USDA FOREST SERVICE

MEYERS LANDFILL

USDA FOREST SERVICE, LAKE TAHOE BASIN MANAGEMENT UNIT MAY 2007

PROPOSED PLAN FOR THE REMEDIAL ACTION OF OPERABLE UNIT 1 AT THE MEYERS LANDFILL SITE IN EL DORADO COUNTY

I. Introduction

This Proposed Plan identifies the Preferred Alternative for the remediation of Operable Unit 1 (OU-1) at the Meyers Landfill Site and provides the rationale for this preference. This Proposed Plan includes summaries of other cleanup alternatives evaluated for use at the Site. This Proposed Plan is issued by the United States Department of Agriculture, Forest Service (Forest Service), who is the lead agency conducting the response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), in cooperation with the staff at the Lahontan Regional Water Quality Control Board (LRWQCB). The Forest Service, in consultation with LRWQCB staff, will select a final remedy for OU-1 at the Meyers Landfill Site after reviewing and considering all information submitted during the 45-day public comment period. The Forest Service, in consultation with the LRWQCB, may modify the Preferred Alternative or select another response action presented in this Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

The Forest Service is issuing this Proposed Plan as part of its public participation responsibilities under CERCLA §117(a) and 40 Code of Federal Regulations 300.430(f)(2). This Proposed Plan summarizes information that can be found in greater detail in the Supplemental Remedial Investigation/Feasibility Study (RI/FS) and other documents contained in the Administrative Record for the Site.

The Forest Service is encouraging the public to review these documents to gain a more comprehensive understanding of the Site and the CERCLA response activities that have been conducted there.

Dates to Remember

Public Comment Period:
May 21– July 5, 2007
The Forest Service will accept written comments on the Proposed Plan during the public comment period.

Public Meetings:
May 24, 2007, 5:30 to 7:30 p.m.
The Forest Service will hold an informational public meeting to explain the Proposed Plan and all of the remedy alternatives presented in the RI/FS.

June 14, 2007, 5:30 to 8:30 p.m.
The Forest Service will hold a second public meeting to explain the Proposed Plan and the remedy alternatives. Oral and written comments will be received at this meeting.

Public Meeting Location:
Lake Tahoe Basin Management Unit
35 College Drive
South Lake Tahoe, California 96150

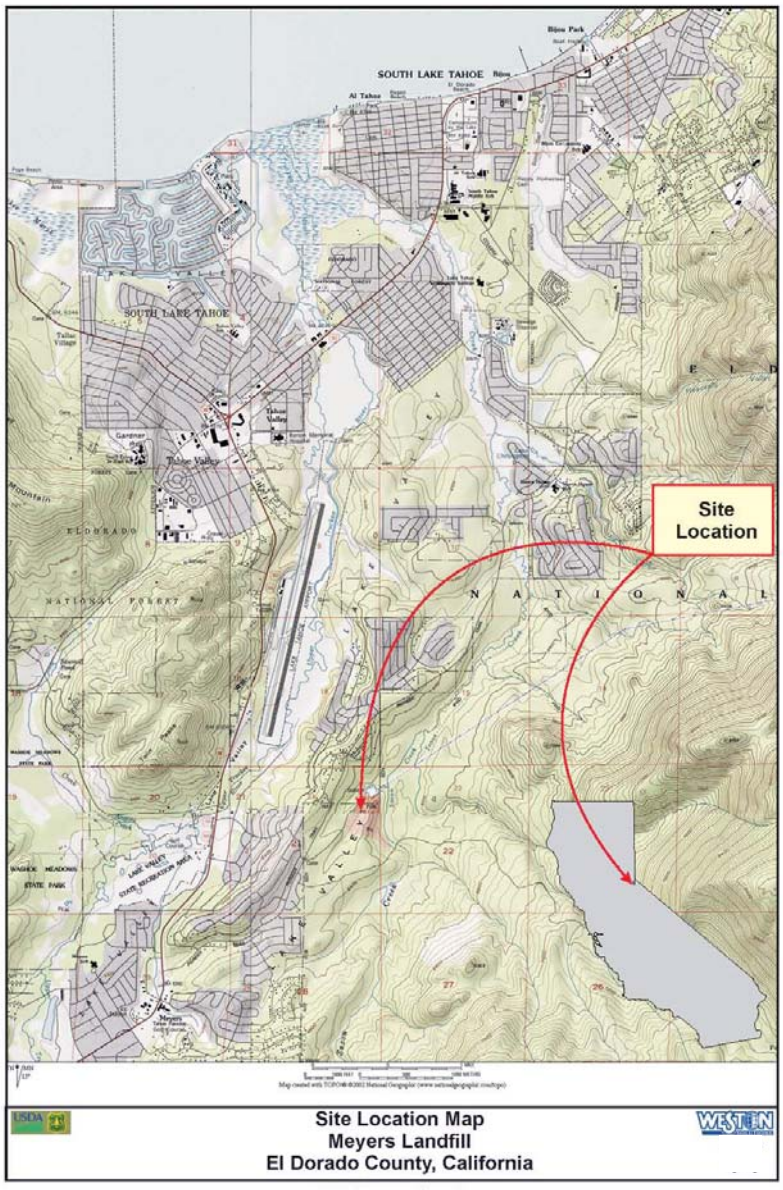
II. Site Background and History

The Meyers Landfill is an old waste disposal site located within the Lake Tahoe Basin on National Forest System lands near the town of Meyers, California (Figure 1). The Site operated from about 1947 through 1971 under a series of Forest Service Special Use Permits that were issued to private parties and El Dorado County (County). Waste disposed at the Site included municipal solid waste from residential and commercial sources from within southern Lake Tahoe Basin area. The Site stopped receiving waste in 1971 and in 1973 the County closed the dump and covered the waste with a soil cap.

In 1974, during inspections of the Site, it was discovered that leachate was flowing from the buried culvert at the north end of the dump into nearby Saxon Creek and that the soil covering the dump was eroding in certain areas, leaving waste exposed. Leachate is contaminated water that is produced when precipitation and snowmelt percolates through the waste materials and leaches out contaminants such as chemicals and metals. Corrective measures were instituted by the Forest Service and the County between 1975 and 1977 in response to a Clean-up and Abatement Order issued by the LRWQCB. These corrective measures were successful in mitigating the leachate discharge to surface waters and the soil erosion from the Site.

In response to the requirements of the California State Water Code Section 13273, the Forest Service began site investigation efforts in 1991 for the purpose of preparing a Solid Waste Assessment Test (SWAT) Report for the Site. Groundwater investigations conducted as part of the SWAT found that groundwater beneath the waste was contaminated with volatile-organic-compounds (VOCs) including vinyl chloride and cis-1,2-dichloroethene (DCE). In August 1996, vinyl chloride was detected downgradient of the Site, and the Forest Service initiated a response under CERCLA to determine the impacts of the contamination, pursuant to its lead agency authority provided by Executive Order 12580.

From 1997 to 2001, additional CERCLA investigations were conducted to define the extent of the waste and the contaminated area. These investigations were conducted by the Forest Service and by the South Lake Tahoe Basin Waste Management Authority, a joint powers authority ("JPA"), on behalf of El Dorado County through an Administrative Order on Consent (AOC). The investigations determined that the contaminants in the groundwater beneath the Site include approximately 34 VOCs, consisting of both halogenated and non-halogenated hydrocarbons.



In 1999, the Forest Service implemented a CERCLA removal action to close the site to public access. In 2000, a second CERCLA removal action was initiated to implement a groundwater pump and treat system for the purpose of containing the vinyl chloride plume.

In January 2002, the Forest Service issued a Feasibility Study and Proposed Plan for remediation of the Site. The 2002 Proposed Plan called for capping the waste mass with an impermeable cover system and treating the contaminated groundwater by installing a multi-phase groundwater extraction and treatment system.

In response to public comments and from discussions with the County and the City of South Lake Tahoe (City), who are potentially responsible parties for the Site, the Forest Service determined that additional remedial site investigation work should be performed to fill identified data gaps and to refine the remedy selection. The

FIGURE 1: SITE LOCATION

Forest Service, the County and the City, under Forest Service direction pursuant to AOCs, initiated a series of supplemental groundwater and landfill investigations at the Site. As a result of these investigations, the Forest Service divided the Site into two operable units, the disposal area and waste mass itself (OU-1) and the contaminated groundwater plume (OU-2). The results of the additional site investigation efforts for OU-1 have been incorporated into the Supplemental RI/FS.

III. Site Characteristics

The disposal site and the area immediately surrounding it form a relatively flat plateau. The entire plateau consists of approximately 17 acres of which, approximately 11 acres are occupied by the waste disposal site itself. A dirt access road crosses the Site from northwest to southeast, connecting to other forest roads, and ends at a gate at Fountain Place Road. Surface features on the landfill area are limited to the access road, storm water drains, drainage ditches, water collection galleries, and sparse vegetation (example, small pine trees).

The only manmade structures on the landfill are landfill gas and groundwater monitoring wells and three (3) manholes associated with the South Tahoe Public Utility District (STPUD) Trout Creek trunk sewer line that runs beneath the landfill debris. The sewer line generally trends north-northeast beneath the landfill, turns sharply to the west at the base of the northern slope of the landfill, and then curves again to the northeast along the west side of the Sierra Pacific Power Company (SPPC) substation (Figure 2). As a result of its location and proximity to waste, the sewer line is a key Site feature that must be addressed as part of the OU-1 remedy.

The aerial distribution of waste is approximately 11 acres. The bottom of the waste fill appears to be at an average depth of approximately 25 feet below grade with the central portions reaching depths up to 50 feet deep. Characterization efforts indicate that the waste volume ranges from approximately 290,000 cubic yards to 305,000 cubic yards.

Landfill gas, generated from decomposing waste, contains an average concentration of 63.5% methane. Sampling indicates that hydrogen sulfide, vinyl chloride and other VOCs such as benzene, toluene, and ethyl benzene are also present in the landfill gas. No VOCs were detected in the airspace above the waste disposal site during the investigation work, indicating VOCs are not venting to the atmosphere in concentrated amounts.

The shallow groundwater aquifer beneath the landfill is impacted with VOCs, primarily vinyl chloride. Groundwater surface elevation calculations indicate that

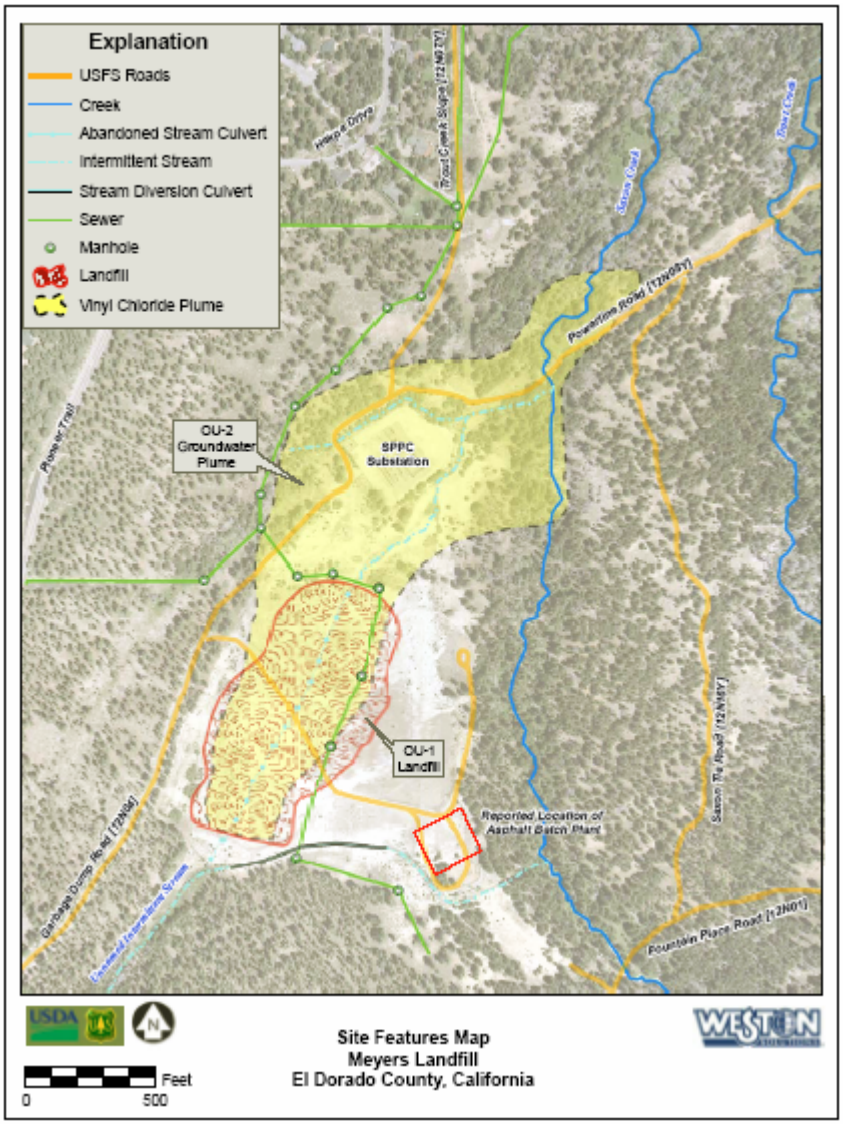


FIGURE 2: SITE FEATURES

groundwater interacts with landfill wastes during periods of high groundwater, such as during spring snow melt and possibly to a lesser extent during the rest of the year. As a result of the high VOC concentrations and the relatively high rate of groundwater movement, the vinyl chloride plume currently extends from the landfill approximately 1,600 feet northeast. Other VOCs detected in the groundwater include: benzene, cis-1,2-DCE, trichloroethene (TCE), and tetrachloroethene (PCE). The groundwater plume has been fully defined laterally; however, the vertical extent has only been partially delineated.

Prior to 2002, vinyl chloride was occasionally detected in surface water samples collected from Saxon Creek near the landfill. The concentrations of vinyl chloride detected were below Safe Drinking Water Act maximum contaminant levels (MCL) for groundwater, and were diluted a short distance downstream. Vinyl chloride has not been detected in samples collected from Saxon Creek since 2002.

IV. Scope and Role of Response Action

The cleanup of a CERCLA site can be divided into a number of discrete operable units ("OUs"), depending on the complexity of the problems and nature of the hazardous substance release associated with the site. Operable units may address geographical portions of a site, specific site problems, or phases of an action. They should be consistent with, and not impede, implementation of subsequent actions, including final action at the site.

In accordance with CERCLA guidance, in early 2006, the Forest Service made a determination to separate the Site into two separate operable units for remediation purposes. OU-1 is the disposal area and waste mass itself and OU-2 is the contaminated groundwater plume (Figure 2). Splitting the disposal area from the groundwater contaminant plume area allowed the agency to focus efforts on covering and containing the waste mass to prevent further groundwater contamination in a manner consistent with the U.S. Environmental Protection Agency's (EPA's) presumptive remedy guidance for CERCLA municipal landfill sites (EPA 540-F-93-035). This Proposed Plan addresses the CERCLA remedy for OU-1, the landfill area and contaminant source.

V. Summary of Site Risks

The Forest Service prepared a human health baseline risk assessment and a screening-level ecological risk assessment for Meyers Landfill in 2001 as part of the RI/FS process for the 2002 Proposed Plan. A baseline risk assessment (BRA) is conducted as part of the RI/FS process to examine the current and potential future effects of the contaminants on human health and the environment. The BRA process evaluates a range of current and potential future exposures assuming that no controls are in place to prevent or limit exposure. No further risk assessments were performed as part of the preparation of the supplemental RI/FS.

Figure 3 is the conceptual site model which shows the probable pathways for contaminant migration from source to receptor. These include surface erosion by wind or water, volatilization to air, dissolution of contaminants from the landfill mass to groundwater, mixture of groundwater with surface water, migration of contaminated groundwater, and transport through the food chain.

Human Health Risks

The human health baseline risk assessment addressed potentially contaminated source media, including air, groundwater, and surface water. The refuse and soil were not considered in the risk assessment because the landfill had been covered with 2 to 4 feet of soil in 1973, resulting in no current direct exposure to these materials. The hypothetical human receptors that were evaluated included future commercial/industrial workers, future construction workers, and future recreational visitors. The exposure pathways for these receptors included inhalation of VOCs released from groundwater or surface water and direct contact (through ingestion or dermal contact) with the surface water of Saxon Creek.

For known or suspected carcinogens, EPA has determined that an acceptable level of exposure correlates to an excess lifetime cancer risk to an individual of between 1 in 10,000 and 1 in 1 million (1×10^{-4} to 1×10^{-6}). This is known as the acceptable risk range. The human health baseline risk assessment concluded that, under current and future site conditions, the impacts to human receptors are below EPA's acceptable risk range.

For the Meyers Landfill site, the cancer risks ranged from 1×10^{-8} for groundwater risks for the commercial/industrial worker and surface water risks to a recreational visitor to 9×10^{-12} for groundwater risk to the construction worker, which are well below EPA risk levels.

Ecological Risks

The screening-level ecological risk assessment evaluated different types of ecological receptors including aquatic invertebrates, amphibians, and terrestrial wildlife. The ecological assessment concentrated on vinyl chloride as the dominant VOC of concern and uses it as a surrogate for all VOCs. Because VOCs are subject to rapid volatilization, the VOCs that had been detected in Saxon Creek are not expected to react with water, bioaccumulate in aquatic organisms, or adsorb to sediment.

Vinyl chloride concentrations in groundwater and surface water were compared to toxicity-based benchmarks considered protective of the environment. The comparisons were based on protecting populations of terrestrial wildlife and aquatic biota from exposure of vinyl chloride in groundwater concentrations that represented the highest levels found. This assumes that contaminated groundwater flows into surface water at the highest contaminant level as a worst case scenario. All detected Site concentrations were below benchmark screening values. This would indicate the both the potential for ecological effects and the risk to ecological receptors from exposure to vinyl chloride in groundwater is still negligible as contaminant levels found by recent sampling are in the same range as results used in this risk assessment. Although methods of risk assessment have progressed in the last few years since the original assessment, the results of the original risk assessment do not indicate the need for further evaluation.

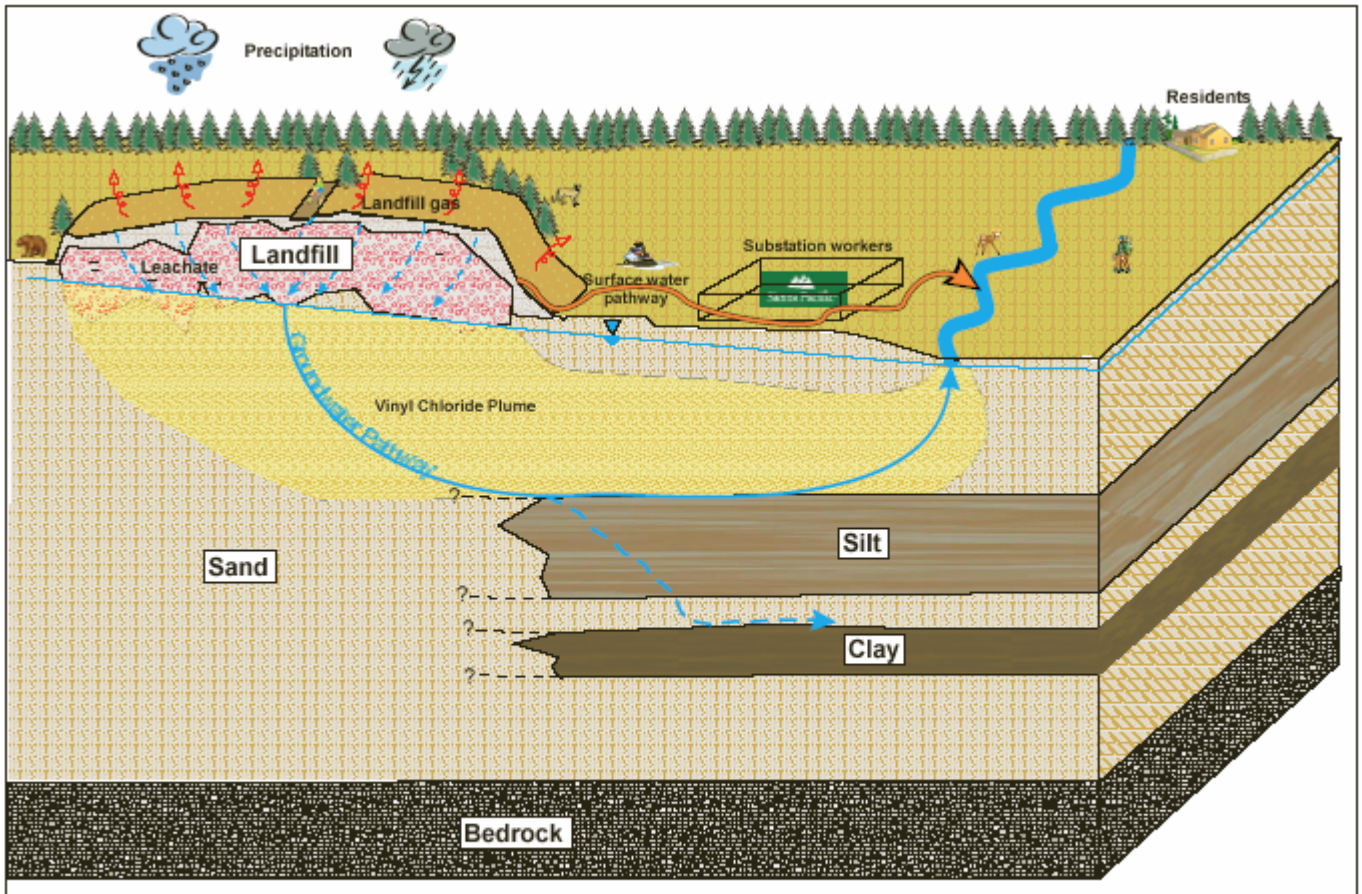


FIGURE 3: CONCEPTUAL SITE MODEL

VI. Remedial Action Objectives

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) provides the implementing regulations for CERCLA. Section 300.430(a)(iii)(B) of the NCP contains the expectation that engineering controls, such as capping or other form of containment, will be used for waste that poses a relatively low long-term threat or where treatment is impracticable. The preamble to the NCP identifies municipal landfills as a type of site where treatment of the waste may be impracticable because of the size and heterogeneity of the contents. Waste in CERCLA landfills is usually present in large volumes and is a heterogeneous mixture of municipal waste frequently co-disposed with industrial and/or hazardous waste. Because treatment is usually impracticable, EPA generally considers containment to be the appropriate response action, or the "presumptive remedy" for the source areas of municipal landfill sites.

Presumptive remedies are preferred technologies for common categories of sites, based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation. EPA has issued guidance that establishes containment as the presumptive remedy for CERCLA municipal landfills including EPA 540-F-93-035 Presumptive Remedy for CERCLA Municipal Landfill Sites; EPA/540/P-92-001 Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites; EPA/540F-95/009 Presumptive Remedies: CERCLA Landfill Caps RI/FS Data Collection Guide; EPA 540/R-94/081 Feasibility Study Analysis for CERCLA Municipal Landfill Sites; and EPA 540-F-99-015 Reuse of CERCLA Landfill and Containment Sites, which are included in the Administrative Record file.

As identified in the Supplemental RI/FS, the Remedial Action Objectives (RAOs) for OU-1 are the following:

- The RAO for the Meyers Landfill is the protection of human and ecological receptors from exposure to landfill refuse and soil contamination by eliminating exposure pathways and contaminant migration.
- The RAO for groundwater is the minimization of the effects of landfill refuse and soil contaminants on groundwater quality (e.g. rainwater infiltration) and rainwater run-on.
- The RAO for landfill gas is the protection of human and ecological receptors by minimizing exposure pathways and gas migration.

These conform to the following RAOs for the CERCLA presumptive remedy for municipal landfills:

- Prevent direct contact with landfill contents;
- Minimize infiltration and any resulting contaminant leaching to ground water;
- Control surface water runoff and erosion; and
- Control and, if necessary, treat landfill gas

The Forest Service is deferring the following component and RAO from the EPA's Presumptive Remedy for CERCLA Municipal Landfill Sites to OU-2.

- Collect and treat contaminated groundwater and leachate to contain any contaminant plume and prevent further migration from the source area.

The evaluation of this component of the containment presumptive remedy for CERCLA municipal landfills will take place as part of the supplemental RI/FS for OU-2.

The Forest Service believes that the implementation of the remedy for OU-1 will have a beneficial effect on groundwater levels in the waste and on contaminant levels and migration through the prevention of water infiltration and landfill gas migration. This in turn may alleviate the need for additional engineering controls for groundwater control and containment beneath the landfill and at the waste boundary.

VII. Summary of Alternatives

The following remedy components address the RAOs identified in Section VI and are addressed in the four (4) alternatives presented below:

- Landfill cap;
- Landfill gas collection and control;
- Long-term monitoring and maintenance; and
- Institutional controls to limit land and resource use.

Another key Site feature that must be addressed as part of the remedy for OU-1 is the STPUD sewer line, which is currently located beneath the waste mass along the eastern boundary of the Site (Figure 2). Three distinct options were evaluated for addressing the sewer line for the purpose of mitigating both the effects of the OU-1 remedy on the operation and maintenance of the sewer line and mitigating the potential effects of the sewer line on the performance and maintenance of the OU-1 remedy. The sewer line remedy component would be conducted as a component of the overall remedy for OU-1. The three (3)

Sewer Options are discussed and presented in Figure 5.

Cover System Remedy Alternatives

Alternative 1 - No Action

Estimated capital cost: $0
Estimated 30 -year O&M cost: $0
Estimated 30-year present worth cost: $0

Alternative 1 (No Action) is included as required by the NCP to serve as a baseline for comparison of the other alternatives. Under this alternative, no engineering measures will be implemented to reduce potential exposures or control potential contaminant migration from OU-1. Similarly, no additional institutional controls and no additional fencing will be implemented to control land use, access, or potential future exposures to wastes and contaminants. No monitoring will be conducted to identify or evaluate any potential changes that may occur to conditions or to contaminant levels or occurrences within OU-1.

Alternative 2 - Subtitle D Cap, Institutional Controls, Passive Landfill Gas (LFG) Venting, Gas Monitoring, and French Drain Expansion

Estimated capital cost: $2,994,283*
Estimated 30 -year O&M cost: $677,500*
Estimated 30-year present worth cost: $3,671,783*
**costs do not include sewer line remedy component*

Alternative 2 consists of a combination of land use and access restrictions (i.e., fencing), and installation of a cover system meeting the minimum Resource Action and Recovery Act (RCRA) Subtitle D and California Code of Regulations (CCR) Title 27 requirements for solid waste landfill covers to isolate landfill refuse, eliminate direct contact with surface soil, reduce erosion, reduce surface soil contaminant migration, and limit surface water infiltration. A RCRA Subtitle D multilayer cover would cover approximately 11 acres and consist of the following components (Figure 4):

- 6 inches of vegetative cover soil.
- 18 inches of cover soil.
- 12 inches of clay material (low permeability).
- 24 inches of foundation material.

Institutional controls consisting of land use and access restrictions, such as fencing, barriers, gates and signs, would be implemented to protect the integrity of the cap and human health. Because this alternative consists of the minimum cap configuration, public access to the Site and area would be restricted.

Landfill gas will be controlled through a passive collection and venting system that is compliant with State Clean Air Act requirements. Approximately 11 LFG vents (one (1) per acre) will be installed at the Site. LFG monitoring probes will also be installed outside of the perimeter of the landfill in accordance with State requirements to monitor for off-site migration of LFG.

This alternative includes an expanded French Drain that will help reduce groundwater/waste interaction resulting from the movement of perched groundwater along the western boundary of the Site. The current French Drain is approximately 100 feet long and is not long nor deep enough to be effective in directing groundwater flow along the western landfill boundary and away from buried waste.

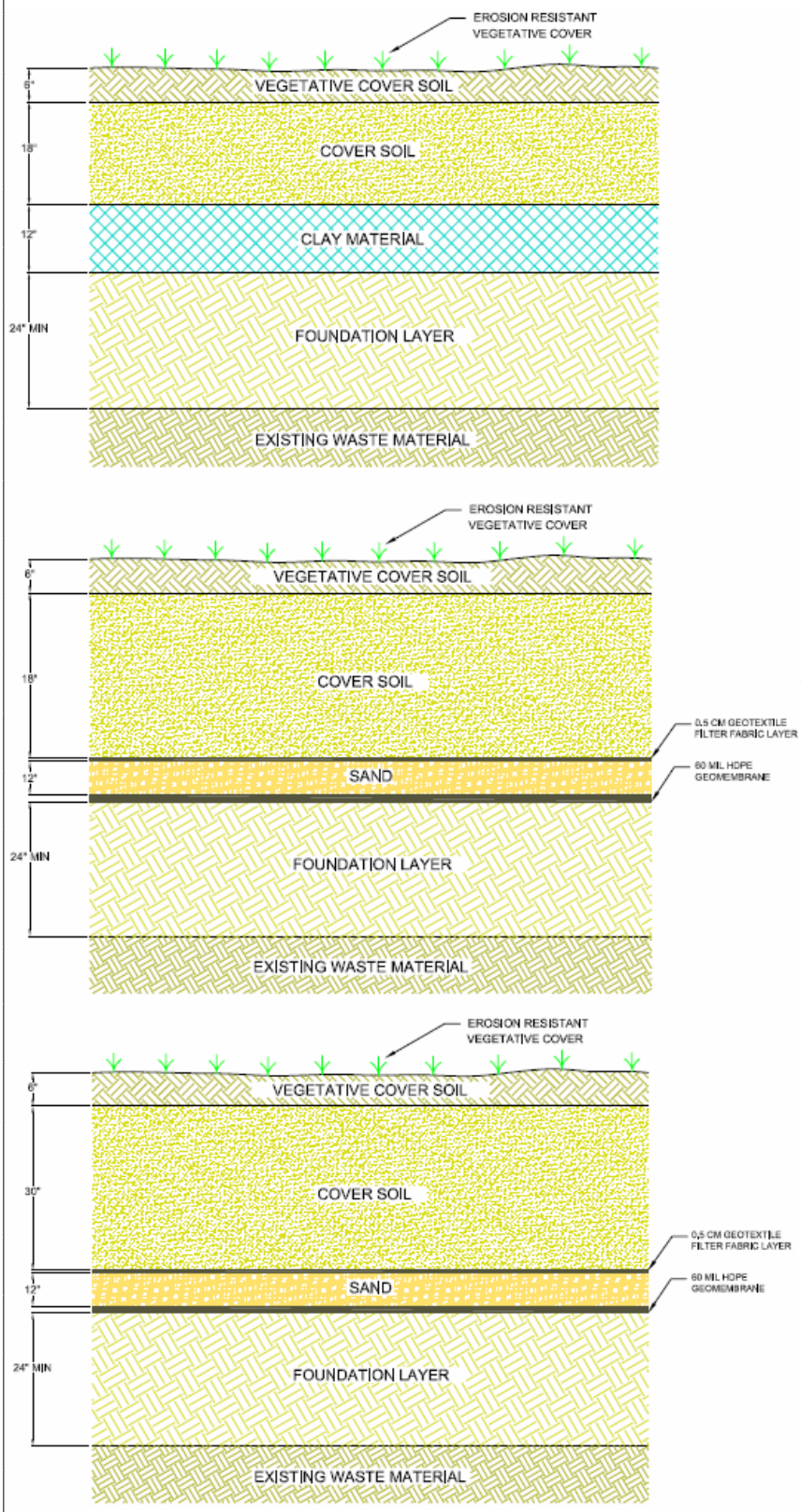
Upon completion of the cover system construction, the ground water monitoring program will be modified and incorporated into the on-going groundwater investigation for OU-2.

Alternative 3 - Multilayer Cap, Passive LFG Venting, Gas Monitoring, Institutional Controls, and French Drain Expansion

Estimated capital cost: $3,700,595*
Estimated 30 -year O&M cost: $677,500*
Estimated 30-year present worth cost: $4,378,095*
**costs do not include sewer line remedy component*

Alternative 3 consists of a multilayer cap (with surface drainage and erosion controls), institutional controls, passive LFG collection and venting, and monitoring, French Drain expansion, and provisions for addressing the sewer line that currently runs beneath the landfill. This multilayer cap is specifically designed to reduce infiltration and meets the minimum design requirements of CCR Title 27, Chapter 3, Subchapter 5, Article 2, § 21090 performance standards and minimum design requirements for a final landfill cover system.

This alternative also incorporates the results of more detailed, site-specific landfill cap analysis that accounts for temperature fluctuations and increased infiltration of water resulting from snow melt at the Site. A multilayer cap implemented under this alternative will isolate landfill refuse,



Alternative 2 - Subtitle D Cap

- 6 inches of vegetative cover soil.
- 18 inches of cover soil.
- 12 inches of clay material.
- 24 inches of foundation material.

Alternative 3 - Multilayer Cap

- 24-inch cover soil layer (6 inches of vegetation 18 inches of cover soil)
- 0.5-cm geotextile drainage fabric layer
- 12-inch drainage layer (sand with minimum 2% slope)
- 60-ml geosynthetic barrier layer
- 24-inch foundation layer (existing cover soil)

Alternative 4 - Enhanced Multilayer Cap

- 36-inch cover soil layer (6 inches of vegetation layer and 30 inches of cover soil)
- 0.5-cm geotextile drainage fabric layer
- 12-inch drainage layer
- 60-ml geosynthetic barrier layer
- 24-inch foundation layer (existing cover soil)

FIGURE 4: CAP ALTERNATIVES

eliminate direct contact of surface soil, reduce erosion, reduce surface soil contaminant migration, and minimize surface water infiltration.

The proposed configuration for the landfill cap, shown in Figure 4, consists of the following components:

- 24-inch cover soil layer (6 inches of vegetation 18 inches of cover soil)
- 0.5-cm geotextile drainage fabric layer
- 12-inch drainage layer (sand with minimum 2% slope)
- 60-ml geosynthetic barrier layer (HDPE geomembrane)
- 24-inch foundation layer (existing cover soil)

Institutional controls consisting of land use and access restrictions, such as barriers, gates and signs, would also be implemented to protect the integrity of the cap and human health from motorized vehicle use. Because this alternative consists of a multi-layer and more protective cap, this remedy alternative will allow for public access and dispersed recreational use.

Landfill gas will be controlled through a passive collection and venting system similar to Alternative 2. A perimeter gas monitoring system will also be installed and monitored for potential off-site migration of landfill gas similar to Alternative 2.

Upon completion of the cap construction, the ground water monitoring program will be modified and incorporated into the on-going groundwater investigation for OU-2, similar to Alternative 2.

Alternative 4 - Enhanced Multilayer Cap, Passive LFG Venting, Gas Monitoring, Institutional Controls and French Drain Expansion

Estimated capital cost: $4,256,976*
Estimated 30 -year O&M cost: $677,500*
Estimated 30-year present worth cost: $4,934,476*
**costs do not include sewer line remedy component*

Alternative 4 contains all the same components as Alternative 3 with one exception; an additional foot of cover soil would be included to be more protective of the landfill cover system and allow for more intense recreational and post closure use (picnic areas, sporting fields, etc.).

The proposed configuration for the cap, shown in Figure 4, consists of the following components:

- 36-inch cover soil layer (6 inches of vegetation layer and 30 inches of cover soil)
- 0.5-cm geotextile drainage fabric layer
- 12-inch drainage layer (sand with minimum 2% slope)
- 60-ml geosynthetic barrier layer (HDPE geomembrane)
- 24-inch foundation layer (existing cover soil)

The remedy elements for institutional controls, groundwater monitoring, passive LFG collection and venting, gas monitoring, French Drain expansion, and groundwater monitoring are identical to those in Alternative 3.

Sewer Line Remedy Component Options

Sewer Option 1 - Leave Line In Place

Estimated capital cost: $75,000
Estimated 30 -year O&M cost: $0
Estimated 30-year present worth cost: $0

Sewer Option 1 involves leaving the operational sewer line in place and constructing the cover system over it (Figure 5). Leaving the STPUD sewer line in place will, at a minimum, require rebuilding the current manholes to accommodate the cap and engineering of an access way on top of the cap to accommodate sewer maintenance equipment. It will also require that engineering controls (cutoff walls) be installed at each end of the sewer line to minimize the potential for landfill gas or leachate migration through the granular fill surrounding the sewer.

Additional institutional controls would be required with this option including operation, monitoring and maintenance programs, spill contingency planning, and access agreements between the Forest Service and STPUD. The administrative costs for these additional institutional controls have not been calculated and could be substantial as they would continue to accrue for the life of the sewer line. Other potential futures costs include the repair of the cover system to original specifications in addition to addressing any future contamination of groundwater caused by a leak from the sewer.

Sewer Option 2 - Moving the sewer line outside the limits of the landfill

Estimated capital cost: $1,258,325
Estimated 30 -year O&M cost: $0
Estimated 30-year present worth cost: $0

The second option for addressing the section of the STPUD sewer line that is beneath waste is to relocate this section to the west or east of the landfill boundary so it will be outside of the perimeter of the cover system. This will involve the construction of approximately 1,400 feet of new line and connecting it into the existing sewer system (see Figure 5).

Approximately 1,000 feet of the existing sewer line between manholes MH 48 and MH-49 will be abandoned in place, plugged and grouted, and trench barriers installed at the location where the sewer crosses the north and south perimeters of the landfill.

Sewer Option 3 - Consolidate the landfill waste from above and east of the sewer line:

Estimated capital cost: $923,763
Estimated 30 -year O&M cost: $0
Estimated 30-year present worth cost: $0

Sewer Option 3 consists of the relocation of the waste that is above and east of the line and consolidating it into the main waste mass west of the sewer line (Figure 5). This option will result in the sewer line being once again located outside of the waste boundary and therefore will be outside of the boundary of the final cover system. Relocation of the waste would require a grading plan that incorporates the current topography and facilitates drainage. All cover soil will be removed from above the waste that is to be relocated and stockpiled in a temporary location. Likewise, cover soil will be stripped from the area where the waste is being relocated to. All waste above and east of the sewer line will be excavated, placed on the west side of the sewer line in designated areas, and compacted. All newly relocated waste and any disturbed areas will be covered with the fill material that was stockpiled at the beginning of the work. Soil will be obtained from the eastern side of the plateau and the east slope to fill the excavation created by the removal of the waste. A new sewer access road will be constructed from Fountain Place Road to the south end of the landfill to minimize the potential impacts to the cap from sewer line operations and maintenance activities.

The consolidation of the waste from above and east of the sewer line will also result in a reduction in the overall size of the landfill cap by approximately 2 acres. This reduction in the footprint of the landfill cover area is estimated to have an associated cost benefit. For example, when combined with Alternative 3, the construction and material costs for the cap is reduced by $482,000 resulting in a net difference of $441,000 of additional costs to relocate the waste.

VIII. Evaluation of Alternatives

The remedial alternatives for OU -1 have been evaluated according to the nine criteria in the NCP 40 C.F.R. 300.430(e)(9) as set forth in the following EPA guidance documents "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" and "Guidance on Preparing Superfund Decision Documents: The Proposed Plan, The Record of Decision, Explanation of Significant Differences, and the Record of Decision Amendment" (Figure 6). These nine criteria can be further categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria, as follows:

Threshold Criteria

- Overall protection of human health and the environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Primary Balancing Criteria

- Long-term effectiveness
- Reduction of toxicity, mobility or volume through treatment
- Short-term effectiveness
- Implementability
- Cost

Modifying Criteria

- Community Acceptance
- State Acceptance

These evaluation criteria relate directly to requirements in Section 121 of CERCLA, 42 U.S.C. § 9621. Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between alternatives. Acceptance by the State and Community are modifying criteria formally considered after public comment is received on the Proposed Plan. This Evaluation of Alternatives supplements the Detailed Analysis of Remedial Alternatives which can be found in the Supplemental RI/FS report that is available in the Administrative Record File.

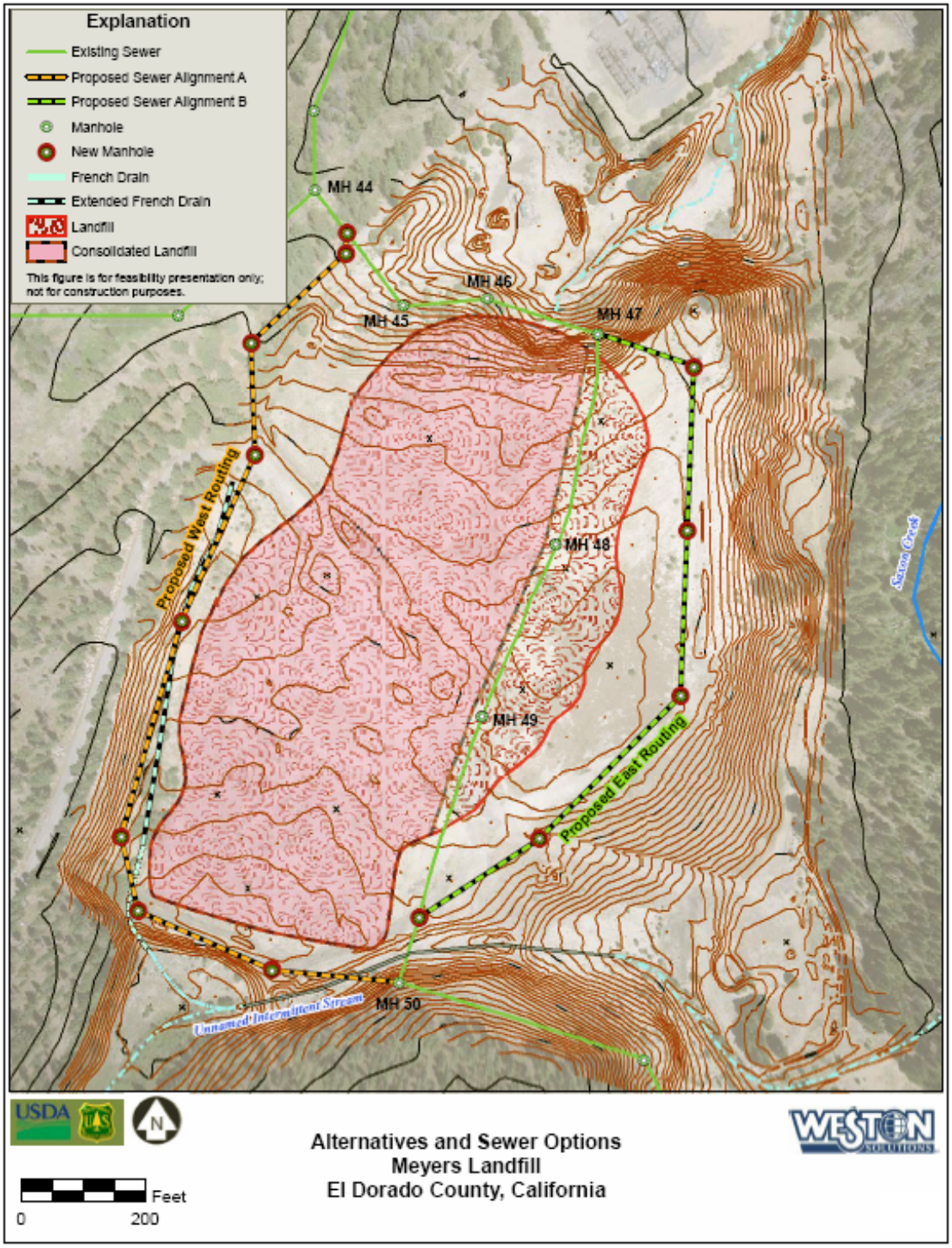


Figure 5: Sewer Line Alternatives

Overall Protection of Human Health and the Environment

Overall Protection of Human Health and the Environment addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering, or institutional controls. The major pathways of concern at the Site are ingestion, inhalation, and dermal contact with landfill debris, leachate, contaminated soils, sediments, groundwater, or surface waters, in the areas within, or outside of the landfill. The overall assessment of the protection draws on the assessment of other evaluation criteria including long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs The selected remedy must meet this criterion.

Alternative 1 does not meet the threshold criteria of overall protection of human health and the environment and does not meet RAOs. The "No-Action" alternative would result in continued groundwater contamination and potential exposure of humans and the environment to contaminants.

Alternative 2 would not be fully protective of human health and the environment. This alternative includes a minimal Subtitle D cap which would not meet the basic cap performance ARARs and long-term effectiveness and permanence, because a clay liner would degrade as a result of freezing-thaw cycles at the Site and effectiveness would be lost.

Alternatives 3 and 4 meet the threshold criteria for protection of human and ecological health. These alternatives eliminate the exposure pathways of concern by isolating the contaminated materials and refuse under the cap, minimizing water infiltration, and providing for gas venting and monitoring and the protection of the cap and will meet the RAOs. Alternative 4 is similar to Alternative 3 but adds an additional foot of cover material to protect the cap from more intense post closure use.

Sewer Option 1 would not be fully protective of human health and the environment. This option involves the leaving of a operational sewer line under the landfill cap and would not provide for long-term effectiveness and permanence of the proposed OU-1 remedy. The landfill cap is the primary component of the remedy for isolating and containing the waste and the elimination of the exposure pathway associated with the waste and debris. Intrusive sewer maintenance and repair efforts of the sewer line section under the cap could require that the engineered cover system be pierced in order to obtain access to the line.

Sewer Options 2 and 3 would be protective of human health and the environment. Both options would result in the sewer line located outside the limits of the cover system when the OU-1 remedy construction is completed and provide for the long-term protection and permanence of the remedy and the elimination of the exposure pathways of concern.

Compliance with Applicable or Relevant and Appropriate Requirements

The compliance with ARARs criterion evaluates whether the alternatives would meet all of the applicable or relevant and appropriate requirements of other environmental statues and/or provide grounds for involving a waiver. Under Section 121(d) of CERCLA, 42 U.S.C. Section 9621 (d), remedial actions must attain ARARs unless such ARARs may be waived under CERCLA Section 121(d)(4), 42 U.S. C. Section 9621(d)(4).

Alternative 1 does not meet the threshold criteria of compliance with ARARs related to landfill closure and groundwater protection.

Alternative 2 will not comply with action-specific and location-specific ARARs concerning the performance of the cap. State regulations require that a cover be designed to function with minimal maintenance and to ensure stability and integrity of the cover. Because Cap Alternative 2 includes a clay layer that was shown in the cap evaluation to be inappropriate for the South Lake Tahoe climatic conditions due to freezing-thaw cycles and potential degradation of the clay layer. This alternative will not meet this ARAR.

Alternatives 3 and 4 are compliant with federal and state ARARs for OU-1.

All three (3) Sewer Options as components of the OU-1 remedy will be complaint with ARARs for the remedy implementation. The relocation of the sewer line under Sewer Option 2 will comply with state and local requirements for the siting, design and construction of sewer transmission lines.

Long-Term Effectiveness and Permanence

The long-term effectiveness and permanence criterion evaluates the long-term protection of human health and the environment over time, once the remedial action goals have

The Forest Service is using the nine EPA criteria to evaluate alternatives for cleaning up hazardous waste sites. The nine criteria are as follows:

1 Overall Protection of Human Health and the Environment

Addresses whether a remedy provides adequate protection of human health and the environment and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Addresses whether a remedy will meet all ARARs or federal and state environmental statutes and/or provide grounds for invoking a waiver.

3 Long-Term Effectiveness

Refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

4 Reduction of Toxicity, Mobility or Volume Through Treatment

Refers to the anticipated ability of a remedy to reduce the toxicity, mobility, and volume of the hazardous components present at the site.

5 Short-Term Effectiveness

Addresses the period of time needed to complete the remedy and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6 Cost

Evaluates the estimated capital, operation, and maintenance costs of each alternative.

7 Implementability

Refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry out a particular option.

8 Agency Acceptance

Indicates whether, based on its review of the information, the lead agency concurs with, opposes, or has no comment on the preferred alternative.

9 Community Acceptance

Indicates whether community concerns are addressed by the remedy and whether the community has a preference for a remedy. Although public comment is an important part of the final decision, the USFS will abide by the EPA's legal mandate to balance community concerns with all previously mentioned criteria.

FIGURE 6: EPA REMEDY EVALUATION CRITERIA

been achieved. It focuses on the magnitude of residual risk and the adequacy and reliability of the controls of the alternatives.

Alternative 1 will not provide long-term protection because no contaminant reduction, removal, or containment measures are implemented to protect human and ecological receptors.

Alternative 2 may not be effective for long-term protection of human health and the environment. A minimal Subtitle D cap would place the clay layer within the soil freeze zone for the area. Clay liners are adversely affected by freezing and can crack, potentially allowing rainwater or snowmelt to infiltrate the waste.

Alternatives 3 and 4 provide long-term effectiveness and permanence for the Meyers Landfill and will isolate the refuse from human and environmental receptors. Both alternatives provide for additional protection of the cover system from damage caused by public recreational activities that currently occur in the area and that are anticipated to continue to occur in the future.

Alternative 4 provides for slightly more resistance to more intense recreational use, whereas Alternative 3 provides a cap sufficient for the passive recreational use that currently occurs in the area. The additional foot of cover material provided under Alternative 4 is warranted if more intense post-closure use is planned that could reduce the effectiveness of the cap or create erosion hazards (example, picnic areas, ball fields, etc.). The cap configurations for both Alternatives 3 and 4 can be modified, both during the design phase and later to accommodate changes in future post-closure Site use.

Sewer Option 1 would not provide for long-term effectiveness and permanence of the proposed cover system. Intrusive sewer maintenance and repair efforts may require that the engineered cover system be pierced in order to obtain access to the line. In addition, the purpose of placing an impermeable engineered cap on top of the landfill is to prevent the infiltration of water and the leaching of contaminants into the groundwater. A sewage leak under the cap could cause the release of the liquids into the groundwater beneath the waste and exacerbate movement of contaminant plume and possibly contribute more contamination. Sewer Options 2 and 3 would provide a long-term remedy solution that will be consistent with maintaining the effectiveness of the proposed cover system. These options result in the sewer line located outside the limits of the cover system when the OU-1 remedy construction is completed.

Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion evaluates the performance of the alternatives to reduce the toxicity, mobility and volume of waste by assessing the degree of irreversibility and the types and quantity of residuals remaining.

Alternative 1 will not result in a reduction in toxicity, mobility, or volume of landfill refuse, leachate, or landfill gas, through treatment except for reductions due to natural attenuation.

None of Alternatives 2, 3 and 4 provides for the reduction in toxicity, mobility, or volume through treatment. Consistent with EPA's presumptive remedy for CERCLA Municipal Landfills, containment technologies generally are more appropriate for municipal landfill waste because the volume of and characteristics of the waste generally make waste treatment impracticable. All three (3) alternatives will reduce the potential for rainwater to infiltrate the refuse and produce additional leachate and contaminated groundwater. Natural attenuation is the only process providing for reduction of toxicity in these alternatives.

None of the three (3) Sewer Option provides for the reduction in toxicity, mobility, or volume through treatment. However, Sewer Option 1 would leave the sewer line in place, beneath and in close proximity to buried refuse and within the footprint of the impermeable cover system. Any leakage or failure of the line could result in additional liquids infiltrating into the groundwater beneath the waste disposal area and exacerbate migration of the vinyl chloride plume.

Short-Term Effectiveness

Short-term effectiveness evaluates the alternatives against the period of time needed to achieve protection of human health and the environment and any adverse impacts that may be posed during the construction and implementation period, until clean-up goals are achieved.
Alternative 1 will not have any short-term impacts or effectiveness, as it does not involve remediation activities. Capping is a standard engineering process for the closure of land disposal sites. Alternatives 2, 3 and 4 pose minimal risk to the nearby community during implementation, although small areas of construction activity during imple-

mentation may expose the existing waste. The short-term effectiveness for each alternative is roughly equivalent, but Alternative 4 would require slightly more time to complete.

All three (3) Sewer Options involve standard engineering and construction processes. Equipment used for implementing the sewer line component of the remedy consists mostly of standard construction equipment. There are adequate numbers of local construction and trained personnel to complete the task. While the movement of waste is a standard construction operation, Sewer Option 3 will require additional health and safety precautions to be implemented during the relocation and consolidation of the waste.

Implementability

The implementability evaluation criterion consists of several sub-components, including those which evaluate the compatibility of remedial measures with site conditions, availability of materials and services, ability to undertake further remedial actions if necessary, and regulatory considerations.

Alternative 1 is readily implementable; however, it does not meet the RAOs and threshold criteria.

Alternatives 2,3 and 4 are both technically and administratively implementable. Equipment used for implementing the capping portion of the remedy consists mostly of standard construction equipment. Additional soil and base material will be required and may be obtained on- or off-site. There are adequate numbers of local construction and trained personnel to complete the task in approximately four months.

All three (3) Sewer Options are both technically and administratively implementable. Equipment used for implementing the sewer line component of the remedy consists mostly of standard construction equipment. There are adequate numbers of local construction and trained personnel to complete the task. Sewer Alternative 3 will require additional health and safety precautions to be implemented during the relocation and consolidation of the waste.

Cost

The cost evaluation criterion considers the estimated cost for the capital and operation and maintenance (O&M) of the alternatives on a present worth basis.

There is no direct cost associated with Alternative 1.

Most of the costs associated with the Alternatives 2,3 and 4 are associated with material purchases for the cover system and construction. Annual O&M costs for the three (3) alternatives are similar and include cap maintenance, and gas monitoring.

The approximate costs for each alternative, excluding the sewer line component, are as follows:

Cap Alternative 1: $ 0
Cap Alternative 2: $ 3,672,000
Cap Alternative 3: $ 4,378,000
Cap Alternative 4: $ 4,934,000

The costs for the three (3) Sewer Options range from $75,000 to $1,239,000. Depending on the final sewer option chosen the total cost with Alternative 2 ranges from $3,747,000 to $4,911,000, with Alternative 3 ranges from $4,453,000 to $5,617,000 and with Alternative 4 ranges from $5,009,000 to $6,192,000.

These numbers do not take into account that relocation of waste from above and east of the sewer and consolidating it with the main landfill mass would reduce the cover system size by approximately two acres. This reduction in the area of the cap is estimated to have a cost offset of $482,000 for the Alternative 3 resulting in a net difference of $441,000 of additional costs to relocate the waste.

Future and ongoing costs for Sewer Alternative 1 can also not be calculated with any reliability. Long-term costs associated with this alternative will depend on the long-term integrity of the sewer line with the potential for much higher costs if the sewer fails or leaks. Future costs would include the repair of the cover system to original specifications in addition to addressing any future contamination of groundwater caused by a leak from the sewer.

State Acceptance

This criterion indicates whether the state concurs with, opposes, or has no comment on the preferred remedy. The LRWQCB has provided the following comments:

Cap Alternative 1 "No Action", will not be acceptable to the State because it does not provide long-term protection of human health and the environment and does not comply with state groundwater protection and landfill closure ARARs.

Cap Alternative 2 may not meet State acceptance. The minimum prescriptive standards meeting California Code of Regulations Title 27 requirements may not achieve performance goals due to specific site conditions. For example, the clay layer is within the soil freeze zone and would likely degrade over time, allowing spring snowmelt and precipitation to percolate through the cap. In addition, the passive landfill gas venting spacing of a single vent per acre of cap may not be robust enough, possibly contributing to continued vinyl chloride gas migration into groundwater.

Cap Alternative 3 or 4 would meet State acceptance. The multilayer cap or the enhanced multilayer cap would meet the California Code of Regulations Title 27 performance goals of isolating the wastes from precipitation or irrigation water. In addition, the passive landfill gas venting spacing of a single vent per acre of cap may not be robust enough, possibly contributing to continued vinyl chloride gas migration into groundwater.

State acceptance of the Proposed Plan will be further evaluated following the public comment period.

Community Acceptance

Community acceptance considers whether the local community agrees with Forest Service's analyses and preferred alternative. Community acceptance will be fully evaluated following the public comment period and the receipt and analysis of public comments on the Proposed Plan.

IX. Summary of Preferred Alternative

The preferred remedy alternative for OU-1 at the Meyers Landfill Site is cover system Alternative 3 (multi-layer cap, passive LFG venting, gas monitoring, institutional controls, and French Drain expansion) combined with Sewer Option 3 (consolidation of waste from above and east of the sewer line). This combination of cover Alternative 3 and Sewer Option 3 is hereafter referred to as the Preferred Alternative.

The Preferred Alternative is selected because it will achieve substantial risk reduction by isolating the contaminated materials and refuse under the cap, minimize water infiltration, control and monitor landfill gas, provide for protection of the cap and will allow for the future use of the Site in a manner consistent with existing land use designations.

State regulations require that the final covers of municipal landfills function with minimum maintenance and provide waste containment to protect public health and safety by controlling at a minimum, vectors, fire, odor, litter and landfill gas migration and be compatible with post-closure land use. The configuration of the Alternative 3 cap will meet this, in addition to addressing Site/location specific needs, such as drainage for snow melt, etc. The additional 12 inches of cover soil is considered necessary to address permanency of the remedy, reduce operation and maintenance requirements, and to allow for current and future use consistent with existing land use designations.

Sewer Option 1 does not meet threshold evaluation criteria and would not provide for the long-term protection and permanence of the cover system remedy. Leaving the sewer line located within the landfill mass creates design, construction, and operation and maintenance issues with sewer components, such as manholes penetrating the cover. In addition, any future intrusive sewer maintenance and repair efforts of the sewer line section under the cap could require that the engineered cover system be pierced in order to obtain access to the line.

Both Sewer Option 2 and 3 would result in the sewer line location outside the limits of the cover system when the OU-1 remedy construction is completed and would provide for the long-term protection and permanence of the remedy and the elimination of the exposure pathways of concern. Option 3 is more cost effective and will reduce long-term operation and maintenance requirements as a result of the waste consolidation. Although there is a unknown element associated with the amount of contaminated soil that may lie beneath the waste, the Forest Service believes the benefits of consolidating the landfill waste mass out weigh this disadvantage. If additional contaminated material is found during consolidation, it can be easily addressed with the equipment already at the Site, and the excess material can be included in the foundation layer of the main waste mass. The main benefits of consolidating the waste includes, but are not limited to:

- Reducing the size of the landfill area by two acres decreases cap material costs and cap construction costs by an estimated $482,000. Long term operation and maintenance costs would be reduced by having a smaller area to maintain, as well as by having the sewer isolated from the landfill cap.
- Waste excavated from the eastern side of the sewer will be utilized in the foundation layer to fill depressions caused by differential settlement of waste. This reduces the amount of fill material that would need to be imported from off site sources.

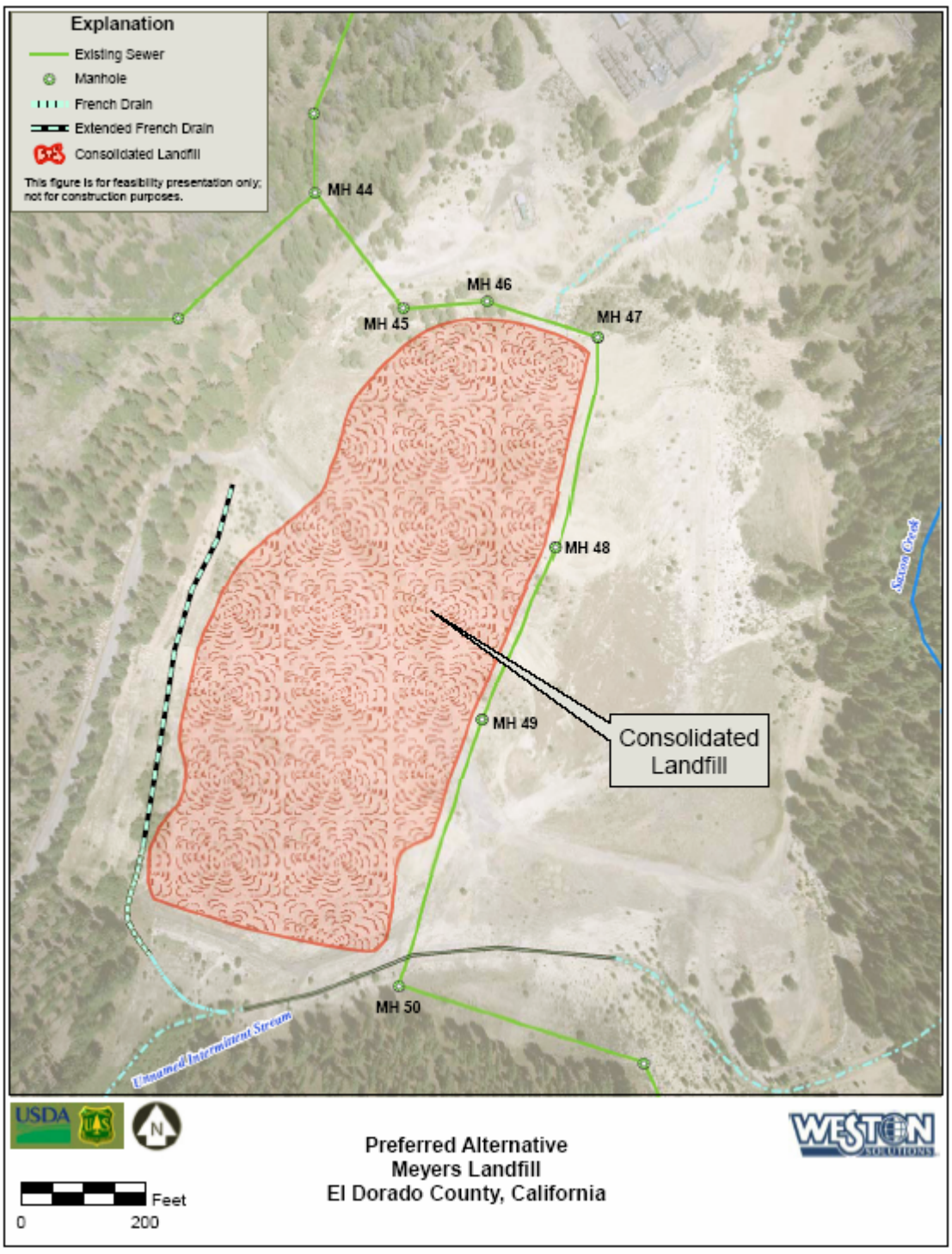


Figure 7: Preferred Remedial Alternative for OU-1

The projected total cost for this Preferred Alternative is $4,819,000. This includes a higher contingency factor for Sewer Option 3 to account for the unknown element associated with the amount of contaminated soil that may lie beneath the waste that is to be relocated.

Based on the information available at this time, the Forest Service believes the Preferred Alternative for OU-1 will be protective of human health and the environment, will comply with ARARs, will be cost effective, and will utilize permanent solutions to the maximum extent practicable. The Preferred Alternative meets the threshold remedy evaluation criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying remedy evaluation criteria. The Forest Service expects the Preferred Alternative to satisfy the following statutory requirements in CERCLA Section 121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for containment as a principle element.

This Preferred Alternative is based on current information and it could change in response to public comment or new information.

X. Opportunities for Public Involvement

Public Comment Period: May 21, 2007, through July 5, 2007

The Forest Service strongly encourages public participation in the decisionmaking process. Copies of the Administrative Record, containing the documents and information used to develop the cleanup alternatives, will be available for public inspection during the public comment period. A set will be available during normal office hours at the Lake Tahoe Basin Management Unit office at 35 College Drive, South Lake Tahoe, California. During the public comment period, you may comment on all the proposed cleanup alternatives, including the Forest Service's preferred remedial alternative. A final remedial action decision will not be made until all comments have been considered. Comments may be submitted verbally or in writing at the second public meeting, or written comments may be postmarked no later than July 5, 2007, to:

Rex Norman, Public Affairs Officer
USDA Forest Service, Lake Tahoe Basin Management Unit
35 College Drive
South Lake Tahoe, California 96150
Telephone: (530) 543-2627
Fax: (530) 543-2693
Email: rnorman@fs.fed.us

The public is invited to attend two public meetings regarding the proposed cleanup alternatives for the Meyers Landfill Site. You are encouraged to attend to have your questions answered and your comments documented for the record.

Dates/Times:	Thursday, May 24, 2007, 5:30 to 7:30 p.m. At this informational meeting, the Meyers Landfill Site will be described and the remedial alternatives will be presented.
	Thursday, June 14, 2007, 5:30 to 8:30 p.m. Written and verbal comments on the remedial alternatives will be received at this meeting.
Meeting Location:	Lake Tahoe Basin Management Unit 35 College Drive South Lake Tahoe, California 96150

U.S.D.A Forest Service Proposed Plan Operable Unit 1 Meyers Landfill Site

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(530) 543-2600

The Administrative Record for the site is also available for public review at the above referenced office location. Advance appointments are recommended.

Lake Tahoe Basin Management Unit
35 College Drive
South Lake Tahoe, CA 96150-4500
ATTN: Rex Norman

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