternative is selected based on the comparative analysis presented in [Section 5.0](#). The primary consideration is the ability of the alternative to meet the removal action objective of reducing risk to the public (i.e., effectiveness) while maintaining an acceptable level of cost effectiveness. The estimated risk for OE exposure and the reduction in risk for each alternative was based on data collected during the 1996 site investigation ([CMS, 1997](#)) and is in [Appendix C](#).

6.0.0.0.2 In addition to the cost-benefit analysis for each sector, East Elliott as a whole must be considered. Because the risk of encountering UXO is greatest within Sector 4, it is appropriate that a greater portion of available funds be allocated to addressing the risks associated with that area. Considering the relative risks associated with the other three sectors, it is also appropriate that the removal action taken in Sector 2 be more intensive than in Sector 1 because landfill operations are currently being conducted in Sector 2. Because no UXO was found in Sector 3 during the 1996 site investigation, and the probability of encountering UXO in this sector is low, the priority for the removal action in Sector 3 should be lowest.

6.0.0.0.3 [Table 6-1](#) summarizes the recommended removal action alternatives and a cost comparison for each sector. In addition, a priority level for implementing the removal actions in each sector is recommended based on the associated reduction in risks. Detailed cost estimates for the recommended alternatives are in [Appendices D and E](#).

6.1 SECTOR 1

6.1.0.0.1 Sector 1 is approximately 750 acres in the northwest quadrant of East Elliott, the majority of which would be occupied by the proposed City of San Diego landfill ([Figure 2-5](#)). The sector is bounded by Oak Canyon to the west and includes Spring Canyon along the eastern perimeter. Topography is canyons and narrow ridges with steep slopes and landslides. Vegetation is mixed chaparral and grass with local expanses of dense brush in the southern and

TABLE 6-1**SUMMARY OF RECOMMENDED ACTIONS
FORMER CAMP ELLIOTT (EAST ELLIOTT)**

Priority^a	Description of Recommended Action	Initial Cost of Recommended Action	Total Cost of Recommended Action Over 30 Years^b
1	Sector 4: Surface and Subsurface Clearance ^c	\$6,844,000	\$15,413,000
2	Sector 2: Surface Clearance ^d	\$1,055,000	\$3,546,000
3	Sector 1: Surface Clearance	\$1,606,000	\$5,757,000
4	Sector 3: Institutional Controls ^e	\$212,000	\$377,000
5	All Sectors: Residual Risk Management Measures	\$719,000	\$1,396,000
Total Costs for Recommended Actions at East Elliott:			\$26,489,000

^a Based on relative risks for each sector.

^b Total initial and recurring costs based on net present worth calculated over 30 years.

^c Costs include those for the recently completed time-critical removal action.

^d Does not include clearance operations already completed within the existing landfill and recent expansion (170 acres).

^e Implementation of this alternative may be combined with residual risk management measures. Installation of warning signs for all sectors should be completed as soon as possible.

western portions of the sector. Roads are constructed along many of the north-south-trending ridges.

6.1.0.0.2 Based on the comparative evaluation and cost-benefit analysis described in [Section 5.1](#), Surface Clearance (Alternative 3) is the recommended removal action alternative for the approximately 750 acres of Sector 1. Surface Clearance reduces risk by 87 percent for recreational users, the most likely exposure scenario, at an estimated cost of \$5,757,000 ([Tables 6-1](#) and [E-2](#)). Construction Support (Alternative 5), which consists of both surface and subsurface clearance, was also considered for the proposed landfill in Sector 1. However, the proposed City of San Diego landfill is still in the pre-planning stages, so recommending a more stringent removal action would be premature before the proposal is confirmed and construction begins at the new landfill.

6.1.0.0.3 As discussed in [Section 5.1](#), Institutional Controls (Alternative 2) cost-effectively reduces the risk of a hazardous encounter and focuses on informing the limited number of individuals who may access the area with UXO hazards present. However, because UXO was encountered in Sector 1, the risk remaining to both recreational users and potential future construction workers in this sector is unacceptably high unless the UXO is removed. Surface Clearance would reduce risk for recreational users, but would provide little risk reduction for construction workers. Surface and Subsurface Clearance to a Depth of 1 Foot and Construction Support would reduce risks for ORV users and construction workers. However, Construction Support would result in a greater threat to the environment (i.e., disturbance of sensitive species and habitats) and a greater cost than is warranted, particularly if the proposed city landfill is not constructed. In addition, implementation of Construction Support would require an unacceptable delay in reducing risks to current site users. Therefore, Surface Clearance is the recommended action for Sector 1. If extensive construction activities are initiated in this sector in the future, a more stringent removal action can be implemented at that time.

6.1.0.0.4 Because the removal action recommended for Sector 1 will not completely eliminate the possibility of encountering UXO, it is also recommended that warning signs be erected in Sector 1 in high use areas as described in the discussion of technologies for

Institutional Controls ([Section 4.3.2](#)). These signs will provide an added risk reduction at a minimal cost. A discussion of costs for coordinated implementation of additional residual risk management measures at all sectors is in [Section 6.5](#).

6.2 SECTOR 2

6.2.0.0.1 Sector 2 is approximately 650 acres in the north-central portion of East Elliott. Little Sycamore Canyon is oriented north-south in the center of the sector. The predominant slope of the terrain is greater than 30 degrees. Vegetation is grasslands and mixed chaparral. Roads are constructed along ridges and within Little Sycamore Canyon. Sector 2 includes the existing Sycamore Landfill, which currently encompasses 170 acres, including a recent 53-acre expansion. The landfill is expected to eventually reach 500 acres. Community members are also using the undeveloped areas for recreational activities.

6.2.0.0.2 Based on the comparative evaluation and cost-benefit analysis described in [Section 5.2](#), Surface Clearance (Alternative 3) is the recommended removal action alternative for Sector 2. Surface Clearance could be conducted at an estimated cost of \$3,546,000 ([Tables 6-1](#) and [E-3](#)), and would result in a significant reduction of risk for recreational users (i.e., 93 percent) and landfill workers (i.e., 71 percent) because most of the OE found in Sector 2 was on the ground surface. In addition, historic firing patterns indicate that the majority of OE would be found on the ridge along east side of the landfill, where clearance operations for construction support have already been conducted.

6.2.0.0.3 OE removal operations have already been conducted in the area currently occupied by the landfill, and the Time-Critical Removal Action for Sector 4 included approximately 65 acres of Sector 2 to the south and northeast of the landfill. Therefore, future removal actions will only be conducted with the 400 acres of Sector 3 west of Little Sycamore Canyon, and in a small area on the northwest side of the landfill. Periodic monitoring associated with Surface Clearance would include investigation and disposal, if warranted, of OE encountered during landfill construction.

6.2.0.0.4 As discussed in [Section 5.2](#), the Institutional Controls alternative cost-effectively reduces the risk of a hazardous OE/UXO encounter and focuses on informing the limited number of individuals who may enter the area. However, because UXO was encountered in the subsurface, the risk remaining to recreational users and site workers in Sector 2 is unacceptably high unless a removal action is performed. Surface and Subsurface Clearance to a Depth of 1 Foot and Construction Support will remove OE from the subsurface and therefore provide an additional risk reduction for ORV users and construction workers. However, the costs and adverse ecological impacts associated with these alternatives are not warranted by the slight increase in risk. In addition, implementation of Construction Support would require an unacceptable delay in reducing risks to current site users.

6.2.0.0.5 Because the removal action recommended for Sector 2 will not completely eliminate the possibility of encountering UXO, it is also recommended that warning signs be erected in Sector 2 along roads and trails in high use areas as described in the discussion of technologies for Institutional Controls ([Section 4.3.2](#)). The signs will provide an added risk reduction at a minimal cost. A discussion of costs for additional residual risk management measures in all sectors is in [Section 6.5](#).

6.3 SECTOR 3

6.3.0.0.1 Sector 3 is approximately 750 acres in the southwest quadrant of East Elliott. The sector is bounded by Oak Canyon to the west, Little Sycamore Canyon to the east, and State Highway 52 to the south. Topography is primarily steep-walled canyons and narrow ridges in the northern part of the sector with less steep slopes in the southern area. Vegetation is mixed chaparral, dense brush, and poison oak in the north, and grasslands in the south. Current land uses include recreational activities by a relatively limited number of people. Future land use possibilities include continued recreational use and residential development. Landfill support facilities for the proposed City Landfill in Sector 1 could also be constructed in Sector 3. The risk assessment indicated that there is no measurable risk associated with current or future activities in Sector 3 because no UXO was found in this area.

6.3.0.0.2 Based on the comparative evaluation and cost-benefit analysis described in [Section 5.3](#), Institutional Controls (Alternative 2) is the recommended removal action alternative for the approximately 750 acres of Sector 3. In this sector, Institutional Controls consists of warning signs and display boards.

6.3.0.0.3 Several significant factors in selecting a preferred removal action for Sector 3 of East Elliott are:

- Based on information gathered during the site investigation, the probability of encountering UXO in Sector 3 is low. There were no reported encounters of UXO during the 1996 site investigation, and no incidents related to UXO have been reported in Sector 3 of East Elliott since investigations at the site began in 1978.
- Only a very small portion of the general public uses the area for recreational purposes, and there is little likelihood that the site will be extensively developed, so the risk of UXO exposure is expected to remain low.
- Future land use plans suggest the probability of developing this sector is relatively low, considering the adjacent landfill, the small area available for building (due to steep slopes and geologic hazards), and the importance of protecting sensitive species.

6.3.0.0.4 The cost and time required to complete either a limited or full-scale removal action are prohibitive considering the low level of risk associated with Sector 3. Because the potential for UXO exposures is very low, Surface Clearance, Surface and Subsurface Clearance to a Depth of 1 Foot, and Construction Support have been eliminated from further consideration for this area. However, because inert OE fragments were encountered in Sector 3, there is a possibility that UXO may be present. In addition, people can access other areas of East Elliott from Sector 3. The remaining alternative, Institutional Controls, modestly reduces the risk of a hazardous encounter (considering the inherently low risk present in Sector 3) and focuses on informing the limited population who may enter the sector. Therefore, Institutional Controls is the recommended action for Sector 3. This alternative can be implemented with relative ease and within a few months. The estimated cost for the recommended alternative in Sector 3 is \$377,000 ([Tables 6-1](#) and [D-8](#)). A discussion of costs and coordinated implementation of additional residual risk management measures for all sectors is presented in [Section 6.5](#).

6.4 SECTOR 4

6.4.0.0.1 Sector 4 is approximately 1,050 acres in the eastern portion of East Elliott and includes the area most accessible to the public and is frequently used for recreational activities. The sector is bounded by the Sycamore Landfill to the west, and the City of Santee to the south and east. The terrain is defined by three primary ridges with moderate slopes. Mast Boulevard and West Hills High School are located in the southeast corner of the sector. Vegetation consists primarily of grasslands and mixed chaparral. Sector 4 is also the most likely to be developed into single-family residential housing. According to the risk assessment ([Appendix C](#)), activities in Sector 4 have the highest amount of risk. Therefore, any actions proposed for this sector have the highest priority. In 1998 and 1999, Surface Clearance was conducted for approximately 900 acres of open area in Sector 4 as a Time-Critical Removal Action.

6.4.0.0.2 Based on the comparative evaluation and cost-benefit analysis described in [Section 5.4](#), Surface and Subsurface Clearance to a Depth of 1 Foot (Alternative 4) is the recommended removal action alternative for Sector 4. The total cost of Surface and Subsurface Clearance in Sector 4 is \$15,413,000 ([Tables 6-1](#) and [E-7](#)). This estimate includes costs for the recent Time-Critical Removal Action, which had an initial cost of approximately \$1.5 million ([HFA, 1999](#)), or an approximate net present work of \$2.4 million.

6.4.0.0.3 Several significance factors in selecting a preferred removal action for Sector 4 of East Elliott are:

- Based on information gathered during the site investigation, Sector 4 has the highest risk of encountering a UXO hazard for the general public. Twenty-five UXO items were found during the 1996 site investigation and recent Time-Critical Removal Action.
- Current land use suggests many people use the area for recreational activities. West Hills High School and residential neighborhoods of the City of Santee are located within and immediately adjacent to Sector 4, so the potential for OE exposure is high.
- Many magnetic anomalies that may indicate the presence of subsurface OE were observed during the Time-Critical Removal Action.

- Future land use plans indicate that the probability of developing Sector 4 is higher than the other sectors, considering the larger amount of area available for building and the conditions set forth in the Elliott Community Plan ([Section 2.1.5](#)).

6.4.0.0.4 As discussed in [Section 5.4](#), Sector 4 has the highest level of risk compared to other sectors at East Elliott. Institutional Controls reduces the risk of a hazardous encounter at a minimal cost. However, because Sector 4 is relatively accessible and attractive to recreational users, No Action and Institutional Controls would result in an unacceptable level of residual risk at the site. Surface Clearance achieves a high reduction in risk for recreational users (who have a much higher risk of exposure than construction workers) and a moderate reduction in risk for construction workers. However, recent observation of recreational activities and detection of subsurface anomalies indicate that risks from subsurface OE in Sector 4 may be underestimated. Therefore, selection of Surface and Subsurface Clearance to a Depth of 1 Foot (Alternative 4) is warranted, even though substantial additional costs are associated with this alternative.

6.4.0.0.5 Based on the data collected during the Time-Critical Removal Action, a reduction in the scope of the proposed removal action is recommended in the northern portion of Sector 4, north and east of Quail Canyon. No OE was found in this area during either the 1996 site investigation or the Time-Critical Removal Action. Therefore, the remaining removal action includes surface removal of OE in areas of heavy brush not included in the Time-Critical Removal Action, and subsurface removal of OE within the approximately 750-acre area south and west of Quail Canyon.

6.4.0.0.6 Because the removal actions recommended for Sector 4 will not completely eliminate the possibility of encountering UXO, it is also recommended that warning signs be erected in Sector 4 in high use areas, as described in the discussion of technologies for Institutional Controls ([Section 4.3.2](#)). These signs will provide an added risk reduction at a minimal cost. A discussion of costs for coordinated implementation of residual risk management measures for all sectors is in [Section 6.5](#).

6.5 RESIDUAL RISK MANAGEMENT

6.5.0.0.1 Because removal actions will not completely eliminate the possibility of encountering UXO, residual risk management measures must be implemented to provide additional protection to the public following implementation of the recommended removal actions. Residual risk management measures consist of both institutional controls and long-term monitoring to evaluate the effectiveness of the removal action. Implementation of these measures is expected to reduce site risk an additional 20 to 25 percent. These residual risk management measures are in addition to the Institutional Controls alternative recommended for Sector 3.

6.5.0.0.2 Additional residual risk management measures will include the following activities:

- use of warning signs in Sectors 1, 2, and 4 (in addition to the institutional controls previously recommended in Sector 3) to inform site users of the potential for OE at the site and to provide emergency contact information in case suspected UXO is encountered;
- use of display boards in Sector 4 to describe the potential hazards and to provide information on what to do if OE is encountered;
- compliance with California Real Estate disclosure laws by establishing deed notification for each parcel at East Elliott;
- notification about potential subsurface hazards through the building permit system;
- coordination of public meetings to describe the removal actions taken at the site and what risks may remain;
- implementation of public education programs aimed people who are most likely to use the site, such as landfill employees and high school students; and
- notification of property owners and local residents with regular fact sheets, newsletters, brochures, and internet sites.

6.5.0.0.3 Warning signs and display boards will be installed in high use areas once the appropriate easements or access agreements are obtained. Display boards will also be installed in

the southern part of Sector 4. Laminated posters of the display board information may also be used to disseminate the information at meetings of community organizations, local schools, and community events. At a minimum, the information portrayed in these display boards will include a detailed site map, photographs of the OE found at East Elliott, and information regarding what individuals should do if OE is encountered.

6.5.0.0.4 Deed notification is also recommended for all parcels comprising East Elliott. This notification clearly identifies the land as a formerly used defense site where OE may be present. The notification would be found during a title search of the subject property whenever it is sold. This measure will help to ensure that future property owners are made aware of any residual risks.

6.5.0.0.5 Brochures describing OE risks will also be provided to the building and planning departments of the cities of Santee and San Diego, and the County of San Diego. These brochures would warn property owners and contractors that East Elliott was part of a military training area and that OE may be present. In addition, the brochure would provide information about any removal actions performed, and provide instructions to call the appropriate response agency (such as the San Diego County Sheriff's Department) in case suspected OE is encountered. Additional brochures may be given to community organizations, or included in a mailing to local residents or people who work in the area.

6.5.0.0.6 Additional public education programs will be implemented as part of the Public Involvement Plan for East Elliott ([Montgomery Watson, 1999](#)). These programs will include public meetings to provide information about on-going removal actions and to solicit feedback, and presentation resources to provide the public with specific information about East Elliott and the OE that may be present. The first public meeting will be held in late 1999. Educational materials will be provided to schools, the landfill for employee use, and community organizations as requested. The educational materials will include posters, brochures, a video, and backup material. Speakers from the USACE will also be available by appointment to facilitate training.

6.5.0.0.7 As part of the Public Involvement Plan, a mailing list is being developed of property owners, local residents, stakeholders, and site users. This mailing list will be used to disseminate information on East Elliott in the form of fact sheets, newsletters, brochures, flyers, and other written information. Community newsletters are being prepared for distribution in late 1999.

6.5.0.0.8 East Elliott will also be included in a long-term monitoring program designed to assess the continued effectiveness of the removal action alternative. The monitoring will include a visual inspection of the site, a review of any additional OE found after the alternative is implemented, an assessment of the continued land use patterns, maintenance of the residual risk management measures, and community feedback. Reviews will be performed every five years after completion of the removal action. During the removal action, a baseline for monitoring erosion will be established to determine if subsurface OE not included in the removal action may become exposed. The baseline will include a general map of drainages, landslides, and other areas of erosion, along with a series of photographs taken from designated locations for comparison over time. In addition, areas of East Elliott will be inspected for exposed ordnance as needed following major storm events or wild fires. Monitoring activities will be documented in a report issued every five years.

6.5.0.0.9 To implement these recommendations, Memoranda of Agreement will be developed between CEHNC and individual parties participating in the overall risk management plan. These memoranda, which may be included as part of an Institutional Controls Plan, will outline the specific authorities and responsibilities of each agency participating in the action. The total cost of residual risk management measures is approximately \$1,396,000 (Tables 6-1 and E-10).

6.6 SUMMARY OF REMOVAL ACTION COSTS

6.6.0.0.1 As shown in Table 6-1, the total cost of all recommended institutional controls and removal actions at East Elliott is \$26,489,000. The priority for each action, based on the relative risks for each sector, is also listed in Table 6-1.