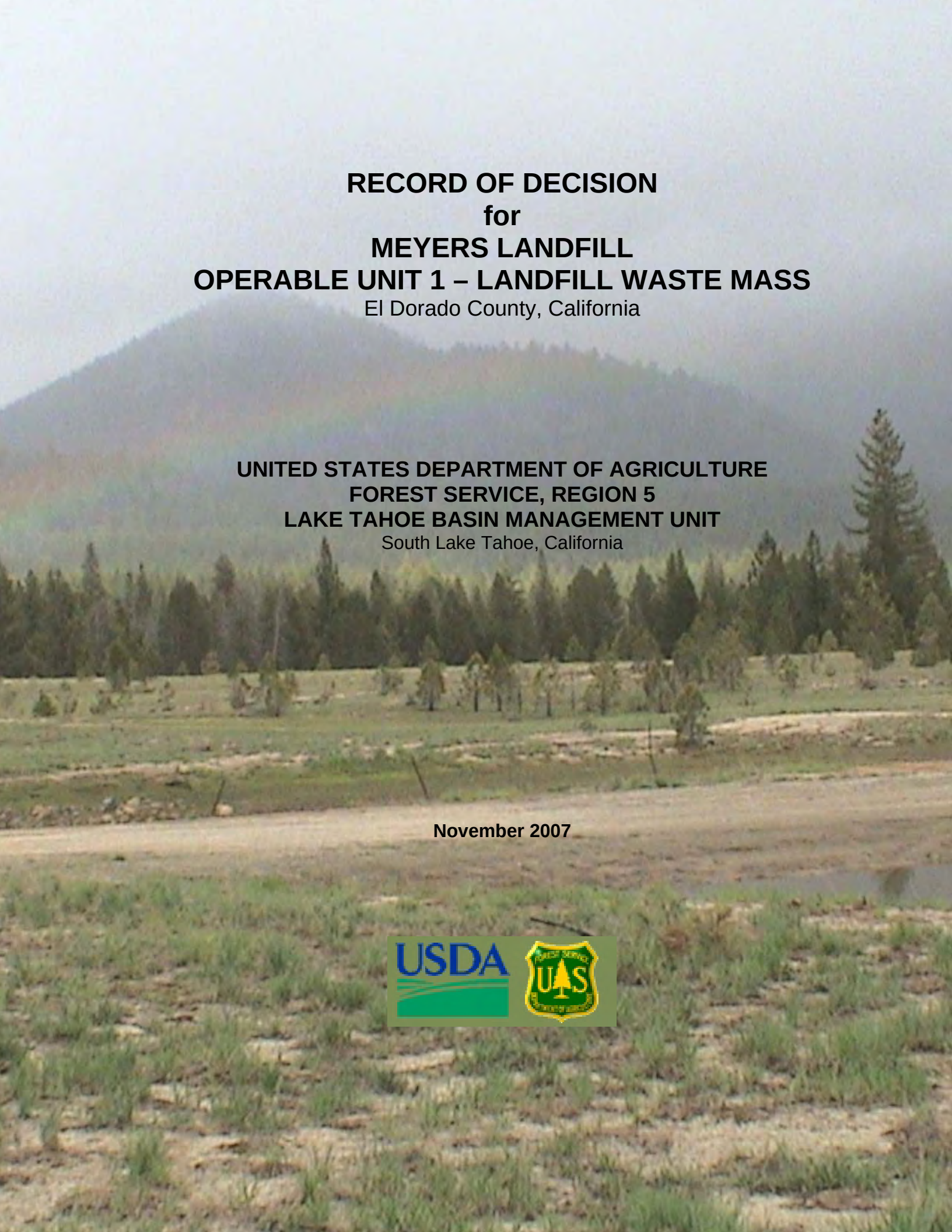

RECORD OF DECISION
for
MEYERS LANDFILL
OPERABLE UNIT 1 – LANDFILL WASTE MASS

El Dorado County, California

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE, REGION 5
LAKE TAHOE BASIN MANAGEMENT UNIT
South Lake Tahoe, California

November 2007

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OPERABLE UNIT 1

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Responsiveness Summary for Meyers Landfill Site Operable Unit 1

ABBREVIATIONS AND ACRONYMS

µg/kg	Micrograms per kilogram
ARAR	Applicable or Relevant and Appropriate Requirement
BMP	Best Management Practice
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIWMB	California Integrated Waste Management Board
COPC	Chemical of Potential Concern
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
FGC	Fish and Game Codes
FS	Feasibility Study
HELP	Hydrologic Evaluation of Landfill Performance
HHRA	Human Health Risk Assessment
HSC	Health and Safety Code
LEL	Lower Explosive Limit
LUC RD	Land Use Control Remedial Design
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
mg/kg	Milligrams per kilogram
msl	Mean Sea Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NPV	Net Present Value
OU	Operable Unit
O&M	Operation and Maintenance
PRG	Preliminary Remediation Goal
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SDR	Standard Dimension Ratio
SVOC	Semi-volatile Organic Compound
SWRCB	State Water Resources Control Board
TBC	To-Be-Considered (regulation)
TDS	Total Dissolved Solids
UCL	Upper Confidence Limit
USC	United States Code
VOC	Volatile Organic Compound
WQMA	Water Quality Management Authority
WQO	Water Quality Objective

1.0 DECLARATION STATEMENT FOR MEYERS LANDFILL OU-1

1.1 SITE NAME AND LOCATION

The Meyers Landfill Site (Site) is located northeast of the town of Meyers on National Forest System lands within the United States Department of Agriculture Forest Service (Forest Service) Lake Tahoe Basin Management Unit (LTBMU), El Dorado County, California (Figure 1). The Forest Service is the lead agency pursuant to its delegated authorities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Executive Order 12580.

1.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Operable Unit 1at the Meyers Landfill Site located on National Forest System lands within the LTBMU, El Dorado County, California. On January 14, 2002, the Forest Service issued a Proposed Plan for the Site for public comment. The 2002 Proposed Plan called for capping the waste mass with an impermeable cover system and remediating the contaminated groundwater plume by installing a "pump and treat" system. Upon review of public comments, and discussions with potentially responsible parties, the Forest Service determined that additional site investigation work should be performed to fill identified data gaps and to refine the remedy selection. In 2006, the Forest Service made a determination to separate the Site into two Operable Units (OUs), OU-1, the landfill waste mass, and OU-2, the groundwater plume, to allow for the acceleration of the selection and implementation of a containment remedy for the landfill waste mass. A Supplemental Remedial Investigation/Feasibility Study (RI/FS) for OU-1 was completed in May 2007 and forms the basis of this Record of Decision (ROD).

The remedy was selected in accordance with CERCLA, 42 USC §9601 et seq., as amended, and the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300. The selection is supported by information in the administrative record for the Meyers Landfill. The remedy is consistent with the U.S. Environmental Protection Agency (EPA) presumptive remedy guidance for CERCLA municipal landfill sites (EPA 1993, 1996) and the NCP. This decision document satisfies requirements for the ROD under CERCLA. The signatures in Section 1.7 indicate approval of this ROD by the Forest Service.

1.3 ASSESSMENT OF THE SITE

The selected remedial action described in this ROD is necessary to protect public health and welfare and the environment from actual or threatened releases of hazardous substances, pollutants, or contaminants from the Site, which may present an imminent and substantial endangerment to public health or welfare, and the environment. The site is releasing CERCLA hazardous substances into the environment. The primary contaminant release and transport mechanism to underlying soils and groundwater at the Site is the leaching of contaminants from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing porous cover soils. If no action is taken, the Site will continue releasing vinyl chloride and other

contaminants into the underlying soils and groundwater and the contaminated groundwater plume will continue to expand, potentially threatening drinking water supply wells and nearby surface waters. In addition, without additional controls, erosion due to precipitation and recreational uses could result in further removal of the existing sandy soil cover and exposure of waste, giving rise to unacceptable exposure of contaminants to human and ecological receptors.

1.4 DESCRIPTION OF THE REMEDY

The selected remedial action described in this ROD addresses potential risks to human health and the environment posed by the Meyers Landfill OU-1. The major components of the selected remedy, Meyers Landfill Cover System Remedy Alternative 3 and Sewer Option 3, include the following:

- Installation of a multilayer cap and cover system to isolate and eliminate direct contact with refuse, reduce or eliminate erosion and surface water infiltration through the waste mass, and reduce or eliminate potential surface contaminant migration. The cover system includes a passive landfill gas (LFG) venting system to control LFG migration.
- The relocation of waste from above and east of the South Tahoe Public Utilities District (STPUD) sewer line and consolidation into the main waste mass. This will result in the sewer line being located outside the boundary of the waste disposal area and the footprint of the cover system.
- Implementation of institutional controls to safeguard the integrity of the multi layer cap and cover system and associated monitoring systems. Institutional controls to protect human health and the environment and the integrity of the remedy, as specified in a future Land Use Control Remedial Design (LUC RD), will consist of prohibitions on groundwater use at the Site and on-site activities and use that could threaten short-term and long-term remedy integrity.
- Long-term post-closure monitoring and maintenance that includes groundwater monitoring, perimeter landfill gas migration monitoring.

The CERCLA investigation, evaluation, and planning for the Site have resulted in the selection of a Site-specific remedy, with associated land use controls, that prevent unacceptable exposure and protect the human health, welfare and the environment. Containment of the landfill waste will prevent direct exposure to the waste and reduce infiltration and production of leachate. The Forest Service will ensure that institutional controls and future land use will be compatible with the Selected Remedy.

This ROD does not address remedial actions that may be necessary to address any groundwater contamination that may continue to be emanating from the waste disposal area after the implementation of the OU-1 remedy. Neither does it address the groundwater plume Operable Unit. The full extent of groundwater contamination and vinyl chloride impacts to groundwater are still being defined and will be further characterized as part of the Supplemental OU-2 RI/FS. There will be a second and final Operable Unit ROD for the site. This second OU ROD will address OU-2, the groundwater plume, and any response action that may be required to address groundwater contamination that may continue to be emanating from the waste disposal area. If groundwater remediation is required in the future, the groundwater remediation system will be designed in a manner that would provide for integrity of the selected OU-1 remedy.

1.5 STATUTORY DETERMINATIONS

The selected remedy is protective of human health, welfare, and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, and is cost effective. The selected remedy uses permanent solutions and satisfies the statutory requirements of CERCLA and the NCP.

In light of the large volume of the waste, the relative heterogeneity of the landfill contents, and the absence of identified hot spots of contamination, treatment of the buried refuse, the principal source of contamination, was not deemed practical or cost effective. Therefore, this remedy does not satisfy the statutory preference for treatment as a principal element. Remedial options, including excavation of the landfill with consolidation and off-site disposal were not formally re-evaluated in the Supplemental RI/FS for OU-1. This was primarily because of the high cost associated with excavation and off-site disposal, potential uncertainties regarding the landfill contents, the lack of suitable areas for consolidation, and the potential for large-scale excavation and backfilling to damage surrounding sensitive environments near Saxon Creek.

For these reasons, and in accordance with EPA guidance on presumptive remedies, a containment technology was selected as the preferred alternative for the Site. Containment technologies, as used by the EPA, refer to remedies that contain or encapsulate waste, rather than treat or destroy waste. Therefore, placement of a multilayer landfill cap is considered a containment technology.

Because the remedy leaves potentially hazardous substances, pollutants, or contaminants in the landfill at concentrations above levels that allow for unlimited use and unrestricted exposure, the Forest Service will conduct five-year reviews in accordance with CERCLA Section 121(c). The reviews will ensure that the remedy continues to provide adequate protection of human health and the environment.

1.6 ROD DATA CERTIFICATION CHECKLIST

The following Data Certification Checklist provides a roadmap to the ROD and identifies the location of key elements or explains why these elements are not addressed in the ROD. Inclusion of the ROD Data Certification Checklist fulfills a commitment by the EPA to the General Accounting Office, now known as the "Government Accountability Office", to ensure that RODs contain certain key information on remedy selection (EPA 1999).

Checklist Item Description

1. *Chemicals of concern and their respective concentrations.* In accordance with the EPA's presumptive remedy guidance for landfills, chemicals of concern and their concentrations within the landfill have not been evaluated. Investigations to determine the size and lateral and vertical extent of the waste disposal area were conducted as part of the Supplemental OU-1 RI/FS.
2. *Baseline risk represented by the chemicals of concern.* EPA's presumptive remedy guidance for CERCLA municipal landfills states that quantitative baseline risk assessment calculations are not required to implement the EPA's municipal landfill presumptive remedy. 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, which included the waste disposal area and groundwater plume. Site risk assessments are discussed in Section 2.7.

3. *Cleanup levels established for chemicals of concern and the basis for these levels.* The EPA's presumptive remedy (landfill cap) is a containment solution and does not include cleanup of the debris within the landfill. Cleanup levels are therefore not included in this ROD.
4. *How source materials constituting principal threats are addressed.* Characterization of the landfill contents is not required to select and construct the EPA's presumptive remedy, a landfill cap. Capping addresses the threats of potential contact with waste and off-site contaminant migration by windborne or surface water erosion of soils and waste. Mitigation of potential threats is discussed in Sections 2.9.1, 2.9.3, 2.9.4, and 2.9.5 of this ROD.
5. *Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD.* Current and anticipated future land uses at the Site are discussed in Section 2.6. Land use assumptions in the human health risk assessment are discussed in Section 2.7.1. Potential groundwater uses will be reviewed in the Supplemental RI/FS for the groundwater OU-2 investigation.
6. *Potential land and groundwater use that will be available at the Site as a result of the selected remedy.* Potential land uses at the Site as a result of the selected remedy are discussed in Section 2.6. Potential groundwater uses will be reviewed in the Supplemental RI/FS for OU-2.
7. *Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected.* The estimated capital, annual O&M, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected are discussed in Section 2.9.7.
8. *Key factors that led to selecting the remedy.* Key factors that led to selecting the remedy are discussed in Sections 2.10 and 2.11.

1.7 AUTHORIZATION SIGNATURE AND ACCEPTANCE OF REMEDY

11/15/07

George Kulick
Director of Engineering
USDA Forest Service, Pacific Southwest Region

Date

2.0 DECISION SUMMARY FOR MEYERS LANDFILL OU-1

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The Meyers Landfill Site is a closed waste disposal site located on National Forest System lands within the Forest Service's Lake Tahoe Basin Management Unit (LTBMU) (Figure 1). The Site is located approximately 1.9 miles northeast of the town of Meyers and 4.5 miles south of Lake Tahoe. The Site is bounded on the west by the paved USFS Road 12N08, also known as Garbage Dump Road. An active electrical substation operated by Sierra Pacific Power Company is north of the Site, Saxon Creek is to the east, and the intermittent stream valley, in which the landfill was constructed, continues to the south. The disposal site and the area immediately surrounding it form a relatively flat plateau of approximately 17 acres (Figure 2).

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 of at the Site included solid waste from residential and commercial sources from within the Lake Tahoe Basin area. The Site stopped receiving waste in 1971, and in 1972-1973, the County closed the dump and placed a sandy-soil cap over the waste.

Surface features on the disposal area are limited to the access road, storm water drains, drainage ditches, and water collection galleries. The only structures on the landfill are Forest Service groundwater monitoring wells and manholes associated with the STPUD Trout Creek trunk sewer line that runs beneath the eastern side of the waste disposal area (Figure 3).

The aerial distribution of the buried waste is approximately 11 acres (Figure 2). The bottom of the waste fill appears to be at an average depth of approximately 25 feet below grade with the central portions of the Site reaching depths of up to 50 feet. Site characterization efforts indicate that the waste volume is approximately 290,000 cubic yards to 305,000 cubic yards. The nearest residences are located approximately 1,500 feet north on Hekpa Drive and 1,100 feet west of the Site on Busch Way.

2.1.1 Geology and Topography

The Site is located in Lake Valley, which was created by a combination of tectonic and glacial processes. Basin and range fault bounded blocks created the Lake Tahoe Basin between the granitic mountains of the Sierra Nevada and the Carson Range. The downdropped Tahoe block is bordered on all sides by faults. Individual faults of the East Tahoe fault zone are located within 3,000 feet north and south of the Site.

The valley floor is made up of basin-fill deposits that generally consist of unconsolidated glacial, lake, and stream sediments. The thicknesses of these deposits vary across the basin from relatively thin toward the margins of the Basin, and in areas where they cover shallow bedrock, to more than 1,000 feet. Bedrock in the area of the Site was encountered at a depth of 228 feet below ground surface (bgs), as documented in boring logs describing STPUD's Elks Club Well No.2 (STPUD, 2006). Boring logs completed for wells D-4 and D-5 indicate that either bedrock or glacial boulders were encountered at depths between 150 and 187 feet bgs (PTEM, 2000).

Glacial deposits form the majority of the aquifers in the Basin. As valley glaciers advanced and

receded, lateral moraines formed along their edges and terminal moraines formed in front of the glaciers. These moraine deposits are typically jumbled deposits of clay- to boulder-size material, with moderate permeability

Sediment-laden melt-waters flowed from the receding glaciers north toward Lake Tahoe in broad coalescing flood fans referred to as outwash plains. These glacial outwash deposits are composed of layered beds of well-sorted gravel, sand and silt-size material, with moderate to high permeability

Glacial streams deposited sediment directly into Lake Tahoe forming thick deltas of interlayered sand and fine-grained silt and clay. These delta sequences grade laterally and include lakeshore deposits, consisting of moderately well sorted sands and gravels with relatively high permeability; marsh deposits, consisting of fine-grained sand, silt and clay; and lake deposits, consisting of silt and clay. Both the marsh and lake deposits have relatively low permeability. The glacial outwash and delta deposits form excellent groundwater reservoirs (STPUD, 2004).

The level of Lake Tahoe has changed up to 600 feet during the three most recent periods of glaciation. Silt and clay layers encountered beneath the Site during investigations may be actual lake deposits that were deposited in the periods of higher lake levels during these glacial periods.

The geologic map of the Freel Peak 15-minute quadrangle shows the landfill located on the eastern slope of a moraine with its axis trending along Pioneer Trail. The United States Geologic Survey (USGS) reports the moraine as deeply weathered, moderately to well compacted, unsorted bouldery to clayey gravel. Flood plain deposits along Saxon Creek to the east of the landfill are identified on the geologic map as moderately to poorly sorted, gravelly to silty sand and sandy to clayey silts (USGS, 1983).

Based on trench and CPT logs, the landfill is covered with fine-to-medium sand, and sand with silt that is loose and highly permeable. Depths of soil covering the landfill have been reported to range from approximately 3 to 15 feet in thickness, averaging between 5 and 6 feet in thickness (PTEM, 2000).

The location of a generalized geologic cross section of the landfill is shown in Figure 4 and the cross section is shown in Figure 5.

2.1.2 Hydrology

The Site is located in the Tahoe Valley South Subbasin, identified by the California Department of Water Resources (DWR) as Groundwater Basin Number: 6-5.01, which occupies 23 square miles (DWR, 2004). The subbasin is part of the Tahoe Valley Groundwater Basin and is within the larger structural feature commonly referred to as the Lake Tahoe Basin. The Tahoe Valley South Subbasin occupies a roughly triangular area and is bounded on the southwest and southeast by the Sierra Nevada mountain range, on the north by the southern shore of Lake Tahoe, and on the northeast by the Carson Range. The southern boundary extends about 3 miles south of the town of Meyers and forms the triangle's apex. Ground elevations within the subbasin range from 6,225 feet MSL at lake level to above 6,500 feet MSL in the south. The current site surface is 35 to 45 feet above natural grade and ranges in elevation from 6,370 to 6,385 feet MSL.

The principal source of groundwater in the Tahoe Valley South Subbasin is Tertiary and Quaternary age glacial, fluvial, and lacustrine sediments, collectively referred to as basin-fill deposits. Most water wells drilled in the basin are completed in basin-fill deposits, where groundwater occurs under confined, semi-confined, and unconfined conditions. Hydraulic conductivity is highly variable, but appears to range at the Site from approximately 20 to 60 feet per day (Geomatrix, 2005). Pre-Cretaceous granitic rocks form the base of the aquifer. Seasonal changes in groundwater elevations in site monitor wells indicate that groundwater recharge is primarily through direct infiltration of precipitation.

As part of regional groundwater studies conducted by the USGS, groundwater data from nine wells completed within the shallow aquifer near the landfill were collected. Groundwater contours calculated from that data show that groundwater flows from the moraine towards Saxon Creek and then trends northward toward Lake Tahoe (USGS, 2000). Groundwater elevations have been collected regularly from numerous groundwater monitor wells surrounding the Site since the 1990's. Figure 6 illustrates the groundwater elevations calculated for the Site using the groundwater levels measured in spring 2007.

The Upper Truckee River flows north along the entire length of the subbasin and drains into Lake Tahoe. The river is joined by Grass Lake Creek and Big Meadow Creek near the southern end of the subbasin, Angora Creek centrally, and Trout Creek near the northern extent of the subbasin. Saxon Creek is located east of the landfill and joins Trout Creek approximately ½ mile north of the landfill. Average annual precipitation in the subbasin ranges from 23 to 49 inches, increasing from north to south (DWR, 2004).

The Site lies within the South Tahoe Hydrologic Area as defined by the Water Quality Control Plan for the Lahontan Region (Basin Plan). The existing and potential beneficial uses identified for Saxon Creek include: municipal, agricultural, groundwater recharge, commercial and sport fishing, contact and non-contact water recreation, cold freshwater habitat, wildlife habitat, migration of aquatic organisms, and spawning, reproduction, and development. The designated beneficial uses of groundwater in the basin include: municipal, agricultural, and industrial service water supply.

2.1.3 Meteorology

The nearest weather data source for the Site is the Tahoe Valley Airport, located approximately 1.4 miles to the north-northwest of the Site. The airport has a National Weather Station (Station No. 048762); however, precipitation data from this weather station is incomplete. A secondary source of weather data is the Meyers Inspection Station (National Weather Station No. 045572) located 2.2 miles southwest of the Site. Temperature data at the Meyers Inspection Station is also incomplete.

Based on data from 1971 to 2000 obtained from the Tahoe Valley Airport weather station, average monthly low temperatures range from 14.1 degrees Fahrenheit (°F) for the month of December to 39.8 °F for the month of July; with average monthly high temperatures range from 41.0 °F in January to 77.5 °F in August. An extreme low temperature of -29 °F was recorded in February 1989 and December 1972 and a high of 99 °F in July 1988.

The majority of the precipitation at the Site falls as snow between the months of November and

April. Summer precipitation is primarily from isolated thunderstorms with monthly averages of less than 1 inch. Average monthly precipitation measured at the Meyers Inspection Station between 1961 and 1990 ranges from 0.33 inches in July to 7.81 inches in January, with an annual average of 42.35 inches. Maximum annual precipitation on record was 54.89 inches in 1963. Snowfall was measured independently of precipitation at the Meyers Inspection Station between 1955 and 1969; monthly snow fall averages range from 0.1 inch in June to 43.5 inches in January, with an annual average snow fall of 200.6 inches. The maximum recorded seasonal snowfall was 306.2 inches from 1955 through 1956. Average snow depths on the ground ranges from approximately 33 inches in the winter months to 2 inches later in the spring.

The frost depth at the Site has been calculated to be 2.62 feet bgs, based on calculations that utilize weather data obtained from local weather stations (Weston, 2007).

2.2 SITE HISTORY

The following sections summarize the history and previous environmental investigations of the Site.

2.2.1 Background

The Site is located in the LTBMU on National Forest System land between the town of Meyers and the City of South Lake Tahoe. The Site was in operation under special use permits from the Forest Service from approximately 1947 to 1971, and operated as a burn dump until the 1960s. The Site accepted solid waste from residential and commercial sources in the South Lake Tahoe area and was closed and covered with soil by 1973. Historically, County-owned structures or features associated with the disposal site included offices, shed, water storage basin, cabin, well, dog pen, and a liquid waste disposal pond for septic tank wastes. There is no surface evidence of these former structures.

The areal distribution of the solid waste is approximately 11 acres within an approximately 17-acre flat plateau area east of Garbage Dump Road (Figure 2). The maximum thickness of the waste is estimated to be 40 to 50 feet in the central portion of the disposal site, including a layer of cover soil that averages approximately 4 feet in thickness. The volume of waste is estimated to range from approximately 290,000 cubic yards (PTEM, 2000) to 305,000 cubic yards (Weston, 2007). Approximately 59,000 cubic yards of cover soil overlie the disposal area. The cover soil overlying the waste mass is composed of silty sand and sand, is permeable, and does not adequately restrict downward migration of precipitation (PTEM, 2000).

Groundwater at the Site is present in two alluvial aquifers, a shallow and a deep aquifer. The shallow aquifer beneath the Site consists primarily of sand and silty sand that has transmissivity rates between 1.62 and 4.36 feet^2/minute (17,486 to 46,948 gallons per day per foot) (PTEM, 2000). Vinyl chloride has been detected in the shallow aquifer. Previous site investigation efforts indicate that the vinyl chloride plume currently extends approximately 1,600 feet northeast from the landfill, possessing an areal extent of approximately 31 acres.

Groundwater flow directions calculated from wells completed in the lower portion of the shallow aquifer, and the presence of a silty layer noted in well logs, suggest that the upper and lower portions of the shallow aquifer may be partially separated by a lower permeability layer.

Groundwater flow directions in the upper portion of the shallow aquifer are controlled by local topography and recharge. However, groundwater flow in the lower portion of the shallow aquifer may be partially controlled by regional forces. Vinyl chloride has been detected in the upper and lower portions of the shallow aquifer.

Data obtained to date indicates that there is a clay layer separating the shallow aquifer from the deep aquifer. Groundwater flow calculations using data from the deep aquifer suggest that the deep aquifer may flow in a westerly direction, rather than northerly as in the shallow aquifer. Vinyl chloride has not been detected in the deep aquifer during the investigations performed to date. Although groundwater monitoring will be conducted as part of the selected remedy for OU-1, the full extent of the groundwater plume will be delineated as part of the Supplemental RI for OU-2.

2.2.2 Summary of Environmental Activities

This section briefly describes the investigations of the Site and surrounding areas.

2.2.2.1 Historical Environmental Assessments of the Landfill

In 1975, during inspections of the Site, the Lahontan Regional Water Quality Control Board (LRWQCB) discovered that leachate was flowing from the buried culvert at the north end of the disposal area into nearby Saxon Creek and that the soil covering the disposal area had eroded in certain areas, leaving waste exposed.

Corrective measures, including placement and grading of additional soil, installation of surface drainage controls, and diversion of stream flow around the landfill, 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.

The Forest Service began new site investigation efforts in 1991 for the purpose of preparing a Solid Waste Assessment Test (SWAT) Report for the Site (USDA FS, 1996). 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.

In August 1996, vinyl chloride was detected down gradient 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 1999, additional CERCLA investigations were conducted to define the extent of the waste and the contaminated area. The investigations determined that the contaminants in the groundwater beneath the Site included halogenated and non-halogenated hydrocarbons.

In January 2002, the Forest Service issued an FS and a proposed remedial plan for the Site. The 2002 Proposed Plan called for capping the waste mass with an impermeable cover system and remediating the contaminated groundwater by installing a “pump and treat” system. In response to public comments and discussions with the County and the City, 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 Forest Service, along with the County and the City, under

Forest Service direction and oversight, initiated a series of supplemental groundwater and landfill investigations at the Site. In 2006, the Forest Service made a determination to separate the Site into two Operable Units. A Supplemental RI/FS focusing on OU-1 was completed in May 2007.

Table 1 summarizes the investigations at the Site related to OU-1.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Forest Service community involvement efforts have included holding informational public meetings, formal public comment periods, distributing fact sheets within the community, and posting information on Forest Service websites. The Forest Service issued a community relations plan for the Site in February 2000, which was updated and revised in December 2006. These and other documents are available for the public to review in the Administrative Record located at the LTBMU office at 35 College Drive, South Lake Tahoe, California, 96150.

On January 14, 2002, the Forest Service issued a Proposed Plan for the Site for public comment. The 2002 Proposed Plan called for capping the waste mass with an impermeable cover system and remediating the contaminated groundwater by installing a “pump and treat” system. During the 30-day public comment period for the 2002 Proposed Plan, the Forest Service held two public meetings on January 17 and February 2, 2002, to provide the public with information on the Proposed Plan and to allow for public comments. A transcript of the February 2, 2002, public meeting is available in the Administrative Record. In response to public requests, the Forest Service extended the Public Comment period another 30 days to March 18, 2002.

Upon review of public comments and discussions with the County and City, the Forest Service determined that additional site investigation work should be performed to fill identified data gaps and to refine the remedy selection. The Forest Service conducted a series of supplemental groundwater and landfill investigations at the Site. The County and City performed some of the supplemental investigations under Administrative Settlement Agreement and Order on Consent (ASAOC) under Forest Service direction and oversight. These investigations are summarized in Table 1. The results of the supplemental Site investigation efforts have been incorporated into a supplemental RI/FS and Proposed Plan issued in May 2007. Documents and correspondence related to the supplemental investigations can be found in the Administrative Record file and the information repository maintained at the LTBMU office in South Lake Tahoe.

In September 2006, the Forest Service held a public meeting to inform the public as to the status of the Site investigation. Key points of the meeting were to explain the Forest Service’s decision of separating the Site into two (2) operable units and to gather public input as to the potential remedies for the Site and long-term future use. In April 2007, the Forest Service issued a fact sheet to update the public on the status of the Supplemental RI/FS and to provide advanced notification of the May 21, 2007 issuance of the Proposed Plan for OU-1 and start of the public comment period.

The Proposed Plan for OU-1 was issued on May 21, 2007. At that time, a 45-day public comment period was opened from May 21 to July 5, 2007. The comment period was later extended an additional 15 days to July 20, 2007. During the public comment period, the Forest Service held two (2) public meetings. An informational public meeting was held on May 24,

2007 to explain the Proposed Plan and the remedy alternatives. A second public meeting was held on June 14, 2007 to, again, present the Proposed Plan and to accept formal oral and written comments. A copy of the transcript for the June 14, 2007 public meeting is included in the Administrative Record.

The Forest Service also held additional meetings with community leaders to discuss the progress of the site investigation and on the Proposed Plan.

The Forest Service has prepared written responses to substantive comments received during the public comment period, which are contained in the Responsiveness Summary (Appendix A). These community participation activities fulfill the requirements of CERCLA Sections 113(k)(2)(B) (i-v) and 117(a)(2).

2.4 SCOPE AND ROLE OF REMEDIAL ACTION

This section describes how the remedial activities for OU-1 at the Site fit within the overall CERCLA remediation of the Site. The selected remedy is for the source control of OU-1, the landfill waste mass, in accordance with the EPA guidance document *Presumptive Remedy for CERCLA Municipal Landfill Sites* (EPA 540-F-93-035) and is an interim remedy. The waste mass is the source of contamination at the Site with landfill gas and leachate acting as the primary release mechanisms for hazardous substances to the soil and groundwater. Surface runoff/erosion is considered a secondary release mechanism.

The selected remedy for OU-1 will address only on-site control of contaminants by:

- the containment of the waste mass through the installation of an impermeable landfill cover system;
- the control of surface water runoff and erosion;
- the control and passive extraction of landfill gas;
- long-term monitoring and maintenance; and
- implementation of institutional controls to limit land and resource use.

The remedy components meet the Remedial Action Objectives (RAOs) identified in the Supplemental RI/FS for OU-1 and satisfies the following EPA presumptive remedy RAOs for CERCLA Municipal Landfill Sites:

- 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.

In January 2002, the Forest Service issued an initial Proposed Plan for the Site based on the June 2000 Remedial Investigation and the January 2002 Feasibility Study. The preferred remedial alternative in the 2002 Proposed Plan called for capping the waste mass with an impermeable cover system and remediating the contaminated groundwater by installing a “pump and treat” system. In response to public comments and discussions with the County and City, the Forest Service initiated a series of supplemental groundwater and landfill investigations at the Site, which are summarized in Table 1.

In 2006, the Forest Service split the Site into two Operable Units to allow for accelerating the selection of a containment remedy for the waste disposal area in accordance with EPA presumptive remedy guidance. The Supplemental RI/FS for OU-1 was completed in May 2007 and the Proposed Plan for OU-1 issued that month.

This ROD addresses only OU-1, the waste disposal area, and does not address remedial actions that may be necessary to address any groundwater contamination that may continue to be emanating from the landfill after the OU-1 Remedy has been implemented. Neither does it address the groundwater plume. A separate supplemental RI/FS will be conducted for the groundwater Operable Unit (OU-2), which will support a second, final Operable Unit ROD for the Site, which will address any remedial actions necessary for the groundwater plume and the groundwater/waste interaction. The ROD for OU-2 will address the following deferred component and RAO from the EPA's Presumptive Remedy for CERCLA Municipal Landfill Sites:

- Collect and treat contaminated leachate and control source area groundwater at the perimeter of the waste disposal area to contain any contaminant plume and prevent further migration from the source area.

Existing site characterization data indicates that the groundwater levels reach into the lower portions of the buried wastes and debris. This interaction creates an additional contaminant release mechanism. It is the intent of the Forest Service to assess what effect the implementation of the remedy for OU-1 has on the groundwater levels in the waste and on contaminant levels before selecting a final remedy component as part of the OU-2 ROD.

2.5 SUMMARY OF SITE CHARACTERISTICS

2.5.1 Nature and Extent of Contamination

The areal distribution of the buried waste is approximately 11 acres within an approximately 17-acre flat plateau area east of Garbage Dump Road (Figure 3). The maximum thickness of the waste is estimated to be 40 to 50 feet in the central portion of the disposal area, including a layer of cover soil that averages approximately 4 feet in thickness. The volume of waste is estimated to range from approximately 290,000 cubic yards (PTEM, 2000) to 305,000 cubic yards (Weston, 2007). Approximately 59,000 cubic yards of cover soil overlie the buried waste. The cover soil overlying the waste mass is composed of silty sand and sand, is permeable, and does not adequately restrict downward migration of precipitation (PTEM, 2000).

Buried waste and debris was exposed in five trenches that were completed to investigate the depth of the fill near the Trout Creek sewer trunk line. Debris observed in the trenches consisted mainly of household waste including bottles, cans, paper, plastic, wood (lumber), yard trimmings (branches and logs), wire, metal debris, and articles of clothing. Also observed were wastes including washing machines, water heaters, insulation, tractor tires, car batteries, carpet, textiles, insulated and bare wire (copper and steel), and car parts. The waste at all locations was observed to be mixed with soil. Soil within the waste typically ranged from 30 to 60% of the total volume and varied from area to area. Waste observed in the trenches did not appear to have been burned in place, although abundant burned debris was present in all of the trenches. The waste was typically moist and highly permeable.

In accordance with the EPA guidance document *Presumptive Remedy for CERCLA Municipal Landfill Sites* (EPA 540-F-93-035), due to the heterogeneous nature of the disposal area contents and the proposed use of capping as the most likely remedy, the RI did not attempt to fully characterize the contents of the waste disposal area.

The predominant VOCs detected in landfill gas at the Site include methane, hydrogen sulfide, and vinyl chloride. Other VOCs detected in at least one of the landfill gas samples include ethyl mercaptan, acetone, chloroethane, carbon disulfide, trans-1,2-dichloroethene, cis-1,2-dichloroethene, methyl ethyl ketone, benzene, toluene, xylenes, and ethylbenzene.

Many of the VOCs detected in the landfill gas have been detected in the groundwater monitoring wells beneath and down gradient of the waste disposal area. Since the initial discovery of VOCs in the groundwater, numerous investigations have confirmed that VOCs originating from the Site have impacted groundwater. Sampling in nearby Saxon Creek has also detected VOC impacts in the past. On-going investigations have not shown any detectable VOC concentrations in Saxon Creek since 2003 (Weston, 2007). However, this may be due to the lower-than-average seasonal rain and snow fall that has occurred in the area over the past several years. The potential hydrological connection between the contaminated groundwater plume and surface waters in Saxon Creek will be addressed as part of the RI for OU-2.

The primary contaminant detected in groundwater and surface water samples is vinyl chloride, a known carcinogen, with lower concentrations of cis-1,2-dichloroethene, trans-1,2-dichloroethene, trichloroethene, tetrachloroethene, tertiary butyl ether, benzene, chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene. Vinyl chloride concentrations in the groundwater plume exceed Safe Drinking Water Act maximum contaminant levels (MCLs) for the State of California, by up to several orders of magnitude. Because of the high VOC concentrations and the relatively high rate of groundwater movement, the vinyl chloride plume currently extends approximately 1,600 feet northeast from the landfill, possessing an areal extent of approximately 31 acres.

Groundwater flow calculations performed on data from Site wells suggest that there may be some variation in the groundwater flow direction in the upper and lower portions of the shallow aquifer. Variations of the groundwater flow direction and the need for additional monitoring wells in the shallow aquifer will be fully evaluated during the OU-2 investigation.

Groundwater gradient calculations performed on data collected from the deep aquifer suggest that the flow may be westerly at a very low gradient. Further characterization of the deep aquifer during the supplemental OU-2 investigation will confirm the groundwater flow direction and gradient, as well as the full extent of the groundwater plume and the groundwater quality impacts from the waste disposal area.

2.5.2 Conceptual Site Model and Contaminant Fate and Transport

The conceptual site model describes pathways for potential migration of contaminants from the Meyers Landfill OU-1. Any remedial decisions related to groundwater plume and the groundwater contamination emanating from the waste disposal area will be evaluated after the implementation of the OU-1 remedy and addressed in a separate OU-2 ROD.

Probable pathways for contaminant migration at the Site include surface erosion by wind or water, volatilization to air, leaching of contaminants from the waste mass to groundwater, contaminated groundwater discharge into nearby surface waters, and transport through the food chain. Potential migration pathways for contaminants from the waste disposal area into groundwater and nearby underlying soils are surface erosion by wind or water, volatilization from the subsurface materials to air, vapor transport, and the downward migration of contaminants mobilized by the infiltration of water through the waste from melting snow and rain fall. Shallow soil particles and landfill debris with adsorbed contaminants may be eroded by wind or rainfall, suspended and transported in air or surface water runoff, and deposited either on- or off-site. Landfill gases, including methane, hydrogen sulfide, and vinyl chloride, are being generated within the waste and can migrate through the soil cap to the atmosphere, to the vadose zone outside the waste mass, or to groundwater. The VOCs detected in the soil may volatilize, migrate through the vadose zone and in the absence of surface cover, vent to the atmosphere.

The waste disposal area is currently covered with approximately 2 to 4 feet of native sandy soil, which prevents direct contact with the bulk of the waste and debris. However, the existing material is prone to erosion and has eroded in the past, exposing refuse at the northern end of the Site. Installation of an impermeable cover system over the waste disposal area, with LFG collection and control and surface water drainage control features, will effectively eliminate the potential for the windborne and surface water erosion of soils. This will prevent the exposure of waste, debris, and contaminants from the surface of the waste disposal area. The impermeable cover will also reduce overall gas production and control any potential VOC releases to the atmosphere.

Site investigation efforts have determined that the primary method of contaminant transport from the waste disposal area to groundwater and underlying soils is the leaching of chemical compounds and elements from the waste and debris by rainfall infiltration and seasonal snow melt. Percolating water accelerates the migration of contaminants, especially more mobile contaminants (e.g., VOCs), to the underlying groundwater. Depths to groundwater measured in wells within the landfill footprint illustrate that the infiltration of water significantly contributes to the leachate during the spring snow melt. Data from the landfill wells indicate water levels rise sharply between the months of March and April, and gradually decline between April and June. Implementation of the remedy would eliminate the infiltration of surface water through the landfill waste, thereby reducing leachate production and the primary release mechanism for vinyl chloride and other contaminants to groundwater.

Other migration pathways include the transport of volatile compounds and contaminants to nearby surface waters. Groundwater in the shallow aquifer flows toward Saxon Creek. Vinyl chloride has been detected in water samples collected from Saxon Creek prior to 2004. This confirms that contaminants in shallow groundwater can be transferred to surface water in Saxon Creek. Since 2004, all Saxon Creek sample results have been below reporting limits. However, LRWQCB staff have stated that the absence of recent detections in Saxon Creek may be a result of the lower than average seasonal rain and snowfall that the area has received over the past several years. The continued presence of impacted groundwater near Saxon Creek presents a continued threat to surface water quality in the area.

A zone of perched water extends from the southwest corner and along the west side of the waste disposal area. A French drain in the southwest corner is only partially effective in controlling the

perched water. The uncontrolled perched water on the west side of the landfill is likely to contribute groundwater to the shallow aquifer beneath the Site, and to be a contributing mechanism for contaminant transport. Rebuilding and expanding the French drain will prevent perched water from affecting the VOC contaminated groundwater beneath the waste disposal area.

The current configuration of the Trout Creek sewer trunk line and the landfill presents numerous challenges for the design, implementation, and future maintenance of an effective remedial alternative for the Site. The sewer is overlain by landfill debris and is surrounded by well-graded, porous sand fill. The fill material around the sewer must be considered a potential migration pathway for the transport of VOCs or leachate during significant precipitation events (e.g., spring snow melt).

Based on groundwater elevations measured in monitoring wells located outside of the landfill boundaries and the depth to waste recorded by PTEM in logs of borings completed within the footprint of the landfill, the shallow aquifer interacts with the landfill waste. If the groundwater is in contact with the waste, it can leach or flush VOCs and other contaminants from the landfill waste into the groundwater. This interaction creates an additional contaminant release mechanism. As discussed in Section 2.4, the Forest Service intends to assess what effect the implementation of the remedy for OU-1 has on lowering the groundwater levels within the waste and on contaminant levels in groundwater before selecting a final remedy component as part of the OU-2 ROD.

Depth to groundwater measurements obtained from the limited number of wells completed in the deep aquifer suggest that groundwater flow in this aquifer is to the west, in the general direction of the Elks Club # 2 well, a well used for drinking water. The flow direction and groundwater quality of the deep aquifer will be investigated further during the supplemental groundwater OU-2 investigation. Based on the results of the OU-2 RI, the Forest Service will determine whether remedial measures are necessary to address the groundwater plume and threats to sources of drinking water.

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The waste disposal area is currently covered with approximately 2 to 4 feet of native sandy material which prevents direct contact with the bulk of the waste and debris. However, the existing material is prone to erosion and has eroded in the past, exposing refuse at the northern end of the Site. In 1999, the Forest Service implemented a CERCLA removal action to close the Site to public access and an area closure order was put in place. Even though the Site is currently closed for public access, evidence indicates that the Site is routinely used for snowmobiling in the winter months and other recreational activities in the summer (mountain biking, motorcycles, etc.).

As the Site is located on National Forest System lands, long-term future use is governed by the LTBMU Land and Resource Management Plan (Forest Plan). The Forest Plan has designated the Site and surrounding area as Reduced Timber Areas and Developed Recreation (Figure 2) (LTBMU, 1988). The current land use prescriptions are described below:

a. Reduced Timber Management Prescription ─ The majority of the site falls under this

land use designation. Apply group selection and single tree selection harvest practices to achieve wildlife habitat diversity and a high timber yield over the long-term, while protecting water quality and providing high quality dispersed recreation opportunities. Opening size produced by group selection will average about 1 to 2 acres, but will not exceed 5 acres. Yields from regenerated stands will be approximately 70% of maximum. Openings will benefit early successional stage species, such as deer and quail and will increase diversity from the predominantly medium-aged trees in the basin. Existing roads may be reconstructed to meet water quality protection standards and to enhance recreation access, including off-highway opportunities. Some temporary roads may be constructed for accessing timber. The visual quality objective is Partial Retention. The preferred ROS setting is Roaded Natural. This Management Prescription may be applied to low and moderate hazard forest land.

b. Recreation Development Management Prescription ─ Construct, maintain and operate recreation facilities. Assure an attractive and usable forest setting within and surrounding existing sites. Manage vegetation to insure a healthy forest, to prevent and/or reduce pest-related damage, and to reduce numbers of mechanically defective trees. Manage potential recreation development sites so that they remain suitable until they are utilized for recreation improvements. Other activities may be allowed on the undeveloped sites or within existing developed sites where their activities do not conflict with the primary emphasis on developed recreation. The visual quality objective is Partial Retention when viewed as middle ground and Modification or better when viewed as foreground. The preferred Recreational Opportunity Spectrum (ROS) setting is Rural or Roaded Natural (LTBMU, 1988).

   Permissible uses include: existing campgrounds, picnic areas, developed beaches, interpretive sites, recreation residence tracts, resorts, organization camps, marinas, etc. whether operated by the Forest Service or its concessionaires. It also includes sites reserved for future development.

There is no proposed change to the Forest Plan designations for future land uses. Although the Forest Plan allows for developed recreation uses to occur in the area, any allowed future post-closure use would have to be compatible with the selected remedy to ensure that the long-term performance and effectiveness of the remedy is not compromised. The OU-1 remedy has been selected to meet the current and reasonably anticipated future land uses with appropriate restrictions to protect the cap. After the cap is constructed and the surface of the cap is revegetated, the waste will be isolated from contact with humans and wildlife. The Forest Service is responsible for ensuring that any acceptable land use does not diminish the landfill cap's ability to achieve the RAOs. The Forest Service is responsible for the implementation of appropriate land use control, e.g., restrictions on motorized vehicle use, to protect the integrity of the remedy.

2.7 SUMMARY OF SITE RISKS

Consistent with the EPA's presumptive remedy guidance, the Forest Service has not characterized the contents of the landfill. As discussed in Section 2.5.1, trenching was conducted along the eastern boundary of the waste disposal area during the Supplemental OU-1 RI/FS to investigate the depth and composition of the refuse near the Trout Creek sewer trunk line.

Wastes observed in the trenches consisted mainly of household waste including bottles, cans, paper, plastic, wood (lumber), yard trimmings (branches and logs), wire, metal debris, and articles of clothing. Also observed were wastes including washing machines, water heaters, insulation, tractor tires, car batteries, carpet, textiles, insulated and bare wire (copper and steel), and car parts.

EPA's *Presumptive Remedy for CERCLA Municipal Landfill Sites* (EPA 540-F-93-035), specifies that a quantitative risk assessment that considers all chemicals, including their potential additive effects, etc., is not required for the source area (waste disposal area) of a municipal landfill to establish a basis for action if groundwater data is available to demonstrate that contaminants clearly exceed established standards, or if other conditions exist that provide a clear justification for action. Site characterization data clearly establishes that the Site is releasing vinyl chloride into the underlying soils and groundwater. Vinyl chloride levels in the groundwater plume exceed the applicable California MCL of 0.5 µg/L by several orders of magnitude (recent sampling results report up to 76 µg/L). The LRWQCB has designated one of the beneficial uses for the South Tahoe Valley groundwater basin where the Site is located as municipal and domestic water supply. Site investigation efforts have determined that the primary method of contaminant transport from the waste disposal area to groundwater and underlying soils is the leaching of chemical compounds and elements from the waste and debris by rainfall infiltration and seasonal snow melt through the existing permeable cover soils.

The remedy cover system and associated Forest Service land use controls, through the LTBMU Forest Plan, preclude the use of the landfill area for residential or industrial purposes, and will prevent human contact with materials in the landfill. Therefore, a quantitative human health risk assessment was not completed for refuse in the landfill. For the same reason, an ecological risk assessment (ERA) was not conducted for the waste disposal area, because the implementation of the CERCLA presumptive remedy involves construction of a landfill cap. The cap and cover system would interrupt the relevant potential exposure pathways (for example, contact with waste and debris, landfill gas), thus eliminating potential ecological risk.

The Forest Service prepared a baseline human health 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 (TetraTech EM Inc, 2001). At the time, the Forest Service had not yet decided to break the site into separate Operable Units. Therefore, the 2001 baseline human health risk assessment and screening-level ecological risk assessment evaluated the risks to potential receptors exposed to contaminant releases from the waste disposal area and in the chemically impacted area outside and adjacent to the source area. The baseline human health risk assessment process evaluated 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.

The results of the 2001 baseline human health risk assessment and screening-level ecological risk assessment are summarized below. The conceptual site model shows the probable pathways for contaminant migration from source to receptor. These include surface erosion by wind or water, volatilization to air, leaching of contaminants from the landfill mass to groundwater, contaminated groundwater discharge into nearby surface waters, migration of contaminated groundwater, and transport through the food chain.

The conceptual site model for Meyers Landfill still contains some data gaps that are relevant to the risk assessments conducted in 2001. The full extent of contaminant and vinyl chloride impacts to groundwater is still being defined. The primary contaminant release and transport mechanism to groundwater at the Site is the leaching of chemical compounds and elements from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing permeable cover soils. Without the implementation of the presumptive remedy, the Site will continue releasing vinyl chloride into the underlying soils and groundwater and the impacts will continue to spread. In addition, the potential for impacts to Saxon Creek will also continue until the landfill is capped. If VOC impacts to the deeper aquifer are present, the potential of contaminated groundwater to impact the Elks Club Well # 2 exists.

2.7.1 Human Health Risk Assessment

The 2001 baseline human health risk assessment addressed potentially contaminated media (air, groundwater, and surface water). The buried refuse and subsurface contaminated soils in the waste disposal area were not considered in the risk assessment because the Site is currently covered with 2 to 4 feet of sandy material. This, together with Forest Service land use controls is preventing direct contact with the wastes and contaminated soils. Therefore, a quantitative human health risk assessment was not completed for refuse in the landfill.

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 surface water in 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. For the Site under current and future site conditions, 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. These cancer risks are well below acceptable EPA risk levels (TetraTech EM Inc, 2001).

However, this analysis was based on the fact that there are no drinking water supply wells at the Site or within the known extent of the plume area. The full extent of contaminant and vinyl chloride impacts to groundwater are still being defined and will be further characterized as part of the OU-2 RI. Implementation of an active response action is still required as available groundwater data demonstrates that contaminants clearly exceed established regulatory standards. The Site is located in a groundwater basin whose beneficial uses include municipal and domestic water supply. Vinyl chloride levels in the groundwater plume exceed applicable California MCLs of 0.5 µg/L by up to several orders of magnitude.

The primary contaminant release and transport mechanism to groundwater at the Site is the leaching of contaminants from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing porous cover soils. If no action is taken, the Site will continue releasing vinyl chloride and other contaminants into the underlying soils and groundwater and the contaminated groundwater plume will continue to expand, contaminating a groundwater aquifer that is designated as a potential source of drinking water and potentially threatening

existing drinking water supply wells. As such, the Site currently poses an imminent and substantial endangerment to human health and the environment, and will continue to do so if no action is taken.

The selected remedy of landfill cap containment is unlikely to change, unless the cover system itself is not protective of human health and the environment. In the event of this finding, any changes to the ROD will be made in accordance with the EPA's Comprehensive Five-Year Review Guidance, OSWER directive 9355.7-03B-P, and the EPA's Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents.

2.7.2 Ecological Risk Assessment

The screening-level ERA 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 used 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, bioconcentrate in aquatic organisms, or adhere to sediments.

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 to vinyl chloride in groundwater at 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 values. This would indicate the potential for ecological effects and the risk to ecological receptors from exposure to vinyl chloride in groundwater is considered negligible since results of recent sampling are in the same range as results used in this risk assessment (TetraTech EM Inc, 2001).

The full extent of contaminant and vinyl chloride impacts to groundwater is still being defined. The continued presence of impacted groundwater near Saxon Creek presents a continued threat to surface water quality in the area. This will be further investigated as part of the OU-2 RI efforts.

2.8 DESCRIPTION OF ALTERNATIVES

In May 2007, the Forest Service presented to the public the "Meyers Landfill Proposed Plan" for OU-1. The Proposed Plan described the Forest Service's proposed approach to addressing contamination at the Site and summarized the proposed remedial alternatives under consideration in the Supplemental RI/FS for OU-1. Descriptions of the remedial alternatives assessed in the Supplemental RI/FS and Proposed Plan for OU-1 are presented in this ROD.

The NCP provides the implementing regulations for CERCLA. 40 CFR 300.430(a)(iii)(B) of the NCP contains the expectation that engineering controls, such as capping or other forms 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 (55 FR 8704). 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.

The May 2007 Supplemental RI/FS for OU-1 and the subsequent Proposed Plan were based on the EPA presumptive remedy approach for identifying and evaluating remedial alternatives. The presumptive remedy is appropriate for the Site because it describes a practical and economic means to reduce risk to human health and the environment.

As identified in the Supplemental RI/FS, the RAOs for OU-1 are the following:

- The RAO for the landfill area 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 source area 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 groundwater;
- Control surface water runoff and erosion; and
- Control and treat landfill gas

As discussed in Section 2.4, the Forest Service is deferring the following component and RAO from the EPA Presumptive Remedy for CERCLA Municipal Landfill Sites to the Groundwater OU-2.

- Collect and treat contaminated leachate and control source area groundwater at the perimeter of the waste disposal area to contain any contaminant plume and prevent further migration from the source area.

Existing site characterization data suggests that the groundwater levels reach into the lower portions of the buried waste and debris, which creates an additional contaminant release

mechanism. It is the intent of the Forest Service to assess what effect the implementation of the remedy for OU-1 has on the groundwater levels in the waste and on contaminant levels in down gradient groundwater before selecting a final remedy component as part of the OU-2 ROD. The OU-1 remedy may alleviate the need for additional engineering controls for source area groundwater remediation and containment at the waste boundary. The ROD for OU-2 will determine any response action that may be required to address the groundwater plume and groundwater contamination that may continue to be emanating from the waste disposal area after the implementation of the OU-1 remedy.

Four remedial alternatives assembled to address the RAOs for OU-1 are as follows:

- Alternative 1 – No Action.
- Alternative 2 – RCRA Subtitle D compliant cover system, institutional controls, passive LFG venting, LFG and groundwater monitoring, and French drain expansion.
- Alternative 3 – Multilayer cap and cover system, institutional controls, gas monitoring, passive LFG venting, LFG and groundwater monitoring, and French drain expansion.
- Alternative 4 – Enhanced multilayer cap, institutional controls, passive LFG venting, LFG and groundwater monitoring, and French drain expansion.

Each of the remedial alternatives involve combinations of process options, including LFG monitoring, grading, revegetation, and maintenance of the cap. Each alternative was analyzed in detail for the Supplemental RI/FS.

Each of the remedial alternatives (Alternatives 2 through 4) includes implementation of one of three Sewer Options. The STPUD Trout Creek sewer line is a key site feature that must be addressed as part of the remedy for OU-1. A section of the STPUD sewer line is currently located below waste near the eastern boundary of the disposal area. Three Sewer Options were developed to mitigate the potential effects of operating and maintaining the sewer line on the performance and maintenance of the cap. The selected Sewer Option is a key component for long-term effectiveness of the OU-1 remedy.

The three Sewer Options include:

1. Leave the sewer line in place.
2. Relocation of the sewer line outside the limits of the landfill.
3. Move the waste from above and east of the sewer line and consolidate within the landfill mass.

Alternative 1, the no-action alternative, and Alternatives 2, 3, and 4 described in this ROD and the three Sewer Options were evaluated against the criteria established under the NCP. The criteria include:

- overall protection of human health and the environment;
- compliance with applicable or relevant and appropriate requirements (ARARs);
- long-term effectiveness and permanence;
- reduction of toxicity, mobility, and volume through treatment;
- short-term effectiveness;
- implementability;

- cost;
- state acceptance; and
- community acceptance

The ARARs pertinent to the alternatives are summarized in Section 2.8.1 below. The remedy alternatives and Sewer Options are described in Sections 2.8.2, 2.8.3, 2.8.4, 2.8.5, and 2.8.6 of this ROD.

2.8.1 Applicable and Relevant and Appropriate Requirements

This section identifies federal and State of California ARARs from the universe of statutes, regulations, requirements, and guidance and sets forth the Forest Service's determinations of ARARs for the selected remedy for the Site.

2.8.1.1 Summary of CERCLA and NCP Requirements

Section 121(d) CERCLA (42 United States Code (U.S.C.) Section 9621(d)), as amended, states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed remedial action and are well suited to the conditions of the site. A requirement must be determined to be both relevant and appropriate in order to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in Title 40 CFR 300.400(g)(2) and include the following:

- The purpose of the requirement and the purpose of the CERCLA action.
- The medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site.
- The substances regulated by the requirement and the substances found at the CERCLA site.
- Any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site.
- The type of place regulated and the type of place affected by the release or CERCLA action.

- The type and size of structure or facility regulated and the type and size of structure or facility affected by the release or contemplated by the CERCLA action.
- Any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site.

According to CERCLA ARARs guidance, a requirement may be "applicable" or "relevant and appropriate," but not both. Identification of ARARs must be done on a site-specific basis and involves a two-part analysis: first, a determination of whether a given requirement is applicable; then, if it is not applicable, a determination of whether it is nevertheless both relevant and appropriate. Some requirements may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis determines that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable.

Tables 2, 3, and 4 included in this ROD present each ARAR for the selected remedy with a determination of ARAR status (i.e., applicable, or relevant and appropriate). For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or remedial action contemplated, and whether the requirement was well suited to the Site. The FS for the Site includes a more detailed ARARs analysis.

To qualify as a state ARAR under CERCLA and the NCP, a state requirement must be:

- A state law,
- An environmental or facility siting law,
- Promulgated (of general applicability and legally enforceable),
- Substantive (not procedural or administrative),
- More stringent than the federal requirement,
- Identified in a timely manner,
- Consistently applied.

To constitute an ARAR, a requirement must be substantive. Therefore, only the substantive provisions of requirements identified as ARARs in this ROD are considered to be ARARs. Permits are considered to be procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or non-environmental, including permit requirements, are not considered to be ARARs. CERCLA Section 121(e)(1), 42 U.S.C. 9621(e)(1), states that "No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section." The term on-site is defined for purposes of this ARARs discussion as "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action" (40 CFR §300.5).

Non-promulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. Such requirements may, however, be useful, and are "to be considered" (TBC) requirements (40 CFR § 300.400(g)(3)). These requirements complement ARARs but do not override them. They are useful for guiding decisions regarding cleanup levels or methodologies when regulatory standards are not available.

As the lead federal agency, the Forest Service has primary responsibility for identifying federal ARARs at the Site. Pursuant to the requirements of 40 C.F.R. § 300.515, for remedial actions the lead federal agency must request that the state identify chemical- and location-specific state ARARs upon completion of site characterization. The requirements also provide that the lead federal agency request identification of all categories of state ARARs upon completion of identification of remedial alternatives for detailed analysis. The state must respond within 30 days of receipt of the lead federal agency requests. The Forest Service requested ARARs from the state in 2001 for the preparation of the 2002 Feasibility Study and Proposed Plan. In 2006, the Forest Service requested that the State update their identification of ARARs for the Site as part of development of the May 2007 Supplemental RI/FS and Proposed Plan for OU-1. The LRWQCB responded with a letter dated January 25, 2007. ARARs common to the alternatives are discussed below. A more detailed discussion of the ARARs that apply to the selected alternative is contained in Section 2.11.2 of this ROD.

2.8.1.2 Chemical-Specific ARARs

Chemical-specific ARARs are generally health- or risk-based numerical values or methodologies applied to site-specific conditions that result in the establishment of a cleanup level. Chemical-specific ARARs do not exist for soil or landfill refuse.

Air, soil, and water are the environmental media potentially affected by the OU-1 response actions. The groundwater underneath the Site is not currently being utilized as a source of drinking water but remains a potential source of drinking water. The Site is located in a groundwater basin whose beneficial uses include municipal and domestic water supply. Vinyl chloride levels in the groundwater plume exceed applicable California MCLs by up to several orders of magnitude. The full extent of groundwater contamination and vinyl chloride impacts to groundwater and existing drinking water wells will be further characterized as part of the Supplemental RI for OU-2. Any remedial decisions related to the groundwater contamination will be addressed in the separate OU-2 ROD.

The conclusions for ARARs related to the OU-1 response actions pertaining to air, soil, and water media are presented below.

Requirements for control of LFG at solid waste landfills under either Subtitle D of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6941-6949a and the associated municipal solid waste landfill regulations (40 CFR Part 258) or Title 27 California Code of Regulations (CCR) 20921, et seq. were considered potential ARARs. Because the landfill stopped receiving waste prior to the effective date of Subtitle D of RCRA (October 9, 1991), RCRA standards are not applicable. However, they are relevant and appropriate to the design, construction, and operation and maintenance of the final cover system.

RCRA LFG control requirements of Subtitle D (Title 40 CFR § 258.23) are relevant and appropriate because methane gas is a common hazard created by landfill decomposition. The Forest Service has reviewed and compared both sets of requirements and determined that the standards of Title 27 CCR are more stringent than the federal RCRA Subtitle D standards. Therefore, the following landfill gas standards of Title 27 are ARARs:

- Section 20921(a)(2), which requires that landfill gas be monitored to ensure that methane

gas concentrations at site boundaries do not exceed the lower explosive limit (LEL) for methane (5 percent methane by volume).

- Section 20921(a)(3), which requires that trace gases shall be controlled to prevent adverse acute and chronic exposure to toxic or carcinogenic compounds.

Landfill gas at the Site contains vinyl chloride. The following are California Clean Air Act (Title 17 CCR) ARARs:

- Section 70200.5 requires discharges of vinyl chloride to air as listed in the Ambient Air Quality Standards for Hazardous Substances to be monitored.

There is periodic surface water runoff to Saxon Creek. Surface water runoff and soil/sediment erosion must be controlled to prevent surface water contamination. The following are ARARS for the OU-1 response action related to surface water:

- National Ambient Water Quality Criteria: Discharges to waters of the United States (Clean Water Act, as Amended, 33 U.S.C., Ch. 26, §§ 1251–1387, and 40 CFR § 131.36(b)).
- Porter-Cologne Water Quality Control Act, California. Water Code, div. 7, §§ 13241, 13243, 13263(a), 13269, and 13360. The substantive provisions of §§ 13241, 13243, 13263(a), 13269, and 13360 of the Porter-Cologne Act enabling legislation, as implemented through waste discharge requirements, promulgated policies of the Water Quality Control Plan for the Lahontan Region (Basin Plan), are ARARs. The Basin Plan establishes water quality objectives, describes waste discharge prohibitions, and designates the beneficial uses for waters in this watershed basin. The substantive requirements are applicable to the implementation and maintenance of the response action.

  Surface water quality objectives (WQOs) pertinent to the construction and maintenance of the OU-1 remedy are as follows:

  - Sediment: The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
  - Settleable Material: Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
  - Suspended material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
  - Suspended Materials: Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affects the water for beneficial uses.
  - Suspended Sediment: Suspended sediment concentrations in streams tributary to Lake Tahoe shall not exceed a 90th percentile value of 60 mg/L.
  - Biostimulatory Substances: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.
  - Floating Materials: Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.

- Toxics: Water shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Federal and State Safe Drinking Water Act MCLs are relevant and appropriate for the OU-1 response action. Groundwater at the Site is not currently being used as a drinking water source. However, it is a potential drinking water source. The Site is located in a groundwater basin whose beneficial uses include municipal and domestic water supply. Vinyl chloride levels in the groundwater plume exceed applicable California MCLs. The OU-1 response action is source control remedy in accordance with EPA presumptive remedy guidance and is therefore an interim action for the purpose of achieving groundwater MCLs.

Federal and State chemical-specific ARARS for the OU-1 response action are summarized in Table 2.

2.8.1.3 Location-Specific ARARs

Location-specific ARARs are restrictions on the concentrations of hazardous substances or the conduct of activities because of the characteristics of the Site or its immediate environment. Biological resources, cultural resources, and federal land use designation are categories relating to location-specific requirements potentially affected by the OU-1 response actions. Location-specific ARARs for the OU-1 response action are summarized in this section.

Biological Resource ARARs

Biological resource ARARs may be either federal or state requirements. No threatened or endangered species have been identified as being present on-site or within the proposed OU-1 response action area and the Site is not identified as critical habitat essential to the conservation of a threatened or endangered species. The Site is also not designated as part of the National Wildlife Refuge System, is not within a federally owned wilderness area, is not near wild, scenic, or recreational rivers, and is not on or near jurisdictional wetlands. Therefore, the Endangered Species Act, the National Wildlife Refuge System Administration Act of 1996, the Wilderness Act, the Wild and Scenic Rivers Act and Executive Order No. 11990, Protection of Wetlands are not considered ARARs for the OU-1 response action.

Biological resource ARARs related to the OU-1 response action are as follows:

<u>Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703 - 712):</u> The MBTA makes it unlawful to pursue, capture, hunt, or take actions adversely affecting a broad range of migratory birds. The MBTA and its implementing regulations are applicable to remedial activities that could affect any protected migratory birds. There have been no migratory birds noted at the Site, but there have been no site-specific studies conducted. The Migratory Bird Treaty Act of 1972 will be relevant and appropriate. The OU-1 response action will be carried out in a manner that avoids taking or killing of protected migratory bird species, including individual birds or their nests.

<u>Protection of Floodplains, Executive Order 11988 (40 CFR Part 6, Appendix A):</u> This executive order mandates that response actions taken by federal agencies must be designed to avoid adverse impacts to floodplains. Specifically, if response activities are located within a 100-year floodplain, the activities must be designed to avoid or minimize adversely impacting floodplains

wherever possible. The Site is in an area of undetermined, but possible, flood hazard. If response activities take place in a floodplain, these requirements will be applicable.

Cultural Resources ARARs

Cultural resource ARARs may be either federal or state requirements. The Site does not encompass any historic properties included or eligible for inclusion on the National Register of Historic Places. No scientific, prehistoric, or archeological artifacts have been identified at the Site. Therefore, no cultural resources ARARs (e.g., National Historic Preservation Act, the Archaeological and Historic Preservation Act, the Historic Sites, Buildings, and Antiquities Act, and the Archaeological Resources Protection Act) have been identified as pertinent to the Site.

Other Location-Specific ARARs

National Forest Management Act of 1976 (16 U.S.C. §§ 1600-1614): Requires that the Forest Service develop coordinated land and resource management plans to govern the management and use of National Forest System lands. As the Site is located on National Forest System lands, long-term future use of the Site is governed by the LTBMU Forest Plan. CERCLA response actions have to address "reasonably anticipated future land use" as part of the remedy evaluation and selection process and the final remedy must be compatible with "reasonably anticipated future land use". The federal land-use designations under the Forest Plan are ARARs for the OU-1 response action.

Federal and state location-specific ARARS for the OU-1 response action are summarized in Table 3.

2.8.1.4 Action-Specific ARARs

Action-specific ARARs are technology- or activity-based requirements or limitations for remedial activities. These requirements are triggered by the particular remedial activities conducted at the Site and suggest how a selected remedial alternative should be achieved. These action-specific requirements do not, in themselves, determine the remedial alternative; rather, they indicate how a selected alternative must be conducted.

Summarized below are the Forest Service’s conclusions as to the controlling ARARs for the OU-1 response action.

Municipal Solid Waste Landfill Closure ARARs

Based on available historical information, the Site received household garbage and municipal waste from residential and commercial sources within the Lake Tahoe Basin area from 1947 to 1971. The results from groundwater samples collected since 1991 indicate that CERCLA hazardous substances are migrating from the landfill in a groundwater plume. This information supports the Forest Service’s finding that wastes disposed of at the Site are consistent with landfills that fall under the EPA presumptive remedy guidance for municipal landfills. Neither the federal nor California hazardous waste regulations for landfills (Title 40 CFR 264, Title 22 CCR and Title 23 CCR Chapter 15) are applicable to the Meyers Landfill because the Site is a solid waste landfill (and not a hazardous waste landfill).

Federal requirements for municipal solid waste landfills generally are not applicable to the Site because Meyers Landfill was not active after the effective date of federal regulations codified in Title 40 CFR 258 (October 9, 1991). Similarly, the solid waste disposal requirements of Title 27 CCR, Division 2, are not applicable because the Site became inactive prior to the effective date of the regulations and did not receive waste after November 27, 1984. However, because the standard closure methods implemented at the time of closure were not adequate to protect human health and the environment, many of the closure and post-closure maintenance standards of Title 27, Division 2, Subdivision 1, Chapter 3, Subchapter 5, are relevant and appropriate to this remedial action, as discussed below.

Pursuant to the State's efforts to consolidate and simplify its environmental programs, the State Water Resources Control Board (SWRCB) and the California Integrated Waste Management Board (CIWMB) have consolidated the solid waste regulations into Title 27 CCR, Division 2. These regulations became effective in July 1997. Until that date, two different sets of solid waste regulations existed in the State of California: SWRCB's regulations in Title 23, and CIWMB's regulations in Title 14. Title 27, Division 2 regulations continue to distinguish between regulations adopted by CIWMB and SWRCB. Therefore, the ARAR analysis considered both SWRCB and CIWMB regulations.

Title 27 CCR, Division 2, 20950 sets forth general standards for closure of all solid waste management units, including performance goals for closing such units. Section 21090 establishes final cover requirements of the SWRCB, including a prescriptive, multilayer cap design. Sections 20310 and 20320 set forth general construction and containment criteria. The Forest Service has determined that the substantive standards of these requirements are relevant and appropriate to closure of the Site. Title 27 CCR 20080 and 21090 are also applicable for the capping alternatives because these sections govern closed, inactive, or abandoned units.

Title 27 CCR § 21100 et seq. contain CIWMB requirements for closed and inactive sites. In particular, CIWMB closure and post-closure maintenance requirements are specified at Title 27 CCR §§21140(a)(b), 21142(a), 21145(a), and 21150(a) and (b). These four sections provide relevant and appropriate narrative standards that duplicate many of the requirements discussed above from Title 27 CCR 21090. These narrative standards are as follows:

- Function with minimum maintenance
- Provide waste containment to protect public health and safety
- Achieve compatibility with post-closure land use
- Provide equivalent protection from wind and surface water soil erosion with an erosion layer that contains a minimum of 6 inches of earthen material capable of sustaining native plant growth

Title 27 CCR § 21130 requires that the operator maintain a written post-closure emergency response plan that identifies occurrences that may exceed the site design and endanger public health or the environment. The plan must describe specific procedures that minimize these hazards to protect public health and safety and address vandalism, fires, explosions, earthquakes, floods, the collapse or failure of artificial or natural dikes, levees, or dams, surface drainage problems, and other waste releases. These requirements are applicable.

Title 27 CCR §§ 21142, 21145, and 21150 specify qualitative CIWMB requirements for final

grading, slope stability, and drainage and erosion control. Substantive portions of these requirements are applicable to the cap construction and are identified in Table 4.

Title 27 CCR §§ 20921, 20923, 20925, 20932, 20933, 20937, and 21160 specify the requirements for construction and operation of a perimeter landfill gas monitoring network and the implementation of a landfill gas monitoring program, as described in Section 2.8.3.5. The Forest Service has determined that these are applicable to the OU-1 response action capping alternatives. These sections are listed as ARARs in Table 4.

Title 27 CCR § 21180(a) requires the implementation of post-closure monitoring and maintenance program for a period of no less than 30 years. This requirement is applicable to the OU-1 response action. The Forest Service will monitor the landfill in accordance with this section to the extent that monitoring is determined to be required. Monitoring may be for less than 30 years if there is no potential for adverse impacts on public health and safety and the environment as stated in Title 27 CCR Section 20918.

Title 27 CCR 21190 requires that proposed post-closure land uses be designated and maintained to protect health and safety and prevent damage to structures, road, utilities and gas monitoring and control systems; to prevent public contact with waste, landfill gas and leachate; and prevent landfill gas explosions. Subsections (a), (d), (e), (f) and (g) are ARARs.

Title 27 CCR §§ 21769 and 21830 are applicable to the OU-1 response action. Section 21769 requires that classified waste management units be closed in accordance with an approved closure and post-closure maintenance plan, which provides for continued compliance with the applicable standards for waste containment and precipitation and drainage controls and monitoring requirements. Section 21830 sets forth requirements for a final post-closure maintenance plan.

Title 27 CCR § 21800(c) states the final closure plan must include a detailed description of each item contained in Section 21790(b) and a detailed description of the sequence of closure stages. The substantive provisions of this section are ARARs.

Other Action-Specific ARARs

California Clean Air Act (Title 17 CCR, El Dorado County Air Quality Management District Rule 223.1: Specifies that grading and earth moving activities shall not cause or allow the emissions of fugitive dust such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source and shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples. These requirements are applicable.

Clean Water Act, as Amended (33 U.S.C. §§ 1251–1387), Discharges to surface waters: Addresses both point and non-point sources of pollution and establishes or requires programs for the control of both sources of pollution. Specifically, owners and operators of construction activities must be in compliance with discharge standards and all direct dischargers to surface waters must meet technology-based requirements including the best control technology and the best available technology economically achievable. Implementation of these provisions of the

Clean Water Act has been delegated to the SWRCB. The provisions are implemented through a series of "Board Orders". Specific "Board Orders" that are ARARs for the remedial action are:

- State Water Resources Control Board Order No. R6T-2005-0007 (Updated Waste Discharge Requirements And National Pollutant Discharge Elimination System General Permit No. CAG616002-Discharges of Storm Water Runoff Associated With Construction Activity Involving Land Disturbance In The Lake Tahoe Hydrologic Unit, El Dorado, Placer, And Alpine Counties): Sets forth requirements for construction activities that involve 1 acre or more of disturbance, to develop and implement a storm water pollution prevention plan, and perform storm water discharge monitoring. The substantive requirements for storm water pollution prevention, erosion control, etc. will be considered ARARs for all actions involving soil movement.
- State Water Resources Control Board Order No. 97-03-DWQ (Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities): Sets forth requirements for industrial activities, which include closed or inactive landfills to develop and implement a storm water pollution prevention plan, and perform storm water discharge monitoring. The substantive requirements for storm water management and pollution prevention are considered ARARs for long-term post closure care and maintenance.

Federal and state action-specific ARARs are summarized in Table 4.

2.8.2 Alternative 1: No Action

Under the "No-Action" alternative, no remedial actions will be implemented. The "No Action" alternative is included to provide a baseline against which other alternatives can be compared. Under the "No-Action" 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 site conditions or to contaminant levels or occurrences within OU-1. The Forest Service would still conduct a separate groundwater study to further assess groundwater conditions under and around the perimeter of the landfill as part of the OU-2 RI/FS.

2.8.3 Alternative 2: Subtitle D Cover System, Institutional Controls, Passive LFG Venting, Groundwater and LFG Monitoring, and French Drain Expansion

Alternative 2, containment, involves the following actions:

- Installation of a Subtitle D compliant landfill cap
- Implementation of institutional controls
- Groundwater monitoring
- Passive LFG venting
- LFG monitoring
- French drain replacement and expansion
- Sewer line remedy option

In summary, Alternative 2 consists of installation of a cover system meeting the minimum RCRA Subtitle D and California Code of Regulations Title 27 requirements for solid waste landfill covers, landfill gas controls and monitoring, and implementation of land use and access restrictions. The RCRA Subtitle D cap will comply with CCR Title 27, Chapter 3, Subchapter 5, Article 2, § 21140. Groundwater monitoring would continue for OU-1. Passive LFG vents would be installed and monitored. The existing French drain would be replaced with a longer and deeper drainage system. Each remedy component of Alternative 2 is further described below. The three Sewer Options are described in Section 2.8.6 below.

2.8.3.1 Subtitle D Compliant Landfill Cap

A soil cap would be implemented under Alternative 2 to isolate and eliminate direct contact with refuse, and reduce erosion, infiltration, and surface contaminant migration at the Site. This cap would use surface grading to promote drainage, low-permeability soil, and evapotranspiration to reduce surface water infiltration.

The Alternative 2 landfill cover system is specifically designed to reduce infiltration and meet the minimum requirements of the CCR Title 27, Chapter 3, Subchapter 5, Article 2, § 21090 performance standards and minimum design requirements solid waste landfill cover systems. The sequence of layers in a prescriptive Title 27 cover system consists of the following from the surface down:

- An erosion-resistant layer that is typically at least 12 inches thick, usually consisting of soil that supports native vegetation (CCR Title 27, § 21090).
- A low hydraulic conductivity layer, typically consisting of compacted clay, at least 12 inches thick (CCR Title 27, § 21090) to reduce infiltration and control upward movement of landfill gases. The layer must meet minimum acceptable permeability requirements of 1×10^{-6} cm/s or be equal to the hydraulic conductivity of the underlying natural geologic material, whichever is less.
- A foundation layer consisting of a minimum 24-inch layer of compacted soil or waste materials, if suitable, to support the low-hydraulic and erosion-resistant layers (CCR Title 27, § 21090).

Section 21140 of Title 27 also requires that the final cover shall function with minimum maintenance and be compatible with post closure land use. Due to the nature of the current and reasonably anticipated future land use for the Site, the cover material thickness was increased by one foot to provide an adequate cover for the current and future use designated in the Forest Plan, i.e. reduced timber and recreational development. Recreation currently observed at the Site includes walking, biking and snowmobiling.

The proposed configuration for the Alternative 2 landfill cap consists of the following components (from top to bottom):

- Minimum 6 inches of vegetative cover soil
- Minimum 18 inches of cover soil
- Minimum 12 inches of low permeability clay material
- Minimum 24 inches of foundation material

Long-term post closure care and operation and maintenance is required to maintain the Alternative 2 cover system. A post-closure maintenance plan will be developed during the detailed Remedial Design phase and would include as a minimum, the following inspection schedules:

- A schedule for periodically inspecting the integrity of the soil cap. Inspections would be directed toward identifying potential erosion areas or breaches in the layer and areas of non-uniform settlement that result or would result in ponding of surface water or direct infiltration of precipitation or surface water.
- A schedule for periodically inspecting the vegetative cover to identify stressed or failed areas.

In addition to the above schedules, a schedule for fertilization and replanting would be included in the maintenance plan if these elements were necessary for the early success of the vegetative cover. Criteria to measure the success of the vegetative cover would be included in the Remedial Design.

2.8.3.2 Institutional Controls

Institutional controls would be implemented as part of Alternative 2 to safeguard the integrity of the Subtitle D cap and associated monitoring systems. Institutional controls are mechanisms for restricting access or exposure to contaminants. The NCP recognizes that institutional controls may be necessary to supplement and protect engineering controls in preventing exposure of humans and the environment when waste is left in place. In addition, the EPA has identified institutional controls as part of the containment presumptive remedy. Institutional controls are included as a component of this remedial action to maintain effectiveness of the selected containment alternative in preventing exposure to debris and contaminated soil and groundwater within the landfill. In particular, these controls are intended to protect the integrity of the soil cover and prevent use of groundwater at the Site. Institutional controls are required to protect the landfill remedy by achieving these land use control performance objectives:

(1) preventing excavation or physical alteration of the landfill cap
(2) preventing unacceptable risk to human health caused by excavation of contaminated materials from the landfill
(3) preventing use of water that presents an unacceptable risk to human health
(4) protecting monitoring equipment
(5) preventing unauthorized access to the Site
(6) preserving access to the Site and associated monitoring equipment.

Institutional controls would prohibit the following activities at the Site:

- Construction of facilities, structures, appurtenances, or any other land-disturbing activity into, or onto, the surface of the landfill that may affect the drainage or increase erosion, including any activity that will damage the cover or affect the drainage and erosion controls developed to protect the cover. Excavations into the landfill would generally be prohibited, except as necessary to maintain or repair the landfill cover.
- Planting vegetation that could threaten the integrity of the landfill cap.
- Land-disturbing activity on lands adjacent to the Site that may cause adverse effects on

the remedy through cover erosion or diversion of off-site surface water onto the Site.

- Removal of, tampering with, or damage to security features (for example, locks on monitoring wells).
- Irrigation of the landfill surface.
- Construction of any buildings on the cover system.
- Withdrawal of groundwater for potable, irrigation, industrial, or agricultural use.

In addition, the Forest Service will develop a Land Use Control Remedial Design (LUC RD) as the land use component of the Remedial Design for the institutional controls. The LUC RD will describe the boundaries of the Site, the objectives of the institutional controls, the restrictions, the specific mechanisms to be implemented or already implemented, the required frequency for inspections, the entities responsible for carrying out the monitoring and inspection, and the methods for certifying compliance with institutional controls after site inspections have been conducted.

The Forest Service will be responsible for implementing, monitoring, reporting, and enforcing these institutional controls for the duration of the controls. The institutional controls shall be maintained until the concentrations of hazardous substances in the soil and groundwater beneath have been reduced to levels that allow for unlimited exposure and unrestricted use.

2.8.3.3 Groundwater Monitoring

A groundwater monitoring program is in place and will be revised upon construction of the cover system and OU-1 remedy. Upon completion of the cap and closure of the landfill, a post-closure monitoring and sampling plan will be implemented in conjunction with the groundwater remedial investigation efforts for OU-2.

2.8.3.4 Passive LFG Venting

The composition and concentrations of LFG at the Site are consistent with other landfills. Low levels of overall gas production are expected at this landfill based on modeling, and can be mitigated by a passive LFG vent system. LFG vents will be installed within the landfill mass. The LFG vents will extend a minimum of three-quarters of the thickness of the waste, and will be installed with a horizontal density of at least one LFG vent per acre. A typical LFG vent will be constructed by boring a 12- to 24-inch diameter boring at selected locations within the footprint of the landfill. An appropriately sized perforated pipe, typically constructed of steel, PVC, or HDPE, will be inserted into the boring and surrounded by appropriately sized gravel. Solid pipe will be used to complete the boring from the top of waste and will extend above ground surface. The LFG vents will be protected by bollards, fencing, or other appropriate means. Final LFG vent spacing and design will be determined in the OU-1 Remedial Design document.

2.8.3.5 Gas Monitoring

LFG monitoring probes will be installed outside of the perimeter of the waste disposal area, in accordance with state requirements to monitor off-site migration of LFG. A gas monitoring program will be implemented as part of the long-term post closure operation and maintenance program to monitor the LFG probes and vents for LFG concentration and composition on a

regular basis (e.g., monthly or quarterly). Gas concentrations will be monitored with field instruments and by collecting representative samples that will be submitted for laboratory analyses. A corrective action program will be implemented should state action levels be exceeded. Location and spacing of the LFG monitoring probes will be determined in the OU-1 Remedial Design.

2.8.3.6 French Drain Replacement/Expansion

The construction of an expanded French drain is planned to prevent uncontaminated perched groundwater present at the southwest and west sides of the waste disposal area from contributing to the contaminated groundwater plume beneath the landfill, and potentially affecting groundwater levels within the waste. The French drain will be longer and deeper than the existing French drain.

The expanded French drain will be installed at approximately 14 feet bgs (below the perched aquifer), will be a minimum of 2 feet wide, and will extend approximately 750 feet along the western boundary of the landfill. The location of the French drain will be outside, and hydraulically up-gradient, of the limits of the waste disposal area. The excavation sidewalls and bottom will be lined with permeable geotextile to eliminate sediments from entering and clogging the gravel drain. A perforated pipe consisting of corrugated steel, PVC, or HDPE will be placed at the bottom of the trench. The pipe will be sloped toward the south with a minimum gradient of 0.5% to drain the groundwater into the existing drainage structure at the south end of the landfill. An approximately 10-foot thick layer of permeable gravel material (i.e., crushed rock or bank run gravel) will be placed inside of the geotextile and around the collection pipe to fill the lower 10 feet of the trench. The gravel will be covered with geotextile, and the remainder of the trench will be filled with soil, compacted and graded to drain. The final field location, design and construction details for the French drain expansion will be determined in the OU-1 Remedial Design.

2.8.4 Alternative 3: Multilayer Cap and Cover System, Institutional Controls, Passive LFG Venting, Groundwater and LFG Monitoring, and French Drain Expansion

Alternative 3 involves the following actions:

- Installation of a multilayer cap and cover system
- Implementation of institutional controls
- Groundwater monitoring
- Passive LFG venting
- LFG monitoring
- French drain replacement and expansion
- Sewer line remedy option

Alternative 3 consists of construction of a multilayer cap and cover system, institutional controls, passive LFG venting, LFG and groundwater monitoring, French drain expansion, and one of the sewer line remedy options described in Section 2.8.6 below. This multilayer cap is specifically designed to reduce infiltration and meets the minimum design requirements of Title 27 CCR, Chapter 3, Subchapter 5, Article 2, § 21090 performance standards and minimum design

requirements for a final landfill cover system. This cap alternative would also incorporate results of a more detailed, site-specific analysis that accounts for temperature fluctuations and increased infiltration of water resulting from snow melt at the Site that may affect the stability of slopes that are associated with the landfill. A multilayer cap would be implemented under this alternative to isolate landfill refuse, eliminate direct contact of surface soil, reduce erosion, reduce surface soil contaminant migration, and limit surface water infiltration.

The proposed design for the landfill cap consists of the following components (from top to bottom):

- Minimum 24-inch cover soil layer (minimum 6 inches of vegetation layer and 18 inches of cover soil)
- 0.5-cm geotextile filter fabric layer
- Minimum 12-inch drainage layer (with minimum 3% slope)
- 60-ml geosynthetic barrier layer (HDPE geomembrane)
- Minimum 24-inch foundation layer (existing cover soil)

The proposed cap design is shown on Figure 7. Complete details of the cover will be developed during the design phase and may entail some modifications of the proposed cap cross-section. For example, the Remedial Design development may find that a synthetic drainage layer will also satisfy long-term cover system performance requirements, but may prove to be more cost effective than a minimum 12-inch sand or gravel layer.

The Alternative 2 discussion of Institutional Controls, Groundwater Monitoring, Passive LFG Venting, French Drain Expansion, and LFG Monitoring also applies to Alternative 3. Section 2.8.6 provides a discussion of the three sewer options assessed for the OU-1 remedy selection process.

The main action-specific ARARs associated with design and construction of the multilayer cap are in Title 27 CCR Division 2, Chapter 3, Subchapter 5. The principal difference between the Alternative 3 multilayer cap and the Alternative 2 Subtitle D prescriptive cap and cover system is the substitution of a 60-mil geosynthetic barrier for the 12-inch low permeability clay layer. The 60-mil geosynthetic barrier is more compatible with the freeze-thaw cycles that are present in the sub-alpine climate where the Site is located.

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

Alternative 4 contains all the same components as Alternative 3 with one exception; an additional foot of cover soil will be included to be more protective of the landfill cover system and allow for more intense post-closure recreational use. The proposed design for the Alternative 4 landfill cap consists of the following components (from top to bottom):

- Minimum 36-inch cover soil layer (minimum 6 inches of vegetation layer and 30 inches of cover soil)
- 0.5-cm geotextile filter fabric layer
- Minimum12-inch drainage layer (sand with minimum 3% slope)
- 60-ml geosynthetic barrier layer (HDPE geomembrane)

- Minimum 24-inch foundation layer (existing cover soil)

The discussions of Institutional Controls, Groundwater Monitoring, Passive LFG Venting and monitoring, French Drain Expansion, and the three Sewer Options are identical to those in Alternative 2.

2.8.6 Sewer Line Remedy Options

The STPUD Trout Creek sewer line is currently located below waste near the eastern boundary of the waste mass. The current configuration of the Trout Creek sewer trunk line and the landfill presents numerous challenges for the design, implementation, and future maintenance of an effective remedial alternative for the landfill. The sewer is overlain by landfill debris and is surrounded by well-graded, porous sand. The fill material around the sewer must be considered a potential migration pathway for the transport of VOCs or leachate during significant precipitation events (e.g., spring snow melt). As a result of the potential impacts the 12-inch sewer line may have on the long-term effectiveness and permanence of a cover system and contaminant migration, the sewer line is a key Site feature that must be addressed as part of the remedy for OU-1. Three remedy options were evaluated during the Supplemental OU-1 RI/FS for the purpose of mitigating the effects of the OU-1 remedy on the operation and maintenance of the sewer line and on sewer line's effects on the long-term performance and maintenance of the OU-1 remedy. The three remedy options that were reviewed for the sewer line are as follows:

2.8.6.1 Sewer Line Option 1 – Leave sewer line in place

Leaving the STPUD sewer line in place would, at a minimum, require rebuilding the current manholes to accommodate the cap and engineering an access way on top of the cap to accommodate sewer maintenance equipment. It is also likely that some engineering controls would be required to prevent the sewer pipe and surrounding granular fill from becoming a potential conduit for landfill gas and leachate. The use of cutoff walls is recommended at locations where the sewer crosses the north and south landfill boundaries. Additional institutional controls would be required with this option including monitoring and O&M programs, a contingency plan, and access agreements between the Forest Service and STPUD. This could be accomplished through issuance of a special use permit by the Forest Service.

2.8.6.2 Sewer Line Option 2- Relocate the active sewer line outside the limits of the landfill

The STPUD sewer line would be relocated to the east or west, outside of the landfill boundary. The Forest Service, Weston, and STPUD have evaluated the costs associated with both the east and west alignments and have determined that the eastern alignment will be less expensive and will likely be easier to construct. Therefore rerouting the sewer to the east side of the landfill was included in the Supplement OU-1 RI/FS for further evaluation. The relocated sewer line would replace the section of pipe between MH-47 and MH-50. The new sewer line pipe would meet STPUD design and construction specifications and be constructed of 12-inch-diameter SDR (Standard Dimension Ratio) 26 PVC with a bell and spigot type assembly. The estimated length of the new line would be approximately 1,255 feet. The existing sewer line between MH-48 and MH-49 would be plugged and grouted, and trench barriers installed where the sewer crosses the north and south perimeters of the landfill.

2.8.6.3 Sewer Line Option 3- Moving the landfill waste from above and east of the sewer line

This option involves relocating all landfill waste from above and east of the sewer line and consolidating it with the main body of landfill waste. Relocation of the waste will require the development of a grading plan that incorporates the current topography and facilitates drainage. All cover soil would be removed from above the waste that is to be relocated and stockpiled in a temporary location. Likewise, cover soil would be stripped from the area where the waste is being relocated. All waste above and east of the sewer line would be excavated, placed on the west side of the sewer line in designated areas, and compacted. Figure 8 shows the outline of the proposed consolidated landfill. All newly placed waste and any disturbed areas would be covered with the fill material that was stockpiled at the beginning of the work. Soil would be obtained from the eastern side of the plateau and the east slope to fill the excavation created by the removal of the waste. All fill material would be placed in lifts, moisture conditioned, compacted, and graded to drain. Additional institutional controls may be required with this option to address the monitoring, maintenance and leak response. Any required institutional controls would be developed as part of the LUC RD.

2.9 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

This section analyzes the advantages and disadvantages of each of the four remedy alternatives and three sewer line options described in Section 2.8. The alternatives were evaluated based on the following nine criteria, as required by Section 300.430(e) of the NCP:

Threshold Criteria

1. Overall protection of human health and the environment
2. Compliance with ARARs

Primary Balancing Criteria

3. Long-term effectiveness and permanence
4. Reduction in toxicity, mobility, or volume through treatment
5. Short-term effectiveness
6. Implementability
7. Cost

Modifying Criteria

8. State acceptance
9. Community acceptance

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. The comparative analysis of the four remedy alternatives and the three sewer line options with respect to these nine criteria is summarized below.

2.9.1 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 overall assessment of the protection is based on the evaluation of long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. This criterion is considered a threshold criterion that must be met by the selected alternative.

Alternative 1–"No Action" alternative does not meet the threshold criteria of overall protection of human health and the environment for the open space/recreational use scenario. The "No Action" alternative would result in site conditions that are controlled only by current land use practices. Without additional controls, erosion due to precipitation and recreational uses could result in removal of soil cover and exposure of waste, giving rise to unacceptable exposure of contaminants to human and ecological receptors. The primary contaminant release and transport mechanism to groundwater at the Site is the leaching of contaminants from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing porous cover soils (Weston, 2007). If no action is taken, the Site will continue releasing vinyl chloride and other contaminants into the underlying soils and groundwater and the contaminated groundwater plume will continue to expand, potentially threatening surface water and drinking water supply wells.

Because Alternative 1 does not meet the threshold criteria or the RAOs, this alternative is not eligible for selection and it is not included in further discussion. According to the NCP, however, the "No Action" alternative provides a basis for comparison with other alternatives.

Alternative 2, which includes a minimal Subtitle D cap, would not meet the cap performance ARARs or satisfy long-term effectiveness and permanence requirements. The key feature of the Alternative 2 cover system is the 12-inch thick low permeability clay layer which would degrade and lose effectiveness as a result of freeze-thaw cycles at the Site. Therefore, Alternative 2 does not meet the threshold criteria.

Alternatives 3 and 4 are protective of human health and the environment. Both alternatives provide protection of human health and the environment by isolating the contaminants with a multilayer cap and cover system that is compatible with site-specific climatic conditions (freeze-thaw cycles, precipitation and snow fall, etc.) and reasonably anticipated future use. Both alternatives eliminate the exposure pathways of concern by isolating the contaminated materials and refuse under the cap and eliminating water infiltration. Gas venting and monitoring and the protection of the cap itself meet the threshold criteria for protection of human and ecological health. The combination of land use controls, passive LFG venting and monitoring will meet the RAOs. The comparative analysis of alternatives in the FS found that both would be similar in effectiveness at preventing surface water infiltration through the waste mass.

Sewer Option 1 would not be fully protective of human health and the environment. This option involves leaving an 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 remedy component 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. In addtion, damage to the sewer line and subsequent leakage

could remain undetected for a long period of time, potentially resulting in impacts to groundwater.

Sewer Options 2 and 3 would be protective of human health and the environment. Both options would result in the sewer line being located 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.

2.9.2 Compliance with ARARs

This evaluation criterion is used to determine whether each alternative will meet all of its identified ARARs. This criterion is a threshold criterion that must be met.

Alternatives 1 and 2 are not compliant with the ARARs; specifically the Criteria for Municipal Waste Landfills will not be met by either alternative. Alternatives 3 and 4 comply with all chemical- location- and action-specific ARARs. Compliance with the specific requirements is evaluated for the selected remedy in section 2.11.2. The OU-1 response action is source control remedy in accordance with EPA presumptive remedy guidance and is therefore an interim action for the purpose of achieving groundwater MCLs.

As described above, Alternatives 1 and 2 do not meet the threshold criteria, and will not be evaluated further.

All three (3) Sewer Options as components of the OU-1 remedy will be complaint with ARARs for the remedy implementation.

2.9.3 Long-Term Effectiveness and Permanence

This criterion evaluates the long-term effectiveness of the alternatives in protecting human health and the environment over time, once the remedy has been implemented. The primary focus of this evaluation is the extent, effectiveness and reliability of controls used to manage the risk posed by untreated wastes.

Alternatives 3 and 4 (multilayer cap and cover system, institutional controls, LFG and groundwater monitoring, passive LFG venting, and French drain expansion) meet the threshold criteria. The following sections discuss the comparative balancing criteria for the alternatives.

Under Alternatives 3 and 4, the multilayer cap and cover system provide long-term effectiveness and permanence for the Site and are compatible with site-specific climatic conditions and reasonably anticipated future use. These alternatives incorporate results of a more detailed, site-specific analysis that accounts for temperature fluctuations (freeze-thaw cycles) and increased infiltration of water resulting from snow melt at the Site that would adversely effect the long-term performance and integrity of a minimal Subtitle D cap. Both alternatives will require long-term operation and maintenance of the cover system. The function of both capping alternatives is to physically isolate the waste from contact with potential receptors, eliminate the exposure of waste to surface soil, reduce erosion, and limit infiltration of rainfall into the landfill waste. The caps are very effective in the long term because with proper O&M, they will both succeed in each of these functions.

Both alternatives provide for additional protection of the cover system from damage caused by current and reasonably anticipated future uses of the area. Alternative 4 provides for slightly more resistance to more intense recreational use, whereas Alternative 3 provides a cap sufficient for passive recreational use such as hiking, wildlife viewing and open space. The additional foot of cover material is warranted only if more intense use (e.g., motorcycle or ATV use, mountain biking, etc.), which could reduce the effectiveness of the cap or create erosion hazards, is approved by the Forest Service under the Forest Plan.

Sewer Option 1 does not provide for long-term effectiveness and permanence of either the Alternative 3 or 4 final cover systems. Intrusive sewer maintenance and repair efforts may require that the engineered cover system be pierced in order to obtain access to the line. A sewage leak under the cap could cause the release of the liquids into the groundwater beneath the waste and exacerbate movement of the contaminant plume.

Sewer Options 2 and 3 will provide for long-term effectiveness and permanence, and 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 being located outside the limits of the cover system when the OU-1 remedy is implemeted.

2.9.4 Reduction in Toxicity, Mobility, or Volume through Treatment

This criterion addresses the statutory preference for selecting remedial actions that use treatment technologies to permanently reduce toxicity, mobility, or volume of hazardous substances.

Neither cap in Alternatives 3 or 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 and characteristics of the waste generally make waste treatment impracticable. However, both Alternatives will reduce or eliminate surface water infiltration through the waste, reducing or eliminating leachate production; and passive LFG venting will reduce the buildup of LFG within the landfill and reduce or eliminate off-site migration of LFG.

The primary contaminant release and transport mechanism to groundwater at the Site is the leaching of contaminants from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing porous cover soils. However, isolating refuse with an impermeable cover system cap, and thereby reducing infiltration of surface water through the refuse, will help to reduce the likelihood that leachate will form and reduce the mobility of contamination from the waste disposal area of the Site. Alternatives 3 and 4 are comparable in controlling the mobility and off-site migration of leachate.

None of the three (3) Sewer Options provide for the reduction in toxicity, mobility, or volume through treatment. The option of leaving the sewer in place may be problematic. Sewer Option 1 would leave the active sewer line in place, beneath and in close proximity to buried refuse and within the footprint of the impermeable cover system. If the sewer is left in place, and leaks or fails during the life of the liner, the additional liquid could infiltrate the groundwater beneath the landfill and exacerbate movement of the contaminant plume.

Sewer Options 2 and 3 eliminate issues with potential impacts of the sewer line on the cap or the

groundwater plume. These options result in the sewer line being located outside the limits of the cover system when the OU-1 remedy is implemented.

2.9.5 Short-Term Effectiveness

Short-term effectiveness addresses the effects of each alternative during the construction and implementation phases until RAOs are met. The alternatives are evaluated with regard to effects on human health and the environment during the implementation of the alternative. Factors considered include the time to achieve RAOs and exposure to the community and the environment during construction.

Alternatives 3 and 4 both provide short-term effectiveness in reducing potential risk to the community during the remedy construction and implementation phase through site access restrictions. Potential exposure of workers to contaminants will be minimized by the use of engineering controls and personal protective equipment and ambient air monitoring.

The short-term effectiveness for Alternatives 3 and 4 is roughly equivalent, but Alternative 4 would require slightly more time to complete. Thus, any exposure to the community or workers under Alternative 4 is somewhat longer.

Of the three (3) Sewer Options, Option 3 would provide for the greatest worker exposure to buried refuse as it involves the excavation and consolidation of wastes from above and east of the sewer line. 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.

2.9.6 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative, and the availability of services and materials required during implementation. 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

Alternatives 3 and 4 are both technically and administratively implementable. The technical effort to implement Alternative 4 is somewhat greater than for Alternative 3 due to the greater thickness of the cap and the additional soil and base material that will be required. Both Alternatives include establishing institutional controls to limit future site and land use to preserve the integrity of the remedy. O&M for both Alternatives 3 and 4 are equivalent and include groundwater monitoring, LFG monitoring, monitoring cap integrity, and cap maintenance.

All three (3) Sewer Options are both technically and administratively implementable. Sewer Option 3 will require additional health and safety precautions to be implemented during the relocation and consolidation of the waste.

2.9.7 Cost

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

consist of direct and indirect costs. Direct costs include the purchase of equipment, labor, and materials necessary to install the alternative. Indirect costs include engineering, financial, and other services such as testing and monitoring. Annual O&M costs for each alternative include operating labor, maintenance materials and labor, auxiliary materials, and energy.

Table 5 shows a summary of total net present value costs for each alternative. The total cost for each alternative excluding the sewer line options are as follows:

Alternative 1:	$ 0.00
Alternative 2:	$ 3,672,000
Alternative 3:	$ 4,378,000
Alternative 4:	$ 4,934,000

Table 5 also shows the calculated costs for each sewer alternative; however, future and ongoing costs for leaving the sewer line in place cannot be calculated with any reliability. Any potential significant leakage from the sewer line could exacerbate migration of the vinyl chloride plume, resulting in unknown increased costs. The cost to repair and replace the cap to original specifications does not fully address the cost of added or on-going contamination of groundwater caused by a leak from the sewer.

Alternatives designed to mitigate impacts caused by the location of the sewer line relative to the buried waste are estimated to range from $75,000 for Sewer Option 1 (leaving the sewer line in place and installing trench barriers) to over $1,258,000 for Sewer Option 2 (relocating the sewer off of the landfill and out of the footprint of the cover system). The relocation estimate is high, and substantial savings may be realized if the line is moved in conjunction with the cap installation.

Sewer Option 3 (leaving the sewer line in place, relocating waste from above and east of the sewer and consolidating it with the main landfill mass on the west side of the sewer) would reduce the area that would require a cap by approximately 2 acres. Weston has estimated the cost of relocating the waste for Sewer Option 3 to be approximately $923,000.

However, as part of this option, the areal extent of waste would be reduced by approximately 2 acres with an accompanying reduction in the area of the cap. For Alternative 3, this 2-acre reduction in cap size is estimated to have a cost reduction of $482,000, resulting in a total net difference of $441,000 of additional costs when Alternative 3 is combined with Sewer Option 3. The total net cost for Alternative 3 with Sewer Option 3 is $4,819,000. Similar cost offsets are seen with Alternative 4 when combined with Sewer Option 3.

2.9.8 State Acceptance

This criterion indicates whether the State concurs with, opposes, or has no comment on the preferred remedy. The State acceptance criteria is used for comparative analysis of remedial alternatives as a CERCLA recognized modifying criterion.

The LRWQCB has participated in a technical review committee for the Site, which has involved review and comment on the Forest Service's CERCLA investigation and remedy selection work plans and reports for the Site. This includes review and comment on the draft Supplement OU-1 RI/FS and draft OU-1 Proposed Plan. During this process, the LRWQCB has indicated that

Alternative 1 is not acceptable to the State because it is not protective of human health or the environment and would result in an on-going release of vinyl chloride into the environment. Alternative 1 also does not comply with state groundwater protection and landfill closure ARARs.

Comments received by the LRWQCB during the site investigation and remedy selection process and during the 60-day comment period, indicate that the LRWQCB is supportive of Alternatives 3 and 4. The RWQCB has expressed concerns that the OU-1 capping remedy may not be sufficient to control leachate and VOC gas migration and that additional corrective measures may be required. The Forest Service has acknowledged this possibility and any remedial decisions related to the groundwater plume and any continuing groundwater contamination emanating from the waste disposal area after the OU-1 remedy is implemented will be assessed as part of the Supplement OU-2 RI/FS.

No other comments were received from state agencies during the comment period.

2.9.9 Community Acceptance

Community acceptance considers whether the local community agrees with the Forest Service's analysis and preferred alternative. The community acceptance criteria are used for comparative analysis of remedial alternatives as a CERCLA recognized modifying criterion.

The majority of the community comments that were received during the 60-day public comment period for the Proposed Plan were concerning the future use of the Site. Specifically, the public was concerned whether any of the OU-1 remedy Alternatives would be compatible with the placement of a wildlife care facility at the Site. This was determined to be outside the scope of the CERCLA remedy decision, as it involves selecting a specific post-closure use for the Site that would require modifying the Forest Plan to allow for that type of land use activities.

2.9.10 Results of the Comparative Analysis

Results of the comparative analyses for all alternatives are summarized in Table 5. Threshold criteria are shown with a "yes" or "no", indicating whether or not the alternative meets the required threshold. The remaining balancing criteria are ranked using a scale of one through five, with the grade of one indicating that an alternative meets a criterion best. The alternatives have been ranked for threshold and balancing criteria. Alternative 1 provides a basis for comparison against other alternatives. Table 5 also summarizes the total costs for each alternative.

Table 5 shows that Alternatives 3 and 4 rate the highest, with Alternative 3 being slightly less expensive than Alternative 4. Alternative 3 provides long-term protection of human health and the environment, matches the current projected use, and is slightly less costly than Alternative 4. Either relocating the sewer (Sewer Option 2) or relocating the waste (Sewer Option 3) will provide long-term solutions while minimizing operation and maintenance issues. Based on providing a permanent remedy, long-term effectiveness, and cost, relocating the waste Sewer Option 3 is the best ranking remedy for the sewer line.

2.10 THE SELECTED REMEDY

The Forest Service has chosen Alternative 3 and Sewer Option 3 as the remedy for OU-1.

Alternative 3 includes a multilayer cap as shown in Figure 7. This cap includes a drainage layer, an HDPE liner, and sufficient cover soil to protect the liner from access required for sewer inspection/maintenance. Sewer Option 3 includes relocating the waste above and east of the sewer line and consolidating it within the main body of the waste. This combination of Alternative 3 and Sewer Option 3 is hereafter referred to as the "Selected Remedy".

The Selected Remedy consists of the following components:

- Installation of a multilayer cap and cover system to isolate landfill refuse from contact with potential receptors, reduce or eliminate erosion and surface water infiltration through the waste mass and potential surface contaminant migration. The cover system includes surface controls for drainage and storm water management.
- Implementation of institutional controls to safeguard the integrity of the soil cap and associated monitoring systems. Institutional controls would prohibit construction of any habitable structures, or other land-disturbing activity into or onto the surface of the landfill; planting of vegetation that could threaten the integrity of the landfill cap; removal of or tampering with posted signs; irrigation of the surface of the landfill; and extraction of groundwater from beneath the landfill for public or private use.
- Implementation of a groundwater monitoring program, in conjunction with the OU-2 RI/FS efforts, to assess the effect of the Selected Remedy on groundwater levels within the waste mass and on the groundwater contamination concentrations emanating from the waste disposal area.
- Implementation of a passive LFG venting system to control LFG migration.
- Implementation of a LFG monitoring program outside of the perimeter of the landfill in accordance with state requirements to monitor off-site migration of LFG.
- Expansion of the French drain along the western boundary of the Site to prevent uncontaminated perched groundwater present at the southwest and west sides of the landfill from contributing to the contaminated groundwater plume beneath the landfill, and potentially affecting groundwater levels within the waste.
- The relocation of waste from above and east of the sewer line and consolidation into the main waste mass.

The Selected Remedy fulfills the following RAOs from the EPA Presumptive Remedy for CERCLA Municipal Landfill Sites:

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

The Selected Remedy meets the Supplemental OU-1 RI/FS RAO for landfill waste of the protection of human and ecological receptors from exposure to landfill refuse and soil contamination by eliminating exposure pathways and contaminant migration. The multilayer cap, passive LFG venting system, institutional controls, expanded French drain, and sewer line waste consolidation act together and will achieve substantial risk reduction by isolating the contaminated materials and refuse under the cap, minimizing water infiltration, and leachate generation, controlling landfill gas migration, and providing for long-term protection of the

Selected Remedy. The multilayer cap, passive LFG venting system, and LFG monitoring system fulfills the Supplemental OU-1 RI/FS RAO for LFG for the protection of human and ecological receptors by minimizing exposure pathways and gas migration. The cap and passive LFG vent system will reduce the migration of VOCs to the underlying groundwater and reduce the potential for the migration of LFG beyond the limits of the disposal area.

The multilayer cap and French drain expansion meet the Supplemental OU-1 RI/FS RAO for source area groundwater for the minimization of the effects of landfill refuse and soil contaminants on groundwater quality (e.g. rain water infiltration) and rain water run-on. The primary release and transport mechanism of hazardous substances to groundwater at the Site is the leaching of contaminants from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing porous cover soils. The multilayer cap will reduce or eliminate leachate generation and contribution of hazardous substances to groundwater.

The capital cost, with contingencies, for the Selected Remedy is $4,142,000. The estimated 30-year operation and maintenance cost, with contingencies, is $677,000. The net present value of the total estimated cost associated with the Selected Remedy is $4,819,000.

The Remedial Design and construction phases may result in variations of the design parameters for the Selected Remedy. For example, the Remedial Design may call for a synthetic drainage layer or closer spacing of the passive LFG vents. These alterations to the design parameters, in general, will reflect modifications resulting from the engineering design process.

The Forest Service has deferred the following component and RAO from the EPA Presumptive Remedy for CERCLA Municipal Landfill Sites to the Supplemental OU-2 RI/FS and remedy selection process:

- Collect and treat contaminated leachate and control source area groundwater at the perimeter of the waste disposal area to contain any contaminant plume and prevent further migration from the source area.

Existing site characterization data indicates that the groundwater levels reach into the lower portions of the buried waste and debris. This interaction creates an additional contaminant release mechanism. The implementation of the Selected Remedy will have a beneficial effect by lowering the groundwater levels within the waste mass. It is the intent of the Forest Service to monitor and assess what effect the implementation of the OU-1 remedy has on the groundwater levels in the waste and on contaminant levels in down gradient groundwater before selecting a final remedy component as part of the OU-2 ROD. Implementation of the Selected Remedy may alleviate the need for costly engineering controls for groundwater remediation and plume containment at the waste boundary.

2.11 STATUTORY DETERMINATIONS

Remedy selection is based on CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and the regulations contained in the NCP. All remedies must meet the threshold criteria established in the NCP. The selected remedy must also be cost effective and use permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ

treatment to permanently, and significantly reduce the volume, toxicity, or mobility of hazardous substances. The following sections discuss how the selected remedy meets these statutory requirements.

2.11.1 Overall Protection of Human Health and the Environment

The Selected Remedy, Alternative 3 and Sewer Option 3, is protective of human health and the environment. The combination of multilayer cap, LFG controls, institutional controls, expanded French drain, sewer line waste consolidation, and monitoring will meet the RAOs identified in the Supplemental OU-1 RI/FS and the EPA presumptive remedy RAOs for CERCLA municipal landfill sites. The Selected Remedy eliminates the exposure pathways of concern by isolating the contaminated materials and refuse under an impermeable cap, eliminating surface water infiltration, and providing for LFG venting and monitoring. The cover system is compatible with site-specific climatic conditions and incorporates results of a more detailed, site-specific analysis that accounts for temperature fluctuations (freeze-thaw cycles) and increased infiltration of water resulting from snow melt at the Site that would adversely effect the long-term performance and integrity of a minimal Subtitle D cap. The Selected Remedy also provides for the long-term protection of the integrity of the cap through monitoring, maintenance, and institutional controls.

The multilayer cap will greatly reduce risks to human health and the environment, will eliminate the possibility of direct contact of humans and animals with landfill waste, and will minimize the potential for erosion, formation of leachate, and migration of surface contaminants. Exposure limits will be maintained well below the EPA risk range for carcinogens, and hazard indices for non-carcinogens will remain at less than 1. In addition, implementation of the Selected Remedy will not pose unacceptable short-term risks or cross-media impacts.

The proposed cap will fully contain all of the debris in the landfill, so human and animal exposure to the waste materials or contaminated leachate in the landfill is not anticipated. The intent of the cap is to provide physical isolation of the waste to prevent contact exposure to potentially toxic material. As long as the cap is in place, is maintained, and is not otherwise disturbed, it is expected to prevent direct receptor contact with the waste. Without contact, the direct exposure pathway is considered broken, and no risk can be posed. As a result, the proposed cap remedy is expected to be fully protective of human health and the environment.

Site investigation efforts have determined that the primary release and transport mechanism of hazardous substances to groundwater at the Site is the leaching of contaminants from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing porous cover soils. The implementation of the Selected Remedy and the construction of an impermeable multilayer cap are key components in reducing or eliminating leachate generation at the Site and subsequent contribution of hazardous substances to groundwater. If no action is taken, the Site will continue releasing vinyl chloride and other contaminants into the underlying soils and groundwater and the contaminated groundwater plume will continue to expand, potentially threatening surface water and drinking water supply wells.

The Selected Remedy will result in the sewer line being located outside the limits of the cover system when the OU-1 remedy is complete and will provide for long-term effectiveness and permanence, and a long-term remedy solution that is consistent with maintaining the integrity and effectiveness of the proposed cover system.

The Selected Remedy includes groundwater monitoring. However, the Selected Remedy is not intended to address the existing vinyl chloride plume or groundwater emanating from the waste disposal area. The full extent of contamination and vinyl chloride impacts to groundwater are still being defined and will be further characterized as part of the Supplemental OU-2 RI/FS. There will be a second and final Operable Unit ROD for the Site addressing OU-2, the groundwater plume, and any response action that may be required to address groundwater contamination that may continue to emanate from the waste disposal area after the implementation of the OU-1 remedy. If groundwater remediation is required in the future, the groundwater remediation system will be designed in a manner that would provide for integrity of the selected OU-1 remedy.

2.11.2 Compliance with ARARs

The Selected Remedy will comply with all site ARARs. Key ARARs are discussed below:

2.11.2.1 Chemical-Specific ARARs

Chemical-specific ARARs for the Selected Remedy are summarized in this section, in Table 2, and in Section 2.8.1.2. Chemical-specific ARARs do not exist for landfill refuse or soil. Chemical-specific ARARs for the Site do exist for landfill gas, groundwater and surface water.

Requirements for control of LFG at solid waste landfills under either Subtitle D of RCRA (40 CFR 258), or Title 27 CCR §20921, et seq. were considered ARARs. The Forest Service reviewed and compared both sets of requirements and determined that the state standards of Title 27 are more stringent than the federal Subtitle D standards. Therefore, the Forest Service is identifying the following standards of Title 27 as ARARs:

- Section 20921(a)(2), which requires that LFG be monitored to ensure that methane gas concentrations at site boundaries do not exceed the lower explosive limit (LEL) for methane (5 percent methane by volume).
- Section 20921(a)(3), which requires that trace gases shall be controlled to prevent adverse acute and chronic exposure to toxic or carcinogenic compounds.

LFG at the Site contains vinyl chloride. The following are California Clean Air Act (Title 17 CCR) ARARs:

- Section 70200.5 requires discharges of vinyl chloride to air as listed in the Ambient Air Quality Standards for Hazardous Substances to be monitored.

A Title 17 and Title 27 LFG monitoring program, both at the passive LFG vents and the perimeter LFG monitoring probes will be implemented as part of the long-term post closure site operation and maintenance program.

Other air requirements include control of trace gases to prevent adverse, acute, and chronic exposures and of overall emission standards. LFG testing shows the generation rates of methane and VOCs are low, likely due to the size and age of the landfill, and would not trigger additional requirements. LFG emissions will be confirmed by monitoring after the remedy is installed to ensure the OU-1 remedy is performing as designed.

Surface water run-off and soil/sediment erosion will be controlled during both the remedy construction and during the long-term O&M of the Site to prevent surface water contamination of Saxon Creek. A storm water pollution prevention plan will be prepared as part of the construction plans and specifications and will be implemented during remedy construction activities. Permanent surface water drainage and soil erosion control features will be designed as part of the Remedial Design. Maintenance of the surface water and sediment control features will be part of the long-term post closure operation and maintenance program.

Federal and State MCLs are relevant and appropriate for the OU-1 response action. Groundwater at the Site is not currently being used as a drinking water source. However, it is a potential drinking water source. The Site is located in a groundwater basin whose beneficial uses include municipal and domestic water supply. Vinyl chloride levels in the groundwater plume exceed the California MCL of 0.5 µg/L by up to several orders of magnitude. The primary contaminant release and transport mechanism to groundwater at the Site is the leaching of contaminants from the waste by the infiltration of water (rainfall and seasonal snow melt) through the existing porous cover soils. If no action is taken, the Site will continue releasing vinyl chloride and other contaminants into the underlying soils and groundwater and the contaminated groundwater plume will continue to expand, potentially threatening surface water and drinking water supply wells. The Selected Remedy provides source control by capping the waste disposal area and rerouting the perched water away from the landfill, reducing or eliminating leachate generation at the Site and subsequent contribution of hazardous substances to groundwater. As a source control remedy, it is an interim action for the purpose of achieving groundwater MCLs.

Additional groundwater control strategies will be evaluated as part of the Supplemental OU-2 RI/FS.

2.11.2.2 Location-Specific ARARs

Location-specific ARARs for the Selected Remedy are summarized in this section, in Table 3, and in Section 2.8.1.3. Biological resources, cultural resources, and federal land use designation are categories related to location-specific requirements potentially affected by the Selected Remedy.

The Migratory Bird Treaty Act of 1972 protects almost all species of native migratory birds in the U.S. from unregulated take. There has not been a specific study to identify the presence or absence of migratory birds at the Site. The construction of the Selected Remedy will be carried out in a manner that avoids taking or killing of protected migratory bird species, including individual birds or their nests.

Executive Order 11988 (40 CFR Part 6, Appendix A) mandates that response actions taken by federal agencies must be designed to avoid adverse impacts to floodplains. Specifically, if response activities are located within a 100-year floodplain, the activities must be designed to avoid adversely affecting floodplains wherever possible. The Site is in an area of undetermined, but possible, flood hazard. If the Remedial Design finds that response activities will take place in a floodplain, then the substantive provisions of 40 CFR Part 6, Appendix A will be applicable and the design adjusted to avoid or minimize flood plane impacts.

The National Forest Management Act of 1976 (16 U.S.C §§ 1600-1614) requires that the Forest

Service develop coordinated land and resource management plans to govern the use of National Forest System Lands. As the Site is located on National Forest System lands, long-term future use of the Site area is governed by the LTBMU Forest Plan. CERCLA response actions have to address "reasonably anticipated future land use" as part of the remedy evaluation and selection process and the final remedy must be compatible with "reasonably anticipated future land use". The Selected Remedy is compatible with the federal land-use designations under the LTBMU Forest Plan.

The Site does not encompass any historic properties included or eligible for inclusion on the National Register of Historic Places. No scientific, prehistoric, or archeological artifacts have been identified at the Site. Therefore, no cultural resources ARARs (e.g., National Historic Preservation Act, the Archaeological and Historic Preservation Act, the Historic Sites, Buildings, and Antiquities Act, and the Archaeological Resources Protection Act) have been identified as pertinent to the Site.

2.11.2.3 Action-Specific ARARs

Action-specific ARARs for the Selected Remedy are summarized in this section and in Section 2.8.1.4. Table 4 provides the overall listing of action-specific ARARs for the Selected Remedy.

Municipal Solid Waste Landfill Closure ARARs

Federal and state landfill closure requirements for municipal waste landfills are set forth in 40 CFR Part 258, Subpart F and Title 27 CCR §20950. Because the Site did not receive wastes after the effective date of these regulations, federal and state requirements for municipal solid waste landfill closure are generally not applicable to the Site. However, because the standard closure methods implemented at the time of closure were not adequate to protect human health and the environment, many of the closure and post-closure maintenance standards of 40 CFR Part 258 and Title 27 CCR, Division 2, Subdivision 1, Chapter 3, Subchapter 5, are relevant and appropriate to this remedial action. Because state requirements are stricter than federal, requirements the ARARs are listed by the state codes.

Title 27 CCR §20950 sets forth specific standards for the closure and post-closure care of landfills. The Selected Remedy achieves the requirements of §20950(a)(2)(A) which specify that a final cover system must be designed and installed to minimize infiltration of water into the waste and therefore leachate and landfill gas production. Surface water infiltration will be controlled through the application of the multilayer cap that includes a drainage layer, HDPE liner, and the expansion of the French drain will prevent uncontaminated perched groundwater present at the southwest and west sides of the landfill from moving into the waste disposal area.

The Selected Remedy will comply with the requirements of Title 27 CCR § 21100 et seq. which contain CIWMB requirements for the closure of municipal solid waste landfills. The final cover system will achieve the CIWMB closure and post-closure maintenance requirements specified in Title 27 CCR §§21140(a)(b), 21142(a), 21145(a), and 21150(a) and (b). These four sections contain requirements for final cover, grading, slope stability, and drainage and erosion control. Substantive portions of these requirements are relevant and appropriate to the Selected Remedy construction and are listed in Table 4.

Title 27 CCR §21140 requires the final cover to function with minimum maintenance and to protect public health and safety. In addition, it requires the cap to be compatible with post-closure land use. The Selected Remedy, with a multilayer cap, is compatible with site-specific climatic conditions and reasonably anticipated future use and will be designed to function with minimum maintenance and to protect public health and safety.

The Forest Service has determined that the Title 27 CCR, Division 2 requirements for a LFG monitoring program, as described in Section 2.8.3.5, are applicable for the Selected Remedy. A perimeter LFG monitoring network will be constructed and operated in accordance with the substantive requirements of Title 27 CCR §§ 20921, 20923, 20925, 20932, 20933, and 21160.

The Forest Service will implement Title 27 CCR §21190 which requires that proposed post-closure land uses be designated and maintained to protect health and safety and prevent damage to structures, road, utilities and gas monitoring and control systems; to prevent public contact with waste, LFG and leachate; and prevent LFG explosions. An LUC RD for the institutional controls will be prepared as the land use component of the Remedial Design. The Forest Service will be responsible for implementing, monitoring, reporting, and enforcing these institutional controls for the duration the controls are required to protect health and safety and prevent damage to the Selected Remedy.

A post-closure maintenance and monitoring plan will be developed to comply with the substantive requirements of the Title 27 CCR post-closure ARAR identified in Table 4 and Section 2.8.1.4 (e.g., Title 27 CCR §21180(a), §21769 and §21830, ,etc.). Federal and state regulations require the implementation of a post-closure monitoring and maintenance program for a period of no less than 30 years. Municipal solid waste landfills routinely require post-closure maintenance and monitoring for a period greater than 30 years, as long as the buried wastes present a threat to human health and the environment. A long-term post-closure monitoring and maintenance program will be implemented for a longer period of time if it is required to maintain the continual effectiveness of the Selected Remedy, and to ensure that the remedy will continue to be protective of human health and the environment. Periodic review of the post-closure monitoring and maintenance program will occur as part of the 5-year remedy review, (see Section 2.11.6).

Other Action-Specific ARARs

El Dorado County Air Quality Management District Regulation 233-1 contains standards for fugitive dust and particulate emissions during earthmoving activities such as excavation and stockpiling of cover material. Compliant dust control and monitoring measures will be developed as part of the construction plans and specifications and will be implemented during the remedial action. Dust control measures will likely include water, spraying and/or proper covering of stockpiled soils, and other acceptable engineering means.

The Forest Service has determined that the substantive requirements of SWRCB Order No. R6T-2005-0007 for storm water pollution prevention, erosion control, etc. are applicable to the construction of the Selected Remedy. A construction storm water pollution prevention plan will be prepared as part of the construction plans and specifications and will be implemented during the remedial action.

The substantive requirements of SWRCB Order No. 97-03-DWQ for storm water pollution prevention and monitoring are applicable to the long-term maintenance of the Selected Remedy. Storm water pollution prevention and monitoring will be incorporated into the post-closure monitoring and maintenance program.

2.11.3 Cost Effectiveness

In the Forest Service's judgment, the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP §300.430(f)(1)(ii)(D)). This was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence, short-term effectiveness, and implementability). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence this alternative represents a reasonable value for the money to be spent.

The total capital cost, with contingencies, for the Selected Remedy is $4,142,000. The estimated 30-year operation and maintenance cost, with contingencies, is $677,000. The estimated total net present worth cost of the Selected Remedy is $4,819,000.

Although Alternatives 3 and 4 will not reduce toxicity, mobility, and volume through treatment, the EPA presumptive remedy for landfills does not require this reduction because treatment of contamination sources within landfills is typically not practical. Based on the remaining two balancing criteria, both Alternatives 3 and 4 are considered effective. They are effective in the long term because, with proper implementation, the multilayer cap and cover system will permanently provide physical isolation of landfill waste and any associated contaminants from humans and the environment. They are effective in the short term because they can be implemented in a matter of months and include measures to protect the environment, workers, and the public during construction of the cap.

2.11.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be applied in a practical manner for OU-1. In accordance with EPA's Presumptive Remedy for CERCLA Municipal Landfill Sites, the Selected Remedy is effective for the long-term protection of human health and the environment. Refuse and contaminants will be isolated from human and environmental receptors through the installation of a multilayer cap and cover system that is compatible with site specific climatic conditions and reasonably anticipated future use. The Selected Remedy will eliminate the exposure pathways of concern and reduce or eliminate water infiltration and generation of leachate and the subsequent migration of hazardous substances into groundwater.

The continual effectiveness of the Selected Remedy will be maintained through the implementation of a long-term post-closure operation and maintenance plan that is compliant

with federal and state municipal landfill closure ARARs.

The Selected Remedy is not intended to address the existing groundwater plume or any groundwater contamination emanating from the waste disposal area. The full extent of contamination and vinyl chloride impacts to groundwater are still being defined and will be further characterized as part of the Supplemental OU-2 RI/FS. There will be a second and final OU ROD for the Site. This second OU ROD will address OU 2, the groundwater plume, and any response action that may be required to address groundwater contamination that may continue to emanate from the waste disposal area after the implementation of the OU-1 remedy. If groundwater remediation is required in the future, the groundwater remediation system will be designed in a manner that would provide for integrity of the selected OU-1 remedy

2.11.5 Preference for Treatment as a Principal Element

The Selected Remedy does not involve treatment to reduce toxicity, mobility, or volume. Section 300.430(a)(iii)(B) of the NCP contains the expectation that engineering controls, such as containment, will be used for waste that poses a relatively low long-term threat 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 (55 FR 8704). The Selected Remedy is consistent with EPA's Presumptive Remedy for CERCLA Municipal Landfills (EPA 540-F-93-035), which established containment technologies as the presumptive remedy. Isolating the waste mass and reducing infiltration through the refuse with a cap will minimize or eliminate the generation of leachate and reduce the mobility of hazardous substances from the waste disposal area.

2.11.6 Five-Year Remedy Review Requirements

Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action in accordance with CERCLA Section 121 to ensure that the remedy is, or will continue to be, protective of human health and the environment.

2.12 DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes have been made to the selected alternative since issuance of the Proposed Plan.

3.0 REFERENCES

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FIGURES

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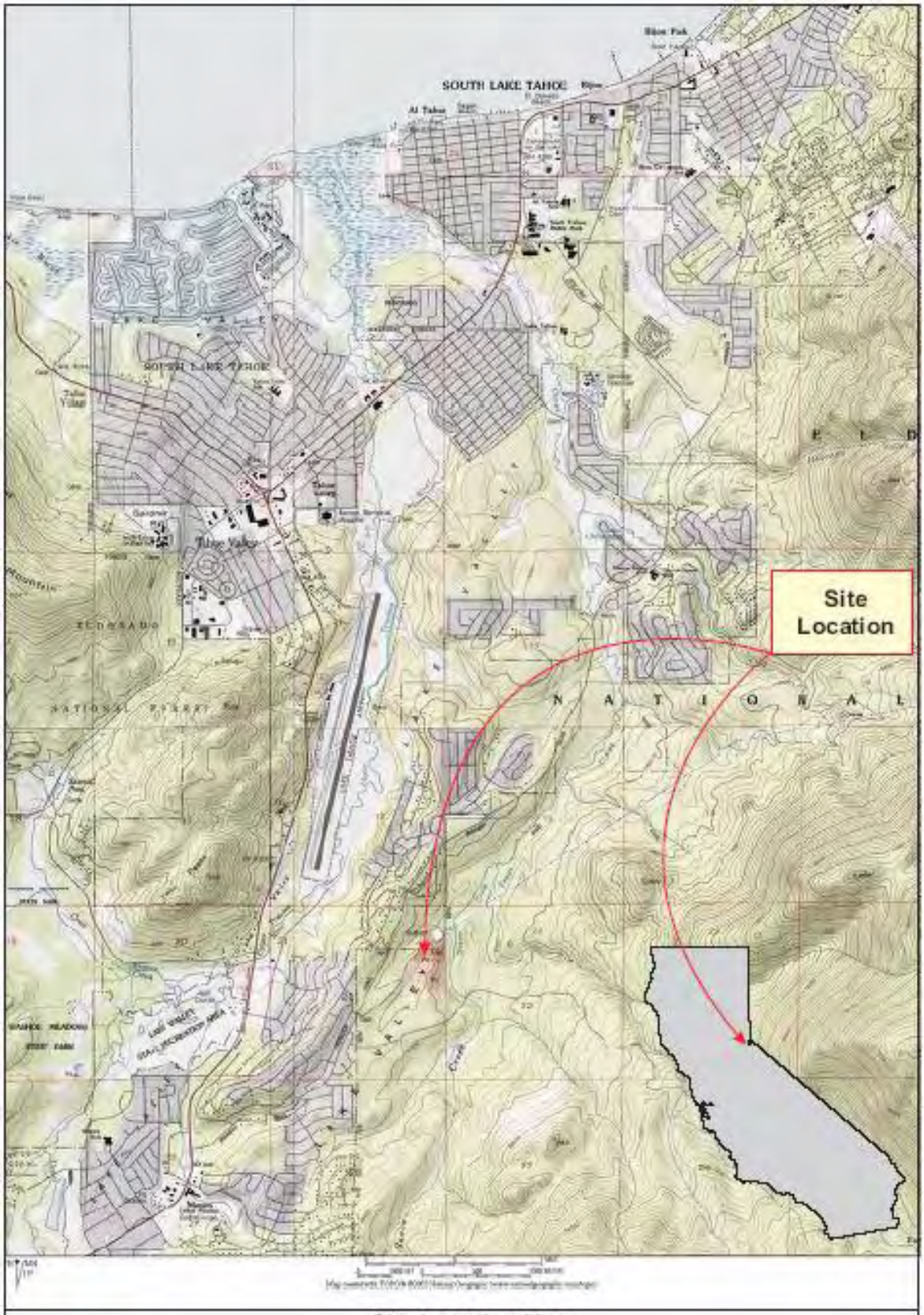
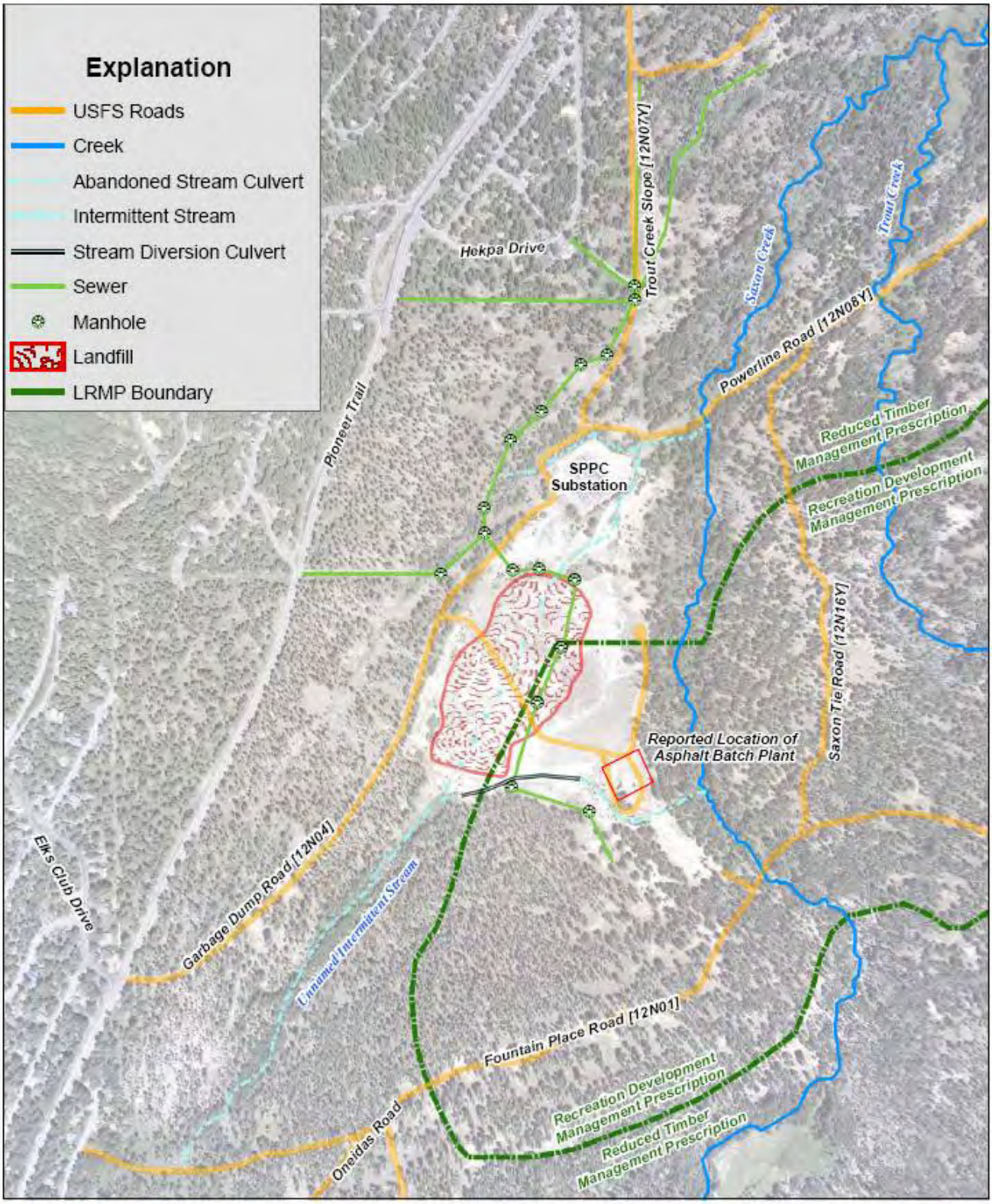


Site Location Map
Meyers Landfill
El Dorado County, California

Figure 1



USDA

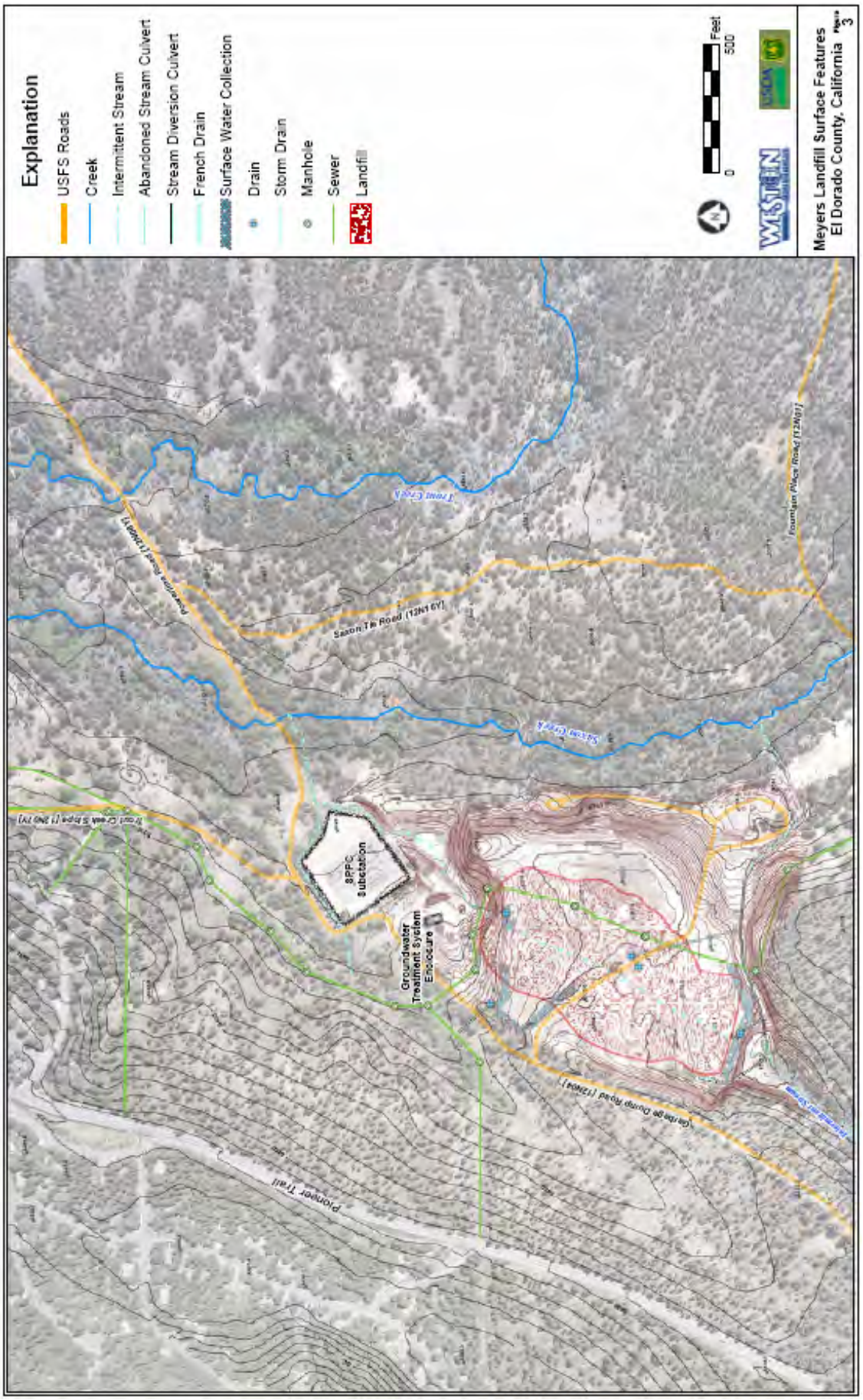
N

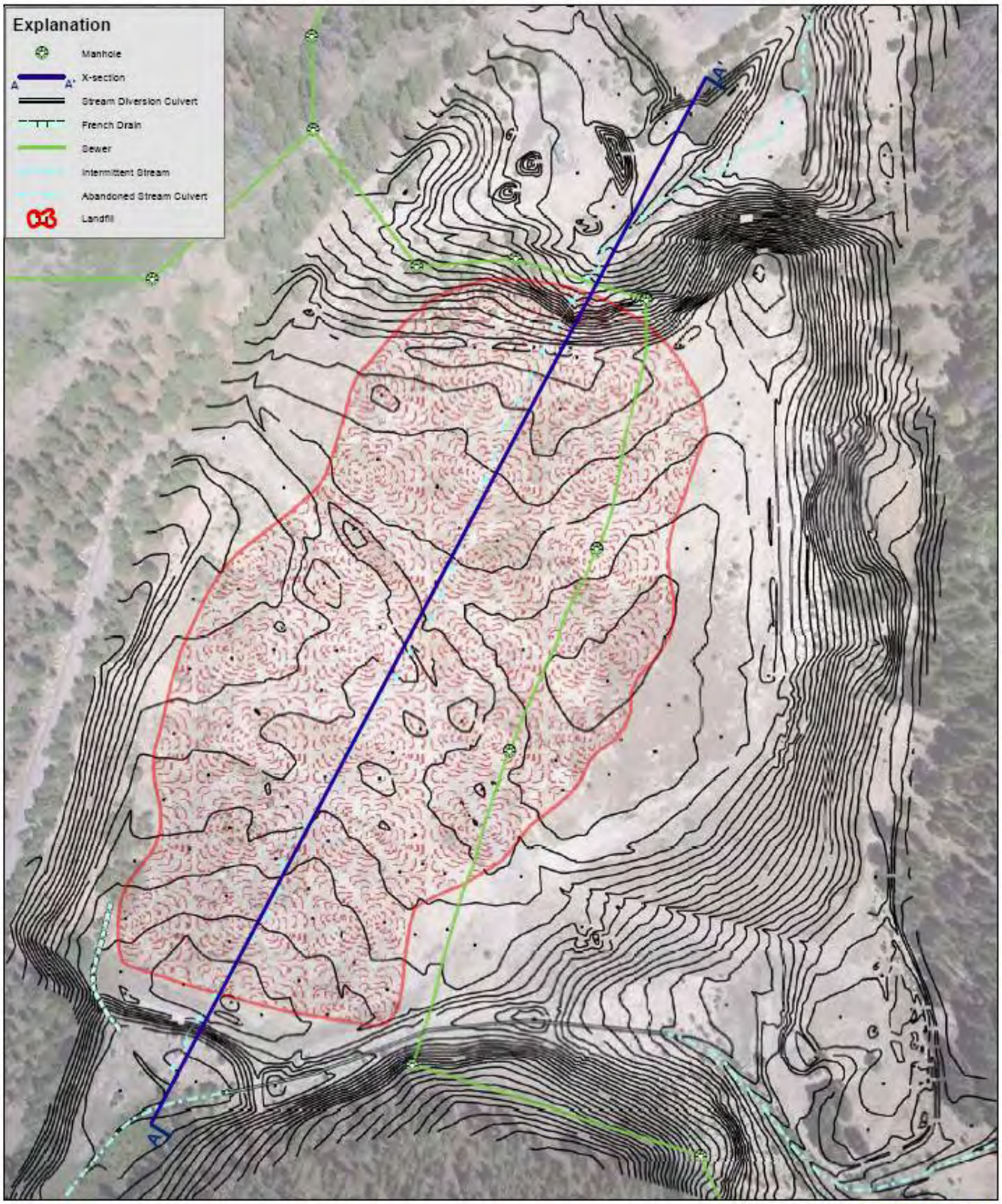
0 1,000 Feet

Site Map
Meyers Landfill
El Dorado County, California

WESTON SOLUTIONS

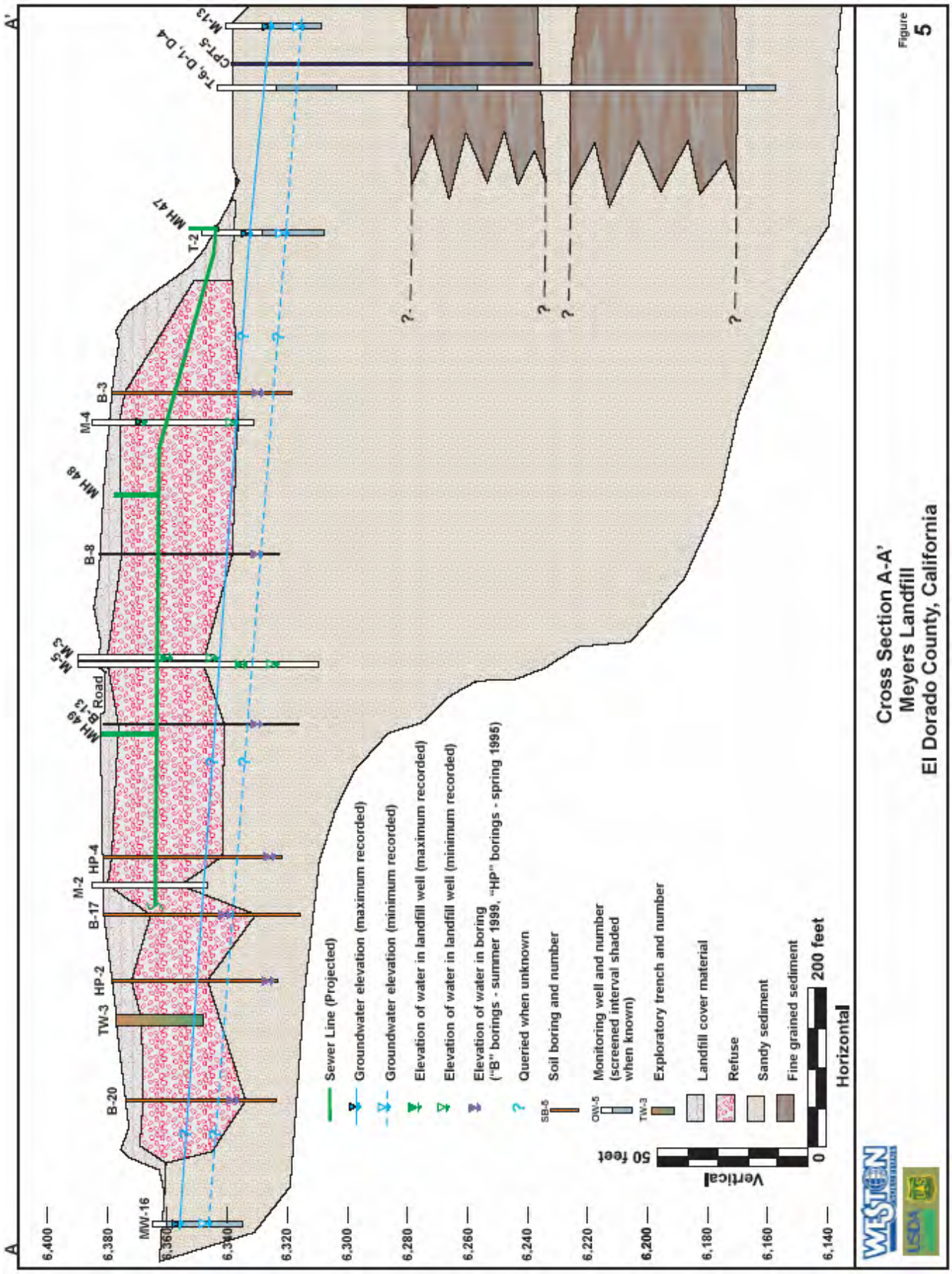
Figure 2

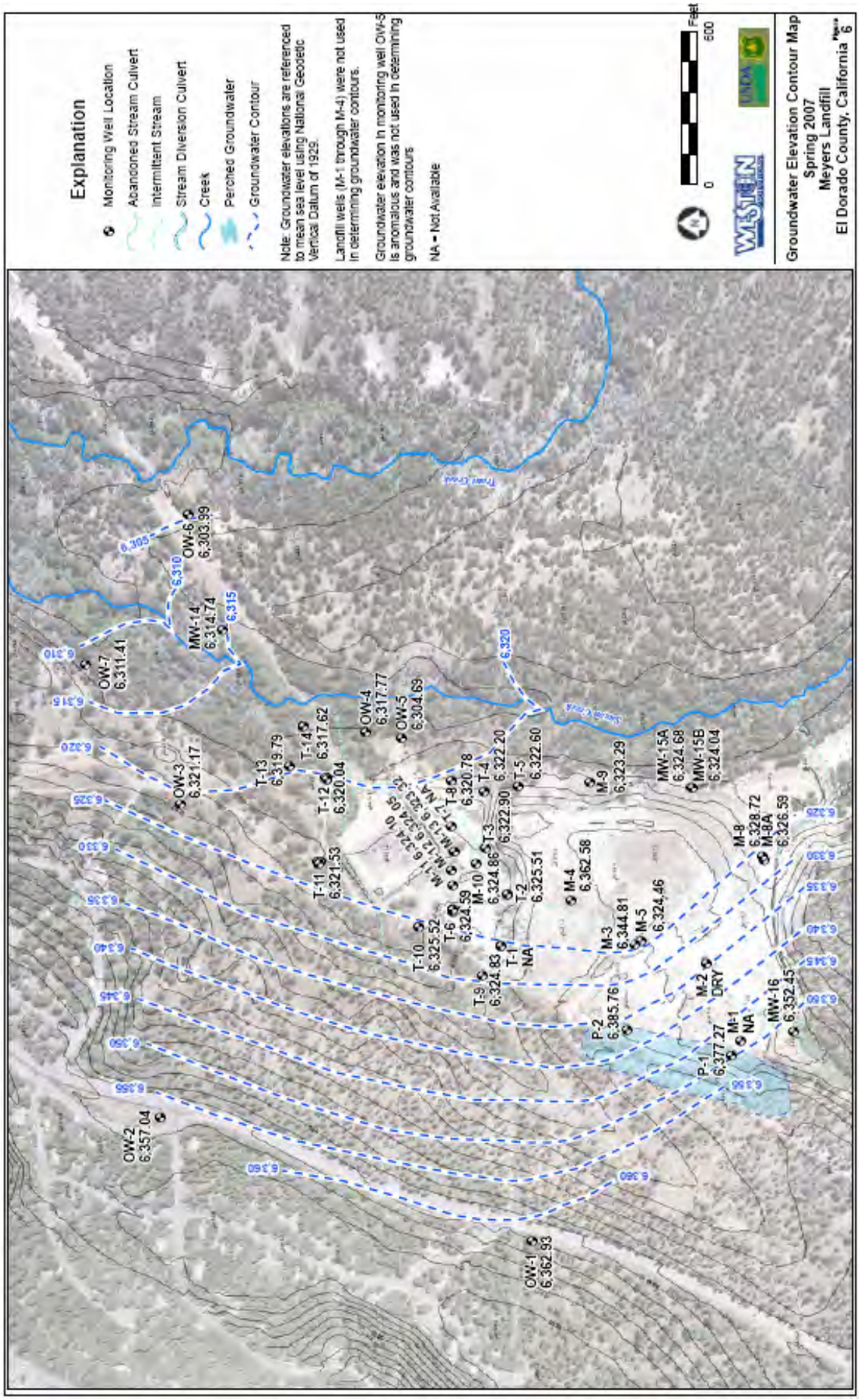

Explanation
USFS Roads
Creek
Intermittent Stream
Abandoned Stream Culvert
Stream Diversion Culvert
French Drain
Surface Water Collection
Drain
Storm Drain
Manhole
Sewer
Landfill
Feet
0
500
Meyers Landfill Surface Features
El Dorado County, California
3
Saxon Tie Road (12N16Y)
Fountain Place Road (12N01)
Pioneer Trail
Garbage Dump Road (12N01)
SPPC Substation
Groundwater Treatment System Enclosure

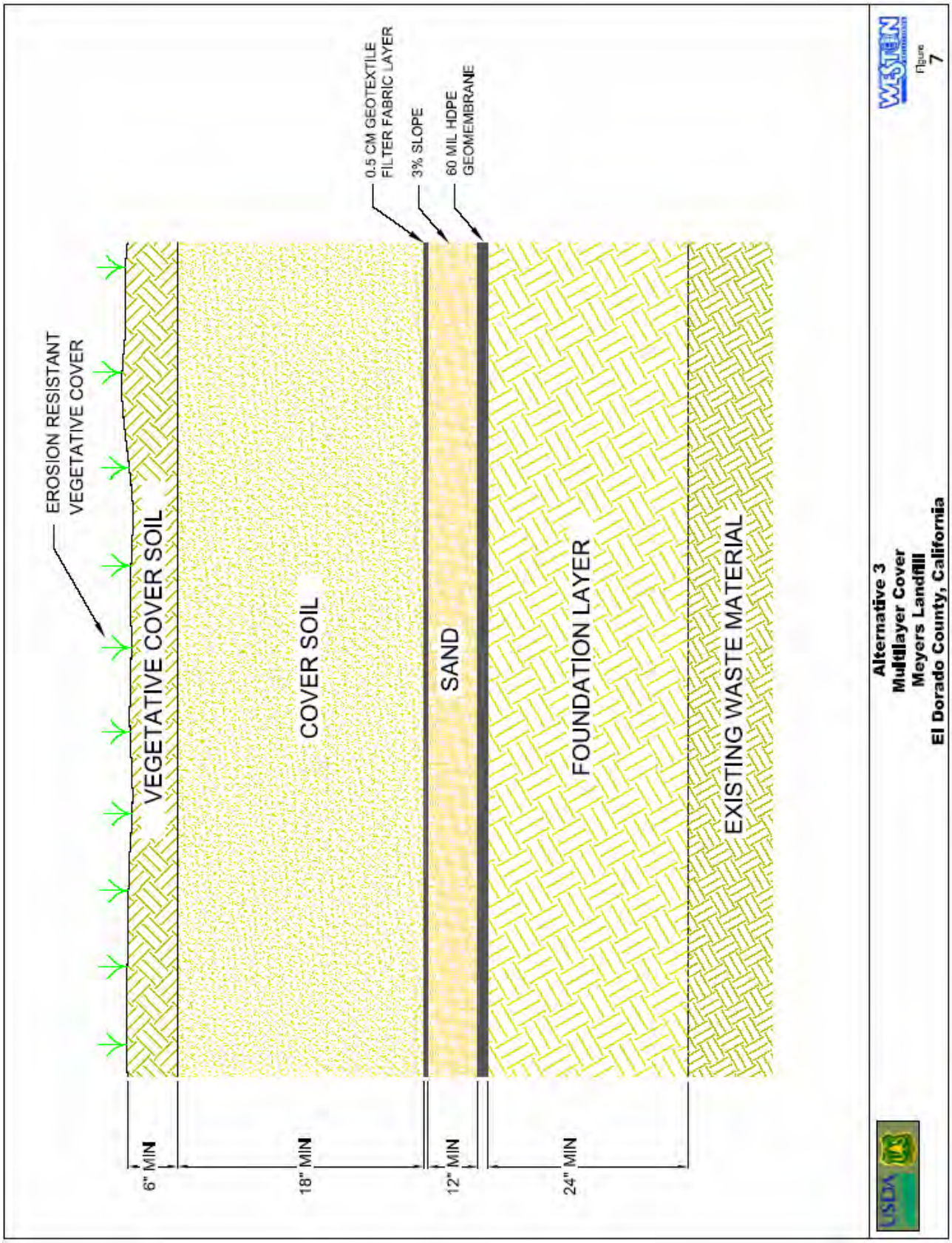


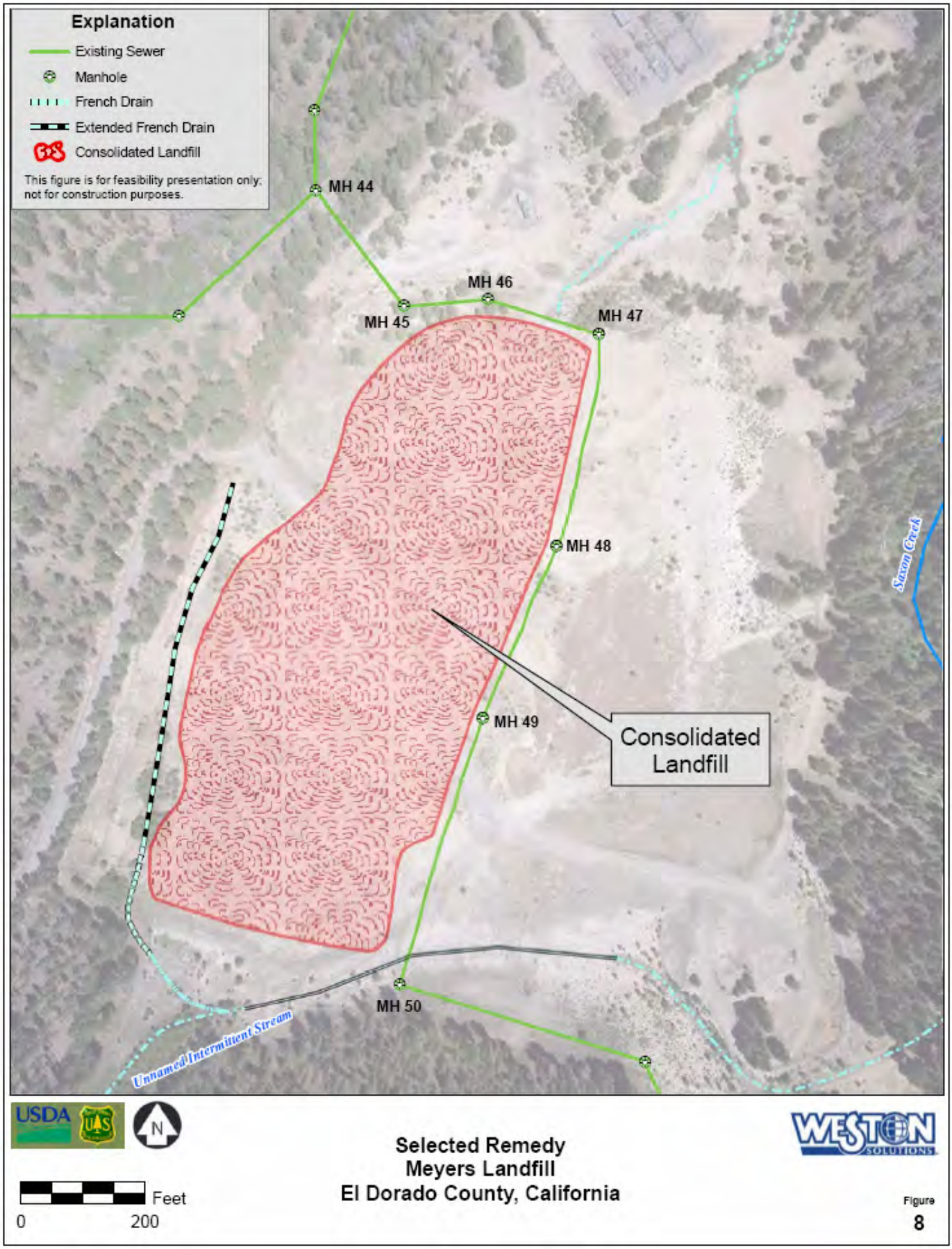
Location of Geologic Cross Section
Meyers Landfill
El Dorado County, California

Figure
4


A
A'
6,400
6,380
6,360
6,340
6,320
6,300
6,280
6,260
6,240
6,220
6,200
6,180
6,160
6,140
MW-16
B-20
TW-3
HP-2
B-17
M-2
HP-4
MH 49
B-13
Road
M-5
M-3
B-8
MH 48
M-4
B-3
MH 47
T-2
T-6, D-1, D-4
CPT-5
M-13
Sewer Line (Projected)
Groundwater elevation (maximum recorded)
Groundwater elevation (minimum recorded)
Elevation of water in landfill well (maximum recorded)
Elevation of water in landfill well (minimum recorded)
Elevation of water in boring ("B" borings - summer 1999, "HP" borings - spring 1995)
Queried when unknown
Soil boring and number
Monitoring well and number (screened interval shaded when known)
Exploratory trench and number
Landfill cover material
Refuse
Sandy sediment
Fine grained sediment
Vertical
50 feet
0
200 feet
Horizontal
Cross Section A-A'
Meyers Landfill
El Dorado County, California
Figure
5


Explanation
Monitoring Well Location
Abandoned Stream Culvert
Intermittent Stream
Stream Diversion Culvert
Creek
Perched Groundwater
Groundwater Contour
Note: Groundwater elevations are referenced to mean sea level using National Geodetic Vertical Datum of 1929.
Landfill wells (M-1 through M-4) were not used in determining groundwater contours.
Groundwater elevation in monitoring well OW-5 is anomalous and was not used in determining groundwater contours
NA = Not Available
Feet
0
600
Groundwater Elevation Contour Map
Spring 2007
Meyers Landfill
El Dorado County, California
6
OW-2
6,357.04
OW-1
6,362.93
OW-7
6,311.41
OW-3
6,321.17
OW-6
6,303.99
MW-14
6,314.74
OW-4
6,317.77
OW-5
6,304.69
T-13
6,319.79
T-14
6,317.62
T-12
6,320.04
T-11
6,321.53
T-10
6,325.52
T-9
6,324.83
T-6
6,324.59
M-10
6,324.86
T-3
6,322.90
T-4
6,322.20
T-8
6,320.78
T-5
6,322.60
T-2
6,325.51
T-1
NA
M-4
6,362.58
M-3
6,344.81
M-5
6,324.46
M-9
6,323.29
MW-15A
6,324.68
MW-15B
6,324.04
M-8
6,328.72
M-8A
6,326.58
MW-16
6,352.45
M-2
DRY
M-1
NA
P-1
6,377.27
P-2
6,385.76
6,305
6,310
6,315
6,320
6,325
6,330
6,335
6,340
6,345
6,350
6,355
6,360


EROSION RESISTANT
VEGETATIVE COVER
VEGETATIVE COVER SOIL
COVER SOIL
0.5 CM GEOTEXTILE
FILTER FABRIC LAYER
3% SLOPE
60 MIL HDPE
GEOMEMBRANE
SAND
FOUNDATION LAYER
EXISTING WASTE MATERIAL
6" MIN
18" MIN
12" MIN
24" MIN
USDA
Alternative 3
Multilayer Cover
Meyers Landfill
El Dorado County, California
Figure
7



Selected Remedy
Meyers Landfill
El Dorado County, California

Figure
8

TABLES

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Table 1
Summary of Investigations
Meyers Landfill

Date	Consultant / Agency	Activities Conducted
1975	RWQCB	Collection of leachate samples and surface water samples. Documented leachate discharge from the landfill.
1976	USFS	Collected surface water samples from upstream and downstream locations along Saxon Creek. Documented leachate discharge to Saxon Creek.
1975-1977	USFS	Approximately 30,000 cubic yards of cover soil was spread over the landfill to fill depressions and control erosion. Drainage systems to collect water from the intermittent stream and spring were installed at the south end of the landfill. The collected water was diverted to Saxon Creek.
1977	USFS	Conducted a geophysical survey of the landfill and determined the landfill waste was over 40 feet thick and covered with a thin permeable soil cap.
1979	BSK Assoc./ USFS	Five monitoring wells (M-1 through M-5) were installed within the boundaries of the landfill. Well M-6 was installed at the base of the northern slope at an unknown time.
1980-1982	USFS	Water elevation measurements were collected from landfill monitoring wells. It is unknown if the wells were sampled.
1980-1989	USFS	Annual sampling of Saxon Creek was performed.
June/ August 1991	Weston Analytics/ USFS	Sampling of landfill wells for VOC analyses. Report documented VOCs, including vinyl chloride.
March 1992	Alpha Analytical/ USFS	Sampling of landfill wells for VOC analyses. Report documented VOCs, including vinyl chloride.
October 1994	Ecology and Environment, Inc. (E&E)/ USFS	Installed upgradient groundwater monitoring well M-7, collected groundwater samples from wells M-4, M-5, and M-7 and surface water samples from Saxon Creek.
May/June 1995	E&E/USFS	Drilled 15 borings (HP-1 through HP-15), ten borings located on the landfill plateau and five located off of the landfill. Groundwater samples were collected from 14 of the 15 borings and from monitoring wells M-4, M-5, and M-7. Surface water samples were collected from Saxon Creek and from the French drain outlet. Well M-6 was destroyed.
July 1996	USFS	Solid Waste Assessment Test Report (SWAT) was prepared for the Site documenting Site activities to date.

Table 1
Summary of Investigations
Meyers Landfill

Date	Consultant / Agency	Activities Conducted
July 1996	E&E/USFS	Installed groundwater monitoring well M-8 between the landfill and Saxon Creek and wells M-9 and M-10 north of the landfill. Installed four soil vapor probes (GP-1 through GP-4) off of the landfill. There is no available information regarding the sampling of these wells by E&E. An undated topographic map of the landfill showing Site drainage features and new wells was prepared after this well installation.
August 1996	Broadbent & Assoc. (BAI)/ USFS	Sampled wells M-7 through M-10 and Saxon Creek. Vinyl chloride was documented in well M-10 at 5.5 µg/L.
November 1996	BAI/USFS	Sampled wells M-7, M-9, M-10, Saxon Creek and soil vapor probes GP-1 through GP-4. Vinyl chloride was not detected.
August 1997	Phase Three Environmental Management (PTEM)/Joint Powers Authority (JPA)[1]	Installed three shallow groundwater monitoring wells (M-11, M-12, and M-13) near well M-10. Sampled wells M-7 through M-13.
October/ November 1997	PTEM/JPA	Installed eight shallow groundwater monitoring wells (T-1 through T-8). Sampled wells M-7, M-9 through M-13, and wells T-1 through T-8. Well M-8 could not be sampled because of low water levels.
December 1997	PTEM/JPA	Sampled wells M-7, M-9 through M-13, and wells T-1 through T-8. Well M-8 could not be sampled because of low water levels.
May 1998	PTEM/JPA	Sampled wells M-7, M-9 through M-13, and wells T-1 through T-8. Installed eight shallow groundwater monitoring wells (T-9, T-10, M-8A, OW-1 though OW-5), and one deeper “intermediate” well, (D-1). Installed three soil vapor probes (M-13, T-3, and T-6). Sampled the wells that were installed.
June 1998	PTEM/JPA	Sampled 23 groundwater monitoring wells and three soil vapor probes.
August 1998	PTEM/JPA	Sampled 23 groundwater monitoring wells.
October 1998	PTEM/JPA	Installed two shallow groundwater monitoring wells (T-11 and T-12), two wells to an intermediate depth (D-2 and D-3), and three deep wells (D-4 through D-6).

Table 1 Summary of Investigations Meyers Landfill		
Date	**Consultant / Agency**	**Activities Conducted**
November 1998	PTEM/JPA	Sampled 30 groundwater monitoring wells and collected three surface water samples from Saxon Creek.
May 1999	PTEM/JPA	Sampled 29 groundwater monitoring wells, excluding well M-7, and collected five surface water samples from Saxon Creek.
June/July 1999	PTEM/JPA	Drilled 23 borings (B-1 through B-23) in and around the landfill and collected 16 groundwater samples from the borings. Installed and sampled two shallow groundwater monitoring wells (T-13 and T-14), and destroyed well M-7.
August/ September1 999	PTEM/JPA	Sampled 31 groundwater monitoring wells and collected five surface water samples from Saxon Creek.
October 1999	PTEM/JPA	Installed one extraction well (X-1) and conducted a 3-day aquifer pump test.
1999- 2005	BAI/ USFS	Operation and maintenance of the pilot pump and treat system. The system was not effective at controlling the plume and was shut down in 2005.
November 1999	PTEM/JPA	Sampled 31 groundwater monitoring wells and collected five surface water samples from Saxon Creek.
May 2000	PTEM/JPA	Sampled 31 groundwater monitoring wells and collected five surface water samples from Saxon Creek.
June 2000	PTEM/JPA	Prepared Meyers Landfill RI Report for USFS.
June 2000	Tetra Tech EM Inc. (TtEMI)/ USFS	Prepared a Draft Baseline Human Health Risk Assessment and Screening Level Ecological Risk Assessment.
January 2002	E&E/USFS	Prepared Meyers Landfill FS Report for USFS.
October/ November 2003	GeoSyntec Consultants, Inc. (GeoSyntec)/ City[2]	Excavated 55 test pits in and adjacent to landfill. Installed one landfill gas extraction well and three landfill gas monitoring probes. Performed a 5-day landfill gas extraction test.
October/ November 2003	Geomatrix Consultants, Inc. (Geomatrix)/ County[3]	Sampled 31 groundwater monitoring wells and collected three surface water samples from Saxon Creek. Drilled 11 borings (GB-1 through GB-11) downgradient of the landfill. Collected groundwater grab samples from 10 of the 11 borings.

Table 1 Summary of Investigations Meyers Landfill		
Date	**Consultant/ Agency**	**Activities Conducted**
May/June 2004	Geomatrix/ County	Installed two shallow groundwater monitoring wells (OW-6 and OW-7) and drilled two borings (GB-12 and GB-13) for the collection of groundwater samples. Sampled 11 groundwater monitoring wells and collected three surface water samples from Saxon Creek.
September/ November 2005	Weston Solutions, Inc. (WESTON) / USFS	Installed four groundwater monitoring wells, two piezometers, and drilled six borings for the collection of depth discrete groundwater samples. Sampled 24 groundwater monitoring wells including the newly installed wells. Installed and sampled 17 soil vapor points. Collected sewer gas and sewer solid samples.
September 2005	South Tahoe Public Utility District	Conducted video inspection of Trout Creek sewer trunk line between manholes 46 and 50.
October 2005	WESTON/ USFS	Conducted geophysical survey that included the landfill plateau and slopes. Performed a 5-day landfill gas extraction test.
January 2006	WESTON/ USFS	Sampled 12 monitoring wells including seven wells with passive diffusion bags installed at various depths in selected wells.
May 2006	WESTON/ USFS	Sampled 20 groundwater monitoring wells. Conducted cone penetration testing at 13 locations and collected depth discrete groundwater samples from 6 of the 13 borings. Installed two soil vapor points.
June 2006	WESTON/ USFS	Conducted investigative trenching in landfill near sewer, inspected sewer bedding material, and trenched west side of landfill in perched water area. Installed one soil vapor point in sewer backfill. Located and elevated buried manhole number 48 in landfill. Collected soil vapor samples from 15 soil vapor points.
June 2006	USFS	Conducted a fly-over of the Site, prepared an aerial photograph and topographic map of the landfill and surrounding area.

1. From 1997-2000, the County, through its Joint Power Authority (JPA), performed Site investigations under a voluntary Administrative Order on Consent (AOC) under Forest Service direction and oversight.
2. From 2003-2004, the City performed supplemental Site investigations of the waste disposal area pursuant to an Administrative Settlement Agreement and Order on Consent (ASAOC) under Forest Service direction and oversight.
3. From 2003-2004, the County performed supplemental groundwater investigations pursuant to an ASAOC under Forest Service direction and oversight.
4. Additional groundwater investigation work is currently being conducted by the County for OU-2.

Table 2
Chemical-Specific[a] ARARs

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
FEDERAL				
GROUNDWATER				
Safe Drinking Water Act (42 U.S.C., ch. 6A, § 300[f]–300[j]-26)[c]				
National primary drinking water standards are health-based standards for public water systems (MCLs).	Public water system.	40 C.F.R. § 141.11–141.13, excluding § 141.11(d)(3), 141.15, 141.16, 141.61(a) and (c), and 141.62(b)	OU-2 ARAR and relevant and appropriate for OU-1 remedy implementation	Groundwater directly underlying Meyers landfill is not currently being utilized for drinking water. However, the South Tahoe Valley groundwater basin is designated for domestic and municipal drinking water source. Vinyl chloride levels in the plume exceed drinking water MCLs.
Clean Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)[c]				
National Ambient Water Quality Criteria.	Discharges to waters of the United States and groundwater.	33 U.S.C. § 1314(a) and 42 U.S.C. § 9621(d)(2) 64 Fed. Reg. 19,781 (22 April 1999)	OU-2 ARAR	Contaminated groundwater may reach surface waters. Past analytical results show impact to surface water in Saxon Creek. Further investigation will occur under the Supplemental OU-2 RI/FS.
Water quality standards.	Discharges to waters of the United States.	40 C.F.R. § 131.36(b) and 131.38	OU-2 ARAR	Contaminated groundwater may reach surface waters. Past analytical results show impact to surface water in Saxon Creek. Further investigation will occur under the Supplemental OU-2 RI/FS.
SURFACE WATER				
Clean Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)[c]				
National Ambient Water Quality Criteria.	Discharges to waters of the United States.	40 C.F.R. § 131.36(b)	Applicable	There is a surface water runoff to the Saxon Creek. Surface water run-off and soil/sediment erosion must be controlled to prevent surface water contamination.

Table 2
Chemical-Specific[a] ARARs

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Water quality standards.	Discharges to waters of the United States	33 U.S.C., ch. 26, § 1314(a) and 42 U.S.C., ch. 103, § 9621(d)(2) 64 Fed. Reg. 19,781 (22 April 1999)	Applicable	There is currently a discharge to groundwater and a potential discharge to surface water. Surface water run-off and soil/sediment erosion must be controlled to prevent surface water contamination. Further groundwater investigation will occur under the Supplemental OU-2 RI/FS.
STATE				
GROUNDWATER, SURFACE WATER, SOIL, SEDIMENTS, AND AIR				
California Department of Health Services[c]				
State MCL list.	Source of drinking water	Cal. Code Regs. tit. 22, §§ 64431 and 64444	OU-2 ARAR and relevant and appropriate for OU-1 remedy implementation	Groundwater at the site is not currently being utilized as a drinking water source. However, it is a potential drinking water source. The South Tahoe Valley groundwater basin is designated for domestic and municipal drinking water source. Vinyl chloride levels in the plume exceed drinking water MCLs.
Cal/EPA Integrated Waste Management Board				
The concentration of methane at the landfill boundary shall not exceed the LEL (5 percent methane in air).	Landfill closure	Cal. Code Regs. tit. 27, § 20921(a)(1), (2) and (a)(3)	Applicable	These regulations are applicable to the landfill because landfill gas containing methane is present at the Site.
State and Regional Water Quality Control Board[c]				
Authorizes the SWRCB and RWQCB to establish in water quality control plans beneficial uses and numerical and narrative standards to protect both surface water and groundwater quality. Authorizes regional water boards to issue permits for discharges to land or surface or groundwater that could affect water quality, including NPDES permits, and to take enforcement action to protect water quality.		Cal. Water Code, div. 7, §§ 13241, 13243, 13263(a), 13269, and 13360 (Porter-Cologne Water Quality Control Act)	Applicable	Substantive provisions of §§ 13241, 13243, 13263(a), 13269, and 13360 of the Porter-Cologne Act enabling legislation, as implemented through the beneficial uses, WQOs, waste discharge requirements, promulgated policies of the Basin Plan for the Lake Tahoe Basin, as ARARs.

Table 2
Chemical-Specific[a] ARARs

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
State and Regional Water Quality Control Board[c]				
Describes the water basins in *the Lahontan Region* establishes beneficial uses of groundwater and surface water, establishes WQOs, including narrative and numerical standards, establishes implementation plans to meet WQOs and protect beneficial uses, and incorporates statewide water quality control plans. Establishes the policy that high-quality waters of the state "shall be maintained to the maximum extent possible" consistent with the "maximum benefit to the people of the State." It provides that whenever the existing quality of water is better than that required by applicable water quality policies, such existing high-quality water will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. It also states that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge to existing high-quality waters will be required to meet waste-discharge requirements that will result in the best practicable treatment or control of the discharge.		Comprehensive Water Quality Control Plan for the Lahontan Region (Basin Plan) (Cal. Water Code § 13240)	OU-1 and OU-2	Substantive requirements pertaining to beneficial uses, WQOs, and certain statewide water quality control plans are state ARARs for the surface water and groundwater components of this response action.
		Statement of Policy With Respect to Maintaining High Quality of Waters in California, SWRCB Res. 68-16	OU-2 potential ARAR	
State and Regional Water Quality Control Board[c]				
Incorporated into all regional board basin plans. Designates all groundwater and surface waters of the state as drinking water except where the TDS is greater than 3,000 ppm, the well yield is less than 200 gpd from a single well, the water is a geothermal resource or in a water conveyance facility, or the water cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices.		SWRCB Res. 88-63 (Sources of Drinking Water Policy)	OU-2 ARAR and justification for OU-1 remedy implementation	Groundwater at the site is not currently being utilized as a drinking water source. However, it is a potential drinking water source. The South Tahoe Valley groundwater basin is designated for domestic and municipal drinking water source. Vinyl chloride levels in the plume exceed drinking water MCLs.

Table 2
Chemical-Specific[a] ARARs

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Establishes concentration limits for cleanup actions, including groundwater, surface water, and the unsaturated zones for other than hazardous waste at background. Allows a higher cleanup limit (but not to exceed MCLs) if background is not technically or economically achievable.		Cal. Code Regs. tit. 27, §§ 20380(a); 20400(a), (c), (d), (e), and (g); and 20405	OU-2 ARAR	
El Dorado County Air Quality Management District				
Requires discharges of vinyl chloride to air as listed in the Ambient Air Quality Standards for Hazardous Substances to be monitored.	Discharge of vinyl chloride to air	Cal. Code Regs. tit. 17, §70200.5	Applicable	Overall gas emissions from the Meyers Landfill are low due to the age and size of the landfill, However, there is vinyl chloride in the landfill gas. Monitoring will be performed after cap installation.

Notes:

[a] Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables

[b] Only the substantive provisions of the requirements cited in this table are potential ARARs

[c] Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Forest Service accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of specific citations are considered potential ARARs

Table 3
Location-Specific[a] ARARs

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
FEDERAL					
Exec. Order No. 11988, Floodplain Management[b]					
Within floodplain	Actions taken should avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values.	Action that will occur in a floodplain (i.e., lowlands) and relatively flat areas adjoining inland and coastal waters and other flood-prone areas.	40 C.F.R. § 6.302(b) 40 C.F.R. pt. 6, app. A, excluding § 6(a)(2), 6(a)(4), and 6(a)(6)	To Be Considered	Meyers Landfill is in an area of undetermined, but possible, flood hazard. If response activities take place in a floodplain, these requirements will be applicable.
Migratory Bird Treaty Act of 1972 (16 U.S.C. §§ 703–712)[b]					
Migratory bird area	Protects almost all species of native migratory birds in the U.S. from unregulated "take," which can include poisoning at hazardous waste sites.	Presence of migratory birds.	16 U.S.C. § 703	Relevant and Appropriate	There have been no migratory birds noted at the site; However, no survey has been completed at the landfill. The selected remedy will be carried out in a manner that avoids taking or killing of protected migratory bird species, including individual birds or their nests.
National Forest Management Act of 1976 (16 U.S.C §§ 1600-1614)[b]					
OU-1 Remedy Implementation Area	Requires that the Forest Service develop coordinated land and resource management plans to govern the use and of National Forest System Lands.	CERCLA response actions have to address "reasonably anticipated future land use" as part of the remedy evaluation and selection process. CERCLA response actions must be compatible with "reasonably anticipated future land use"	Lake Tahoe Basin Management Unit Land and Resource Management Plan (Forest Plan) (16 U.S.C. § 1604)	To Be Considered	Long-term future use of the Meyers Landfill area is governed by the Lake Tahoe Basin Management Unit Land and Resource Management Plan (Forest Plan).

Notes:

[a] Only the substantive provisions of the requirements cited in this table are potential ARARs

[b] Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Forest Service accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs

Table 3
Location-Specific[a] ARARs

Acronyms/Abbreviations:

app. – appendix
ARAR – applicable or relevant and appropriate requirement
C.F.R. – *Code of Federal Regulations*
Exec. Order No. – executive order number
pt. – part
Pub. L. No. – public law number
§ – section
U.S. – United States
U.S.C. – *United States Code*

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
FEDERAL				
Clean Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251–1387) [b]				
Discharge to surface waters	Owners and operators of construction activities must be in compliance with discharge standards.	CWA Section 402 (33 U.S.C. ch. 26, § 1342)	Applicable	Construction activities will be managed to meet standards regarding discharge to surface waters.
	All direct dischargers meet technology-based requirements including the best control technology and the best available technology economically achievable.	CWA Section 301(b) (33 U.S.C. ch. 26, § 1311)	Applicable	ARARs for construction activities that will be managed to meet standards regarding discharge to surface waters.
STATE				
State Water Resources Control Board and Regional Water Quality Control Board [b]				
Industrial activities, which include closed or inactive landfills, must comply with the substantive requirements for eliminating most non-storm water discharges, developing and implementing a storm water pollution prevention plan, and performing monitoring of storm water discharges.		SWRCB Order No. 97-03-DWQ (Industrial Activities General Storm Water Permit, Excluding Construction Activities)	Applicable	Substantive requirements for storm water management and pollution prevention are considered applicable for long-term post-closure maintenance.

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
Construction activities that disturb greater than 1 acre must develop and implement a Storm Water Pollution Prevention Plan (SWPPP) and comply with the substantive requirements for eliminating most non-stormwater discharges and performing monitoring of storm water discharges.		SWRCB Order No. R6T-2005-0007 (Updated Waste Discharge Requirements And National Pollutant Discharge Elimination System General Permit No. CAG616002-Discharges of Storm Water Runoff Associated With Construction Activity Involving Land Disturbance In The Lake Tahoe Hydrologic Unit, El Dorado, Placer, And Alpine Counties)	Applicable	Substantive requirements should be complied with for all actions that involve soil-moving.
State Water Resources Control Board [b]				
General closure and post-closure maintenance standards.	Waste discharged after 18 July 1997	Cal.Code Regs. Tit. 27, § 20950(a), (b), (d), and (e)	Relevant & Appropriate	No wastes were discharged after July 18, 1997. Relevant and appropriate evaluation for the substantive provisions should be done for the selected remedy.
Provides specific standards for closure and post-closure of landfills.	Waste discharged after 18 July 1997	Cal. Code Regs. tit. 27, § 21090	Relevant & Appropriate	Specific standards for landfill closure and post-closure are relevant and appropriate to closure of the landfill.
Contains general standards for the design of the final cover.	Waste discharged after 18 July 1997	Cal. Code Regs. tit. 27, § 21140(a) and (b)	Relevant & Appropriate	The cover will be designed to function with minimal maintenance and to control vectors, prevent exposure to landfill contents, and ensure cover stability and integrity.
Contains general standards for landfill grading.	Waste discharged after 18 July 1997	Cal. Code Regs. tit. 27, § 21142(a)	Relevant & Appropriate	The cover will be designed to function with minimal maintenance and to control vectors, prevent exposure to landfill contents, and ensure cover stability and integrity.

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
Contains general standards for slope stability.	Waste discharged after 18 July 1997	Cal. Code Regs. tit. 27, § 21145(a)	Relevant & Appropriate	The cover will be designed to function with minimal maintenance and to control vectors, prevent exposure to landfill contents, and ensure cover stability and integrity.
Contains general standards for drainage and erosion control.	Waste discharged after 18 July 1997	Cal. Code Regs. tit. 27, § 21150(a) and (b)	Relevant & Appropriate	The cover will be designed to function with minimal maintenance and to control vectors, prevent exposure to landfill contents, and ensure cover stability and integrity.
Classified waste management units shall be closed in accordance with an approved closure and post-closure maintenance plan, which provides for continued compliance with the applicable standards for waste containment and precipitation and drainage controls and monitoring requirements.	Waste discharged after 18 July 1997	Cal. Code Regs. tit. 27, § 21769	Relevant & Appropriate	No wastes were placed in the landfill after 1997. Preparation of closure and post-closure maintenance plans are procedural requirements. The design documents for the remedial response will document how the substantive requirements will be met.
Sets forth requirements for final post-closure maintenance plan.	Waste discharged after 18 July 1997	Cal. Code Regs. tit. 27, § 21830	Relevant & Appropriate	Preparation of closure and post-closure maintenance plans are procedural requirements; however, design documents for the remedial response will explain how the substantive requirements will be met.
Requires the RWQCB to establish water quality protection standards in the waste discharge requirements consisting of the constituents of concern of Section 20395.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20395	Relevant & Appropriate OU-1 post-closure monitoring and OU-2	The Forest Service will comply with the substantive portions of this requirement as part of the OU-1 post-closure monitoring.

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
Requires the RWQCB to specify in the waste discharge requirements the constituents of concern to which the water standard under Section 20390 applies.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20390	Relevant & Appropriate OU-1 post-closure monitoring and OU-2	The Forest Service will comply with the substantive portions of this requirement as part of the OU-1 post-closure monitoring.
Allows for exemptions from the landfill gas monitoring requirements based on a showing that there is no potential for adverse impacts on public health and safety and the environment.		Cal. Code Regs. tit. 27, § 20918	Applicable	This requirement is applicable to the landfill because it was not closed in accordance with all currently applicable requirements.
Requires landfill gas control and prevention of leachate contact with the public or animals consistent with Article 6, Subchapter 4 (§ 20918 et seq.)		Cal. Code Regs. tit. 27, § 211060	Applicable	This requirement is applicable.
Air Quality Management District/Air Pollution Control District[b]				
Shall not cause or allow the emissions of fugitive dust such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source and shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples.		EDCAQMD Rule 223.1	Applicable	Fugitive dust can be generated from any grading and earth-moving activities including placement of various cover layers and consolidation of wastes. Substantive requirements pertaining to fugitive dust emission control will be applicable.

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
California Integrated Waste Management Act of 1989 [b]				
Emergency Response: potential emergency conditions that may exceed the design of the site and could endanger the public health or environment must be anticipated. Response procedures for these conditions must be addressed in the RD/RA plans.		27 CCR 21130 Ch. 3, Subch. 5, Art. 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.
Site Security: all points of access to the site must be restricted, except permitted entry points. All monitoring, control, and recovery systems shall be protected from unauthorized access.		27 CCR 21135 Ch. 3, Subch. 5, Art. 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.
Structure Removal: site structures and leachate and gas control systems not intended for reuse will be dismantled and removed at the time of closure to protect public health and safety.		27 CCR 21137 Ch. 3, Subch. 5, Art. 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.
Final Cover: the final cover shall 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. The final cover shall also be compatible with post-closure land use.		27 CCR 21140 Ch. 3, Subch. 5, Art. 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
Final Grading: final grades must be designed and maintained to reduce impacts to health and safety and take into consideration any post-closure land use.		27 CCR 21142 Ch. 3, Sub. 5, Article 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.
Slope Stability: the operator shall ensure the integrity of final slopes under both static and dynamic conditions to protect public health & safety and prevent damage to post-closure land-uses, roads, structures, utilities, gas monitoring and control systems, leachate collection and control systems to prevent public contact with leachate, and prevent exposure of waste.		27 CCR 21145 Ch. 3, Subch. 5, Art. 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Postc-Cosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.
Drainage and Erosion Control: the drainage and erosion control system shall be designed and maintained to ensure integrity of post-closure land uses, roads, and structures; to prevent public contact with waste and leachate; to ensure integrity of gas monitoring and control systems; to prevent safety hazards; and to prevent exposure of waste.		27 CCR 21150 Ch. 3, Subch. 5, Art. 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Sub. 5, Art. 2. Scope & Applicability pursuant to 27 CCR 21100.

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
Landfill Gas Control and Leachate Contact: landfill gas control shall be implemented and maintained; leachate must be collected and controlled in a manner which prevents public contact and controls vectors, nuisance and odor.		27 CCR 21160 Ch. 3, Sub. 5, Article 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable to Groundwater OU-2 leachate	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100. The state does not intend that subsurface leachate monitoring and collecting systems need to be added to existing landfills unless leachate production and/or accumulation is evident. Leachate will be investigated further in the Groundwater OU-2 RI.
Gas Monitoring and Control During Closure and Post-Closure: to protect public health and safety and the environment, landfill gases generated at a disposal site will be controlled to ensure that: 1) concentrations of methane gas do not exceed 1.25% by volume in air within on-site structures, 2) concentrations of methane do not exceed 5% by volume in air at the property or designated landfill boundary and 3) trace gases do not pose an acute or chronic exposure to toxic or carcinogenic compounds.		27 CCR 20921-20937 Ch. 3, Sub. 4, Article 6, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100.
Post-Closure Maintenance: the landfill must be maintained and monitored for no less than 30 years following closure.		27 CCR 21180 Ch. 3, Sub. 5, Article 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100.

Table 4
Action-Specific[a] ARARs

Requirement	Prerequisite	Citation	ARAR Determination	Comments
Post-Closure Land Use: Site Closure Design shall show one or more proposed uses of the closed site or show development that is compatible with open space. Changes in post-closure land use must be approved by the appropriate State agency prior to implementation.		27 CCR 21190 Ch. 3, Sub. 5, Article 2, Closure & Post-Closure Maint. Standards for Disposal Sites and Landfills	Applicable	Closure or Post-Closure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100. Substantial provisions only.
Provides the content requirements for closure plans for solid waste disposal sites.		27 CCR 21800 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant & Appropriate	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990.
Provides the content requirements for post-closure maintenance plans for solid waste disposal sites.		27 CCR 21830 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant & Appropriate	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990.
Provides the content requirements to obtain certification that the solid waste disposal sites have closed pursuant to state standards.		27 CCR 21880 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant & Appropriate	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990.

Notes:

[a] Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables

[b] Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of specific citations are considered potential ARARs.

Table 4
Action-Specific[a] ARARs

Acronyms/Abbreviations:

ARAR – applicable or relevant and appropriate requirement
Cal. Code Regs. – *California Code of Regulations*
Cal/EPA – California Environmental Protection Agency
Cal. Water Code – *California Water Code*
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
div. – division
gpd – gallons per day
MCL – maximum contaminant level
NPDES – National Pollutant Discharge Elimination System
OU – operable unit
ppm – parts per million
RD/RA – Remedial Design/Remedial Action
Res. – Resolution
RWQCB – (California) Regional Water Quality Control Board
Lahontan section
SIP – State Implementation Plan
SWRCB – (California) State Water Resources Control Board
TDS – total dissolved solids
tit. – title
WQO – water quality objective

Table 5
Comparison of Remedial Alternatives for OU-1

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Subtitle D Cap	Alternative 3 Multilayer Cap	Alternative 4 Enhanced Multilayer Cap
Overall Protection of Human Health and the Environment	No	No	Yes	Yes
Compliance with ARARs	No	No	Yes	Yes
Long-Term Effectiveness	5	4	1	1
Reduction of Toxicity, Mobility, Volume by Treatment	5	5	5	5
Short-Term Effectiveness	4	3	1	1
Implementability	1	2	3	4
Cost	n/a	$3,672,000	$4,378,000	$4,934,000
Cost with Sewer Options	n/a	$3,747,000 - $4,930,000	$4,453,000 - $5,636,000	$5,009,000 - $6,192,000
Total Score	**15**	**14**	**10**	**11**
Overall Rating	**4**	**3**	**1**	**2**

Alternative Meets Threshold Criteria? Yes/No

Balancing Criteria Ranking Scale (Alternative with lowest Total Score receives best Overall Rating)

1 Meets Criteria Best

5 Meets Criteria Least

***** No Action Alternative does not meet threshold criteria and therefore obtains least favorable Overall Rating

Note:
ARAR = Applicable or Relevant and Appropriate Requirement
n/a = Not applicable
All dollars truncated to nearest 1000

Table 5
Comparison of Remedial Alternatives for OU-1

Sewer Option	Cost	Comment
1. No Action – install trench barriers	**$75,000**	Does not include sleeving or administrative control costs
2. Sewer Relocation	**$1,258,000**	Substantially lower installation costs may be realized if constructed in conjunction with the landfill cap.
3. Waste Relocation	**$923,000**	Some unknown costs to be based on what is found in the waste to be moved.
3a. Waste Relocation capping offset	**$441,000**	Cost offset of installing a smaller landfill cover based on an Alternative 3 type cover equals $**482,000**

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APPENDIX A

Responsiveness Summary
For
Meyers Landfill Operable Unit 1

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CERCLA RESPONSIVENESS SUMMARY
FOR
MEYERS LANDFILL OPERABLE UNIT 1

I) OVERVIEW

On May 21, 2007, the Forest Service issued a Proposed Plan for Operable Unit (OU) 1 at the Meyers Landfill Site (Site), to the public. The Proposed Plan described the Forest Service's proposed approach to addressing contamination at the Meyers Landfill Site. The Forest Service has investigated environmental conditions at the Site pursuant to its delegated lead agency authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The Selected Remedy for OU-1 at the Meyers Landfill Site is described in the Record of Decision and is the same as the preferred approach described in the 2007 Proposed Plan. The major components of the Selected Remedy for OU-1 of the Site are as follows:

- Capping and containment of the waste with a Multilayer Cap comprised of the following components from top to bottom:
  - Minimum 24-inch cover soil layer (minimum 6-inch of vegetation and 18-inch cover soil)
  - 0.5-cm geotextile filter fabric layer
  - Minimum 12-inch drainage layer (with minimum 3% slope)
  - 60-ml geosynthetic barrier layer (HDPE geomembrane)
  - Minimum 24-inch foundation layer (existing cover soil)
- Consolidation of waste from above and east of the South Tahoe Public Utilities District (STPUD) sewer line which runs along the eastern side of the landfill
- Expansion of the French drain on the western side of the Site to help reduce groundwater/waste interaction resulting from the movement of perched groundwater along the western boundary of the Site.
- Implementation of a passive landfill gas (LFG) venting system to control LFG migration
- Implementation of a LFG monitoring program outside of the perimeter of the landfill in accordance with state requirements to monitor off-site migration of LFG.
- Implementation of institutional controls to safeguard the integrity of the soil cap and associated monitoring systems.
- Implementations of a long-term maintenance and monitoring program.

A 45-day public comment period on the Proposed Plan for OU-1 was held from May 21, 2007 to July 5, 2007. In response to public requests, the public comment period was extended another 15 days to end on July 20, 2007. During the public comment period, two public meetings were held at the Lake Tahoe Basin Management Unit (LTBMU) Forest Supervisor's office in South Lake Tahoe, California.

The first public meeting was held on May 24, 2007 to present the Proposed Plan and to answer questions about the Site. The second public meeting was held on June 14, 2007 to again present the Proposed Plan and to accept oral and written public comments. Additional information on the community involvement for OU-1 is discussed in Section 2.3 of the ROD.

CERCLA requires that a responsiveness summary be prepared following the public comment period. The responsiveness summary must present significant community comments on the Forest Service's proposed cleanup alternative presented in the proposed plan, and the Forest

Service's responses to those comments. This responsiveness summary has been prepared to fulfill the requirements of CERCLA.

The Forest Service received written comments during the 60-day public comment period and oral comments on the Proposed Plan during the June 24, 2007 public meeting. The following is a summary of significant comments and questions received by the Forest Service during the 60-day public comment period. General comments and multiple comments on the same subject are presented first. Specific comments are presented following general comments.

II) VERBAL COMMENTS/QUESTIONS RECEIVED DURING JUNE 14, 2007, PUBLIC MEETING

A) General Verbal Comments and Questions

1) Future Land Use:

Many of the questions the Forest Service has received concern two primary issues: 1) the future use of the Site and how it was factored into the Forest Service's remedy evaluation and selection process, and 2) the overall confusion regarding the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedy selection as it relates to choosing a specific post-closure use under the Forest Plan and Forest Service regulations.

a) In answer of the first, how was the future use of the Site factored into the Forest Service's CERCLA remedy evaluation and selection process: CERCLA response actions have to address "reasonably anticipated future land use" as part of the remedy evaluation and selection process. The consistency of the chosen remedy with the future use of a site contributes to its long-term protectiveness. Protecting human health and the environment over the long term is the key objective of remedial action. Thus, understanding and accommodating reasonably anticipated future use in selecting and implementing remedies is an integral part of CERCLA process and the lead agency's cleanup responsibility. The U.S. Environmental Protection Agency (EPA) has issued a directive that outlines how future land use should be evaluated as part of the remedy selection process. This directive, entitled *"Land Use in the CERCLA Remedy Selection Process"*, EPA OSWER Directive No. 9355.7-04, is included in the Administrative Record.

   As discussed in the EPA directive, a key component of identifying the "reasonably anticipated future land use" of a site is to look at factors such as: current surrounding land uses, zoning, development plans, and federal/state land use designations. The Meyers Landfill Site is located on National Forest System lands and, as such, the federal land use designation in the Lake Tahoe Basin Management Unit Land and Resource Management Plan (Forest Plan) and Forest Service land management regulations governs the identification of "reasonably anticipated future use" of this Site.

   The 2007 Supplemental OU-1 Remedial Investigation/Feasibility Study (RI/FS) and Proposed Plan were prepared based on the anticipated future land use allowed under the federal land use designation identified in the Forest Plan. Under the Forest Plan, the Site and surrounding area is designated for Developed Recreation and as a Reduced Timber Area. Allowable land uses include hiking, picnicking, mountain biking, horseback riding and other non-motorized day uses. Please refer to Section 2.6 of the ROD for more information regarding Developed Recreation and Reduced Timber Areas. The Selected

Remedy is consistent with the Forest Plan and the two management prescriptions stated therein.

The LTBMU is currently conducting the 15-year review and revision process on the existing Forest Plan. However, there are presently no plans to change the federal land use designation in the Forest Plan for the Meyers landfill Site. Potential future land use changes that may occur if the Site is conveyed out of federal ownership as a result of CERCLA litigation or through legislative action are not “realistic assumptions” for the identification of "reasonably anticipated future use".

b) To answer the second, the scope of the CERCLA remedy selection as it relates to choosing a specific post-closure use under the Forest Plan and Forest Service regulations: As discussed above, CERCLA response actions have to be consistent with "reasonably anticipated future land use,” dictated in this instance by the Forest Plan and Forest Service regulations. The identification of the "reasonably anticipated future land use" of a site is different from the siting and permitting of a specific site re-use or development.

In its Superfund Redevelopment Initiative, EPA is clear that land use is a local decision and that the remedy has to be consistent with "reasonably anticipated future land use". Local zoning regulations and development plans can have a significant effect on the cleanup levels and the type of remedy implemented as part of a CERCLA response action (example, whether an area is zoned and developed for residential or industrial use). However, the authority to permit a specific type of site re-use and development is outside the scope of CERCLA. Under CERCLA, the Forest Service does have the authority through the implementation of land use controls that are part of a selected remedy to prevent specific site uses if the protectiveness of the remedy is compromised.

In terms of the Meyers Landfill Site, CERCLA does not provide the Forest Service with the authority to alter the Federal land use designation specified in the Forest Plan nor does it have the authority to authorize a specific future site use such as a power plant, ball field or wildlife center. Any specific future use of National Forest System lands is a separate administrative process outside of CERCLA that needs to go through the normal agency administrative process for authorizing those types of activities.

2) Is the preferred cover system alternative compatible with the Lake Tahoe Wildlife Center Feasibility Study?

Based on discussions with the Wildlife Center proponents, it is the understanding of the Forest Service that the current proposal for the Wildlife Center does not include structures or activities on the landfill cap area, aside from open space and potential picnic areas. As stated during the May 24th public meeting, both the Selected Remedy for the Landfill OU-1 (Alternative 3) and Alternative 4 are compatible with these proposed types of activities from an engineering standpoint.

3) Community Relations and Outreach Efforts:

In both the May 24th and June 14th public meetings, concerns were raised by members of the public regarding the Forest Service’s community relations and outreach efforts. Specifically, they said that they had not received any notifications or information regarding the meetings, even though they had signed up to be on the mailing list.

Notice of the public comment period and public meetings was provided to those listed on the Site community mailing list and was also publicized in the Lake Tahoe Daily Tribune and posted on the LTBMU website. Prior to the May 24th public meeting, the Forest Service mailed out 80 copies of the Proposed Plan to the individuals and entities on the Site mailing list. This mailing included individuals who attended the May 24th and June 14th public meetings When this issue was first raised at the May 24th public meeting, the Forest Service checked on the distribution of the Fact Sheet and Proposed Plan. Only one came back as undeliverable.

Notification for the June 14th meeting was printed in the Lake Tahoe Daily Tribune and posted on the LTBMU website. The time and location of the June 14th public meeting was also identified in both the April 2007 Fact Sheet and the May 2007 Proposed Plan, as well as discussed during the May 24th public meeting.

B) Specific Verbal Questions and Comments

1) Question: The RI/FS and Proposed Plan do not identify who is going to pay for the proposed remedy. Who is going to pay for the implementation of the proposed remedy?

1) Answer: The question of who will pay for the implementation of the CERCLA remedy at the Meyers Landfill Site will ultimately be decided in the outcome of the CERCLA cost recovery litigation in the case pending in the United States District Court for the Eastern District of California (U.S. v. El Dorado County, et al, Civil Action No. S-01-1520 MCE GGH). It is not the purpose of the RI/FS and Proposed Plan to discuss and/or identify who will pay for the implementation of the CERCLA remedy.

The overall purpose of the RI/FS is characterization of the nature and extent of risks posed by uncontrolled contaminated sites and the evaluation of potential remedial options, while the Proposed Plan is a document that presents the lead agency's preliminary recommendation concerning how best to address contamination at the Site, the alternatives that were evaluated, and explains the reasons the lead agency recommends the Preferred Alternative.

For further information regarding the purpose and scope of the RI/FS and Proposed Plan, see the following EPA guidance documents *"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA"*, EPA/540/G-89/004; *"Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites"*, EPA/540/P-91/001, and *"A Guide To Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents"*, EPA 540-R-98-031. These documents are available in the Administrative Record.

2) Question: Does the Forest Service currently have the funds budgeted to implement the Proposed Remedy?

2) Answer: The Forest Service currently has funds budgeted for the completion of the public comment period and preparation of the CERCLA Record of Decision. The Forest Service also has funds budgeted to continue the groundwater monitoring and to continue investigation of OU-2, the contaminated groundwater plume.

The Forest Service will not know if it has sufficient funding for the next phase of the CERCLA remedial action process for the Landfill OU-1, the Remedial Design and the preparation of the design and construction plans and specifications, until the Fiscal Year 2008 budget is passed. The actual implementation and construction of the Landfill OU-1 remedy is contingent on the

availability of funds and the speed and outcome of the CERCLA litigation between the Forest Service and the potentially responsible parties.

3) Question: The RI/FS and Proposed Plan discuss that landfill gas monitoring will be conducted as part of the remedy. At what level will it be decided that something has to be done with regards to the cap because gases have reached a level that is not compliant with the State Clean Air Act?

3) Answer: Monitoring, operation, and maintenance of the Meyers Landfill remedy are included for two years after the remedy is installed to ensure that the capping and venting systems work as designed. The estimated costs include the anticipated level of effort that will be required for quarterly air monitoring and initial landfill, cap, and vent system maintenance. Costs have also been included for system modification, if needed. The size and age of the landfill, and gas modeling do not indicate that there will be problems meeting current Clean Air Act requirements. However, monitoring will be performed to determine if the landfill emissions are in compliance with all federal, state, and local requirements. If current emission thresholds are exceeded, a corrective action plan will be developed and implemented.

Under CERCLA 121(c), periodic reviews are required to be conducted at least every five years when hazardous substances remain on a site at levels that do not allow for unrestricted use and unlimited exposure. The purpose of a five-year review is not to reconsider decisions made during the selection of the remedy, as specified in the Record of Decision, but to evaluate the implementation and performance of the selected remedy to determine whether it remains protective of human health and the environment. This includes whether the remedy is functioning in compliance with applicable federal and state regulations as identified in the Record of Decision. Protectiveness is determined by answering the following three questions:

a) Is the remedy functioning as intended by the decision documents?
b) Are the exposure assumptions, toxicity data, and Remedial Action Objectives used at the time of remedy selection still valid?
c) Has any other information come to light that could call into question the protectiveness of the remedy?

The data collected as part of the remedy operations and maintenance plays a key role in the five-year remedy review process. If the landfill gas monitoring program indicates that gas emissions are exceeding applicable standards, the effect and cause would be evaluated as part of the review process and potential mitigation measures developed.

For more information regarding the CERCLA 5- Year remedy review process, please see the following EPA guidance document, *"Comprehensive Five-Year Review Guidance"*, EPA 540-R-01-007 and the April 2003 EPA fact sheet *"Five-Year Review Process in the Superfund Program"*. Both of these documents are available in the Administrative Record.

4) Question: The RI/FS and Proposed Plan do not identify who is going to pay for and perform the landfill gas monitoring and who will pay for the monitoring. Who will pay for and perform the landfill gas monitoring?

4) Answer: The performance of the landfill gas monitoring is part of the implementation and monitoring and maintenance of the OU-1 cover system remedy. The RI/FS and the Proposed Plan do not provide this level of detail. For further information regarding the purpose and scope of the RI/FS and Proposed Plan, see the following EPA guidance documents

"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA", EPA/540/G-89/004; *"Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites"*, EPA/540/P-91/001, and *"A Guide To Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents"*, EPA 540-R-98-031. These documents are available in the Administrative Record. The actual implementation of the OU-1 remedy, including monitoring and maintenance, will be determined by the CERCLA litigation between the Forest Service and the potentially responsible parties.

Cost estimates for the remedies include operation and maintenance costs which include air monitoring. Operations and maintenance costs are slightly higher for years one and two versus years 2-30 to account for a more intense monitoring program during the first two years.

5) Question: How are the costs for the landfill gas monitoring incorporated into the remedy alternatives?

5) Answer: The costs for quarterly landfill gas monitoring are incorporated into the operations and maintenance (O&M) costs for each of the cover system alternatives. See Tables 12-1 through 12-4 of the May 2007 Supplemental RI/FS for summaries of O&M costs. Detailed O&M costs are shown below and include increased costs for the first two years of operation to monitor and modify the remedy, if required, to ensure that it is working as designed and is in compliance with current regulations. Monitoring programs will be developed in the design phase.

Maintenance Detail, Landfill Cap Alternatives 2, 3, and 4

Item Description	Unit	Qty	Unit Price	Total	Source	Comments
Groundwater Quarterly monitoring	EA	8	$28,000	$224,000	Engineer's Estimate	2 year time frame to cover basic monitoring until groundwater RI/FS is complete. Based on similar work performed in 2006.
Gas monitoring	EA	20	$20,000	$400,000	Engineer's Estimate	Quarterly for 5 years perimeter. Vent sampling.
Inspections years 1-2	EA	8	$2,500	$20,000	Engineer's Estimate	Includes contracted labor and reports
Five year CERCLA review	EA	1	$30,000	$30,000	Engineer's Estimate	First 5 year CERCLA review data analyses and report.
Institutional Control Review	LS	1	$21,500	$21,500	Engineer's Estimate	
Maintenance years 1 & 2	EA	2	$30,000	$60,000	Engineer's Estimate	Includes any adjustments to cap or venting required.
O&M years 3-30	EA	28	$20,000	$560,000	Engineer's Estimate	Includes inspections, 5 year review reports and periodic cap maintenance.
Subtotal				$1,315,500		
NPV				$542,000		3% discount rate based on Federal facility and 2006 OMB values
O&M in perpetuity	1	LS	$201,000	$201,000		Based on a yield of $15,000/year 2006 dollars starting in year 31.

6) Question: Has groundwater monitoring included sampling and testing for tertiary butyl alcohol (TBA)?

6) Answer: Groundwater and surface samples were analyzed by EPA Method 8260 during the fall 2005 and winter 2006 monitoring events. Tertiary butyl alcohol is a compound measured by EPA Method 8260. Tertiary butyl alcohol was detected in groundwater samples collected from monitoring well D-1 at a concentration of 10 µg/L (equivalent to parts-per-billion or ppb) and in a groundwater grab sample collected from boring SB-4 at a concentration of 13 µg/L

(Tables 5-2 and 5-3 in the May 2007 Supplemental RI/FS). Tertiary butyl alcohol was not detected in the surface water samples that were analyzed by EPA Method 8260. Currently, neither the EPA nor the California Department of Health Services list a maximum concentration level (MCL) for tertiary butyl alcohol (http://www.dhs.ca.gov/ps/ddwem/chemicals/MCL/EPAandDHS.pdf). Because tertiary butyl alcohol was detected in only one monitoring well and one soil boring, is contained within the vinyl chloride plume, and because vinyl chloride is the primary contaminant of concern with the lowest MCL, no additional analysis for TBA will be conducted on a regular basis.

7) Question: Has there been soil vapor monitoring that's been done?

7) Answer: Section 5.3 of the May 2007 Supplemental RI/FS describes the soil vapor studies that have been performed.

8) Question: Several questions have been asked regarding the proposed thickness of the cover soils and whether it will be sufficient for the rooting depths of native plant species in the area.

8) Answer: The purpose of the Feasibility Study is to develop remedial alternatives for the Site, and determine the most effective method of mitigating potential impacts to human health and the environment. The Feasibility Study is a "broad brush" approach that provides enough detail to estimate the cost of implementing the various remedial actions that are selected. Specific plant species used to re-vegetate the Site will be selected during the remedial design stage. For the Site, grass and plant species native to the South Lake Tahoe area that are compatible with the proposed cover system will be selected for the re-vegetation efforts. Forest Service LTBMU botanists have stated that the cover layers of both Alternatives 3 and 4 have sufficient thickness to support a variety of native grasses.

9) Question: A question was raised regarding the longevity of the plastic liner material in the proposed cover system.

9) Answer: The cover system in the preferred alternative incorporates a 60-mil thickness High Density Polyethylene (HDPE) geomembrane as the impermeable layer to prevent surface water infiltration into the buried wastes. Studies conducted by the Geosynthetic Institute in 2005 show that the expected half-life (time for properties to degrade to 50% performance) of the HDPE geomembrane is predicted to be from 270 to 449 years.

III. WRITTEN COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD

1) Lahontan Regional Water Quality Control Board

Lahontan Regional Water Quality Control Board Comment 1:

Lahontan Board staff suspect that there will be groundwater interaction with the lowermost landfill wastes during periods of high groundwater. If leachate and VOC gas generation continues after capping and landfill gas controls, then Operating Unit OU-1 and OU-2 need to have corrective action implemented. California Code of Regulations, Title 27, Section 20430 requires implementation of corrective action measures that ensure that groundwater cleanup levels are achieved and requires groundwater monitoring to determine the effectiveness of the corrective actions. The USDA Forest Service needs continue quarterly monitoring of the groundwater contamination in Groundwater OU-2.

Response to Lahontan Regional Water Quality Control Board Comment 1:

The Forest Service agrees with the comment that regular groundwater monitoring should continue. As stated in the Proposed Plan, 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 downgradient waste boundary. For this reason, the Forest Service is deferring the component and remedial action objective from the EPA's Presumptive Remedy for CERCLA Municipal Landfill Sites related to the collection and treatment of contaminated leachate and source area groundwater control. Depending on the effectiveness of the remedy for OU-1 and the results of the remedial investigation of OU-2, the Forest Service will determine whether additional remedial actions are necessary for OU-2.

Lahontan Regional Water Quality Control Board Comment 2:

The Lahontan Regional Board is not in any way waiving its rights to enforce groundwater cleanup under any and all applicable state laws pursuant to CERCLA section 120(a)(4), including State Water Resources Control Board Resolution No. 92-49, and in particular, the applicability of Resolution No. 92-49, III. G. at the Meyers Landfill Site. The necessary Resolution No. 92-49 III.G. determination is that it is unreasonable to cleanup groundwater to background levels and that such an alternative level of cleanup is appropriate, recognizing secondary maximum contaminant levels, provisions in the Water Quality Control Plan (Basin Plan) for the Lahontan Region concerning identification of water quality objectives and beneficial uses.

Response to Lahontan Regional Water Quality Control Board Comment 2:

Comment noted. The Forest Service will continue to coordinate the response action at the Site with the LRWQCB in accordance with CERCLA and the NCP.

Lahontan Regional Water Quality Control Board Comment 3:

Finally, Lahontan Board staff is concerned that the proposed landfill gas vent spacing of a single vent per acre may not be adequate to prevent continued VOC gas migration into groundwater. Ambient air monitoring of the landfill vents is deemed prudent. The State of California Ambient Air Quality Standard for vinyl chloride is 26 micrograms per cubic meter and vinyl chloride is considered by the California Air Resources Board a toxic air contaminant.

Response to Lahontan Regional Water Quality Control Board Comment 3:

Landfill gas testing was performed within the landfill mass, and soil vapor studies were performed around the perimeter of the landfill. Additional landfill gas studies were performed by Geosyntec Consultants, Inc. in 2003. The results of these studies were utilized in conjunction with records of historical Site operations to model landfill gas production rates. Based on the results of this model, a horizontal density of one landfill gas well per acre has been determined to exceed the number of wells that will actually be required to control the landfill gas, and to eliminate or limit landfill gas migration. However, the actual number of passive landfill gas collection wells that will be installed, and their locations, will be determined as part of the Remedial Design for the OU-1 remedy.

As discussed in Section 10.3.1.5 of the Supplemental RI/FS, landfill gas emissions and migration will be monitored at regular intervals after the installation of the landfill gas mitigation system. A landfill gas monitoring program will be planned during the design phase of the selected remedy. The landfill gas monitoring plan will specify the frequency of monitoring events and will include applicable regulatory thresholds for both methane and non-methane organic compounds that may be emitted from the Meyers Landfill. Vinyl chloride will be included in the list of non-methane organic compounds that will be monitored. The need for additional landfill gas wells, a mechanical extraction system, and/or gas treatment systems will be evaluated after the wells have been installed, during the initial period of performance and will be specified in the monitoring plan.

2) <u>Comments of Geomatrix, Technical Consultant for El Dorado County:</u>

Geomatrix Comment 1:

The final selection of the remedy for OU1 should consider the future use of the landfill and the potential use as a wildlife rescue facility should be evaluated in the RI/FS.

Response to Geomatrix Comment 1:

Please refer to the response to the General Comment 2, regarding future land use and how it was addressed as part of the CERCLA remedy selection process.

Geomatrix Comment 2:

Table 1-1 in Section 1.2.3 is a summary of the studies conducted at the Site from 1975 to present. Additional work has been conducted at the Site by Geomatrix on behalf of El Dorado County includes the installation of four wells and the pilot study. This information should be included in the table and report text.

Response to Geomatrix Comment 2:

Comment noted.

Geomatrix Comment 3:

Section 4.2, first paragraph: Other historical operations included an asphalt batch plant at the site (shown on Figure 1-2). The asphalt batch plant should be included in the discussion on the operational history for the site.

Response to Geomatrix Comment 3:

Comment noted.

Geomatrix Comment 4:

The RI/FS refers to “STPUD wells” in several sections, including the last paragraph of Section 4.4.6 where it states “Geomatrix compared water level measurements collected from environmental monitoring wells and STPUD wells and determined that strong downward (negative) vertical hydraulic gradients are present in the Basin.” The wells used by Geomatrix for this evaluation were installed by PTEM on behalf of the JPA (as reported in Table 1-1 of the RI/FS). The RI/FS only identifies one well owned by STPUD (in Section 4.4.4) which is the Elks

Club Well No. 2 that is located offsite. The report text should be revised to remove the additional references to “STPUD wells” or clarify which additional wells are owned by STPUD.

Response to Geomatrix Comment 4:

There is only one known well owned by STPUD in the vicinity of the Site.

Geomatrix Comment 5:

The institutional controls described in Section 11 for Alternatives 2, 3, and 4 require approval by the Forest Service for future activities that result in cap or soil disturbance. Because the Forest Service may not always be the lead regulatory agency for the landfill, we suggest modifying the text to state “cap or soil disturbance can not be conducted without approval from the appropriate oversight agency.”

Response to Geomatrix Comment 5:

The Forest Service disagrees with the comment as any future land ownership change is speculative at this time. As specified in EPA guidance, CERCLA response actions have to address "reasonably anticipated future land use" as part of the remedy evaluation and selection process. Potential future land use changes that may occur if the Site was conveyed out of federal ownership as a result of CERCLA litigation or through legislative action are not considered to be “realistic assumptions” for identifying "reasonably anticipated future use". If in the future the Site is conveyed out of federal ownership, the new landowner has the ability to petition the lead regulatory agency to amend the institutional control and land use restrictions that have been put in place through the CERCLA Record of Decision. Any future transfer of Forest Service lands at the Site out of federal ownership would be governed by CERCLA Section 120(n). The deed transferring the property would provide for appropriate land use controls to prevent damage to the landfill cap and such restrictions on future land use would continue to apply.

Geomatrix Comment 6:

The RI/FS states that the long term costs of maintenance and repair of the sewer line if left in place were not evaluated and selects relocating the waste is the best ranking remedy for the sewer line. The RI/FS apparently rules out leaving the sewer line in place under the proposed landfill cap based on the unquantified operations and maintenance requirements of the sewer. Because there will be an ongoing operation and maintenance requirement for the landfill cap and gas collection/venting system, the incremental additional costs for the sewer may not be as significant as assumed. O&M and repairs such as installing a liner in the sewer line could be incorporated into the O&M requirements for the other aspects of the OU1 remedy. On this basis, we believe it is premature to rule out leaving the sewer in place and suggest this alternative be carried forward for additional analysis and consideration.

Response to Geomatrix Comment 6:

The Forest Service disagrees with the comment. CERCLA remedy decisions have to be evaluated based on the following nine established criteria:

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

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

As discussed in Section VIII of the Proposed Plan, leaving an operational sewer line under the landfill cover system would not be fully protective of human health and the environment and would not provide for long-term effectiveness and permanence of the proposed OU-1 remedy as called for in CERCLA guidance and protocol.

Geomatrix Comment 7:

Figure 7-1 shows soil as an exposure pathway but does not list any receptors.

Response to Geomatrix Comment 7:

Section 7 in the Supplemental RI/FS discusses exposure pathways and potential receptors, including those for soil. Likely Receptors that may be impacted by the soil pathway include Site visitors, as migration of surface sediments to areas much beyond the footprint of the landfill is unlikely. Routes of exposure to contaminants by Site visitors would likely be via ingestion, inhalation, and dermal contact. Terrestrial animals may be exposed to contaminants through the soil pathway via inhalation, ingestion, and dermal contact. Aquatic life is not likely to be exposed to contaminants through the soil pathway.

3) <u>Comments of Geosyntec, Technical Consultant for the City of South Lake Tahoe</u>

Geosyntec Comment 1:

In the Final RI/FS, Weston proposes to implement remedial Alternative #3 at Meyers Landfill, which consists of a multilayer cover, institutional controls, gas monitoring, passive landfill gas venting, and French drain expansion. In previous comments on the RI/FS, Geosyntec requested a discussion of the engineering basis for the cover soil thickness proposed in Alternative #3 (above the 12 inches required in the California Code of Regulations (CCR) Title 27) and the necessity of a sand drainage layer on the top deck of the landfill. This discussion has not been included in the Final RI/FS. Without such a discussion, the basis for the cover soil thickness has not been adequately considered and the decision to adopt Alternative #3 lacks proper support.

Response to Geosyntec Comment 1:

The Forest Service disagrees with the comment. Discussion presented in Section 10.3.1.2 of the Supplemental RI/FS defines the criteria for containment options, and includes the discussion regarding the minimum and performance-based multilayer cap design standards found in CCR Title 27, Division 2, § 21140 for closure of a non-hazardous solid waste landfill. As discussed in Section VIII of the Proposed Plan, a minimal Title 27 cap configuration 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. This requires that final cover systems be designed to account

for Site-specific factors, such as climate and land use.

The Site is in a sub-alpine climate with freeze/thaw cycles during the winter and is subject to several feet of snow each year. Spring snow melt generates large amounts of melt water that can infiltrate the landfill cover. A drainage layer is needed to minimize the hydraulic head on the impermeable liner. The multilayer cap proposed in Alternative 3 is specifically designed to remove infiltrating moisture and meets the performance standards and minimum design requirements for a final landfill cover system of CCR Title 27, Chapter 3, Subchapter 5, Article 2, § 21090. Additionally, the minimum cap design standards in CCR Title 27, Division 2, § 21140 do not allow for the types of Site access and use that presently occur and those that will be allowed to occur under the Forest Plan.

Geosyntec Comment 2:

Geosyntec also suggested performing engineering analyses, including slope stability, infiltration and drainage analyses, prior to finalizing the landfill cover design. These analyses have not been included in the RI/FS. However, Weston states that "complete details of the cover will be developed during the design phase and may entail some modifications of the proposed design." Geosyntec agrees that the Final RI/FS provision that additional analyses be performed during the design phase of the project to verify the various components of the final cover. The results of these analyses may reduce the construction costs of the final cover.

Response to Geosyntec Comment 2:

The commenter appears to misconstrue the intent and purpose of the RI/FS. The engineering analysis and level of detail noted in the comment are not typically part of the RI/FS process, but are part of the CERCLA Remedial Design. For further information regarding the intended nature and scope of a CERCLA RI/FS, please see *"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA"*, EPA/540/G-89/004; and *"Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites"*, EPA/540/P-91/001.

Geosyntec Comment 3:

The cost of the installation of the cover soil layer should be reduced by one-third, to reflect the reduction of soil thickness from 18 inches to 12 inches over the footprint of the landfill. The volume of the drainage soil layer should be reduced from 17,700 cubic yards (12 inches over 11 acres of landfill) to 3,220 cubic yards (12 inches over 2 acres of landfill slopes). For geomembrane, Geosyntec obtained a vendor estimate of $0.50 per square foot, not the $1.34 per square foot price quoted by Weston. These revisions would result in costs of $150,040 for cover soil, $48,300 for the drainage layer, and $293,500 for the geomembrane. Using these amounts to calculate the cost of the Landfill Cap Alternative 3 in the Final RI/FS Table 12-3 would result in a reduction of costs of nearly $1,200,000.

Response to Geosyntec Comment 3:

For clarity of response, the Geosyntec Comment 3 will be broken down into three topics: a) reduction of the cover soil layer, b) reduction of the volume of the drainage soil layer, and c) the price of the geomembrane.

a) As discussed in the Response to Geosyntec Comment 1, the minimum multilayer cap design standards in CCR Title 27, Division 2, § 21140 would not be adequate to account for local climate and land use, as required in the performance-based standards of that regulation.

b) We believe Geosyntec's estimated savings for the elimination of the drainage layer on the top deck of the landfill to be greatly overestimated. The thickness or volume of the drainage sand would have to be replaced by fill soil in order to maintain the thickness of the proposed landfill cap, and cannot be eliminated altogether. The importation of drainage sand or segregation of sand from material on Site, in lieu of fill soil will not significantly increase the cost of the overall cap.

c) Weston has based the cost of geomembrane installation on jobs performed in northern California within the past year. The pricing in the RI/FS is based on projects performed for government agencies using prevailing wage rates. Actual pricing will be determined in the design and bidding stages of the work. The cost estimate conducted for the Supplemental RI/FS has been done in conformance with EPA CERCLA cost estimating guidance and the accuracy of the pricing is consistent with the pricing guidelines for performing an FS.

Geosyntec Comment 4:

It is our opinion that one of the remedial alternatives to be considered in the RI/FS should incorporate the prescriptive cover soil thickness required by CCR Title 27 and eliminate the sand drainage layer on the top deck of the landfill.

Response to Geosyntec Comment 4:

The Forest Service disagrees with the comment. Alternative 2 is the closest to the minimum Title 27 prescriptive cap with the primary difference being the additional thickness of cover soil. Alternative 2 includes a clay liner with minimal soil cover that would degrade under the severe climate conditions and current and future land use at the Site. 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) that relate directly to requirements in Section 121 of CERCLA, 42 U.S.C. § 9621. As discussed in Section VIII of the Proposed Plan, Alternative 2 does not comply with the two Threshold Criteria (overall protection of human health and the environment and compliance with federal and state applicable or relevant and appropriate requirements [ARARs]); with the first balancing criterion of long-term effectiveness; nor with the first modifying criterion of state acceptance due to degradation under Site-specific conditions.

4) <u>Comments of Kennedy/Jenks, Consultant for the South Tahoe Public Utilities District</u>

Kennedy/Jenks Comment 1:

<u>Minimum Grade.</u> One fundamental closure construction element not considered by Remedial Alternatives 2, 3 and 4 is the regrading of the landfill site to provide a subgrade to the final cover system that meets the minimum 3 percent grade per Title 27 CCR 21090 (b)(1)(A). This minimum grade for the final cover is required to promote both surface and subsurface drainage, and be sufficient to maintain positive drainage after underlying waste settles and deforms the

final cover system. The current landfill surface is overall flatter than 3 percent and in some cases settlement has formed closed depressions that pond precipitation and snow melt. To achieve the minimum grade, soil or waste will need to be added to the landfill area prior to constructing the final cover.

Within the Proposed Plan, Sewer Option 3 is the preferred alternative which includes activities and costs for relocation of existing waste from over the sewer pipeline. The work associated with this Option includes many of the same activities and related costs required to grade the landfill to correct slopes discussed above by use of onsite borrow soils. Thus the additional cost of Sewer Option 3 should be limited to the handling required for waste in lieu of soil, which would be significantly less than the $923,763 presented in the Proposed Plan. Sewer Option 3 does recognize that the reduced landfill footprint will result in smaller final cover area and a corresponding reduction in final cover costs. If the costs for regrading the landfill are deducted from Sewer Option 3, and the credit for the reduced final cover section are considered, it is estimated that the net cost stated would be significantly reduced or eliminated.

The Final Supplemental RI/FS should include a grading plan to address the final grading design as required by Title 27 CCR 21090 (b)(1)(A). This grading plan should provide the quantities necessary to develop a rational basis for calculating the costs associated with raising the landfill to minimum grades and relocating the waste that is present over the pipeline. Until a grading plan is prepared that provides a clear basis for estimating volumes, the grading/fill costs are speculative and do not provide a defensible basis for cost comparisons.

Response to Kennedy/Jenks Comment 1:

The response to Kennedy/Jenks Comment 1 will be broken down into three topics for clarity. The topics will be: a) regrading of the foundation layer, b) cost associated with removal/relocation of soil associated with Sewer Option 3, and c) the inclusion of a grading plan in the Final Supplemental RI/FS.

a) Comment noted. The final grade will be compliant with applicable regulations.

b) Comment noted. Discussions of costs are included in Sections VIII and IX in the Proposed Plan.

c) Comment noted. Grading plans are not a requirement for RI/FS documents and are typically included in remedial design documents. Please refer to *"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA"*, EPA/540/G-89/004; and *"Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites"*, EPA/540/P-91/001 for additional information regarding the appropriate location of grading plans.

Kennedy/Jenks Comment 2:

<u>Landfill and Sewer Pipeline Access Road</u>. Although not described in the Final Supplemental RI/FS, the description of the Alternative 3, Sewer Option 3 (Preferred Alternative) in the Proposed Plan includes a "new sewer access road" that 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." It is not clear why the proposed sewer pipeline access road is necessary. After implementing the preferred remedial alternative, the Forest Service will require continued, routine access to the landfill in order to monitor existing wells and to inspect

and maintain the landfill cover and drainage systems on the east side of the landfill. The District will also require continued access to the east side of the landfill in order to inspect and maintain the sewer manholes and sewer pipeline. The current landfill access road across the landfill cover can be replaced with a properly engineered, gravel-paved road capable of accommodating the movement of landfill- and sewer-maintenance vehicles and fire suppression equipment, both of similar weight and size, without compromising the effectiveness of the landfill cover. Further, a new access road to the east side of the landfill could prove both difficult to permit and acquire access rights and expensive to construct. The cost of constructing a road across the landfill would be far less than the development of the proposed new access road. Access roads have been constructed across many landfills and are generally accepted as not adversely affecting landfill caps.

Routine sewer inspections will typically require annual access for visual inspection of manholes and access every 3 to 5 years for cleaning and video logging equipment. The heaviest loads would be from a limited number of vacuum truck access trips (similar in size and weight to a fire truck) used to remove grit from manholes 48, 49, and 50 during cleaning. These access requirements are no different than those anticipated in the special use permit that was issued to the District by the USFS prior to construction of the sewer.

Response to Kennedy/Jenks Comment 2:

A roadway extending from Fountain Place to the south end of the landfill currently exists, but access has been blocked to preclude public use. The road will take minimal effort to reopen and make useable. A roadway across the landfill has not been ruled out. Actual pricing will be determined during the design phase.

Kennedy/Jenks Comment 3:

Impacts of Sewer Line Maintenance on Landfill Cover. Descriptions included in Proposed Plan overstate the potential for impacts to the final cover from potential sewer pipeline maintenance and repairs. Routine maintenance does not require excavation to expose the pipeline and alternative, trenchless technologies, such as slip lining, can be used to perform major repairs through existing manholes. These types of pipeline rehabilitation methods will extend the life of the sewer pipeline without the need to pierce the landfill cover. In the event that the sewer pipeline had to be abandoned, it would be abandoned in place through the existing manholes and a new pipeline would be installed outside the limits of the landfill. Conditions in the Trout Creek Trunk sewer pipeline suggest that major repair or replacement activities will not be required for decades and that the need for repairs could be determined in advance based on the results of routine inspections.

Response to Kennedy/Jenks Comment 3:

As discussed in Section VIII of the Proposed Plan, leaving the operational sewer line in place and constructing the cover system would not be fully protective of human health and the environment and would not provide for long-term effectiveness and permanence of the proposed OU-1 remedy. 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 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 could be substantial as they would continue to accrue for the life of the sewer line.

Long-term and short-term effectiveness of the remedy, including the potential for damage resulting from earthquakes or other occurrences, are required to be addressed as part of RI/FS and cannot be dismissed. The South Lake Tahoe area is in an earthquake-prone area. Recent data suggests several M 7 Holocene earthquakes have occurred in the Lake Tahoe Basin. Based on the Modified Mercalli Intensity Scale, an earthquake with Mercalli intensity of IX to X, approximately equivalent to a magnitude of 7 on the Richter Scale, causes significant damage, and some underground pipes could be broken.

The subject sewer pipe is constructed of transite, a brittle concrete-asbestos mixture. Video inspections performed in September of 2005 documented several areas of the pipe that had fractures, damage, and points of weakness that were located within the boundaries of the landfill.

The Supplemental RI/FS takes into account the possibility of damage to the pipe caused by earthquakes. Based on the fact that the sewer pipe is located within a seismically active area with the potential of magnitude 7 earthquakes, and the composition of the pipe, the potential for the pipe to break exists. Depending on the size and location of the break to the pipe, a significant amount of time may pass before the break is discovered or repaired. This could result in potential future costs including the repair of the cover system to original specifications if it is breached for sewer line repair and addressing any future contamination of groundwater caused by a leak from the sewer.

Kennedy/Jenks Comment 4:

Consequences of Sewer Pipeline Leakage. The Final Supplemental RI/FS and the Proposed Plan overstate both the potential for the sewer pipeline to leak and the consequences of leakage on groundwater. The sewer pipeline adjacent to the landfill is constructed through competent, stable, undisturbed glacial deposits. The recent video inspection confirms that the sewer pipeline, after approximately 38 years of under-utilized service, is in very good condition. Given the size and volume of the local groundwater flow system relative to minimal flow in the sewer pipeline, it appears unlikely that leakage could raise groundwater levels over a sufficiently large area to cause changes in groundwater flow direction or contribute to a general increase in water levels that would bring the bottom of the waste in contact with groundwater. It appears equally unlikely that a sufficient volume of wastewater could be introduced to the local flow system to adversely alter the geochemistry of the vinyl chloride plume originating from the landfill. Finally, the position of sewer pipeline east of and below most of the landfill mass suggests that any leakage would not enter the landfill mass itself. Finally, the potential contribution of chemicals introduced into the sewer pipeline by household activities in the residential service area is reasonably expected to be very small, and is certainly no greater than any other similar sewer pipeline in the District's service area.

Response to Kennedy/Jenks Comment 4:

Please see the response to Kennedy/Jenks comment 3. The long-term and short-term issues associated with earthquakes and other potential causes of failure to the sewer pipe are required to be addressed as part of evaluating long term effectiveness of the remedy and cannot be

dismissed.

Kennedy/Jenks Comment 5:

More Intensive Recreational Use. The description for Alternative 4 in the Proposed Plan includes sporting fields as an example of more intensive recreational use of the closed landfill (See page 9). Sporting fields implies some form of irrigation, which has not been previously mentioned in the text of the Draft or the Final Supplemental RI/FS and has not been included in the evaluation of alternative final cover performance within Appendix D. Conversion of closed landfills to irrigated playing fields has been approved before, but regulatory acceptance is typically only granted after extensive attention to the design of irrigation controls, landscaping, surface and subsurface drainage of the final cover, and methane protection for associated structures. If such a use is to be considered, the Final Supplemental RI/FS will need to be revised to consider any of these improvements for Alternative 4 as described in the Proposed Plan.

While these types of improvements and future uses provide certain benefits, they would significantly raise the cost of Alternative 4 beyond that indicated in the Final Supplemental RI/FS. Any such costs are not required to effectively close the landfill and should not be considered as part of the response costs. These costs should be borne by those interested in using the landfill area for such uses.

Response to Kennedy/Jenks Comment 5:

The example of sporting fields does not imply that the Forest Service intends to have any feature that requires irrigation. Any proposed changes to post closure use would require further analysis and consultation with the California Integrated Waste Management Board and Regional Water Quality Control Board. Changes to post closure use outside of what is allowed under the Forest Plan are not under consideration at this time.

5) Comments of Tahoe Regional Planning Agency (TRPA)

TRPA Comment 1:

Impacts of Preferred Alternative on Recreation and Land Uses: In regard to the proposed project's impact on recreation and land uses, the preferred alternative, Alternative 3 – Multilayer Cap, will allow only for public access and dispersed recreational use. As defined under TRPA Code of Ordinances, dispersed outdoor recreation uses require few or no developed facilities and include activities such as hiking, jogging, and back country camping. Alternative 3 would limit any of the higher intensity land uses that are permitted by TRPA Code beyond dispersed recreational uses. Opportunities for more intensive recreational re-use of the site should be considered during the alternative consideration, due to the existing disturbed state, proximity to residential areas and available access. Alternative 4 – Enhanced Multilayer Cap – is the most stable option for future land and recreation uses and would allow higher intensities of recreational and other land uses, and therefore would provide a broader range of options for future land uses. TRPA staff recommends that Alternative 4 be considered as the "referred alternative".

Response to TRPA Comment 1:

Comment noted. As discussed under General Comment 2, Future Land Use, CERCLA response

actions need to be consistent with reasonably anticipated future use, which is governed by the Forest Plan. Alternative 3 is consistent with the types of activities allowed under the Forest Plan. As there are presently no plans to change federal land use designation in the Forest Plan for the Meyers landfill Site, factoring in potential future land use changes that may occur if the Site was conveyed out of federal ownership is not considered to be a “realistic assumption” for identifying "reasonably anticipated future use".

TRPA Comment 2:

In each alternative a discussion should be included describing the anticipated future uses. Additionally, a more detailed description of “the stated land use restrictions” should be provided, particularly in relation to any restrictions or limitations on future recreation and land uses on the site.

Response to TRPA Comment 2:

Comment noted. The Forest Service believes that sufficient detail has been presented in both the Proposed Plan and Supplemental RI/FS on this subject.

TRPA Comment 3:

Any design and land use restrictions should consider how future use might be impacted.

Response to TRPA Comment 3:

As discussed under General Comment 2, Future Land Use, CERCLA response actions need to be consistent with reasonably anticipated future use, which is governed by the Forest Plan. The selected remedy for OU-1, as set forth in the Record of Decision, is consistent with the Forest Plan and will allow for dispersed recreational use similar to current uses. The CERCLA remedial design will be prepared to ensure that the goals and objectives of the Record of Decision, including the long-term future use, as defined under the Forest Plan, are addressed and met.

TRPA Comment 4:

All considerations to ensure the maximum safety for future users of the site should be incorporated into the remedial design.

Response to TRPA Comment 4:

Comment noted. The Forest Service agrees that all considerations to ensure the maximum safety for future users of the Site should be incorporated into the remedial design.

TRPA Comment 5:

TRPA Permitting Process: Please be aware that a TRPA permit may be required for the project. Any proposed plan and design should comply with TRPA Code of Ordinances standards and requirements for grading, permanent and temporary BMP controls, etc.

Response to TRPA Comment 5:

The Forest Service is conducting the response action at the Site pursuant to its delegated lead

agency authorities under CERCLA. Section 121(e)(1) of CERCLA and 42 U.S.C. Section 9621(e)(1) provides that no federal, state or local permits are required for any portion of an on-site response action. However, current Forest Service Best Management Practices (BMPs) and procedures for protection of surface water quality will be used during construction of the OU-1 remedy. Storm water run-off controls will be incorporated into the remedial design and a Storm Water Pollution Prevention Plan (SWPPP) will be prepared for the Site.