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Summary of Watersheds Potentially Impacted by the Los Alamos National Laboratory

Prepared by Environmental Programs–Environment and Remediation Support Services

EXECUTIVE SUMMARY

The goal of this document is to summarize and identify potential risks within each of eight watersheds containing the Los Alamos National Laboratory (the Laboratory) rather than on a site-by-site basis. Each watershed consists of one or more mesas, the drainages from those mesas (or portions of mesas), and the major canyon or canyons into which the drainages converge. The Laboratory assesses an entire watershed to evaluate how contamination moves in sediments, surface water, soils, and groundwater. Remediation decisions are made by quantification of human health and ecological risks, taking the watershed system into consideration through evaluation of the types and levels of contamination as well as public accessibility.

The activities described within this document are conducted in accordance with the March 1, 2005, Compliance Order on Consent (Consent Order) signed by the New Mexico Environment Department (NMED), DOE, and the University of California. The Laboratory's cleanup actions will be at a level appropriate for land use designations, will support mission needs, and be compliant with all applicable laws and regulations. All corrective action activities subject to the Consent Order will be approved by NMED as required by the Order.

This document captures the state of knowledge and conditions present as of at least December 2005 and is intended for informational purposes only. It is a summary of pre-existing information and is not a release of new information or new program management decisions.

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1.0 INTRODUCTION

The purpose of this document is to present the site-specific conditions that exist now and are likely to exist in 2015 (referred to as the "future state"), based on available planning sources, for the Laboratory. This document is intended to be a brief compendium of information on the environmental state of the Laboratory and in no way is intended to circumvent or otherwise impede statutorily required public review processes or other opportunities for public input.

1.1 Laboratory Management

1.1.1 Past Mission

Activities at the Laboratory have included conducting research and development in basic and applied chemistry, biology, and physics; fabricating and testing explosives; and working with radioactive materials. These activities produced solids, liquids, and gases that contain radioactive and/or nonradioactive hazardous materials. In addition, many historic practices for the disposal of wastes from these activities, although generally accepted at the time, do not fall within today's environmental standards.

1.1.2.1 Long-Term Planning

The Laboratory's Ten-Year Comprehensive Site Plan (TYCSP) is the strategic long-term planning instrument for the Laboratory physical complex. The activities proposed in the TYCSP are subject to the National Environmental Policy Act (NEPA). NEPA ensures that all federal actions that may significantly impact the environment are reviewed before the initiation of the action.

The NEPA review process is documented in the *DOE Record of Decision: Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory in the State of New Mexico* and in the *2000 DOE Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory in the State of New Mexico*. Both of these documents are accessible to the general public. An updated version of the *Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory in the State of New Mexico* is currently in preparation. This update will address Laboratory operations through 2011.

1.1.2.2 Long-Term Stewardship

DOE is committed to protecting human health and the environment and to meeting its long-term, post cleanup obligations in a safe and cost-effective manner. For the foreseeable future, the Laboratory will continue to support national security under DOE by continuing to conduct operations that require the use, production, and disposal of materials that are known to impact human health and the environment. However, in order to continue operations, the Laboratory must implement DOE Order 450.1 which requires all DOE facilities "to implement sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources…."

DOE controls access to and use of the Laboratory by implementing institutional and physical controls to minimize the potential for human exposure to contamination. In the event that DOE transfers property to another entity, appropriate use restrictions will be attached to the real-estate transaction to ensure that specific institutional controls remain in place.

1.2 Status of the Cleanup Program

From 1990 to March 1, 2005, the Laboratory implemented the cleanup of its hazardous legacy waste sites under the Hazardous and Solid Waste Amendments (HSWA) of RCRA. Currently, legacy waste

cleanup is implemented by the Laboratory's Environmental Programs under the Consent Order, except for radionuclides, which are regulated under the Atomic Energy Act.

In 2002, the Laboratory submitted the *Performance Management Plan for the Accelerated Cleanup of the Los Alamos National Laboratory* to DOE. The Performance Management Plan set forth an accelerated plan for completing the DOE cleanup of nonoperational legacy waste sites at the Laboratory by 2015—fifteen years earlier than the original end date of 2030.

The goals of the Performance Management Plan were used as the basis for setting the schedule for completion milestones included in the March 1, 2005, Compliance Order on Consent (hereafter, the Consent Order) signed by the New Mexico Environment Department (NMED), DOE, and the University of California. Both the Performance Management Plan and the Consent Order identify the need for reducing high risks to the public and the environment, for assessing the potential impacts from the Laboratory to drinking water supplies by means of the groundwater pathway, and for sustaining funding for Laboratory cleanup projects.

2.0 REGIONAL DESCRIPTION

2.1 Physical Description

The Laboratory and its neighboring residential areas of Los Alamos and White Rock are situated on New Mexico's Pajarito Plateau, an east-sloping tableland bounded on the west by the Jemez Mountains and on the east by the Rio Grande. The Pajarito Plateau consists of a series of finger-like mesas separated by deep east-west-oriented canyons. Mesa tops range in elevation from approximately 7800 ft on the flank of the Jemez Mountains to about 6200 ft at their eastern termination above the Rio Grande Valley. The eastern margin of the plateau stands 300 to 900 ft above the Rio Grande. Most Laboratory and neighboring community developments are confined to mesa tops. All surface water drainage and groundwater discharge from the plateau ultimately arrives at the Rio Grande through a complex system of watershed drainages.

Extending approximately 40 mi^2 across the Pajarito Plateau, the Laboratory is one of DOE's largest facilities. The region influenced by Laboratory operations is extensive and includes a large portion of the northern half of New Mexico. This region of Laboratory influence is designated as the Northern New Mexico Region, and its boundaries are defined as follows:

To the **north**, the region is bounded by Santa Clara Pueblo, which lies approximately 6 mi due north of the Laboratory, and the city of Española, which lies approximately 12 mi northeast of the Laboratory. Santa Clara and Española are the two northernmost population centers in the state influenced by Laboratory operations.

To the **south**, the region is bounded by the city of Albuquerque, approximately 60 mi southwest of the Laboratory. Albuquerque is New Mexico's largest population center.

To the **east**, the region is bounded by the Sangre de Cristo Mountain range, which lies approximately 25 mi east of the Laboratory. The range defines the eastern extent of the large basin that drains into the Rio Grande. The city of Santa Fe lies at the edge of this eastern boundary.

To the **west**, the region is bounded by the Jemez Mountains, which abut the western boundary of the Laboratory and serve as the origin for all drainages crossing the Laboratory facility. The Jemez Mountains define the western extent of the basin that drains into the Rio Grande.

Thirteen Native American Pueblos are located within 53 mi of the Laboratory. Each tribe has the rights of sovereign government, with technical and administrative assistance from the Bureau of Indian Affairs.

The Rio Grande is New Mexico's largest river. It is important to note that all Laboratory drainages flow to the Rio Grande. Approximately 10 mi south of the Laboratory, Cochiti Reservoir impounds the Rio Grande and acts as a trap for sediments, some of which are contaminated by activities in major Northern New Mexico population centers as well as at the Laboratory.

Because of its wide elevation range and complex terrain, the Northern New Mexico region supports multiple ecosystems and habitats. The regional ecology has been greatly impacted by two recent events: the Cerro Grande fire of May 2000 and an extended drought.

The Laboratory contains three major nonagricultural vegetation zones—juniper savanna, piñon-juniper woodland, and ponderosa pine forest—in addition to several types of localized or unique habitats, such as wetlands or cliffs.

Multiple species of insects, reptiles, mammals, and birds inhabit the Pajarito Plateau. Harvester ants are the most abundant insects. Common reptiles include fence lizards, plateau striped whiptails, gopher snakes, and garter snakes. Common mammals include rodents, mule deer, elk, black bear, mountain lion, bobcat, fox, and coyote. The plateau supports a variety of bird species, including a wide range of songbirds. A variety of nesting and migrating raptors have been identified in less-disturbed areas of the plateau's canyons. Burrowing animals are common to the mesa tops across the plateau.

Habitats for threatened species and endangered species exist within Laboratory boundaries.

Within Laboratory boundaries are multiple ancestral villages, shrines, petroglyphs, sacred areas, springs, trails, and traditional-use areas that are of cultural value to various regional tribal nations. It is Laboratory policy not to identify these sites to prevent looting and vandalism.

Additionally, the Laboratory has many Manhattan Project and early Cold-War-era sites that have historical significance. To date, the Laboratory has 139 historic sites recorded that are associated with the historic Pueblo, U.S. territorial, statehood, and homestead periods, many of which are eligible for the National Registry of Historic Places. In the future, additional buildings may be added to the Laboratory's list of historic properties; however, the number and location of such buildings is not currently known.

2.2 Land Use

Most of the land surrounding the Laboratory is used for nonurban activities and managed as natural resources. Wilderness and backcountry recreation (including hiking, fishing, hunting, river sports, and snow skiing) are popular among the residents of the region. The Rio Grande and its tributaries provide a source of commercial revenue (river recreation and fishing) and also provide irrigation water for regional agriculture. The forested portions in the higher elevations of the region are commercially logged, and geologic materials are commercially mined.

The majority of the land surrounding the Laboratory is largely undeveloped and federal, county, or tribal governments north, west, and south of the Laboratory administer large tracts of land. The townsite of Los Alamos is located north of the Laboratory, and the community of White Rock is located southeast of the Laboratory. San Ildefonso Pueblo bounds Laboratory property to the northeast.

The Laboratory is divided into 48 separate TAs that are used for building sites, experimental areas, waste disposal locations, etc. However, these uses apply to only a small part of the total Laboratory land area. Additional Laboratory development is limited by steep canyon slopes and by the need for security and safety buffers because of the work performed. The DOE administers the area occupied by the Laboratory and largely restricts public access. Currently, the public is allowed limited access to certain areas along State Highways 4, 501, and 502.

Land uses relevant to the Laboratory and surrounding area include commercial and industrial, residential, recreational, and open space (the Laboratory uses the term *reserve* rather than *open space* to describe its undeveloped property).

The majority of the Laboratory's usable land is industrial/commercial. Approximately 18,500 acres, or two-thirds of the Laboratory's total acreage, is undesirable for development because of physical considerations (such as steep topography) and operational constraints (such as explosives blast zones). Of the remaining 9300 acres, over half is currently developed, leaving about 3800 acres still undeveloped. The majority of this undeveloped land is in remote locations that are not considered prime developable lands for Laboratory activities.

Land use outside the Laboratory boundary is largely open space. Within the communities of White Rock, Los Alamos, and San Ildefonso Pueblo, land use is primarily residential or commercial. The Rio Grande is the primary source of water for local agriculture, including overland irrigation of crops and water for livestock (primarily sheep and cattle). The river is also used for recreation such as fishing, boating, and swimming.

Neighboring land owners include federal government agencies (the U.S. Forest Service and, the National Park Service, the Valles Caldera National Preserve, and the Bureau of Land Management); the state of New Mexico; Los Alamos, Rio Arriba, Sandoval, and Santa Fe Counties; and other governments (San Ildefonso Pueblo, Santa Clara Pueblo, Jemez Pueblo, Cochiti Pueblo).

2.3 Infrastructure

Laboratory structures represent approximately 8,000,000 ft^2 of building space. Current plans call for about two dozen new building and upgrade projects over the next 10 years. The Laboratory plans to consolidate its 18 existing nuclear operations facilities into 5 facilities by 2011.

Utility systems include electrical services, natural gas, steam, water, sanitary wastewater, and telecommunications.

The Laboratory is supplied with electrical power through a partnership arrangement between DOE and Los Alamos County. On-site electricity is generated by the Laboratory's steam and electric power plant, which is capable of producing up to 20 megawatts of electric power. There are approximately 140 mi of primary electrical distribution lines at the Laboratory. Recent population growth in northern New Mexico, together with expanded industrial and commercial usage, has greatly increased power demands on the northern New Mexico regional power system. Several proposals for bringing additional power into the region have been considered; however, it is uncertain when any new regional power lines will be constructed and become serviceable.

Approximately four miles of gas pipeline owned by Public Service Company of New Mexico traverse the Laboratory. Ninety percent of the gas used by the Laboratory is for heating (steam and hot air); the remaining 10% is used for the production of electricity.

Potable water for the Laboratory and Los Alamos County is obtained from deep wells located in three well fields. Water is pumped into production lines, and booster pump stations lift the water to reservoir storage tanks for distribution. The well fields have the ability to meet forecasted water demands for at least the next 10 years. Although Los Alamos County oversees supplying water to the Laboratory, the Laboratory maintains the distribution system, which consists of a series of reservoir storage tanks, pipelines, and fire pumps. The distribution system is gravity fed with pumps for high-demand fire situations at limited locations.

One municipal solid-waste landfill, the Los Alamos County Landfill, is located within Laboratory boundaries. The landfill serves the nonhazardous municipal solid-waste disposal needs of Los Alamos County municipalities and the Laboratory.

In addition to numerous formerly used material disposal areas (MDAs), the Laboratory has one operational disposal facility for receiving current Laboratory-generated solid low-level radioactive waste (Area G, located within TA-54).

3.0 CONCEPTUAL SITE MODEL & RISK PATHWAYS

Risk is defined as the measure of the potential for harm to humans and wildlife (i.e., receptors) from hazardous and radiological substances in the environment resulting from Laboratory operations. The risk to a receptor posed by a potential hazard is dependent on

- What type of contamination is present,
- How much contamination is present,
- Where the contamination is located, and
- How frequently and how long the receptor comes into contact with the contamination.

The type and amount of contamination in a specific environmental medium at a given location and time is determined by analyzing samples of that medium. Data from the Laboratory's environmental protection programs provide a basis for understanding the distribution of hazardous and radiological constituents in air, surface water, alluvial and intermediate groundwater, drinking water, soils, sediments, and biota. The distribution of contaminants provides a basis for understanding the *potential* for exposure and the effectiveness of institutional controls designed to prevent exposure that may result in harm.

To understand the potential for harm from contact with contaminated environmental media, conceptual site models (CSMs) are developed. A CSM represents the current state of knowledge about where contamination may be located, how and where contamination might move over time, and how and where humans and wildlife might be exposed to contamination.

For exposures to occur, a source, a transport pathway or mechanism, and a receptor are required. Direct exposures occur between a source and a receptor. Indirect exposures occur when at least one and often many environmental media and processes intervene between a source and receptor. An exposure pathway indicates how contaminants enter the body of a receptor. Exposure pathways include inhalation, ingestion, dermal contact/penetration, and external irradiation. Potential receptors of contaminants in environmental media include plants, terrestrial and aquatic wildlife, and humans. Human exposures are additionally dependent on land use and institutional controls (e.g. access limitations). Human land-use exposure scenarios for the Laboratory include occupational, recreational, and residential scenarios.

Facility-wide risk assessments of the impact of Laboratory operations to surrounding areas have been or are currently being conducted by organizations outside the Laboratory.

3.1 Conceptual Site Model for Los Alamos National Laboratory

An exposure model identifies exposure pathways that indicate how contaminants might enter the body of a potential receptor. Table 3.1-1 provides the descriptions of exposure media, contaminated media, transport pathways, and exposure pathways shown in CSM Figure 3.1-1.

As per the requirements of the Consent Order, the administrative and/or engineered exposure remedies and controls that mitigate the potential for exposures between contaminants and receptors at the Laboratory will be determined by NMED.

Site-wide institutional monitoring and mitigation will meet the requirements of DOE Order 450.1 (Environmental Protection Program) for systematic site-wide long term environmental monitoring to ensure the early identification of, and appropriate response to, potential adverse environmental impacts associated with DOE operations. Long-term monitoring is also a requirement of the Consent Order.

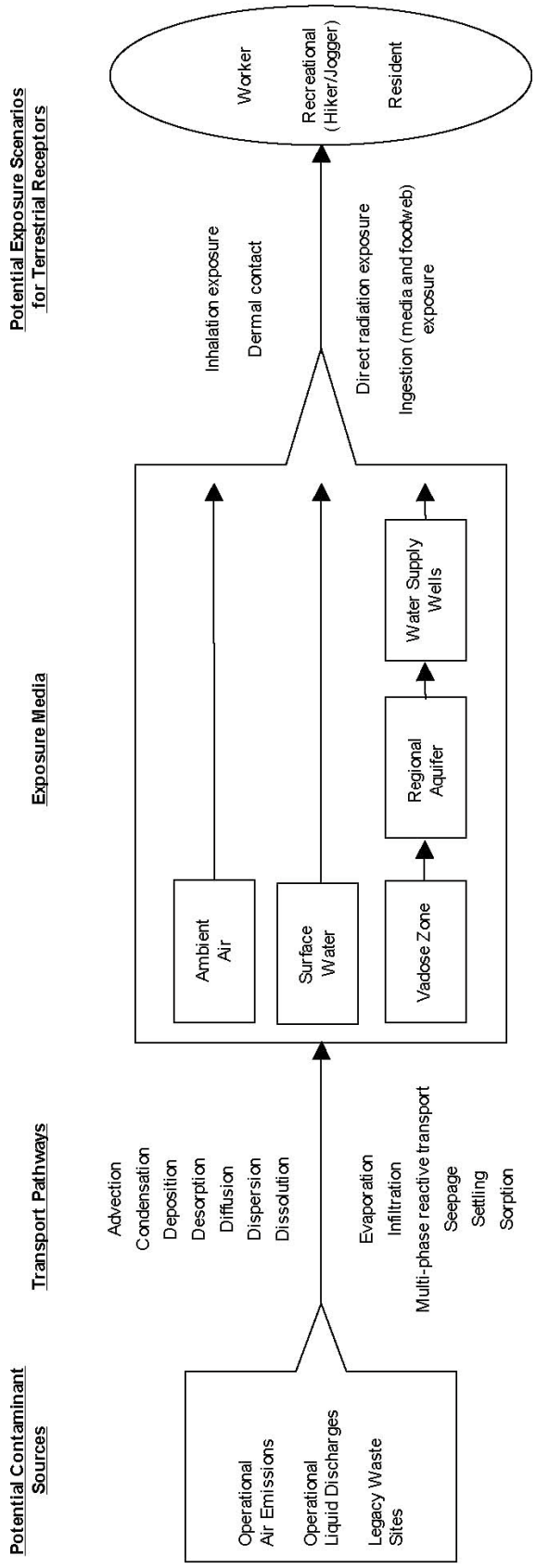

Figure 3.1-1. Conceptual site model for the Laboratory

Table 3.1-1
Descriptions of Media and Pathways Used in Figure 3.1-1

Contaminant & Exposure Media	Description
Ambient air	The earth's atmosphere
Surface water	Perennial, intermittent, and ephemeral stream reaches (both naturally occurring and effluent-driven), springs, ponds, snowmelt, and storm water flow
Surface soil and sediment	Naturally occurring soil and imported fill materials on mesa tops and soils and sediments on mesa slopes and canyon floors
Contaminated Media	**Description**
Vadose Zone	Unsaturated material between the ground surface and saturation zones
Alluvial water	Groundwater in canyon alluvium
Perched zones of saturation	Localized zones of saturated bedrock that are not continuous on a regional scale
Regional aquifer	Regionally continuous zone of saturated bedrock
Transport Pathway	**Description**
Advection	Dissolved contaminants moving with the bulk flow of water
Condensation	Concentration and settling of vapor-phase airborne contaminants onto solid surfaces
Deposition	Gravity-driven settling of suspended particulate contaminants from air or water onto solid media
Desorption	Release of solutes that were bound to solid media
Diffusion	Movement of dissolved contaminants in liquid water and volatile contaminants in air from areas of higher concentration to areas of lower concentration
Dispersion	Atmospheric distribution of airborne contaminants controlled by temperature and pressure gradients, wind speed and direction, precipitation, and surface- and groundwater distribution of solutes in saturated conditions
Dissolution	Chemical reaction with surface water or groundwater, causing a solid-phase contaminant to disperse into liquid water as a solute
Evaporation	Conversion of liquid water and volatile contaminants to vapor phases resulting from contact with ambient air. Pore-water evaporation appears to occur deep within mesas resulting from barometric coupling.
Infiltration	Flow of surface water and solutes into surface media through pores or small openings
Matrix flow	Steady-state movement of liquid water, solutes, and colloids (smaller than pore spaces) through pore spaces in unsaturated rock
Seepage	Flow of water from the subsurface onto the ground surface
Sorption	Dissolved contaminants on the surface that bind with soil and sediment particles, which can be transported by runoff and concentrated in depositional areas in the canyons and dissolved contaminants in the subsurface that bind to the natural components in solid porous media
Suspension	Precipitation runoff, surface water flow, and effluent discharge moving contaminants as either suspended or dissolved phases into a canyon stream or into groundwater
Unearthing	Re-exposure of subsurface materials by natural (nonanthropogenic) processes, such as biotic intrusion, surface erosion, and mass wasting
Volatilization	Solutes with relatively high vapor pressure released to the atmosphere

3.1.1 Potential Hazards in Air

Contaminants may be released directly into air either as gases/vapors or particles. The Laboratory monitors hazardous air pollutants as defined by EPA, radioactivity, asbestos, and beryllium. Various sampling and monitoring protocols are implemented at on-site and off-site locations to comply with the regulations of the Clean Air Act. The Laboratory monitors ambient air for types and amounts of gross radioactivity, specific radionuclides, and specific nonradioactive constituents. The Laboratory also measures emissions from air-vented stacks at its facilities as appropriate to the specific operation at the facility. In addition, the Laboratory monitors gamma/neutron radiation at multiple on-site and off-site locations. The Laboratory's nonradiological air monitoring network measures suspended particulates and volatile organic compounds in ambient air and inorganic compounds in particulate matter suspended in air.

3.1.2 Potential Hazards in Water and Sediment

Contaminants may be released as dissolved solutes, or as sorbed species on suspended sediment particles. Contaminants may be released directly into surface waters in operational liquid discharges (i.e., industrial effluents), or in storm water and snowmelt runoff discharges from regulated industrial and construction activities, including surface legacy waste sites.

The Laboratory controls and/or monitors pollutants as defined by the Clean Water Act in industrial point-source effluents discharged on-site at NPDES-permitted outfalls; and in storm water and snowmelt runoff discharged from regulated on-site and off-site industrial activities (including landfills and legacy waste sites) as required by the NPDES Multi-Sector General Permit and the Federal Facility Compliance Agreement.

The Laboratory monitors local and regional surface water and stream sediments. Samples are analyzed for radionuclides, high explosives, metals, organic compounds, and general chemistry. In accordance with the Consent Order, the Laboratory submitted an *Interim Site-Wide Groundwater Monitoring Plan* to NMED. As part of this process, the Laboratory is continuing to develop a monitoring well network (which must ultimately be approved by NMED) to be used for the continued monitoring of groundwater.

Groundwater in the regional aquifer provides municipal and industrial water to Los Alamos County through the county water distribution system. The regional aquifer, through private wells and some springs in the area, is also a source of water for San Ildefonso Pueblo. In Los Alamos County, the regional aquifer is situated approximately 600 to 1000 ft below canyon floors and about 800 to 1200 ft below mesa tops. The municipal water supply is periodically tested and treated by the county to ensure compliance with the Safe Drinking Water Act

The primary mechanism for redistributing contaminants into and within the watersheds of the Pajarito Plateau is soil and sediment transport by surface water, which occurs during storm flood events, snowmelt, and sustained releases from outfalls. The largest potential for soil and sediment redistribution is from floods caused by summer thunderstorms. Depending on the length and severity of a thunderstorm, materials transported by storm flow are either redeposited further downstream at various geomorphic locations (such as active or inactive channels, floodplains, and low terraces) or transported directly to the Rio Grande. Sediments in active channels have frequent movement and tend to move downstream quickly. Sediments residing in floodplains or low terraces are moved only by major flood events. In the Southwest, such events occur infrequently. Thus, contaminants in floodplains and low terraces have little movement and can remain for decades or longer.

3.1.3 Potential Hazards in Surface Soil

The Laboratory collects and analyzes soil samples from on-site and off-site locations. These samples are collected annually from on-site locations, perimeter locations, and regional locations and analyzed for radionuclides, metals, and organic compounds. On-site and perimeter sampling locations are generally located on mesa tops, downwind from major Laboratory facilities or operations. Regional samples are used as a reference for comparing on-site and perimeter sampling results.

3.1.4 Potential Hazards in Biota

The Laboratory collects samples from a wide variety of wild and domestic edible plant, fruit, and animal products to assess the impact of Laboratory operations on the human food chain.

4.0 WATERSHED DESCRIPTIONS

In 2000, the Laboratory in partnership with NMED and DOE, grouped the drainages of the Pajarito Plateau that comprise and immediately surround the Laboratory into eight[1] watersheds. Each watershed consists of one or more mesas, the drainages from those mesas (or portions of mesas), and the major canyon or canyons into which the drainages converge. All eight watersheds ultimately discharge to the Rio Grande. All Laboratory legacy waste sites located within each watershed are grouped into 28 watershed aggregates (indicated in Table 4.0-1 and on Map 4.0). Generally, each watershed contains two or more aggregates. In some cases, legacy waste sites physically located within one aggregate are assigned to a different aggregate for investigative and reporting purposes. Table 4.0-1 is provided as an index of Laboratory watersheds and watershed aggregates.

Each of the Laboratory watershed aggregates are represented in Maps 4.1.1-a through 4.8.1-b′. Table 4.0-1 gives the section number associated with each watershed aggregate and also provides an index for the aggregates indicated in Map 4.0. In addition, Table 4.0-1 provides the number for the Appendix B table that lists the legacy waste sites within the aggregate and for the Appendix C map that shows the location of the legacy waste sites within the aggregate.

For each aggregate, separate maps are provided to distinguish between legacy waste sites and potential hazards from operating sites.[2] In addition, each aggregate is depicted in both its current (2005) and future (2015) states. Thus, each aggregate has a map set consisting of the following four maps:

Map 4.x.x-a	current state: legacy waste sites;
Map 4.x.x-a′	current state: potential hazards from operational sites;
Map 4.x.x-b	future state: legacy waste sites; and
Map 4.x.x-b′	future state: potential hazards from operational sites;

where “x.x” designates the aggregate number (see Table 4.0-1).

In addition, each map of the four-map set includes natural and administrative features that may impact the potential for human and ecological exposures potential. Locations that are monitored as part of the Laboratory’s environmental protection programs are also shown on these maps.

Land uses are provided for each watershed aggregate. Land uses include commercial/industrial, residential, and recreational, which are the general land uses designated by the U.S. Environmental Protection Agency (EPA). The Laboratory uses ten land-use categories to describe Laboratory activities (e.g., high-explosive testing, experimental science, waste management). Nine of the land-use categories fall under the general EPA-designated land-use category of industrial. The tenth land-use category, reserve, is specific to the Laboratory, and is used to describe areas of the Laboratory that are not developed.

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[1] A ninth watershed, the Lake Fork Watershed, is situated outside the influence of the Laboratory, approximately 20 miles due west of the Laboratory’s western boundary. The Lake Fork Watershed contains a single aggregate (the TA-57 Fenton Hill Aggregate). None of the eight watersheds that are potentially impacted by Laboratory operations drain into the Lake Fork Watershed and, therefore, do not influence the Lake Fork Watershed. No Laboratory hazardous facilities (as defined in Footnote 2) are located within the TA-57 Fenton Hill Aggregate. The six in-progress legacy waste sites within the Fenton Hill Aggregate are associated with geothermal energy experiments conducted in the Jemez Mountains by the Laboratory. Therefore, the Lake Fork Watershed and the TA-57 Fenton Hill Aggregate are outside the scope of this document, which is to discuss aggregates and potential hazards at the Laboratory.

[2] The Laboratory’s February 2002 *A Special Edition of the SWEIS Yearbook*, *Description of Technical Areas and Facilities at Los Alamos National Laboratory*, controlled publication LA-CP-02-75 (official use only) identifies the operational facilities at the Laboratory that are hazardous facilities. A facility falls within a hazard category if it typically contains a hazardous material, an energy source, or an operation with the potential to cause illness, injury, or death to personnel or damage to a facility or to the environment (without regard for the likelihood or credibility of accident scenarios or consequence mitigation).

Table 4.0-1
Index of Laboratory Watersheds and Watershed Aggregates to Chapter 4 Section Headings and Maps, Appendix B Tables, and Appendix C Maps

	Aggregate Number	Ch. 4 Section Heading	Ch. 4 Map Number(s)	App. B Table Number	App. C Map Number
Los Alamos/Pueblo Watershed	**1**	**4.1**	**4.0**	**—**	**—**
Guaje/Barrancas/Rendija Canyons Aggregate	1.1	4.1.1	4.1.1-a, -a′, -b, -b′	B-1.1	1
Bayo Canyon Aggregate	1.2	4.1.2	4.1.2-a, -a′, -b, -b′	B-1.2	2
Pueblo Canyon Aggregate	1.3	4.1.3	4.1.3-a, -a′, -b, -b′	B-1.3	3
Upper Los Alamos Canyon Aggregate	1.4	4.1.4	4.1.4-a, -a′, -b, -b′	B-1.4	4
Middle Los Alamos Canyon Aggregate	1.5	4.1.5	4.1.5-a, -a′, -b, -b′	B-1.5	5
Delta Prime (DP) Site Aggregate	1.6	4.1.6	4.1.6-a, -a′, -b, -b′	B-1.6	6
Lower Los Alamos Canyon Aggregate	1.7	4.1.7	4.1.7-a, -a′, -b, -b′	n/a*	7
Sandia Watershed	**2**	**4.2**	**4.0**	**—**	**—**
Upper Sandia Canyon Aggregate	2.1	4.2.1	4.2.1-a, -a′, -b, -b′	B-2.1	8
Lower Sandia Canyon Aggregate	2.2	4.2.2	4.2.2-a, -a′, -b, -b′	B-2.2	9
Mortandad Watershed	**3**	**4.3**	**4.0**	**—**	**—**
Upper Mortandad Canyon Aggregate	3.1	4.3.1	4.3.1-a, -a′, -b, -b′	B-3.1	10
Middle Mortandad/Ten Site Canyons Aggregate	3.2	4.3.2	4.3.2-a, -a′, -b, -b′	B-3.2	11
Lower Mortandad/Cedro Canyons Aggregate	3.3	4.3.3	4.3.3-a, -a′, -b, -b′	B-3.3	12
Upper Cañada del Buey Aggregate	3.4	4.3.4	4.3.4-a, -a′, -b, -b′	B-3.4	13
Middle Cañada del Buey Aggregate	3.5	4.3.5	4.3.5-a, -a′, -b, -b′	B-3.5	14
Lower Mortandad/Cañada del Buey Aggregate	3.6	4.3.6	4.3.6-a, -a′, -b, -b′	n/a*	15
Pajarito Watershed	**4**	**4.4**	**4.0**	**—**	**—**
Twomile Canyon Aggregate	4.1	4.4.1	4.4.1-a, -a′, -b, -b′	B-4.1	16
Starmer/Upper Pajarito Canyons Aggregate	4.2	4.4.2	4.4.2-a, -a′, -b, -b′	B-4.2	17
Threemile Canyon Aggregate	4.3	4.4.3	4.4.3-a, -a′, -b, -b′	B-4.3	19
Lower Pajarito Canyon Aggregate	4.4	4.4.4	4.4.4-a, -a′, -b, -b′	B-4.4	18
Water Canyon/Cañon de Valle Watershed	**5**	**4.5**	**4.0**	**—**	**—**
Potrillo/Fence Canyons Aggregate	5.1	4.5.1	4.5.1-a, -a′, -b, -b′	B-5.1	21
Cañon de Valle Aggregate	5.2	4.5.2	4.5.2-a, -a′, -b, -b′	B-5.2	20
S-Site Aggregate	5.3	4.5.3	4.5.3-a, -a′, -b, -b′	B-5.3	22
Upper Water Canyon Aggregate	5.4	4.5.4	4.5.4-a, -a′, -b, -b′	B-5.4	23
Lower Water/Indio Canyons Aggregate	5.5	4.5.5	4.5.5-a, -a′, -b, -b′	B-5.5	24
Ancho Watershed	**6**	**4.6**	**4.0**	**—**	**—**
North Ancho Canyon Aggregate	6.1	4.6.1	4.6.1-a, -a′, -b, -b′	B-6.1	25
South Ancho Canyon Aggregate	6.2	4.6.2	4.6.2-a, -a′, -b, -b′	B-6.2	26
Chaquehui Watershed	**7**	**4.7**	**4.0**	**—**	**—**
Chaquehui Canyon Aggregate	7.1	4.7.1	4.7.1-a, -a′, -b, -b′	B-7.1	27
Frijoles Watershed	**8**	**4.8**	**4.0**	**—**	**—**
Frijoles Canyon Aggregate	8.1	4.8.1	4.8.1-a, -a′, -b, -b′	B-8.1	28

* Not applicable. No table is available because there are no legacy waste sites within this aggregate.

— Column heading does not apply.

Text descriptions of legacy waste sites contained within aggregates are limited to those sites that contribute the most potential for contaminant risk and those sites, such as MDAs, for which stakeholders have expressed interest.

4.1 The Los Alamos/Pueblo Watershed

The Los Alamos/Pueblo Watershed, identified in Map 4.0, is east trending and originates in the Sierra de los Valles within the Valles Caldera National Preserve. The drainage extends 15.6 mi from its headwaters [10,430 ft above sea level (asl)] to its confluence with the Rio Grande (5500 ft asl), and comprises a drainage area of 57.7 mi^2. The watershed's drainage system passes through approximately 0.5 mi of the Valles Caldera National Preserve and through large portions of the Santa Fe National Forest, the Laboratory, and the Los Alamos townsite before crossing San Ildefonso Pueblo land where it joins the Rio Grande.

This watershed covers a significant portion of the northern area of the Laboratory, extending from its western to eastern boundaries. The watershed consists of interrupted streams characterized by extremely variable flow. Two springs in the uppermost portion of the watershed support a short perennial reach that extends only a few hundred yards. On Laboratory property above and west of Bayo Canyon, surface water flow is ephemeral to intermittent. At the edge of the Laboratory's east boundary, discharges of treated effluent from the Los Alamos County municipal wastewater treatment facility result in perennial surface water flow below the confluence of Los Alamos and Bayo Canyons. Three springs below the confluence flow intermittently and provide additional surface water to the stream. Combined with seasonally variable saturated alluvial conditions, springs, effluent flow, and precipitation provide surface flow from the lower Los Alamos/Pueblo Watershed to the Rio Grande several days of the year.

Surface water in the Los Alamos/Pueblo Watershed is monitored under the Laboratory's surface-water monitoring program. The alluvial and regional aquifers are monitored by the Laboratory's groundwater monitoring program. Water supply, alluvial, intermediate, and regional aquifer wells are located in the watershed. In accordance with the Consent Order, the Laboratory submitted an *Interim Site-Wide Groundwater Monitoring Plan* to NMED. As part of this process, the Laboratory is continuing to develop a monitoring well network (which must ultimately be approved by NMED) to be used for the continued monitoring of groundwater.

A major characterization study of Los Alamos/Pueblo Watershed has been completed, and a report was recently submitted to and approved by NMED. The investigation of the canyon floors within this watershed addressed sediment, surface water (including springs), alluvial groundwater, and biota potentially impacted by Laboratory legacy waste sites within the watershed. The objectives included defining the nature and extent of chemicals of potential concern (COPCs) in sediment, surface water, and alluvial groundwater and assessing potential risks to human health and the environment from these COPCs. The investigation also addressed the sources, fate, and transport of COPCs in the canyons.

The COPCs identified in the canyon floors included inorganic chemicals, organic chemicals (polychlorinated biphenyls, semivolatile organic compounds, and pesticides) and radionuclides (isotopic plutonium, isotopic uranium, americium-241, strontium-90, and cesium-137). Evaluations of the COPC concentrations in sediment, surface water, and alluvial groundwater indicated that the concentrations are either relatively stable or are decreasing over time. These decreases are associated with processes that remobilize, transport, and mix sediment-borne and water-borne constituents. The results of the investigation indicate that COPCs released from legacy waste sites are below NMED and DOE human health risk/dose target levels for present-day and foreseeable-future land uses (i.e., recreational activities). In addition, an ecological assessment of small mammals, birds, plants, earthworms, aquatic

invertebrates, and the Mexican spotted owl (an endangered species) indicate that no adverse effects to terrestrial and aquatic receptors are present in the watershed.

The Los Alamos/Pueblo Watershed is important to the Laboratory's Environmental Programs for the following reasons:

- Contamination is contained within the watershed's boundaries.
- The potential for off-site migration of contaminants in surface water is augmented by continued discharges from the Bayo Canyon Wastewater Treatment Plant (operated by Los Alamos County).
- A portion of the watershed provides potential habitat for threatened and/or endangered species.

The Los Alamos/Pueblo Watershed consists of seven canyons (Los Alamos, Pueblo, Delta Prime [DP], Bayo, Guaje, Barrancas, and Rendija) and the adjacent mesa tops that drain into these canyons. A brief description of each of these canyons follows.

Los Alamos Canyon originates northwest of the Laboratory on the slopes of the Sierra de los Valles in the Valles Caldera National Preserve at an elevation of 10,430 ft asl. The canyon extends southeast and enters Laboratory property at its northwest corner, near the Los Alamos townsite. The canyon then runs east across the northern portion of the Laboratory and is joined by DP Canyon. The canyon exits Laboratory property at its eastern boundary. It enters San Ildefonso Pueblo land 0.7 mi downstream of its confluence with Pueblo Canyon. Further downstream, Bayo and Guaje Canyons join Los Alamos Canyon before reaching the Rio Grande at an elevation of 5500 ft asl. Los Alamos Canyon has a drainage area of 14.1 mi^2 and a channel length of 18.9 mi. The total area, including all tributary canyons, is 57.7 mi^2. The canyon passes through Laboratory TA-02 and portions of TA-03, -21, -41, -43, -53, -62, -72, -73 and former TA-01, -26, and -32. In addition, some TA-00 sites are adjacent to the canyon. The portion of the canyon upstream (west) of TA-41's eastern boundary to the canyon's point of origin on Valles Caldera National Preserve land is referred to as upper Los Alamos Canyon; the portion of the canyon downstream of TA-41's eastern border and extending to approximately 0.3 mi below its confluence with DP Canyon is referred to as middle Los Alamos Canyon. The remainder of the canyon is referred to as lower Los Alamos Canyon.

Streamflow in upper and middle Los Alamos Canyon includes snowmelt runoff from the Sierra de los Valles and runoff from rainstorms. Lower Los Alamos Canyon receives snowmelt and runoff from tributaries and also includes a short perennial reach that is fed by discharge from Basalt Springs. Surface water flow is mainly ephemeral until Los Alamos Canyon joins Pueblo Canyon. At this confluence, effluent from Los Alamos County's Bayo Canyon Wastewater Treatment Plant typically supports surface flow to the Laboratory's eastern boundary. During the summer months, effluent discharge from the treatment plant to the canyon is reduced or discontinued because the effluent is used to irrigate the Los Alamos County golf course and athletic fields. Springs, effluent flow, and precipitation, combined with seasonally variable saturated alluvial conditions in the lower canyon, can support surface flow to the Rio Grande several days of the year.

Three operating and two inactive Laboratory NPDES-permitted outfalls drain into Los Alamos Canyon. The two inactive outfalls have been requested for deletion from the Laboratory's NPDES permit. Environmental monitoring has been conducted in the canyon since 1966 and documented in annual reports. In addition, the Laboratory has conducted numerous investigations and remedial actions in association with the legacy waste sites located in and around the canyon.

Pueblo Canyon originates on the eastern slope of the Sierra de los Valles within the Santa Fe National Forest at an elevation of 8940 ft asl. After crossing through 1.3 mi of Forest Service land, the

canyon extends east across 4.5 mi of Los Alamos County land, then crosses into the northeastern portion of the Laboratory. The canyon crosses 3.2 mi of Laboratory land and ends where it joins Los Alamos Canyon at an elevation of 6300 ft asl. Pueblo Canyon has a total drainage area of 8.3 mi^2 and a channel length of 9.7 mi. The canyon passes through Laboratory TA-72, -73, -74, and former TA-19, -31, and -45. The canyon passes through a major portion of the Los Alamos townsite, and some TA-00 sites are adjacent to the canyon.

No source of water to sustain perennial flow is present in upper Pueblo Canyon, although sections with extremely variable flow occur on the canyon floor. Snowmelt runoff from the upper portion of the canyon occasionally extends downstream as far as the Los Alamos townsite but does not normally reach Laboratory land. Apart from ephemeral runoff from rainstorms and snowmelt, streamflow in Pueblo Canyon has been influenced by extended discharges of treated effluent from three wastewater treatment plants. The westernmost plant was the former Pueblo Wastewater Treatment Plant located upstream of Acid Canyon, a small tributary of Pueblo Canyon. The Pueblo Wastewater Treatment Plant operated from 1951 until 1991. The former Central Wastewater Treatment Plant was located farther east on the east rim of Pueblo Canyon and operated from 1947 until 1966. The Los Alamos County Bayo Canyon Wastewater Treatment Plant (treatment of sanitary waste only), located between lower Pueblo Canyon and Bayo Canyon, began operating in 1963 and is the active sewage treatment plant for the Los Alamos townsite. The Bayo Canyon Wastewater Treatment Plant produces frequent flow in lower Pueblo Canyon. Although effluent discharges from the plant have provided long periods of low flow in Pueblo Canyon, storm runoff provides the largest streamflow and the highest potential for erosion and sediment transport.

No Laboratory NPDES-permitted outfalls drain into Pueblo Canyon. Environmental investigations in Pueblo Canyon include many studies associated with contaminant releases from former TA-45 on the rim of Acid Canyon. The first sediment sampling (performed in 1946) documented the presence of plutonium along the full length of Pueblo Canyon downstream of Acid Canyon. The Laboratory's Environmental Surveillance Program has monitored Pueblo Canyon regularly since 1970. In addition, the Laboratory and DOE conducted intensive studies in the 1970s under the Formerly Utilized Sites Remedial Action Program (FUSRAP). An interim action, completed by the Laboratory in 2001, removed the most highly contaminated sediments from Acid Canyon.

DP Canyon originates in the southeastern portion of the Los Alamos townsite at an elevation of 7330 ft asl. The canyon extends east-southeast and, after a short distance, enters the Laboratory at TA-73. The canyon then crosses TA-21 and continues until it joins Los Alamos Canyon at the boundary between TA-21 and -73 (at an elevation of 6620 ft asl). DP Canyon has a total drainage area of 0.6 mi^2 and a channel length of 1.5 mi. The canyon passes through TA-21 and -73.

DP Spring, located near the bottom of the canyon, has a flow range from 0 to 20 L/min. Other than flow from the spring, streamflow in DP Canyon is intermittent, resulting from storm water and snowmelt runoff.

No Laboratory NPDES-permitted outfalls drain into DP Canyon. TA-21 is the most significant potential source of contamination for DP Canyon. Environmental investigations in DP Canyon include environmental monitoring that has been conducted by the Laboratory's Environmental Surveillance Program since the 1970s and documented in annual reports. In addition, the Laboratory has conducted numerous investigations and remedial actions in and around TA-21 in association with the legacy waste sites located within that TA.

Bayo Canyon originates north of the Laboratory in the north-central portion of the Los Alamos townsite at an elevation of 7400 ft asl. The canyon extends east-southeast across the townsite before

entering Laboratory property at TA-74. The canyon continues east entering San Ildefonso Pueblo land before joining Los Alamos Canyon at an elevation of 5780 ft asl. Bayo Canyon has a drainage area of 4.0 mi^2 and a channel length of 8 mi. The canyon passes through a small portion of TA-74 and through former TA-10. In addition, some TA-00 sites are adjacent to the canyon.

Streamflow in Bayo Canyon is ephemeral and generally associated with runoff from rainstorms.

No Laboratory NPDES-permitted outfalls drain into Bayo Canyon. Environmental investigations in Bayo Canyon include studies conducted in 1965 and 1970 to assess the concentration and movement of plutonium and radioactivity in stream channels in the Laboratory vicinity. Sediment samples were collected between former TA-10 and the confluence with Los Alamos Canyon. The results indicated plutonium concentrations within the range of fallout values. Since 1973, the Laboratory's Environmental Surveillance Program has sampled sediment in Bayo Canyon at its confluence with Los Alamos Canyon. This sampling has detected no radionuclides above fallout values in sediments. DOE also conducted sediment sampling in the 1970s under FUSRAP. In addition, the Laboratory has conducted numerous investigations and remedial actions in and around former TA-10 in association with the legacy waste sites located within this former TA.

Guaje Canyon originates northwest of the Laboratory on the slopes of the Sierra de los Valles in the Valles Caldera National Preserve at an elevation of 10,450 ft asl. The canyon extends across 0.3 mi of the Valles Caldera National Preserve, and then enters the Santa Fe National Forest. The canyon extends south-southeast across Forest Service land for 12.7 mi before entering San Ildefonso Pueblo land. The canyon continues another 2.3 mi before joining Los Alamos Canyon at an elevation of 5660 ft asl. Guaje Canyon has an area of 16.9 mi^2 and a channel length of 16.4 mi. Guaje Canyon does not pass through nor is it adjacent to any former or active Laboratory TA.

Two springs in the upper part of Guaje Canyon in the Santa Fe National Forest produce a reach that has perennial flow. A reservoir was constructed within this reach and served as a municipal water supply for Los Alamos from 1947 to 1959. From 1972 to 1992 Los Alamos County used the reservoir as a source of irrigation water. The northernmost of Guaje Canyon's tributaries is Agua Piedra Canyon, which originates on Santa Clara Pueblo land and is approximately 3.0 mi long. Agua Piedra Spring, in the middle of Agua Piedra Canyon, results in a short perennial reach. The remaining tributaries are ephemeral, with streamflow resulting from snowmelt and rainfall runoff. The Guaje well field, a series of supply wells, is located in the middle and lower parts of Guaje Canyon. These wells provide a significant portion of the Los Alamos County municipal water supply.

No Laboratory NPDES-permitted outfalls drain into Guaje Canyon. Environmental investigations at Guaje Canyon include studies conducted in 1970 to assess the concentration and movement of plutonium and radioactivity in stream channels in the vicinity of the Laboratory. Sediment samples were collected in Guaje Canyon above its confluences with Rendija Canyon, Barrancas Canyon, and Los Alamos Canyon. Results indicated plutonium concentrations within the range of fallout values. The Laboratory's Environmental Surveillance Program has sampled sediment in Guaje Canyon at its confluence with Los Alamos Canyon since 1973. This sampling has not detected radionuclides above fallout values.

Barrancas Canyon originates north of the Laboratory in a residential area of the Los Alamos townsite at an elevation of 7270 ft asl. The canyon extends east-southeast across Los Alamos townsite entering San Ildefonso Pueblo land before joining Guaje Canyon at an elevation of 5860 ft asl. Barrancas Canyon has an area of 5 mi^2 and a channel length of 5.5 mi. Until recently, Barrancas Canyon passed through TA-74. However, that portion of TA-74 was transferred to the Department of the Interior in trust for San Ildefonso Pueblo in October 2002.

Streamflow in Barrancas Canyon is ephemeral and primarily results from storm water runoff.

No Laboratory NPDES-permitted outfalls drain into Barrancas Canyon. Environmental investigations at Barrancas Canyon include studies conducted in 1965 and 1970 to assess the concentration and movement of plutonium and radioactivity in stream channels in the vicinity of the Laboratory. Sediment samples were collected above their confluences with Guaje Canyon. The results indicated that plutonium concentrations were within the range of fallout values.

Rendija Canyon originates northwest of the Los Alamos townsite on the slopes of the Sierra de los Valles on Santa Fe National Forest land at an elevation of 9810 ft asl. The canyon extends east, passing along the north side of the townsite, and enters DOE land north of Barranca and Deer Trap Mesas. The canyon continues east and re-enters the Santa Fe National Forest before joining Guaje Canyon at an elevation of 6280 ft asl. Rendija Canyon has an area of 8.3 mi^2 and a channel length of 8 mi. Rendija Canyon does not pass through nor is it adjacent to any former or active Laboratory TA.

Streamflow in Rendija Canyon is ephemeral and results from snowmelt and rainfall runoff.

No Laboratory NPDES-permitted outfalls drain into Rendija Canyon. Environmental investigations at Rendija Canyon include studies conducted in 1965 and 1970 to assess the concentrations and movement of plutonium in stream channels in the vicinity of the Laboratory. Sediment samples were collected at three locations in Rendija Canyon above its confluence with Guaje Canyon. The results indicate plutonium concentrations within the range of fallout values. In addition, the Laboratory has conducted numerous investigations and remedial actions in association with the legacy waste sites located in and around the canyon.

4.1.1 Watershed Aggregate 1.1—Guaje/Barrancas/Rendija Canyons Aggregate

The Guaje/Barrancas/Rendija Canyons Aggregate, identified in Maps 4.1.1-a, 4.1.1-a′, 4.1.1-b, and 4.1.1-b′, consists of three canyon systems situated north of the Laboratory and north of the Los Alamos townsite. The majority of the aggregate consists of Forest Service land (Santa Fe National Forest) but also includes a portion of the Los Alamos townsite (land owned by Los Alamos County and private individuals), a portion of San Ildefonso Pueblo, and certain TA-00 sites. A description of TA-00 is provided in Appendix A.

For Laboratory lands within this aggregate (TA-00 Rendija Tract), land use is reserve. For lands owned by the Forest Service, land use is recreational. For lands within the Los Alamos townsite, land use is residential or recreational. For lands within the San Ildefonso Pueblo, land use is recreational.

4.1.1.1 Guaje/Barrancas/Rendija Canyons Aggregate, Current State

Map 4.1.1-a shows the legacy waste sites located within the Guaje/Barrancas/Rendija Canyons Aggregate. Legacy waste sites within this aggregate are relatively few in number, and most of them are located in Rendija Canyon; they include former mortar-impact areas, former firing sites, an active small-arms firing range, and disposal areas. A complete listing of the sites within this aggregate is included in Appendix B, Table B-1.1.

Map 4.1.1-a′ indicates that no Laboratory operational potential hazards are located within the Guaje/Barrancas/ Rendija Canyons Aggregate. The Laboratory has no operational facilities within this aggregate, and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.1.1.2 Guaje/Barrancas/Rendija Canyons Aggregate, Future State

Map 4.1.1-b represents the future state of the legacy waste sites subject to corrective action in the Guaje/Barrancas/Rendija Canyons Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Because the public uses this aggregate, any potential corrective actions will be conducted to achieve levels protective of human health under residential or recreational uses where appropriate.

The Laboratory has submitted a work plan for investigating the Guaje, Barrancas, and Rendija Canyon systems to NMED. The work plan has been approved. The planned sediment investigations for all three canyons will include geomorphic surveys to identify sediment age and physical characterization. Sediment samples will be collected and analyzed. Full-suite analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also may include collection and analysis of surface water samples at areas of persistent surface water, if any are encountered. For Guaje Canyon, the focus of the planned sediment investigation is to evaluate the potential, if any, for downstream migration of contaminants. For Barrancas Canyon, which is downstream of side drainages near the location of the former TA-10 firing sites in Bayo Canyon, the focus of the planned sediment investigation will be to evaluate potential contamination associated with former TA-10 firing tests. For Rendija Canyon, the sediment investigation will focus on evaluating potential contamination associated with the TA-00 legacy waste sites located in Rendija Canyon and also any potential contamination from upstream sources.

The Laboratory has also submitted a work plan for the investigation of the legacy waste sites located within the Guaje/Barrancas/ Rendija Canyons Aggregate to NMED. Once the work plan is approved and the investigation is completed, an aggregate report documenting the investigation will be submitted to NMED according to the schedule in Section XII of the Consent Order.

Because no Laboratory operational potential hazards are currently located within the Guaje/Barrancas/Rendija Canyons Aggregate or planned for the future, Map 4.1.1-b′ shows no difference from Map 4.1.1-a′. The Laboratory's current long-range plan for the TA-00 Rendija tract is for it to remain a reserve area.

4.1.2 Watershed Aggregate 1.2—Bayo Canyon Aggregate

The Bayo Canyon Aggregate, identified in Maps 4.1.2-a, 4.1.2-a′, 4.1.2-b, and 4.1.2-b′, includes a large portion of the Los Alamos townsite (land owned by Los Alamos County and private individuals), a portion of San Ildefonso Pueblo, portions of Laboratory TA-00 and -74, and all of former TA-10. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is reserve. For lands within the Los Alamos townsite, land use is residential or recreational (hiking trails along canyon sides). For lands within the San Ildefonso Pueblo, land use is recreational.

4.1.2.1 Bayo Canyon Aggregate, Current State

Map 4.1.2-a shows the legacy waste sites located within the Bayo Canyon Aggregate. Legacy waste sites within this aggregate include tanks, septic systems and leach fields, industrial waste lines and manholes, surface disposal areas, landfills, subsurface disposal pits, a mortar impact area, and inactive firing sites. A complete listing of the sites within this aggregate is included in Appendix B, Table B-1.2.

Former TA-10 is the principal contamination source in the Bayo Canyon Aggregate. At the time of its decommissioning, unacceptable levels of radioactivity remained at TA-10 between 10 and 40 ft below ground level. Concrete monuments delineate the area as a Designated Restricted Area. The FUSRAP

investigated the site in 1976 and 1977 to determine whether further remedial actions were needed. Radioactivity above background levels was detected, but dose assessments indicated that additional cleanup was not required because the contamination present is sufficiently buried and has no potential for migration. The Laboratory has conducted investigation activities at each legacy waste site within the aggregate, and interim actions have been conducted to remediate surface contamination. Also, further characterization and remediation of the aggregate are planned.

Map 4.1.2-a′ indicates that no Laboratory operational potential hazards are located within the Bayo Canyon Aggregate. The Laboratory has no current operational facilities within this aggregate, and no Laboratory NPDES-permitted outfalls drain into this aggregate. However, the Bayo Canyon Wastewater Treatment Plant (treatment of sanitary waste only), operated by Los Alamos County, is located within the aggregate. This plant began operation in 1963 and holds NPDES-permit number NM0020141 (issued to Los Alamos County). The plant discharges large volumes of treated wastewater into Pueblo Canyon, thus influencing the movement of sediments within the canyon.

4.1.2.2 Bayo Canyon Aggregate, Future State

Map 4.1.2-b represents the future state of the legacy waste sites subject to corrective action in the Bayo Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Because the majority of this aggregate is accessible to and used by the public, any potential corrective actions will be conducted to achieve levels protective of human health under residential or recreational uses where appropriate.

Los Alamos County plans to replace the Bayo Canyon Wastewater Treatment Plant with a new (or refurbished) wastewater treatment plant that will discharge into Pueblo Canyon.

The Laboratory has submitted a work plan for investigating the Bayo Canyon system to NMED. The work plan has been approved. The sediment investigation will include geomorphic surveys to identify sediment age and physical characterization and sediment sample collection and analyses to assess current and future risk associated with potentially contaminated sediments. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigation also will include sampling and analysis of vegetation to evaluate contaminant uptake by vegetation in the land-transfer parcel and may include the analysis of surface water samples at areas of persistent surface water, if any are encountered.

The Laboratory has also submitted a work plan for the investigation of legacy waste sites located within the Bayo Canyon Aggregate to NMED. Once the work plan is approved and the investigation is completed, an aggregate report documenting the investigation will be submitted to NMED according to the schedule in Section XII of the Consent Order.

Map 4.1.2-b′ shows the potential hazards associated with future operational use of TA-74. Because no Laboratory operational potential hazards are currently located within the Bayo Canyons Aggregate or planned for the future, Map 4.1.2-b′ shows no difference from Map 4.1.2-a′. The Laboratory's current long-range plan for TA-74 is for it to remain a reserve area.

4.1.3 Watershed Aggregate 1.3—Pueblo Canyon Aggregate

The majority of the Pueblo Canyon Aggregate, identified in Maps 4.1.3-a, 4.1.3-a′, 4.1.3-b, and 4.1.3-b′, lies within the Los Alamos townsite (land owned by Los Alamos County and private individuals). In addition, the aggregate includes a portion of public land managed by the Forest Service (Santa Fe National Forest), a portion of land owned by San Ildefonso Pueblo, and portions of Laboratory TA-00, -72, -73, -74 and former TA-19, -31, and -45. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within the Los Alamos townsite, land use is residential or recreational (canyon-side hiking trails). For lands within the San Ildefonso Pueblo and within the Santa Fe National Forest, land use is recreational.

4.1.3.1 Pueblo Canyon Aggregate, Current State

Map 4.1.3-a shows the legacy waste sites located within the Pueblo Canyon Aggregate. Legacy waste sites within this aggregate include underground storage tanks, septic systems, outfalls, a former decontamination facility, surface disposal areas, waste storage and disposal areas, and potential contamination from current and historic wastewater treatment plants. A complete listing of the sites within this aggregate is included in Appendix B, Table B-1.3.

The majority of legacy waste sites within the Pueblo Canyon Aggregate are located within the Los Alamos townsite (TA-00). Because of the potential for public exposure to residual contamination, the Laboratory focused on these sites very early in the corrective-action process. Consequently, many of the legacy waste sites in this aggregate have been investigated and remediated to levels that are protective of human health under current and future land use.

Legacy waste sites within the Pueblo Canyon Aggregate that have contributed major contamination to or that have influenced the movement of sediments within Pueblo Canyon are the following:

The former Pueblo Wastewater Treatment Plant [legacy waste site 00-018(a) in Appendix C, Map 3] was built between 1946 and 1948, began operating in 1951, and received waste from the Health Research Laboratory at TA-43 until 1983 and from Los Alamos business and residential customers until 1991. From 1983 to 1991, the plant received only sanitary waste from Los Alamos businesses and residences. The plant was the primary supplier of irrigation water for the Los Alamos golf course and recreational ball fields. Originally, the Zia Company operated the plant for the Atomic Energy Commission. In the early 1960s, Los Alamos County assumed control. Formerly, the plant held NPDES permit number NM0020125. Los Alamos County decommissioned the wastewater treatment plant in 1992. Although the Health Research Laboratory generated short-lived radioactive medical isotopes used for diagnostic purposes as well as chemical wastes, Laboratory policy required that radioactive wastes generated at this facility be managed as such and not be discharged to the drains. Most Health Research Laboratory chemical wastes consisted of salt buffers, cell culture media, and organic chemicals. Suspected contaminants are organic chemicals, inorganic chemicals, and radionuclides.

The former Central Wastewater Treatment Plant [legacy waste site 00-019 in Appendix C, Map 3] operated from 1947 until 1961, when it was taken out of service and kept on standby until the property it was located on was transferred to Los Alamos County in 1967. The treatment plant was used to treat sanitary sewage from Laboratory buildings and Los Alamos residential and commercial areas. The plant used conventional wastewater treatment processes, including primary settling, activated sludge digestion, sludge drying beds, trickling filtration, final clarification, and chlorination. Operations were confined to the mesa top and the two outfalls that discharged into Graduation Canyon (a tributary of Pueblo Canyon). This legacy waste site is made up of two areas: the mesa-top portion, which includes the former aboveground structures and subsurface piping, and the canyon-side outfall drainage areas north of the former plant. The plant initially was decommissioned in 1961. Los Alamos County continued subsequent structure removal from 1965 to 1991. The investigation and remediation of this site have been completed, and the site was approved by NMED for no further action in May 2002. Construction of a senior-citizen assisted-living facility on the site was completed in 2004.

The former TA-45 Radioactive Wastewater Treatment Plant [Legacy waste site 45-001, a component of Consolidated Unit 45-001-00 in Appendix C, Map 3] consists of a former radioactive liquid waste treatment plant (Building 45-2) and its associated outfalls. The TA-45 Radioactive Wastewater Treatment Plant, the first facility of its kind at the Laboratory, was located in the Los Alamos townsite near the current intersection of Canyon Road and Central Avenue. The treatment plant began operation in 1951 and operated until 1961. The plant initially received radioactive liquid waste from TA-01 only. As Laboratory operations expanded, radioactive liquid wastes from TA-03, -43, and -48 were also sent to the plant. Effluent from the plant discharged to Acid Canyon through two outfalls located near the canyon rim. One outfall was used to discharge treated wastewater, and the other was connected to floor drains in Building 45-2. Operation of the TA-45 Radioactive Wastewater Treatment Plant ceased after a new radioactive-liquid-waste treatment facility was constructed at TA-50. Decontamination and decommissioning (D&D) of the plant began in October 1966 and included demolition and removal of the treatment plant equipment, facilities, and waste lines, as well as excavation of contaminated soils. Portions of the walls of Acid Canyon below the outfalls were also decontaminated. In September 1967, the TA-45 property was transferred to Los Alamos County. Several environmental investigations have been conducted at this site, including investigations conducted as part of facility decommissioning to verify decontamination. DOE investigated former TA-45, including this site, during the period 1977 to 1981 as part of FUSRAP. This investigation included analysis of soil and sediment samples collected at and below outfalls, at the former treatment plant location, in canyons, and along waste lines. No contamination was detected above FUSRAP soil cleanup criteria at the site. In addition, the Laboratory has conducted extensive investigations and remedial actions in and around Acid Canyon in association with the legacy waste sites associated with TA-45. In particular, the Laboratory conducted a Phase I RCRA facility investigation (RFI) for this site in 1994 to determine whether there was residual soil/tuff contamination associated with the former treatment plant and outfalls. The results of the Phase I sampling and analysis for inorganic and organic chemicals were used to perform a human-health risk-based screening assessment. Based on this assessment, the RFI report recommended no further action for this site for inorganic chemicals and organic chemicals. The basis for the no-further-action recommendation was that the site has been characterized, and available data indicate that contaminants either are not present or are present in concentrations that pose no potential unacceptable risk under the current and projected land use. The results of sampling and analysis for radionuclides for all TA-45 legacy waste sites were used to conduct radiological assessments for TA-45. The results from this site were included in the assessments conducted for exposure units in the TA-45 mesa top and canyon. The results of these assessments indicated that resultant doses would be below dose limits, and no additional activities were recommended. An interim measure completed by the Laboratory in 2001 removed the highly contaminated sediments from Acid Canyon. The contamination within the Acid Canyon sediments related predominantly to untreated effluent discharged from 1944 to 1951.

The Bayo Canyon Wastewater Treatment Plant [Legacy waste site 00-018(b), in Appendix C, Map 3] is Los Alamos County's currently active wastewater treatment plant. The Bayo plant, located at the intersection of Pueblo and Bayo Canyons, began operating in 1963 and was upgraded in 1966. Initially, the plant treated only sanitary waste from residences on Barranca Mesa in Los Alamos township and the sanitary waste stream that had been previously routed to the Central Wastewater Treatment Plant (legacy waste site 00-019). Most wastes treated at the Bayo plant were from Los Alamos township businesses, eastern residences, and Barranca Mesa residences. After the Pueblo Canyon Wastewater Treatment Plant [legacy waste site 00-018(a)] was decommissioned in 1992, the remaining Los Alamos township northern and western residential sanitary waste streams were routed to the Bayo Canyon Wastewater Treatment Plant. Since 1992, treated effluent from the Bayo plant has been the primary supply of irrigation water for the Los Alamos township golf course

and recreational ball fields. Sanitary effluent and sludge samples were collected from the plant in 1972 and 1991 to address requirements of the NPDES permit. Samples collected in 1972 were analyzed for inorganic chemicals and radionuclides. Samples collected in 1991 were analyzed for inorganic chemicals. Analytes detected in 1972 and 1991 were acceptable for the conditions of the NPDES permit. In addition, the Laboratory conducted an RFI at the Bayo Canyon Wastewater Treatment Plant in 1996 to determine the nature and extent of any contamination that potentially may have been released from the plant. RFI activities consisted of a site survey, geodetic survey, borehole drilling, field screening, and subsurface sampling. A total of seven samples were collected: six were collected from depths up to 52.5 ft in two boreholes, and one was collected from media inside a pipe. Samples were analyzed for inorganic chemicals, organic chemicals, tritium, and gross alpha/beta/gamma radioactivity. No inorganic chemicals were detected above the soil background value in any sample. Tritium and acetone were detected and were carried forward to a screening assessment; however, their concentrations did not exceed their respective screening action levels. The RFI report recommended no further action at the Bayo Canyon Wastewater Treatment Plant because it had been characterized in accordance with current applicable state and federal regulations, and the available data indicate that contaminants pose no potential unacceptable human health risk under current and projected future land use.

The main source of contamination in the Pueblo Canyon Aggregate is associated with the former TA-45 Radioactive Wastewater Treatment Plant, which discharged wastewater into Acid Canyon (a tributary of Pueblo Canyon) from 1944 to 1965. Structures and some soils contaminated by the former treatment facility were removed in 1966 before the land was transferred to Los Alamos County. Additional remediation occurred in 1982. Contaminants detected in recent sediment samples from Pueblo Canyon include radionuclides, lead, mercury, and silver. Sediment investigations indicate that concentrations have been stable or have declined since discharges ceased in 1965. With no additional contaminant source, concentrations will continue to slowly decrease over time as a result of displacement and redistribution when floodwaters flow in the canyon.

The Laboratory has investigated the sediment, surface water, and alluvial groundwater in the Los Alamos and Pueblo Canyons system, including the portions of Pueblo Canyon that lie within the Pueblo Canyon Aggregate. This investigation is documented in the *Los Alamos and Pueblo Canyons Investigation Report*, which was submitted to NMED and recently approved. As documented in the report, human health and ecological risk assessments for the Los Alamos and Pueblo Canyon systems indicate that for contaminants released from Laboratory legacy waste sites, human health risks are below DOE and NMED target levels for present-day and foreseeable-future land uses, and adverse ecological effects have not been observed in terrestrial and aquatic systems within the canyons. The available data indicate that potential risks or doses from Laboratory-derived COPCs either will remain stable or will decrease in the absence of new contaminant sources. The report also concluded that continued monitoring of sediment, surface water, alluvial groundwater, and biota is appropriate to document trends in contaminant concentrations over time and to verify conceptual models and risk-assessment results.

Map 4.1.3-a′ indicates that no Laboratory operational potential hazards are located within the Pueblo Canyon Aggregate. The Laboratory has no operational facilities (other than monitoring wells) within this aggregate and no Laboratory NPDES-permitted outfalls drain into this aggregate. However, Los Alamos County operates the Bayo Canyon Wastewater Treatment Plant (treatment of sanitary waste only), which discharges into Pueblo Canyon (indicated in Map 4.1.3-a′).

4.1.3.2 Pueblo Canyon Aggregate, Future State

Map 4.1.3-b represents the future state of the legacy waste sites subject to corrective action in the Pueblo Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans,

and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under recreational or residential use.

The Laboratory recently submitted a work plan for the investigation of legacy waste sites located within the Pueblo Canyon Aggregate to NMED. Once the work plan is approved and the investigation is completed, an aggregate report documenting the investigation will be submitted to NMED according to the schedule in Section XII of the Consent Order. In addition, the Laboratory is currently implementing an investigation of intermediate and regional groundwater for Pueblo Canyon. When the work is completed, an investigation report will be submitted to NMED.

Los Alamos County plans to replace its Bayo Canyon Wastewater Treatment Plant with a new (or refurbished) wastewater treatment plant that will discharge into Pueblo Canyon.

Map 4.1.3-b′ shows the potential hazards associated with future operational use of TA-72, -73, and -74 within the Pueblo Canyon Aggregate. Because no Laboratory operational potential hazards are currently located within the Pueblo Canyon Aggregate or planned for the future, Map 4.1.3-b′ shows no difference from Map 4.1.3-a′. The Laboratory's current long-range plan is for TA-72, and -74 to remain under reserve land use and for TA-73 to continue functioning as the Los Alamos County Airport.

4.1.4 Watershed Aggregate 1.4—Upper Los Alamos Canyon Aggregate

The majority of the Upper Los Alamos Canyon Aggregate identified in Maps 4.1.4-a, 4.1.4-a′, 4.1.4-b, and 4.1.4-b′, lies within public land managed by the Forest Service (Santa Fe National Forest). In addition, the aggregate includes a small portion of the Valles Caldera National Preserve, a portion of the Los Alamos townsite (land owned by Los Alamos County and private individuals), and portions of Laboratory TA-00, -03, -41, -43, -61, -62 and former TA-01, -30, and -32. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within the Los Alamos townsite, land use is commercial/industrial or residential. For lands within the Santa Fe National Forest, land use is recreational.

4.1.4.1 Upper Los Alamos Canyon Aggregate, Current State

Map 4.1.4-a shows the legacy waste sites located within the Upper Los Alamos Canyon Aggregate. Legacy waste sites within this aggregate include underground storage tanks, septic systems, waste lines, drainlines and outfalls, surface disposal areas, areas of potential soil contamination, radioactive liquid storage, and a wastewater treatment facility. A complete listing of the sites within this aggregate is included in Appendix B, Table B-1.4.

The most significant contamination within the aggregate is associated with former TA-01 hillside sources.

The Laboratory has investigated the sediment, surface water, and alluvial groundwater in the Los Alamos and Pueblo Canyons system, including the portions of Los Alamos Canyon that lie within the Upper Los Alamos Canyon Aggregate. This investigation is documented in the *Los Alamos and Pueblo Canyons Investigation Report*, which was submitted to NMED and recently approved. As documented in the report, human health and ecological risk assessments for the Los Alamos and Pueblo Canyon systems indicate that for contaminants released from Laboratory legacy waste sites, human-health risks are below DOE and NMED target levels for present-day and foreseeable-future land uses, and adverse ecological effects have not been observed in terrestrial and aquatic systems within the canyons. The available data indicate that potential risks or doses from Laboratory-derived COPCs either will remain stable or will decrease in the absence of new contaminant sources. The report also concluded that continued monitoring of

sediment, surface water, alluvial groundwater, and biota is appropriate to document trends in contaminant concentrations over time and to verify conceptual models and risk-assessment results.

Map 4.1.4-a′ indicates that no Laboratory operational potential hazards are located within the Upper Los Alamos Canyon Aggregate and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.1.4.2 Upper Los Alamos Canyon Aggregate, Future State

Map 4.1.4-b represents the future state of the legacy waste sites subject to corrective action in the Upper Los Alamos Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because a portion of this aggregate is used for recreational and residential purposes, potential corrective actions may be conducted to achieve levels protective of human health under residential or recreational uses where appropriate.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Upper Los Alamos Canyon Aggregate and a report documenting the investigation.

Map 4.1.4-b′ shows the potential hazards associated with future operational use of TA-00, -03, -41, -43, -61, and -62. The Laboratory's current long-range plan for these TAs is to have them remain under industrial and reserve use. Because no Laboratory operational potential hazards are currently located within the Upper Los Alamos Canyon Aggregate or planned for the future, Map 4.1.4-b′ shows no difference from Map 4.1.4a′.

4.1.5 Watershed Aggregate 1.5—Middle Los Alamos Canyon Aggregate

The Middle Los Alamos Canyon Aggregate, identified in Maps 4.1.5-a, 4.1.5-a′, 4.1.5-b, and 4.1.5-b′, includes a small portion of the Los Alamos townsite (land owned by Los Alamos County and private individuals) as well as Laboratory TA-02, portions of TA-00, -21, -53, -61, -73, and former TA-26 and -31. A description of each TA is provided in Appendix A.

Only a very small portion of the northeastern corner of TA-61 is contained within the Middle Los Alamos Canyon Aggregate. No legacy waste sites or operational facilities associated with TA-61 are located within the aggregate.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within the Los Alamos townsite within this aggregate, land use is commercial/industrial, residential (areas are located in the northern portion of the aggregate), or recreational (hiking trails along canyon sides).

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within the Los Alamos townsite, land use is residential or recreational (canyon-side hiking trails). For lands within the San Ildefonso Pueblo and within the Santa Fe National Forest, land use is recreational.

4.1.5.1 Middle Los Alamos Canyon Aggregate, Current State

Map 4.1.5-a shows the legacy waste sites located within the Middle Los Alamos Canyon Aggregate. Legacy waste sites within this aggregate include storage areas, soil potentially contaminated from transformer oil, inactive septic systems, drainlines and outfalls, former building or structure locations, holding tanks, effluent storage tanks, industrial waste lines and sumps, surface disposal sites, and the

former Omega West reactor building and associated structures. A complete listing of the sites within this aggregate is included in Appendix B, Table B-1.5.

A significant source of contamination in the Middle Los Alamos Canyon Aggregate is from TA-02, primarily associated with the former Omega West nuclear research reactor. The reactor core assembly (fuel and control elements) was removed in 1994, and the reactor was placed in safe shutdown mode pending D&D activities. Subsequently, the reactor building and all other support buildings and ancillary structures have been dismantled and removed from TA-02; however, residual contamination from reactor activities remains.

The Laboratory conducted an evaluation of sediment contamination in Los Alamos Canyon from 1996 through 1998 in accordance with an RFI work plan. The results of the sediment analyses were used to perform preliminary human health and ecological risk assessments for upper and lower Los Alamos Canyon. These assessments indicated that sediment contamination levels in Los Alamos Canyon do not require immediate remedial actions with respect to present-day risk. In addition, geomorphic assessments indicated that the concentrations of contaminants carried by floods have been stable or have declined for decades.

The Laboratory has investigated the sediment, surface water, and alluvial groundwater in the Los Alamos and Pueblo Canyons system, including the portions of Los Alamos Canyon that lie within the Middle Los Alamos Canyon Aggregate. This investigation is documented in the *Los Alamos and Pueblo Canyons Investigation Report*, which was submitted to NMED and recently approved. As documented in the report, human health and ecological risk assessments for the Los Alamos and Pueblo Canyon systems indicate that for contaminants released from Laboratory legacy waste sites, human-health risks are below DOE and NMED target levels for present-day and foreseeable-future land uses, and adverse ecological effects have not been observed in terrestrial and aquatic systems within the canyons. The available data indicate that potential risks or doses from Laboratory-derived COPCs either will remain stable or will decrease in the absence of new contaminant sources. The report also concluded that continued monitoring of sediment, surface water, alluvial groundwater, and biota is appropriate to document trends in contaminant concentrations over time and to verify conceptual models and risk-assessment results.

Map 4.1.5-a′ identifies the operational potential hazards located within the Middle Los Alamos Canyon Aggregate. These potential hazards are as follows:

- A very small portion of the Los Alamos Neutron Science Center (LANSCE) facility at TA-53. LANSCE programs and activities are housed in a large complex that includes the building housing the linear accelerator itself, experimental areas and laboratories, and experimental support operations and advanced technology programs. LANSCE is presently used for research in condensed-matter science and engineering, accelerator science, fundamental nuclear physics, and radiography. In the SWEIS, the whole of TA-53 is designated as a nonnuclear hazard facility. Radioactive air emissions from LANSCE have historically accounted for 95% of the total off-site radiological dose from the Laboratory.
- Three operating Laboratory NPDES-permitted outfalls (02A129, 03A048, and 03A158) drain into this aggregate. NPDES-permitted outfall 02A129 is associated with the TA-21 steam plant (Building 21-357), outfall 03A048 is associated with a cooling tower at TA-53, and outfall 03A158 is associated with the TA-21 tritium science and technology building (Building 21-209). Outfall 03A158 will be requested for deletion from the Laboratory's NPDES permit once D&D of Building 21-209 is completed.

Two inactive Laboratory NPDES-permitted outfalls (03A047 and 03A049) also drain into the Middle Los Alamos Canyon Aggregate. The two inactive outfalls have been requested for deletion from the

Laboratory's NPDES permit and are, therefore, not operational potential hazards. Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-00, -21, and former TA-26. For TA-00, these include DOE-related administration and public access buildings and utility support facilities. No structures of any kind are located in the portion of TA-73 contained within this aggregate.

4.1.5.2 Middle Los Alamos Canyon Aggregate, Future State

Map 4.1.5-b represents the future state of the legacy waste sites subject to corrective action in the Middle Los Alamos Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents.

Generally, potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because a portion of this aggregate includes non-Laboratory lands used for recreational and residential as well as commercial/industrial purposes, potential corrective actions may be conducted to achieve levels protective of human health under residential or recreational uses when appropriate.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Middle Los Alamos Canyon Aggregate and a report documenting the investigation. In addition, the Laboratory is currently implementing an investigation of the intermediate and regional groundwater for Los Alamos Canyon, including the Middle Los Alamos Canyon. When the work is completed, an investigation report will be submitted to NMED.

Map 4.1.5-b′ shows the potential hazards associated with future operational use of TA-02, -21, -53, and -73 within the Middle Los Alamos Canyon Aggregate. The Laboratory's current long-range plan is for TA-53 to remain under industrial land use and for TA-02 and -21 to become an area of reserve land use.

4.1.6 Watershed Aggregate 1.6—DP Site Aggregate

DP Site Aggregate, identified in Maps 4.1.6-a, 4.1.6-a′, 4.1.6-b, and 4.1.6-b′, is physically located within the Middle Los Alamos Canyon Aggregate. DP Site Aggregate includes a large portion of Laboratory TA-21 and a very small portion of TA-73. A description of these TAs is provided in Appendix A.

DP Site Aggregate contains the majority of legacy waste sites associated with TA-21 (the remaining TA-21 legacy waste sites are contained within the Middle Los Alamos Canyon Aggregate).

Land use within this aggregate is primarily industrial.

4.1.6.1 DP Site Aggregate, Current State

Map 4.1.6-a shows the legacy waste sites located within the DP Site Aggregate. Legacy waste sites within this aggregate include storage areas, septic systems, drainlines and outfalls, aboveground tanks, industrial waste lines/sumps, surface disposal sites, five MDAs, and areas of surface soil contamination (including those resulting from air deposition). A complete listing of the sites within this aggregate is included in Appendix B, Table B-1.6.

Five of the legacy waste sites located within the DP Site Aggregate are formerly used MDAs (A, B, T, U, and V) located at TA-21. The Laboratory maintains fencing and radiological postings around all five MDAs.

MDA A (legacy waste site 21-014 in Appendix C, Map 6) was used from 1945 to 1949 and from 1969 to 1977 for disposal of radioactively contaminated solid waste, radioactively contaminated debris from

D&D activities, and radioactive liquids generated at TA-21. The MDA consists of two buried storage tanks, two rectangular disposal pits, and a large central pit. Suspect contaminants for the pits are radionuclides as well as a mixed solution of sodium hydroxide and stable iodine. The two buried storage tanks contained liquids from plutonium-processing operations contaminated with plutonium and americium. The tank contents have been decanted and processed; however, an unknown volume of potentially radioactively contaminated sludge remains in the tanks. MDA A was decommissioned in 1978, when a soil cover was installed over the top. Chemicals of primary concern are organic chemicals, inorganic chemicals, and radionuclides.

MDA B (legacy waste site 21-015 in Appendix C, Map 6) operated from 1945 through 1949. The site may have five or more burial pits. About 90% of the wastes received at MDA B consisted of miscellaneous radioactively contaminated materials. The remainder of waste included hazardous chemicals, radioactive waste products from a water-boiler reactor, and wood from temporary storage cabinets. The existing cover systems at MDA B consist of asphalt surfacing and a vegetated cap. Chemicals of primary concern are organic chemicals and radionuclides.

MDA T [Consolidated Unit 21-016(a)-99 in Appendix C, Map 6] consists of four absorption beds (layered sand, gravel, and crushed cobble-sized tuff), buried sumps and pipes, up to 64 shafts, the former Retrievable Waste Storage Area, former and current wastewater treatment plant locations, and portable incinerators. From 1945 to 1952, the four absorption beds received untreated acidic wastewater from uranium and plutonium processing laboratories and floor drain water from Filter Building 21-012. From 1968 until April 1976, the shafts received cement-treated radioactive mixtures from a pugmill in Building 21-257. The Retrievable Waste Storage Area [legacy waste site 21-016(b)], which began operation in 1974, consisted of an excavation that contained 20 ft long by 2.5 ft diameter corrugated metal pipes filled with cement-treated raffinate sludge. In 1982, the Retrievable Waste Storage Area stopped receiving waste. In 1984 and 1986, the corrugated metal pipes were removed and taken to TA-54, and the excavation was backfilled.

TA-21's first wastewater treatment facility, Building 21-035, treated industrial wastewater from TA-21's plutonium-processing facilities using settling, filtration, and neutralization processes. Building 21-035 operated from 1949 to 1967. During this period, Building 21-035 discharged most of its treated wastewater to the 21-011(k) outfall but also discharged small quantities of treated wastewater to the MDA T absorption beds. In 1967, when Building 21-035 was decommissioned and a new industrial-waste treatment facility (Building 21-257) came online, the absorption beds were no longer needed; discharges from Building 21-257 occurred solely through the 21-011(k) outfall. After 1986, all effluent was sent to TA-50 for treatment. Chemicals of primary concern at the various components of MDA T are organic chemicals and radionuclides.

MDA U [Consolidated Unit 21-017(a)-99 in Appendix C, Map 6] consists of two liquid-waste absorption beds. From 1948 to 1968, this site was used for the subsurface disposal of radioactively contaminated liquid wastes. The liquid-waste distribution systems were removed in 1985, leaving subsurface radionuclide contamination. Chemicals of primary concern are radionuclides.

MDA V [Consolidated Unit 21-018(a)-99 in Appendix C, Map 6] consists of three absorption beds that were used from 1945 through 1961 for liquid-waste disposal from a laundry facility that washed clothing used in uranium and plutonium refinement operations. The beds were underdesigned for the volume of wastewater discharged, resulting in overflows into adjacent drainages and a tributary of Los Alamos Canyon. Data from MDA V suggest low-level contamination of soils/tuff and vegetation with tritium, uranium, and plutonium. It is unknown if organic or inorganic chemicals were part of the waste stream. A portion of MDA V was used recently for a successful demonstration of nontraditional

in situ vitrification. Chemicals of primary concern are organic chemicals, inorganic chemicals, and radionuclides.

Investigation work plans to finalize the investigation of the nature and extent of contamination at MDAs A, B, T, U, and V have been submitted to NMED and approved.

The major sources of contamination to DP Canyon are the former and current radioactive liquid-waste treatment facilities at TA-21:

TA-21 Industrial Liquid-Waste Treatment Facility, former Building 21-35 [a component of Consolidated Unit 21-016(a)-99 in Appendix C, Map 6], operated from 1952 to 1967 and was used for the treatment of contaminated liquid waste from plutonium- and uranium-processing laboratories at DP site. Treated effluent from Building 21-35 discharged through an outfall [legacy waste site 21-011(k)] into DP Canyon. The facility was decontaminated and decommissioned in 1967, when a new industrial-waste treatment facility (Building 21-257) came online.

TA-21 Industrial Liquid-Waste Treatment Facility, Building 21-257, [a component of Consolidated Unit 21-016(a)-99 in Appendix C, Map 6] also treated liquid waste from plutonium-processing operations associated with DP site. The treatment plant was used to treat and prepare waste and discharged treated effluent through an outfall [legacy waste site 21-011(k)] into DP Canyon. After 1986, all effluent was sent to TA-50 for treatment. Currently, the facility continues to treat minor quantities of wastewater from DP East.

Outfall 21-011(k) in Appendix C, Map 6 consists of the outfall discharge line that formerly carried industrial wastewater from the current industrial-waste treatment plant (Building 21-257) through two holding tanks to a discharge point on the south slope of DP Canyon. The outfall is no longer active. The wastes were liquids remaining after treatment of plutonium extraction process effluents and potentially contained a variety of radioactive and chemical constituents. Untreated wastes from the former industrial-waste treatment plant (former Building 21-35) were also discharged in the area of the outfall.

RFI activities were conducted in 1992 and 1993. Analytical results of the 1992 investigation reported no concentrations above screening action levels for inorganic analytes and demonstrated that radionuclide concentrations were greater than screening action levels. The 1993 investigation included resampling the 1992 sample locations for volatile organic compound analysis because the holding times were missed. Analytical results of the 1993 investigation also indicated that radionuclide concentrations exceeded screening action levels. As a result, in late 2002/early 2003, the Laboratory implemented a voluntary corrective measure to control the radionuclide contamination remaining on the hillside, reduce the potential dose associated with the remaining contaminated material, and to prevent future contaminant migration. Activities included the excavation and disposal of the outfall drainline and contaminated soil, tuff, and sediment from the site; site restoration; and installation of storm water run-on and run-off controls.

In 2004, the Laboratory submitted the *Los Alamos and Pueblo Canyons Investigation Report* to NMED. This report presents results of studies conducted between 1996 and 2003 in the Los Alamos/Pueblo Watershed. Legacy waste site 21-011(k) is located within this watershed. The investigations documented in the report addressed sediment, surface water, alluvial groundwater, and biota potentially affected by Laboratory legacy waste sites located within the watershed. The investigations also addressed the sources, fate, and transport of potential contaminants in the canyons and evaluated the need for additional characterization sampling and remedial actions. Investigation results indicated that, for contaminants released from legacy waste sites, human

health risks are below NMED and DOE target levels for present-day and foreseeable-future land uses, and adverse ecological effects have not been observed within terrestrial and aquatic systems in the watershed. The data indicate that potential risks or doses from Laboratory-derived potential contaminants either will remain relatively stable or will decrease in the absence of new contaminant sources. The report concludes that no additional remedial actions are needed. However, continued monitoring of sediment, surface water, alluvial groundwater, and biota is appropriate to document trends in contaminant concentrations over time and to verify conceptual models and risk-assessment results.

The Laboratory has investigated the sediment, surface water, and alluvial groundwater in the Los Alamos and Pueblo Canyons system, including the portions of Los Alamos Canyon and DP Canyon associated with the DP Site Aggregate. This investigation is documented in the *Los Alamos and Pueblo Canyons Investigation Report*, which was submitted to NMED and recently approved. As documented in the report, human health and ecological risk assessments for the Los Alamos and Pueblo Canyon systems indicate that for contaminants released from Laboratory legacy waste sites, human-health risks are below DOE and NMED target levels for present-day and foreseeable-future land uses, and adverse ecological effects have not been observed in terrestrial and aquatic systems within the canyons. The available data indicate that potential risks or doses from Laboratory-derived COPCs either will remain stable or will decrease in the absence of new contaminant sources. The report also concluded that continued monitoring of sediment, surface water, alluvial groundwater, and biota is appropriate to document trends in contaminant concentrations over time and to verify conceptual models and risk-assessment results.

The Laboratory has also submitted a work plan for the investigation of legacy waste sites located within the DP Site Aggregate to NMED. The work plan was approved by NMED. Once the investigation is completed, an aggregate report documenting the investigation will be submitted to NMED according to the schedule in Section XII of the Consent Order.

Map 4.1.6-a′ indicates that no Laboratory operational potential hazards are located within the DP Site Aggregate. Although two NPDES-permitted outfalls are physically located within this aggregate, the outfalls drain into Middle Los Alamos Canyon and have been grouped into the Middle Los Alamos Canyon Aggregate.

4.1.6.2 DP Site Aggregate, Future State

Map 4.1.6-b represents the future state of the legacy waste sites subject to corrective action in the DP Site Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents.

Buildings within this aggregate will undergo D&D under DOE direction and funding. Corrective action will be conducted to ensure that contaminated soil and sediment do not exceed levels acceptable for safe industrial use.

The majority of the land in this aggregate will be retained and used by DOE, which will retain responsibility for sustaining the future states achieved by corrective actions. Current Laboratory plans envision future industrial use of the DP Site Aggregate area, including MDAs A, B, T, U, and V.

Management, maintenance, and monitoring will be conducted by DOE to meet the requirements of DOE Order 450.1, “Environmental Protection Program”; 10 CFR 830, ”Nuclear Safety Management”; and Module VIII of the Laboratory’s Hazardous Waste Facility Permit (as revised).

As currently planned, the alternative remedies for the MDAs in this aggregate are as follows

- complete excavation;
- partial excavation, stabilization of residual inventory, and monitoring and maintenance of stabilized inventory; or
- stabilization of inventory, monitoring, and maintenance.

Risk assessments will be conducted to evaluate these alternative remedies. Remedies that are shown to meet the criteria for performance, reliability, environmental, and human health will be evaluated for feasibility, safety, and the requirements of 10 CFR 830, *Nuclear Safety Management*. Current plans are to complete corrective actions at the MDAs within this aggregate by 2011.

The future state of all five of the TA-21 MDAs is depicted in Map 4.1.6-b as long-term environmental stewardship sites that are stabilized in place. Long-term environmental stewardship (LTES) depicts uncertainties associated with excavation options but does not preclude excavation as an option. Any MDA inventory stabilized in place will remain under DOE as an LTES site and may also require nuclear facility management. Potential corrective actions will be conducted to achieve levels protective of human health under industrial land use.

The Laboratory is currently implementing an investigation of intermediate and regional groundwater for the entire Los Alamos Canyon (DP Canyon is a tributary of Los Alamos Canyon). When the work is completed, an investigation report will be submitted to NMED.

Map 4.1.6-b′ shows the potential hazards associated with future operational use at TA-21 and -73 within the DP Site Aggregate. The Laboratory has closed the majority of TA-21 tritium operations and is in the process of closing the few tritium operations remaining at TA-21. All tritium activities are being consolidated elsewhere at the Laboratory. Because no Laboratory operational potential hazards are currently located within the DP Site Aggregate or planned for the future, Map 4.1.6-b′ shows no difference from Map 4.1.6a′. The Laboratory's current long-range plan is for TA-21 to become an area of reserve land use and for TA-73 to continue functioning as the Los Alamos County Airport.

4.1.7 Watershed Aggregate 1.7—Lower Los Alamos Canyon Aggregate

The Lower Los Alamos Canyon Aggregate, identified in Maps 4.1.7-a, 4.1.7-a′, 4.1.7-b, and 4.1.7-b′, includes lands owned by Bandelier National Monument and the San Ildefonso Pueblo as well as portions of Laboratory TA-53, -72, -73 and -74. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is industrial or reserve. For Bandelier National Monument lands within this aggregate, land use is recreational. For lands within the San Ildefonso Pueblo within this aggregate, land use is residential or recreational.

4.1.7.1 Lower Los Alamos Canyon Aggregate, Current State

No legacy waste sites are associated with the Lower Los Alamos Canyon Aggregate, as indicated in Map 4.1.7-a. Although two administratively complete sites [00-029(a and b)] are physically located within this aggregate, these sites have been grouped into the Middle Los Alamos Canyon Aggregate solely for the purpose of work-scheduling efficiency.

Human-health risk assessments were conducted to evaluate the potential impacts of exposures to contaminated sediments in lower Los Alamos Canyon. The risk assessments, which considered recreational, industrial, and residential land uses, concluded that levels of contamination in lower Los Alamos Canyon do not present unacceptable risk to human health.

The majority of the contaminated sediments are located on DOE property, but contaminated sediments have been transported in floodwaters to the Rio Grande. Current contaminant concentrations in sediments near the Rio Grande are relatively low. The highest concentrations occur near the confluence of lower Los Alamos Canyon and Pueblo Canyon.

The Laboratory has investigated the sediment, surface water, and alluvial groundwater in the Los Alamos and Pueblo Canyons system, including the portions of Los Alamos Canyon that lie within the Lower Los Alamos Canyon Aggregate. This investigation is documented in the *Los Alamos and Pueblo Canyons Investigation Report*, which was submitted to NMED and recently approved. As documented in the report, human health and ecological risk assessments for the Los Alamos and Pueblo Canyon systems indicate that for contaminants released from Laboratory legacy waste sites, human-health risks are below DOE and NMED target levels for present-day and foreseeable-future land uses, and adverse ecological effects have not been observed in terrestrial and aquatic systems within the canyons. The available data indicate that potential risks or doses from Laboratory-derived COPCs either will remain stable or will decrease in the absence of new contaminant sources. The report also concluded that continued monitoring of sediment, surface water, alluvial groundwater, and biota is appropriate to document trends in contaminant concentrations over time and to verify conceptual models and risk-assessment results.

Map 4.1.7-a′ identifies the single operational potential hazard located within the aggregate:

- LANSCE facility at TA-53. LANSCE programs and activities are housed in a large complex that includes the building housing the linear accelerator itself; experimental areas and laboratories; and experimental support operations and advanced technology programs. LANSCE is presently used for research in condensed-matter science and engineering, accelerator science, fundamental nuclear physics, and radiography. In the SWEIS, the whole of TA-53 is designated as a nonnuclear hazard facility. Radioactive air emissions from LANSCE have historically accounted for 95% of the total off-site radiological dose from the Laboratory.

No Laboratory NPDES-permitted outfalls drain into the Lower Los Alamos Canyon Aggregate. The portions of TA-53, -73, and -74 located within this aggregate are undeveloped and designated reserve.

4.1.7.2 Lower Los Alamos Canyon Aggregate, Future State

Because there are no legacy waste sites within the Lower Los Alamos Canyon Aggregate, Map 4.1.7-b shows no change from Map 4.1.7-a.

Map 4.1.7-b′ shows the potential hazards associated with future operational use of TA-53, -72, -73 and -74 within the Lower Los Alamos Canyon Aggregate. The Laboratory's current long-range plan is for TA-53 and -72 to remain under industrial land use surrounded by reserve land, for TA-73 to continue functioning as the Los Alamos County Airport, and for TA-74 to remain under reserve land use.

The Laboratory is currently implementing an investigation of the intermediate and regional groundwater for Los Alamos Canyon, including the Lower Los Alamos Canyon. When the work is completed, an investigation report will be submitted to NMED.

4.2 The Sandia Watershed

The Sandia Watershed, identified in Map 4.0, is an east-to-southeast-trending drainage that originates on Laboratory property within TA-03 at an elevation of 7450 ft asl. The drainage extends 9.6 mi from its headwaters to its confluence with the Rio Grande, draining an area of 5.5 mi^2. The drainage extends 5.6 mi across the central part of the Laboratory following the boundary between TA-60 and -61, passing through TA-53 and -72 before crossing the Laboratory's eastern boundary onto Bandelier National

Monument. The drainage remains in the monument for 0.25 mi, then crosses into San Ildefonso Pueblo. The drainage crosses San Ildefonso for 4 mi before joining the Rio Grande at an elevation of 5489 ft asl.

The Sandia Watershed is ephemeral to a point about 3 mi east of the Laboratory's eastern boundary, where Sandia Spring supports perennial flow for a few hundred yards. This flow does not normally reach the Rio Grande. In the upper canyon, effluent-supported surface flow, arising from discharge of treated sanitary effluent, supports a significant wetland and typically extends about 2.5 to 3 mi before infiltrating the canyon-bottom alluvium.

Surface water in the Sandia Watershed is monitored under the Laboratory's surface-water monitoring program. The Laboratory's site-wide groundwater monitoring program monitors the alluvial and regional aquifers. Water supply, alluvial, and regional aquifer wells are located in the watershed, but there are no intermediate wells. In accordance with the Consent Order, the Laboratory submitted an *Interim Site-Wide Groundwater Monitoring Plan* to NMED. As part of this process, the Laboratory is continuing to develop a monitoring well network (which must ultimately be approved by NMED) to be used for the continued monitoring of groundwater.

The Sandia Watershed consists of one canyon (Sandia) and the adjacent mesa tops that drain into this canyon. A brief description of the canyon follows:

Sandia Canyon originates on Laboratory property near the east boundary of TA-03 at an elevation of 7300 ft asl. The canyon extends east-southeast across the Laboratory for 5.6 mi, then enters Bandelier National Monument for 0.25 mi before crossing into San Ildefonso Pueblo. The canyon passes through 4 mi of San Ildefonso Pueblo land before reaching the Rio Grande at an elevation of 5489 ft asl. Sandia Canyon has a channel length of 9.6 mi and a drainage area of 5.5 mi^2. The canyon passes through Laboratory TA-53, -60, -72, and former TA-20. In addition, certain TA-03 and -61 sites are associated with the canyon.

Stream flow in upper Sandia Canyon is perennial, resulting from discharges from the TA-46 Sanitary Wastewater System Consolidation system (which is currently routed to TA-03), the TA-03 steam plant and two cooling towers. These discharges have created a wetland area in upper Sandia Canyon. Other contributions to flow in the canyon are surface runoff from rainfall and snowmelt. Also, a small reach with perennial flow in lower Sandia Canyon is fed by discharges from Sandia Spring. Two municipal water supply wells are located within Sandia Canyon.

Five operating and one inactive Laboratory NPDES-permitted outfalls drain into Sandia Canyon. The inactive outfall has been requested for deletion from the Laboratory's NPDES permit. Of the five operating Laboratory NPDES-permitted outfalls, four drain into the upper portion of the canyon at TA-3 and one into the lower canyon from TA-53.

Environmental investigations in Sandia Canyon include monitoring that has been conducted since 1970 by the Laboratory's Environmental Surveillance Program and documented in annual reports. This program includes monitoring surface water and sediments in the canyon and groundwater discharged from Sandia Spring. In addition, the Laboratory has conducted numerous investigations and remedial actions in association with the legacy waste sites located in and around the canyon.

4.2.1 Watershed Aggregate 2.1—Upper Sandia Canyon Aggregate

The Upper Sandia Canyon Aggregate, identified in Maps 4.2.1-a, 4.2.1-a′, 4.2.1-b, and 4.2.1-b′, includes the Los Alamos townsite Royal Crest Mobile Home Park and portions of Laboratory TA-03, -05, -53, -60, and -61. A description of each TA is provided in Appendix A.

Only very small portions of the northwestern corner of TA-05 and the southwestern quadrant of TA-53 are contained within this aggregate. No legacy waste sites or operational facilities are located within these portions of TA-05 or TA-53.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within the Los Alamos townsite, land use is residential (Royal Crest Mobile Home Park), recreational, or industrial (the Los Alamos County municipal landfill).

4.2.1.1 Upper Sandia Canyon Aggregate, Current State

Map 4.2.1-a shows the legacy waste sites located within the Upper Sandia Canyon Aggregate. Legacy waste sites within this aggregate include tanks, septic systems, drain lines and outfalls, sumps, surface disposal areas, storage areas, areas of potential soil contamination, a surface impoundment, a landfill, and a former wastewater treatment facility. A complete listing of the sites within this aggregate is included in Appendix B, Table B-2.1.

The legacy waste sites within the Upper Sandia Canyon Aggregate that have contributed major contamination are a former wastewater treatment plant, cooling towers associated with a power plant, and a former storage area used for storing electrical equipment, capacitors, and transformers with polychlorinated-biphenyl (PCB)-containing dielectric fluids:

The former TA-03 Wastewater Treatment Plant [legacy waste site 03-014(a)-99 shown in Appendix C, Map 8] operated from 1951 until 1992, when the Laboratory's Sanitary Wastewater Systems Consolidation plant came online at TA-46. The TA-03 wastewater treatment plant was adjacent to and east of the utilities control center (Building 03-223) on the southern rim (near the head) of Sandia Canyon. The northern portion of the plant was built in 1951; the southern portion of the plant was built in 1964. The northern and southern portions were different in some physical dimensions but essentially functioned identically, with a total capacity of 750,000-gal. per day. The wastewater treatment plant served TA-03, -43, -59, and -60; the trailer park on West Jemez Road; and holding tanks and septic system wastes throughout the Laboratory. The plant also began treating sanitary wastes from TA-02 and -41 in 1990 and TA-21 in 1992.

The TA-03 power plant (TA-3-22) cooling towers [Consolidated Unit 03-012(b)-00] used potassium dichromate for corrosion control, probably between 1956 and 1972. Characterization monitoring at regional well R-28 in Mortandad Canyon in 2005 led to the identification of chromium in the regional aquifer at concentrations above NMED and U.S. Environmental Protection Agency (EPA) standards (50 µg/L and 100 µg/L, respectively). The power plant cooling towers are expected to be the primary source of the chromium observed in the regional aquifer at R-28.

Former storage area [legacy waste site 03-056(c) shown in Appendix C, Map 8] was located outdoors on the north side of Building 03-223, a utilities shop. This area was primarily used for storing electrical equipment, capacitors, and transformers with PCB-containing dielectric fluids. In 1992, the storage area was decommissioned.

In 1994, an RFI investigation was conducted at this site. A total of 22 soil samples were collected from 18 locations at depths ranging from 0 to 3 ft below grade. Results of the sampling indicated that inorganic chemicals, semivolatile organic chemicals, pesticides, and volatile organic chemicals were properly characterized and that these contaminants were below risk-based cleanup levels. In 1995, the site was further characterized as part of an expedited cleanup to identify the lateral extent of soils containing residual PCBs. Ten samples were collected from the western slope area to better define the lateral extent of the PCB contamination. A 10 ft x 10 ft grid was placed over a 45-ft diameter area

of suspected contamination, and soil samples were collected within grid nodes. The results of the grid sampling were used to target areas for soil excavation. During soil excavation activities, the lateral extent of soil contamination was further defined to encompass an area approximately 130 ft long x 70 ft wide. PCB-contaminated soil was excavated from an area approximately 60 ft long x 70 ft wide. Additionally, three soil samples were collected from the ephemeral slope drainages, down slope from the north and west slope areas. Analytical results from this sampling effort indicated that soils containing greater that 10 mg/kg of PCBs were present on the western and northern slope areas.

Voluntary corrective action activities at the site began in 2000 and were conducted in accordance with an NMED-approved voluntary corrective action plan. Field-screening techniques were used to determine the extent of PCB contamination. Approximately 2,400 yd^3 of contaminated soil and unconsolidated tuff were excavated. During excavation, additional field screening was used to provide immediate confirmation that all PCB-contaminated soil and unconsolidated tuff in the excavated area had been removed to a cleanup level of less than 1 mg/kg. The field screening determined that contamination extended beyond the original legacy waste site boundary. Following excavation activities, 89 confirmation samples were collected from 79 locations. All samples were submitted to a fixed laboratory for PCB analysis, and 21 of these samples were also analyzed for organic chemicals and inorganic chemicals. Based on the confirmation sample results, four areas of elevated (greater than 1 mg/kg) PCBs were identified. In March 2001, these areas were excavated. In April 2001, additional confirmation sampling was conducted. One sample was collected from each excavated location. All samples were analyzed for PCBs, and three were also analyzed for organic chemicals and inorganic chemicals. Confirmation sample results indicated the site met the EPA-mandated cleanup criterion for less than 1 mg/kg. Potential contaminants were assessed for their potential to pose an unacceptable risk to human or ecological receptors. These assessments determined that residual concentrations of chemicals at legacy waste site 03-056(c) pose no potential unacceptable risk to human health or the environment. The voluntary corrective action report for legacy waste site 03-056(c) was approved by NMED in September 2002.

Map 4.2.1-a′ identifies the operational hazards located within the aggregate. These are the following:

- The TA-03 Chemistry and Metallurgy Research (CMR) Building (3-29),[3] where activities include various research and development projects. The facility has continuously housed analytical chemistry functions since it was constructed. Process chemistry and metallurgy research and development operations involving plutonium and other actinides have been performed continuously.
- The TA-03 Beryllium Technology Facility (3-141),[4] where activities consist of research and development on materials fabrication; coating, joining, and processing; characterization of materials, including the properties of metals, alloys, ceramic-coated metals, and other combinations; and the fabrication of items from these materials.
- The TA-03 Liquid and Compressed Gas Facility (Building 3-170), which functions as the Laboratory's receiving and distribution point for bulk quantities of specialized gases used in research and development activities.
- Four operating (13S, 01A001, 03A027, 03A199) Laboratory NPDES-permitted outfalls that drain into upper Sandia Canyon: NPDES-permitted outfall 13S associated with the TA-46 Sanitary

[3] The CMR Building straddles the boundary of two watershed aggregates: the south boundary of the Upper Sandia Canyon Aggregate and the north boundary of the Upper Mortandad Canyon Aggregate.

[4] The TA-03 Beryllium Technology Facility straddles the boundary of two watershed aggregates: the south boundary of the Upper Sandia Canyon Aggregate and the north boundary of the Upper Mortandad Canyon Aggregate.

Wastewater System Consolidation plant (which is pumped to the reuse tank at the TA-03 steam plant and ultimately discharges to outfall 01A001), outfall 01A001 associated with the TA-03 steam plant, and outfalls 03A027 and 03A199 associated with cooling towers at TA-03.

Another inactive NPDES-permitted outfall (03A024) previously drained into upper Sandia Canyon. Outfall 03A024 has been requested for deletion from the Laboratory's NPDES permit.

The most significant sources of contamination within this aggregate are associated with historic releases from the former TA-03 wastewater treatment plant and large volumes of discharge from the outfall at the TA-03 power plant (up to 300,000 gal./day). This outfall also receives effluent from the Sanitary Wastewaters Systems Consolidation plant at TA-46, which is reused as cooling water or discharged directly to the outfall. PCBs from legacy waste sites at the head of Sandia Canyon have also been released into the canyon.

Buildings located within this aggregate that are not operational hazards include buildings and ancillary structures (not mentioned previously as hazards) within TA-03, -60, and -61. These include several administrative, technical, and physical-support buildings and structures. For TA-60, these include transport containers, trailers and storage buildings, a fuel-pumping station, and a pesticide storage facility.

It should be noted that the Los Alamos County Landfill is located within this aggregate.

The Laboratory has implemented the investigation of two reaches (S-1 and S-2) in upper Sandia Canyon because of the past detection of PCBs in wetland sediments and the presence of PCBs at many of the legacy waste sites in the upper portion of the Sandia Canyon watershed. Reach S-1 begins near the head of Sandia Canyon and extends for 1150 ft east, ending 200 ft west of the wetland area. Reach S-2 is in the wetlands area and extends for 2100 ft. The investigation included sediment sampling and quarterly surface-water base flow and storm-water runoff sampling. These investigations began in 1998 and were reported in 2000. Analytical results indicated that low concentrations of PCBs are distributed throughout both reaches; however, no area has significantly elevated concentrations of PCBs. Surface water samples were collected quarterly for one year at six locations. No PCBs were detected in any of the quarterly samples from any of the stations.

4.2.1.2 Upper Sandia Canyon Aggregate, Future State

Map 4.2.1-b represents the future state of the legacy waste sites subject to corrective action in the Upper Sandia Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under residential or recreational use.

The Laboratory has submitted a work plan for investigating the entire Sandia Canyon system. The work plan was approved by NMED. Investigation activities for upper Sandia Canyon will include geomorphic surveys to identify sediment age and physical characterization. Sediment samples will be collected and analyzed. Full-suite analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigation also will include sampling and analyzing surface water; measuring surface water flow; installing alluvial and regional aquifer wells; sampling and analyzing alluvial, perched, and regional groundwater; and, as necessary, will support ecological risk assessment, sampling and analyzing biota.

The Laboratory will undertake field investigations in Sandia Canyon under an *Interim Measures Work Plan for Chromium Contamination in Groundwater*. This work is scheduled to begin in the summer of

2006 focusing primarily on determining chromium distributions in surface water, alluvial groundwater, vadose-zone pore water and regional groundwater.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Upper Sandia Canyon Aggregate and a report documenting the investigation.

Map 4.2.1-b′ shows the hazards associated with future operational use of TA-03, -05, -53, -60, and -61. The Laboratory's current long-range plan is for TA-03, -05, -53, -60, and -61 to remain under industrial and reserve use.

In addition to the sampling previously described in Section 4.2.1.1, additional sediment sampling will be conducted in upper Sandia Canyon to complete the determination of nature and extent of contamination and to support human-health and ecological risk assessments. In addition, the Laboratory will conduct storm water monitoring.

4.2.2 Watershed Aggregate 2.2—Lower Sandia Canyon Aggregate

The Lower Sandia Canyon Aggregate, identified in Maps 4.2.2-a, 4.2.2-a′, 4.2.2-b, and 4.2.2-b′, includes lands within Bandelier National Monument, lands within San Ildefonso Pueblo, and portions of Laboratory TA-05, -53, -72, and former TA-20. A description of each TA is provided in Appendix A.

Only a small portion along the northern border of TA-05 is contained within this aggregate. No legacy waste sites or operational facilities are located within this portion of TA-05.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within the Bandelier National Monument within this aggregate, land use is recreational. For lands within San Ildefonso Pueblo within this aggregate, land use is residential or recreational.

4.2.2.1 Lower Sandia Canyon Aggregate, Current State

Map 4.2.2-a shows the legacy waste sites located within the Lower Sandia Canyon Aggregate. Legacy waste sites within this aggregate include tanks, septic systems, drain lines and outfalls, disposal pits and landfills, storage areas, areas of potential soil contamination, surface impoundments and former firing sites. A complete listing of the sites within this aggregate is included in Appendix B, Table B-2.2.

Map 4.2.2-a′ identifies the operational hazards located within the aggregate. These are the following:

- The LANSCE facility at TA-53, which is the site of a high-energy linear accelerator. LANSCE programs and activities are housed in a large complex that includes the building housing the linear accelerator itself; experimental areas and laboratories; and experimental support operations and advanced technology programs. LANSCE is presently used for research in condensed-matter science and engineering, accelerator science, fundamental nuclear physics, and radiography. In the SWEIS, the whole of TA-53 is designated as a nonnuclear hazard facility. Radioactive air emissions from LANSCE have historically accounted for 95% of the total off-site radiological dose from the Laboratory.
- One active Laboratory NPDES-permitted outfall (03A113), which drains into lower Sandia Canyon. This outfall is associated with Buildings 53-293 and 53-1032 of the LANSCE facility.

Buildings located within this aggregate that are not operational hazards include buildings and ancillary structures within TA-53 and -72. These include several administrative, technical, and physical-support buildings and structures. For TA-72, these include training areas (including classrooms), storage and

target maintenance buildings, an inactive skeet range, a training tower and rappelling platform, bullet impact berms, and an ammunition storage magazine.

The most significant source of contamination in the canyon within this aggregate is potentially contaminated sediments carried in floodwaters from upstream reaches of Sandia Canyon.

4.2.2.2 Lower Sandia Canyon Aggregate, Future State

Map 4.2.2-b represents the future state of the legacy waste sites subject to corrective action in the Lower Sandia Canyon Aggregate, reflecting assumptions in the DOE corrective-action plan, applicable DOE site plans, and available municipal-planning documents. Generally, potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because this aggregate includes non-Laboratory lands used for recreational and residential as well as industrial purposes, potential corrective actions may be conducted to achieve levels protective of human health under residential or recreational uses when appropriate.

The Laboratory has submitted a work plan for investigating the entire Sandia Canyon system. The work plan was approved by NMED. Investigation activities for lower Sandia Canyon will include geomorphic surveys to identify sediment age and physical characterization. Sediment samples will be collected and analyzed. Full-suite analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigation also will include sampling and analyzing surface water; measuring surface water flow; installing alluvial and regional aquifer wells; sampling and analyzing alluvial, perched, and regional groundwater; and, as necessary, will support ecological risk assessment, sampling and analyzing biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Lower Sandia Canyon Aggregate and a report documenting the investigation.

Map 4.2.2-b′ shows the hazards associated with the future operational use of TA-05, -53, and -72. The Laboratory's current long-range plan is for TA-05, -53, and -72 to remain under industrial and reserve use.

4.3 The Mortandad Watershed

The Mortandad Watershed, identified in Map 4.0, is an east-to-southeast trending drainage that originates on Laboratory property in the central portion of TA-03 at an elevation of 7410 ft asl. The drainage extends southeast across the Laboratory for 4.4 mi and San Ildefonso Pueblo for 5.6 mi before joining the Rio Grande at an elevation of 5450 ft asl. The drainage extends 10 mi from its headwaters to its confluence with the Rio Grande, draining an area of 10.4 mi^2.

The Mortandad Watershed consists of streams that are entirely ephemeral; neither perennial springs nor perennial reaches occur in this watershed. No significant snowmelt runoff occurs within this watershed. NPDES-permitted outfall (051), associated with the Laboratory's Radioactive Liquid Waste Treatment Plant at TA-50, drains into the watershed. Surface flow typically extends approximately 1 mi downstream of the TA-50 outfall. The current discharges from TA-50 are permitted under NPDES and monitored in accordance with the Laboratory's permit requirements.

Secondary liquid and sludge wastes have been discharged into different sections of the Mortandad Watershed from two of the Laboratory's wastewater-treatment plants. One of the plants operated at TA-35 between 1951 and 1963; the other at TA-50 from 1963 to the present. The Los Alamos County-operated White Rock Overlook Wastewater Treatment Plant (sanitary sewage treatment) discharges into the drainage at a point about 0.5 mi east of White Rock's northern boundary. This discharge results in effluent-supported flow that regularly extends to the Rio Grande.

Surface water in the Mortandad Watershed is monitored under the Laboratory's surface-water monitoring program. The Laboratory's site-wide groundwater monitoring program monitors the alluvial and regional aquifers. Water supply, alluvial, intermediate, and regional aquifer wells are located in the watershed. In accordance with the Consent Order, the Laboratory submitted an *Interim Site-Wide Groundwater Monitoring Plan* to NMED. As part of this process, the Laboratory is continuing to develop a monitoring well network (which must ultimately be approved by NMED) to be used for the continued monitoring of groundwater.

The Mortandad Watershed is important to the Laboratory's Environmental Programs for the following reasons:

- The large number of legacy waste sites within the watershed, including several former radioactive-liquid-waste outfalls that have resulted in significant contamination within the canyon (currently five NPDES-permitted liquid discharge outfalls drain into the Mortandad Watershed);
- The presence of several DOE mission-critical facilities within the watershed (at TA-03, -35, -46, -48, -50, -55, and -54);
- The potential for off-site migration of contaminants onto San Ildefonso Pueblo land, via surface water augmented by continuing discharge of treated wastewater from the Laboratory's Radioactive Liquid Waste Treatment Facility located at TA-50; and
- The potential for human exposure to on-site contamination during recreational activities occurring within the watershed.

The Mortandad Watershed consists of four canyons (Mortandad, Ten Site, Cedro, and Cañada del Buey), and the adjacent mesa tops that drain into these canyons. A brief description of each of these canyons follows.

Mortandad Canyon originates on Laboratory property near the southeast corner of TA-03 at an elevation of 7410 ft asl. The canyon extends east-southeast across the Laboratory for 4.4 mi, crossing the southern boundary of TA-05 and entering San Ildefonso Pueblo land. The canyon crosses San Ildefonso Pueblo land for 5.6 mi before reaching the Rio Grande at an elevation of 5450 ft asl. Mortandad Canyon has a channel length of 10 mi and a drainage area of 4.7 mi^2. The canyon passes through Laboratory TA-03, -05, -35, -48, and former TA-04 and -42. In addition, some TA-00 sites are adjacent to the canyon and certain TA-50, -52, -54, -55, -60, and -63 sites are associated with the canyon.

Streamflow in the canyon is ephemeral, with no perennial springs or natural perennial reaches. Flow in the canyon results from snowmelt and storm water runoff as well as discharges from Laboratory outfalls. Four Laboratory NPDES-permitted outfalls drain into Mortandad Canyon. The most important source of surface water is from discharges of treated wastewater from the Radioactive Liquid Waste Treatment Facility at TA-50. The treated wastewater flows a short distance along the canyon floor and eventually infiltrates into alluvium.

Environmental monitoring has been conducted in Mortandad Canyon since 1970 by the Laboratory's Environmental Surveillance Program and documented in annual reports. This program includes monitoring surface water and sediments in the canyon. The primary contamination source in the Mortandad Canyon system is discharge of Laboratory wastewaters, which have occurred since at least 1951 and possibly as early as 1943. In addition, the Laboratory has conducted numerous investigations in association with the legacy waste sites located in and around the canyon.

Ten Site Canyon originates on Laboratory property at the northern end of TA-50 at an elevation of 7230 ft asl. The canyon extends east across the Laboratory for 1.5 mi before joining Mortandad Canyon near the northwest corner of TA-05. Ten Site Canyon has a channel length of 1.5 mi and a drainage area of 0.3 mi^2. Ten Site Canyon includes a small tributary, called Pratt Canyon, which originates in TA-35. In the past, Pratt Canyon received discharges of liquid and sludge from the TA-35 wastewater treatment plant, which operated from 1951 to 1963.

Streamflow in Ten Site Canyon is the result of surface runoff and is entirely ephemeral. One Laboratory NPDES-permitted outfall drains into Ten Site Canyon.

Cedro Canyon originates in the southwest portion of San Ildefonso Pueblo at an elevation of 6960 ft asl. The canyon extends east across the Pueblo for 2.8 mi before joining Mortandad Canyon near State Highway 4. Cedro Canyon has a channel length of 2.8 mi and a drainage area of 1.1 mi^2.

Streamflow in Cedro Canyon is the result of surface runoff and is entirely ephemeral.

Cañada del Buey originates on Laboratory property near the western boundary of TA-63 at an elevation of 7230 ft asl. The canyon extends southeast across the Laboratory for 3.6 mi, then crosses into San Ildefonso Pueblo. It continues through San Ildefonso Pueblo for 1.7 mi to the community of White Rock. The canyon passes through 1.5 mi of White Rock and re-enters San Ildefonso Pueblo land for 0.4 mi before joining Mortandad Canyon at an elevation of 5620 ft asl. Cañada del Buey has a channel length of 7.2 mi and a drainage area of 4.3 mi^2. The canyon passes through Laboratory TA-46, -51, -54, and former TA-04. In addition, some TA-00 sites are adjacent to the canyon and certain TA-52 sites are associated with the canyon.

Streamflow in Cañada del Buey is the result of surface runoff and is entirely ephemeral on Laboratory property. In the lower canyon, below the community of White Rock, a short reach of the canyon has continuous flow as the result of discharges from the White Rock Overlook Wastewater Treatment Plant (sanitary sewage treatment).

Although no Laboratory NPDES-permitted outfalls drain into Cañada del Buey, one NPDES-permitted outfall (13S) is physically located within this canyon, but is routed to TA-03 where it discharges to Sandia Canyon. Environmental investigations include monitoring of surface water and sediments in Cañada del Buey that has been conducted since approximately 1970 by the Laboratory's Environmental Surveillance Program and documented in annual reports. In addition, the Laboratory has conducted numerous investigations in association with the legacy waste sites located in and around the canyon.

4.3.1 Watershed Aggregate 3.1—Upper Mortandad Canyon Aggregate

The Upper Mortandad Canyon Aggregate, identified in Maps 4.3.1-a, 4.3.1-a′, 4.3.1-b, and 4.3.1-b′, includes portions of Laboratory TA-03, -35, -48, -50, -55, -59, -60 and -64 and former TA-42. A description of each TA is provided in Appendix A.

Only a very small part of the northwestern portion of TA-64 is located within this aggregate. No legacy waste sites or operational facilities are located in this portion of TA-64.

TA-50 is the most significant source of contamination into upper Mortandad Canyon. Since 1963 large volumes of treated wastewater have been discharged from the TA-50 Radioactive Liquid Waste Treatment Facility into Effluent Canyon (a tributary of upper Mortandad Canyon).

Land use within this aggregate is entirely industrial.

4.3.1.1 Upper Mortandad Canyon Aggregate, Current State

Map 4.3.1-a shows the legacy waste sites located within the Upper Mortandad Canyon Aggregate. Legacy waste sites within this aggregate include tanks, septic systems, sumps, waste lines, drainlines and outfalls, surface disposal areas, storage areas, areas of potential soil contamination, a former firing site, a surface impoundment, a former incinerator complex, and a former decontamination facility. Legacy waste sites associated with TA-50 mainly include sites associated with the TA-50 Radioactive Liquid Waste Treatment Facility and other waste-management activities. A complete listing of the sites within this aggregate is included in Appendix B, Table B-3.1.

One of the legacy waste sites located within the Upper Mortandad Canyon Aggregate is formerly used MDA C, located at TA-50:

> MDA C (legacy waste site 50-009 in Appendix C, Map 10), consisting of 7 disposal pits and 108 disposal shafts, was established in May 1948 and used for the disposal of radioactive and chemical waste through 1965. The landfill was used until April 1974 but received waste only intermittently from 1968 to 1974. Chemicals of primary concern include inorganic chemicals, organic chemicals, and radionuclides. Currently, the pits are capped with crushed tuff. The depth to groundwater below MDA C is approximately 1300 ft. The Laboratory maintains fencing and postings around the MDA. Continued investigation activities at MDA C are planned in the near future. The investigation is designed to complete the determination of the nature and extent of contamination and to collect information on the hydrogeologic properties and other physical characteristics of the vadose zone beneath the MDA.

Map 4.3.1-a′ identifies the operational potential hazards located within the Upper Mortandad Canyon Aggregate. These potential hazards include the following:

- The TA-03 CMR Building (3-29)[5], where activities include various research and development projects. The facility has continuously housed analytical chemistry functions since it was constructed. Process chemistry and metallurgy research and development operations involving plutonium and other actinides have been performed continuously.
- The TA-03 Beryllium Technology Facility (3-141)[6], where activities consist of research and development on materials fabrication; coating, joining, and processing; characterization of materials, including the properties of metals, alloys, ceramic-coated metals, and other combinations; and the fabrication of items from these materials.
- The TA-50 Radioactive Liquid Waste Treatment Facility (Buildings 50-1, -2, -66, and -90), which provides waste-treatment services for organizations throughout the Laboratory, including concentrating radioactive components and removing them from liquid waste. Pipelines throughout the Laboratory connect facilities to this facility, which is composed of radioactive liquid-waste treatment areas, wastewater analytical laboratories, environmental chemistry laboratories, and several holding tanks. The storage and treatment areas in this facility have several features to prevent leaks, spills, and overflows of radioactive and hazardous materials from reaching the environment.

[5] The CMR Building straddles the boundary of two watershed aggregates: the north boundary of the Upper Mortandad Canyon Aggregate and the south boundary of the Upper Sandia Canyon Aggregate.

[6] The TA-03 Beryllium Technology Facility straddles the boundary of two watershed aggregates: the south boundary of the Upper Sandia Canyon Aggregate and the north boundary of the Upper Mortandad Canyon Aggregate.

- The TA-50 Waste Characterization, Reduction, and Repackaging Facility (Building 50-69), which houses the Laboratory's transuranic-waste size reduction, visual examination, headspace gas sampling/analysis, and repackaging operations. The facility handles solid waste only. Routine operations at the facility produce small quantities of transuranic waste and low-level waste, including transuranic waste generated by reduction and repackaging activities. After repackaging, low-level waste is transported to TA-54, Area G, for proper disposal. Transuranic waste is transported to TA-54, Area G, for interim storage until it can be characterized and shipped to the Waste Isolation Pilot Plant in Carlsbad, New Mexico.
- The Plutonium Building (55-4) within the TA-55 Plutonium Facility, where activities include chemical and metallurgical processes for recovering, purifying, and converting plutonium and other actinides into many compounds and forms.
- Four operating Laboratory NPDES-permitted outfalls (051, 03A021, 03A022, and 03A181): Outfall 051, associated with the TA-50 Radioactive Liquid Waste Treatment Facility; outfall 03A021, associated with the CMR Laboratory at TA-03; outfall 03A022, associated with the TA-03 Sigma Building; and outfall 03A181, associated with Building 55-6 (a utility building) at the TA-55 Plutonium Facility.

The most significant source of contamination in the canyon within this aggregate is the Radioactive Liquid Waste Treatment Facility at TA-50.

Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures (not included previously as potential hazards) within TA-03, -48, -50, -55, and -64. For TA-03, -48, -50, -55, and -64; these include several administrative, technical, and physical-support buildings and structures. For TA-35, these include the Target Fabrication Facility (Building 35-213) and multiple other buildings used for physical support, technical, administrative, and other nonhazardous operations. For TA-59, nonoperational potential hazard buildings include the Occupational Health Laboratory Building as well as multiple buildings used for administrative and other office operations. For TA-60, these include multiple transportainers, trailers and storage buildings, a fuel pumping station, and a pesticide storage facility.

The characterization of the canyons within the Upper Mortandad Canyon Aggregate is currently in progress as part of the investigation of Mortandad Canyon. The investigation is addressing sediment, surface water, alluvial groundwater, and biota potentially impacted by Laboratory legacy waste sites located within the watershed. The objectives include defining the nature and extent of COPCs in sediment, surface water, and alluvial groundwater and assessing their potential risks to human health and the environment. The investigation is also addressing the sources, fate, and transport of COPCs in the canyons.

4.3.1.2 Upper Mortandad Canyon Aggregate, Future State

Map 4.3.1-b represents the future state of the legacy waste sites subject to corrective action in the Upper Mortandad Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Upper Mortandad Canyon Aggregate and a report documenting the investigation.

Map 4.3.1-b′ shows the potential hazards associated with future operational use of TA-03, -35, -48, -50, -55, -59, and -60. The Laboratory's current long-range plan is for TA-03, -35, -48, -50, -55, and -60 to remain under industrial and reserve use and for TA-59 to change from industrial and reserve use to reserve use only.

4.3.2 Watershed Aggregate 3.2—Middle Mortandad/Ten Site Canyons Aggregate

The Middle Mortandad/Ten Site Canyons Aggregate, identified in Maps 4.3.2-a, 4.3.2-a′, 4.3.2-b, and 4.3.2-b′, includes portions of Laboratory TA-05, -35, -52, -60, and -63 and former TA-04. A description of each TA is provided in Appendix A.

Land use within this aggregate is mainly industrial or reserve. However, Laboratory employees use portions of the aggregate for recreational hiking primarily during lunch hours.

4.3.2.1 Middle Mortandad/Ten Site Canyons Aggregate, Current State

Map 4.3.2-a shows the legacy waste sites located within the Middle Mortandad/Ten Site Canyons Aggregate. Legacy waste sites within this aggregate include storage tanks, septic systems, drainlines and outfalls, sumps, surface disposal areas, storage areas, areas of potential soil contamination, former firing sites, surface impoundments, two MDAs, a landfill, and a former wastewater treatment facility. A complete listing of the sites within this aggregate is included in Appendix B, Table B-3.2.

The most significant sources of contamination within this aggregate are potentially contaminated sediments carried in floodwaters from upstream reaches of Mortandad Canyon and historic releases from the former TA-35 wastewater treatment plant:

> The former TA-35 wastewater-treatment plant [Consolidated Unit 35-003(a)-99 in Appendix C, Map 11] operated from 1951 until 1963. It consisted of an array of underground waste lines, storage tanks, and chemical treatment precipitation tanks. The plant treated liquid waste that originated from TA-35 radiochemistry laboratories and from the operation of radioactive lanthanum-140 hot cells in Building 35-2. Radioisotopes in the waste include barium-140, lanthanum-140, strontium-89, strontium-90, and yttrium-90. Two of the plant's waste lines had direct outfalls into a small tributary of Ten Site Canyon called Pratt Canyon.

Map 4.3.2-a′ identifies the single operational potential hazard located within the Middle Mortandad/Ten Site Canyons Aggregate:

- One operating Laboratory NPDES-permitted outfall (03A160) drains into Middle Mortandad/Ten Site Canyons Aggregate. Outfall 03A160 drains into Ten Site Canyon and is associated with the Antares Target Hall at TA-35 (Building 35-124).

Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures (not included previously as potential hazards) within TA-05, -35, -52, -60, and -63. For TA-05, -35, -52, -60, and -63, these include several administrative, technical, and physical-support buildings and structures. For TA-60, these include multiple transportainers, trailers and storage buildings, a fuel pumping station, and a pesticide storage facility.

The characterization of the canyons within the Middle Mortandad/Ten Site Canyons Aggregate is currently in progress. The investigation is addressing sediment, surface water, alluvial groundwater, and biota potentially impacted by Laboratory legacy waste sites located within the watershed. The objectives of the investigation include defining the nature and extent of COPCs in sediment, surface water, and

alluvial groundwater and assessing potential risks to human health and the environment from these COPCs. The investigation is also addressing the sources, fate, and transport of COPCs in the canyons.

The Laboratory has submitted to NMED both a work plan for the investigation of legacy waste sites located within the Middle Mortandad/Ten Site Canyons Aggregate and a report documenting the investigation. The work plan has been approved; the report is currently in the review process.

4.3.2.2 Middle Mortandad/Ten Site Canyon Aggregate, Future State

Map 4.3.2-b represents the future state of the legacy waste sites subject to corrective action in the Middle Mortandad/Ten Site Canyons Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial or recreational use as appropriate.

Map 4.3.2-b′ shows the potential hazards associated with future operational use of TA-05, -35, -52, -60, and -63. The Laboratory's current long-range plan is for TA-05, -35, -52, -60, and -63 to remain under industrial and reserve use.

4.3.3 Watershed Aggregate 3.3—Lower Mortandad/Cedro Canyons Aggregate

The majority of the Lower Mortandad/Cedro Canyons Aggregate, identified in Maps 4.3.3-a, 4.3.3-a′, 4.3.3-b, and 4.3.3-b′, lies within San Ildefonso Pueblo land. The aggregate also includes the entire southeastern half of the Laboratory's TA-05. A description of TA-05 is provided in Appendix A.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within San Ildefonso Pueblo within this aggregate, land use is residential or recreational. In addition, San Ildefonso Pueblo uses its lands within this aggregate for traditional purposes.

4.3.3.1 Lower Mortandad/Cedro Canyons Aggregate, Current State

Map 4.3.3-a shows the legacy waste sites located within the Lower Mortandad/Cedro Canyons Aggregate. Legacy waste sites within this aggregate are relatively few in number and include a former septic system, an outfall, a former firing site, areas of soil potential contamination, and a former neutron detector calibration chamber. A complete listing of the sites within this aggregate is included in Appendix B, Table B-3.3.

The most significant sources of contamination within this aggregate are associated with potentially contaminated sediment carried in floodwaters from upstream reaches of Mortandad Canyon.

The characterization of the canyons within the Lower Mortandad/Cedro Canyons Aggregate is currently in progress as part of the investigation of Mortandad Canyon. The investigation is addressing sediment, surface water, alluvial groundwater, and biota potentially impacted by Laboratory legacy waste sites located within the watershed. The objectives of the investigation include defining the nature and extent of COPCs in sediment, surface water, and alluvial groundwater and assessing their potential risks to human health and the environment. The investigation is also addressing the sources, fate, and transport of COPCs in the canyons.

Map 4.3.3-a′ indicates that no Laboratory operational potential hazards are located within the Lower Mortandad/Cedro Canyons Aggregate. The Laboratory has no current operational facilities within this aggregate, and no Laboratory-permitted outfalls drain into this aggregate.

4.3.3.2 Lower Mortandad/Cedro Canyons Aggregate, Future State

Map 4.3.3-b represents the future state of the legacy waste sites subject to corrective action in the Lower Mortandad/Cedro Canyons Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under industrial use. Because this aggregate is used for recreational and residential as well as industrial purposes, potential corrective actions may be conducted to achieve levels protective of human health under residential or recreational uses when appropriate.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Lower Mortandad/Cedro Canyons Aggregate and a report documenting the investigation.

Map 4.3.3-b′ shows that no potential hazards are associated with the future operational use of TA-05. Because there are no Laboratory operational facilities currently within this aggregate or planned for the future, Map 4.3.3-b′ shows no change from Map 4.3.3-a′. The Laboratory's current long-range plan is for TA-05 to remain under industrial and reserve use.

4.3.4 Watershed Aggregate 3.4—Upper Cañada del Buey Aggregate

The Upper Cañada del Buey Aggregate, identified in Maps 4.3.4-a, 4.3.4-a′, 4.3.4-b, and 4.3.4-b′, includes a small portion of San Ildefonso Pueblo and portions of Laboratory TA-05, -46, -51, -52, -54, and -63 and former TA-04. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within San Ildefonso Pueblo within this aggregate, land use is recreational.

4.3.4.1 Upper Cañada del Buey Aggregate, Current State

Map 4.3.4-a shows the legacy waste sites located within the Upper Cañada del Buey Aggregate. Legacy waste sites within this aggregate include septic systems, drainlines and outfalls, sumps, surface disposal areas, storage areas, areas of potential soil contamination, and surface impoundments. A complete listing of the sites within this aggregate is included in Appendix B, Table B-3.4.

No significant sources of contamination are contained within this aggregate.

The portions of TA-05, -51 and -54 that lie within the Upper Cañada del Buey Aggregate are quite small in area and contain no Laboratory legacy waste sites or operational facilities. Therefore, these areas are not potential sources of contaminants for Cañada del Buey and do not impact the aggregate.

Map 4.3.4-a′ indicates that no Laboratory operational potential hazards are located within the Upper Cañada del Buey Aggregate. The Laboratory has no current operational facilities within this aggregate, and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.3.4.2 Upper Cañada del Buey Aggregate, Future State

Map 4.3.4-b represents the future state of the legacy waste sites subject to corrective action in the Upper Cañada del Buey Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

The Laboratory has developed a work plan for investigating the Cañada del Buey canyon system as part of the work plan for investigating Sandia Canyon and Cañada del Buey. Data will be collected to assess current and future risk associated with potentially contaminated sediments and to improve the understanding of transport processes. Activities will include geomorphic surveys. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also will include sampling and analyzing alluvial, perched, and regional groundwater and, as necessary, will support ecological risk assessments and biota sampling and analyses.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Upper Cañada del Buey Aggregate and a report documenting the investigation.

Map 4.3.4-b′ shows that no potential hazards are associated with the future operational use of TA-46, -52, and -63. Because there are no Laboratory operational facilities currently within this aggregate or planned for the future, Map 4.3.4-b′ shows no change from Map 4.3.4-a′. The Laboratory's current long-range plan is for TA-46, -52, and -63 to remain under industrial and reserve use.

4.3.5 Watershed Aggregate 3.5—Middle Cañada del Buey Aggregate

The Middle Cañada del Buey Aggregate, identified in Maps 4.3.5-a, 4.3.5-a′, 4.3.5-b, and 4.3.5-b′, includes a portion of San Ildefonso Pueblo and portions of Laboratory TA-51 and -54. Descriptions of TA-51 and -54 are provided in Appendix A.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within San Ildefonso Pueblo within this aggregate, land use is recreational. In addition, San Ildefonso Pueblo uses its lands within this aggregate for traditional purposes.

4.3.5.1 Middle Cañada del Buey Aggregate, Current State

Map 4.3.5-a shows the legacy waste sites located within the Middle Cañada del Buey Aggregate. Legacy waste sites within this aggregate include a septic system, several storage areas, two MDAs, and areas of potential soil contamination. A complete listing of the sites within this aggregate is included in Appendix B, Table B-3.5.

Two of the legacy waste sites located within the Middle Cañada del Buey Aggregate are formerly used MDAs (H and L), located at TA-54. The Laboratory maintains fencing and radiological postings around both MDAs.

> MDA H [legacy waste site 54-004 shown in Appendix C, Map 14] is a 0.3-acre site that contains nine inactive shafts used from 1960 to 1986 for the disposal of Laboratory classified waste such as weapon-component mockup shapes and detonators. Most of the classified waste disposed of at MDA H was nonhazardous; however, some of the waste consisted of depleted uranium, fuel elements, material contaminated with residual plutonium, and high explosives. One shaft, Shaft 9, received hazardous waste after July 26, 1982, and is therefore an RCRA-regulated unit. Each shaft is 6 ft in diameter and 60 ft deep. The shafts were capped when waste came to within 6 ft of the surface. Shafts 1 through 8 are capped with 3 ft of crushed tuff followed by 3-ft-thick concrete caps; shaft 9 is capped solely by a 6-ft-thick layer of concrete. Primary chemicals of potential concern are tritium and volatile organic compounds. In December of 2000, NMED directed the Laboratory to prepare a corrective measures study (CMS) plan for MDA H because of NMED's concern that hazardous wastes at MDA H may present a future threat to human health and the environment over the life of the buried wastes. In addition, NMED stated that the requirements for the closure of Shaft 9

could be met by the corrective measures evaluated in the CMS. Thus, the unit would remain subject to corrective action along with the other eight shafts. Pursuant to DOE orders, the Laboratory also addressed the potential for adverse impacts from future releases of radionuclides (tritium) in the CMS. The CMS plan was approved by NMED in December 2001. The CMS was conducted, a CMS report was submitted to NMED in May 2003, and a revised CMS report was submitted to NMED in June 2005.

MDA L (legacy waste site 54-006 in Appendix C, Map 14) consists of 1 inactive subsurface disposal pit, 3 inactive subsurface treatment and disposal impoundments, and 34 inactive disposal shafts. The entire fenced surface area of Area L is an active RCRA-permitted hazardous waste unit because of ongoing permitted waste-management activities at Area L. The subsurface disposal pit received chemical waste from the late 1950s until December 1978. Initial waste-disposal practices included the disposal of noncontainerized chemical wastes and liquids in drums without added sorbents. The pit also was used as an evaporative pit. After reaching capacity, the pit was covered with crushed, consolidated tuff. The operational dates of the subsurface impoundments vary, but collectively they operated from January 1979 to June 1985. The subsurface impoundments were used to evaporate treated salt solutions and electroplating wastes or to treat small quantities of lithium hydride by reaction with water. All three impoundments have been covered with crushed tuff. The 34 disposal shafts at MDA L range from 15 ft to 65 ft deep and vary in diameter from 3 ft to 8 ft. The operational dates of the shafts vary, but collectively the shafts operated from February 1975 to August 1985. The shafts were used to dispose of containerized and bulk liquid chemical wastes. After reaching capacity, the shafts were covered with a concrete plug approximately 3 ft thick. Subsurface vapor contamination at MDA L is well characterized and consists primarily of 1,1,1-trichloroethane and trichoroethylene. This subsurface contamination continues to be well monitored. An investigation report describing the characterization of the nature and extent of contamination beneath MDA L was submitted to NMED on September 13, 2005.

The most significant source of contamination in the canyon within this aggregate is potentially contaminated sediment carried in floodwaters from upstream reaches of Cañada del Buey.

Map 4.3.5-a′ identifies the following single operational potential hazard located within the Middle Cañada del Buey Aggregate:

- the TA-54 Radioassay and Nondestructive Testing Facility (Building 54-38). This facility is used to determine the characteristics of packaged transuranic waste.

No Laboratory NPDES-permitted outfalls drain into this aggregate. Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-51 and -54 (except Building 54-38), including several administrative, technical, and physical-support buildings and structures (many of which are transportables).

4.3.5.2 Middle Cañada del Buey Aggregate, Future State

Map 4.3.5-b represents the future state of the legacy waste sites subject to corrective action in the Middle Cañada del Buey Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because a portion of this aggregate is used for recreational purposes, corrective actions may be conducted to achieve levels protective of human health under recreational uses when appropriate.

The Laboratory has developed a work plan for investigating the Cañada del Buey canyon system as part of the work plan for investigating Sandia Canyon and Cañada del Buey. Data will be collected to assess

current and future risk associated with potentially contaminated sediments and to improve the understanding of transport processes. Activities will include geomorphic surveys. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also will include sampling and analyzing alluvial, perched, and regional groundwater and, as necessary, will support ecological risk assessments and biota sampling and analyses.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Middle Cañada del Buey Aggregate and a report documenting the investigation.

Map 4.3.5-b′ shows the potential hazards associated with future operational use of TA-51 and -54. The Laboratory's current long-range plan is for TA-51 and -54 to remain under industrial and reserve use.

4.3.6 Watershed Aggregate 3.6—Lower Mortandad/Cañada del Buey Aggregate

The majority of the Lower Mortandad/Cañada del Buey Aggregate, identified in Maps 4.3.6-a, 4.3.6-a′, 4.3.6-b, and 4.3.6-b′, lies within San Ildefonso Pueblo. The aggregate also includes a small portion of Laboratory TA-36 (the northeastern corner) and the southeastern portion of TA-54. Descriptions of TA-36 and -54 are provided in Appendix A.

The portion of TA-36 within this aggregate contains no legacy waste sites and no potential hazardous operational facilities or other potential sources of contamination.

For Laboratory lands within this aggregate, land use is industrial or reserve. For lands within San Ildefonso Pueblo within this aggregate, land use is residential or recreational. In addition, San Ildefonso Pueblo uses its lands within this aggregate for traditional purposes.

4.3.6.1 Lower Mortandad/Cañada del Buey Aggregate, Current State

The Lower Mortandad/Cañada del Buey Aggregate, identified in Map 4.3.6-a, contains no legacy waste sites.

Map 4.3.6-a′ identifies the single operational potential hazard located within the Lower Mortandad/Cañada del Buey Aggregate:

- the TA-54 Area G[7] waste management site. Area G operations include low-level radioactive waste treatment and disposal; legacy transuranic waste container exhumation, venting, and storage; the Green-is-Clean Project (identifies wastes that do not contain radionuclides and may be disposed of as solid waste); and mixed-waste certification for off-site shipment.

No Laboratory NPDES-permitted outfalls drain into this aggregate. Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-54 (except buildings within Area G), including several administrative, technical, and physical-support buildings and structures. No buildings are located within the portion of TA-36 that is located within this aggregate.

[7] Area G straddles the boundary of two watershed aggregates: the north boundary of the Lower Pajarito Canyon Aggregate and the south boundary of the Lower Mortandad/Cañada del Buey Aggregate. The majority of the site is located within the Lower Pajarito Canyon Aggregate.

4.3.6.2 Lower Mortandad/Cañada del Buey Aggregate, Future State

Map 4.3.6-b represents the future state of legacy waste sites subject to corrective action in the Lower Mortandad/Cañada del Buey Aggregate. Because there are no legacy waste sites within this aggregate, Map 4.3.6-b shows no change from Map 4.3.6-a.

The Laboratory has developed a work plan for investigating the Cañada del Buey canyon system as part of the work plan for investigating Sandia Canyon and Cañada del Buey. Data will be collected to assess current and future risk associated with potentially contaminated sediments and to improve the understanding of transport processes. Activities will include geomorphic surveys. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also will include sampling and analyzing alluvial, perched, and regional groundwater and, as necessary, will support ecological risk assessments and biota sampling and analyses.

Per the schedule in the Consent Order and in association with the corrective measure underway at MDA G, TA-54 Area G will be closed by 2015.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Lower Mortandad/Cañada del Buey Aggregate and a report documenting the investigation.

Map 4.3.6-b′ shows the potential hazards associated with the future operational use of TA-36 and -54. The Laboratory's current long-range plan is for TA-36 and -54 to remain under industrial and reserve use.

4.4 The Pajarito Watershed

The Pajarito Watershed, identified in Map 4.0, is a southeast-to-south-trending drainage that originates on the slopes of the Sierra de los Valles on the eastern boundary of the Valles Caldera National Preserve at an elevation of 10,440 ft asl. The drainage extends into Forest Service land for 2.9 mi before crossing into the western boundary of the Laboratory at TA-03, -08, -62, and -69. The drainage extends across the entire central portion of the Laboratory before crossing the eastern boundaries of TA-36 and -54 and entering into the community of White Rock (land owned by Los Alamos County and private individuals). The drainage extends across White Rock for 3.4 mi before joining the Rio Grande at an elevation of 5422 ft asl. The drainage is 15.4 mi long from its headwaters to its confluence with the Rio Grande and drains an area of 12.8 mi^2.

On a regional scale, Pajarito Canyon alternates between perennial and intermittent flow. Springs support perennial flow in the upper canyon, followed by an intermittent reach to within 0.5 mi west of the Laboratory boundary. At about 1.0 mi east of the western Laboratory boundary, Homestead Spring supports another perennial reach for at least several hundred yards, followed by an intermittent and/or ephemeral reach that extends down to the confluence with Threemile Canyon. East of this confluence, Pajarito Canyon is ephemeral across Laboratory land and White Rock to a point 0.4 mi upstream from its confluence with the Rio Grande. At this point, Pajarito Spring (a large perennial spring fed by the regional aquifer) supports perennial flow for the remainder of the distance to the Rio Grande. In most years, snowmelt flows in the watershed for periods ranging from a few days to a few weeks. Snowmelt occasionally extends downstream as far as the confluence with the Rio Grande.

Several hiking trails provide recreational access to the portion of Pajarito Canyon both within the Laboratory and the community of White Rock. Although the trails on Laboratory lands are restricted to Laboratory personnel, residents of White Rock have unrestricted access to the portion of the canyon within White Rock.

Surface water in the Pajarito Watershed is monitored under the Laboratory's surface-water monitoring program. The Laboratory's site-wide groundwater monitoring program monitors the alluvial and regional aquifers. Water supply, alluvial, and regional aquifer wells are located in the watershed, but there are no intermediate wells. In accordance with the Consent Order, the Laboratory submitted an *Interim Site-Wide Groundwater Monitoring Plan* to NMED. As part of this process, the Laboratory is continuing to develop a monitoring well network (which must ultimately be approved by NMED) to be used for the continued monitoring of groundwater.

The Pajarito Watershed consists of three canyons (Pajarito, Twomile, and Threemile) and the adjacent mesa tops that drain into these canyons. A brief description of each canyon follows.

Pajarito Canyon originates on the eastern slopes of the Sierra de los Valles in Valles Caldera National Preserve land at an elevation of 10,440 ft asl. The canyon trends east-southeast across Valles Caldera National Preserve land for 2.1 mi before crossing into the Santa Fe National Forest. After passing through 2.9 mi of the Santa Fe National Forest, the canyon enters the western boundary of the Laboratory along the common boundary of TA-08 and -69. The canyon crosses through the central portion of the Laboratory, passing through several TAs. It is joined by Twomile Canyon near the southwestern corner of TA-66 and by Threemile Canyon in the southern portion of TA-18. Other tributaries on Laboratory lands are the south fork of Pajarito Canyon, also known as Starmer Gulch, the north Anchor East Basin, also known as Arroyo de LaDelfe, and south Anchor East Basin. These tributaries are located in TA-08 and -09. After crossing through the Laboratory for 8.9 mi, the canyon enters Los Alamos County land and crosses the community of White Rock for 3.4 mi before reaching the Rio Grande in White Rock Canyon at an elevation of 5422 ft asl. Pajarito Canyon has a drainage area of 7.0 mi^2 and a channel length of 15.4 mi.

Streamflow in the canyon is discontinuously perennial in the uppermost and lowermost reaches and mostly ephemeral and/or intermittent throughout the canyon. Springs are located in upper Pajarito Canyon on Santa Fe National Forest land and on Laboratory land within the south fork of Pajarito Canyon and north Anchor East Basin. Springs also are present in TA-18 and in lower Pajarito Canyon within White Rock Canyon.

No Laboratory NPDES-permitted outfalls drain into Pajarito Canyon. Environmental investigations in Pajarito Canyon include monitoring that has been conducted since approximately 1970 by the Laboratory's Environmental Surveillance Program and documented in annual reports. This program includes monitoring surface water and sediments in the canyon. In addition, the Laboratory has conducted numerous investigations in association with the legacy waste sites located in and around the canyon.

Twomile Canyon originates on the slopes of the Sierra de los Valles in the Santa Fe National Forest at an elevation of 9822 ft asl. The canyon trends east-southeast for 2 mi across the Santa Fe National Forest and crosses the western boundary of the Laboratory at the common boundary of TA-62 and -69. The canyon continues across the Laboratory for 3.2 mi before joining Pajarito Canyon near the southwestern corner of TA-66 at an elevation of 6940 ft asl. Twomile Canyon has a drainage area of 2.5 mi^2 and a channel length of 5.2 mi. The canyon consists of several tributaries known as the north, main, southwest, and southeast forks of Twomile Canyon. Twomile Canyon is adjacent to TA-03, -50, -55, -58, -59, -62, -64, -66 and -69 and passes through former TA-07.

Streamflow in Twomile Canyon is generally ephemeral and/or intermittent with seasonal springs.

No Laboratory NPDES-permitted outfalls drain into Twomile Canyon, and the Laboratory's Environmental Surveillance Program does not conduct sampling in this canyon. The Laboratory has

conducted numerous investigations in association with the legacy waste sites located in and around the canyon.

Threemile Canyon originates on Laboratory property in the central portion of TA-14 at an elevation of 7440 ft asl. The canyon trends east-southeast across the Laboratory for 3.4 mi passing through TA-15, -36, and -06 before joining Pajarito Canyon in the southern portion of TA-18 at an elevation of 6738 ft asl. Threemile Canyon has a drainage area of 1.7 mi^2 and a channel length of 3.4 mi.

Stream flow in Threemile Canyon generally is ephemeral and/or intermittent with perennial springs supporting short reaches of perennial flow.

No Laboratory NPDES-permitted outfalls drain into Threemile Canyon, and the Laboratory's Environmental Surveillance Program does not conduct sampling in this canyon. The Laboratory has conducted numerous investigations in association with the legacy waste sites located in and around the canyon.

4.4.1 Watershed Aggregate 4.1—Twomile Canyon Aggregate

The Twomile Canyon Aggregate, identified in Maps 4.4.1-a, 4.4.1-a′, 4.4.1-b, and 4.4.1-b′, includes Forest Service land (Santa Fe National Forest) and portions of Laboratory TA-03, -06, -22, 40, -48, -50, -55, -58, -59, -62, -63, -64, -66, -69, and former TA-07. A description of each TA is provided in Appendix A.

No legacy waste sites and no potential hazardous operational facilities associated with TA-48, -50, or -55 are located within the Twomile Canyon Aggregate.

For Laboratory lands within this aggregate, land use is primarily industrial or reserve, but certain reserve areas are also used for recreational purposes. For lands within the Santa Fe National Forest within this aggregate, land use is recreational.

4.4.1.1 Twomile Canyon Aggregate, Current State

Map 4.4.1-a shows the legacy waste sites located within the Twomile Canyon Aggregate. Legacy waste sites within this aggregate include storage areas, surface disposal areas, landfills, areas of potential soil contamination, waste lines, sumps, tanks, septic systems, outfalls, an active wastewater treatment system, firing sites, an MDA, and a former incinerator. A complete listing of the sites within this aggregate is included in Appendix B, Table B-4.1. No legacy waste sites are present in the portions of TA-48, -55, -58, -62, -63, and -66 within this aggregate.

Five of the firing sites within the Twomile Canyon Aggregate are listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5). These are legacy waste sites 06-003(a) and C-06-019, which are part of Consolidated Unit 06-003(a)-99; 06-003(h); and 07-001(c and d), which are part of Consolidated Unit 07-001(a)-99. Legacy waste site 06-003(h) and Consolidated Units 06-003(a)-99 and 07-001(a)-99 are shown on Map 16 of Appendix C.

No significant sources of contamination from legacy waste sites or operational facilities occur within this aggregate.

Map 4.4.1-a′ indicates that the Twomile Canyon Aggregate and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.4.1.2 Twomile Canyon Aggregate, Future State

Map 4.4.1-b represents the future state of the legacy waste sites subject to corrective action in the Twomile Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because a portion of this aggregate is used for recreational purposes, corrective actions may be conducted to achieve levels protective of human health under recreational uses when appropriate.

The five legacy waste sites within this aggregate that are active firing sites and listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5) will likely remain active past 2015. These sites will remain under DOE operational control until they become inactive, at which time they will be investigated and, if appropriate, remediated.

The Laboratory has submitted a work plan for investigating the Pajarito Canyon system. The work plan was approved by NMED. Data are currently being collected to assess current and future risk associated with potentially contaminated sediments and to improve the understanding of transport processes. Activities include geomorphic surveys. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also will include sampling and analyzing perched and regional groundwater, and, as necessary, will support ecological risk assessments and biota sampling and analyses.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Twomile Canyon Aggregate and a report documenting the investigation.

Map 4.4.1-b′ shows the potential hazards associated with the future operational use of TA-03, -06, -22, -40, -48, -50, -55, -58, -59, -62, -63, -64, -66, and -69. The Laboratory's current long-range plan is for TA-03, -06, -22, 40, -48, -50, -55, -58, -62, -63, -64, -66, and -69 to remain under industrial and reserve use and for TA-59 to change from industrial and reserve use to reserve use only. Because no Laboratory operational potential hazards are currently located within the Twomile Canyon Aggregate or planned for the future, Map 4.4.1-b′ shows no difference from Map 4.4.1-a′.

4.4.2 Watershed Aggregate 4.2—Starmer/Upper Pajarito Canyons Aggregate

The Starmer/Upper Pajarito Canyons Aggregate, identified in Maps 4.4.2-a, 4.4.2-a′, 4.4.2-b, and 4.4.2-b′, includes Forest Service land (Santa Fe National Forest) and portions of Laboratory TA-06, -08, -09, -14, -15, -18, -22, -36, -40, -46, -51, -54, -66, -67, and -69. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is primarily industrial or reserve. For lands within the Santa Fe National Forest within this aggregate, land use is recreational.

4.4.2.1 Starmer/Upper Pajarito Canyons Aggregate, Current State

Map 4.4.2-a shows the legacy waste sites located within the Starmer/Upper Pajarito Canyons Aggregate. Legacy waste sites within this aggregate include storage areas, surface disposal areas, landfills, surface impoundments, sumps, settling tanks, underground tanks, septic systems, drainlines, outfalls, firing sites, three MDAs, burn areas, and areas of potential soil contamination. A complete listing of the sites within this aggregate is included in Appendix B, Table B-4.2.

No significant sources of contamination from legacy waste sites or operational facilities occur within this aggregate. No legacy waste sites are present in the portions of TA-06, -14, -15, -18, -36, -46, -51, -66, -67, and -69 within this aggregate.

Map 4.4.2-a′ shows that a single operational potential hazard is located within the Starmer/Upper Pajarito Canyons Aggregate:

- TA-08, Radiography Facility, Building 08-120, which has a limited radiography capability.

No Laboratory NPDES-permitted outfalls drain into this aggregate. Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-06, -08 (except Building 08-120), -09, -14, -15, -18, -22, -36, -40, -46, -51, -54, -66, -67, and -69, including several administrative, technical, and physical-support buildings and structures. These are

- for TA-08, a high-explosives magazine (Structure 16-32);
- for TA-09, high-explosive process facilities;
- for TA-22, high-explosive storage and process facilities and a shed used for solvent storage; and
- for TA-40, firing sites and high explosives storage magazines.

TA-67 contains no buildings or structures.

4.4.2.2 Starmer/Upper Pajarito Canyons Aggregate, Future State

Map 4.4.2-b represents the future state of the legacy waste sites subject to corrective action in the Starmer/Upper Pajarito Canyons Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because a portion of this aggregate is used for recreational purposes, corrective actions may be conducted to achieve levels protective of human health under recreational uses when appropriate.

The Laboratory has submitted a work plan for investigating the Pajarito Canyon system. The work plan was approved by NMED. Data are currently being collected to assess current and future risk associated with potentially contaminated sediments and to improve the understanding of transport processes. Activities include geomorphic surveys. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also will include sampling and analyzing perched and regional groundwater, and, as necessary, will support ecological risk assessments and biota sampling and analyses.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Starmer/Upper Pajarito Canyons Aggregate and a report documenting the investigation.

Map 4.4.2-b′ shows the potential hazards associated with the future operational use of TA-06, -08, -09, -14, -15, -18, -22, -36, -40, -46, -51, -54, -66, -67, and -69. The Laboratory's current long-range plan is for these TAs to remain under industrial and reserve use.

4.4.3 Watershed Aggregate 4.3—Threemile Canyon Aggregate

The Threemile Canyon Aggregate, identified in Maps 4.4.3-a, 4.4.3-a′, 4.4.3-b, and 4.4.3-b′, includes portions of Laboratory TA-14, -15, -18, -36, and -67 and former TA-12. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is primarily industrial or reserve.

4.4.3.1 Threemile Canyon Aggregate, Current State

Map 4.4.3-a shows the legacy waste sites located within the Threemile Canyon Aggregate. Legacy waste sites within this aggregate include storage areas, surface disposal areas, a sump, an underground tank, septic systems, drainlines, outfalls, several firing sites (both active and inactive), a burn area, a radiological test site, two firing test shafts, and areas of potential soil contamination. A complete listing of the sites within this aggregate is included in Appendix B, Table B-4.3. No legacy waste sites are present in the portion of TA-67 within this aggregate.

One of the legacy waste sites located within the Threemile Canyon Aggregate is an active firing site, known as the Ector Firing site.

> The Ector Firing Site [legacy waste site 15-006(b) in Appendix C, Map 19], located within TA-15, is used for dynamic radiography of explosion-driven weapons components. This firing site was originally established in 1973 and used periodically until 1982. The Ector radiography machine was then constructed at this site, and the site has operated with this machine from the mid-1980s until the present. Structures associated with the firing site are a firing-point chamber (Structure 15-276), a multidiagnostic hydrotest building (Building 15-306), and blast protection (Structure 15-319). Materials used in the tests at this site include uranium, beryllium, lead, and high explosives. Past environmental surveys at this site include an aerial radiological survey conducted in 1982 that determined radioactivity to be at background values. A 1991 surface radiation survey identified elevated contact exposure rates on blast mats and shields and on chunks of uranium in soil. Surface and subsurface soil samples were collected in 1991 under the Sanitary Wastewater Collection System Project. These samples determined uranium to be present above background values. Inorganic chemicals did not exceed background values, and organic chemicals and high explosives were not detected. The Ector Firing Site is listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

No significant sources of contamination from legacy waste sites or operational facilities occur within this aggregate.

Map 4.4.3-a′ indicates that no Laboratory operational potential hazards are located within the Threemile Canyon Aggregate. The Laboratory has no current operational facilities within this aggregate, and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.4.3.2 Threemile Canyon Aggregate, Future State

Map 4.4.3-b represents the future state of the legacy waste sites subject to corrective action in the Threemile Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial uses.

The active Ector Firing Site [legacy waste site 15-006(b)], which is listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5) will likely remain active past 2015. This site will remain under DOE operational control until it becomes inactive, at which time it will be investigated and, if appropriate, remediated.

The Laboratory submitted a work plan for investigating the Pajarito Canyon system. The work plan was approved by NMED. Data are currently being collected to assess current and future risk associated with potentially contaminated sediments and to improve the understanding of transport processes. Activities

include geomorphic surveys. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also will include sampling and analyzing perched and regional groundwater, and, as necessary, will support ecological risk assessments and biota sampling and analyses.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Threemile Canyon Aggregate and a report documenting the investigation.

Map 4.4.3-b′ shows that no potential hazards are associated with the future operational use of TA-14, -15, -18, -36, and -67. Because there are no Laboratory operational facilities currently within this aggregate or planned for the future, Map 4.4.3-b′ shows no change from Map 4.4.3-a′. The Laboratory's current long-range plan is for TA-14, -15, -18, -36, and -67 to remain under industrial and reserve use.

4.4.4 Watershed Aggregate 4.4—Lower Pajarito Canyon Aggregate

The Lower Pajarito Canyon Aggregate, identified in Maps 4.4.4-a, 4.4.4-a′, 4.4.4-b, and 4.4.4-b′, includes a portion of the White Rock community (land owned by Los Alamos County and private individuals) and portions of Laboratory TA-18, -36, -54 and former TA-27. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is primarily industrial or reserve. For White Rock Community lands within this aggregate, land use is residential and recreational.

4.4.4.1 Lower Pajarito Canyon Aggregate, Current State

Map 4.4.4-a shows the legacy waste sites located within the Lower Pajarito Canyon Aggregate. Legacy waste sites within this aggregate include storage areas, sumps, aboveground and underground tanks, septic systems, drainlines, outfalls, former firing sites and mortar impact areas, one MDA, areas of potential soil contamination, and a former sanitary wastewater treatment system. A complete listing of the sites within this aggregate is included in Appendix B, Table B-4.4. No legacy waste sites are present in the portion of TA-36 within this aggregate.

One of the legacy waste sites located within the Lower Pajarito Canyon Aggregate is formerly used MDA G, located at TA-54. The Laboratory maintains fencing and radiological postings around this MDA.

> MDA G [Consolidated Unit 54-013(b)-99 in Appendix C, Map 18] consists of inactive subsurface units within TA-54 Area G that no longer receive waste. Portions of MDA G began operation in 1957. DOE initially authorized MDA G for the disposal of low-level radioactive waste and for the temporary placement of transuranic waste. In 1974, MDA G began receiving retrievable transuranic and mixed transuranic waste. MDA G ceased receiving wastes in 1997. Sampling of sediment and surface water runoff downgradient from MDA G has been part of the Laboratory's environmental surveillance activities since 1982. Data indicate low levels of tritium, plutonium, and cesium at concentrations above background levels but below soil-screening levels. MDA G has undergone intense scrutiny as both a permitted RCRA storage facility and as an authorized DOE low-level waste disposal facility. In addition, MDA G has undergone intensive investigation as a legacy waste cleanup site. Site characterization to determine the nature and extent of contaminants beneath MDA G was completed in 2005, and an investigation report was submitted to NMED in September 2005. The MDA is known to have subsurface vapor-phase plumes of volatile organic compounds and tritium, but no other releases have been found in the subsurface.

The most significant source of contamination in the canyon within this aggregate resulted from discharges from the TA-18 former wastewater-treatment plant:

> Former TA-18 Sanitary Wastewater-Treatment System [Consolidated Unit 18-001(a)-00 in Appendix C, Map 18] consists of legacy waste sites 18-001(a) and 18-001(b), which comprised the sanitary wastewater system for the central part of TA-18 [excluding Critical Assembly Storage Areas (CASAs) 1, 2, and 3] from before 1969 until 1992, when a new sewage treatment plant at TA-46 went into service. Liquid waste that discharged into this system consisted of sanitary sewage, wash water from laboratory industrial drains and sinks, and photochemical wastes. Legacy waste site 18-001(a) is the location of two historic sanitary sewage lagoons, the associated sewer line, and outfall. Legacy waste site 18-001(b) consists of drainlines that carried sanitary wastewater from TA-18 buildings to lagoons that discharged the wastewater to a former NPDES-permitted outfall in Pajarito Canyon. The Laboratory conducted a voluntary corrective action at legacy waste site 18-001(a) in 1995. Although no RCRA-regulated potential contaminants presented a health risk, the voluntary corrective action was performed to eliminate any health or safety hazard from non-RCRA constituents in the lagoons. The concrete portion of the berms was left intact and the asphalt portion was bulldozed into the lagoons as fill material. Clean fill dirt was brought from another location to complete filling the lagoons. The area was graded to match the surrounding area and was seeded with native grasses. The voluntary corrective action report recommended no further action for the site. The Laboratory conducted an expedited cleanup at legacy waste site 18-001(b) in 1995. The cleanup consisted of pouring approximately 1 yd^3 of concrete into the bottom of each manhole to plug the inlet and outlet portions of the sewer line at each manhole. The top portion of each manhole was removed; checked for radionuclides; and disposed of, following appropriate regulations. Open excavations were backfilled with soil and graded to blend the backfill with the surrounding terrain. The areas were reseeded with native grasses. The expedited cleanup report recommended no further action.

Map 4.4.4-a′ identifies the operational potential hazards located within the Lower Pajarito Canyon Aggregate. These are

- The TA-18 CASA 1 (Building 18-23), which is used for the remote assembly of critical experiments; and
- The TA-54 Area G[8] waste-management site, where operations include low-level radioactive waste treatment and disposal; legacy transuranic waste container exhumation, venting, and storage; the Green-is-Clean Project (identifies wastes that do not contain radionuclides and may be disposed of as solid waste); and mixed-waste certification for off-site shipment.

No Laboratory NPDES-permitted outfalls drain into this aggregate. Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures (not previously mentioned) within TA-18, -36, and -54, including several administrative, technical, and physical-support buildings and structures. For TA-18, these include the Accelerator Development Laboratory (Building 18-227) and a storage shed used to store beryllium. For TA-36, these include high-explosive storage and testing areas.

[8] Area G straddles the boundary of two watershed aggregates: the north boundary of the Lower Pajarito Canyon Aggregate and the south boundary of the Lower Mortandad/Cañada del Buey Aggregate. The majority of the site is located within the Lower Pajarito Canyon Aggregate.

4.4.4.2 Lower Pajarito Canyon Aggregate, Future State

Map 4.4.4-b represents the future state of the legacy waste sites subject to corrective action in the Lower Pajarito Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because a portion of this aggregate is used for recreational and residential purposes, corrective actions may be conducted to achieve levels protective of human health under residential or recreational uses when appropriate.

The Laboratory has submitted a work plan for investigating the Pajarito Canyon system. The work plan was approved by NMED. Data are currently being collected to assess current and future risk associated with potentially contaminated sediments and to improve the understanding of transport processes. Activities include geomorphic surveys. Analyses will include radionuclides, inorganic chemicals, and organic chemicals. The investigations also will include sampling and analyzing perched and regional groundwater, and, as necessary, will support ecological risk assessments and biota sampling and analyses.

Per the schedule in the Consent Order and in association with the corrective measure underway at MDA G, TA-54 Area G must and will be closed by 2015.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Lower Pajarito Canyon Aggregate and a report documenting the investigation. Prior to the completion of corrective actions at MDA G and the closure of Area G, the legacy waste disposition project will complete the characterization and shipment of TRU waste in storage, the retrieval and shipment of retrievable TRU waste, and the treatment and disposal of remaining legacy mixed low-level waste.

Map 4.4.4-b′ shows the potential hazards associated with the future operational use of TA-18, -36, and -54. The Laboratory's current long-range plan is for these TAs to remain under industrial and reserve use.

4.5 The Water Canyon/Cañon de Valle Watershed

The Water Canyon/Cañon de Valle Watershed, identified in Map 4.0, is an east-to-southeast trending drainage that originates on the eastern slopes of the Sierra de los Valles in the Valles Caldera National Preserve at an elevation of 10,380 ft asl. The watershed remains on the Valles Caldera National Preserve for 0.4 mi, then passes through 2.8 mi of the Santa Fe National Forest before it crosses into the Laboratory at the western boundary of TA-16. The drainage extends east/southeast 9.7 mi across the entire Laboratory before it crosses into the community of White Rock. The drainage passes through White Rock for 0.5 mi before joining the Rio Grande at an elevation of 5427 ft asl. The drainage extends 13.8 mi from its headwaters to its confluence with the Rio Grande, draining an area of 19 mi^2.

The Water Canyon/Cañon de Valle Watershed consists mainly of occasional perennial reaches arising from springs that occur in the upper reaches of the watershed; however, Potrillo and Fence Canyons are entirely ephemeral in character.

Surface water in the Water Canyon/Cañon de Valle Watershed is monitored under the Laboratory's surface-water monitoring program. The Laboratory's site-wide groundwater monitoring program monitors the alluvial and regional aquifers. Alluvial, regional aquifer, and intermediate wells are located in the watershed, but there are no water supply wells. In accordance with the Consent Order, the Laboratory submitted an *Interim Site-Wide Groundwater Monitoring Plan* to NMED. As part of this process, the

Laboratory is continuing to develop a monitoring well network (which must ultimately be approved by NMED) to be used for the continued monitoring of groundwater.

Currently, hiking trails provide recreational access to the portion of the drainage west of the Laboratory boundary on Forest Service land. Local residents and Laboratory employees use this area for activities such as hiking, biking, jogging, and camping.

The Water Canyon/Cañon de Valle Watershed is important to the Laboratory's Environmental Programs for the following reasons:

- High explosives and other contaminants detected in springs, alluvial groundwater, and perched groundwater exceed EPA health advisory levels.
- The amount and distribution of contaminants contained in the watershed.

The Water Canyon/Cañon de Valle Watershed includes numerous sites that have been used for testing and developing weapons components. Several of these sites have been inactive since the early 1950s, while others remain in use. Potential contaminant releases into the drainage as a result of these operations include high explosives, organic chemicals, radionuclides, and metals. Elevated concentrations of barium and high-explosive compounds have been measured in sediment and surface water in the watershed. The Laboratory has begun to characterize the nature and extent of contamination in sediments, surface water, and alluvium along the canyons. This characterization will supplement aggregate-specific investigations and corrective actions to ensure a future state that is sustainably protective of humans and sensitive ecosystem habitats.

The Water Canyon/Cañon de Valle Watershed consists of five canyons (Water, de Valle, Potrillo, Fence, and Indio) and the adjacent mesa tops that drain into these canyons. A brief description of each of these canyons follows:

Water Canyon originates west of the Laboratory on the eastern slopes of the Sierra de Los Valles in the Santa Fe National Forest at an elevation of 9943 ft asl. The canyon extends east-southeast 2.6 mi across the Santa Fe National Forest before crossing into the Laboratory at the western boundary of TA-16. The canyon extends east-southeast across the entire Laboratory and is joined by Cañon de Valle and Potrillo Canyon just before it crosses into the community of White Rock. The canyon extends through White Rock for 0.5 mi before reaching the Rio Grande at an elevation of 5427 ft asl. Water Canyon has a channel length of 13.8 mi and a drainage area of 8.8 mi^2. The canyon passes through Laboratory TA-15, -16, -36, -37, -68, and -71. In addition, some TA-11 and -49 sites are associated with the canyon. The canyon includes a small tributary, S-Site Canyon, which originates in TA-16 and joins Water Canyon just above its confluence with Cañon de Valle. S-Site Canyon has a channel length of 2.1 mi, a drainage area of 0.8 mi^2, and contains one spring (Martin Spring).

On a regional scale, Water Canyon is an interrupted stream. Several perennial springs are located in the upper reaches of Water Canyon and Cañon de Valle (the major subdrainage to Water Canyon). Streamflow is ephemeral over most of the canyon passing through Laboratory property. Several perennial springs are located in upper Water Canyon in the Santa Fe National Forest, including Armistead Spring and American Spring. These springs result in perennial reaches. A small perennial spring in lower Water Canyon, below the confluence with Potrillo Canyon, supports a very short perennial reach. Snowmelt seldom extends downstream as far as the Laboratory boundary. Some anthropogenic flow occurs in Water Canyon from near the southwest boundary of the Laboratory to the confluence with Cañon de Valle. The anthropogenic flow results from discharges from the Water Canyon gallery, which is located in Water Canyon west of Laboratory. Two active NPDES-permitted outfalls drain into the lower reaches of Water Canyon. NPDES-permitted outfall 03A028 is associated

with a power-control building and cooling tower at TA-15. NPDES-permitted outfall 03A185 is associated with the Dual-axis Radiographic/Radiography Hydrotest (DARHT) facility, also located at TA-15.

Environmental monitoring has been conducted in Water Canyon by the Laboratory's Environmental Surveillance Program and documented in annual reports. This program includes monitoring surface water and sediments in the canyon as well as spring and runoff sampling. In addition, the Laboratory has conducted numerous investigations and remedial actions in association with the legacy waste sites located in and around the canyon.

Cañon de Valle originates west of the Laboratory, on the eastern slopes of the Sierra de Los Valles in the Valles Caldera National Preserve at an elevation of 10,389 ft asl. The canyon extends east-southeast for 0.4 mi, crosses into the Santa Fe National Forest and continues east-southeast for 2.8 mi before entering the Laboratory at the western boundary of TA-16. The canyon extends east-southeast across the entire length of TA-16 to its eastern boundary, where it turns south, straddling the boundary between TA-15 and -37 for 0.8 mi before eventually joining Water Canyon at the juncture of TA-15, -37, and -49 at an elevation of 6812 ft asl. Cañon de Valle has a channel length of 7.5 mi and a drainage area of 4.2 mi^2.

Streamflow in Cañon de Valle is interrupted upstream of the Laboratory's western boundary and is largely ephemeral on Laboratory property with short perennial reaches in the upper portion of the canyon. Several perennial springs located in the Santa Fe National Forest in upper Cañon de Valle result in perennial reaches. Cañon de Valle contains one active NPDES-permitted outfall (05A055), which is associated with the TA-16 high-explosives wastewater-treatment facility (Building 16-1507). In addition, one active (03A130) and one inactive (05A097) NPDES-permitted outfall drains/formerly drained into S-Site Canyon, a tributary of Cañon de Valle. The inactive outfall has been requested for deletion from the Laboratory's NPDES permit. The active outfall is associated with the TA-11 vibration test building (Building 11-30).

Environmental investigations in Cañon de Valle include routine sediment and runoff sampling performed by the Laboratory's Environmental Surveillance Program and documented in annual reports. In addition, the Laboratory has conducted numerous investigations and remedial actions in association with the legacy waste sites located in and around the canyon.

Potrillo Canyon originates on Laboratory property in the central portion of TA-15 at an elevation of 7280 ft asl. The canyon extends southeast across the Laboratory for 6.5 mi through TA-15, -36, and -71 before joining Water Canyon at an elevation of 5810 ft asl in the southeastern portion of TA-71 (near the northern boundary of TA-71). Potrillo Canyon has a channel length of 6.5 mi and a drainage area of 3.4 mi^2.

Streamflow in Potrillo Canyon is entirely ephemeral, occurring only during rainfall runoff. Potrillo Canyon has no perennial springs and no perennial reaches.

No Laboratory NPDES-permitted outfalls drain into Potrillo Canyon. Environmental investigations in Potrillo Canyon include routine sediment and runoff sampling by the Laboratory's Environmental Surveillance Program and documented in annual reports. In addition, the Laboratory has conducted numerous investigations in association with the legacy waste sites located in and around the canyon.

Fence Canyon originates on Laboratory property near the western boundary of TA-36 at an elevation of 7094 ft asl. The canyon extends southeast and runs near the northern boundaries of TA -68 and

-71 before joining Potrillo Canyon in the northeastern corner of TA-71 at an elevation of 6426 ft asl. Fence Canyon has a channel length of 3.1 mi and a drainage area of 1.1 mi^2.

Streamflow in Fence Canyon is ephemeral and results primarily from rainfall runoff. The canyon contains no perennial springs or perennial reaches.

No Laboratory NPDES-permitted outfalls drain into Fence Canyon. Environmental investigations in Fence Canyon include routine sediment sampling performed by the Laboratory's Environmental Surveillance Program and documented in annual reports.

Indio Canyon originates on Laboratory property in the north-central portion of TA-39 (near its northern boundary) at an elevation of 6863 ft asl. The canyon extends southeast and joins Water Canyon in the southwestern corner of TA-71 at an elevation of 6380 ft asl. Indio Canyon has a channel length of 1.2 mi and a drainage area of 0.7 mi^2.

Streamflow in Indio Canyon is ephemeral, occurring only during rainfall runoff. Indio Canyon has no perennial springs or perennial reaches.

No Laboratory NPDES-permitted outfalls drain into Indio Canyon. Environmental investigations in Indio Canyon include routine sediment and runoff sampling performed by the Laboratory's Environmental Surveillance Program and documented in annual reports.

4.5.1 Watershed Aggregate 5.1—Potrillo/Fence Canyons Aggregate

The Potrillo/Fence Canyons Aggregate, identified in Maps 4.5.1-a, 4.5.1-a′, 4.5.1-b, and 4.5.1-b′, includes a portion of the White Rock community (land owned by Los Alamos County and private individuals) and portions of Laboratory TA-15, -36, -68, and -71. A description of each TA is provided in Appendix A.

The portions of TA-68 and -71 located within this aggregate contain no legacy waste sites and no operational facilities or other potential sources of contamination.

For Laboratory lands within the Potrillo/Fence Canyons Aggregate, land use is industrial or reserve. For White Rock Community lands within this aggregate, land use is residential and recreational.

4.5.1.1 Potrillo/Fence Canyons Aggregate, Current State

Map 4.5.1-a shows the legacy waste sites located within the Potrillo/Fence Canyons Aggregate. Legacy waste sites within this aggregate include septic systems, storage areas, active and inactive firing sites, a disposal pit and burn site, underground tanks, surface disposal areas, areas of potential soil contamination, and two MDAs. A complete listing of the sites within this aggregate is included in Appendix B, Table B-5.1.

The most significant sources of contamination in the canyon within the Potrillo/Fence Canyons Aggregate are associated with several firing sites:

The TA-15 Pulsed, High-Energy, Radiographic Machine Emitting X-rays (PHERMEX) Firing Point [legacy waste site 15-006(a), part of Consolidated Unit 15-003-00 in Appendix C, Map 21] consists of an inactive firing point where explosives were detonated in tests formerly conducted at PHERMEX. PHERMEX is currently in the process of being shut down. Materials used include uranium, beryllium, lead, mercury, thorium, and high explosives. Environmental surveys at the PHERMEX firing point include an aerial radiological survey conducted in 1982 that identified elevated levels of uranium-238. Surface soil sampling conducted in 1987 and 1994 identified elevated concentrations of uranium and

beryllium. A 1991 surface radiation survey identified elevated contact exposure rates suspected of being associated with chunks of depleted uranium at the firing point. Firing Site 15-006(a) is listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

The TA-36 Eenie Firing Site [legacy waste site 36-004(a) contained within Consolidated Unit 36-006-99 in Appendix C, Map 21] consists of an active firing site that was constructed in 1951. Materials used in shots conducted at the site include lead oxide, mercury, copper, nickel, brass, and depleted uranium. The hazard radius for the firing site is 3000 ft. Activities conducted at the site have also included firing shoulder-mounted projectiles into targets. Environmental investigations conducted at the Eenie Firing Site consist of sediment sampling in the stream channel that drains the site. Uranium was detected in these samples. Firing Site 36-004(a) is listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

The TA-36 Meenie Firing Site [legacy waste site 36-004(b) in Appendix C, Map 21] consists of an active firing site constructed in 1950. The site has been used extensively for gun firing, with shots fired into a cliff north of the firing area and into an embankment south of the firing area. Shots fired at this site have involved up to 300 lb of high explosives. Lead bricks were often used in shots until 1971 and were sometimes pulverized during detonation. Other potential contaminants include barium, beryllium, depleted uranium, and mercury. An RFI investigation was conducted at the Meenie Firing Site in 1994. Field activities included the investigation of off-site migration of potential contaminants via major drainage channels. Sediment catchment areas having substantial accumulations of fine particles were identified and sediments from each were sampled. Four surface sediment samples were collected and submitted to an off-site analytical laboratory for analysis of organic chemicals, inorganic chemicals, and radionuclides. Inorganic chemicals and radionuclides were detected above background/fallout values but not above screening action levels. No organic chemicals were detected. Firing Site 36-004(b) is listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

The TA-36 Minie Firing Site [legacy waste site 36-004(c) in Appendix C, Map 21] consists of an active firing site constructed in 1950. The site has been extensively used to conduct armor-piercing experiments. The Minie Firing Site has also been used for open detonation of scrap high explosives. In addition, emergency detonation of leaking gas cylinders has been performed on an infrequent basis. Potential contaminants include barium, beryllium, depleted uranium, lead, and mercury. An RFI investigation was conducted at this firing site in 1994. Field activities included the investigation of off-site migration of potential contaminants via major drainage channels. Sediment catchment areas having substantial accumulations of fine particles were identified and sediments from each were sampled. Four surface sediment samples were collected and submitted to an off-site analytical laboratory for analysis of organic chemicals, inorganic chemicals, and radionuclides. Inorganic chemicals and radionuclides were detected above background/fallout values but not above screening action levels. No organic chemicals were detected.

The TA-36 Lower Slobbovia Firing Site [legacy waste site 36-004(d) in Appendix C, Map 21] consists of an active firing site that includes two firing points, an inactive firing site (the Skunk Works), and inactive burn pits. One firing point was constructed in 1950 and the second in 1986. Shots conducted at Lower Slobbovia have generally involved only high explosives. Less than 2% of the shots involved significant amounts of metal (e.g., depleted uranium, lead, copper, aluminum, and steel). The largest shot fired at Lower Slobbovia used 6000 lb of high explosives. The Skunk Works Firing Site was used to conduct small explosives experiments in the 1950s. These experiments involved gas (acetylene and oxygen), liquid (tetranitromethane), and solid explosives. Beryllium and radioactive materials are not suspected to have been used at the site. This legacy

waste site also includes burn pits that were used for burning and disposing of test debris before the mid-1960s. The DOE Environmental Survey performed sampling of the Lower Slobbovia Firing Site in 1988. This effort involved the collection of five composite surface samples and analyses of these samples for inorganic chemicals and radionuclides. Results indicated elevated levels of copper, lead, uranium, and zinc. A Phase I RFI of the Skunk Works Firing Site and the burn pits was conducted from 1994 to 1996 to determine whether contamination was present. Phase I activities at the Skunk Works Firing Site included a radiological survey of the site and field screening for inorganic chemicals, organic chemicals, and high explosives. A surface and subsurface soil sample were collected at the former firing pad adjacent to Building 36-45, a depression northwest of Building 36-45, and a former battery storage room. A surface sediment sample was also collected from the drainage channel receiving surface runoff from the site. Phase I activities at the burn pits included the collection of subsurface soil samples. The samples were screened in the field for radioactivity, organic chemicals, and high explosives and submitted for laboratory analysis for inorganic chemicals, isotopic uranium, and organic chemicals. No inorganic chemicals were detected above background values. Uranium-235 was the only uranium isotope detected above fallout values at the Skunk Works Firing Site, and uranium-238 was the only radionuclide detected above fallout values at the burn pits, but neither was above its screening action level. No organic chemicals were detected at the Skunk Works. The results of the Phase I sampling and analysis do not indicate the presence of any potential contaminants at the Skunk Works Firing Site or at the burn pits. Two organic chemicals were detected at the burn pits, but these organic chemicals were detected at very low concentrations and are not expected to be associated with site activities. As a result, the RFI report recommended no further action for the Skunk Works and the burn pits. No request for permit modification was recommended, because investigations for other parts of legacy waste site 36-004(d) are being deferred until the site is no longer active. Firing Site 36-004(d) is listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

The TA-36 I-J Firing Site [legacy waste site 36-004(e) in Appendix C, Map 21] consists of an active firing site constructed in 1948. This firing site was in TA-15 until 1981, when the boundary of TA-36 was expanded to include I-J Site. Shots at I-J Site have used up to 500 lb of high explosives and have involved a variety of solid and liquid explosives and metals. All shots involving radioactive materials at this site were conducted in fully enclosed containment vessels. These vessels were then removed from the site for use at TA-15, though one was later returned to I-J Site. This returned vessel was identified in the *1990 Solid Waste Management Units Report* as legacy waste site C-36-001 and was removed from the site in 1994 and disposed of at TA-54, Area G. A surface radiological survey conducted in 1991 identified hot spots up to 255,000 counts/min. Because numerous pieces of depleted uranium were present at the site, an interim action was recommended. In 1997, an interim action plan was prepared that called for the removal of visible pieces of uranium from the firing site and surrounding area. The interim action plan also addressed legacy waste sites 15-008(f), 36-004(e), and C-36-006(e). Firing Site 36-004(e) is listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

Map 4.5.1-a′ indicates that no Laboratory operational potential hazards are located within the Potrillo/ Fence Canyons Aggregate and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.5.1.2 Potrillo/Fence Canyons Aggregate, Future State

Map 4.5.1-b represents the future state of the legacy waste sites subject to corrective action in the Potrillo/Fence Canyons Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Generally, any potential corrective actions will be conducted to achieve levels protective of human health under industrial use. However, because a

portion of this aggregate is used for recreational and residential purposes, corrective actions may be conducted to achieve levels protective of human health under residential or recreational uses when appropriate.

The six legacy waste sites (PHERMEX, Eenie, Meenie, Minie, Lower Slobbovia, and I-J) within this aggregate that are active firing sites listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5) will likely remain active past 2015. These sites will remain under DOE operational control until they become inactive, at which time they will be investigated and, if appropriate, remediated.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including Potrillo and Fence Canyons. These investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in Potrillo and Fence Canyons, including geomorphic surveys to identify sediment age and physical characterization, and to collect and analyze sediment samples. As appropriate, the work plan may also include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Potrillo/Fence Canyons Aggregate and a report documenting the investigation.

Map 4.5.1-b′ shows the potential hazards associated with the future operational use of TA-15, -36, -68, and -71. The Laboratory's current long-range plan is for these TAs to remain under industrial and reserve use. Because no Laboratory operational potential hazards are currently located within the Potrillo/Fence Canyons Aggregate or planned for the future, Map 4.5.1-b′ shows no difference from Map 4.5.1-a′.

4.5.2 Watershed Aggregate 5.2—Cañon de Valle Aggregate

The Cañon de Valle Aggregate, identified in Maps 4.5.2-a, 4.5.2-a′, 4.5.2-b, and 4.5.2-b′, includes portions of Laboratory TA-08, -09, -14, -15, -16, and -37 and former TA-13. A description of each TA is provided in Appendix A.

A Mexican spotted owl nest site exists in this aggregate, and the species may hunt over a wide area of the aggregate.

For Laboratory lands within this aggregate, land use is industrial or reserve.

4.5.2.1 Cañon de Valle Aggregate, Current State

Map 4.5.2-a shows the legacy waste sites located within the Cañon de Valle Aggregate. Legacy waste sites within this aggregate include septic systems, storage areas, active and inactive firing sites, an open burn/open detonation area, burn sites, an active incinerator, aboveground and underground tanks, dry wells, sumps and associated drainlines, surface disposal areas, outfalls and associated drainlines, settling ponds, filter units, landfills, high-explosives magazines, areas of potential soil contamination, and three MDAs. A complete listing of the sites within this aggregate is included in Appendix B.

One of the legacy waste sites located within the Cañon de Valle Aggregate is MDA P, located at TA-16.

> MDA P (legacy waste site 16-018 in Appendix C, Map 20) operated from 1950 until 1984 as a disposal site for debris that resulted from burning high explosives and high-explosives-contaminated material at TA-16. Concrete and construction debris were deposited directly onto the slopes leading

down the canyon. Other materials were burned at one of the nearby open-burn units, and the resulting debris or residue was also pushed over the mesa rim. The western area of MDA P received primarily construction debris from the demolition of World-War-II-era buildings; the eastern area received debris and residue from the open-burn units. Chemicals of primary concern at MDA P include detonable high explosives, high-explosive residues in soil, barium, and asbestos. Low levels of uranium and metals such as lead and cadmium were also detected. The Laboratory submitted a closure plan to NMED in 1995. The plan was approved in 1997 and Phase I work began to remove the waste from MDA P. The discovery of detonable high explosives in the MDA P landfill required the use of a remote excavator. Remote landfill excavation began in February 1999 and was completed in May 2000. Nonremote excavation of contaminated soil beneath the landfill resumed after Cerro Grande Fire recovery and was completed in March 2001. Waste disposal was completed in June 2001. Phase II confirmatory sampling and geophysical measurements began in June 2001. During the Phase II sampling, additional contamination was found, and additional excavation of localized contamination was completed. Nearly 55,000 yds^3 of soil, rock, metal, and concrete debris were excavated from MDA P. Of this quantity, 21,506 yds^3 of soil were disposed of as hazardous waste. The remainder consisted of industrial waste soils, concrete, and metal debris that were recycled or managed as industrial waste and rock that was decontaminated and then used as riprap within TA-16. Other excavated waste included 3947 lb of asbestos-containing material; 888 containers of unknown content; 95 miscellaneous metal objects; 3240 lb of low-level radioactive waste; 5389 lb of mixed waste; and various smaller quantities of high explosives, high-explosives-contaminated debris, and residuals from treating high explosives. The Laboratory submitted the final MDA P Area closure certification report to NMED in 2003. NMED approved the report and supporting documentation in November 2005.

The most significant source of contamination in the canyon within the Cañon de Valle Aggregate is the TA-16 260 High-Explosives Machining Outfall:

The 260 High-Explosives Machining Outfall [legacy waste site 16-021(c)-99 in Appendix C, Map 20] consists of 13 currently active high-explosives sumps and drainlines associated with Building 16-260, their outfall (former NPDES-permitted outfall 05A056), and a former pond and drainage. The outfall became inactive in November 1996 and was removed from the Laboratory's NPDES permit effective January 14, 1998. The sumps, drainlines, and outfall served a high explosives machining facility (Building 16-260) that was built in 1951. In 1966, the loading dock at the rear of Building 16-260 was removed, and new sumps with watertight aluminum liners were installed adjacent to the northeast wall of the building. High-explosives-contaminated soil under the old sumps was removed and replaced with clean compacted earth. The new sumps were connected by vitrified clay pipe to a 4-ft-deep concrete trough that paralleled Building 16-260. The feeder trough discharged into a second concrete trough that discharged into former NPDES-permitted outfall 05A056 [legacy waste site 16-021(c) part of Consolidated Unit 16-021(c)-99 in Appendix C, Map 20]. At one point, discharge to the outfall reportedly was as high as several million gallons per year. The sumps, which are now plugged so that they do not discharge to the environment, are pumped, and the water is treated at the TA-16 high-explosives wastewater treatment facility. Currently, the former pond contains no water, although soil and sediment are wet sporadically. Sediment surveys conducted from 1970 to 1985 and again in 1991 indicated the presence of high explosives and barium in the outfall and drainage from the surface to the soil/tuff interface.

The Laboratory conducted a Phase I RFI in 1995. The RFI data analysis determined that a corrective measures study was required. A potassium bromide tracer that was deployed in April 1997 was detected in two locations at TA-16 in August 1997, suggesting that the 260 Outfall is a source of contamination in the springs, seeps, surface water, and alluvium of Cañon de Valle. The Laboratory

performed a major interim measure cleanup in 2000 and 2001, removing approximately 1500 yds^3 of contaminated material from the site. Verification sample results indicated that the interim measure removed most of the high explosives from the site.

An RFI report detailing recent monitoring data and providing site-specific human-health and ecological risk assessments was submitted to NMED in September 2003. The report was approved by NMED in June 2004. The human-health risk assessment showed unacceptable risk levels in the former pond and outfall area and potentially acceptable risk levels in Cañon de Valle. The ecological risk assessment suggests low ecological risks in Cañon de Valle, with risk confined to localized areas with high silver abundances. A CMS report that evaluated potential cleanup options for 16-021(c)-99 was submitted to NMED in November 2003. This report recommended further soil cleanup in the outfall area, installation of storm-water management systems on springs, and the installation of permeable reactive barriers in Cañon de Valle and Martin Spring Canyon. Current plans anticipate the removal of approximately 100 yds^3 of additional soil and sediment to achieve contaminant concentrations safe for the planned industrial use.

Under the CMS at Consolidated Unit 16-021(c)-99, a hydrogeological study is being conducted to identify the best and most cost-effective remedy to achieve groundwater contamination levels that are safe for future site workers, the local ecosystem, and members of the public. Activities include collecting samples from three springs and one seep. In addition, two deep boreholes (greater than 1500 vertical ft) were drilled in 2000/2001 to the east and southeast of legacy waste site 16-021(c)-99 to help evaluate whether groundwater contamination is migrating from TA-16. To date, sampling data collected from these wells have not indicated significant high-explosives contamination. Quarterly sampling of these wells will continue. Three intermediate-depth (less than 1400 vertical ft) boreholes were drilled in 2003/2004, to the east of legacy waste site 16-021(c)-99. These were designed to better determine the nature and extent of contamination in the perched aquifer. Based on screening data obtained during drilling, two of the wells contained high explosives; the third borehole did not contain high explosives.

Map 4.5.2-a′ identifies the operational potential hazards located within the Cañon de Valle Aggregate. These include the following:

- The TA-08 Radiographic Testing Facility, Building 08-23. The facility has transient radiological hazards presented by high-energy x-ray generators, a cobalt-60 source, and a portable linear accelerator. The facility offers nondestructive radiography (used to inspect weapons components for flaws) as a Laboratory-wide service.
- One operating Laboratory NPDES-permitted outfall (05A055) drains into Cañon de Valle. This outfall is associated with the TA-16 high-explosives wastewater treatment facility (Building 16-1507).

Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-08, -09, -14, -15, -16, and -37 that are not listed under operational potential hazards, including several administrative, technical, and physical-support buildings and structures. For TA-14, these include two explosives magazines and two buildings used for high-explosives tests. For TA-15, these include structures used for high-explosives storage. For TA-16, these include high-explosives fabrication facilities, high-explosives storage magazines, and the High Explosives Treatment Facility. No administrative, technical, or physical support structures are located in the portion of TA-37 that lies within the Cañon de Valle Aggregate.

4.5.2.2 Cañon de Valle Aggregate, Future State

Map 4.5.2-b represents the future state of the legacy waste sites subject to corrective action in the Cañon de Valle Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including Cañon de Valle. These investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in Cañon de Valle, including geomorphic surveys to identify sediment age and physical characterization, and collect and analyze sediment samples. As appropriate, the work plan will also include investigations and/or monitoring of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Cañon de Valle Aggregate and a report documenting the investigation.

Map 4.5.2-b′ shows the potential hazards associated with the future operational use of TA-08, -09, -14, -15, -16, and -37. The Laboratory's current long-range plan is for these TAs to remain under industrial and reserve use.

4.5.3 Watershed Aggregate 5.3—S-Site Canyon Aggregate

The S-Site Canyon Aggregate, identified in Maps 4.5.3-a, 4.5.3-a′, 4.5.3-b, and 4.5.3-b′, includes portions of Laboratory TA-11, -16, and -37 and former TA-13 and -25. A description of each TA is provided in Appendix A.

For Laboratory lands within this aggregate, land use is industrial or reserve.

4.5.3.1 S-Site Aggregate, Current State

Map 4.5.3-a shows the legacy waste sites located within the S-Site Canyon Aggregate. Legacy waste sites within this aggregate include septic systems, storage areas, active and inactive firing sites, an air gun, a mortar impact area, a burn site, tanks, a dry well, sumps, surface disposal areas, landfills, outfalls, high-explosives magazines, areas of potential soil contamination, one MDA, and a wastewater treatment plant. A complete listing of the sites within this aggregate is included in Appendix B, Table B-5.3.

The most significant source of contamination in the canyon within the S-Site Canyon Aggregate is the active TA-11 Drop-Tower Complex firing site:

> The TA-11 Drop-Tower Complex [Consolidated Unit 11-004(a)-99 in Appendix C, Map 22] consists of six legacy waste sites [11-004(a–f)] that comprise the components of the active TA-11 Drop-Tower Complex, which was built in 1956 when TA-11 was modified to conduct explosives and weapons-safety studies. The consolidated unit consists of a 160-ft-high drop tower [structure 11-25, legacy waste site 11-004(a)], which is surrounded by a 130-ft-diameter concrete pad [structure 11-26, legacy waste site 11-004(b)]; two hoists [structures 11-27 and 11-28, legacy waste sites 11-004(c and d)]; and two asphalt drop pads [structures 11-41 and 11-42, legacy waste sites 11-004(e and f)]. The drop tower is used to conduct drop- and skid-sensitivity tests. The asphalt pads on the concrete apron are arranged so that debris is thrown primarily to the south and east. Cased warheads and bare explosives charges were dropped from the tower to measure impact sensitivity. The investigation of

legacy waste sites 11-004(a–f) is deferred until the sites are no longer active. These sites are listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

Map 4.5.3-a′ identifies the single operational potential hazard located within the S-Site Canyon Aggregate:

- One operating Laboratory NPDES-permitted outfall (03A130), which drains into S-Site Canyon. This outfall is associated with the TA-11 vibration test building (Building 11-30). In addition, one inactive (05A097) NPDES-permitted outfall formerly drained into S-Site Canyon. The inactive outfall has been requested for deletion from the Laboratory's NPDES permit.

Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-11, -16, and -37 that are not listed under operational potential hazards, including several administrative, technical, and physical-support buildings and structures. For TA-11, these include an explosives magazine and a drop tower used for tests to determine the effects of dropping a component or assembly from a height of 150 ft. For TA-16, these include high-explosives fabrication facilities and test-device assembly buildings. No administrative, technical, or physical-support buildings or structures are located in the portion of TA-37 contained within the S-Site Canyon Aggregate.

4.5.3.2 S-Site Aggregate, Future State

Map 4.5.3-b represents the future state of the legacy waste sites subject to corrective action in the S-Site Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

The active TA-11 Drop-Tower Complex listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5) will likely remain active past 2015. This Drop-Tower Complex will remain under DOE operational control until it becomes inactive, at which time it will be investigated and, if appropriate, remediated.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including S-Site Canyon. These investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in S-Site Canyon, including geomorphic surveys to identify sediment age and physical characterization, and the collection and analyses of sediment samples. As appropriate, the work plan will also include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the S-Site Aggregate and a report documenting the investigation.

Map 4.5.3-b′ shows the potential hazards associated with the future operational use of TA-11, -16, and -37. The Laboratory's current long-range plan is for these TAs to remain under industrial and reserve use.

4.5.4 Watershed Aggregate 5.4—Upper Water Canyon Aggregate

The Upper Water Canyon Aggregate, identified in Maps 4.5.4-a, 4.5.4-a′, 4.5.4-b, and 4.5.4-b′, includes portions of Laboratory TA-11, -15, -16, -28, -37, and -49. A description of each TA is provided in Appendix A.

Only very small portions of the western tip of TA-15 and the northwest corner of TA-49 lie within this aggregate.

For Laboratory lands within this aggregate, land use is industrial or reserve.

4.5.4.1 Upper Water Canyon Aggregate, Current State

Map 4.5.4-a shows the legacy waste sites located within the Upper Water Canyon Aggregate. Legacy waste sites within this aggregate include a dry well, septic systems, storage areas, high-explosives rest houses, decommissioned magazines, an inactive firing site, aboveground and underground tanks, outfalls and associated drainlines, sumps and associated drainlines and outfalls, incinerators, and areas of potential soil contamination. A complete listing of the sites within this aggregate is included in Appendix B, Table B-5.4.

No significant sources of contamination occur within this aggregate.

Map 4.5.4-a′ identifies the single operational potential hazard located within the Upper Water Canyon Aggregate:

- The TA-16 Weapons Engineering Tritium Facility, Building 16-205. This facility is used for tritium processing and replaced the former tritium-processing facility located at TA-33. Tritium-processing activities include unloading containers of tritium, repackaging tritium into smaller quantities, removing contaminants, mixing tritium with other gases, analyzing gaseous tritium and gas mixtures, repackaging tritium and other gases to user-specified pressures, conducting experiments using tritium, performing function tests of components and apparatus containing tritium, reacting tritium with other materials to form compounds, and analyzing the effects of tritium.

No NPDES-permitted outfalls drain into the Upper Water Canyon Aggregate. Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-11, -16, -28, and -37 that are not listed under operational potential hazards, including several administrative, technical, and physical-support buildings and structures. For TA-16, these include high-explosives fabrication facilities and test-device assembly buildings. For TA-28, these include five formerly used high-explosives storage magazines. No structures of any kind are located in the portions of TA-11, -15, -37, and -49 contained within the Upper Water Canyon Aggregate.

4.5.4.2 Upper Water Canyon Aggregate, Future State

Map 4.5.4-b represents the future state of the legacy waste sites subject to corrective action in the Upper Water Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including upper Water Canyon. These investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in upper Water Canyon, including geomorphic surveys to identify sediment age and physical characterization, and collect and analyze sediment samples. As appropriate, the work plan will also include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Upper Water Canyon Aggregate and a report documenting the investigation.

Map 4.5.4-b′ shows the potential hazards associated with the future operational use of TA-11, -15, -16, -28, -37, and -49. The Laboratory's current long-range plan is for these TAs to remain under industrial and reserve use.

4.5.5 Watershed Aggregate 5.5—Lower Water/Indio Canyons Aggregate

The Lower Water/Indio Canyons Aggregate, identified in Maps 4.5.5-a, 4.5.5-a′, 4.5.5-b, and 4.5.5-b′, includes a small portion of the White Rock community (land owned by Los Alamos County and private individuals) and portions of Laboratory TA-15, -36, -39, -49, -68, -70, and -71. A description of each TA is provided in Appendix A.

The portions of TA-36, -39, -68, -70, and -71 within this aggregate contain no legacy waste sites and no operational facilities or other potential sources of contamination.

For Laboratory lands within this aggregate, land use is industrial or reserve. For White Rock community lands within this aggregate, land use is recreational.

4.5.5.1 Lower Water/Indio Canyons Aggregate, Current State

Map 4.5.5-a shows the legacy waste sites located within the Lower Water/Indio Canyons Aggregate. Legacy waste sites within this aggregate include septic systems, drains and drainlines, an outfall, an inactive firing site, underground tanks, and a burn site and landfill. A complete listing of the sites within this aggregate is included in Appendix B, Table B-5.5.

The most significant sources of contamination within this aggregate are associated with potentially contaminated sediments carried in floodwaters from upstream reaches of upper Water Canyon, Cañon de Valle, and S-Site Canyon.

Map 4.5.5-a′ identifies the operational potential hazards located within the Lower Water/Indio Canyons Aggregate. These are:

- Two operating Laboratory NPDES-permitted outfalls drain into the lower reaches of Water Canyon. NPDES-permitted outfall 03A028 is associated with a power control building and cooling tower at TA-15. NPDES-permitted outfall 03A185 is associated with the DARHT facility, also located at TA-15.

Buildings located within this aggregate that are not operational potential hazards include buildings and ancillary structures within TA-15, -36, -39, and -49 that are not listed under operational potential hazards, including several administrative, technical, and physical-support buildings and structures. No structures of any kind are located in the portions of TA-68, -70, and -71 contained within the Lower Water/Indio Canyons Aggregate.

4.5.5.2 Lower Water/Indio Canyons Aggregate, Future State

Map 4.5.5-b represents the future state of the legacy waste sites subject to corrective action in the Lower Water/Indio Canyons Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including lower Water and Indio Canyons. These investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in lower Water and Indio Canyons, including geomorphic surveys to identify sediment age and physical characterization and to collect and analyze sediment samples. As appropriate, the work plan will also include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Lower Water/Indio Canyons Aggregate and a report documenting the investigation.

Map 4.5.5-b′ shows the potential hazards associated with the future operational use of TA-15, -36, -39, -49, -68, -70, and -71. The Laboratory's current long-range plan is for these TAs to remain under industrial and reserve use.

4.6 The Ancho Watershed

The Ancho Watershed, identified in Map 4.0, is a southeast trending drainage that originates in the northwestern corner of the Laboratory's TA-49 at an elevation of 7285 ft asl. The drainage extends 7.3 mi from its headwaters to its confluence with the Rio Grande at an elevation of 5410 ft asl, draining an area of 6.8 mi^2. The drainage extends across the southern portion of the Laboratory crossing through TA-49, -39, -33, and -70 before joining the Rio Grande at an elevation of 5410 ft asl.

Ancho Canyon is ephemeral within the Laboratory boundary up to a point about 0.8 mi upstream from its confluence with the Rio Grande. At that point, a perennial spring (Ancho Spring), fed by the regional aquifer, supports perennial flow all the way to the confluence with the Rio Grande. No significant snowmelt occurs in this drainage. The portion of this watershed east of State Highway 4 is used frequently for hiking access to the Rio Grande.

Surface water in the Ancho Watershed is monitored under the Laboratory's surface-water monitoring program. The Laboratory's site-wide groundwater monitoring program monitors the alluvial and regional aquifers. Alluvial and regional aquifer wells are located in the watershed, but there are no water supply or intermediate wells. No contaminants were detected in groundwater samples taken from wells in the Ancho Watershed in 2002. In accordance with the Consent Order, the Laboratory submitted an *Interim Site-Wide Groundwater Monitoring Plan* to NMED. As part of this process, the Laboratory is continuing to develop a monitoring well network (which must ultimately be approved by NMED) to be used for the continued monitoring of groundwater.

The Ancho Watershed consists of a single primary canyon (Ancho Canyon) and the adjacent mesa tops that drain into this canyon. A brief description of the canyon follows.

> *Ancho Canyon* originates on Laboratory property near the northwest corner of TA-49 at an elevation of 7285 ft asl. The canyon extends southeast across the Laboratory for 7.3 mi before reaching the Rio Grande along the boundary between TA-33 and TA-70 at an elevation of 5410 ft asl. Ancho Canyon has a channel length of 7.3 mi and a drainage area of 6.8 $mi.^2$ The canyon passes through Laboratory TA-33, -39, -49, and -70.
>
> Streamflow in Ancho Canyon is ephemeral over most of the canyon length. About 0.8 mi upstream of its confluence with the Rio Grande, Ancho Spring supports perennial flow over the remainder of the canyon. No Laboratory NPDES-permitted outfalls drain into Ancho Canyon.

Environmental investigations in Ancho Canyon include routine surface water, sediment, spring, and runoff sampling performed by the Laboratory's Environmental Surveillance Program. In addition, The Laboratory has conducted numerous investigations and remedial actions in association with the legacy waste sites located in and around the canyon.

4.6.1 Watershed Aggregate 6.1—North Ancho Canyon Aggregate

The North Ancho Canyon Aggregate, identified in Maps 4.6.1-a, 4.6.1-a′, 4.6.1-b, and 4.6.1-b′, includes portions of Laboratory TA-15, -33, -39 and -49. A description of each TA is provided in Appendix A.

Only a very small portion of the southeastern corner of TA-15 and the northern boundary of TA-33 are contained within this aggregate. No legacy waste sites or operational facilities are located within these portions of TA-15 and -33.

Land use within this aggregate is industrial or reserve.

4.6.1.1 North Ancho Canyon Aggregate, Current State

Map 4.6.1-a shows the legacy waste sites located within the North Ancho Canyon Aggregate. Legacy waste sites within this aggregate include an aboveground tank, septic systems, a leach field, a seepage pit, an outfall, a sump, landfills, storage areas, areas of potential soil contamination, firing sites, a former incinerator, and two MDAs. A complete listing of the sites within this aggregate is included in Appendix B, Table B-6.1.

One of the legacy waste sites located within the North Ancho Canyon Aggregate is MDA AB, located at TA-49. The Laboratory maintains fencing and postings around the MDA.

MDA AB [Consolidated Unit 49-001(a)-00 in Appendix C, Map 25] includes vertical shafts and chambers used for hydronuclear and related experiments performed from late 1959 to mid-1961. The experiments were conducted underground in multiple shafts and chambers at depths between 60 ft and 80 ft to assess the safety of storage and transportation of nuclear weapons components. In 1961, the surface over the shafts in Area 2 was covered with a clay/gravel layer overlaid with asphalt to stabilize residual surface contamination. This pavement was removed in 1999 as part of an interim measure to protect the site from subsurface moisture that results from surface water ponding, run-on, and inhibited evapotranspiration. The interim measure was completed by installing a clean, crushed-tuff cap containing a wire-mesh layer to inhibit burrowing animals. The cap was covered with native grasses and gravel to promote the transpiration of moisture and to inhibit erosion. Moisture content monitoring at MDA AB was initiated in 1999 and continues through the present day. The depth to groundwater below MDA AB is approximately 1120 ft. Suspected contaminants in the subsurface at MDA AB include high explosives and radionuclides.

The most significant sources of contamination in the canyon within this aggregate are sediments potentially contaminated by past and current activities at TA-39 firing sites:

TA-39 Firing Sites [legacy waste sites 39-004(a, b, c, d, and e) in Appendix C, Map 25] have been in use since 1953 for firing experiments to test explosive materials. The experiments conducted at these firing sites are designed to expend all the high explosives in the device. If a shot fails and therefore not all the high explosives are spent, an effort is made to pick up and destroy the unexploded high explosives. A typical shot carries 10 to 100 lb of explosives, but on occasion up to 1000 lb may be used. Legacy Waste Sites 39-004(c and d) are RCRA open detonation sites, which are used for both experimental purposes and for the treatment of hazardous waste by open detonation. A unit-specific Part B permit application for Legacy Waste Sites 39-004(c and d) has been submitted to NMED to

address open detonation, pursuant to the requirements of the New Mexico Hazardous Waste Act and implementing regulations. Legacy Waste Sites 39-004(a, b, and e) are listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5).

Unlike many other firing sites at the Laboratory, which are located on mesa tops, the TA-39 firing sites are located on the floor of Ancho Canyon's north fork. Because of their location on the floor of the canyon, these sites are directly within a major drainage, making them more likely to contribute contaminants to sediments within the drainage.

Map 4.6.1-a′ indicates that no Laboratory operational potential hazards are located within the North Ancho Canyon Aggregate. The Laboratory has no potential hazardous operational facilities within this aggregate and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.6.1.2 North Ancho Canyon Aggregate, Future State

Map 4.6.1-b represents the future state of the legacy waste sites subject to corrective action in the North Ancho Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

The five legacy waste sites within this aggregate that are active firing sites listed in Table IV-2, *Deferred Sites in Testing Hazard Zones*, of the Consent Order (Section IV.A.5) will likely remain active past 2015. These sites will remain under DOE operational control until they become inactive, at which time they will be investigated and, if appropriate, remediated.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including Ancho Canyon. The investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in Ancho Canyon, including geomorphic surveys to identify sediment age and physical characterization. Field radiological surveys will be conducted and sediment samples will be collected and analyzed. As appropriate, the work plan also will include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the North Ancho Canyon Aggregate and a report documenting the investigation.

Map 4.6.1-b′ shows that no potential hazards are associated with the future operational use of TA-39 and -49. Because there are no Laboratory operational potential hazards currently located within this aggregate or planned for the future, Map 4.6.1-b′ shows no change from Map 4.6.1-a′. The Laboratory's current long-range plan is for TA-39 and -49 to remain under industrial and reserve use.

4.6.2 Watershed Aggregate 6.2—South Ancho Canyon Aggregate

The South Ancho Canyon Aggregate, identified in Maps 4.6.2-a, 4.6.2-a′, 4.6.2-b, and 4.6.2-b′, includes portions of Laboratory TA-33, -39, -49 and -70. A description of each TA is provided in Appendix A.

Land use within this aggregate is industrial or reserve.

4.6.2.1 South Ancho Canyon Aggregate, Current State

Map 4.6.2-a shows the legacy waste sites located within the South Ancho Canyon Aggregate. Legacy waste sites within this aggregate include septic systems, outfalls, a landfill, surface disposal areas, areas of potential soil contamination, inactive firing sites, and one MDA. A complete listing of the sites within this aggregate is included in Appendix B, Table B-6.2.

The most significant source of contamination in the canyon within this aggregate is potentially contaminated sediments carried in floodwaters from upstream reaches of Ancho Canyon.

Map 4.6.2-a′ indicates that no Laboratory operational potential hazards are located within the South Ancho Canyon Aggregate. The Laboratory has no potential hazardous operational facilities within this aggregate, and no Laboratory NPDES-permitted outfalls drain into this aggregate.

4.6.2.2 South Ancho Canyon Aggregate, Future State

Map 4.6.2-b represents the future state of the legacy waste sites subject to corrective action in the South Ancho Canyon Aggregate, reflecting assumptions in the DOE corrective action plan, applicable DOE site plans, and available municipal-planning documents. Any potential corrective actions will be conducted to achieve levels protective of human health under industrial use.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including Ancho Canyon. The investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in Ancho Canyon, including geomorphic surveys to identify sediment age and physical characterization. Field radiological surveys will be conducted and sediment samples will be collected and analyzed. As appropriate, the work plan also will include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the South Ancho Canyon Aggregate and a report documenting the investigation.

Map 4.6.2-b′ shows that no potential hazards are associated with the future operational uses of TA-33, -39, -49 and -70. Because there are no Laboratory operational potential hazards currently located within this aggregate or planned for the future, Map 4.6.2-b′ shows no change from Map 4.6.2-a′. The Laboratory's current long-range plan is for TA-33, -39, -49 and -70 to remain under industrial and reserve use.

4.7 The Chaquehui Watershed

The Chaquehui Watershed, identified in Map 4.0, is a southeast-trending drainage originating in Bandelier National Monument just south of State Highway 4 at an elevation of 6770 ft asl. The watershed's drainage system passes through 1 mi of Bandelier National Monument land and then crosses onto Laboratory property at the northwestern corner of TA-33. The drainage remains in TA-33 for 2 mi before it enters the Rio Grande at an elevation of 5400 ft asl. The drainage extends 3.4 mi from its headwaters to its confluence with the Rio Grande, draining an area of 1.6 mi^2.

The Chaquehui Watershed consists of a single primary canyon (Chaquehui Canyon) and the adjacent mesa tops that drain into this canyon. A brief description of the canyon follows.

Chaquehui Canyon is a southeast-trending drainage that originates in Bandelier National Monument at an elevation of 6580 ft asl. The canyon begins at the northeast corner of the monument, extending 0.4 mi before entering Laboratory property at the northwestern corner of TA-33. The canyon continues across 2 mi of TA-33 and enters the Rio Grande at an elevation of 6580 ft asl. Chaquehui Canyon has a channel length of 3.4 mi and a drainage area of 1.6 $mi.^2$

Streamflow in Chaquehui Canyon is ephemeral over most of the canyon's length, until about 0.5 mi upstream of the confluence with the Rio Grande, where Doe Spring is located. Two other perennial springs, Spring 9 and Spring 9A, are located approximately 0.25 mi above the confluence with the Rio Grande. These springs support perennial flow in the remainder of the canyon to the Rio Grande.

No Laboratory NPDES-permitted outfalls drain into Chaquehui Canyon. Environmental investigations at Chaquehui canyon include routine sediment, spring, and runoff sampling performed by the Laboratory's Environmental Surveillance Program.

Surface water in the Water Canyon/Cañon de Valle Watershed is monitored under the Laboratory's surface-water monitoring program. However, the Laboratory's site-wide groundwater monitoring program does not monitor its alluvial and regional aquifers. No water supply, alluvial, intermediate, or regional aquifer wells are located in the watershed.

4.7.1 Watershed Aggregate 7.1—Chaquehui Canyon Aggregate

The Chaquehui Watershed contains a single aggregate, the Chaquehui Canyon Aggregate. This aggregate, identified in Maps 4.7.1-a, 4.7.1-a′, 4.7.1-b, and 4.7.1-b′, includes small portions of Bandelier National Monument and a major portion of TA-33. A description of TA-33 is provided in Appendix A.

For Laboratory lands within the Chaquehui Canyon Aggregate, land use is industrial or reserve. For Bandelier National Monument lands within this aggregate, land use is recreational.

4.7.1.1 Chaquehui Canyon Aggregate, Current State

Map 4.7.1-a shows the legacy waste sites located within the Chaquehui Canyon Aggregate. Legacy waste sites within this aggregate include surface disposal areas, septic systems, outfalls, firing sites, storage areas, former structures, and two MDAs. A complete listing of the sites within this aggregate is included in Appendix B, Table B-7.1.

Map 4.7.1-a′ shows that no Laboratory operational potential hazards are located within and no Laboratory NPDES-permitted outfalls drain into the Chaquehui Canyon Aggregate.

4.7.1.2 Chaquehui Canyon Aggregate, Future State

Map 4.7.1-b illustrates future potential hazards in the Chaquehui Canyon Aggregate, represented according to the planned corrective-action future state of TA-33 legacy waste sites. Accelerated corrective actions are planned to ensure that risks from surface-soil contaminants are within acceptable industrial levels.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including Chaquehui Canyon. The investigations will be conducted to characterize potential contamination in the canyon systems to assess current and future risk. The work plan will address sediment investigations in Chaquehui Canyon, including geomorphic surveys to identify sediment age and physical characterization. Field radiological surveys will be conducted and sediment samples will be

collected and analyzed. As appropriate, the work plan also will include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

Per the schedules in Section XII of the Consent Order, the Laboratory will submit both a work plan for the investigation of legacy waste sites located within the Chaquehui Canyon Aggregate and a report documenting the investigation.

Map 4.7.1-b′ shows that no potential hazards are associated with the future operational use of TA-33 within the Chaquehui Canyon Aggregate. Because there are no Laboratory operational potential hazards currently located within this aggregate or planned for the future, Map 4.7-1-b′ shows no change from Map 4.7-1-a′.The Laboratory's current long-range plan is for TA-33 to remain under industrial and reserve use. The areas of TA-33 currently being used for experimental science work are being expanded but will remain within the industrial zone for experimental science work. The future expanded TA-33 industrial areas will continue to be surrounded by large areas of reserve lands.

4.8 The Frijoles Watershed

The Frijoles Watershed, identified in Map 4.0, is a southeast-trending drainage originating on the eastern slopes of the Sierra de los Valles in the Valles Caldera National Preserve. The watershed's drainage system passes through 0.6 mi of the Valles Caldera National Preserve before passing through Bandelier National Monument where it remains for 13 mi before entering the Rio Grande. While on Bandelier National Monument property, the watershed encompasses portions of the Santa Fe National Forest; encroaches into extremely small portions of the southern boundaries of Laboratory TA-16, -39, and -49; and encompasses a very a small portion of the western part of TA-33 (approximately 1 mi long by 0.1 mi wide). The drainage extends 13.7 mi from its headwaters at 10,180 ft asl to its confluence with the Rio Grande at 5360 ft asl, draining an area of 19.1 $mi.^2$

The Frijoles Watershed consists of a single primary canyon (Frijoles Canyon) and the adjacent mesa tops that drain into this canyon. A brief description of the canyon follows.

> *Frijoles Canyon* is a southeast-trending drainage that originates in Bandelier National Monument at an elevation of 10,180 ft asl. The canyon begins at the northwest corner of the monument, extending across it for 13.5 mi before entering the Rio Grande at 5360 ft asl. The canyon remains on monument land for almost its entire extent, the Rio Grande. Frijoles Canyon has a channel length of 13.7 mi and a drainage area of 19.1 mi^2. The canyon passes through no Laboratory TAs.
>
> Streamflow in Frijoles Canyon is perennial over the entire length of the canyon. A small perennial stream named Rito de los Frijoles originates from springs and seeps in upper Frijoles Canyon (Frijoles Spring 1, Frijoles Spring 2, and Apache Spring) and routinely extends to its confluence with the Rio Grande.
>
> No Laboratory NPDES-permitted outfalls drain into Frijoles Canyon. Environmental investigations at Frijoles Canyon include routine sediment, spring, and runoff sampling performed by the Laboratory's Environmental Surveillance Program.

The surface waters of the Frijoles Watershed are monitored under the Laboratory's surface-water monitoring program. The Laboratory's site-wide groundwater monitoring program does not monitor the alluvial and regional aquifers. No water supply, alluvial, intermediate, or regional aquifer wells are located in the watershed.

4.8.1 Watershed Aggregate 8.1—Frijoles Canyon Aggregate

The Frijoles Watershed contains a single aggregate, the Frijoles Canyon Aggregate. This aggregate, identified in Maps 4.8.1-a, 4.8.1-a′, 4.8.1-b, and 4.8.1-b′, lies almost exclusively south of the Laboratory's southern boundary. However, very small portions of the southern boundaries of TA-16, -39, and -49 and the western boundary of TA-33 infringe slightly into the northern and eastern boundaries of the aggregate. The segments of TA-16 contained within Frijoles Canyon Aggregate total 0.005 mi^2; the segments of TA-49 within the aggregate total .003 mi^2; and the segments of TA-33 within the aggregate total .009 mi^2.

For the small segments of Laboratory land within the Frijoles Canyon Aggregate, land use is reserve. For lands within the Valles Caldera National Preserve, Santa Fe National Forest, and Bandelier National Monument within this aggregate, land use is recreational.

4.8.1.1 Frijoles Canyon Aggregate, Current State

Six legacy waste sites were originally identified within the Frijoles Canyon Aggregate (Map 4.8.1-a; Appendix B, Table B-8.1; Appendix C, Map 28). The legacy waste sites are all located on land within Bandelier National Monument that was acquired from the U.S. Forest Service to support the Manhattan Project. The land was acquired in May 1943 and transferred to the monument in January 1961. The legacy waste sites include four borrow pits [C-00-036(a-d)], one landfill (C-00-037), and one surface disposal area(C-00-038).

The four borrow pits were excavated in the 1950s for fill material used during road improvements to State Highway 4. The pits were also used to dispose of construction debris from road resurfacing and associated grade and drainage improvements. In 1995, the Laboratory conducted a voluntary corrective action at the borrow pits to excavate and remove asphalt, concrete, and metal debris and to confirm that the four areas of concern had not been used for Laboratory activities. Field screening for radioactivity and volatile organic vapors did not indicate the presence of radioactivity or volatile organic vapors or above instrument background. Confirmatory sampling was conducted and analyzed for radionuclides, organic chemicals, and inorganic chemicals. Analytical results indicated no detectable residual contamination at any of the sites.

In 1994, an archeological investigation was conducted at the landfill and at the surface disposal area by the National Park Service Division of Anthropology. In addition Laboratory personnel conducted a search of historical records of Laboratory operations in the area. The archival search concluded that former Laboratory activities in the area did not include any disposal at the landfill or at the surface disposal area. The National Park Service Division of Anthropology also determined that the two sites were not associated with Laboratory activities but rather with National Park Service activities during the 1930s and 1940s.

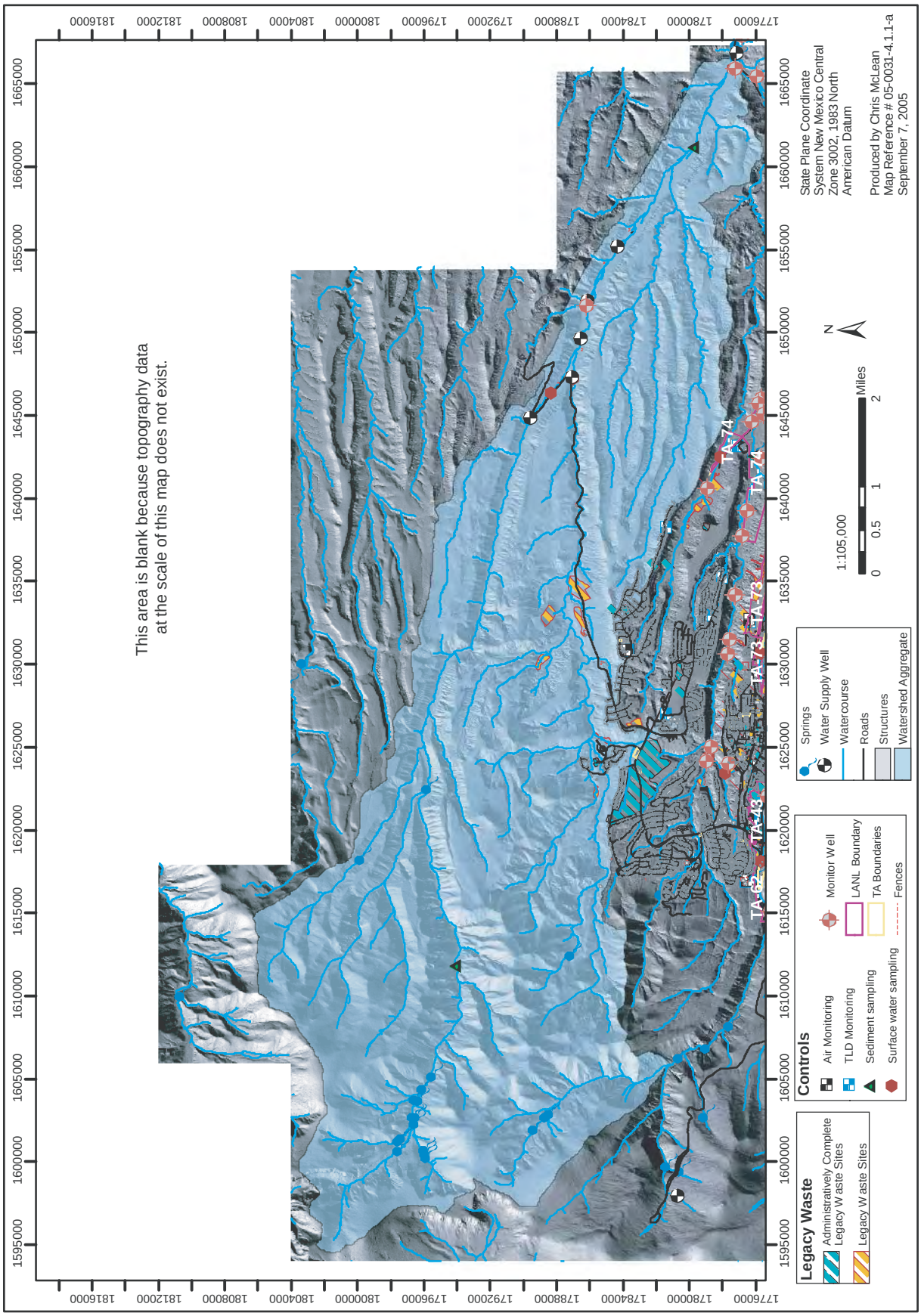
Because none of the Bandelier National Monument sites were associated with past Laboratory operations, all six sites were erroneously identified as areas of concern and none of the sites are Laboratory-related legacy waste sites. No Laboratory operational facilities are located within the aggregate, as indicated in Map 4.8.1-a′.

4.8.1.2 Frijoles Canyon Aggregate, Future State

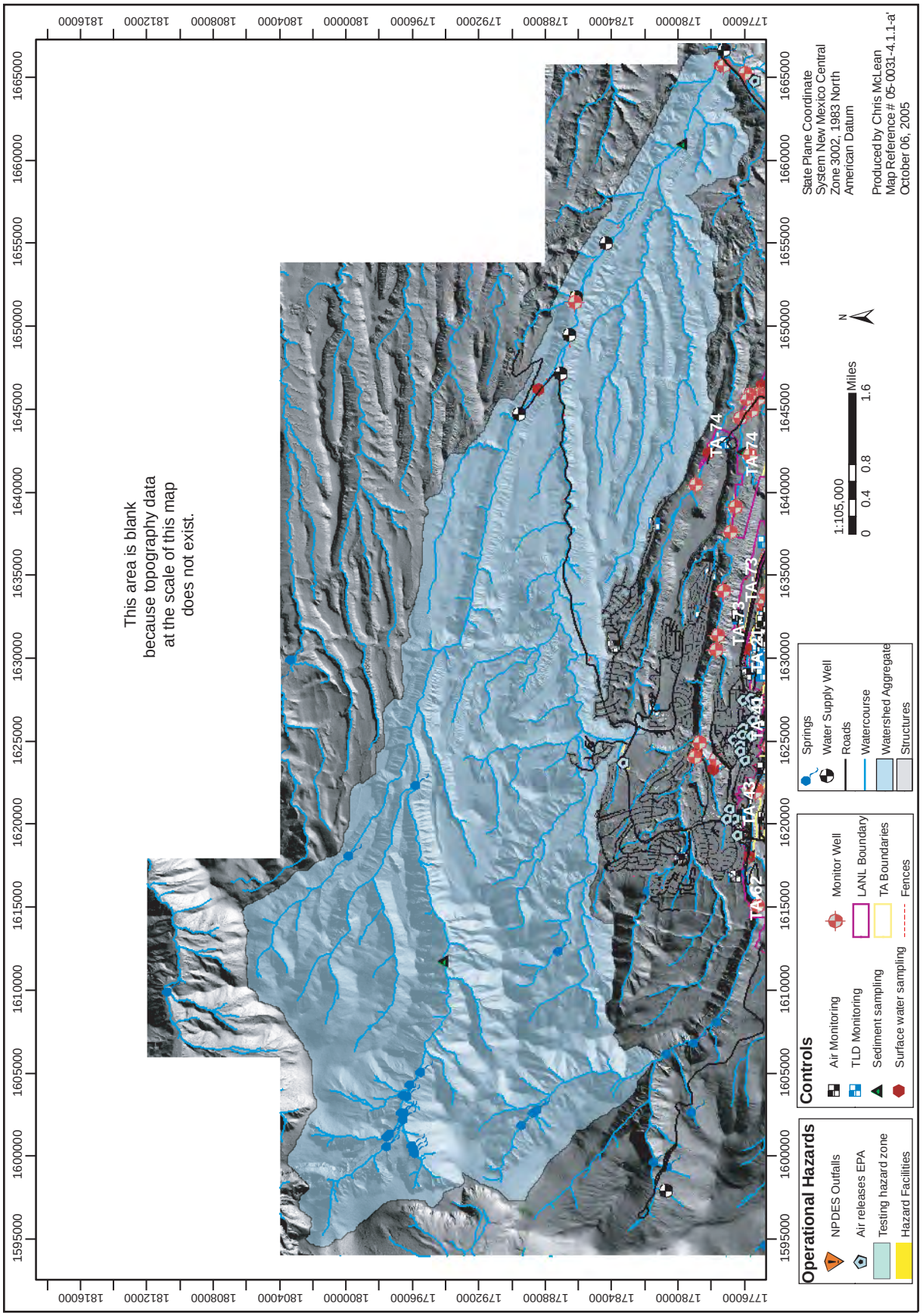
No change from the current nonhazard, recreational land use state is anticipated for the Frijoles Canyon Aggregate, as represented in Maps 4.8.1-b and 4.8.1-b′.

The Laboratory will develop a work plan for investigating canyon systems in the southern portion of the Laboratory, including Frijoles Canyon. The work plan will address sediment investigations in Frijoles Canyon, including geomorphic surveys to identify sediment age and physical characterization. Field radiological surveys will be conducted and sediment samples will be collected and analyzed. As appropriate, the work plan also will include investigations of alluvial, perched, and regional groundwater; surface water; airborne particulates; and biota.

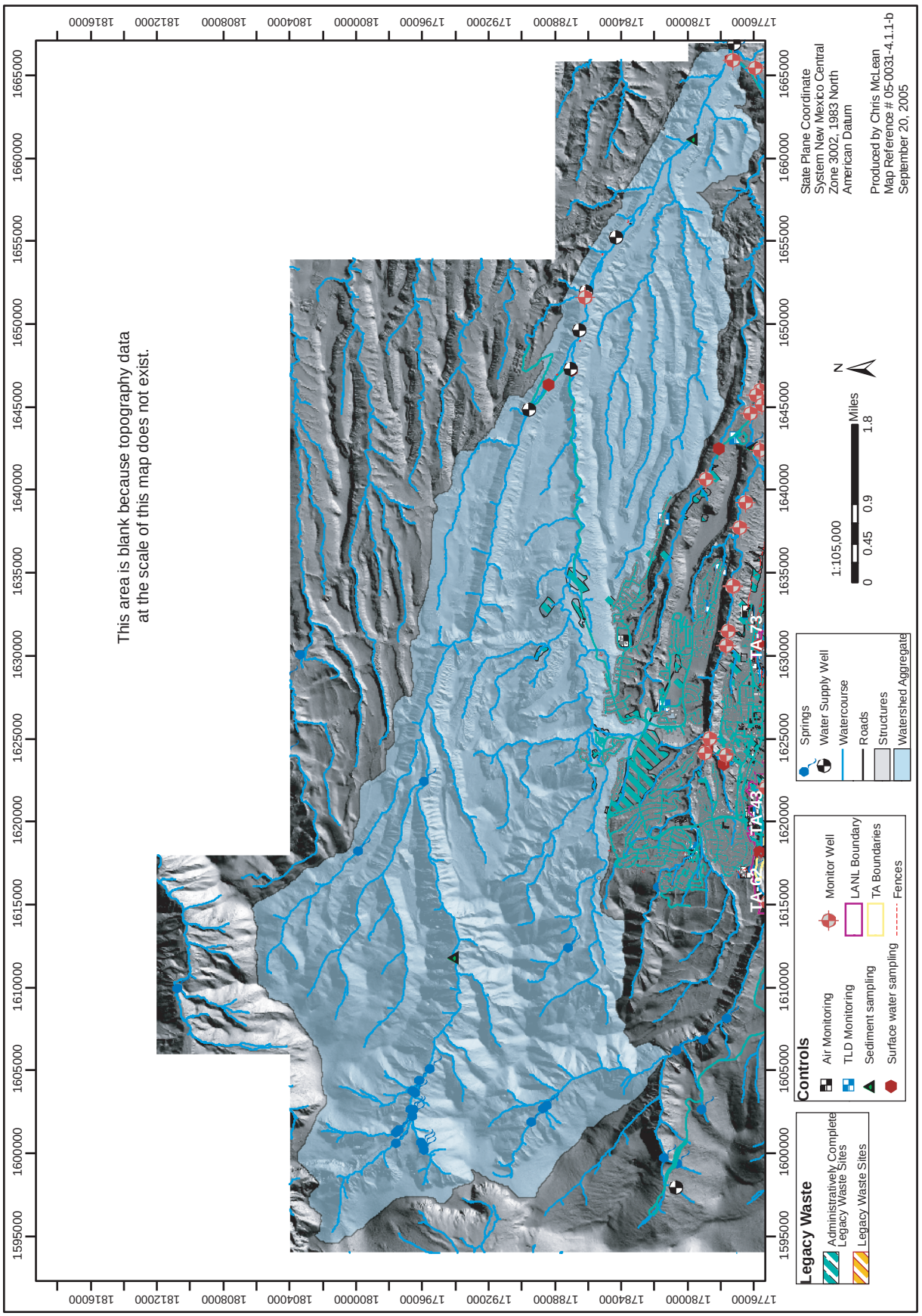
Per the schedule in Section XII of the Consent Order, the Laboratory will submit a work plan documenting that the six sites located within the Frijoles Canyon Aggregate were erroneously identified as areas of concern, and none of the sites are Laboratory-related legacy waste sites. No investigation is planned.



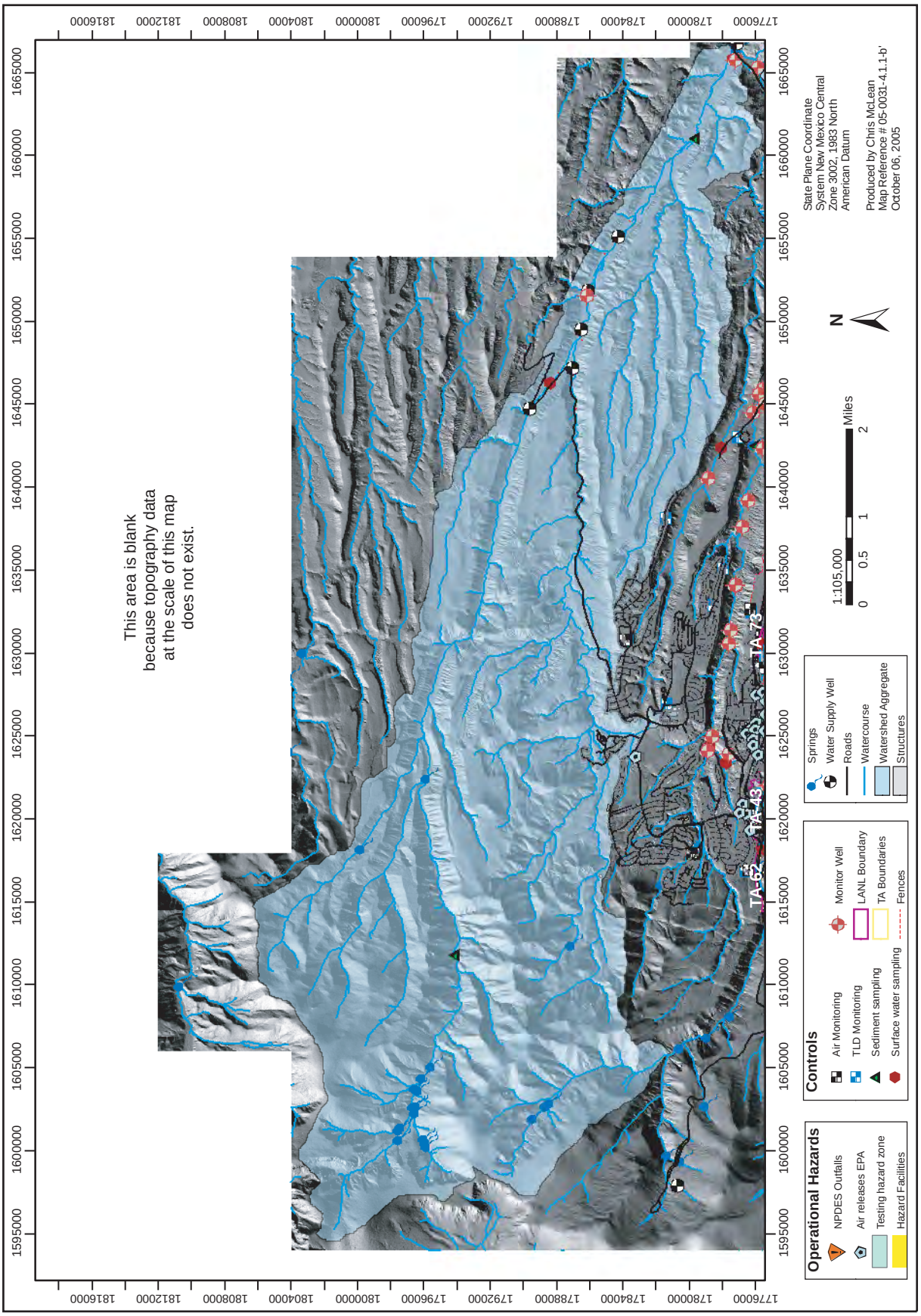
Map 4.1.1-a. Current state: legacy waste sites within Guaje/Barrancas/Rendija Canyons Aggregate



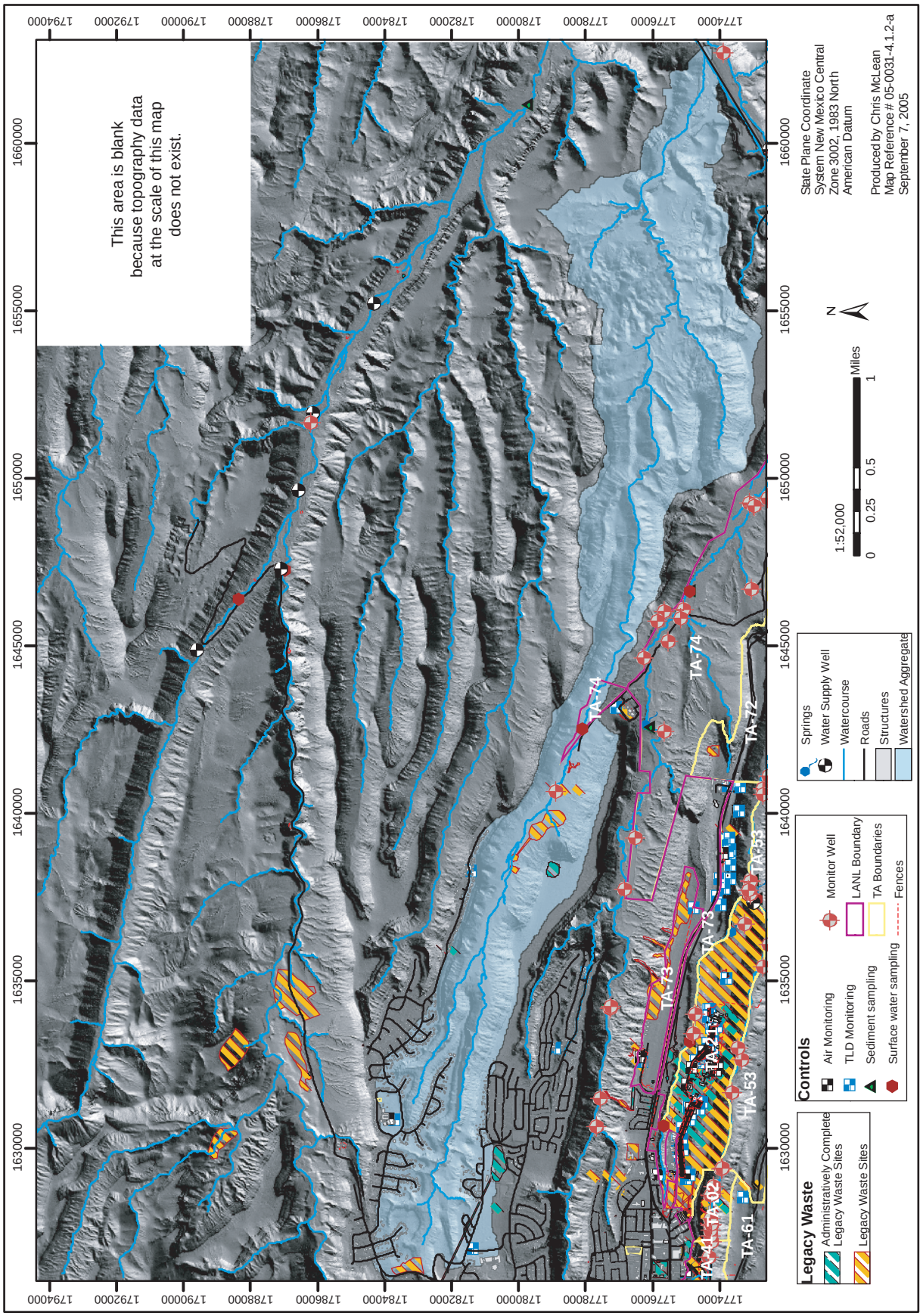
Map 4.1.1-a'. Current state: operational hazards within Guaje/Barrancas/Rendija Canyons Aggregate



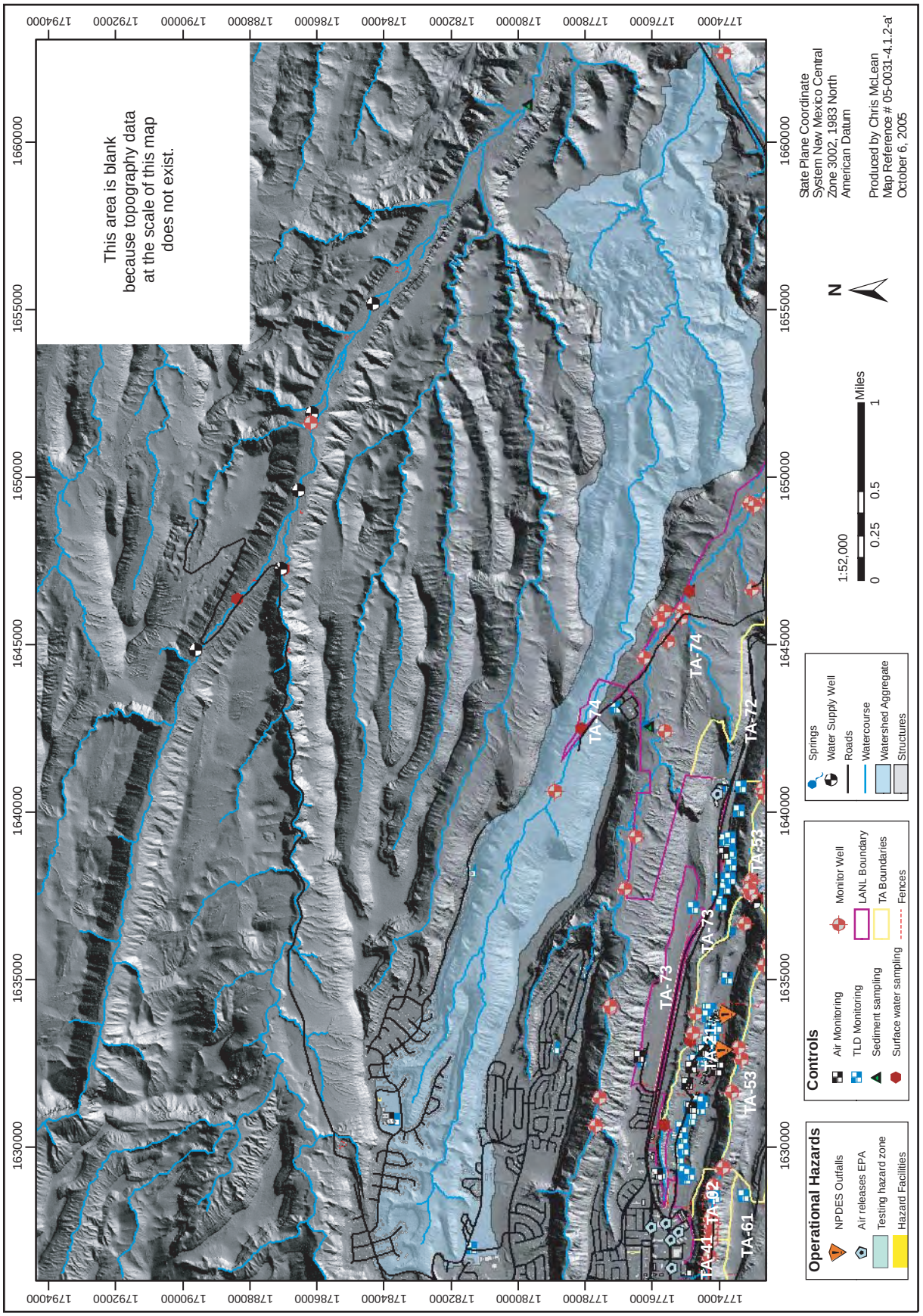
Map 4.1.1-b. Future state: legacy waste sites within Guaje/Barrancas/Rendija Canyons Aggregate



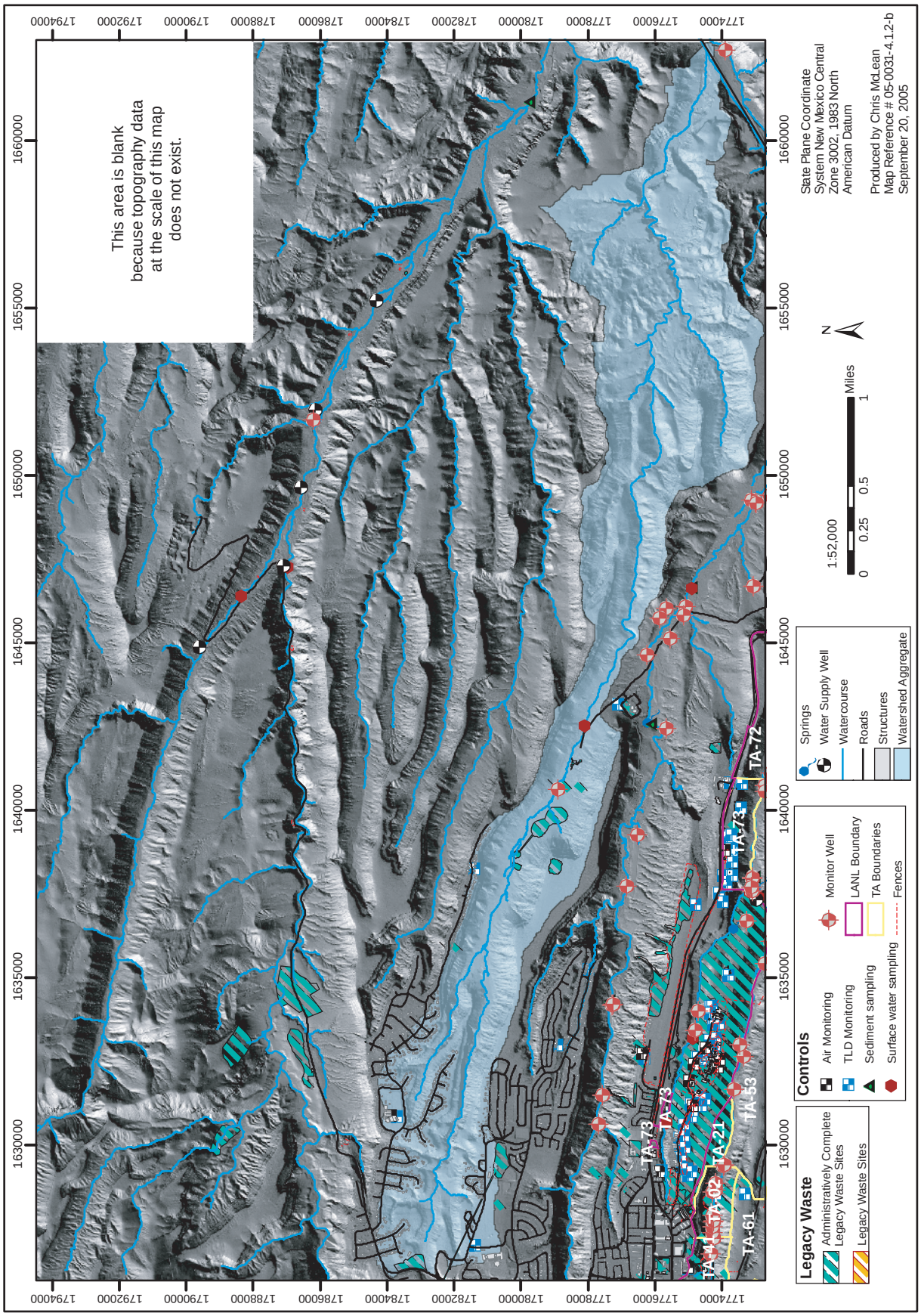
Map 4.1.1-b'. Future state: operational hazards within Guaje/Barrancas/Rendija Canyon Aggregate



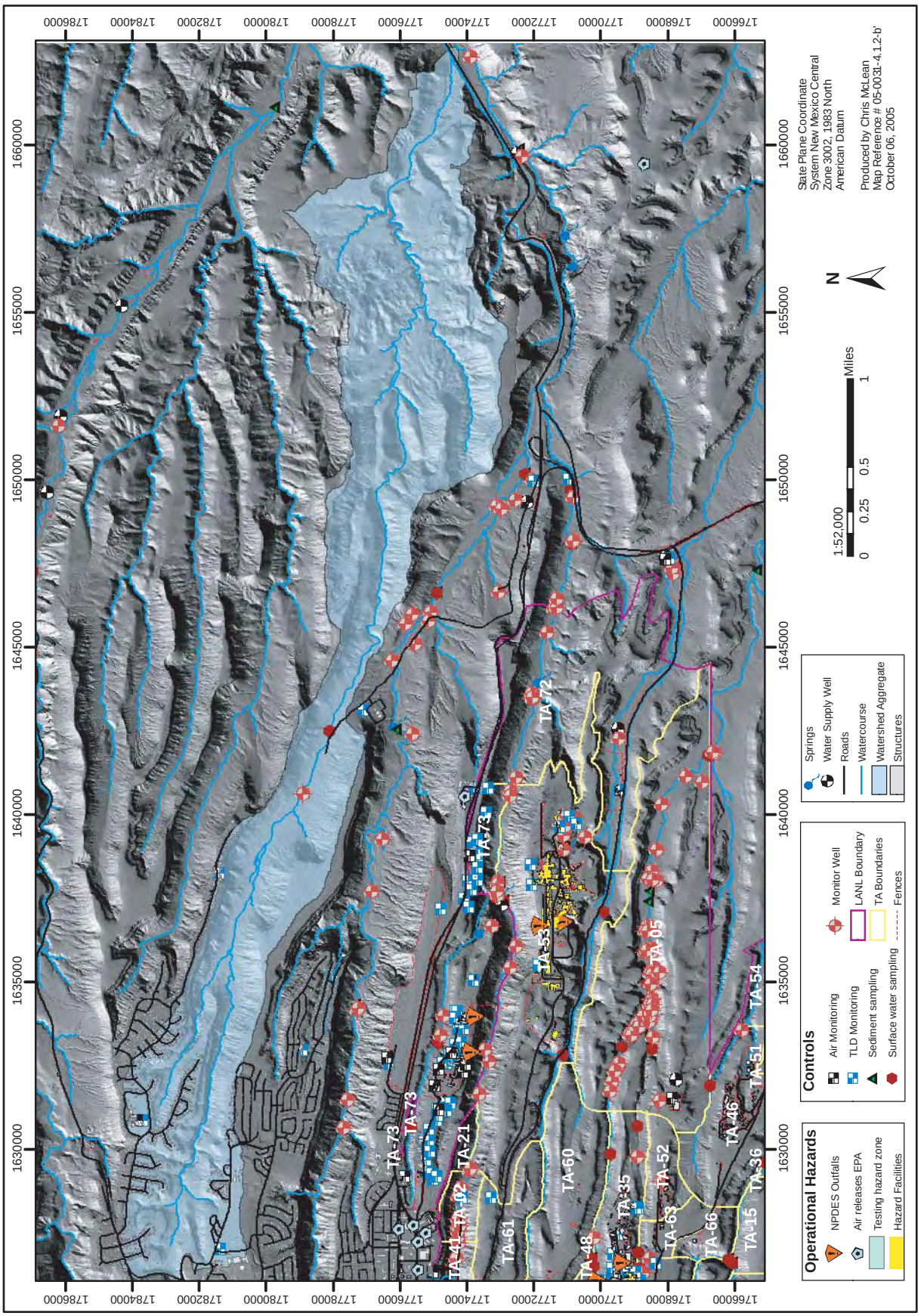
Map 4.1.2-a. Current state: legacy waste sites within Bayo Canyon Aggregate



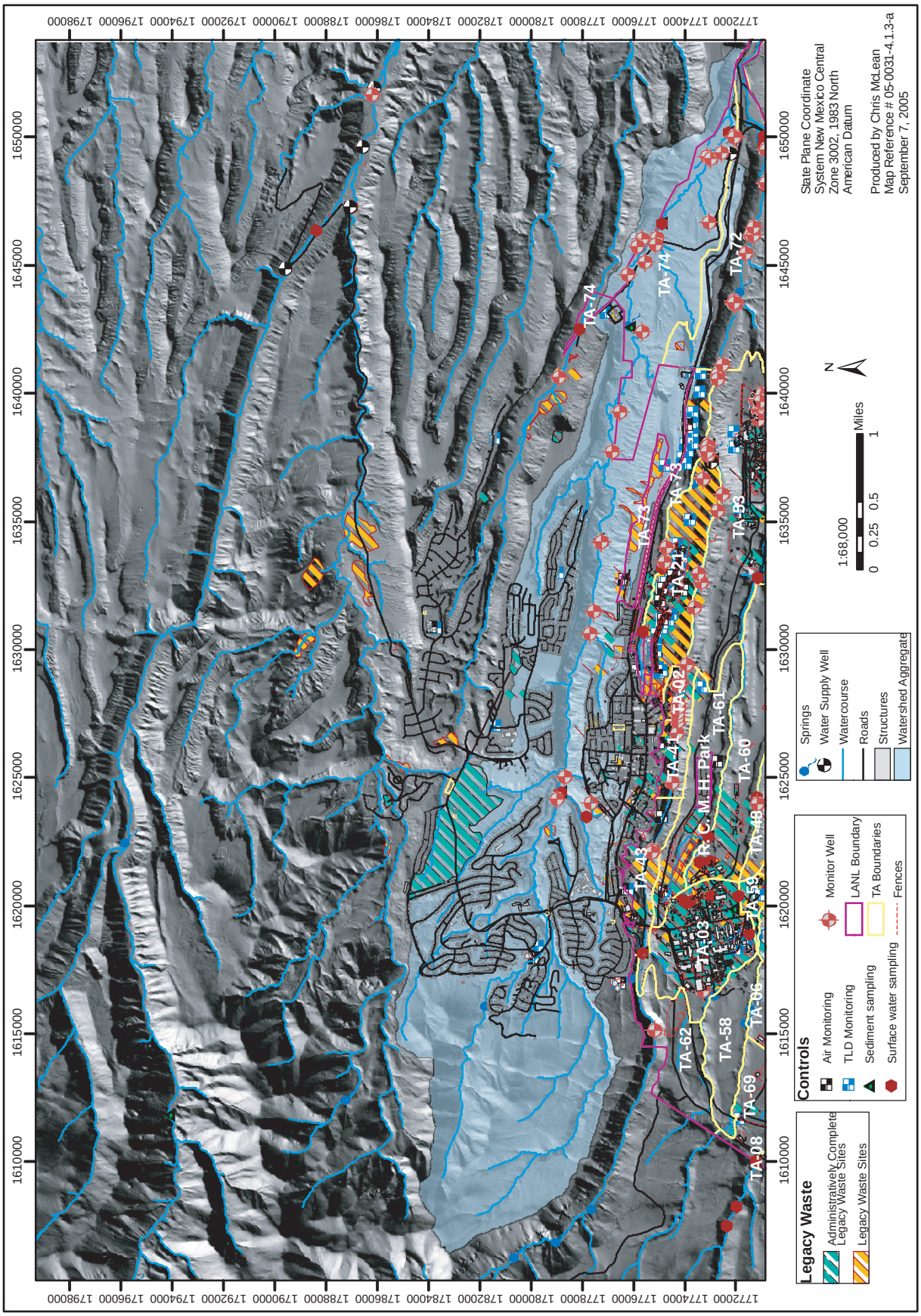
Map 4.1.2-a'. Current state: operational hazards within Bayo Canyon Aggregate



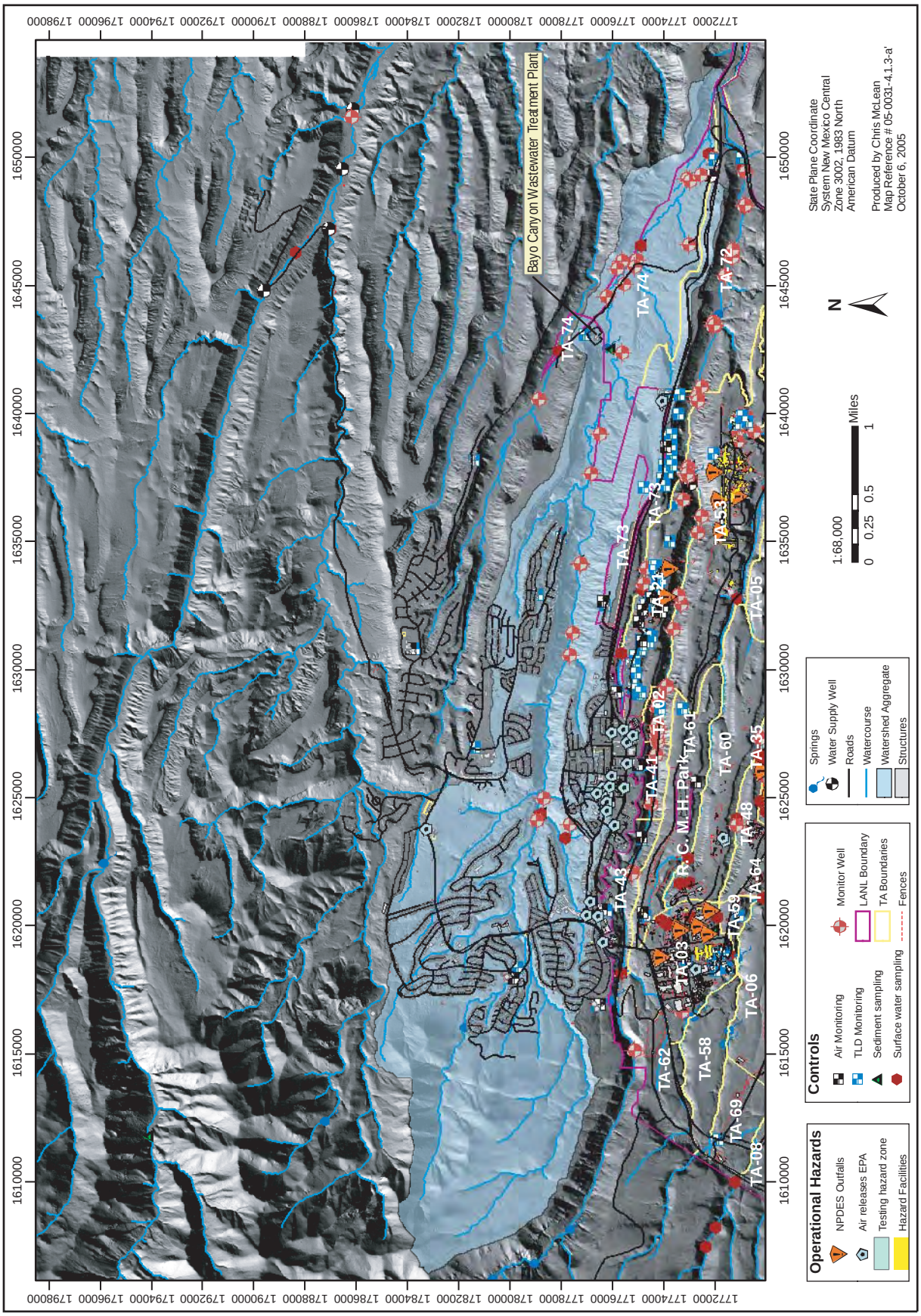
Map 4.1.2-b. Future state: legacy waste sites within Bayo Canyon Aggregate



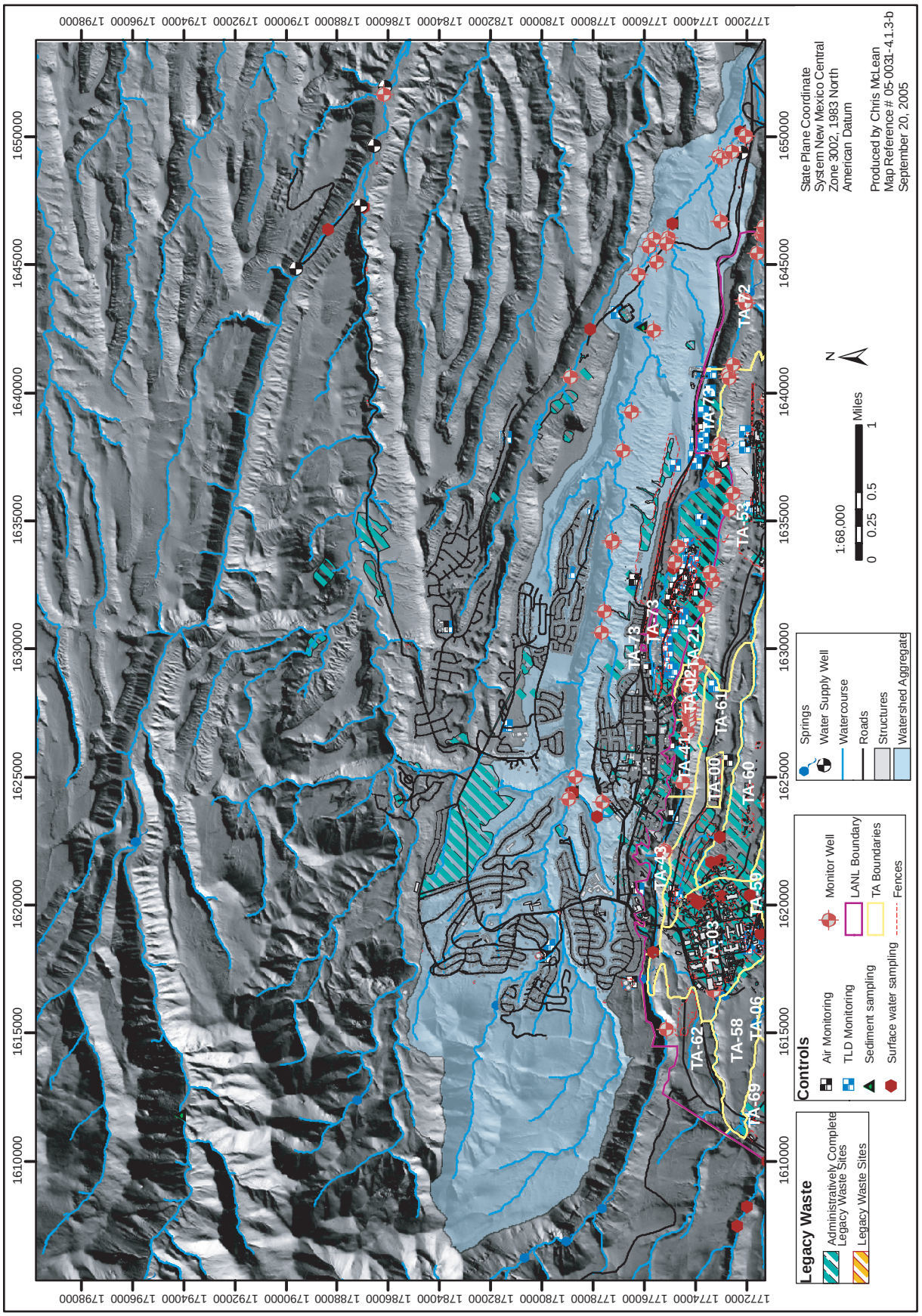
Map 4.1.2-b'. Future state: operational hazards within Bayo Canyon Aggregate



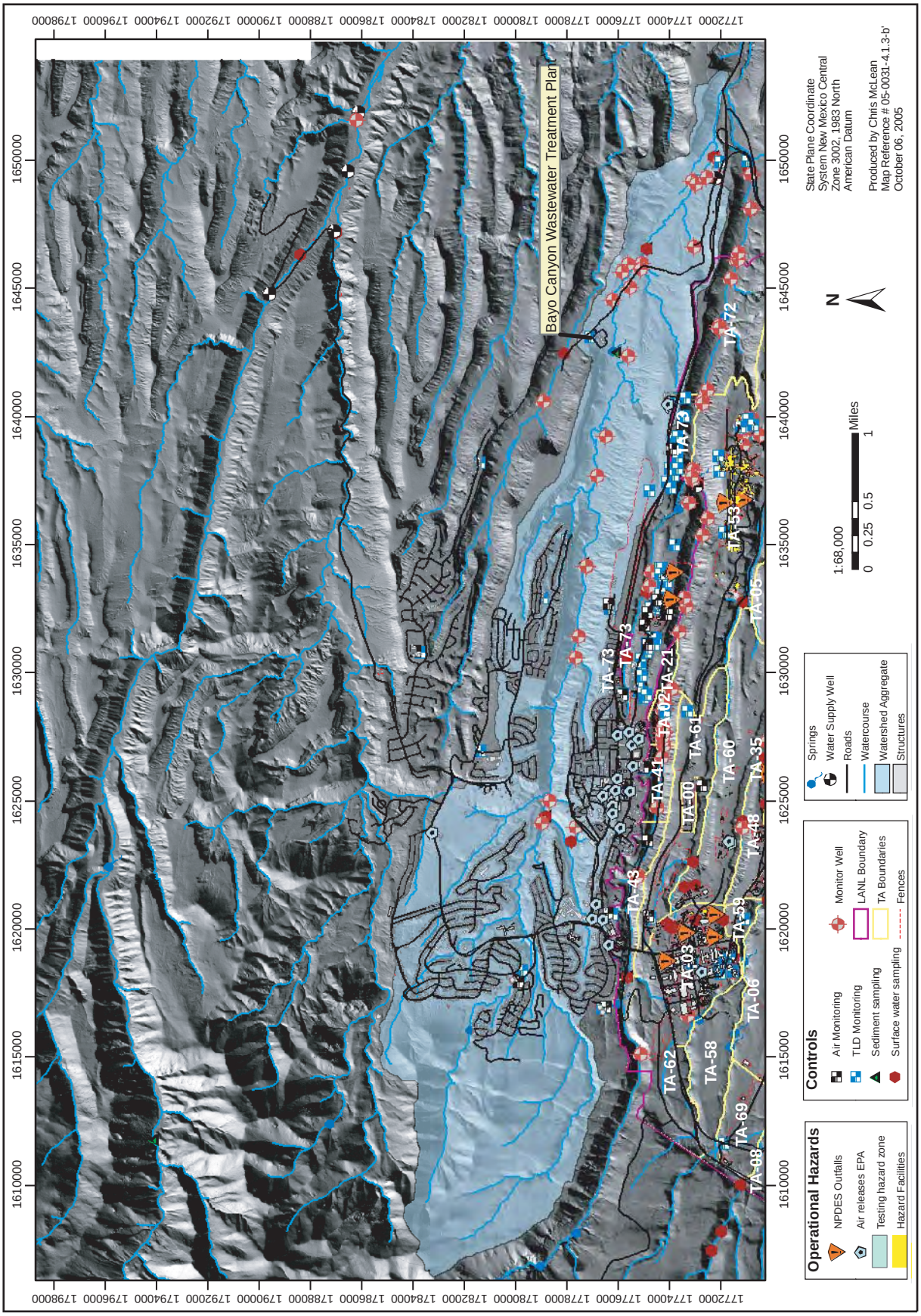
Map 4.1.3-a. Current state: legacy waste sites within Pueblo Canyon Aggregate



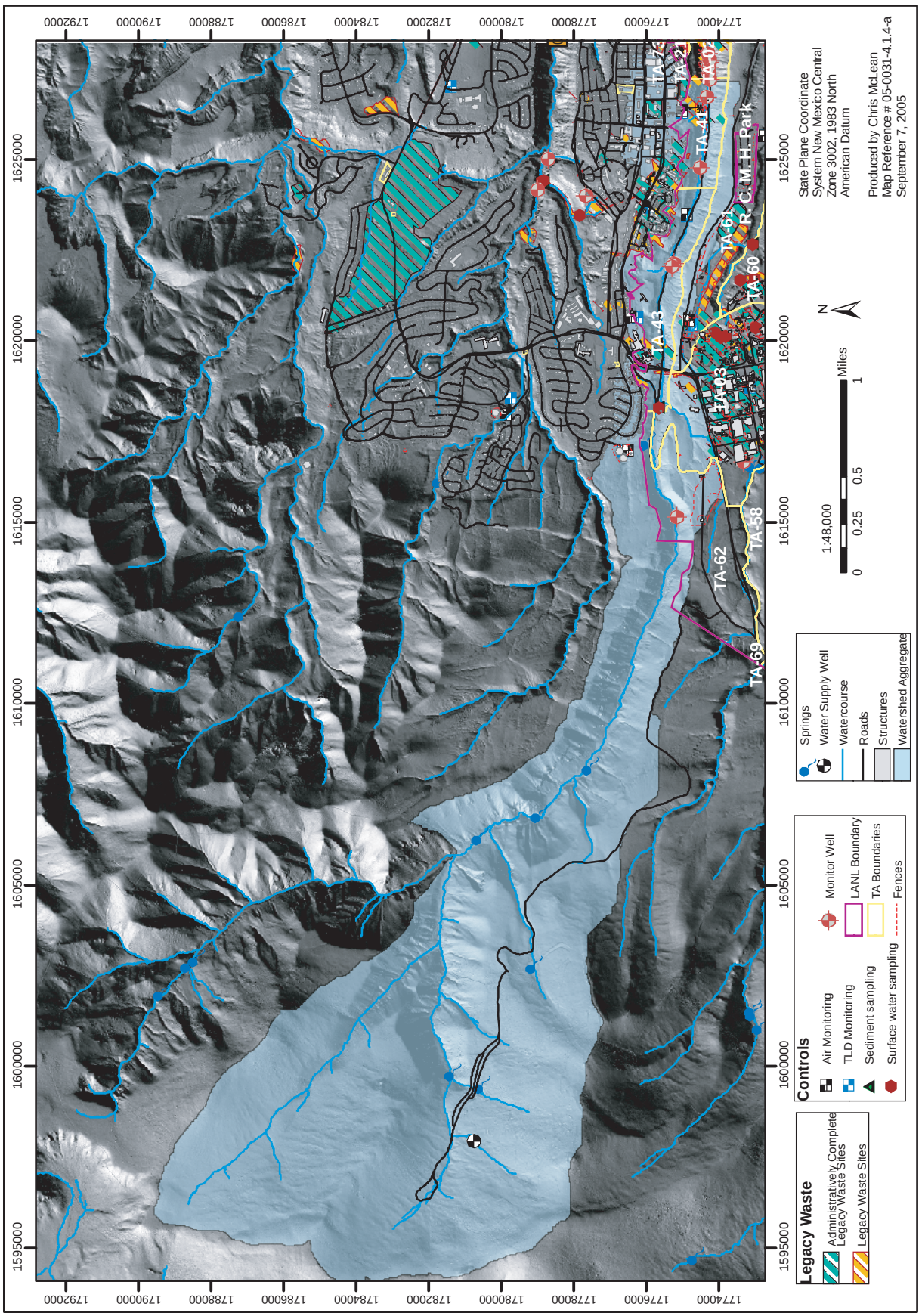
Map 4.1.3-a'. Current state: operational hazards within Pueblo Canyon Aggregate



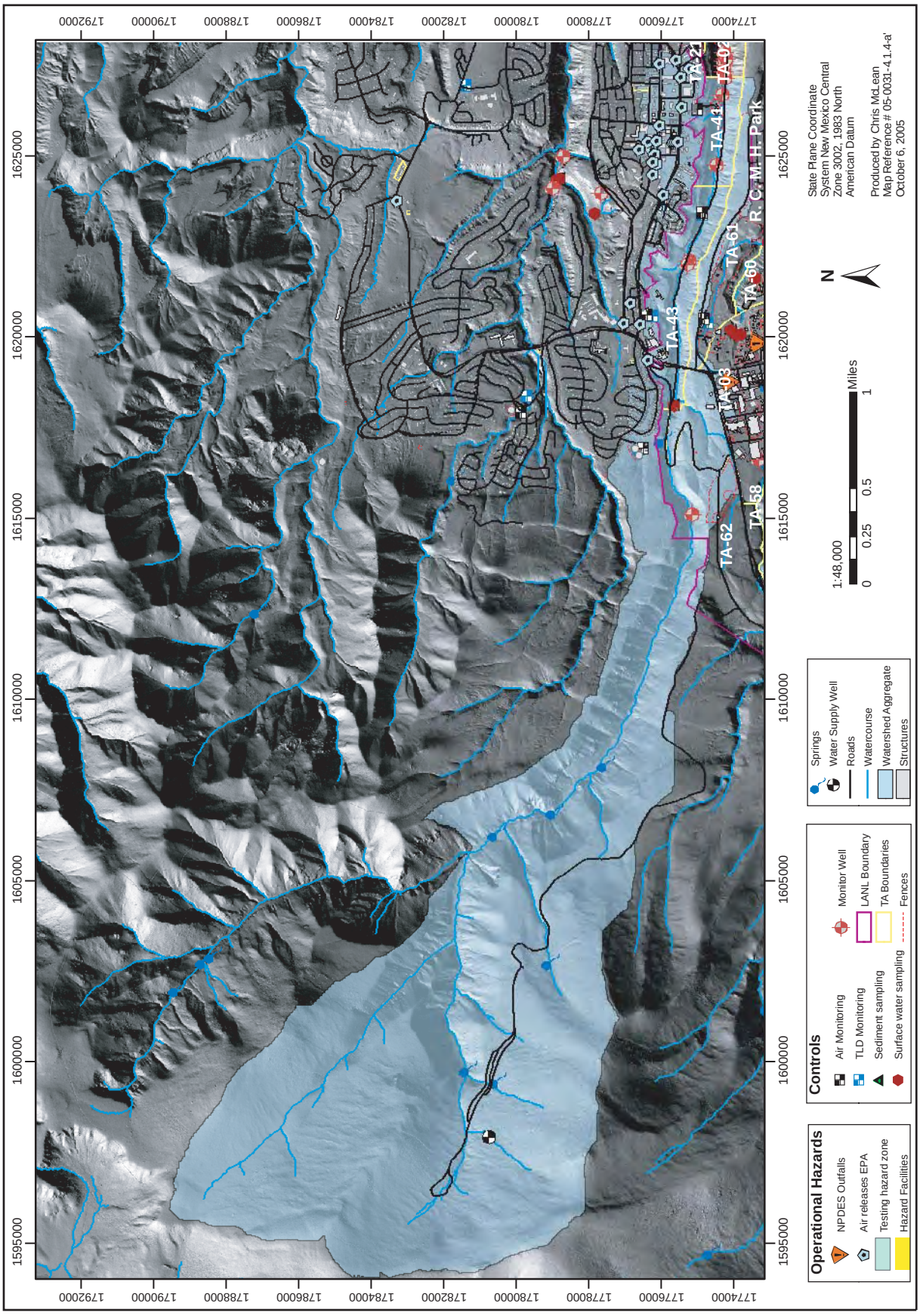
Map 4.1.3-b. Future state: legacy waste sites within Pueblo Canyon Aggregate



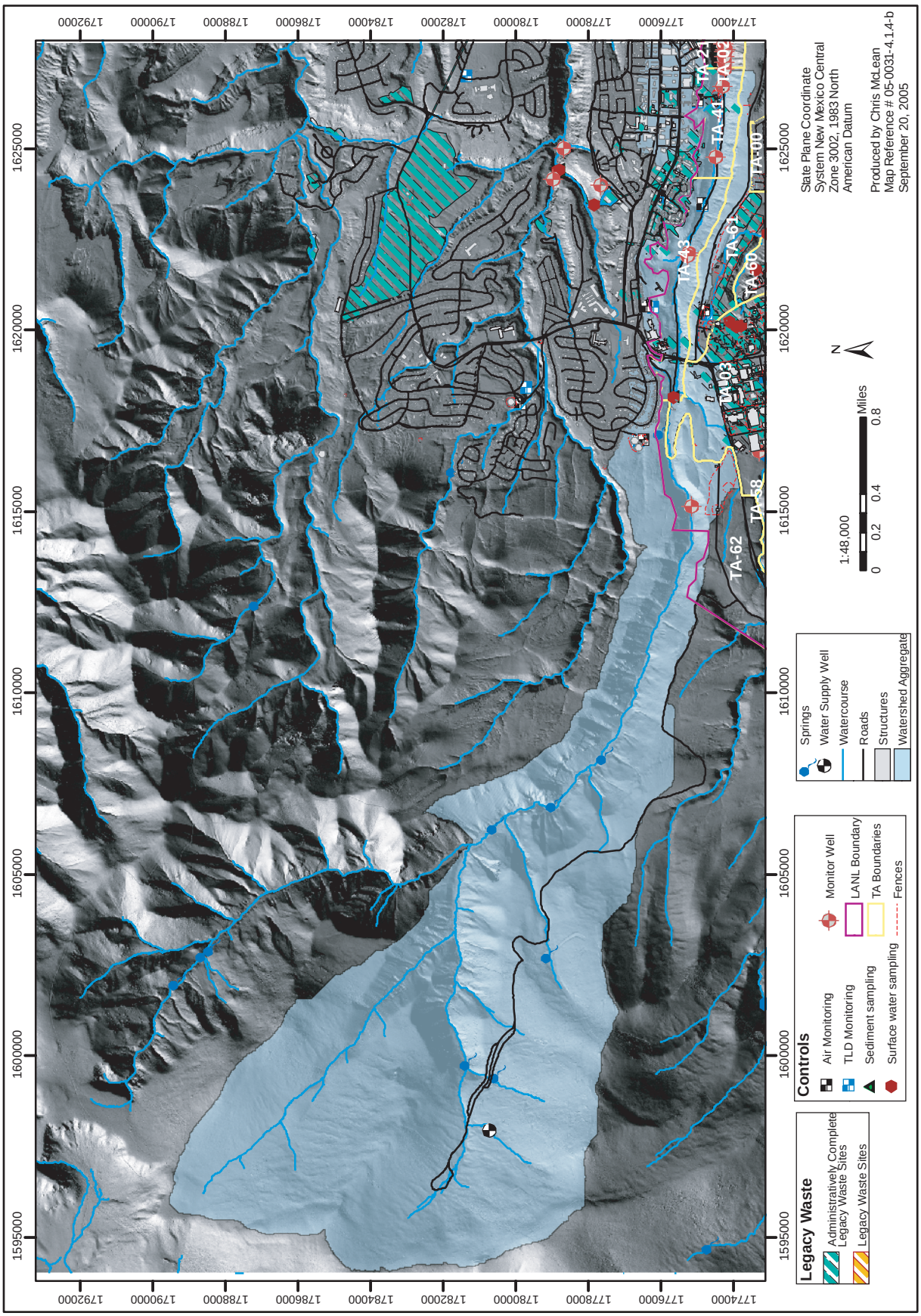
Map 4.1.3-b'. Future state: operational hazards within Pueblo Canyon Aggregate



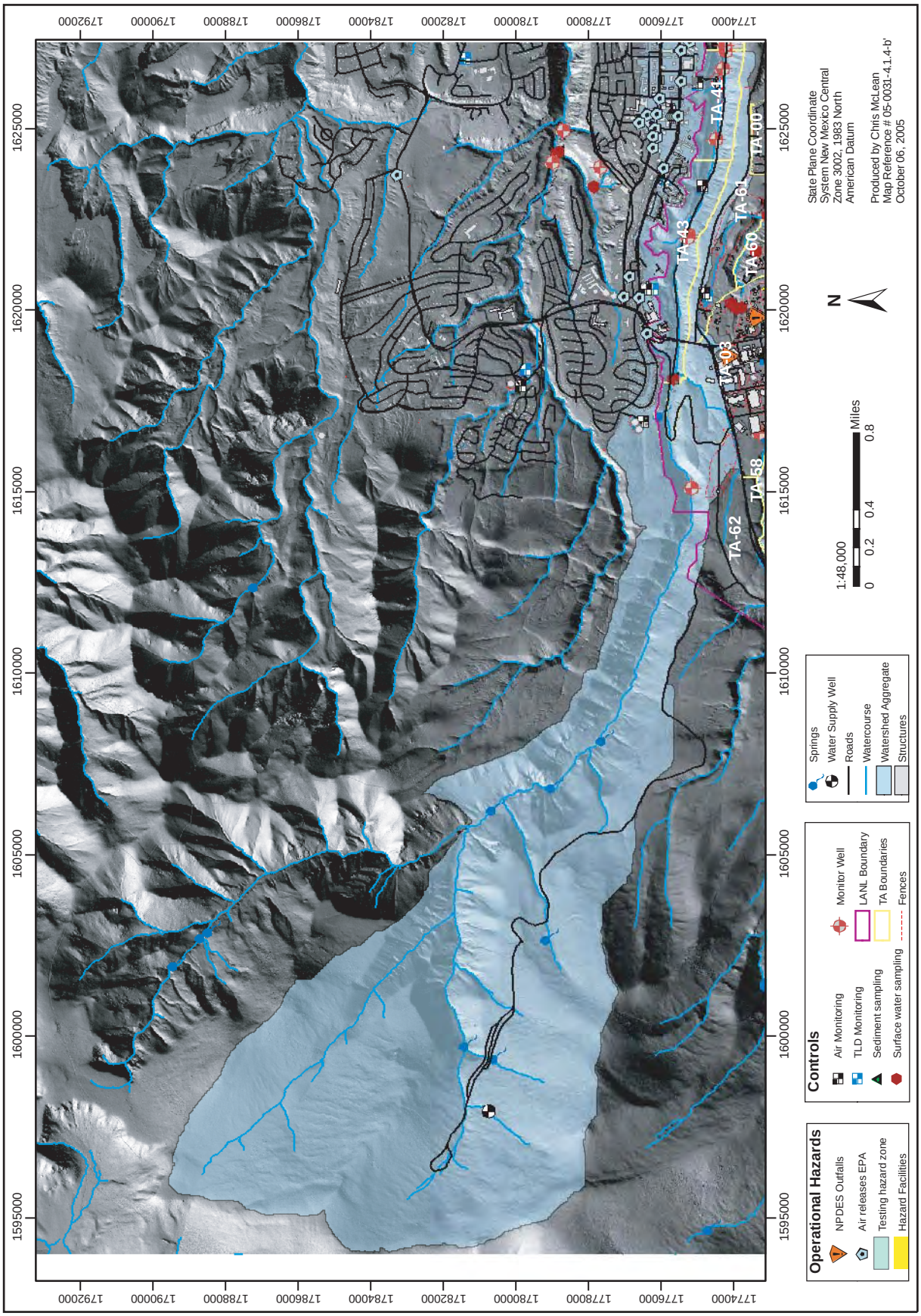
Map 4.1.4-a. Current state: legacy waste sites within Upper Los Alamos Canyon Aggregate



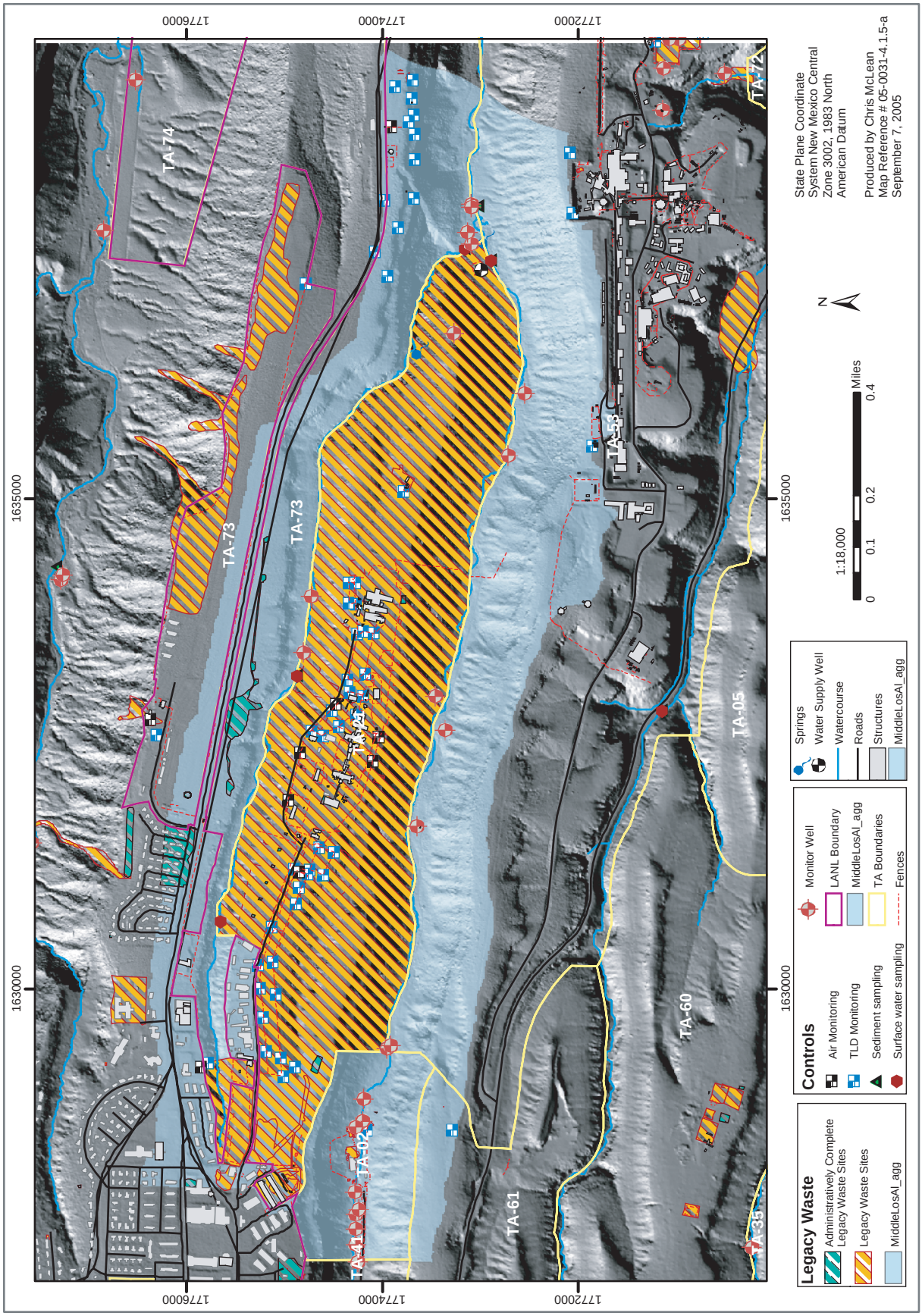
Map 4.1.4-a'. Current state: operational hazards within Upper Los Alamos Canyon Aggregate



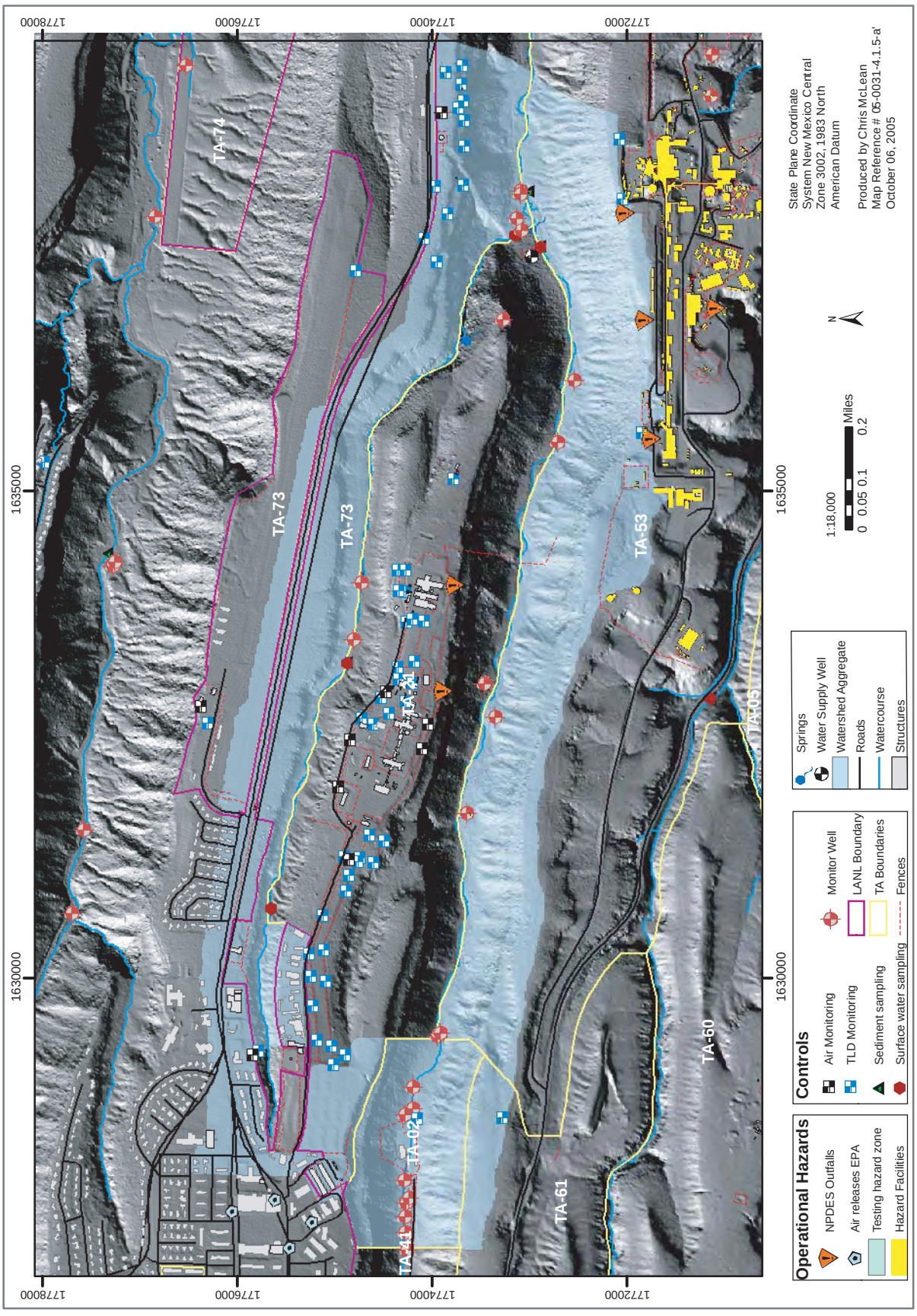
Map 4.1.4-b. Future state: legacy waste sites within Upper Los Alamos Canyon Aggregate



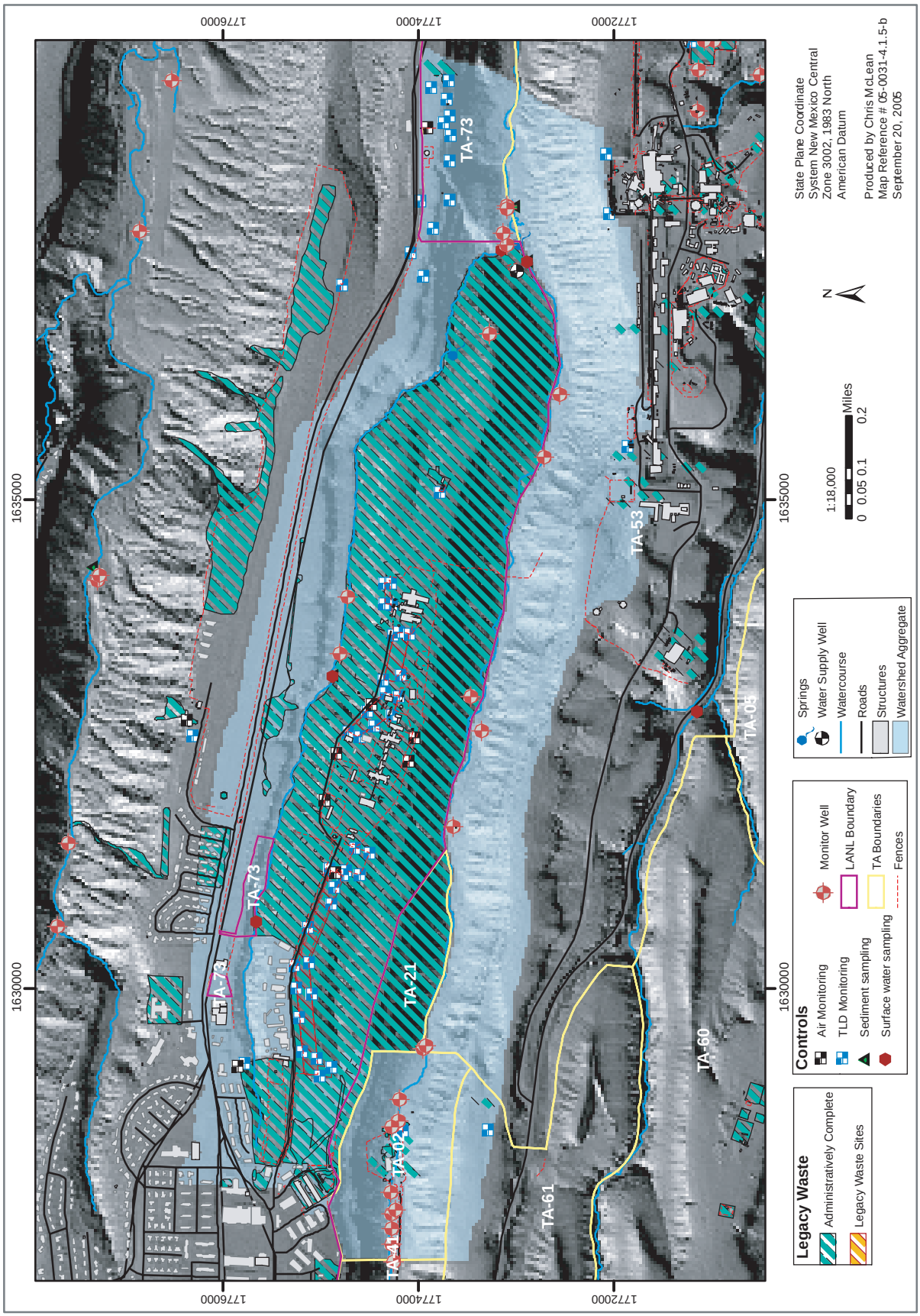
Map 4.1.4-b'. Future state: operational hazards within Upper Los Alamos Canyon Aggregate



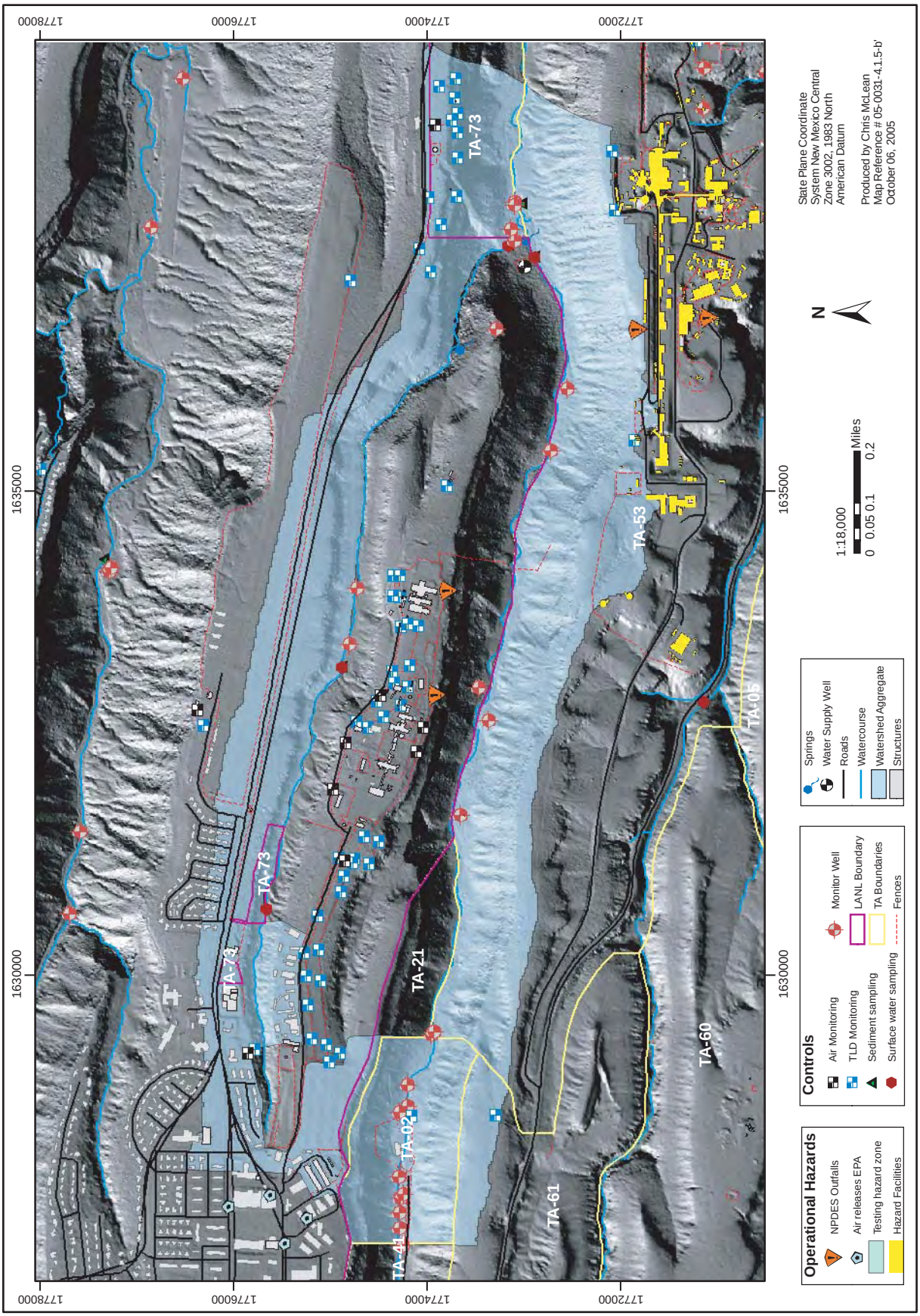
Map 4.1.5-a. Current state: legacy waste sites within Middle Los Alamos Canyon Aggregate



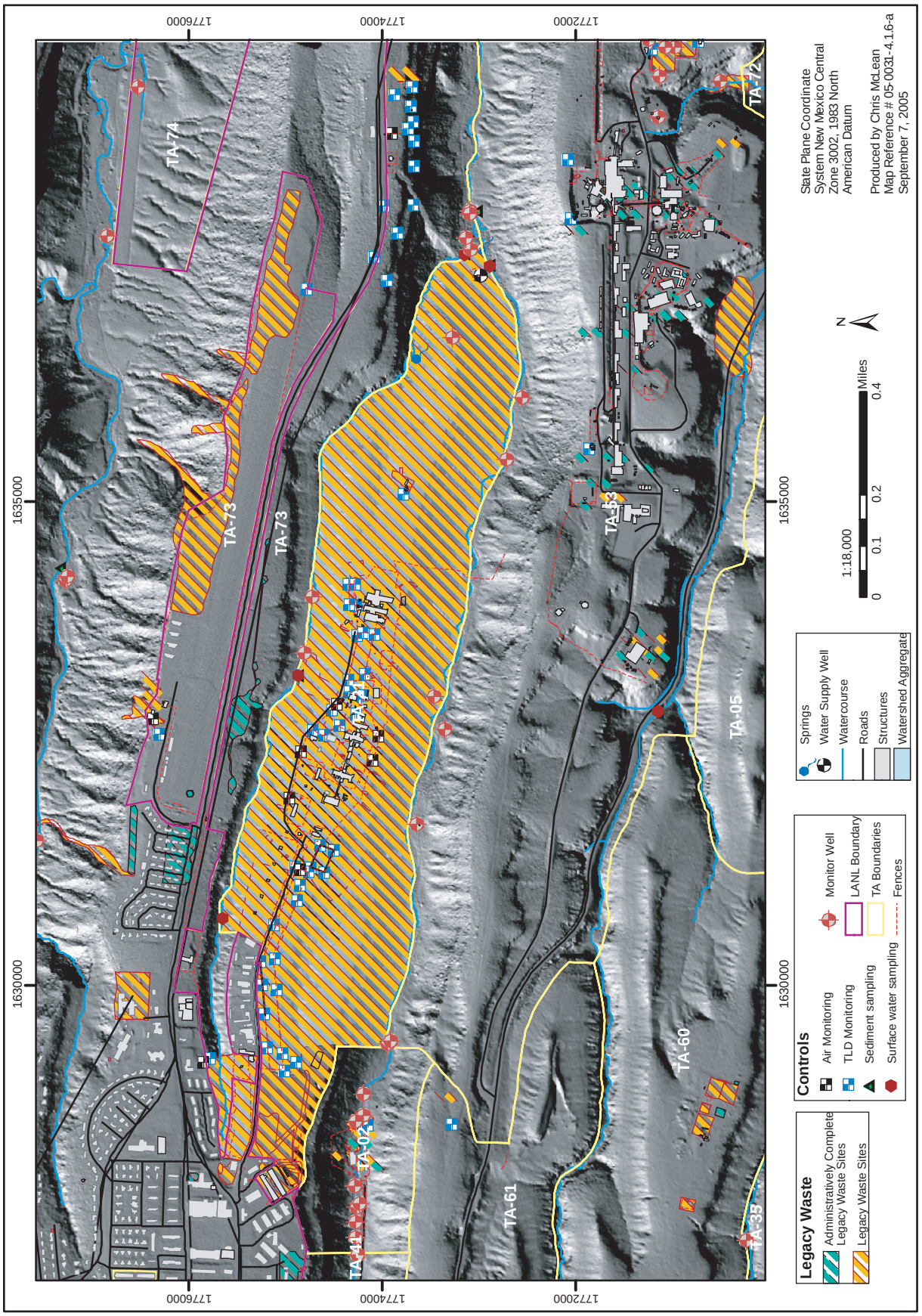
Map 4.1.5-a'. Current state: operational hazards within Middle Los Alamos Canyon Aggregate



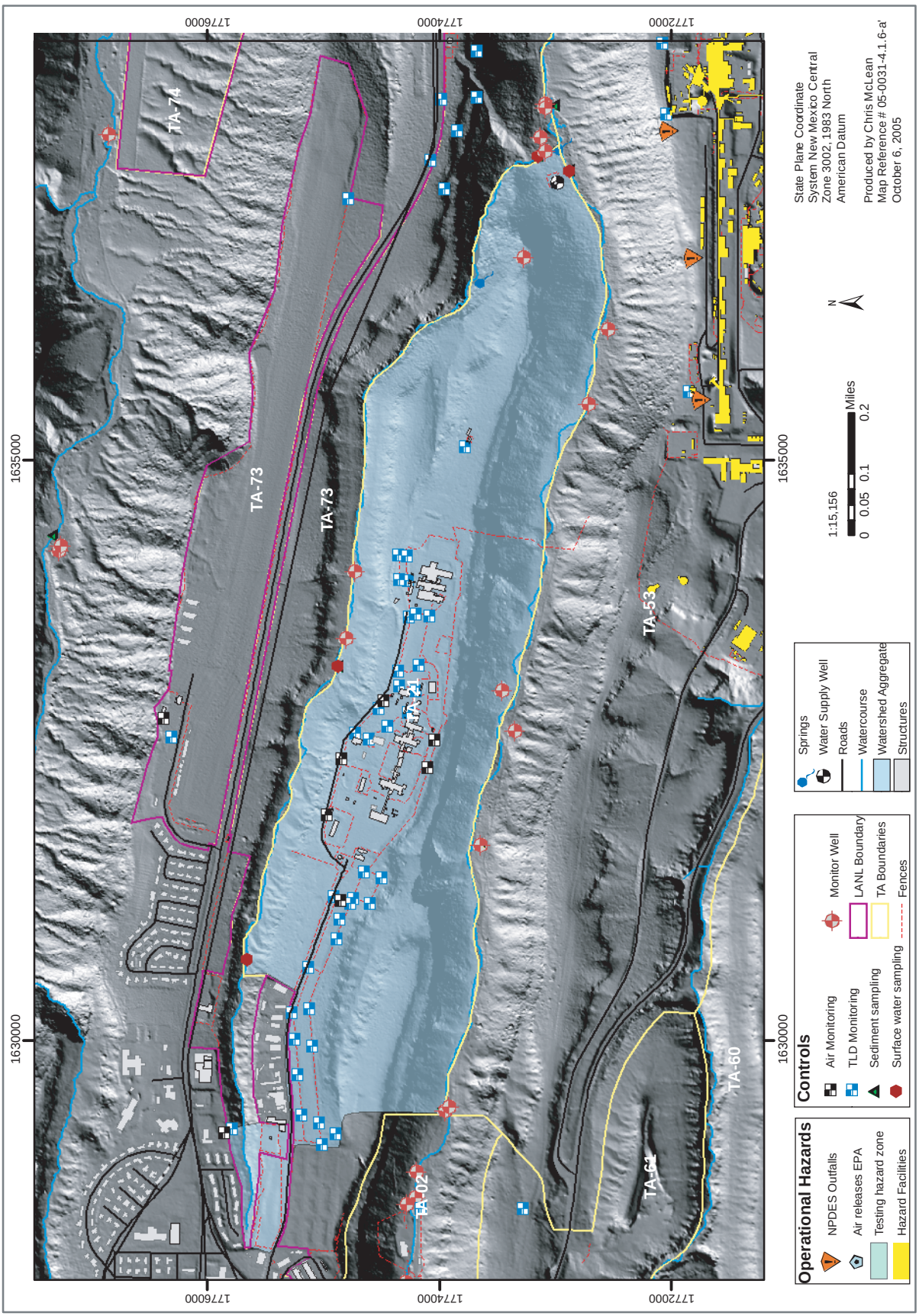
Map 4.1.5-b. Future state: legacy waste sites within Middle Los Alamos Canyon Aggregate



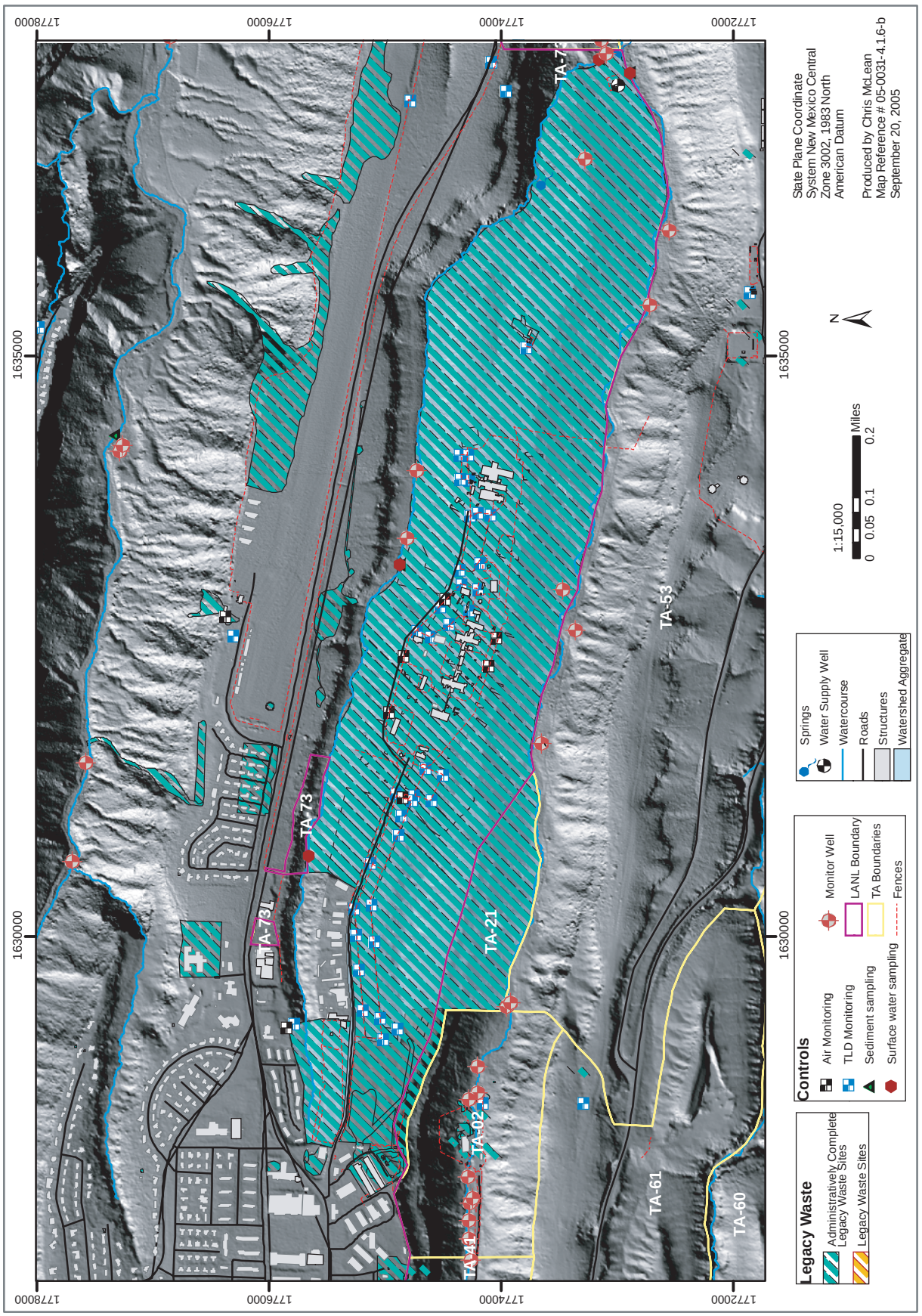
Map 4.1.5-b'. Future state: operational hazards within Middle Los Alamos Canyon Aggregate



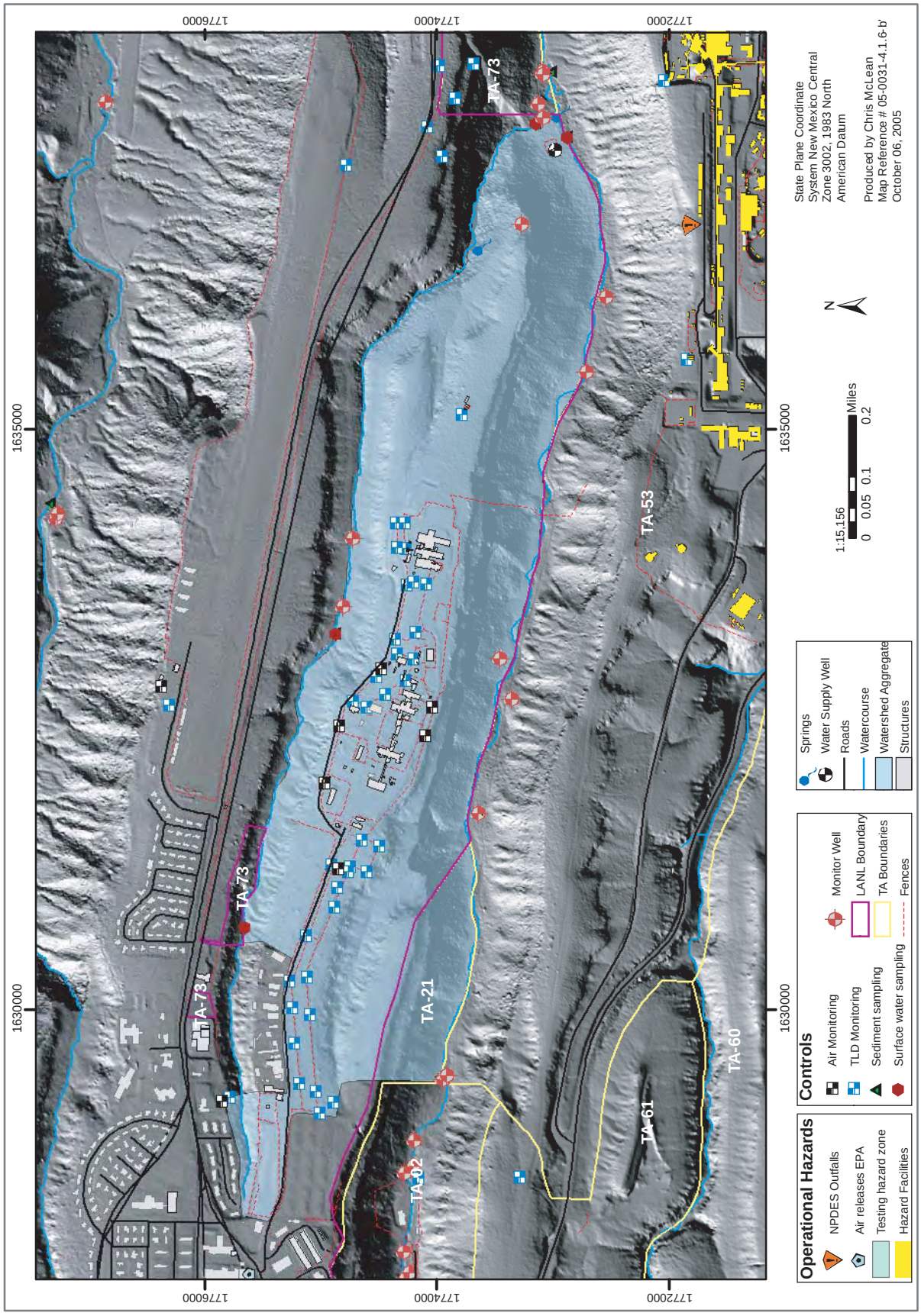
Map 4.1.6-a. Current state: legacy waste sites within DP Site Aggregate



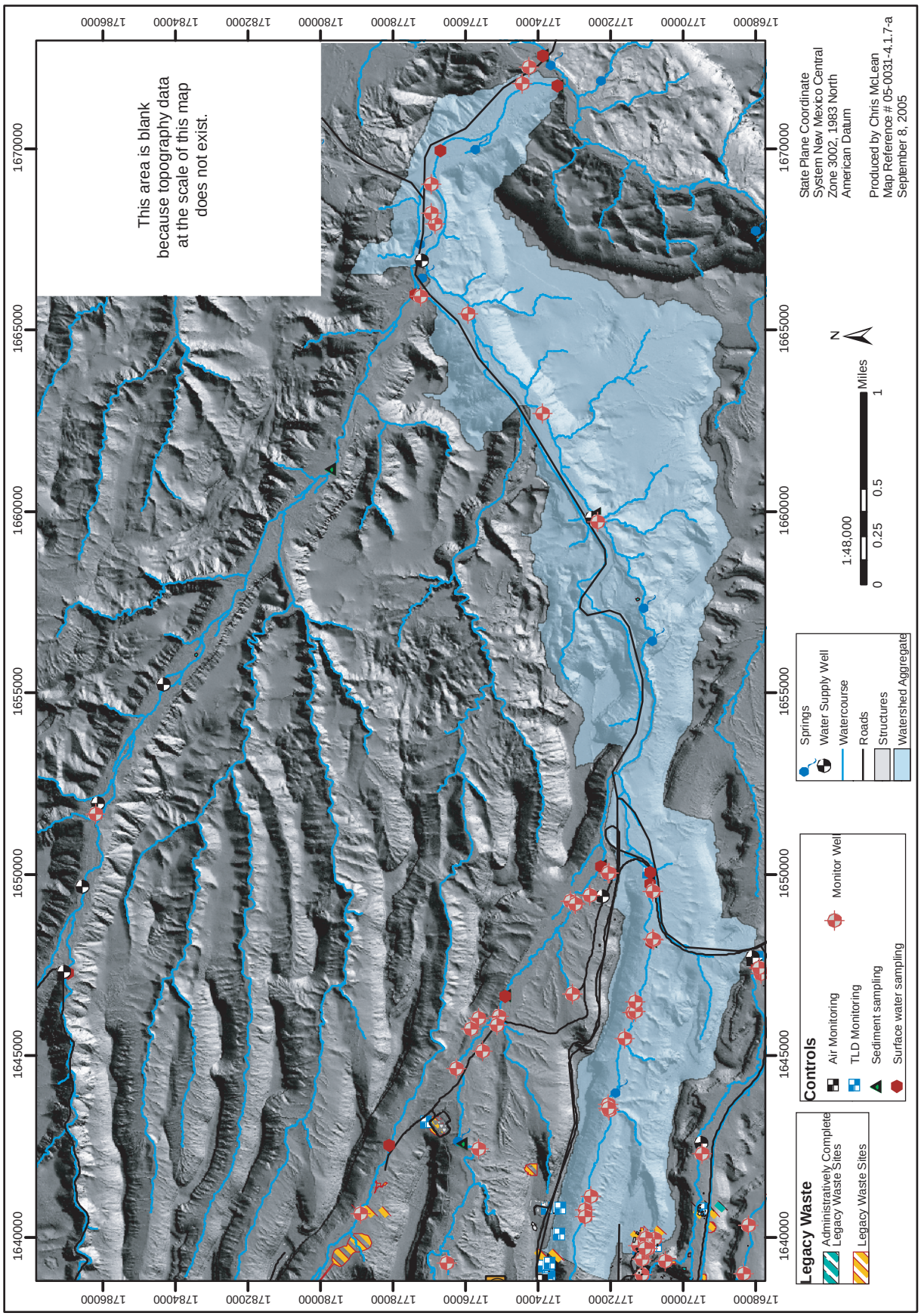
Map 4.1.6-a'. Current state: operational hazards within DP Site Aggregate



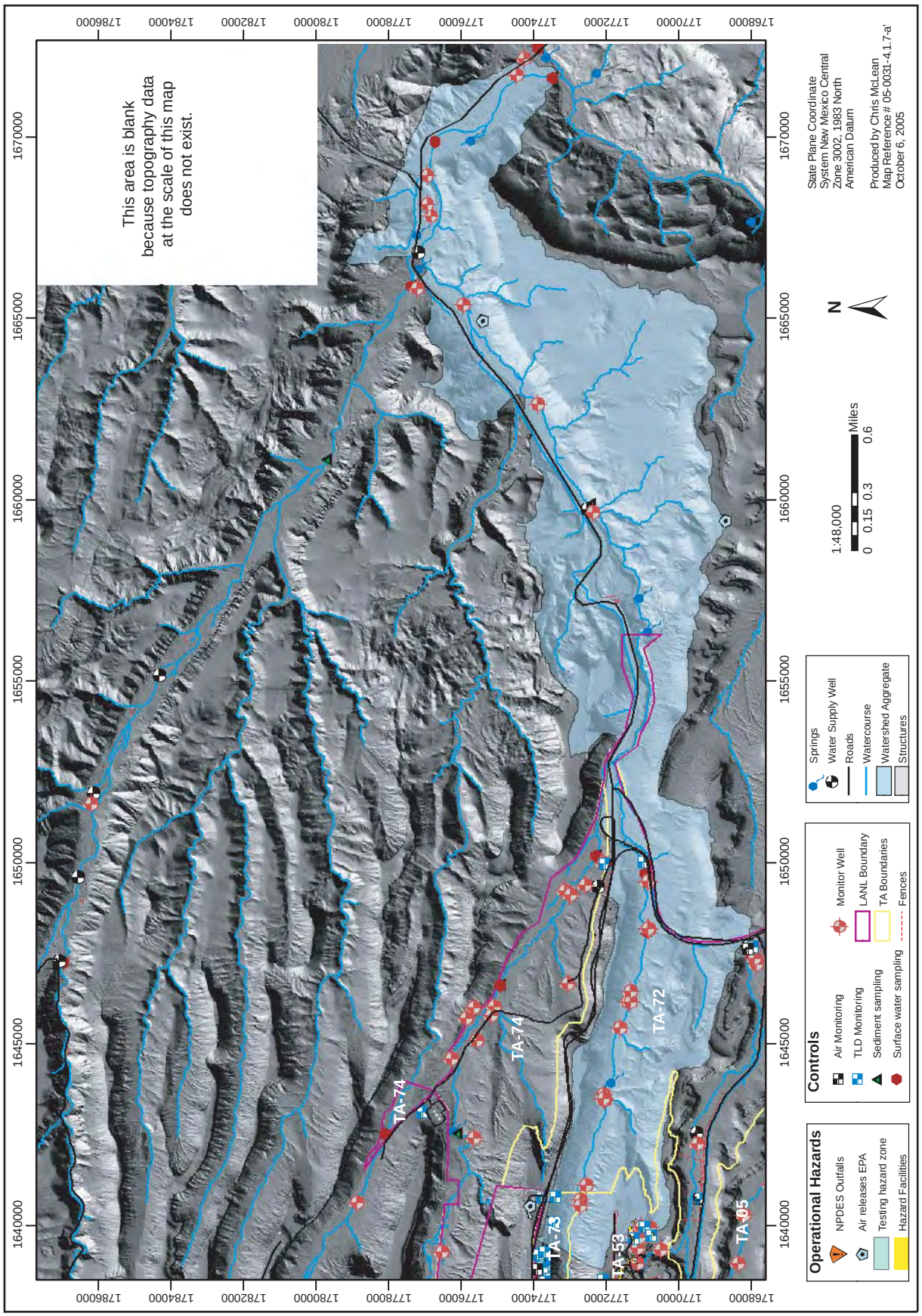
Map 4.1.6-b. Future state: legacy waste sites within DP Site Aggregate



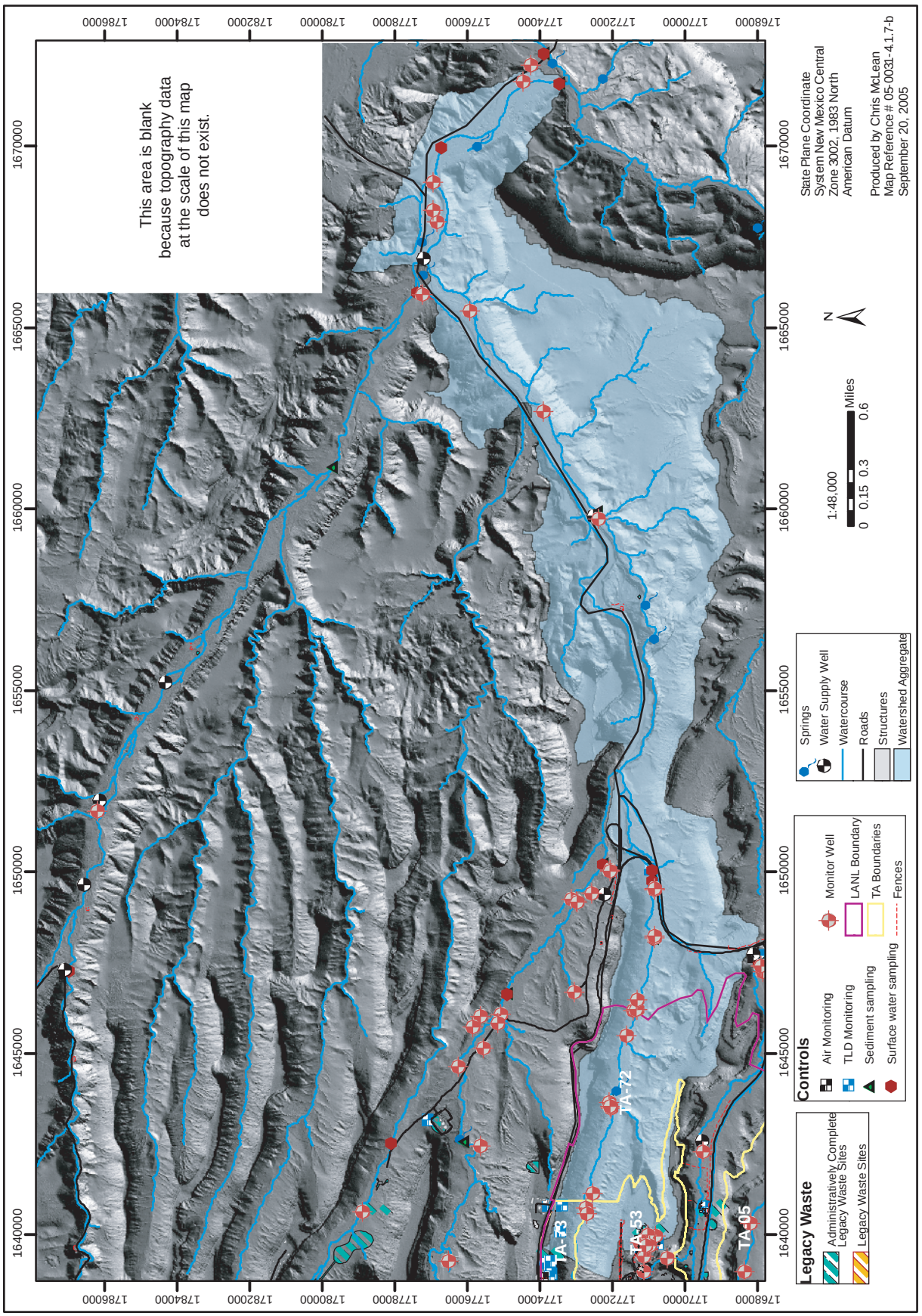
Map 4.1.6-b'. Future state: operational hazards within DP Site Aggregate



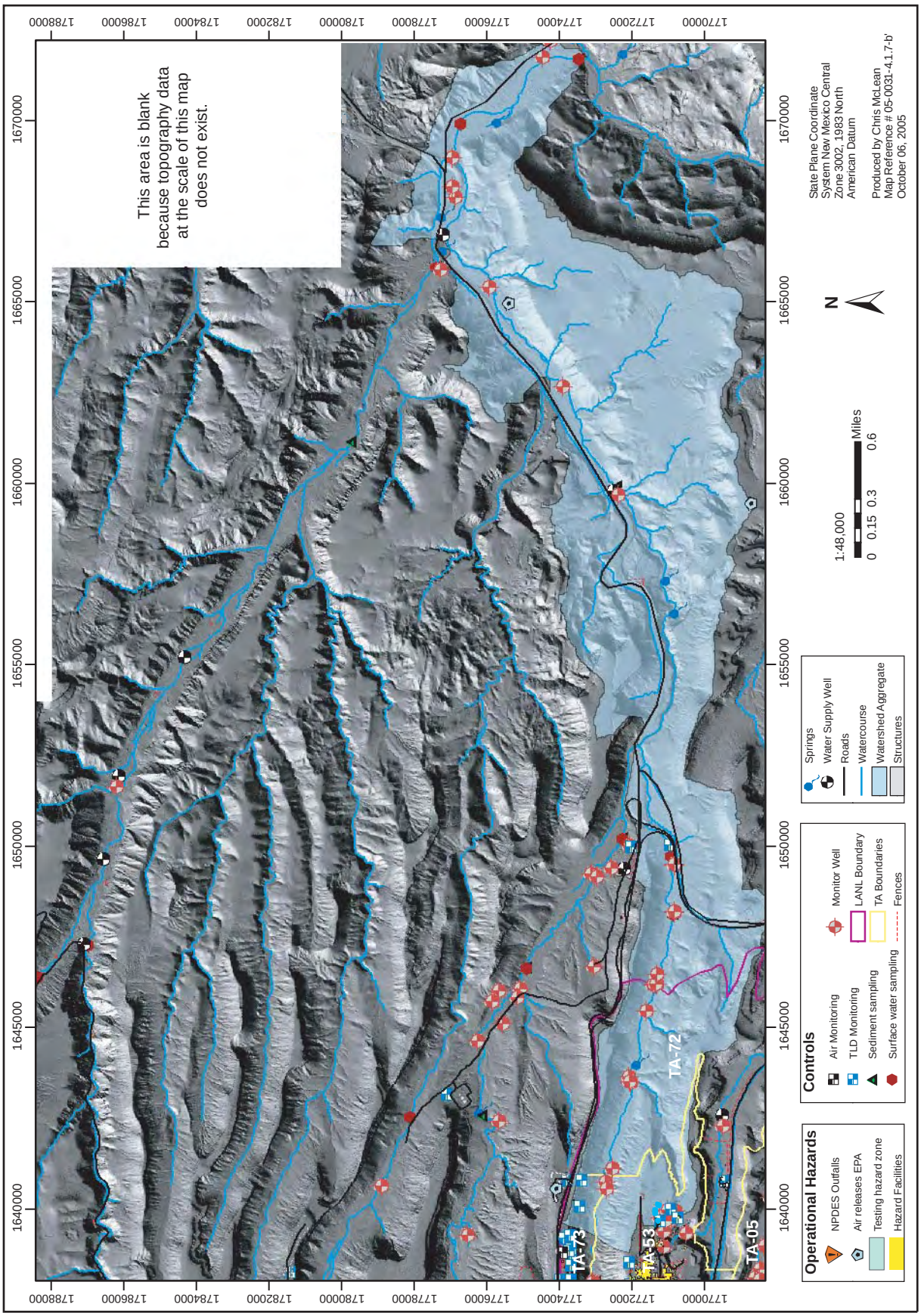
Map 4.1.7-a. Current state: legacy waste sites within Lower Los Alamos Canyon Aggregate



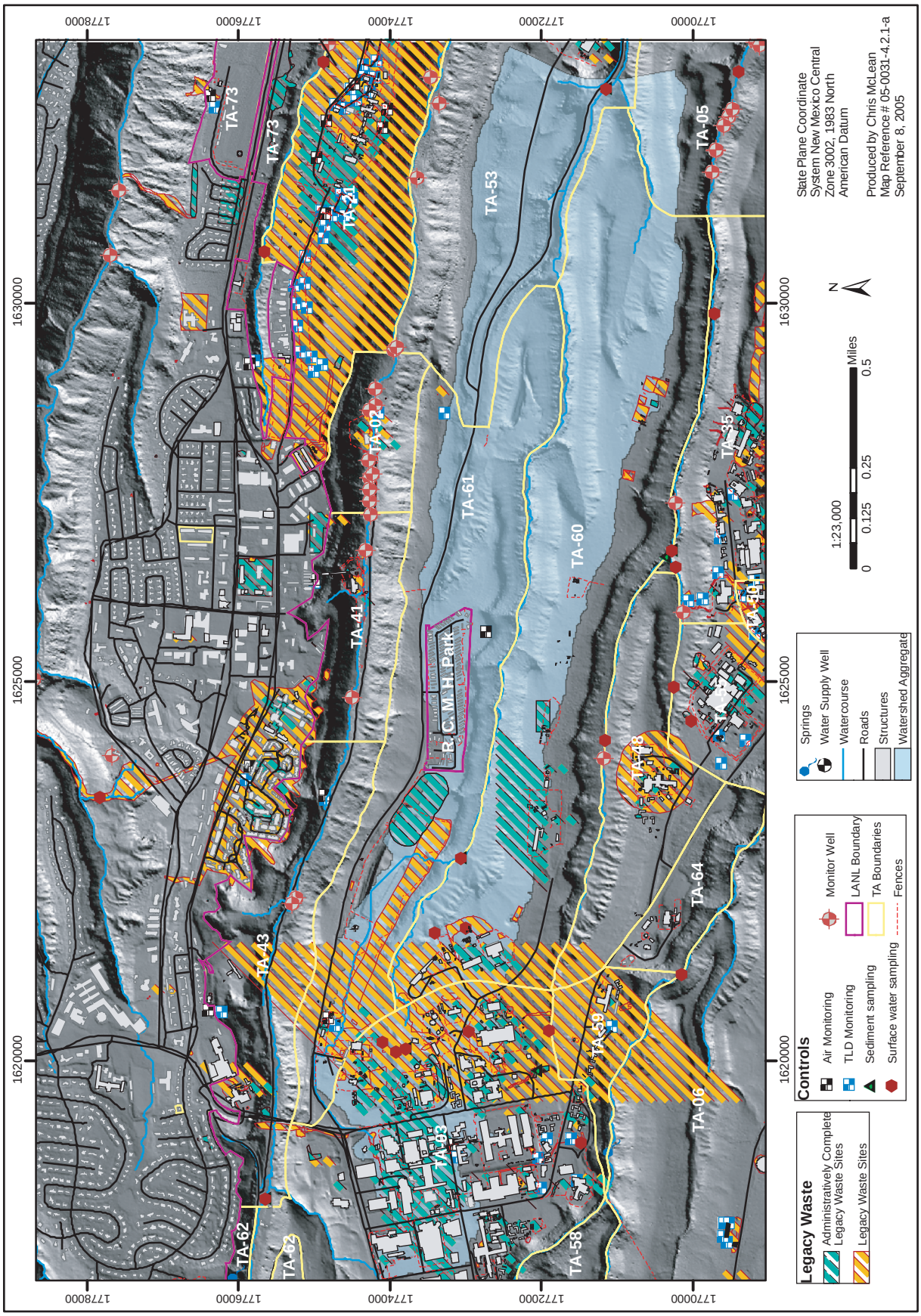
Map 4.1.7-a'. Current state: operational hazards within Lower Los Alamos Canyon Aggregate



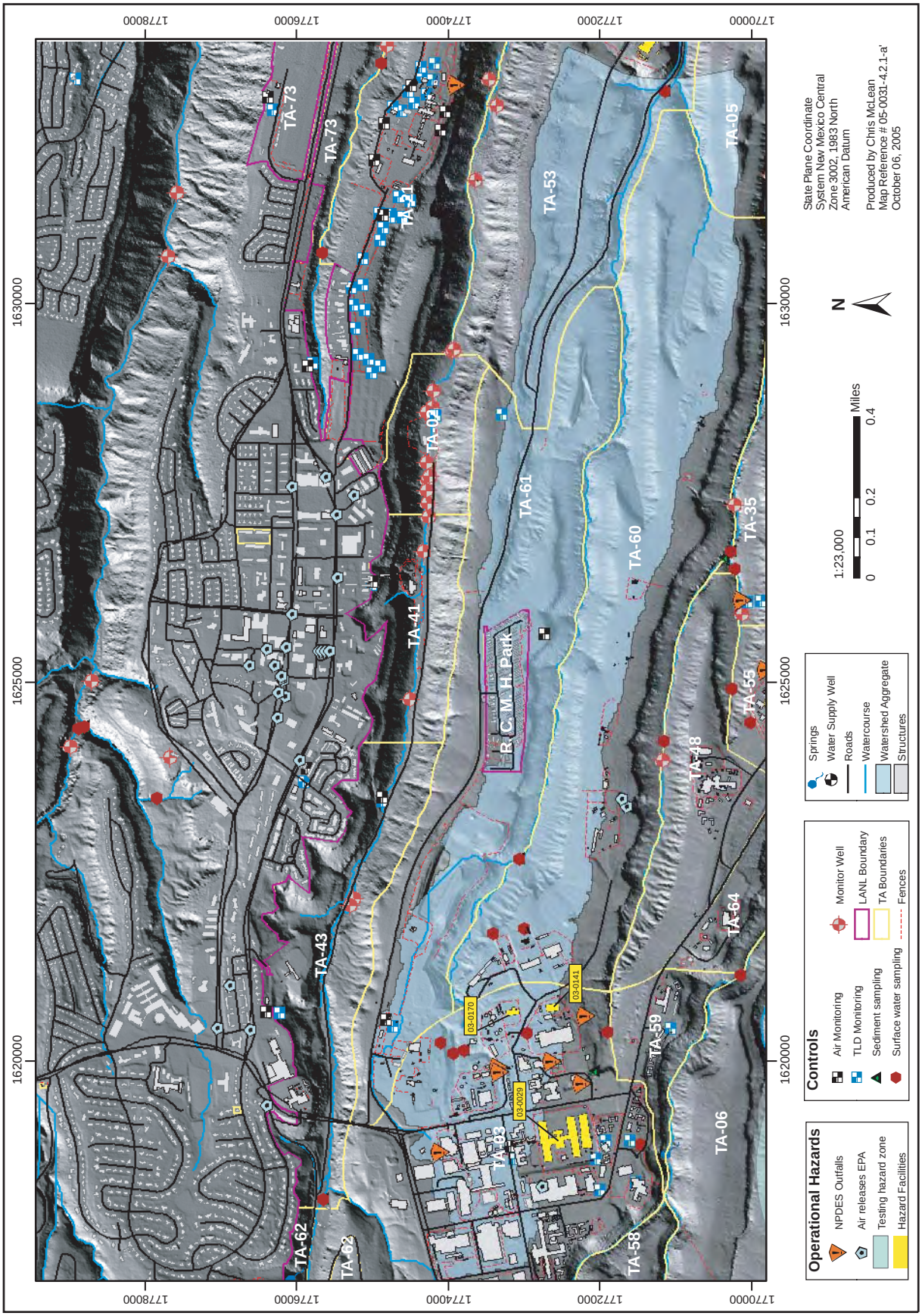
Map 4.1.7-b. Future state: legacy waste sites within Lower Los Alamos Canyon Aggregate



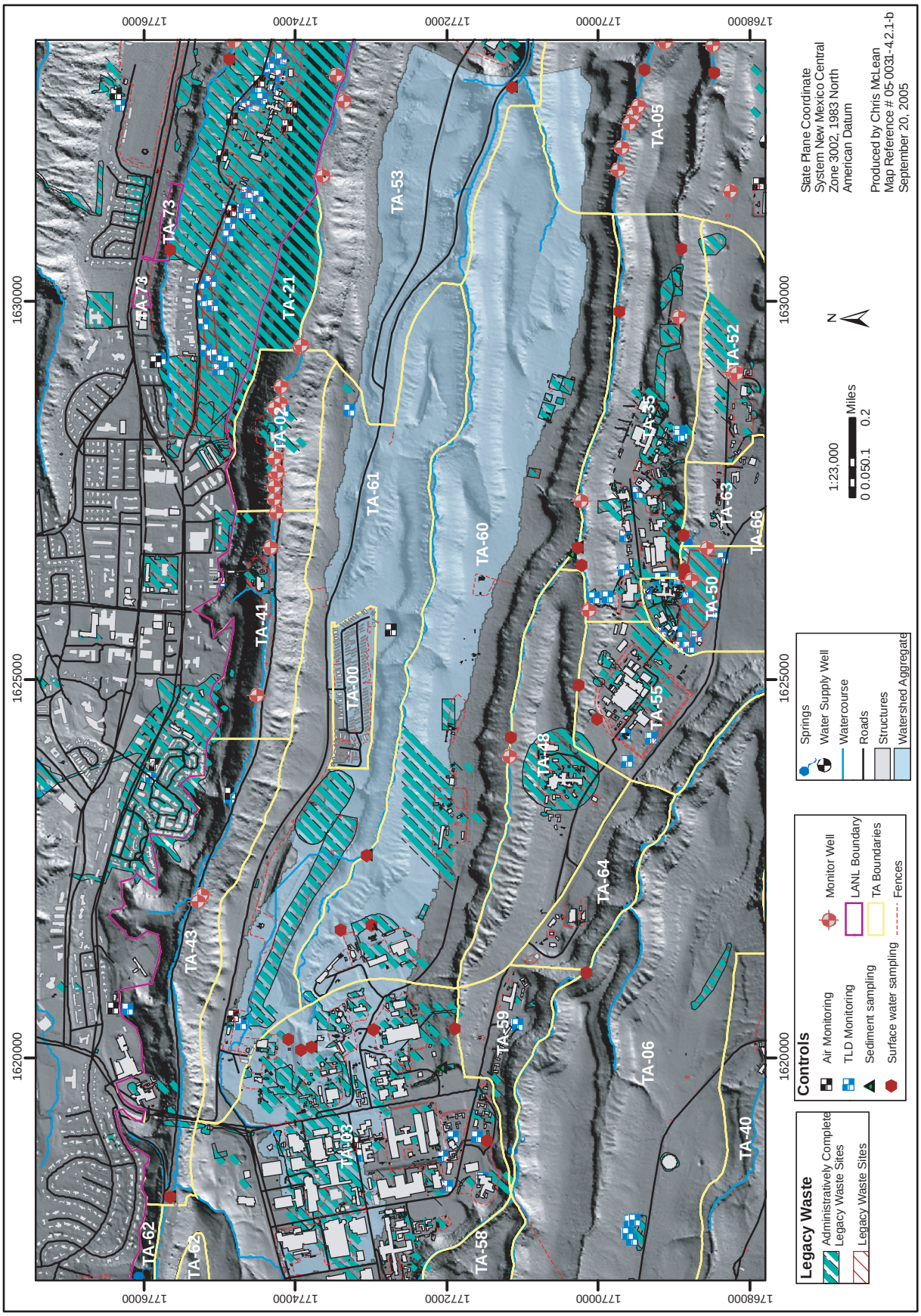
Map 4.1.7-b'. Future state: operational hazards within Lower Los Alamos Canyon Aggregate



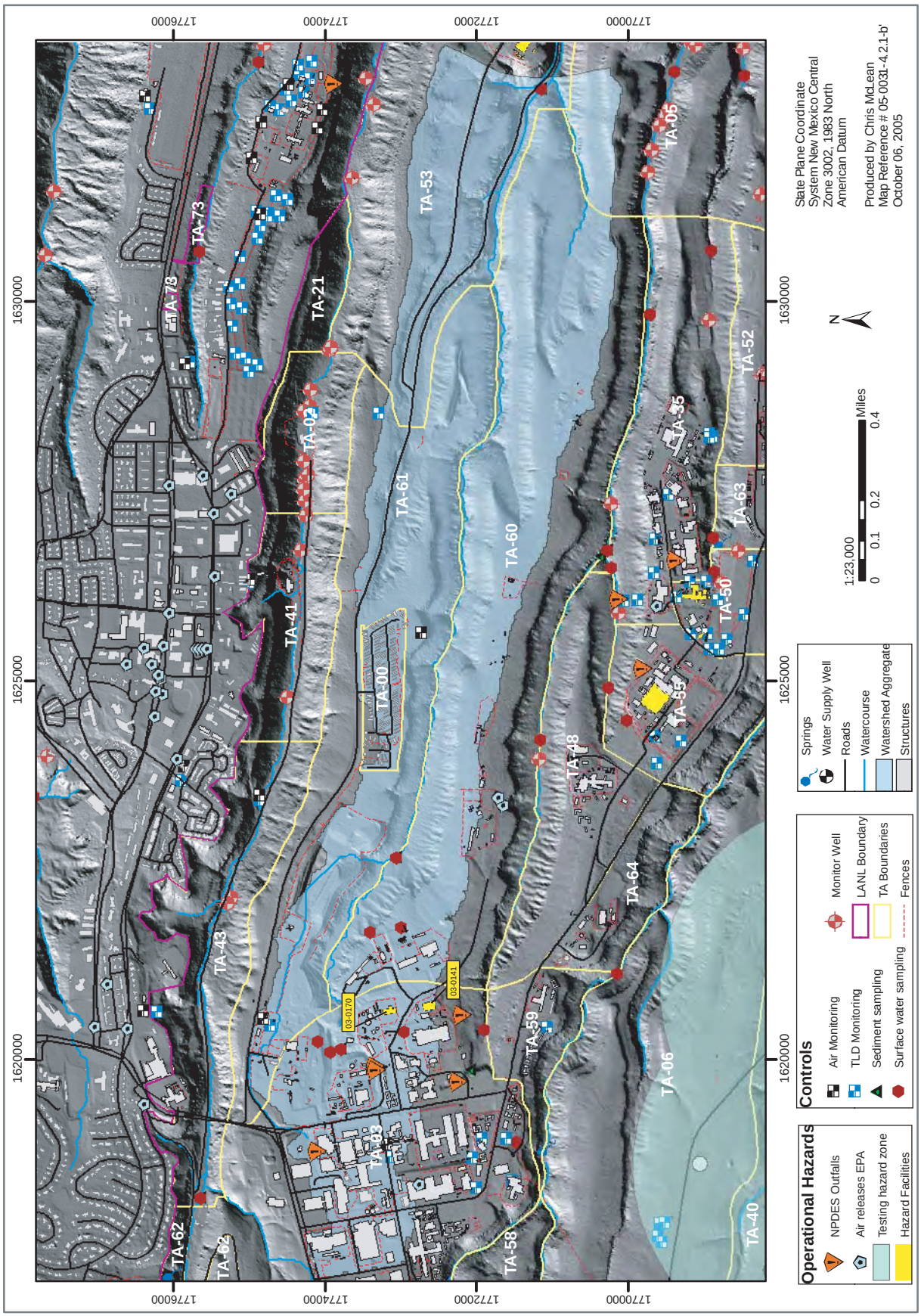
Map 4.2.1-a. Current state: legacy waste sites within Upper Sandia Canyon Aggregate



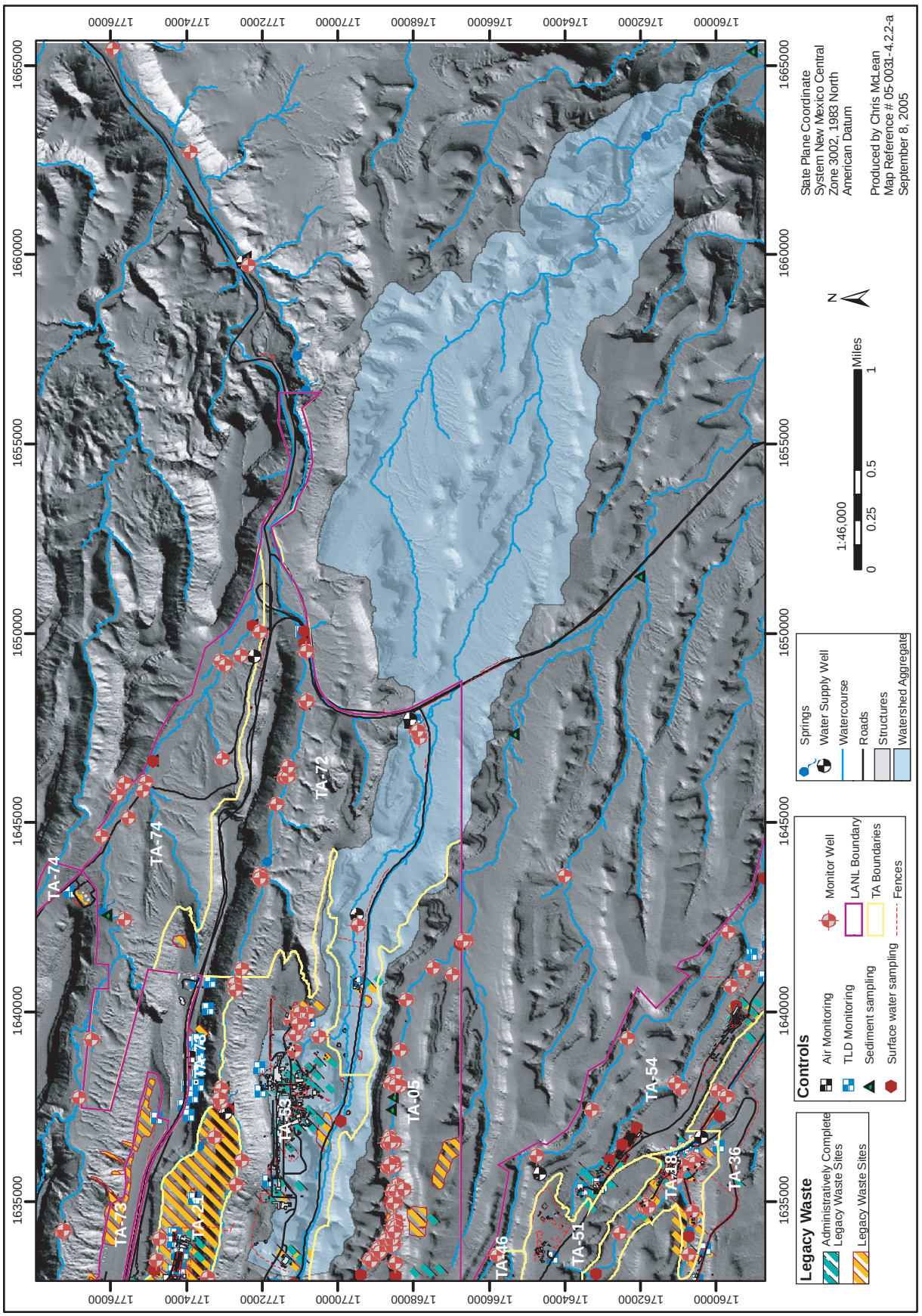
Map 4.2.1-a'. Current state: operational hazards within Upper Sandia Canyon Aggregate



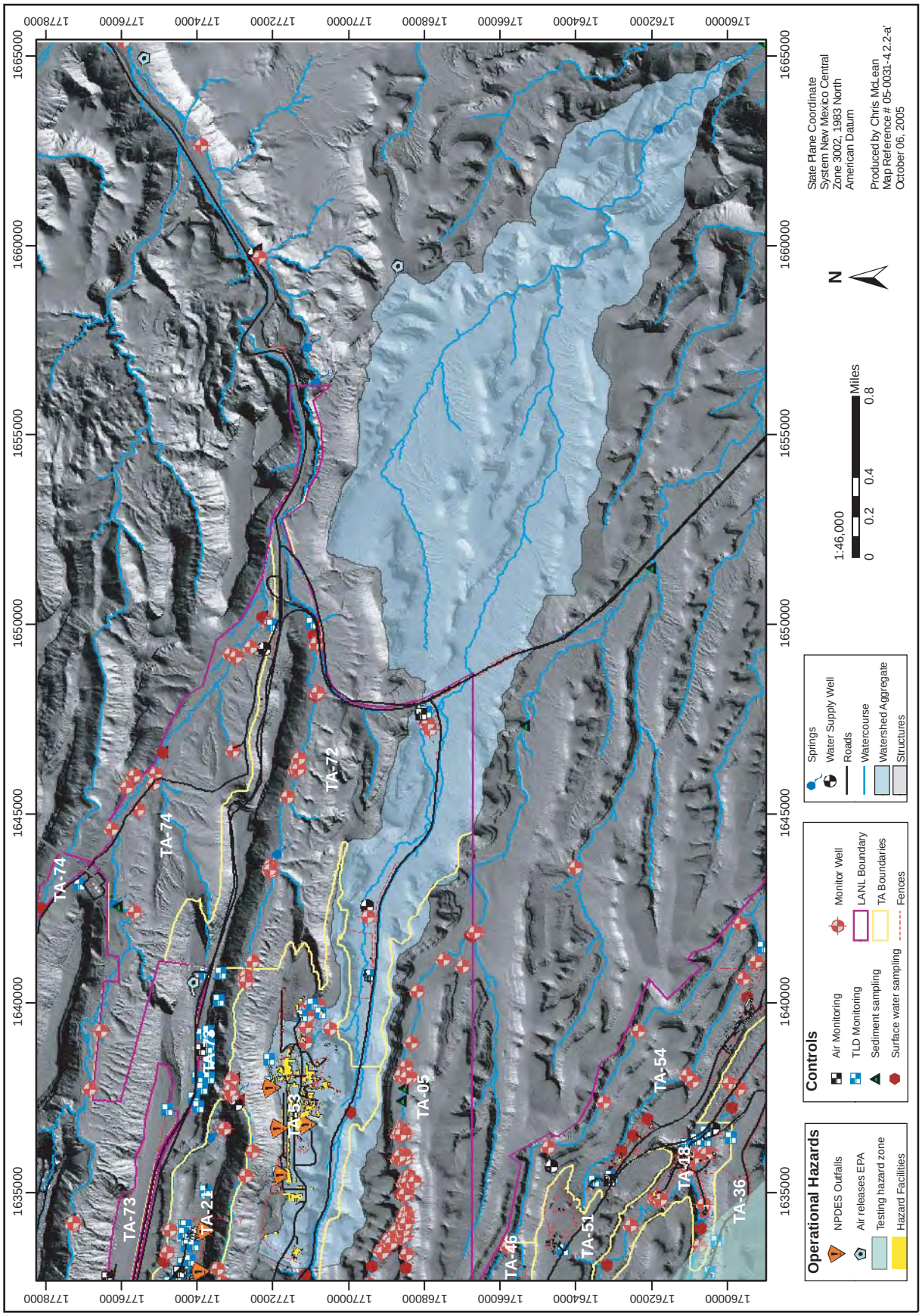
Map 4.2.1-b. Future state: legacy waste sites within Upper Sandia Canyon Aggregate



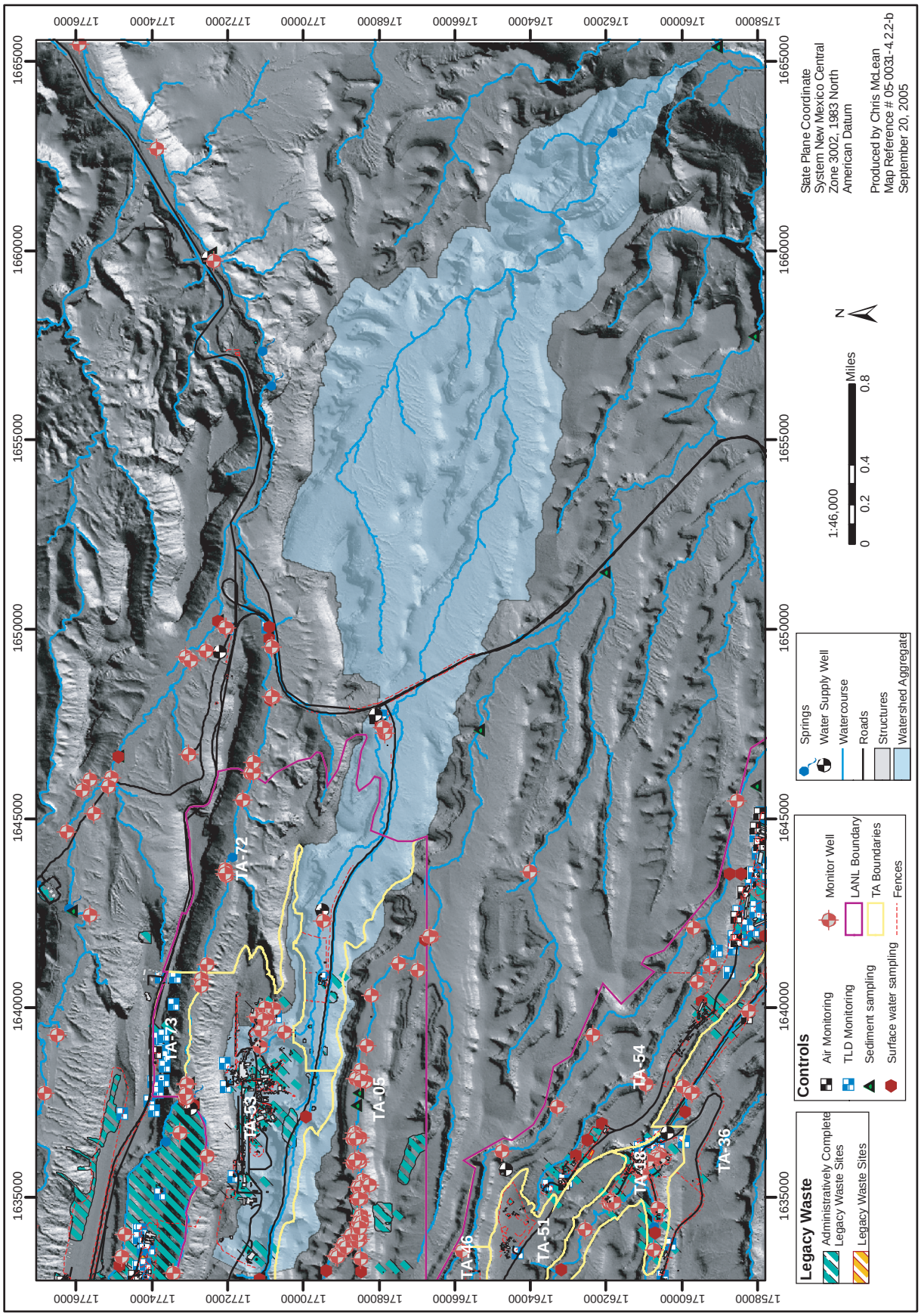
Map 4.2.1-b'. Future state: operational hazards within Upper Sandia Canyon Aggregate



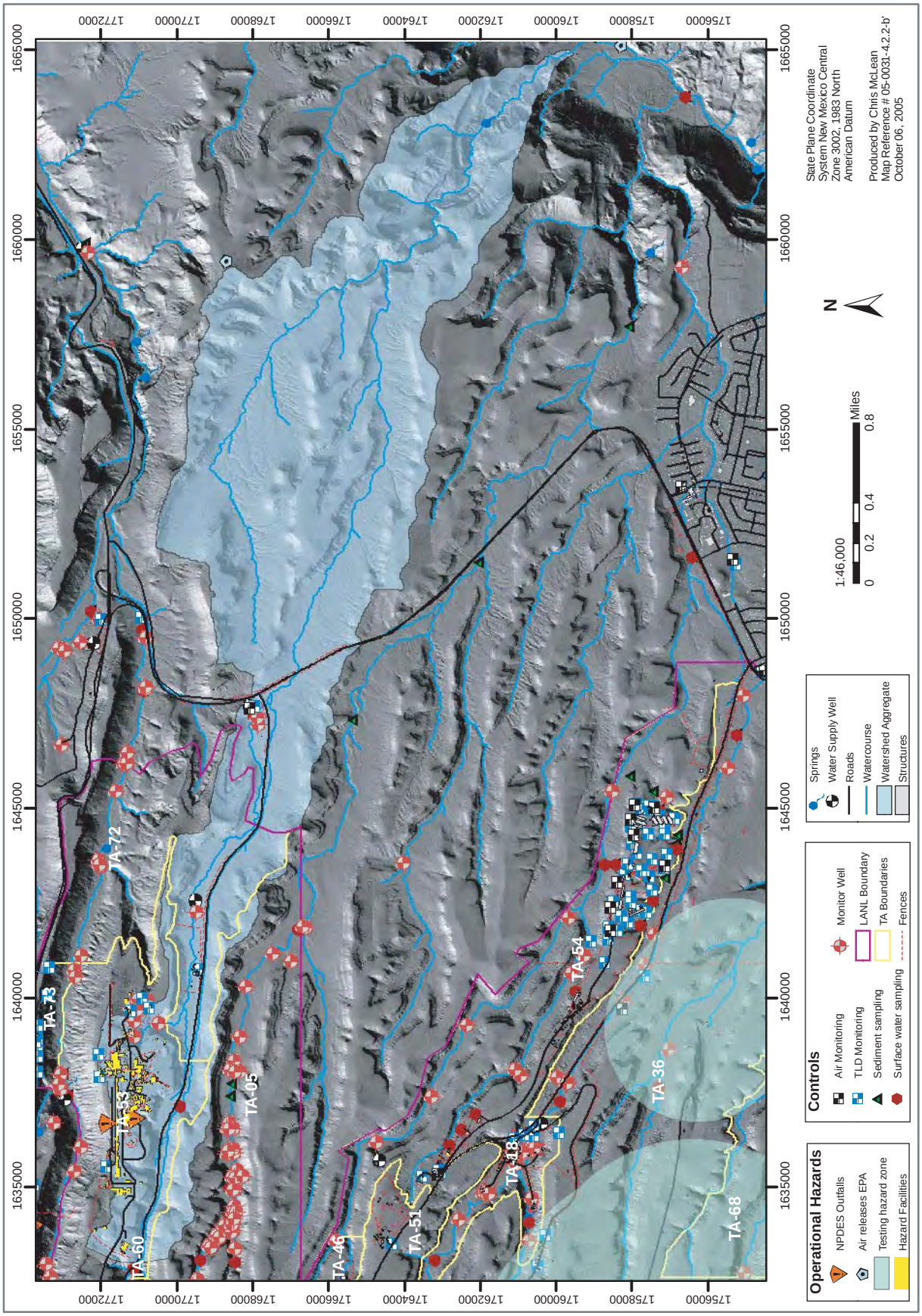
Map 4.2.2-a. Current state: legacy waste sites within Lower Sandia Canyon Aggregate



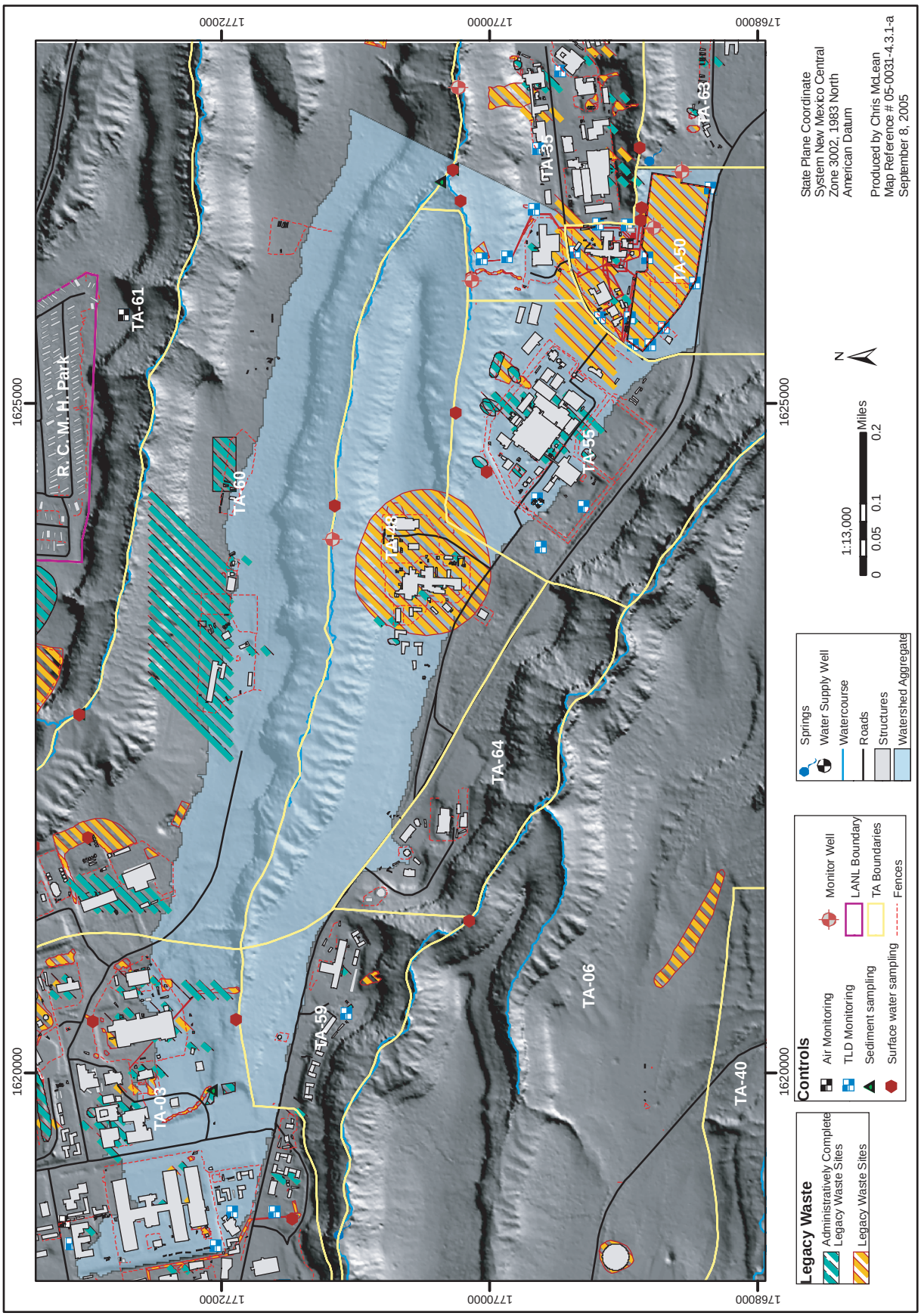
Map 4.2.2-a'. Current state: operational hazards within Lower Sandia Canyon Aggregate



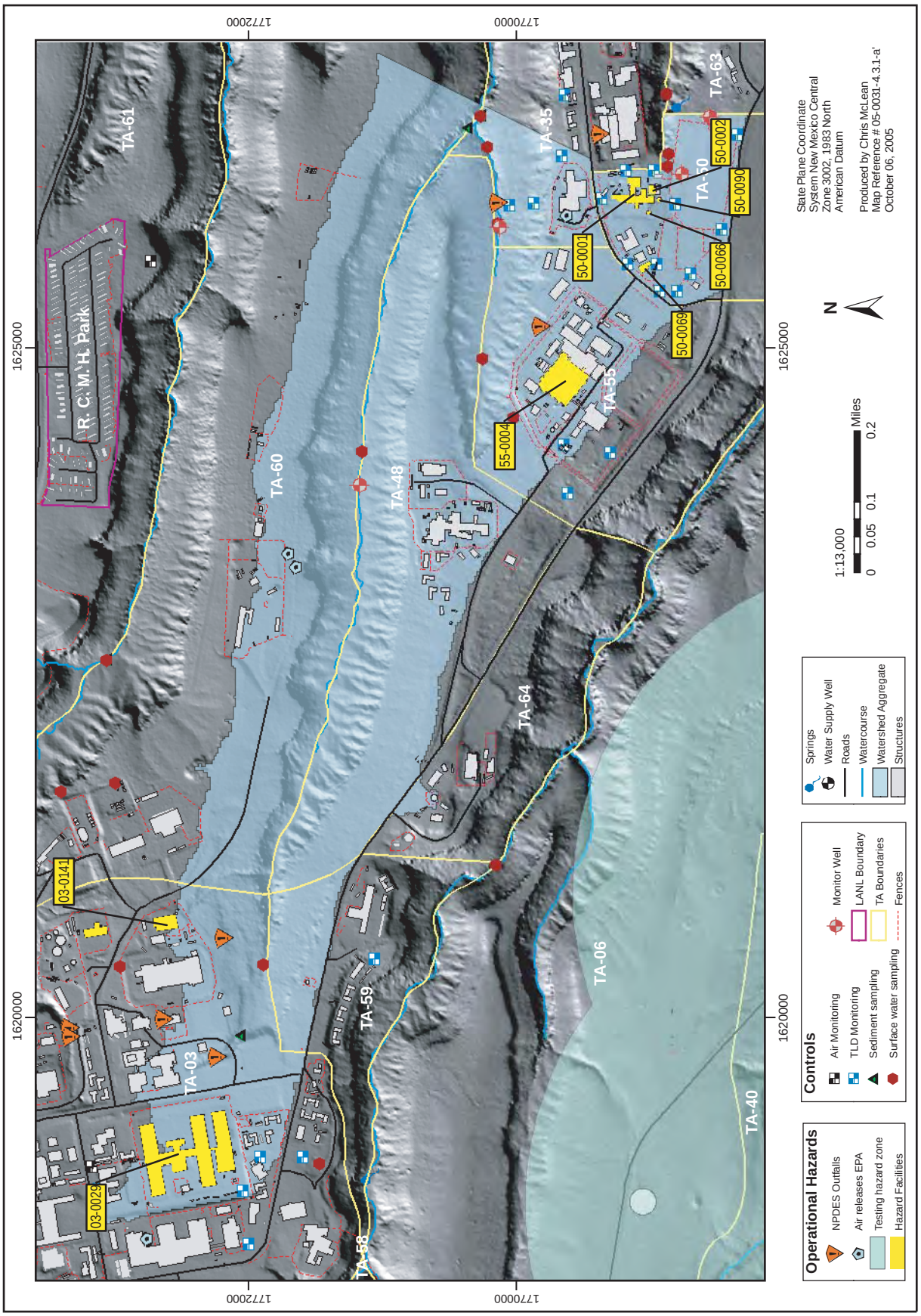
Map 4.2.2-b. Future state: legacy waste sites within Lower Sandia Canyon Aggregate



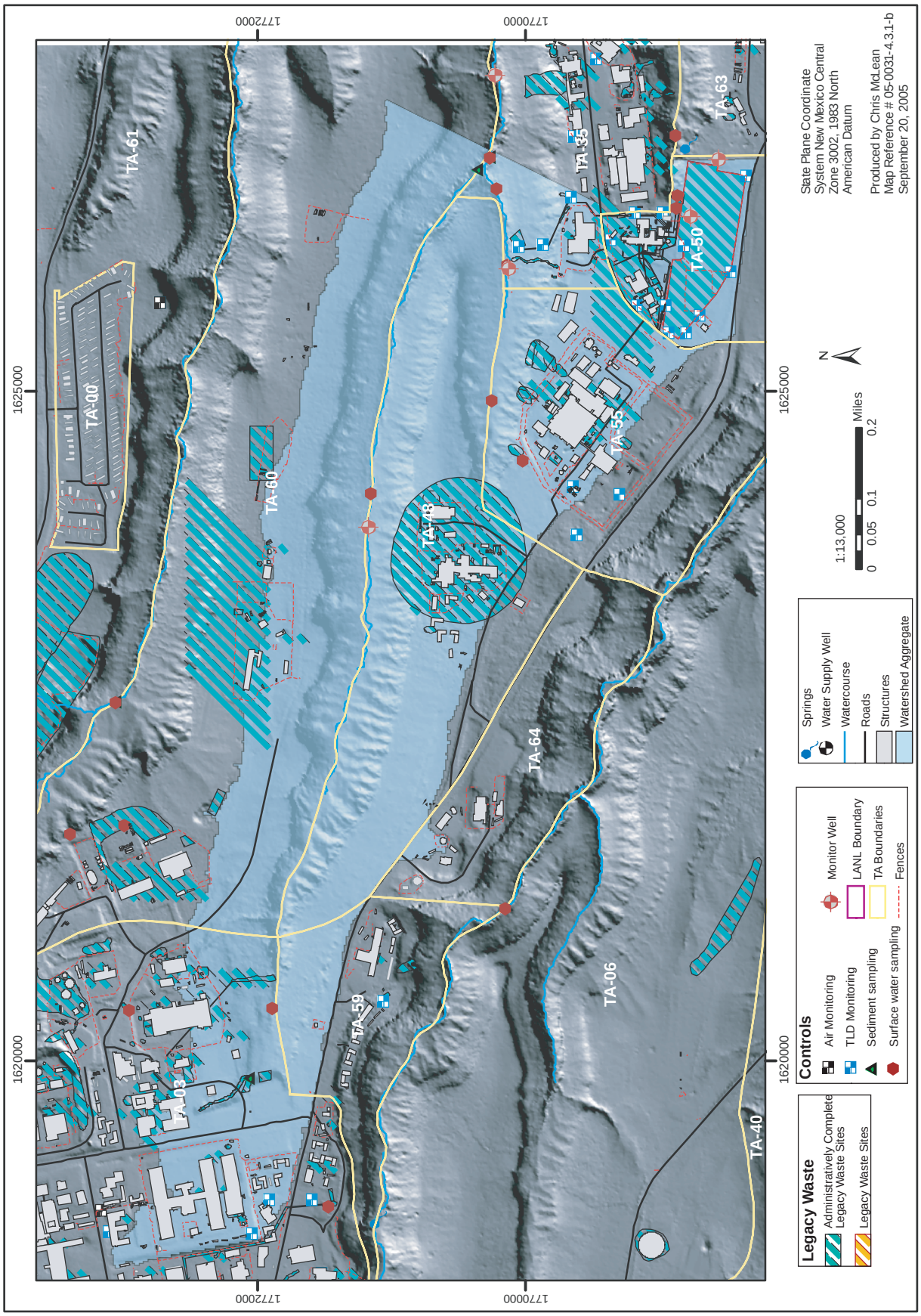
Map 4.2.2-b'. Future state: operational hazards within Lower Sandia Canyon Aggregate



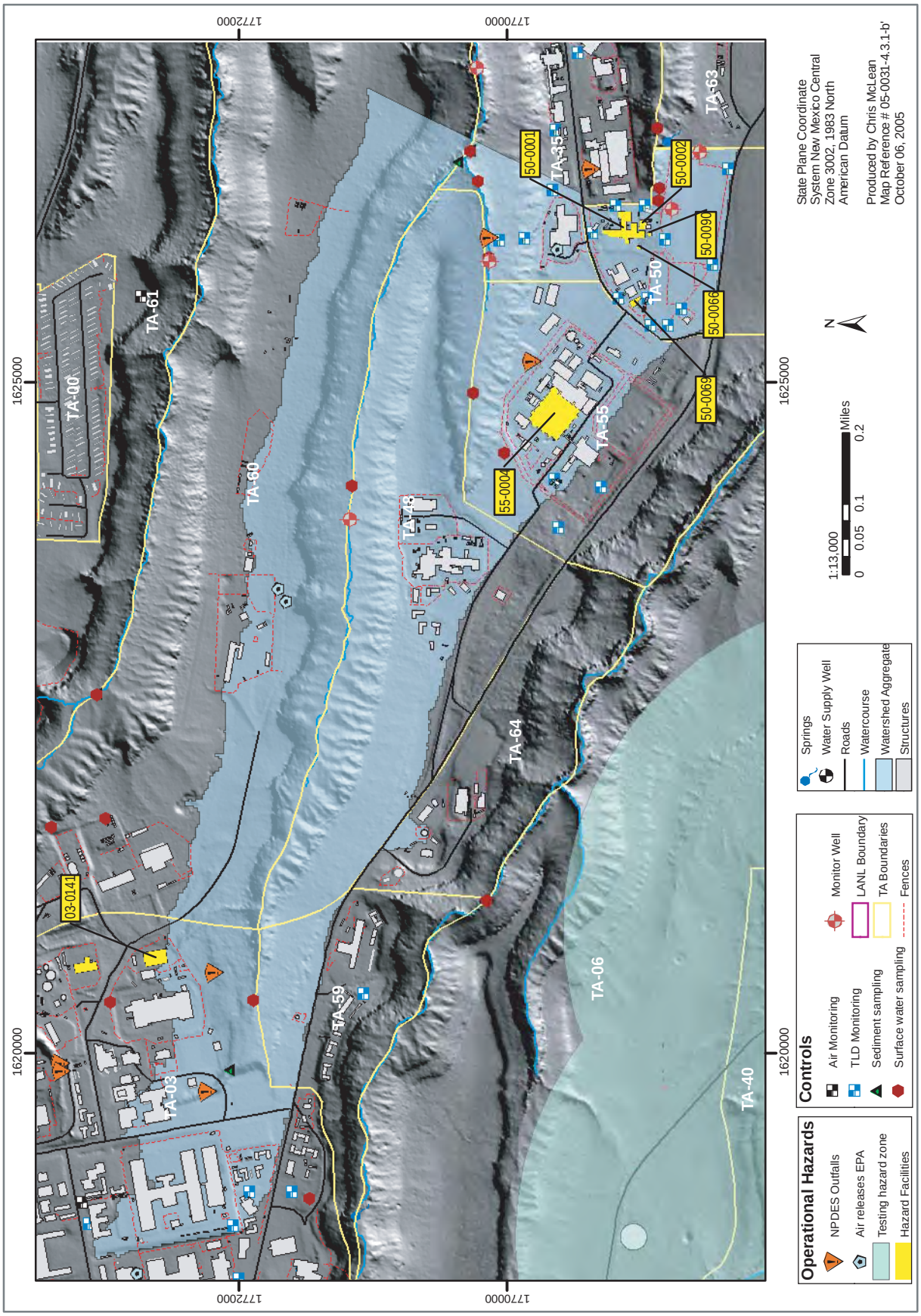
Map 4.3.1-a. Current state: legacy waste sites within Upper Mortandad Canyon Aggregate



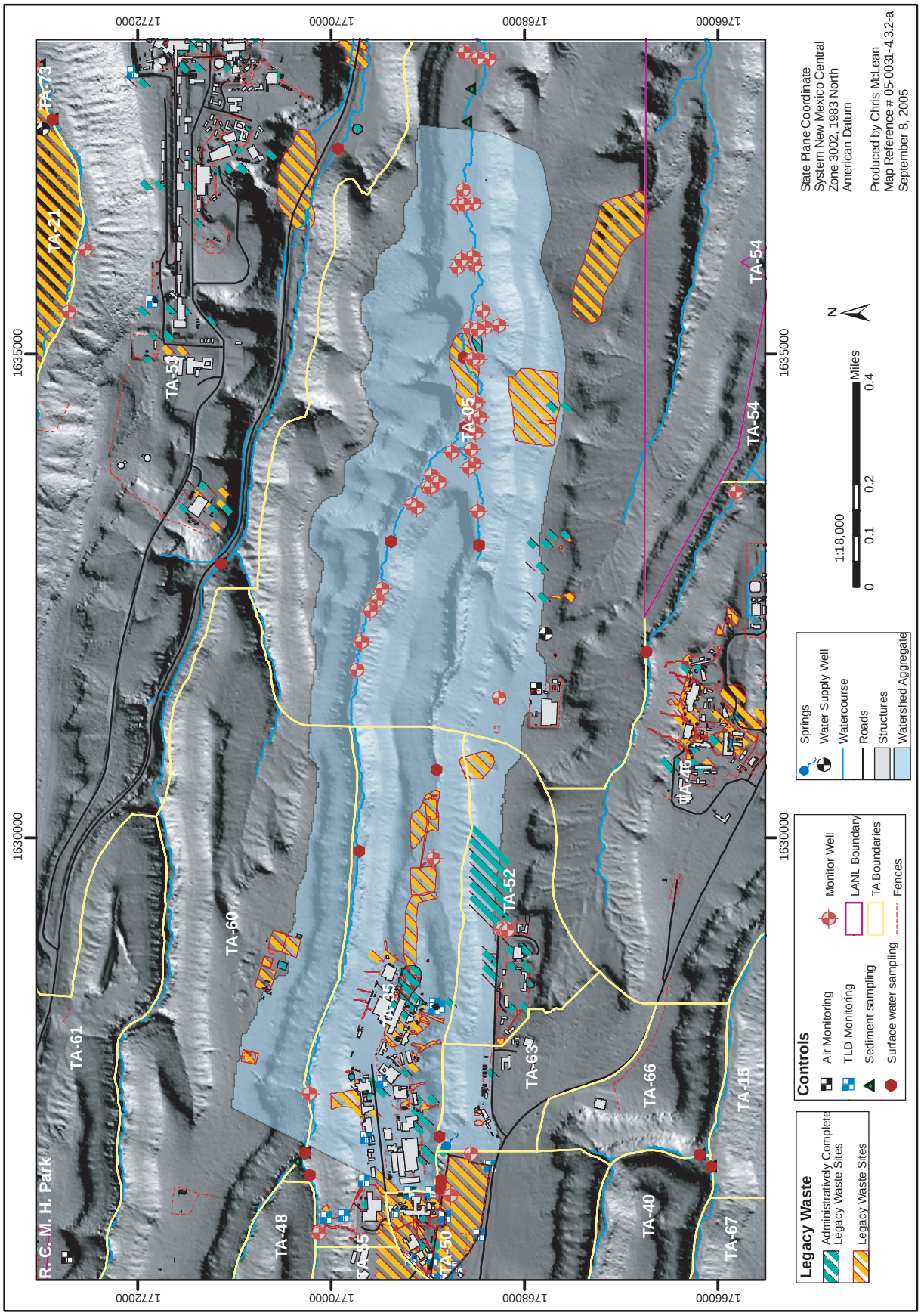
Map 4.3.1-a'. Current state: operational hazards within Upper Mortandad Canyon Aggregate



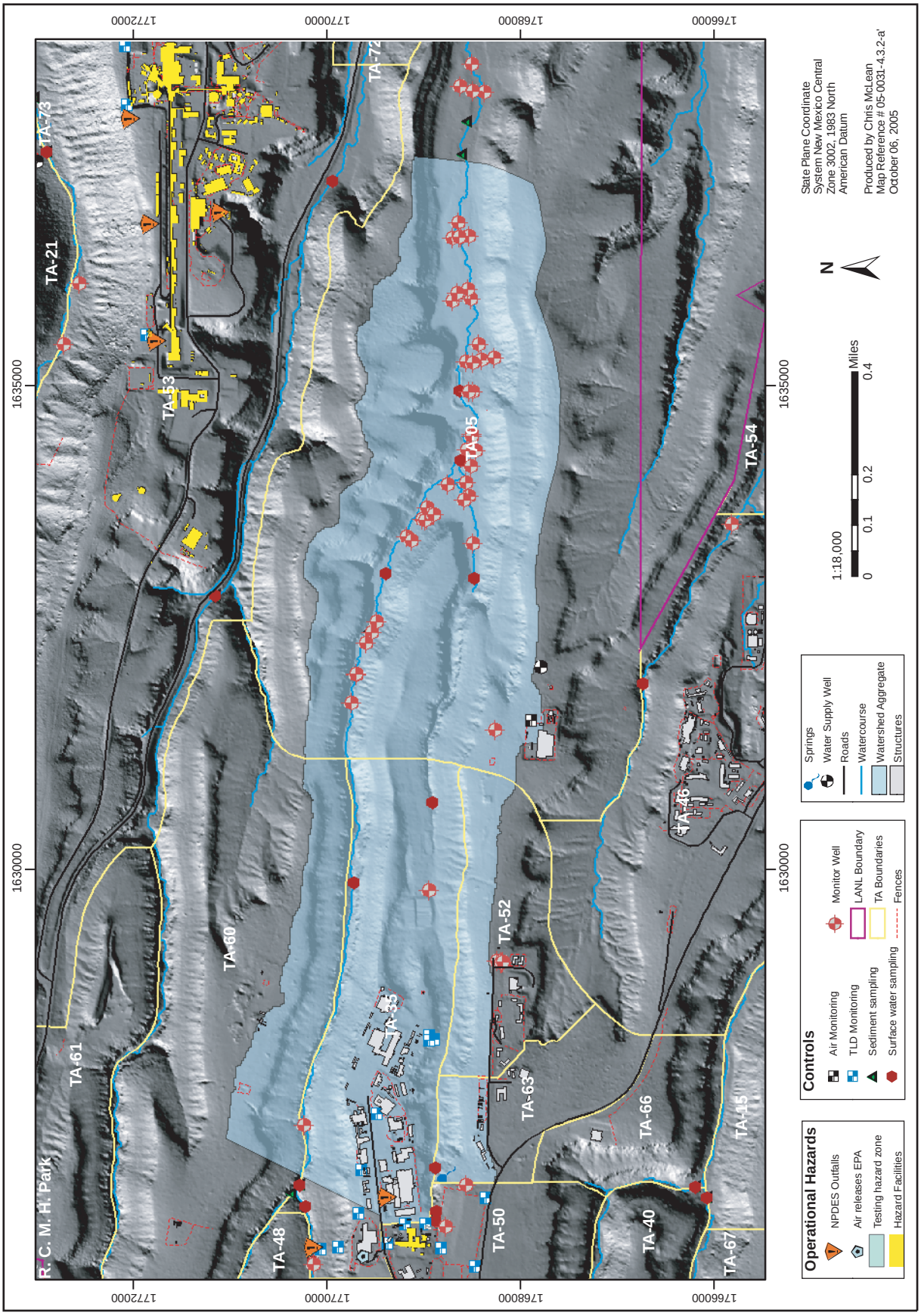
Map 4.3.1-b. Future state: legacy waste sites within Upper Mortandad Canyon Aggregate



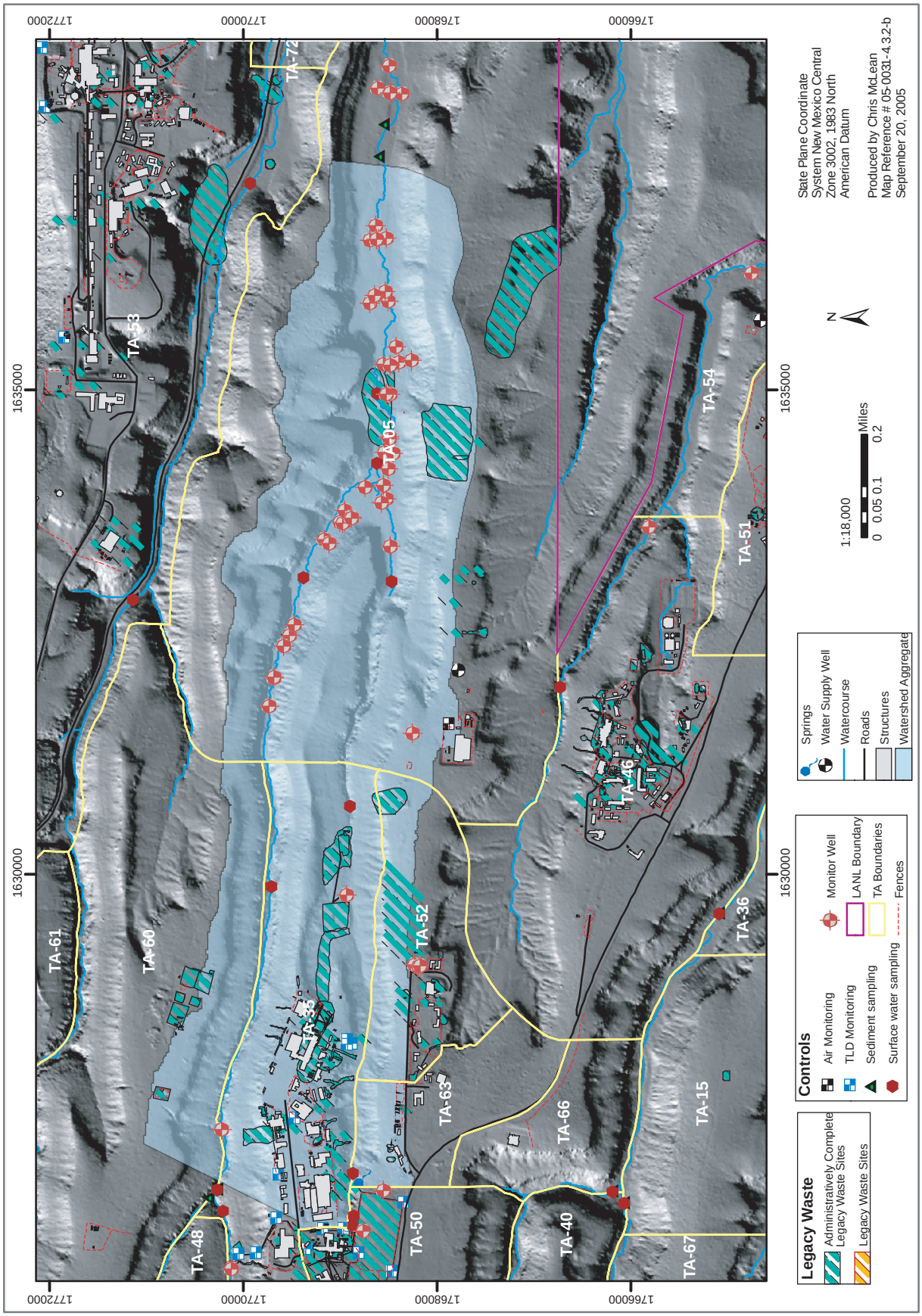
Map 4.3.1-b'. Future state: operational hazards within Upper Mortandad Canyon Aggregate



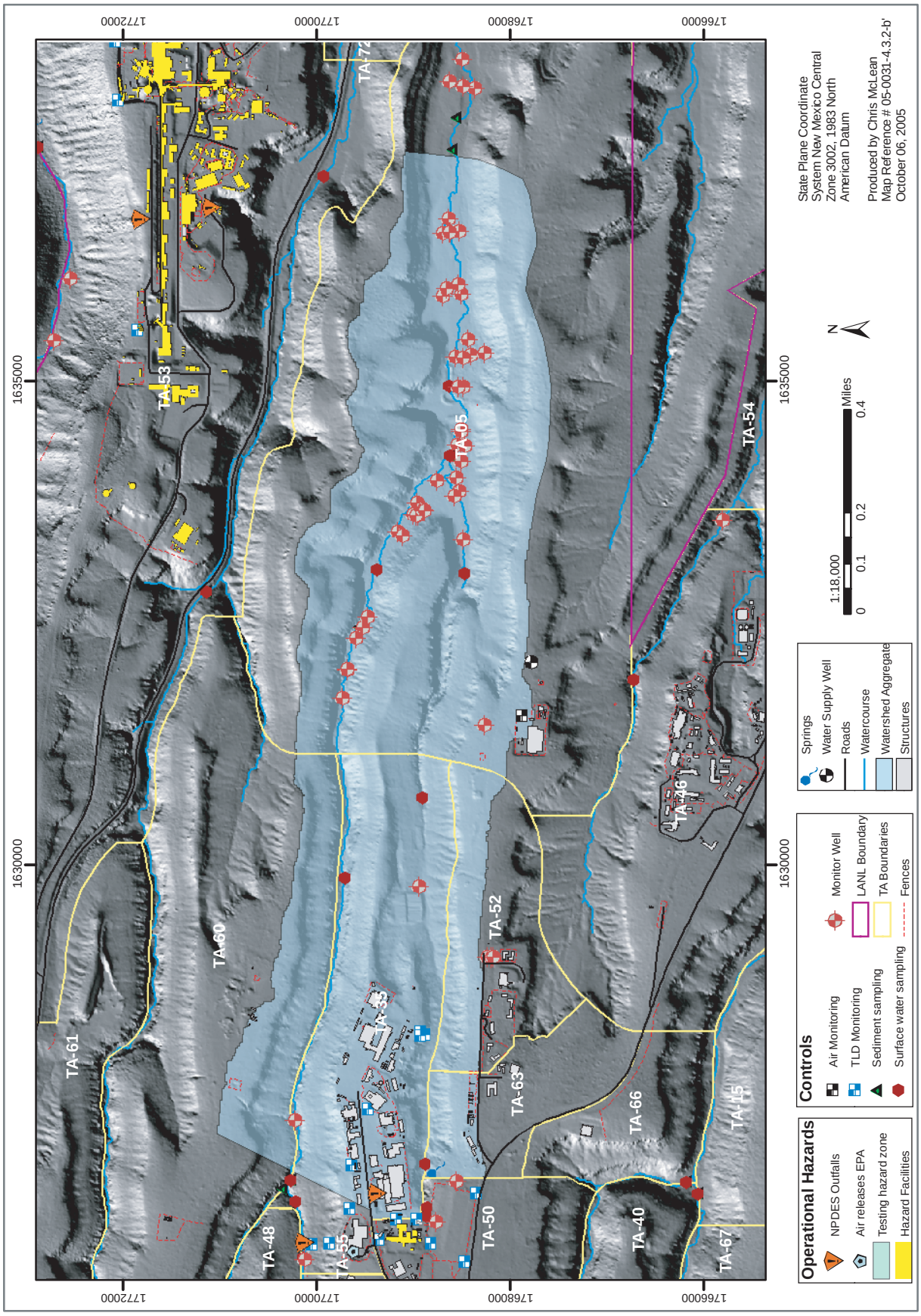
Map 4.3.2-a. Current state: legacy waste sites within Middle Mortandad/Ten Site Canyons Aggregate



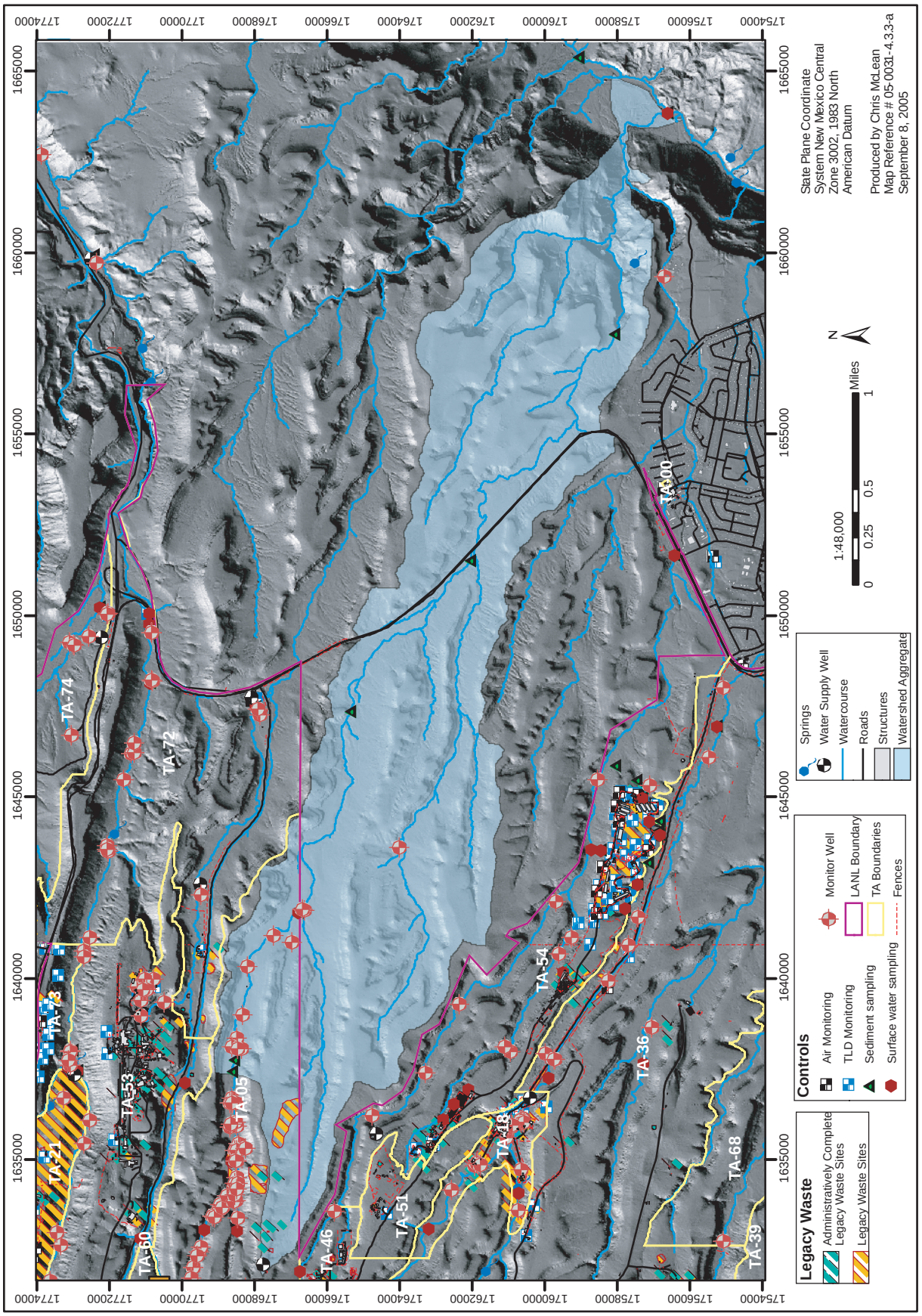
Map 4.3.2-a'. Current state: operational hazards within Middle Mortandad/Ten Site Canyons Aggregate



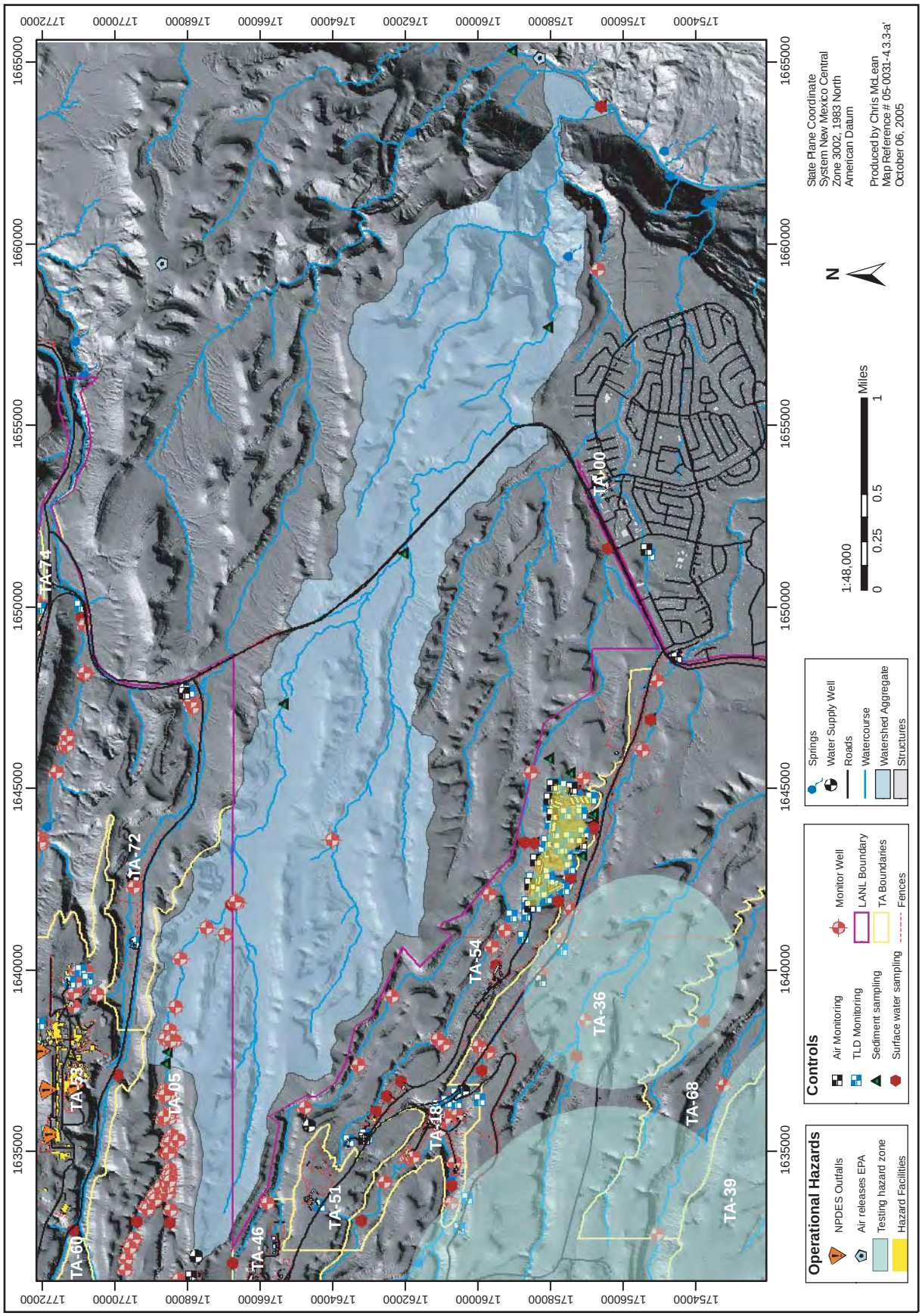
Map 4.3.2-b. Future state: legacy waste sites within Middle Mortandad/Ten Site Canyons Aggregate



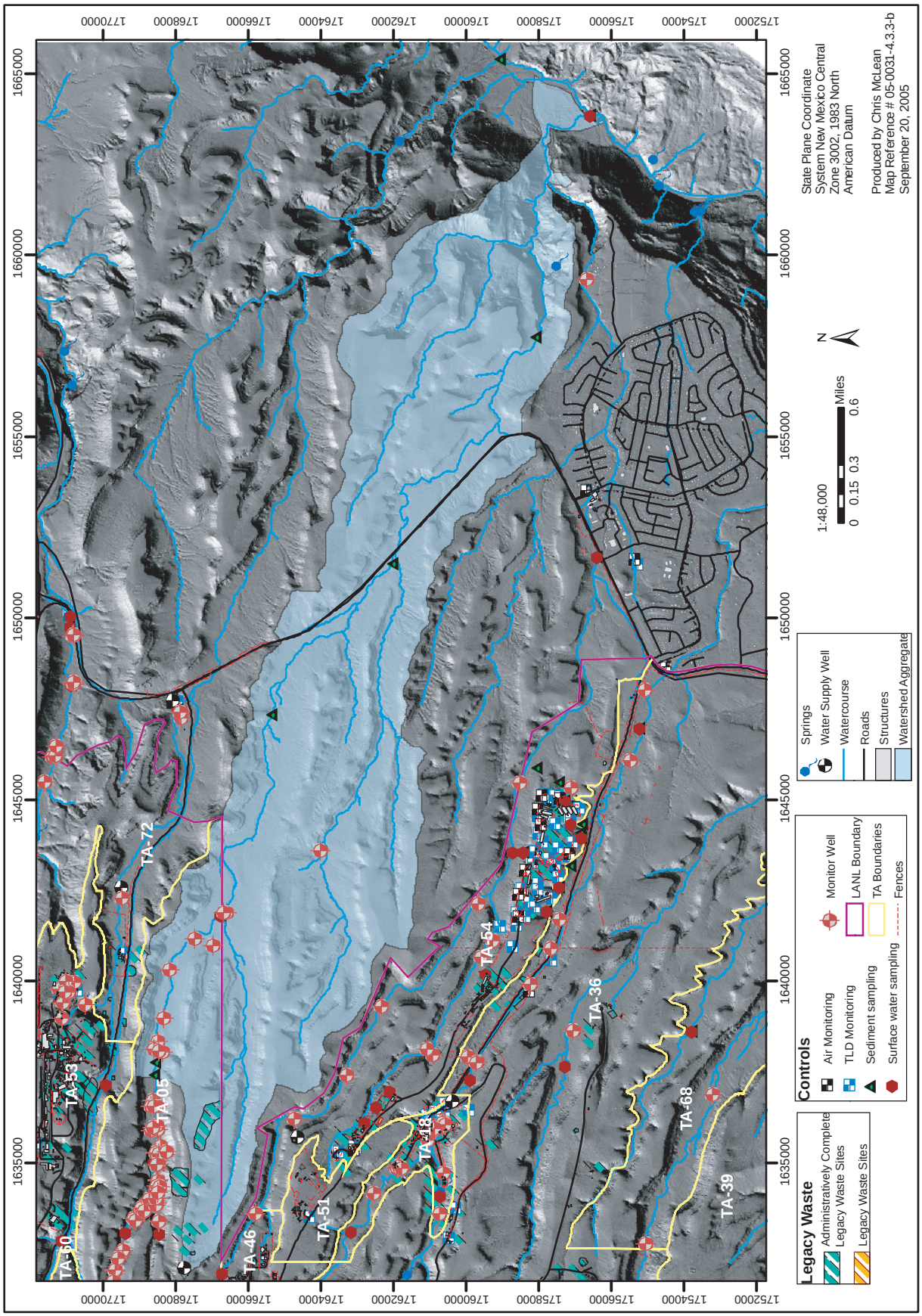
Map 4.3.2-b'. Future state: operational hazards within Middle Mortandad/Ten Site Canyons Aggregate



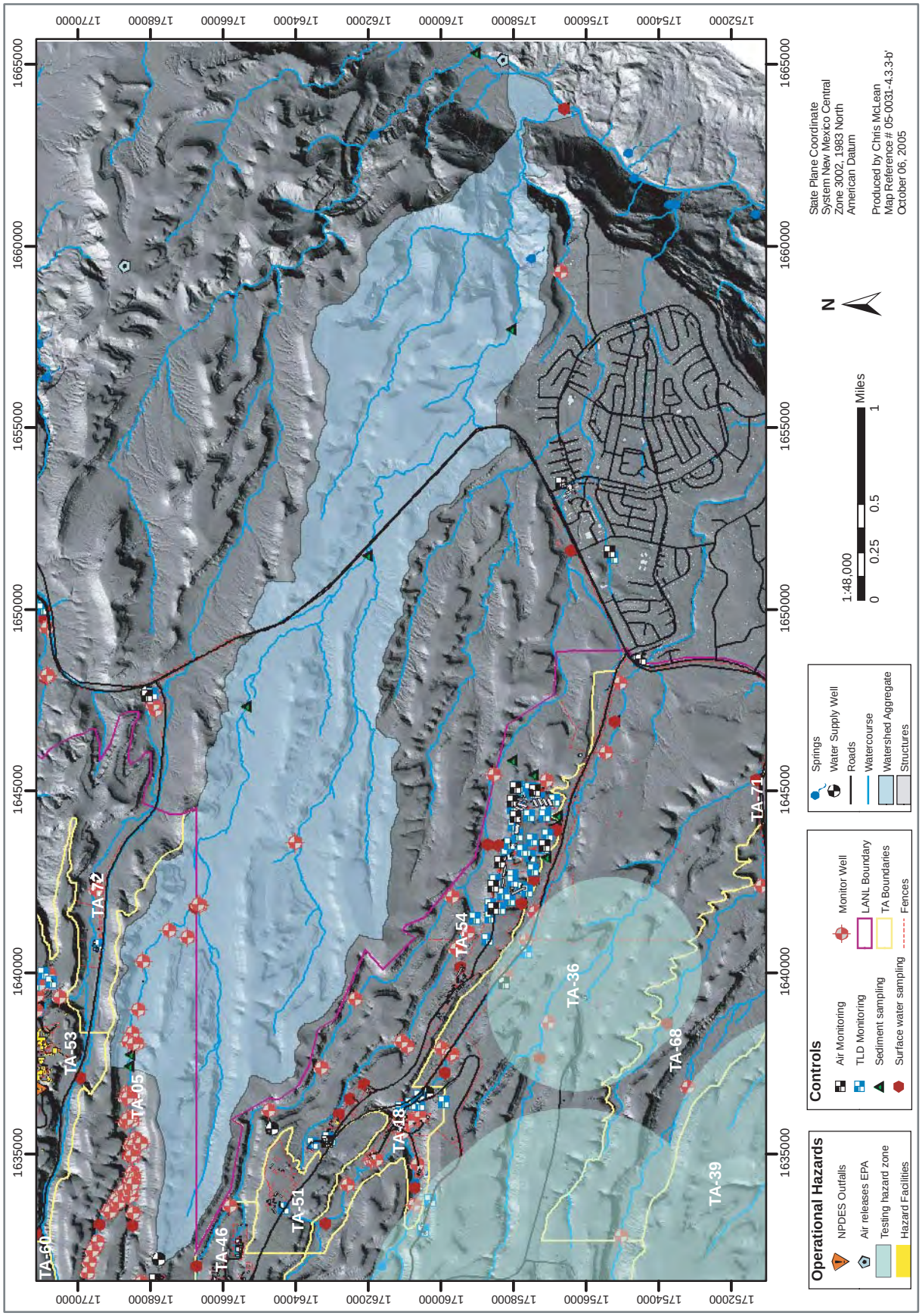
Map 4.3.3-a. Current state: legacy waste sites within Lower Mortandad/Cedro Canyons Aggregate



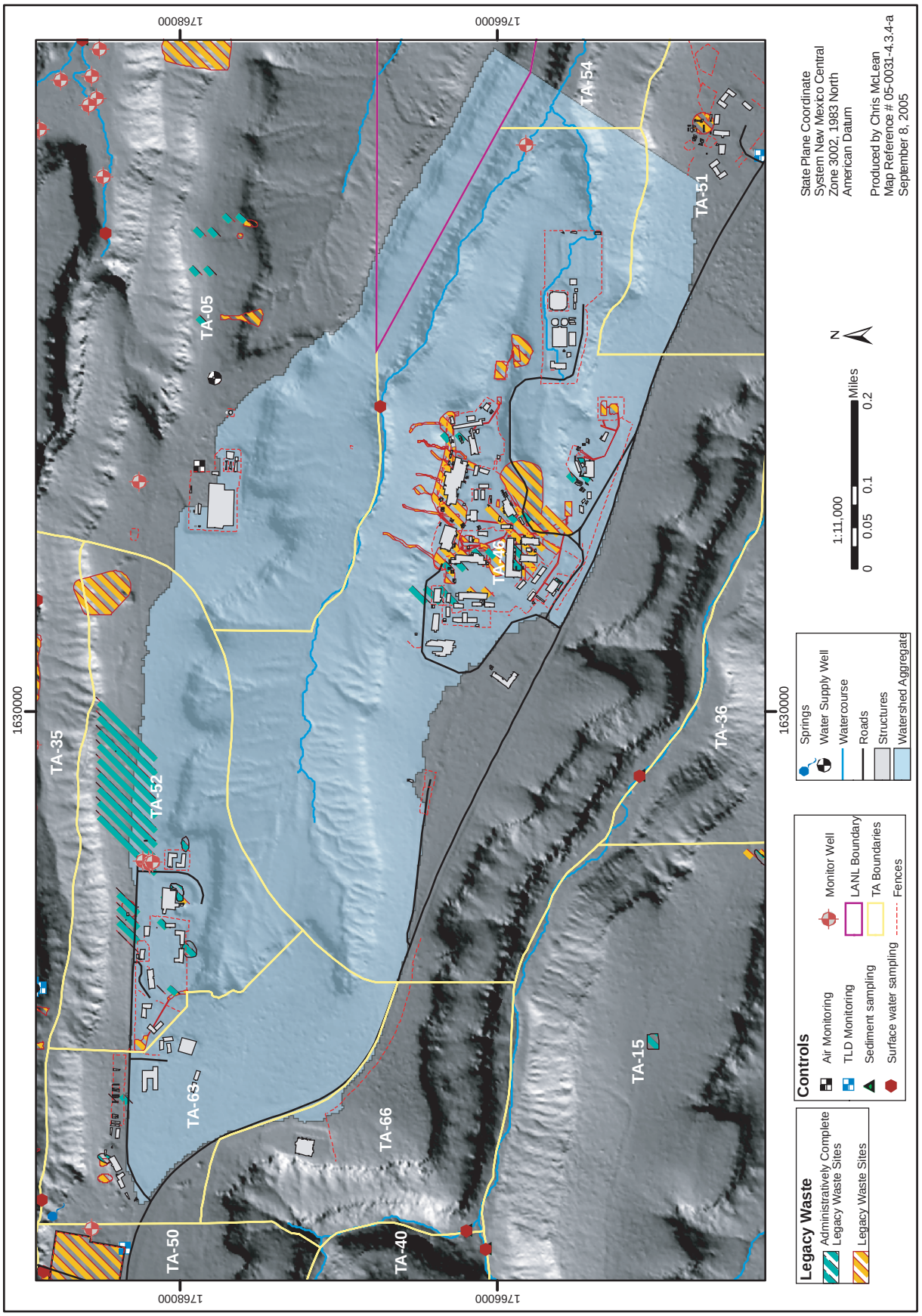
Map 4.3.3-a'. Current state: operational hazards within Lower Mortandad/Cedro Canyons Aggregate



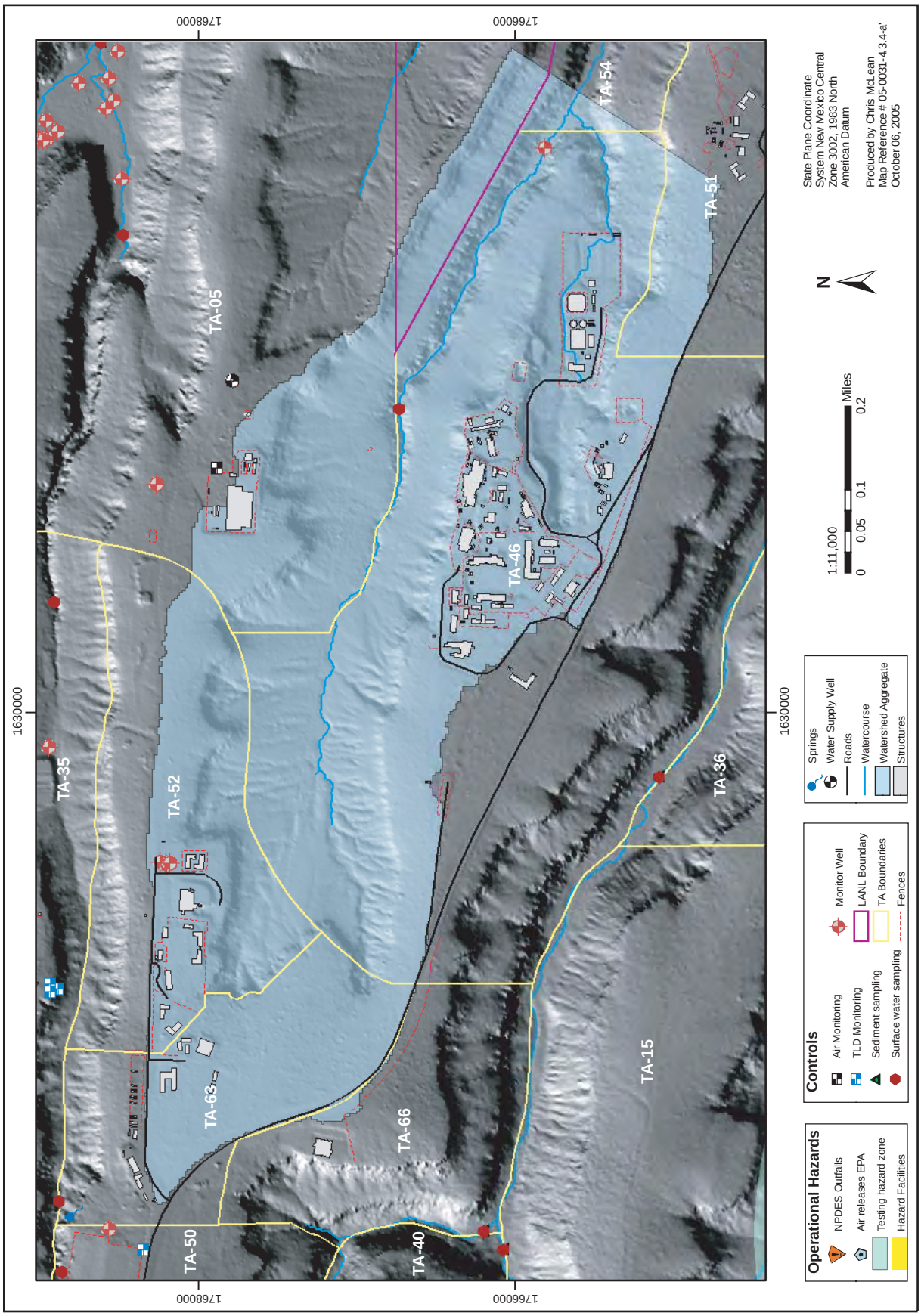
Map 4.3.3-b. Future state: legacy waste sites within Lower Mortandad/Cedro Canyons Aggregate



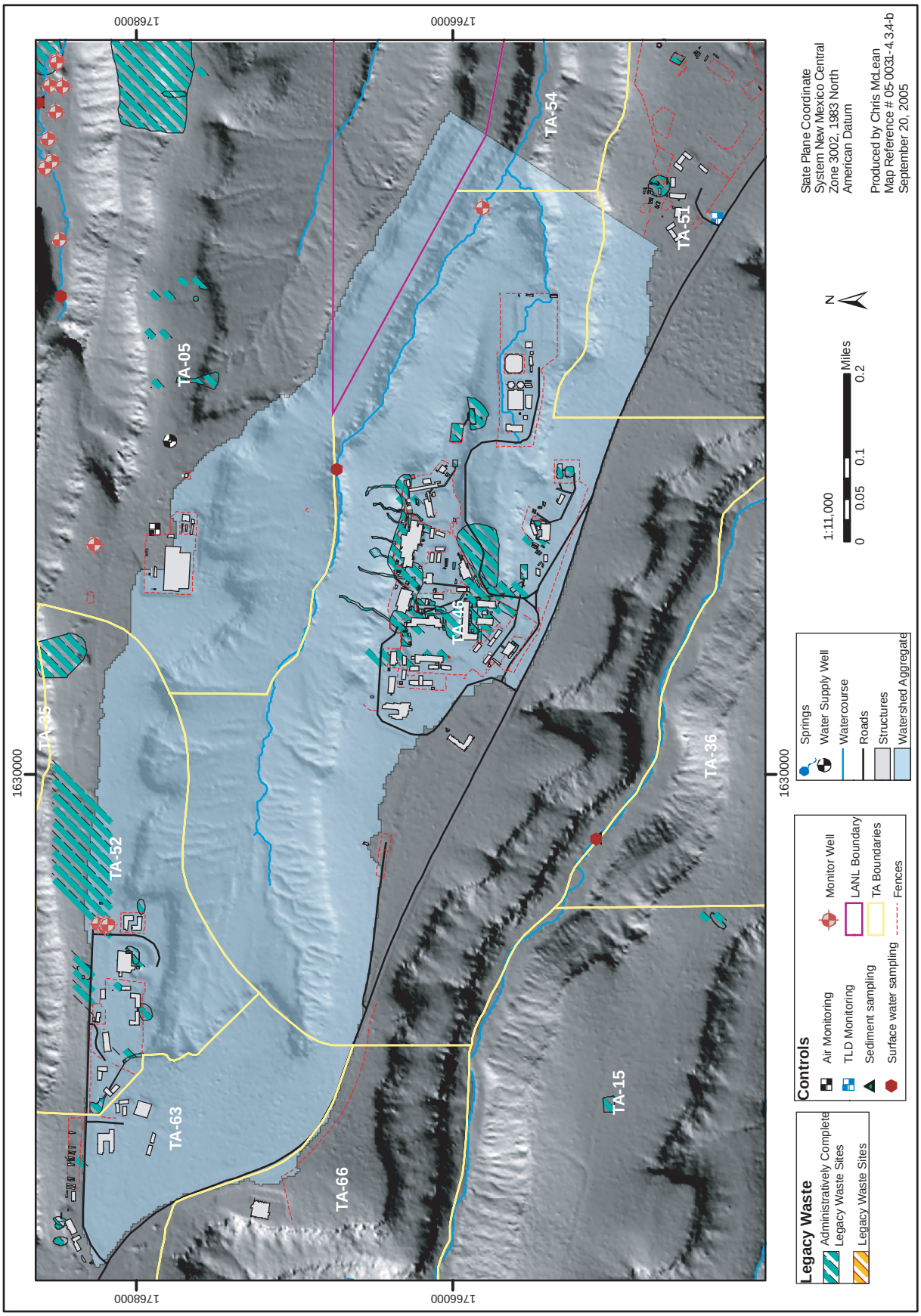
Map 4.3.3-b'. Future state: operational hazards within Lower Mortandad/Cedro Canyons Aggregate



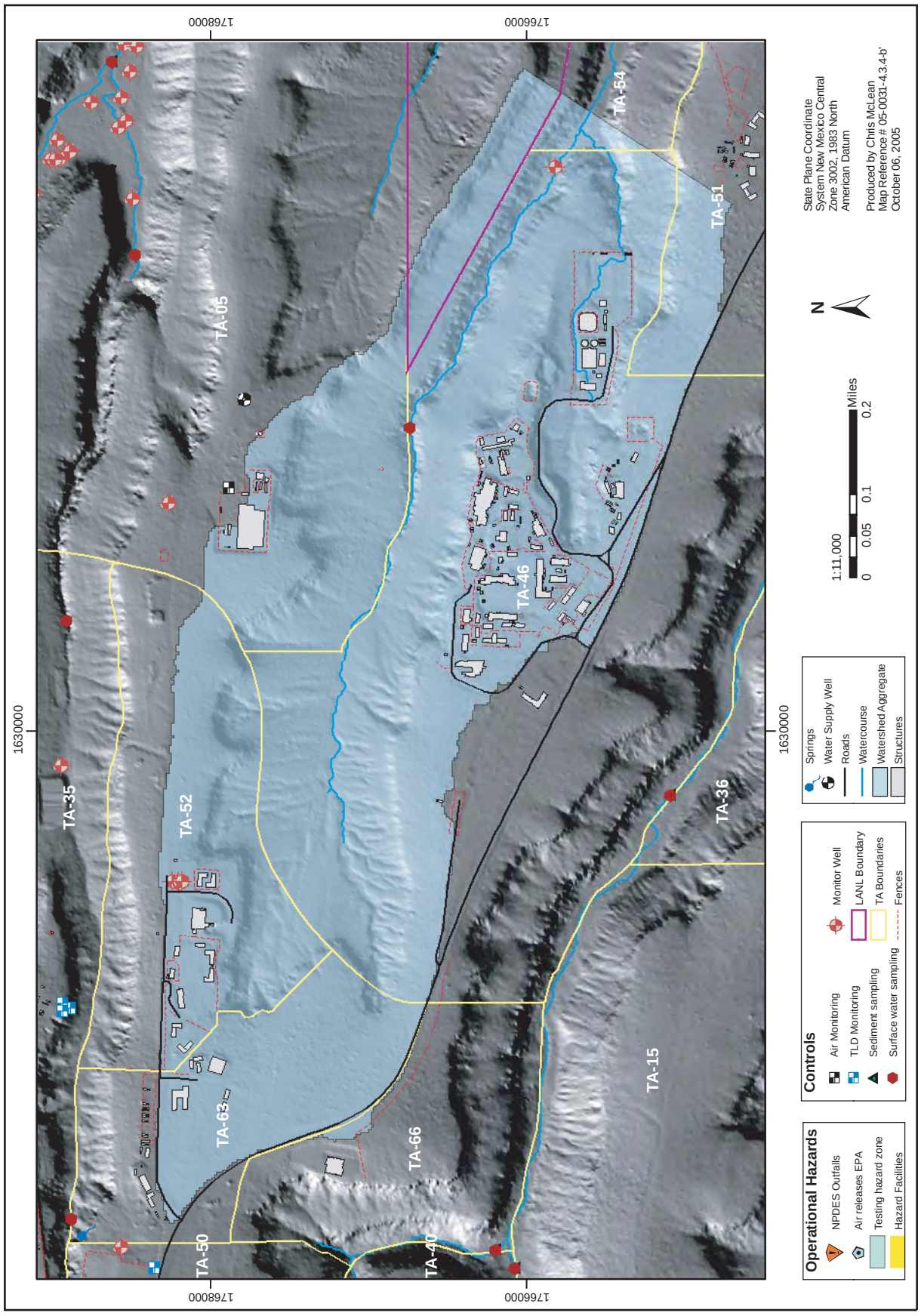
Map 4.3.4-a. Current state: legacy waste sites within Upper Cañada del Buey Aggregate



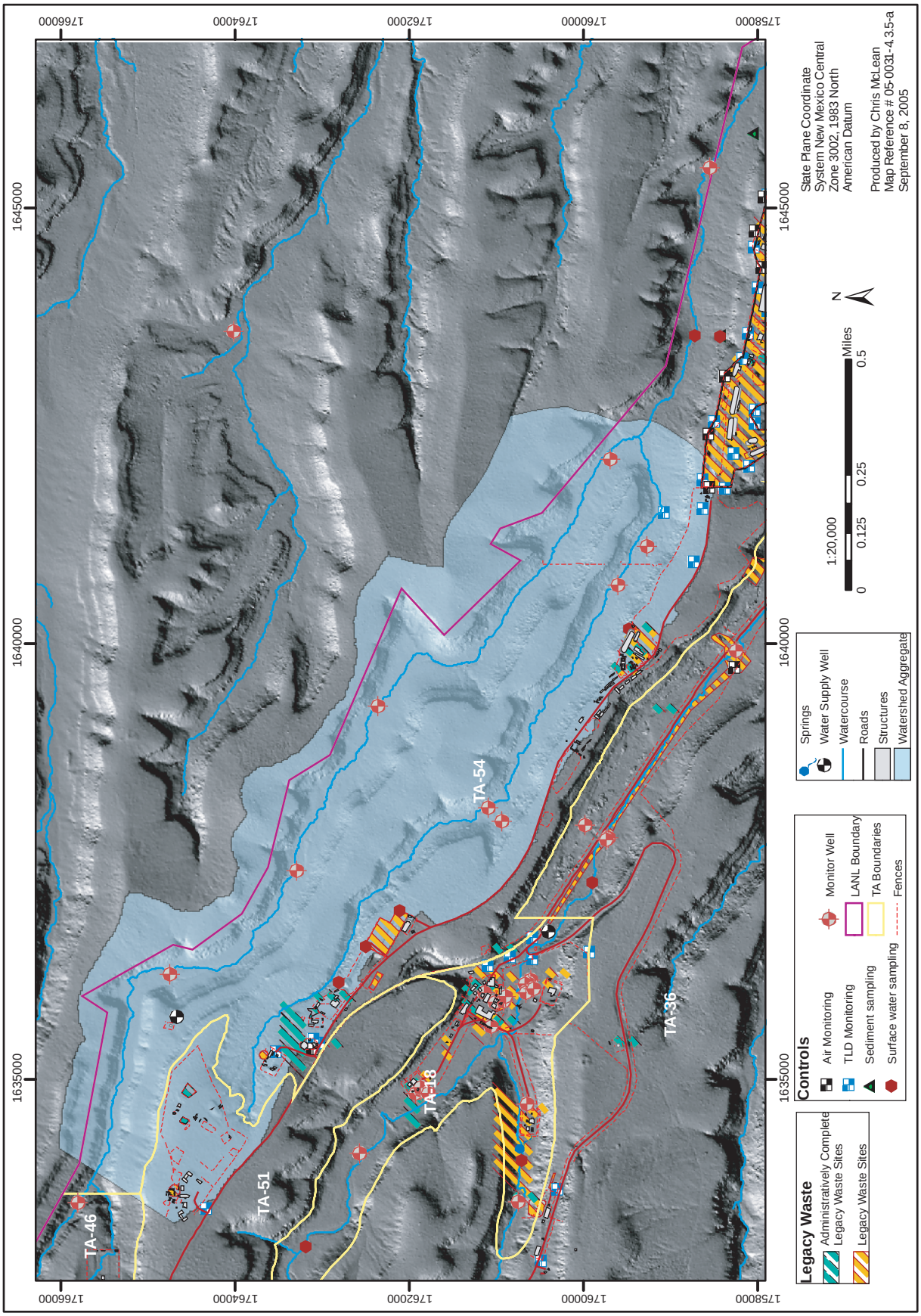
Map 4.3.4-a'. Current state: operational hazards within Upper Cañada del Buey Aggregate



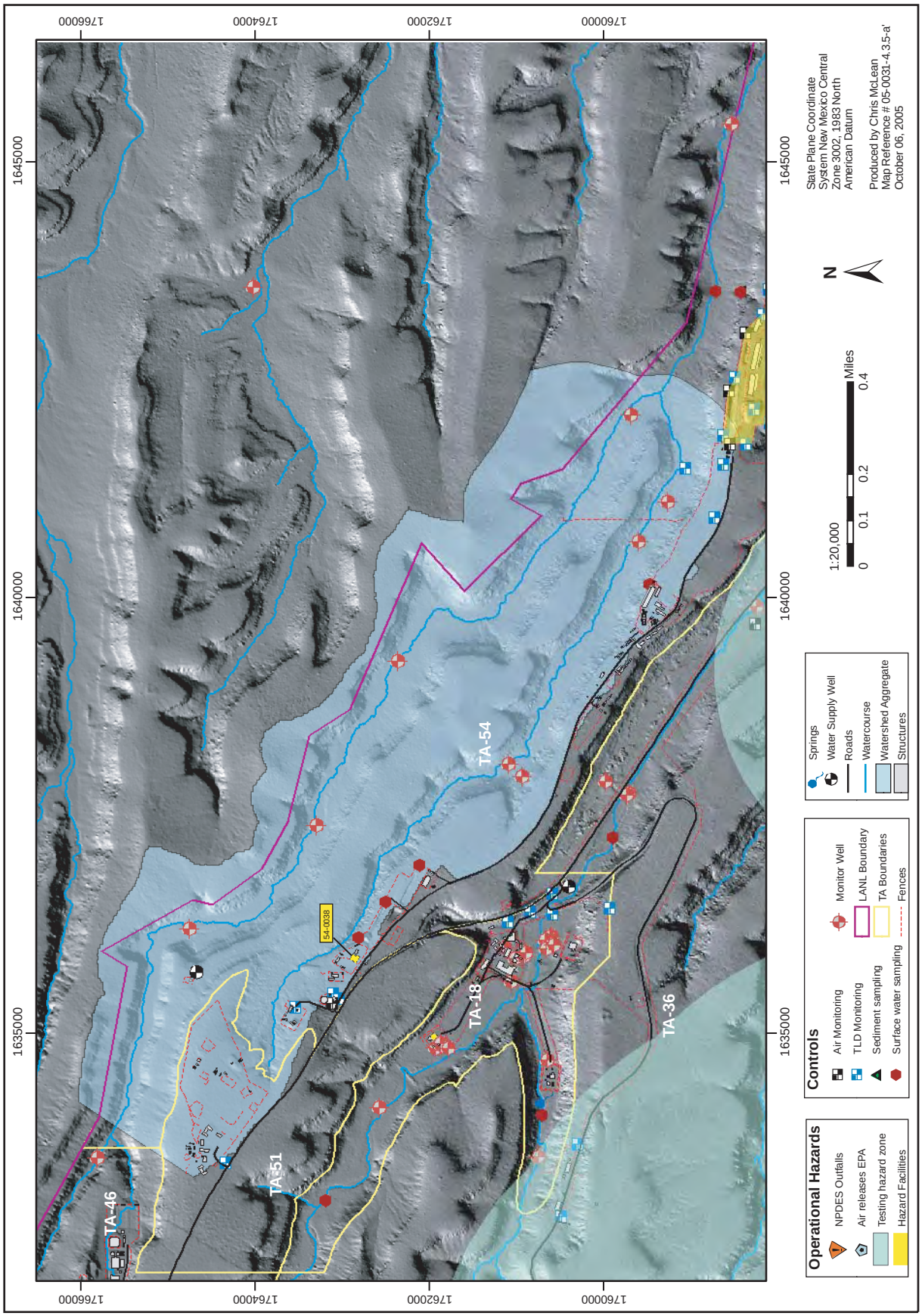
Map 4.3.4-b. Future state: legacy waste sites within Upper Cañada del Buey Aggregate



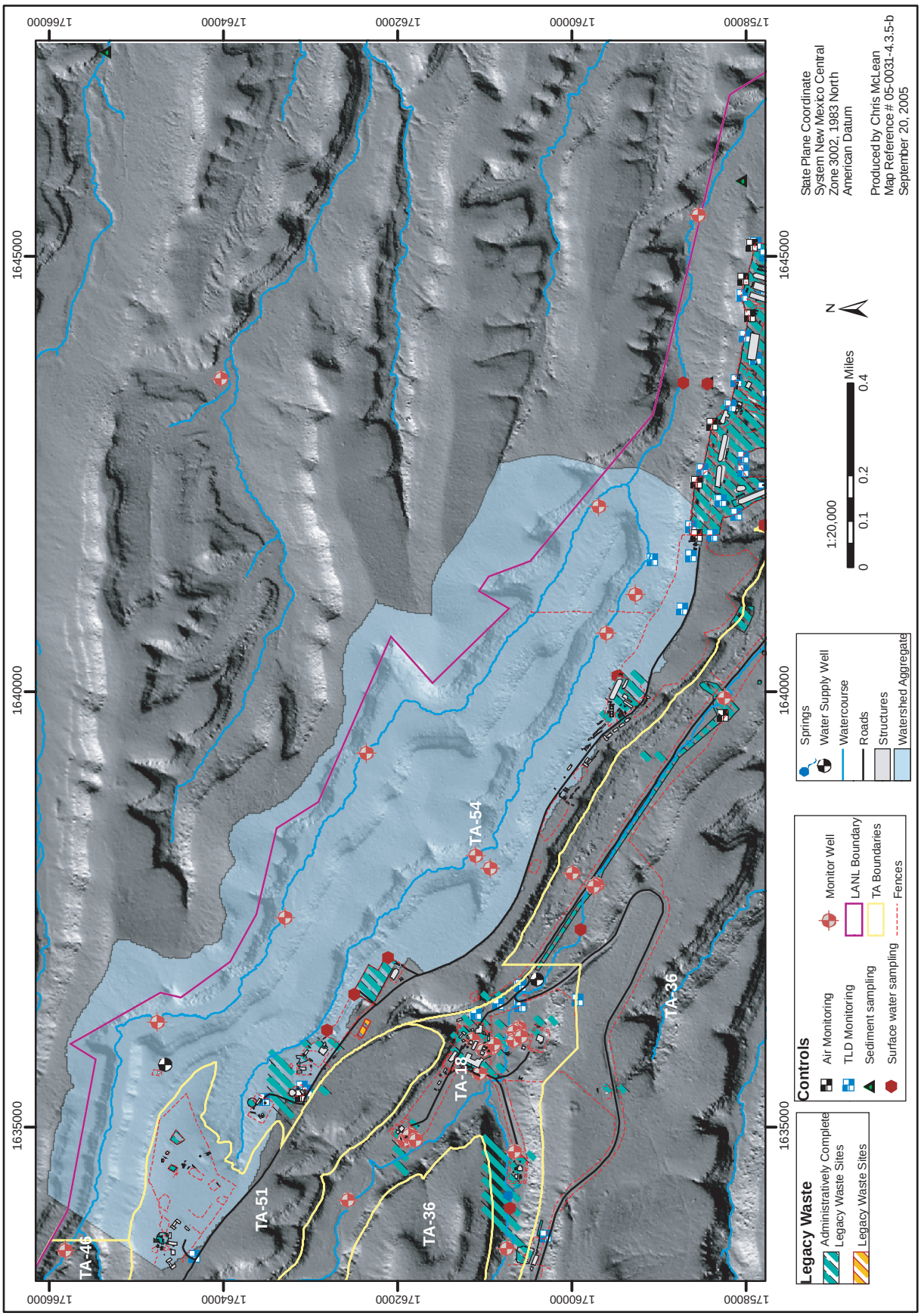
Map 4.3.4-b'. Future state: operational hazards within Upper Cañada del Buey Aggregate



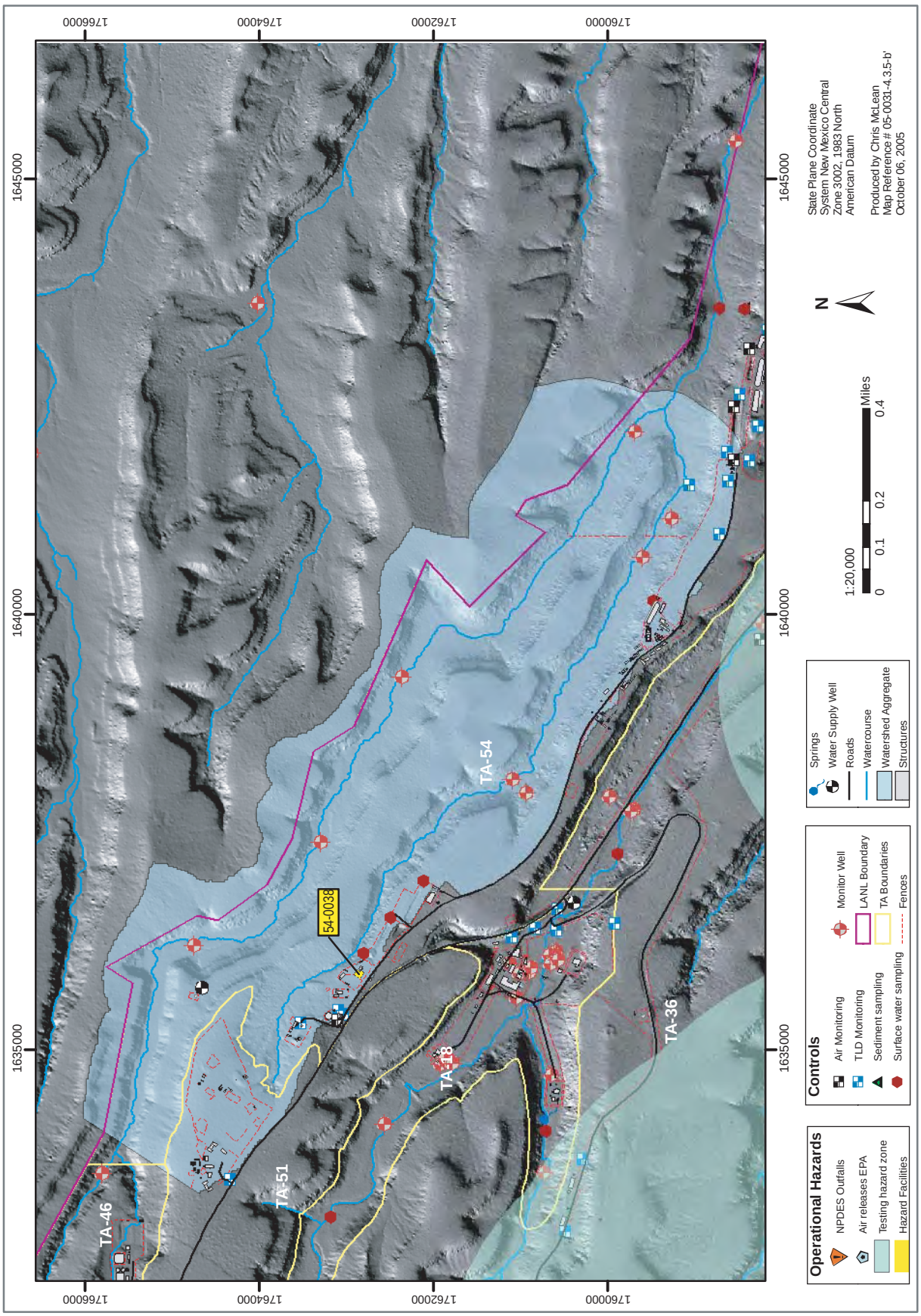
Map 4.3.5-a. Current state: legacy waste sites within Middle Cañada del Buey Aggregate



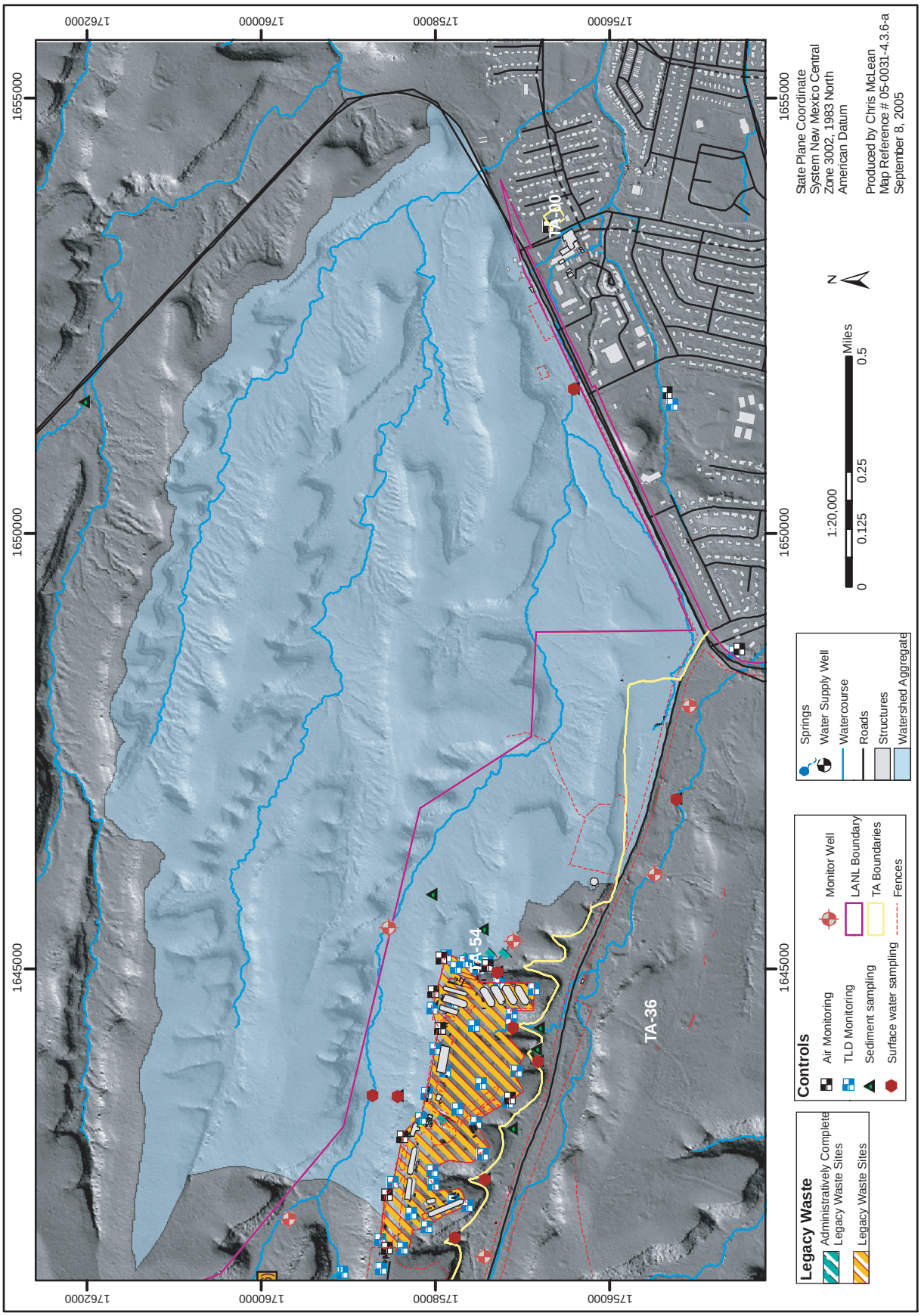
Map 4.3.5-a'. Current state: operational hazards within Middle Cañada del Buey Aggregate



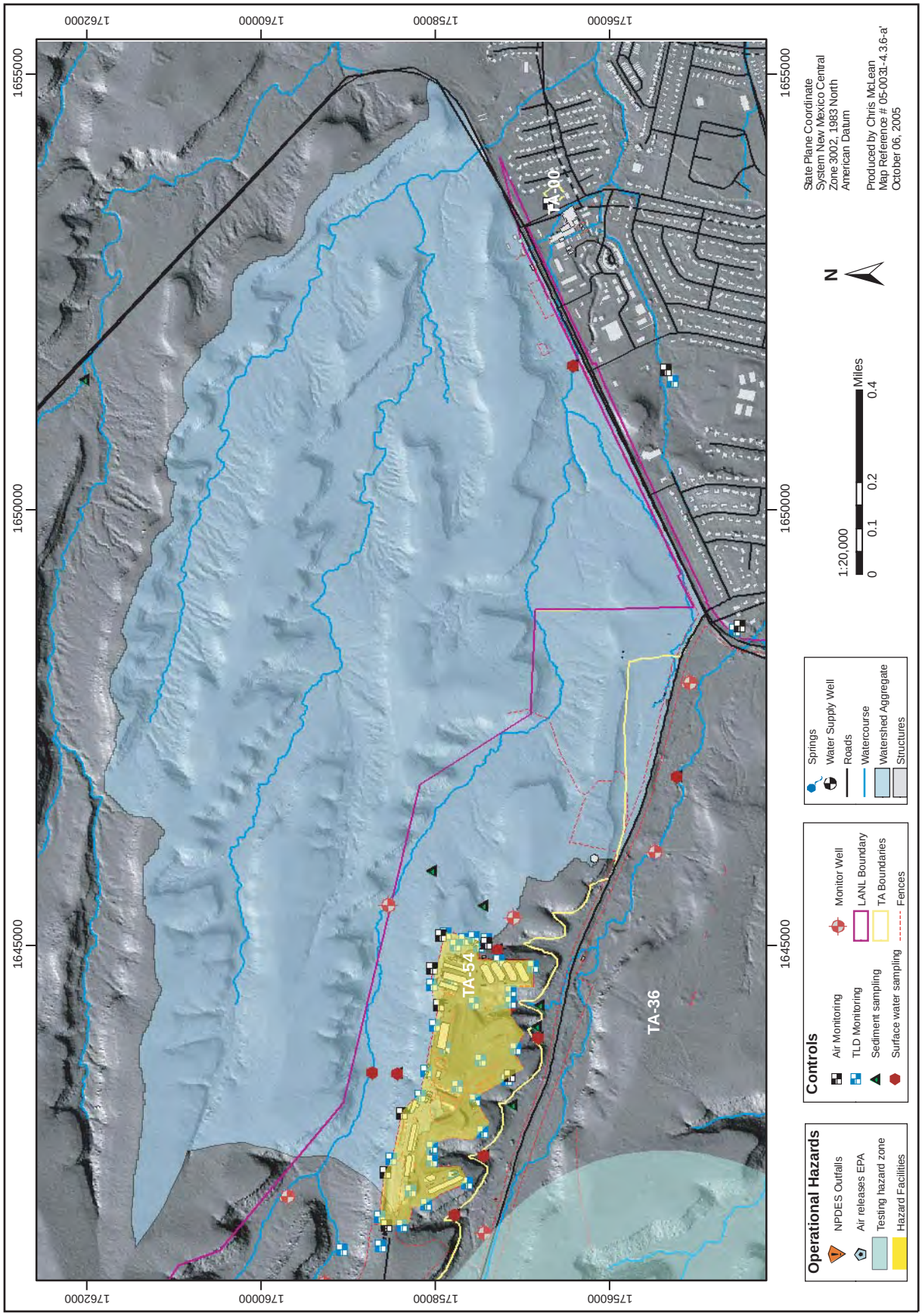
Map 4.3.5-b. Future state: legacy waste sites within Middle Cañada del Buey Aggregate



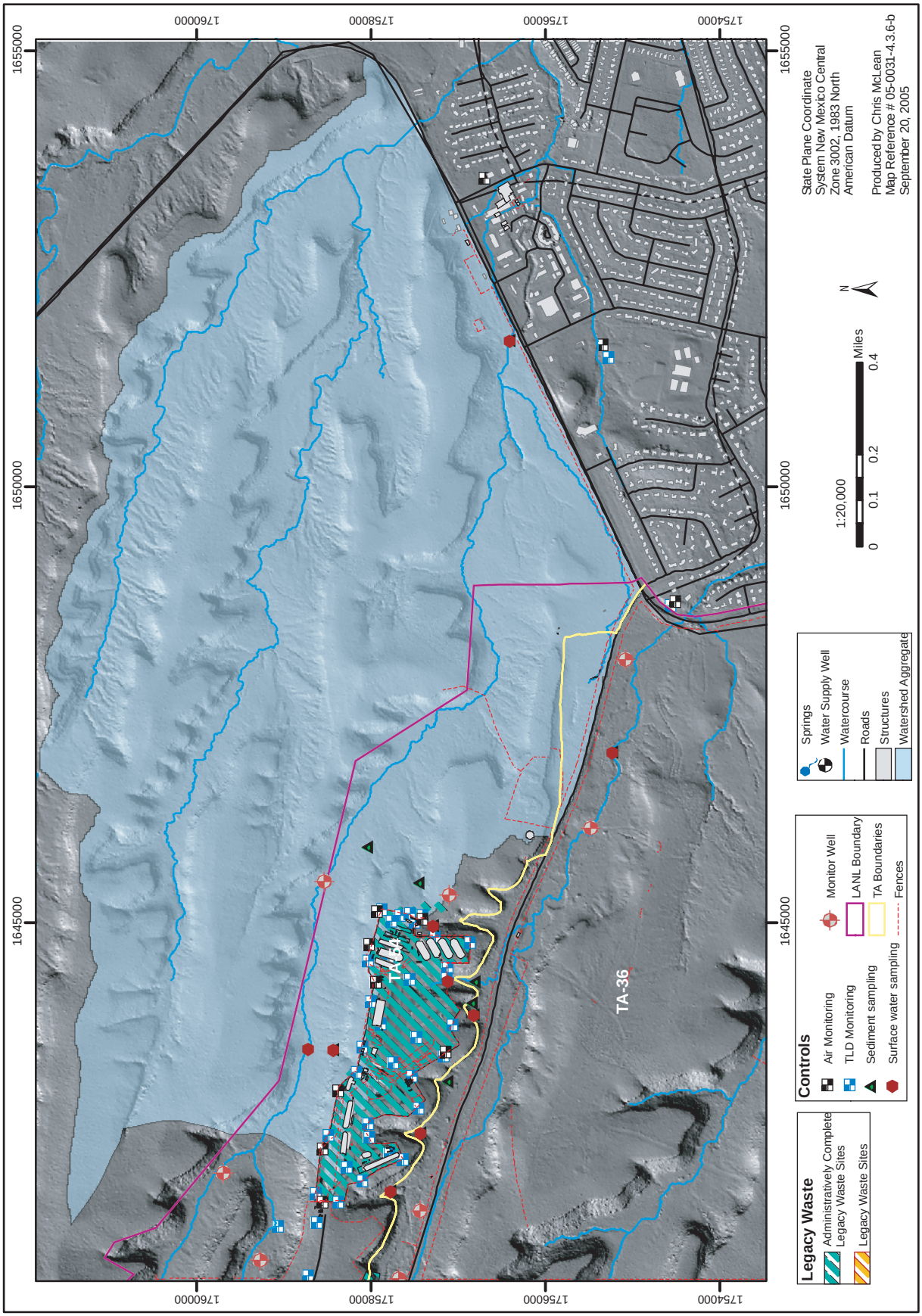
Map 4.3.5-b'. Future state: operational hazards within Middle Cañada del Buey Aggregate



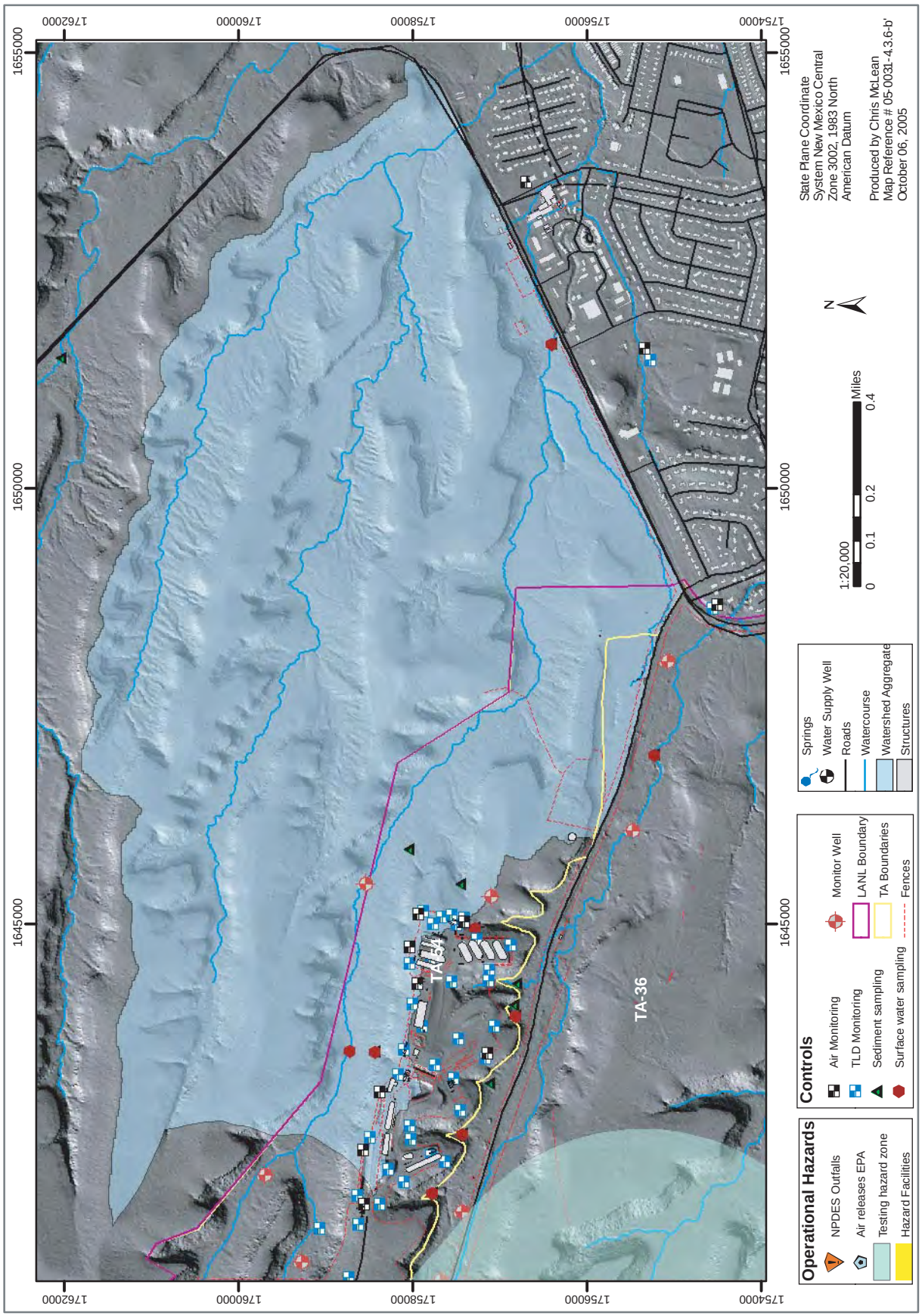
Map 4.3.6-a. Current state: legacy waste sites within Lower Mortandad/Cañada del Buey Aggregate



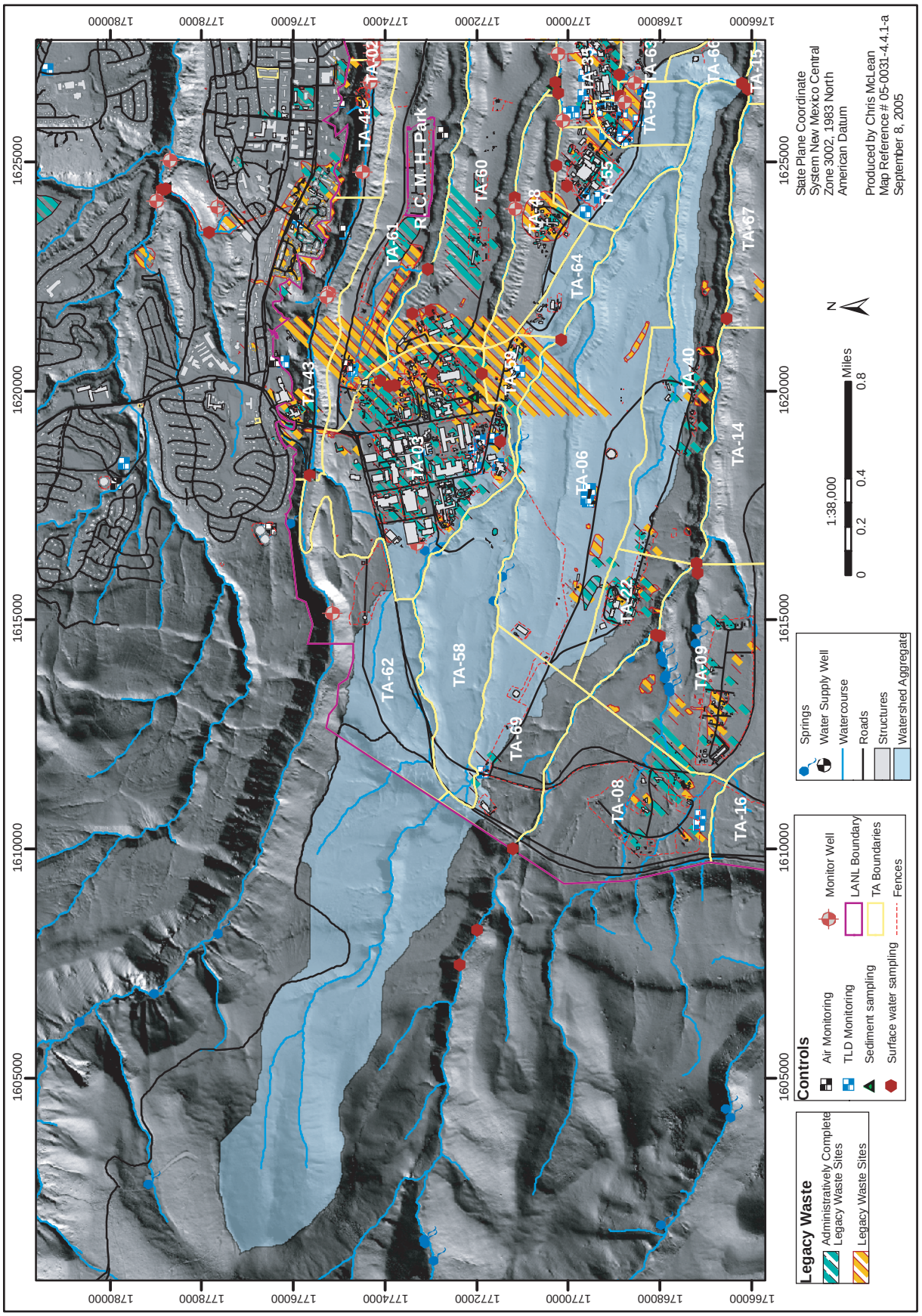
Map 4.3.6-a'. Current state: operational hazards within Lower Mortandad/Cañada del Buey Aggregate



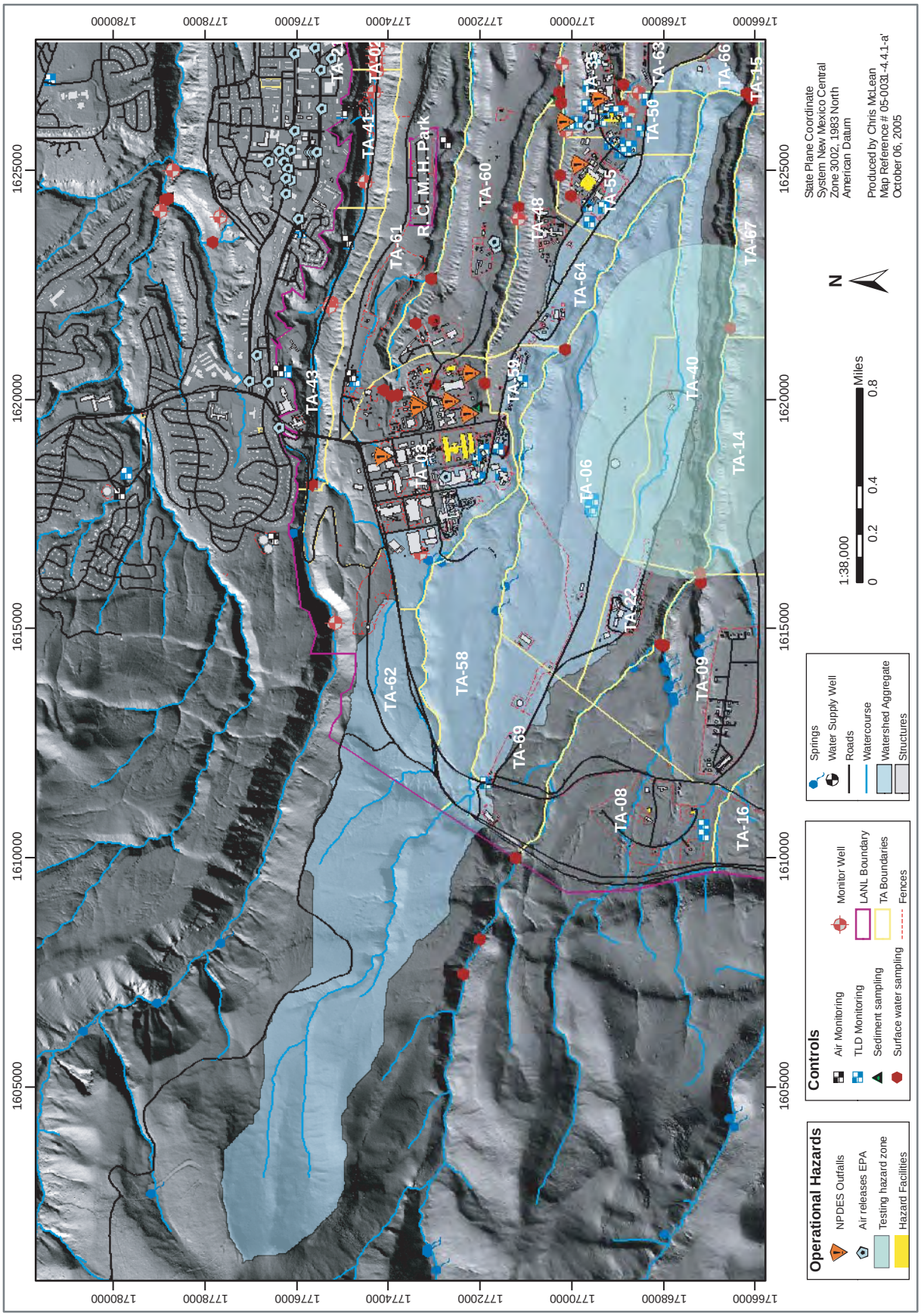
Map 4.3.6-b. Future state: legacy waste sites within Lower Mortandad/Cañada del Buey Aggregate



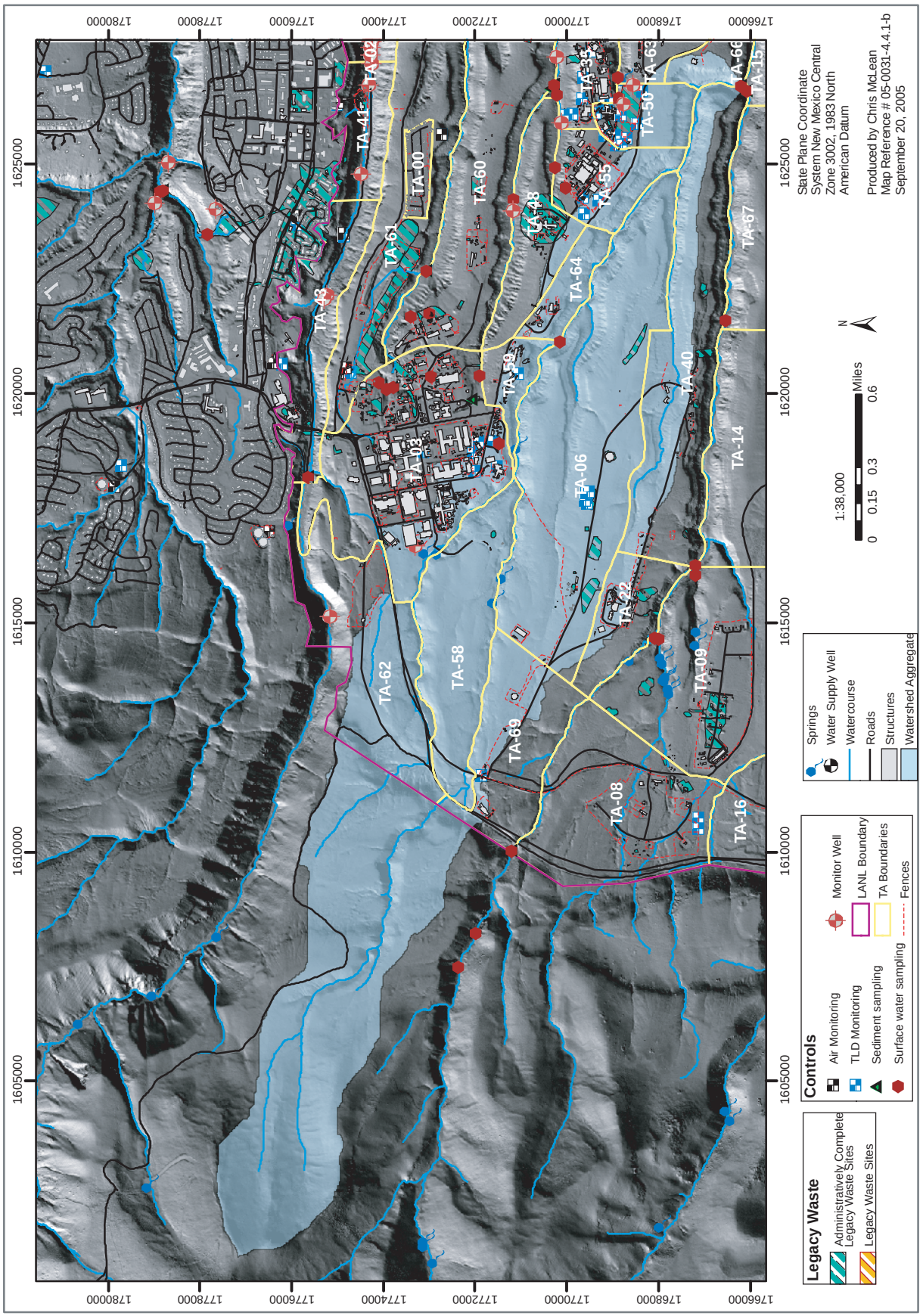
Map 4.3.6-b'. Future state: operational hazards within Lower Mortandad/Cañada del Buey Aggregate



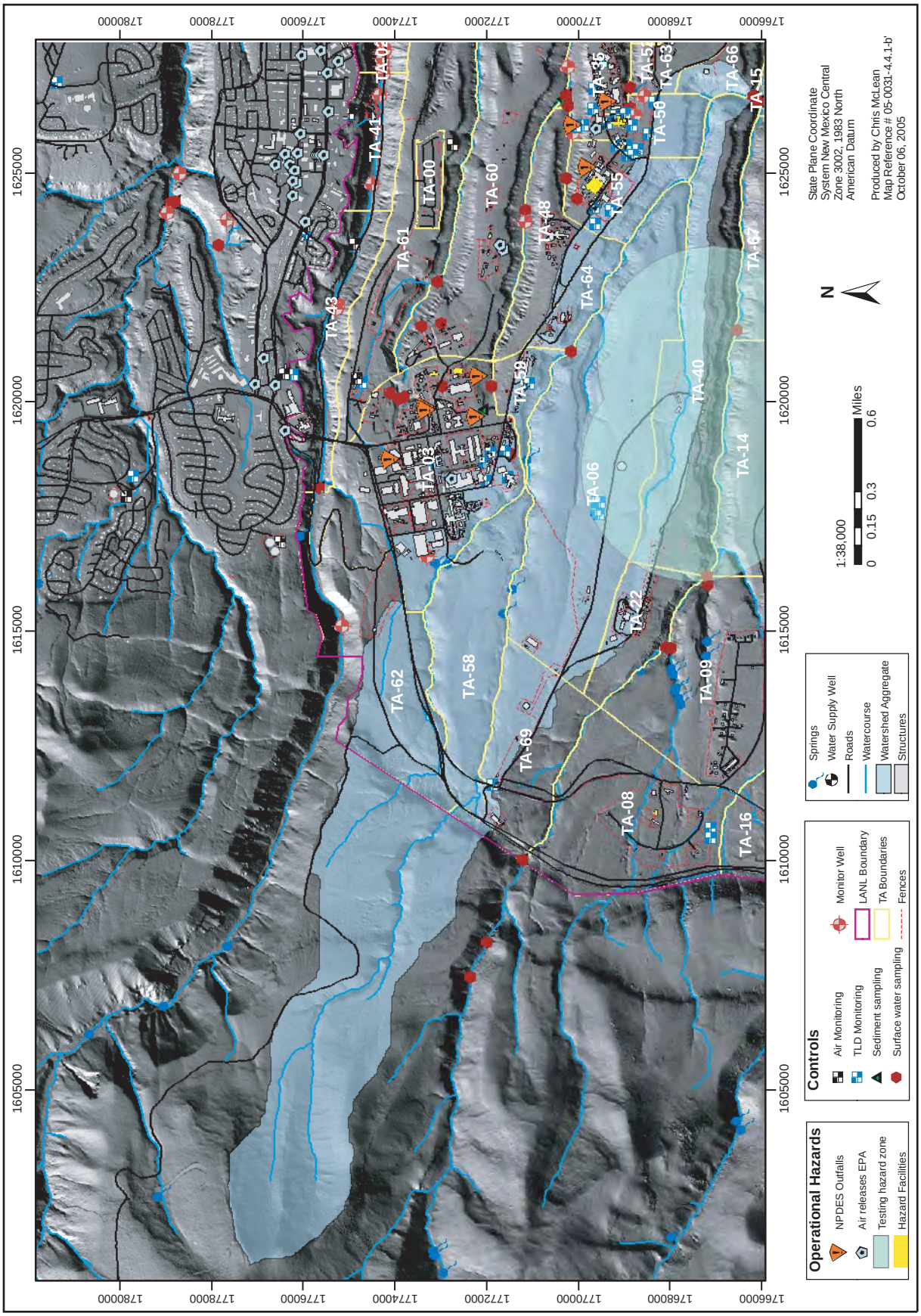
Map 4.4.1-a. Current state: legacy waste sites within Twomile Canyon Aggregate



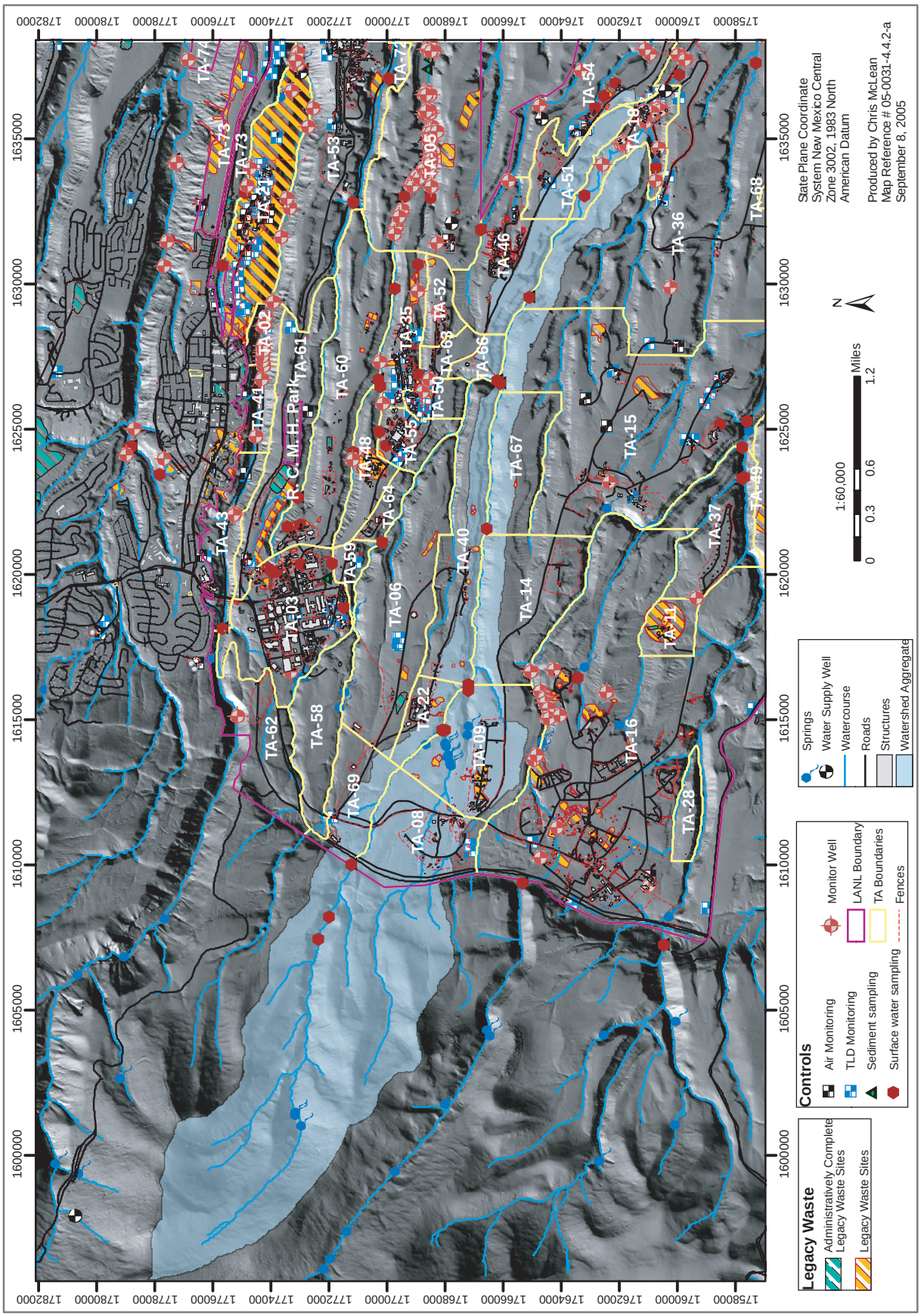
Map 4.4.1-a'. Current state: operational hazards within Twomile Canyon Aggregate



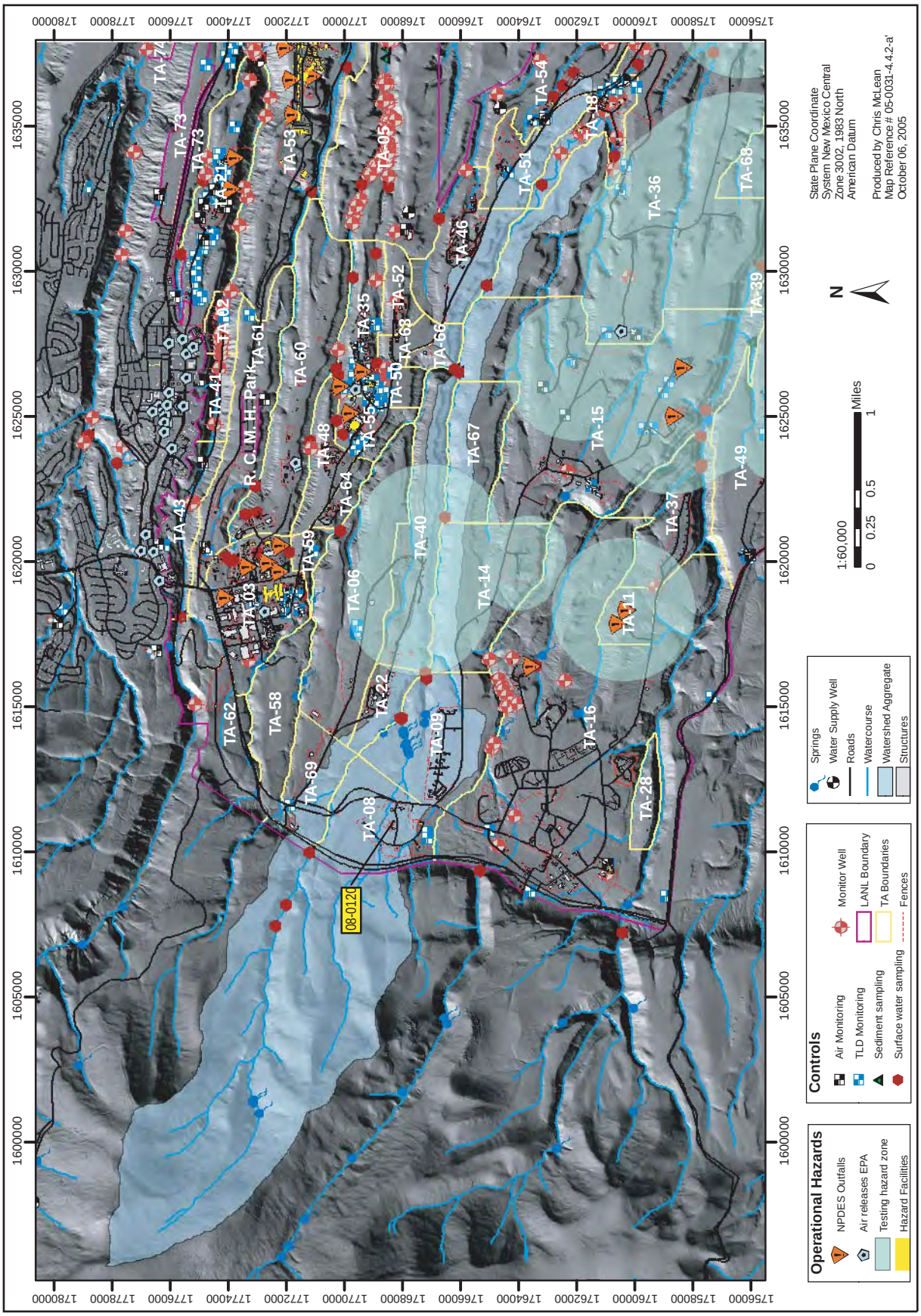
Map 4.4.1-b. Future state: legacy waste sites within Twomile Canyon Aggregate



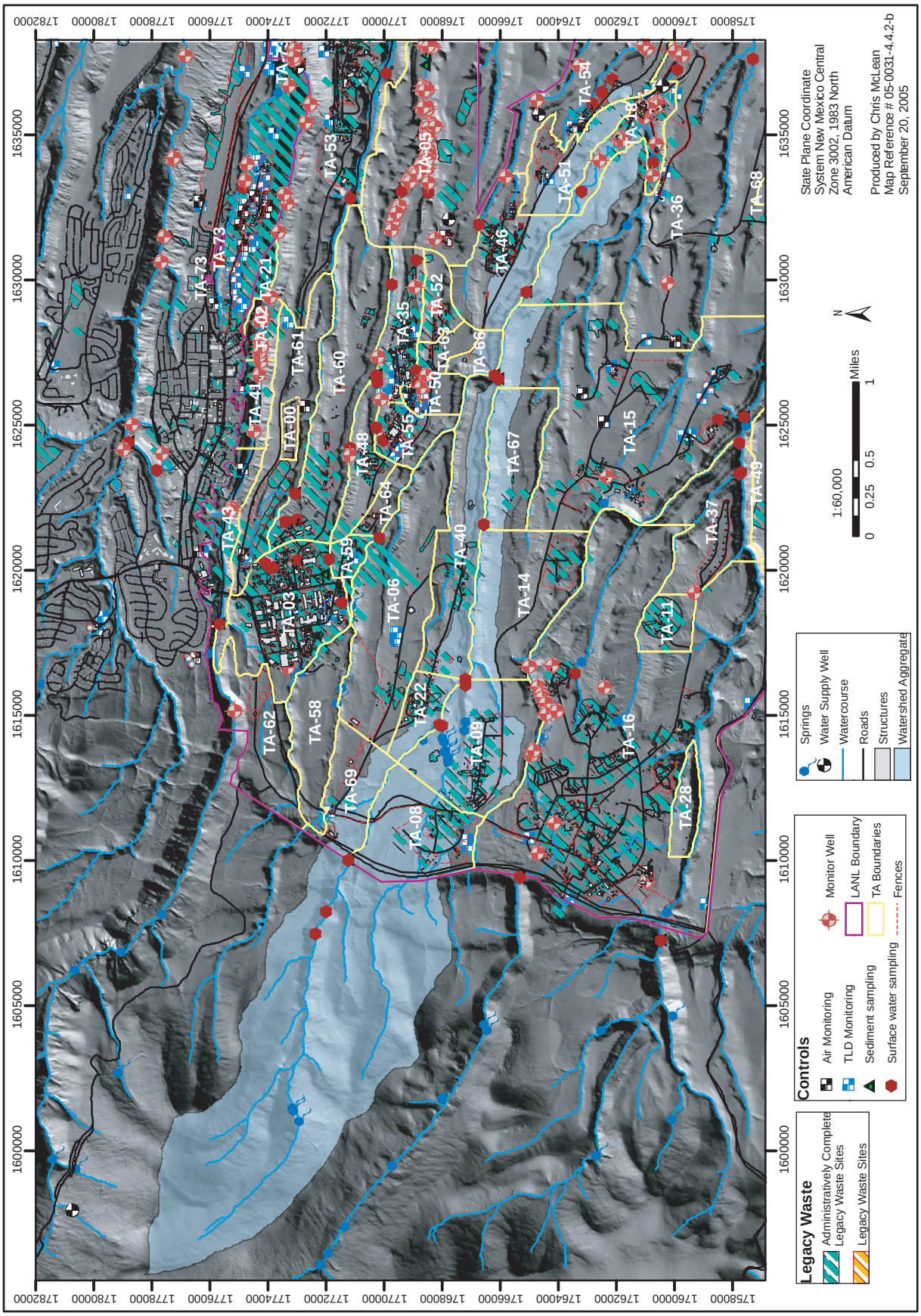
Map 4.4.1-b'. Future state: operational hazards within Twomile Canyon Aggregate



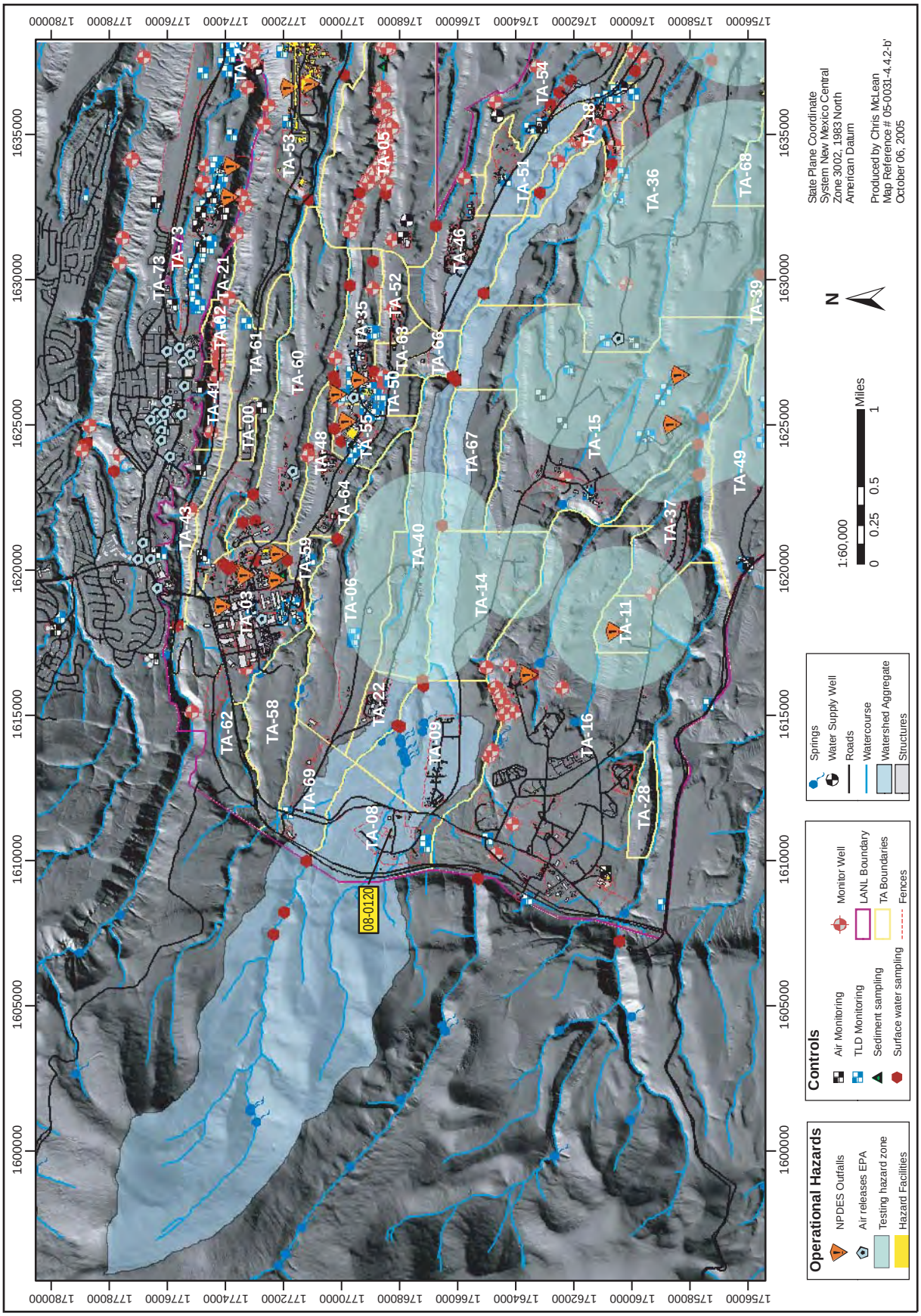
Map 4.4.2-a. Current state: legacy waste sites within Starmer/Upper Pajarito Canyons Aggregate



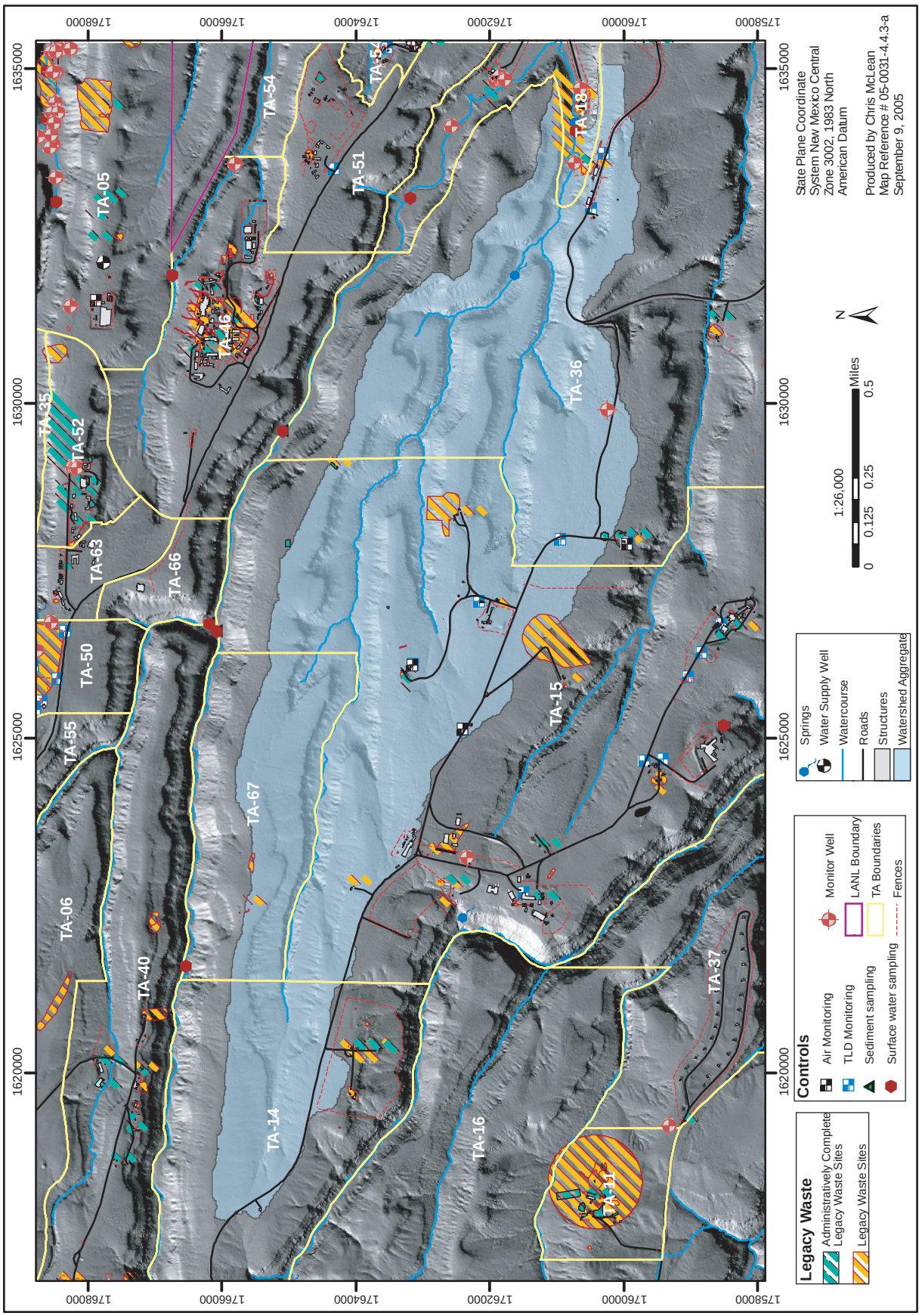
Map 4.4.2-a'. Current state: operational hazards within Starmer/Upper Pajarito Canyons Aggregate



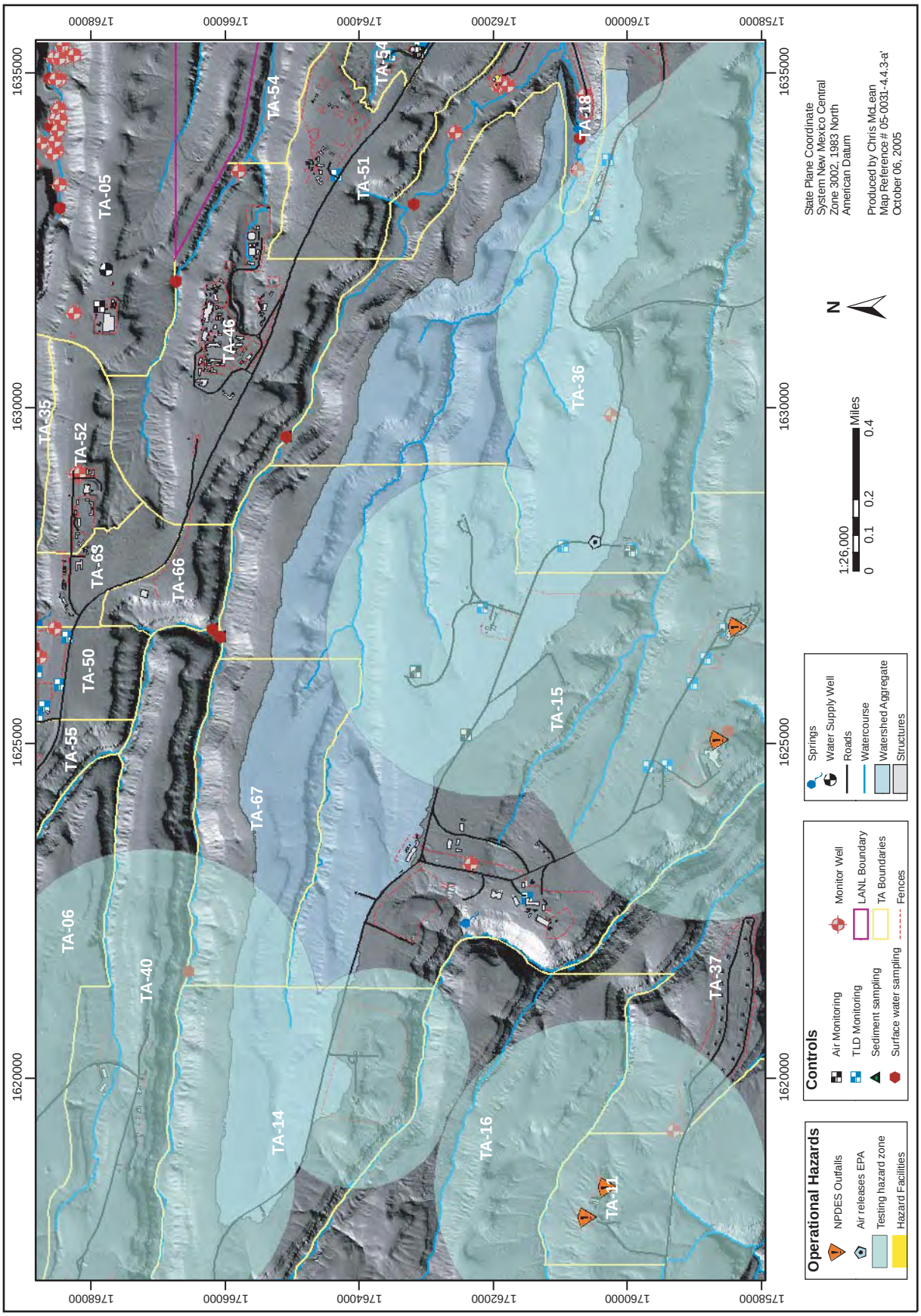
Map 4.4.2-b. Future state: legacy waste sites within Starmer/Upper Pajarito Canyons Aggregate



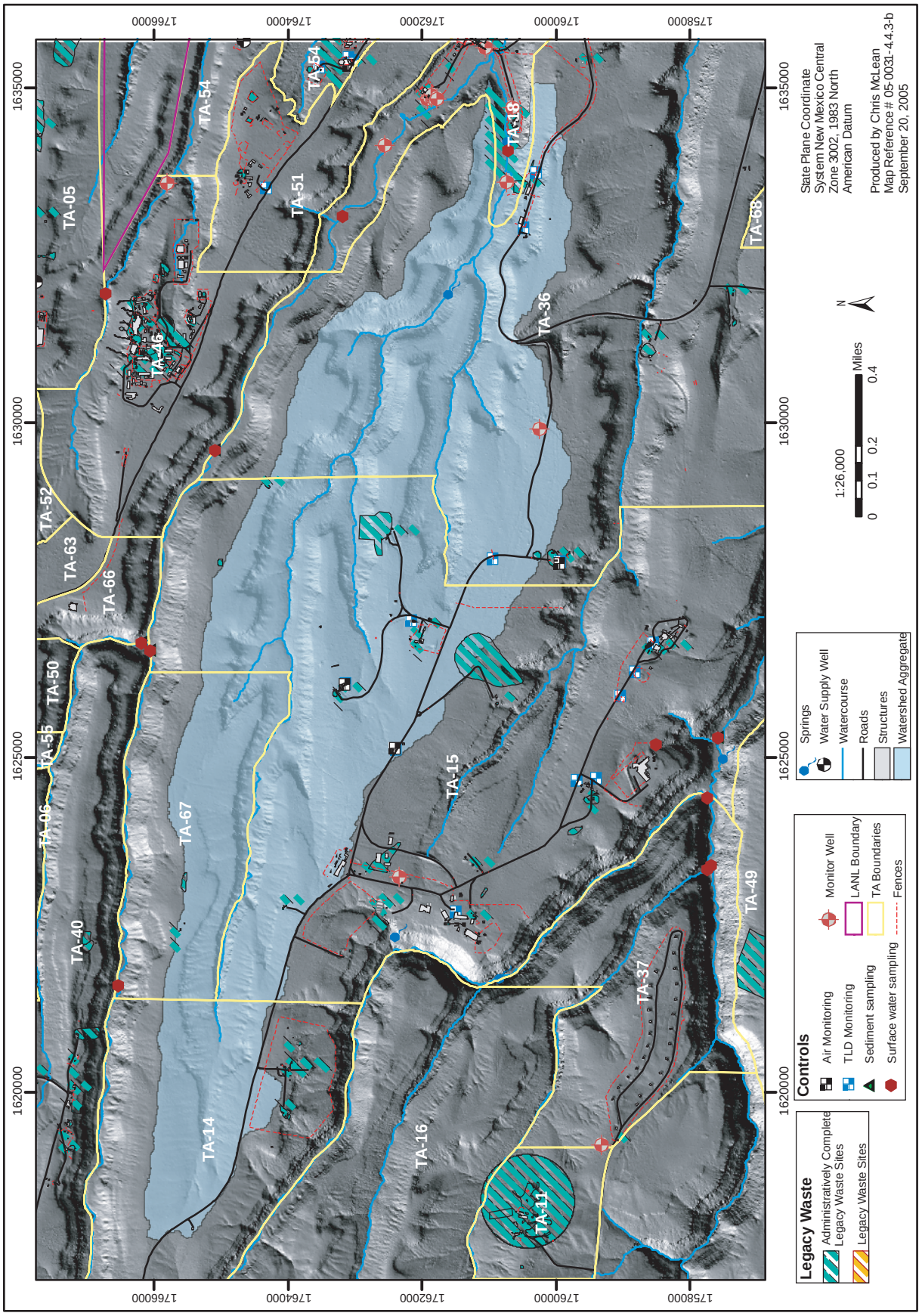
Map 4.4.2-b'. Future state: operational hazards within Starmer/Upper Pajarito Canyons Aggregate



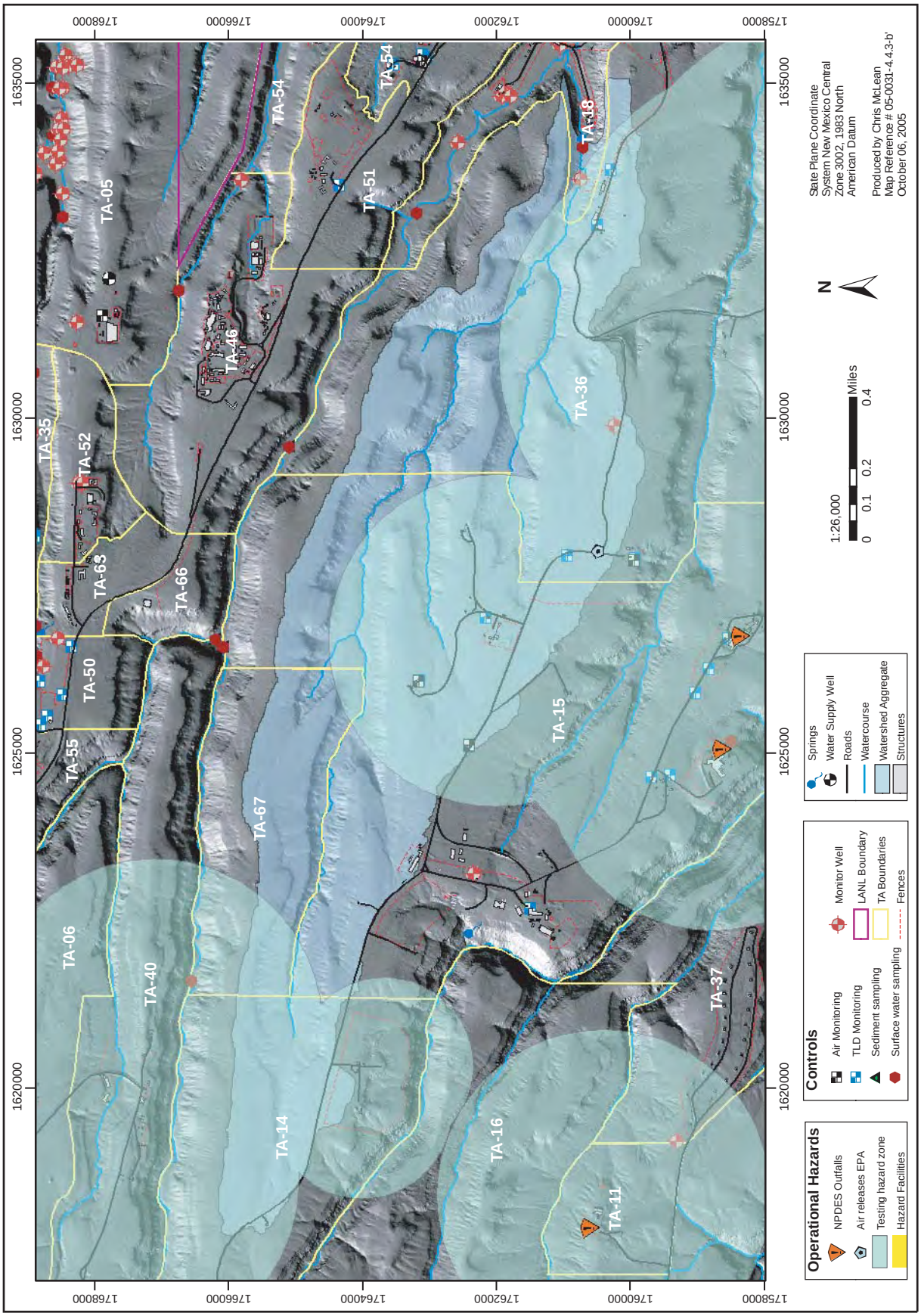
Map 4.4.3-a. Current state: legacy waste sites within Threemile Canyon Aggregate



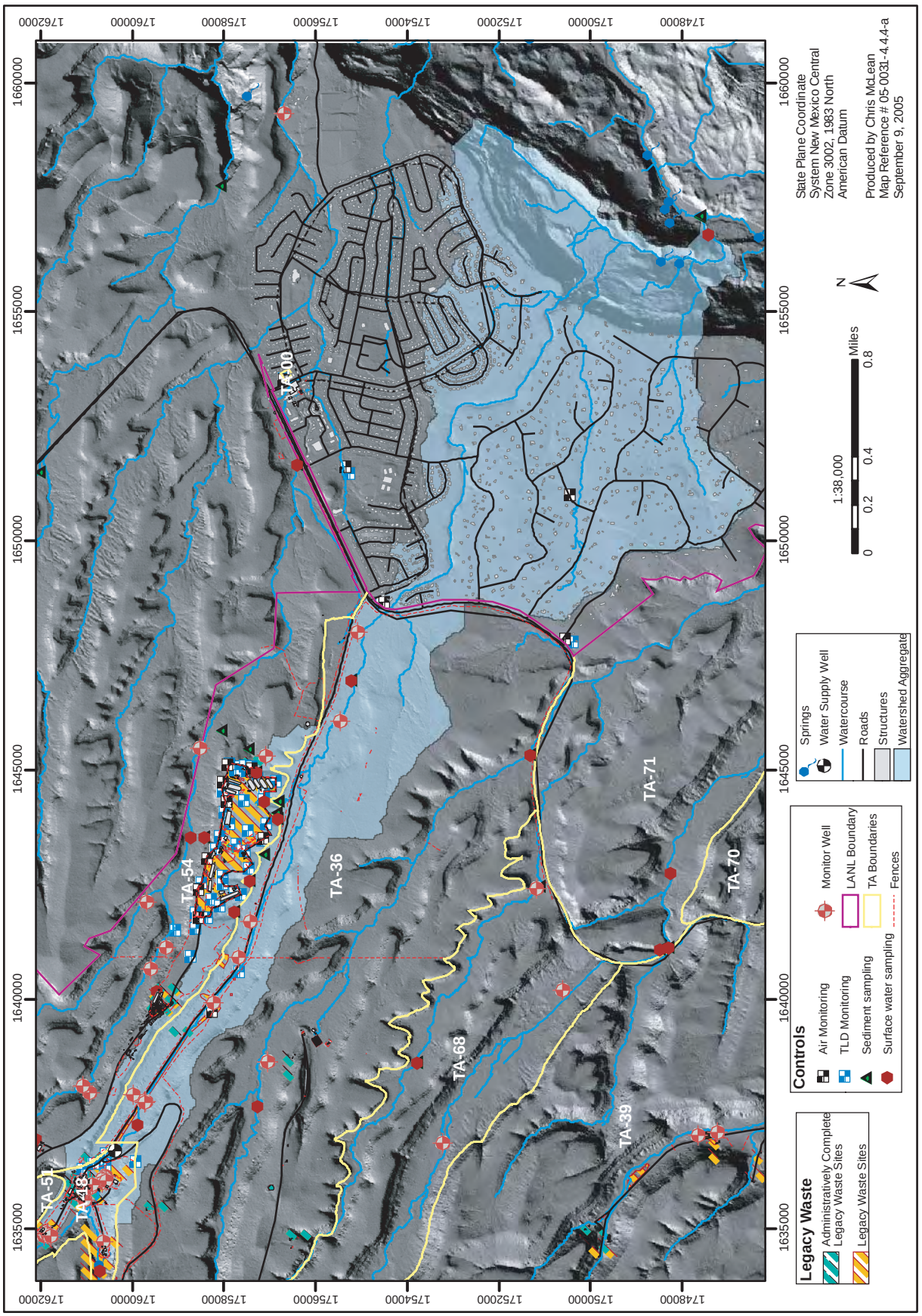
Map 4.4.3-a'. Current state: operational hazards within Threemile Canyon Aggregate



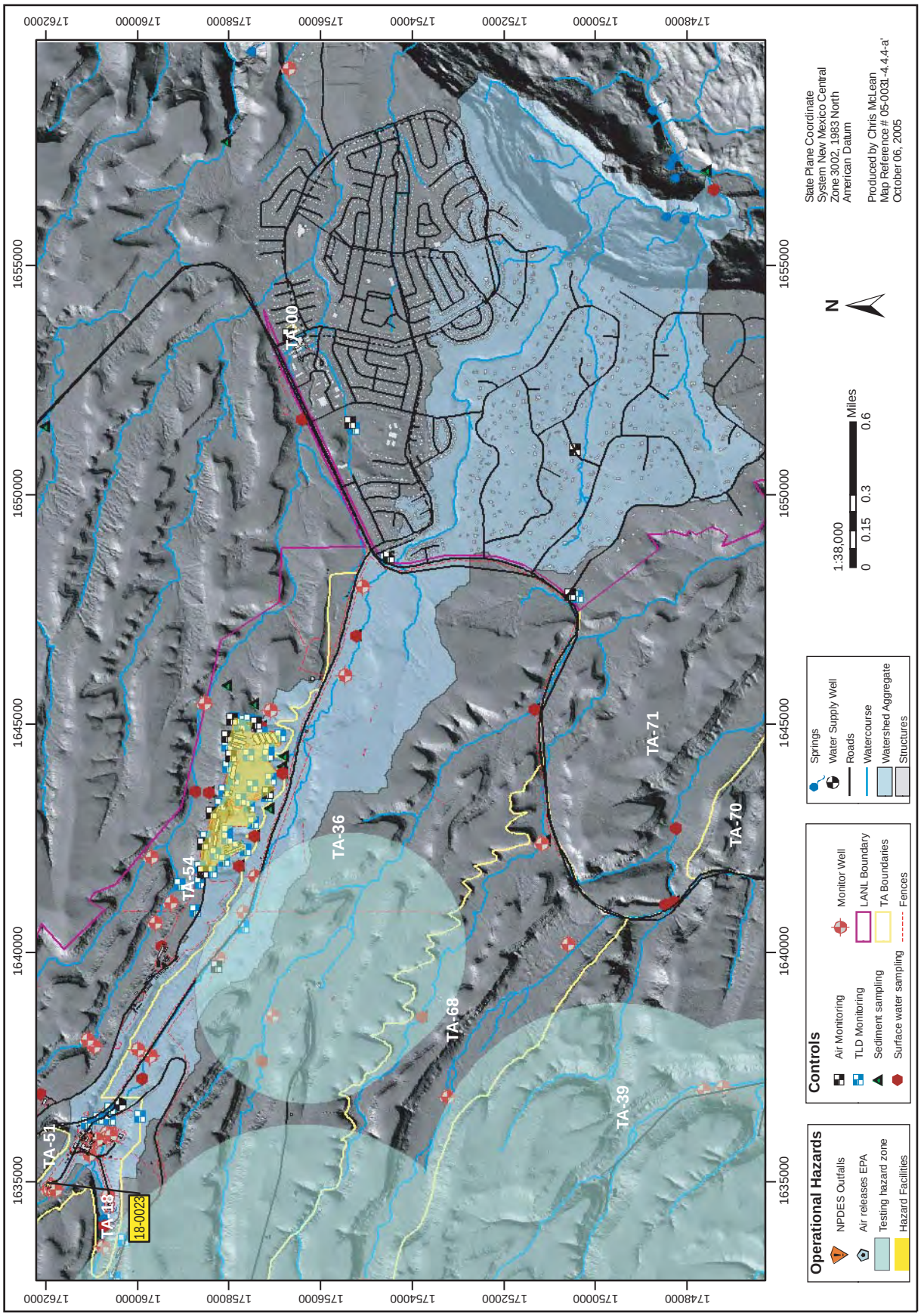
Map 4.4.3-b. Future state: legacy waste sites within Threemile Canyon Aggregate



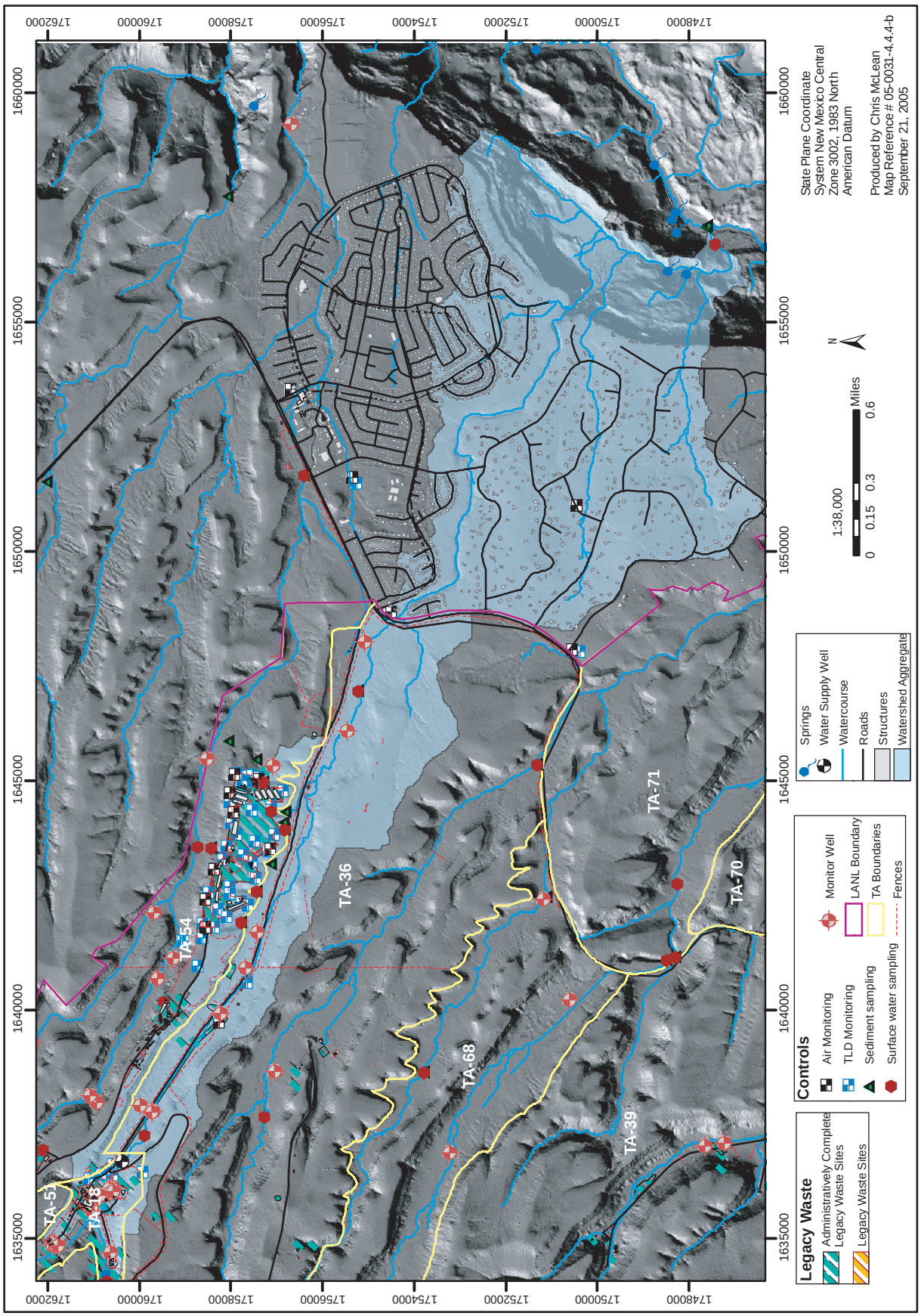
Map 4.4.3-b'. Future state: operational hazards within Threemile Canyon Aggregate



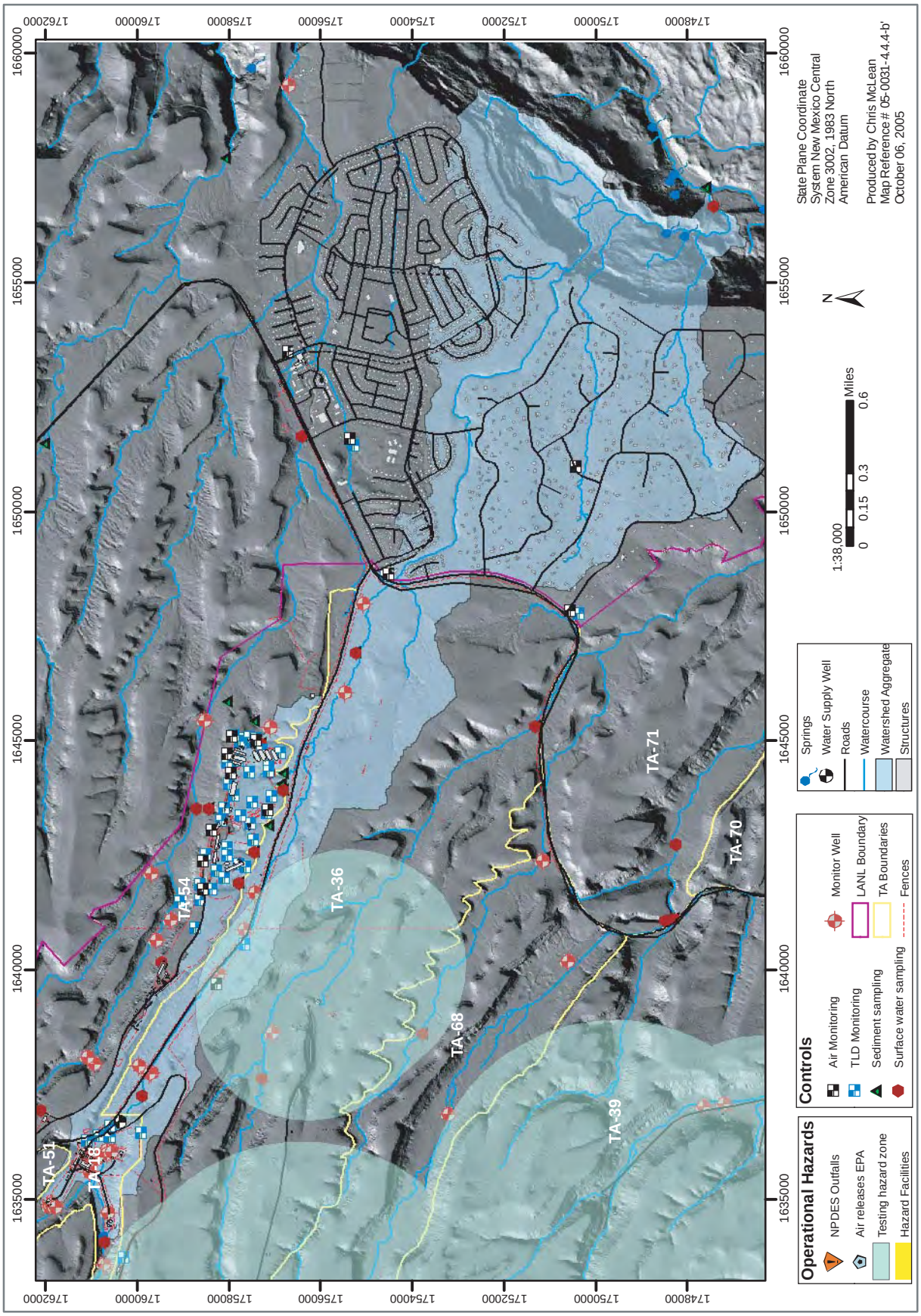
Map 4.4.4-a. Current state: legacy waste sites within Lower Pajarito Canyon Aggregate



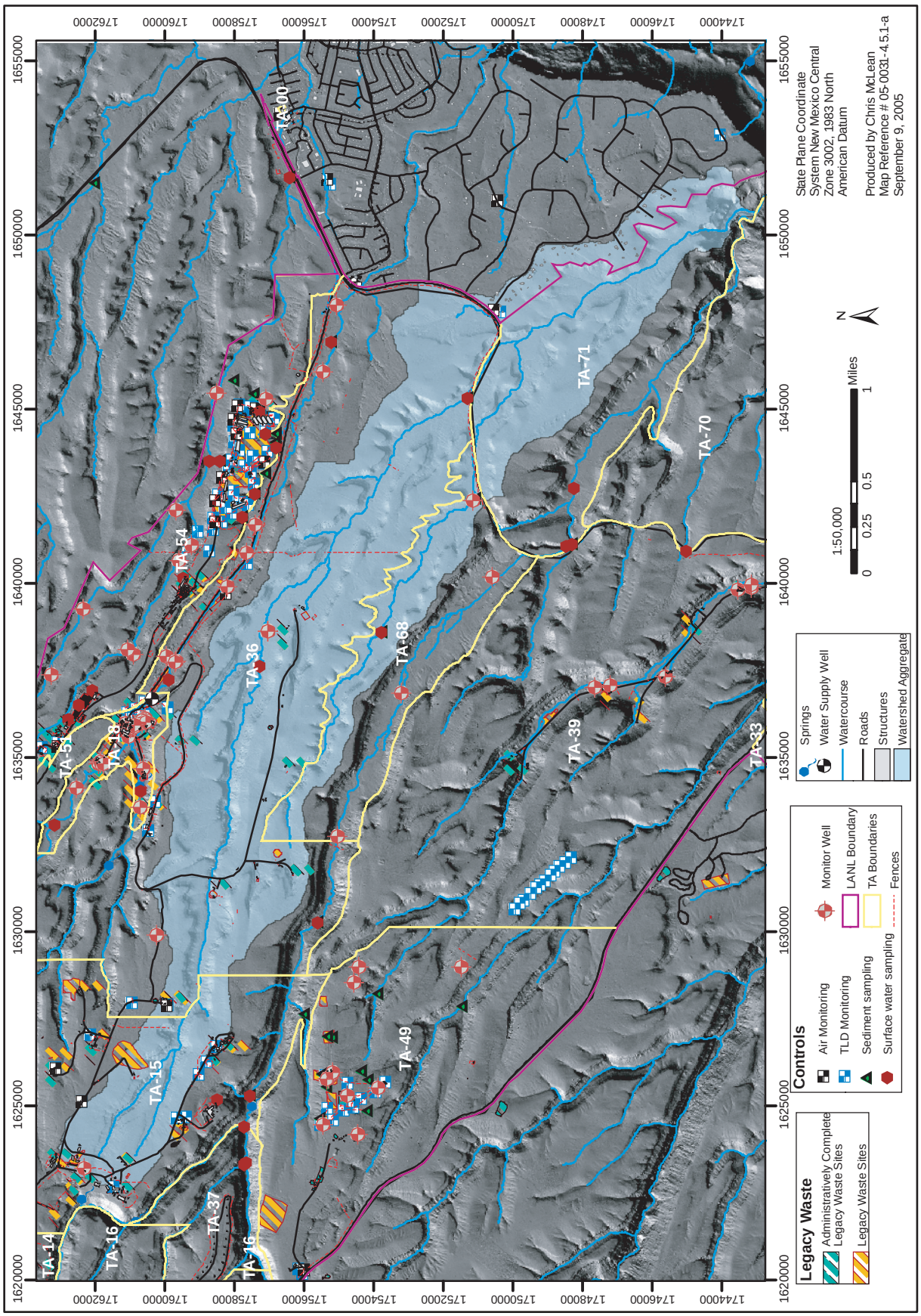
Map 4.4.4-a'. Current state: operational hazards within Lower Pajarito Canyon Aggregate



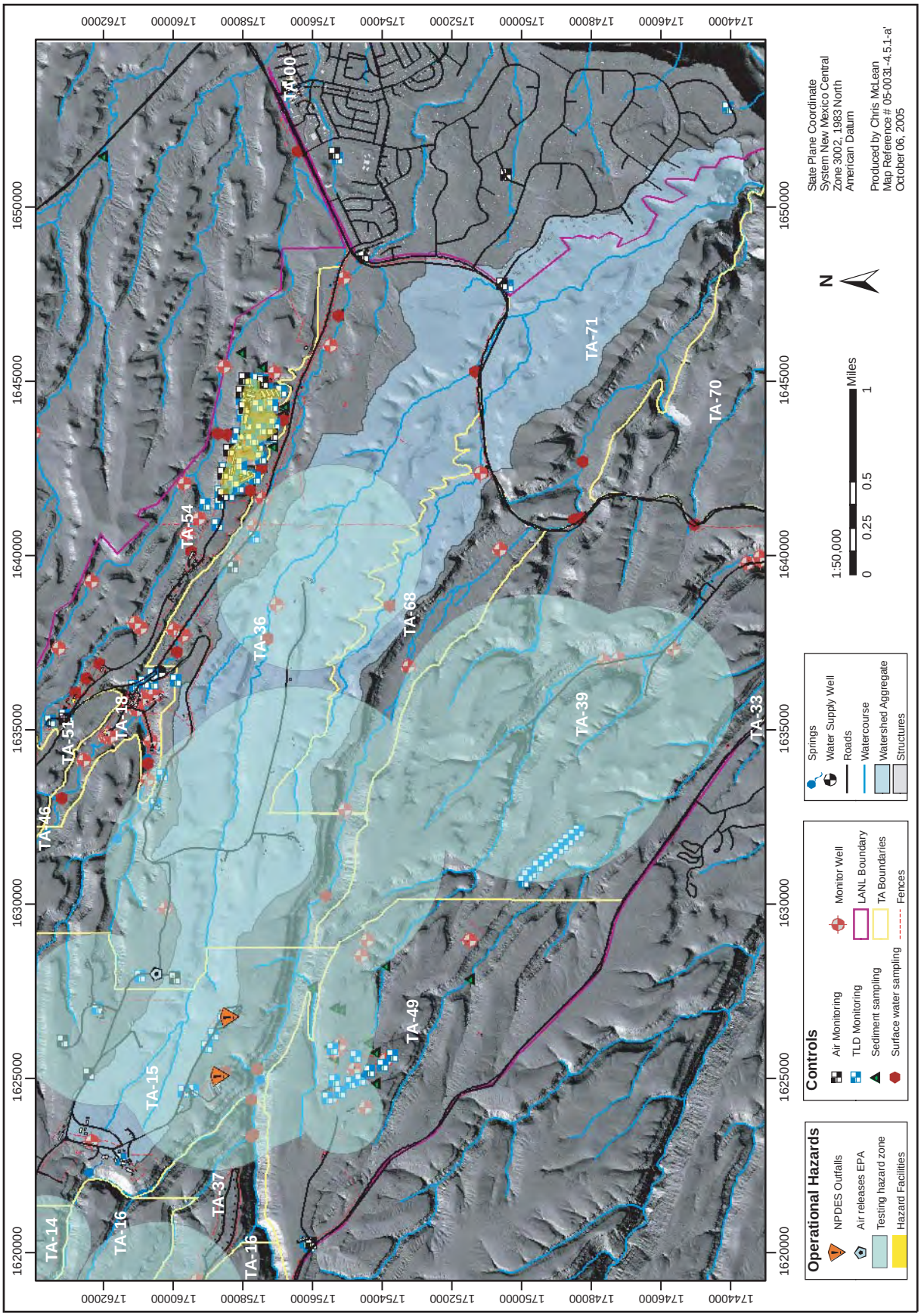
Map 4.4.4-b. Future state: legacy waste sites within Lower Pajarito Canyon Aggregate



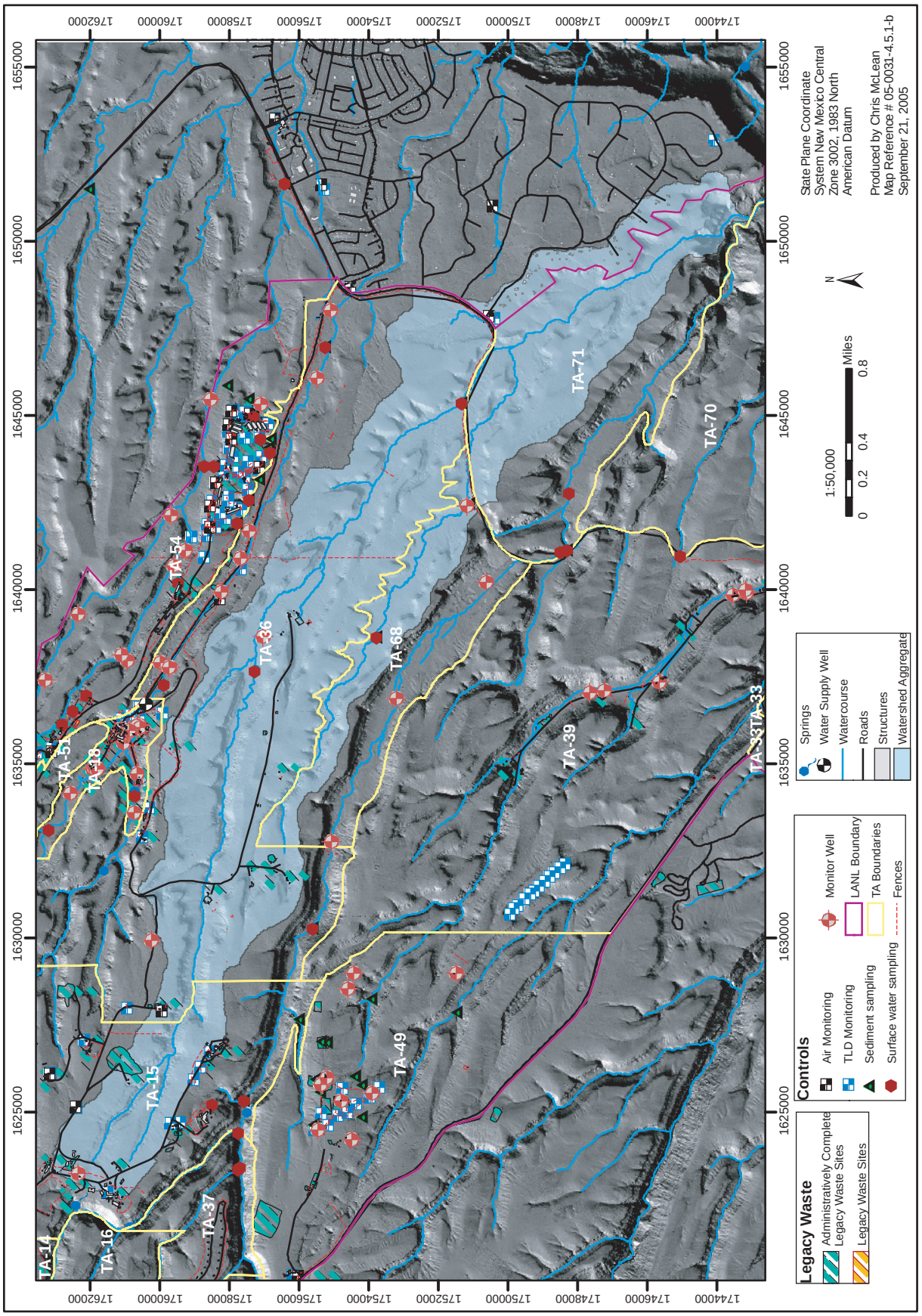
Map 4.4.4-b'. Future state: operational hazards within Lower Pajarito Canyon Aggregate



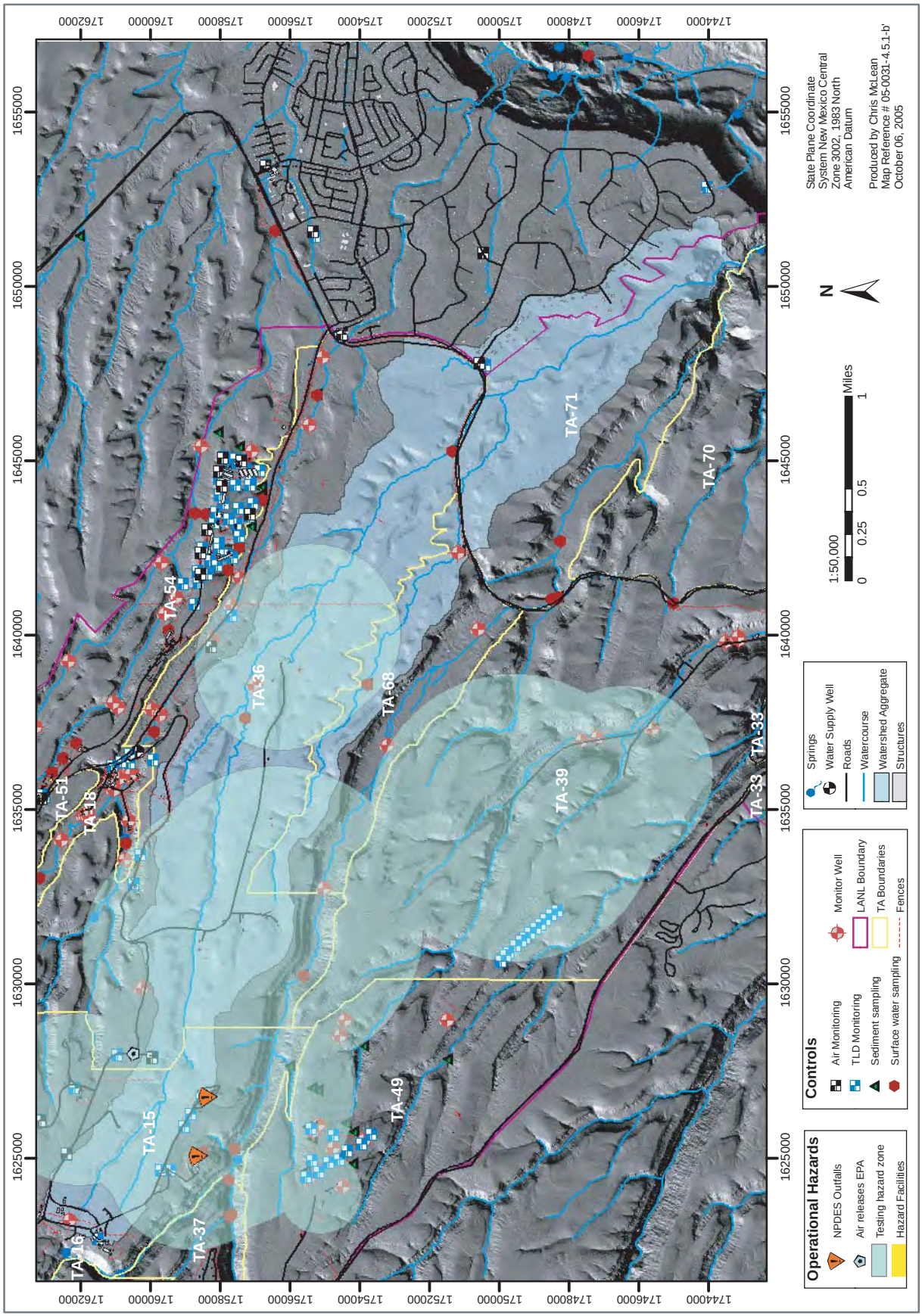
Map 4.5.1-a. Current state: legacy waste sites within Potrillo/Fence Canyons Aggregate



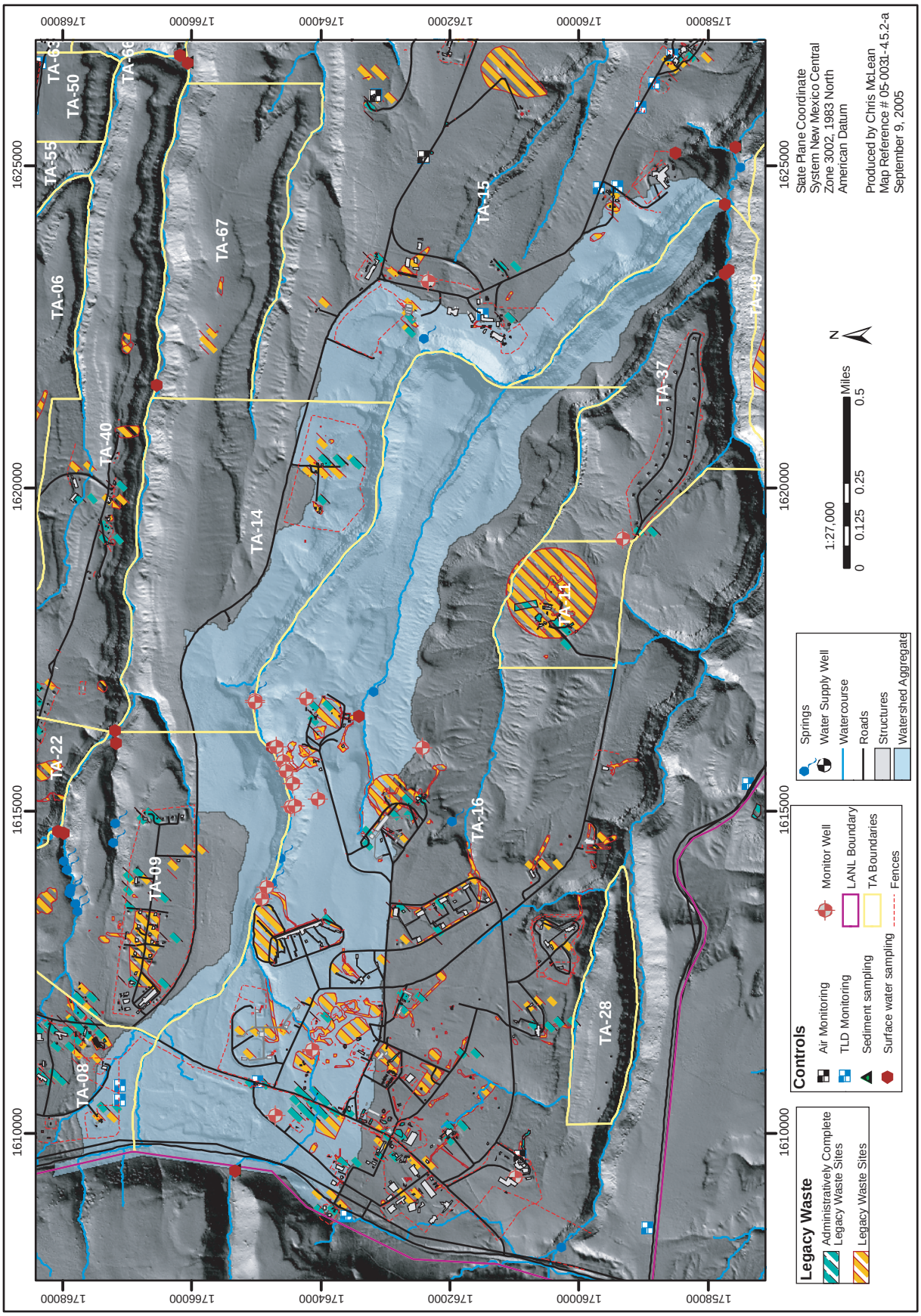
Map 4.5.1-a'. Current state: operational hazards within Potrillo/Fence Canyons Aggregate



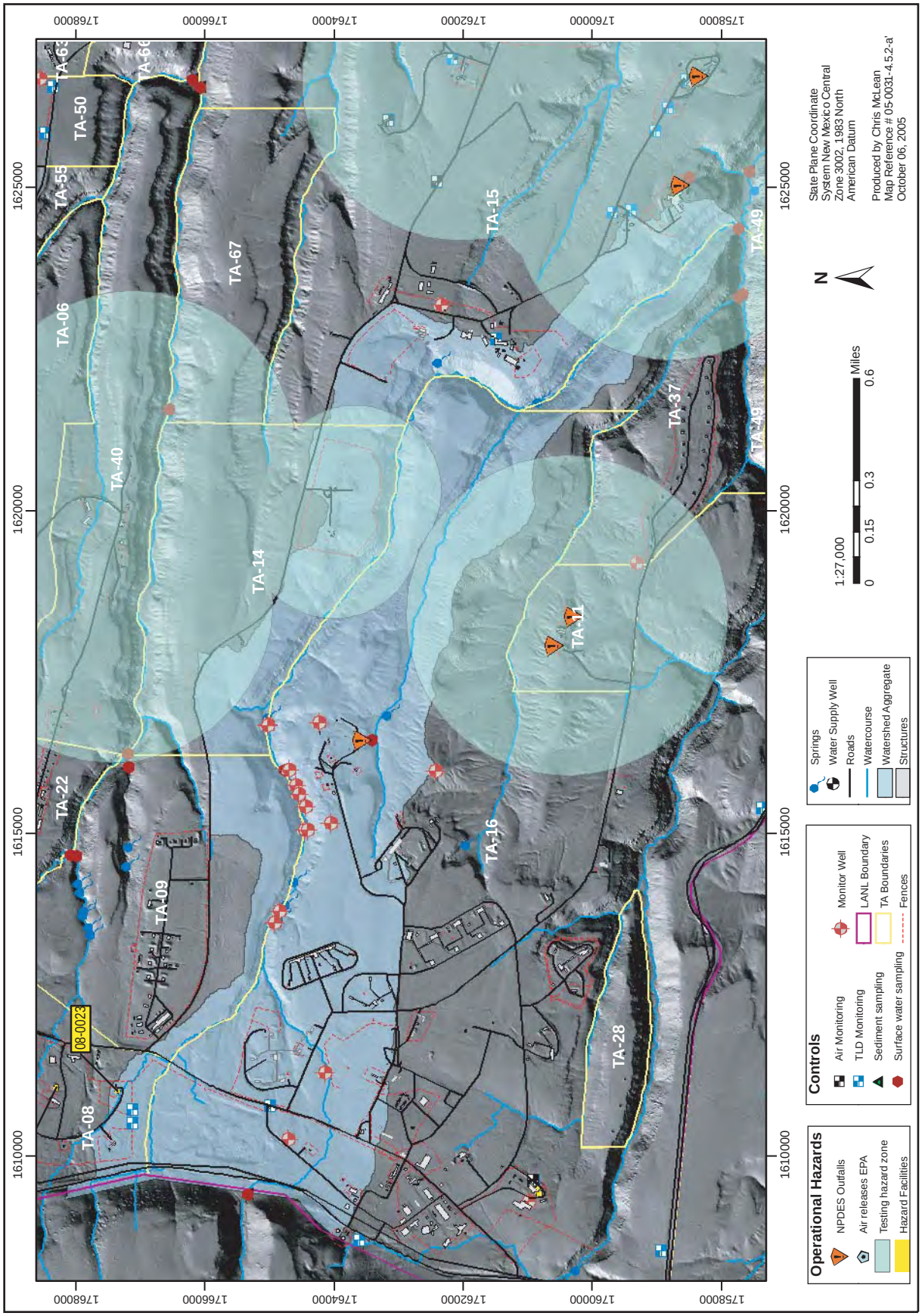
Map 4.5.1-b. Future state: legacy waste sites within Potrillo/Fence Canyons Aggregate



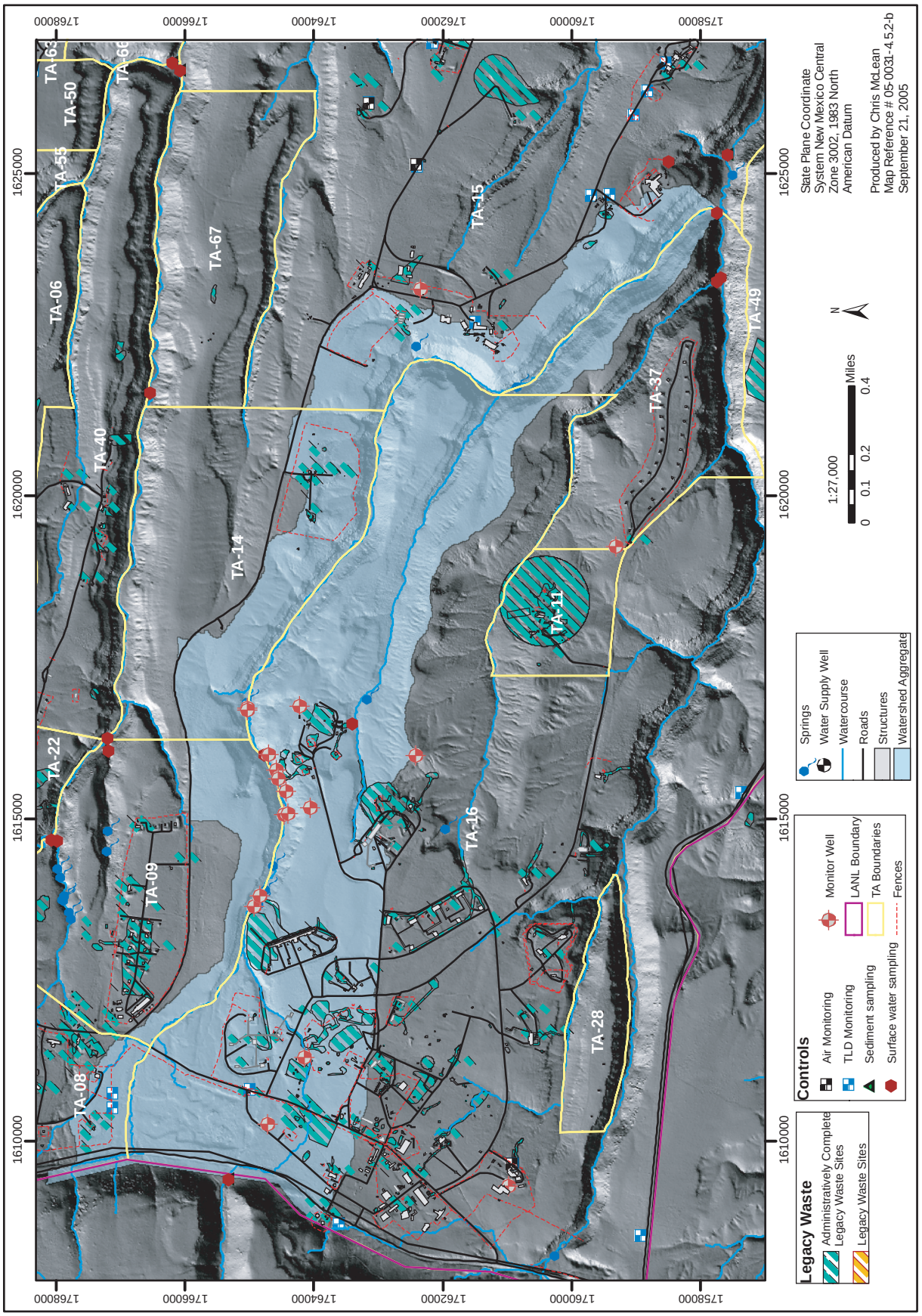
Map 4.5.1-b'. Future state: operational hazards within Potrillo/Fence Canyons Aggregate



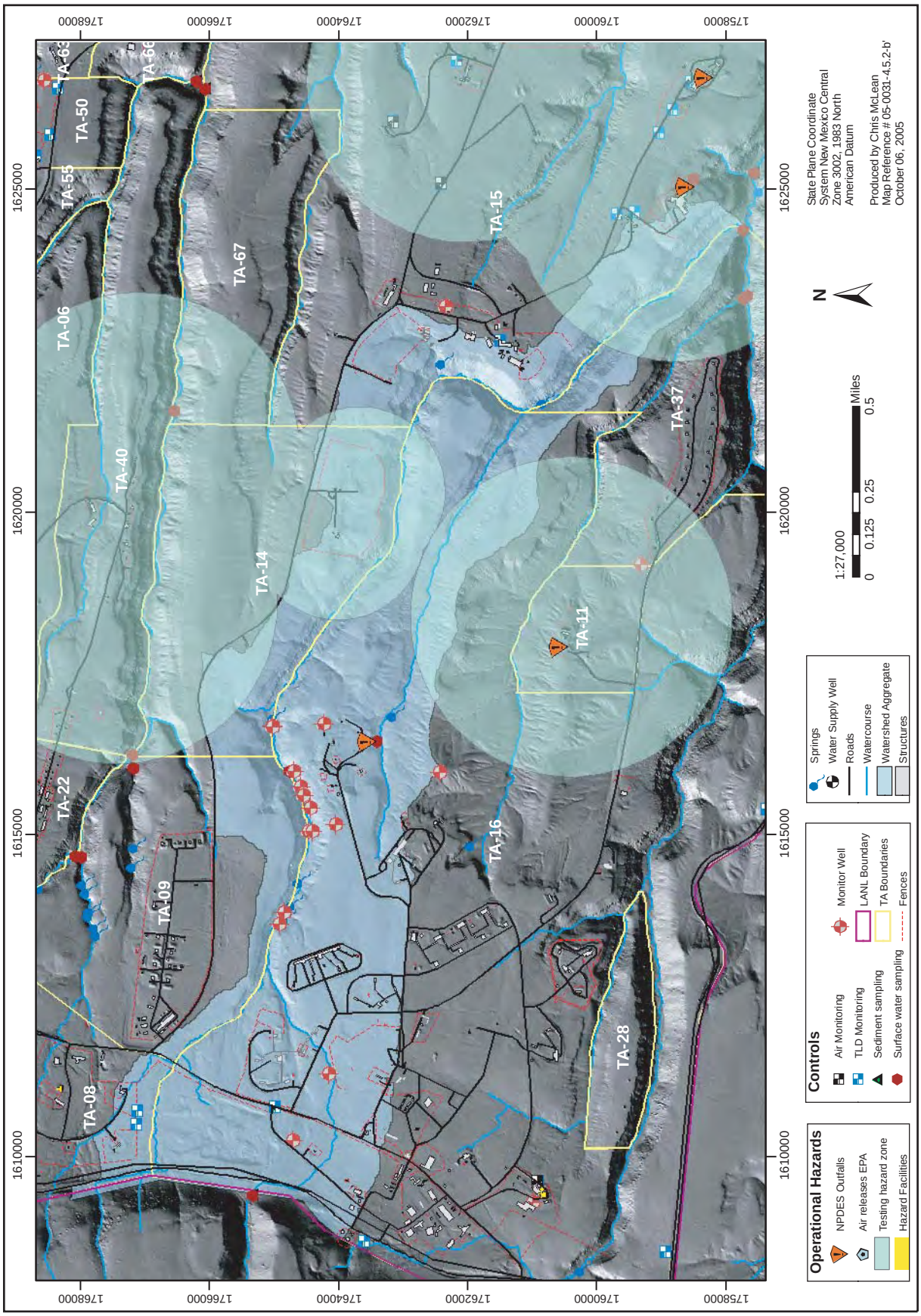
Map 4.5.2-a. Current state: legacy waste sites within Cañon de Valle Aggregate



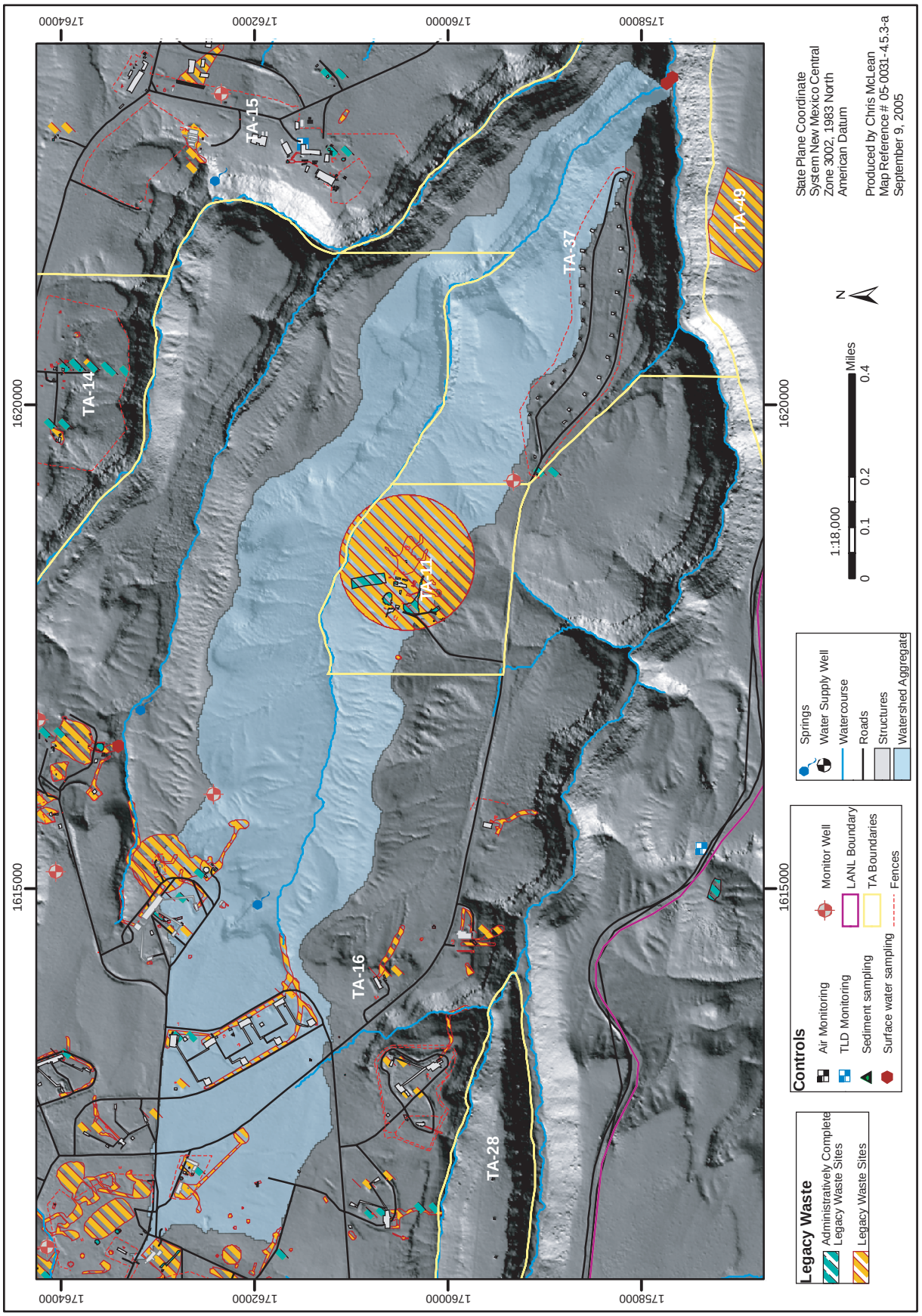
Map 4.5.2-a'. Current state: operational hazards within Cañon de Valle Aggregate



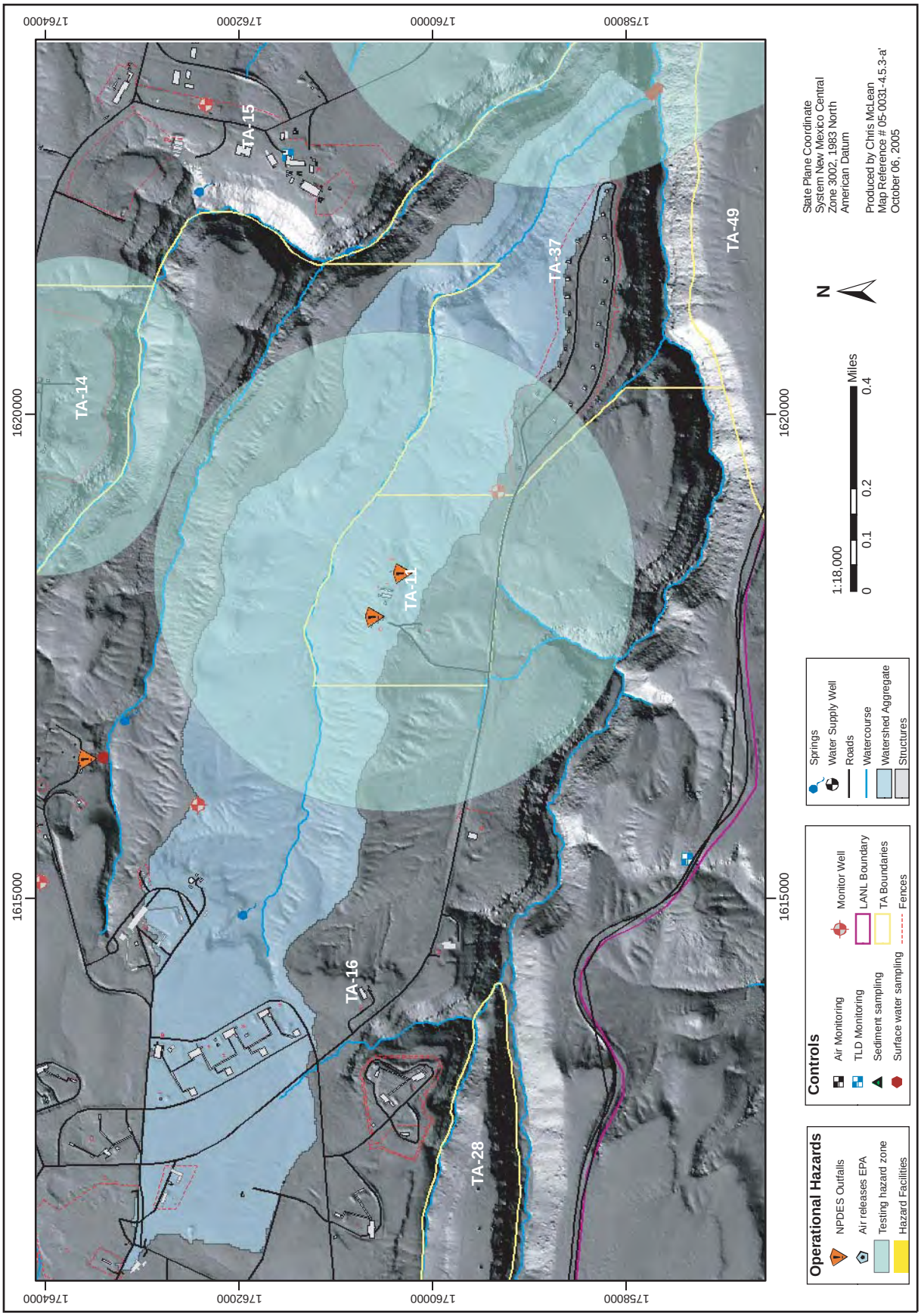
Map 4.5.2-b. Future state: legacy waste sites within Cañon de Valle Aggregate



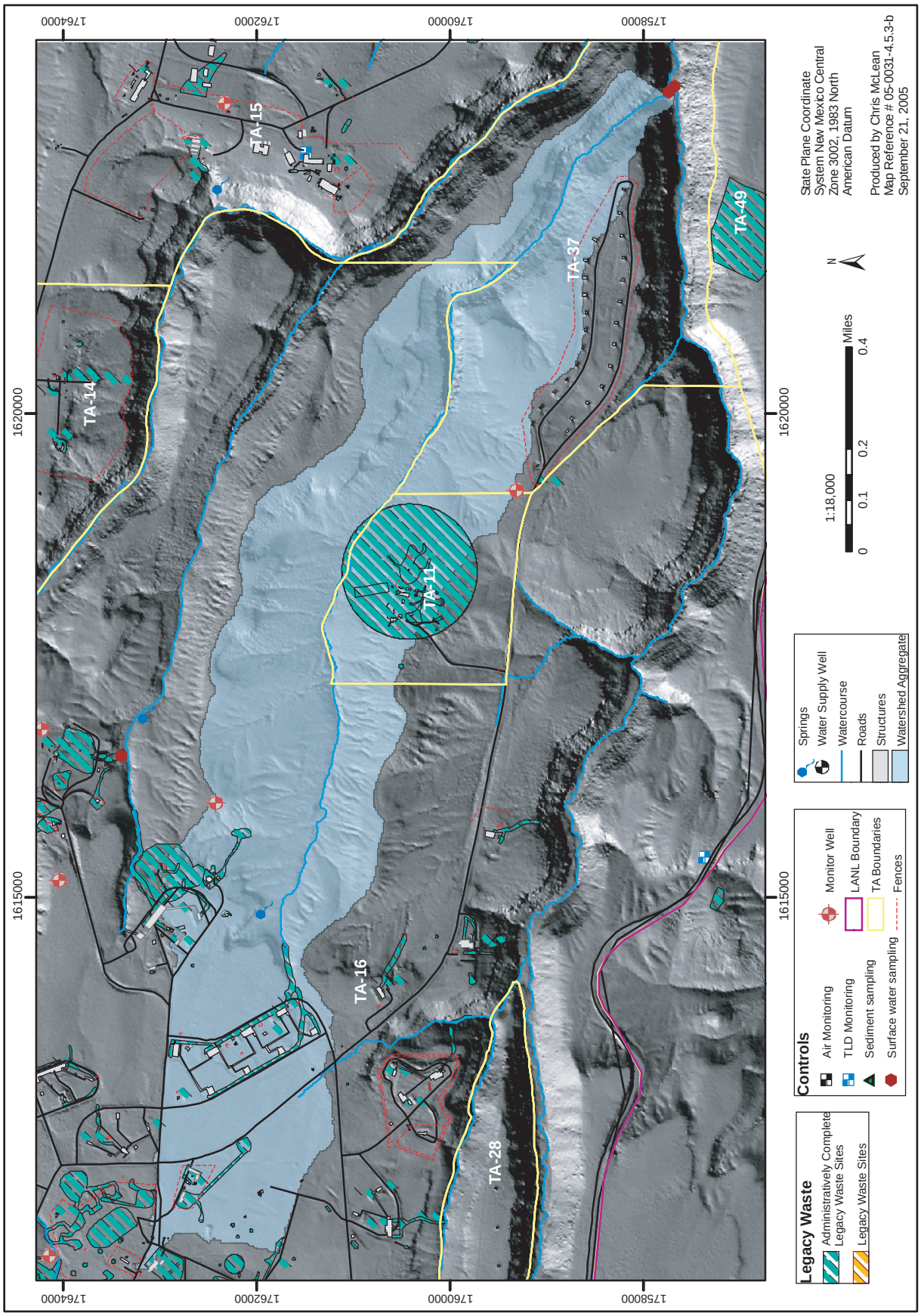
Map 4.5.2-b'. Future state: operational hazards within Cañon de Valle Aggregate



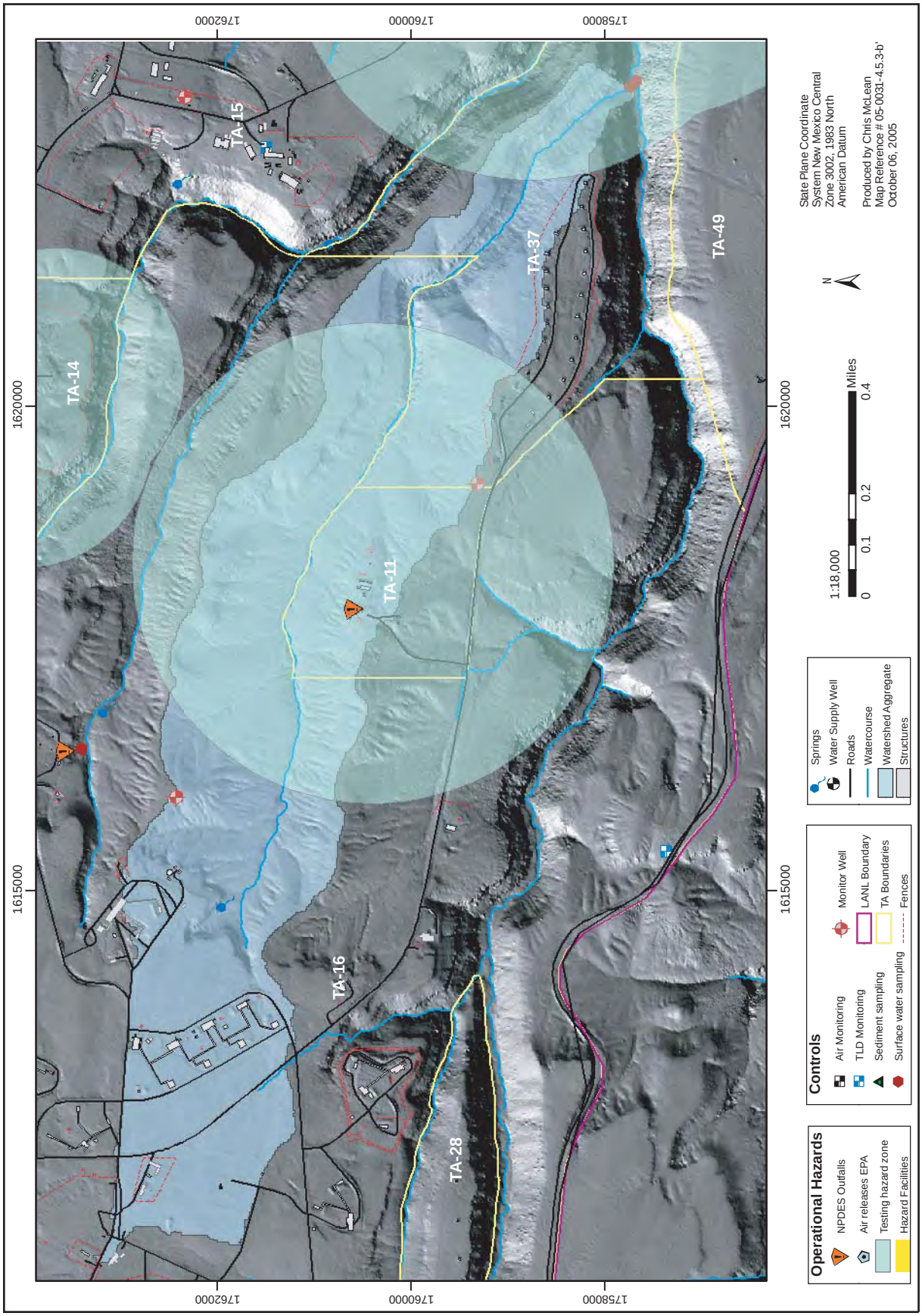
Map 4.5.3-a. Current state: legacy waste sites within S-Site Aggregate



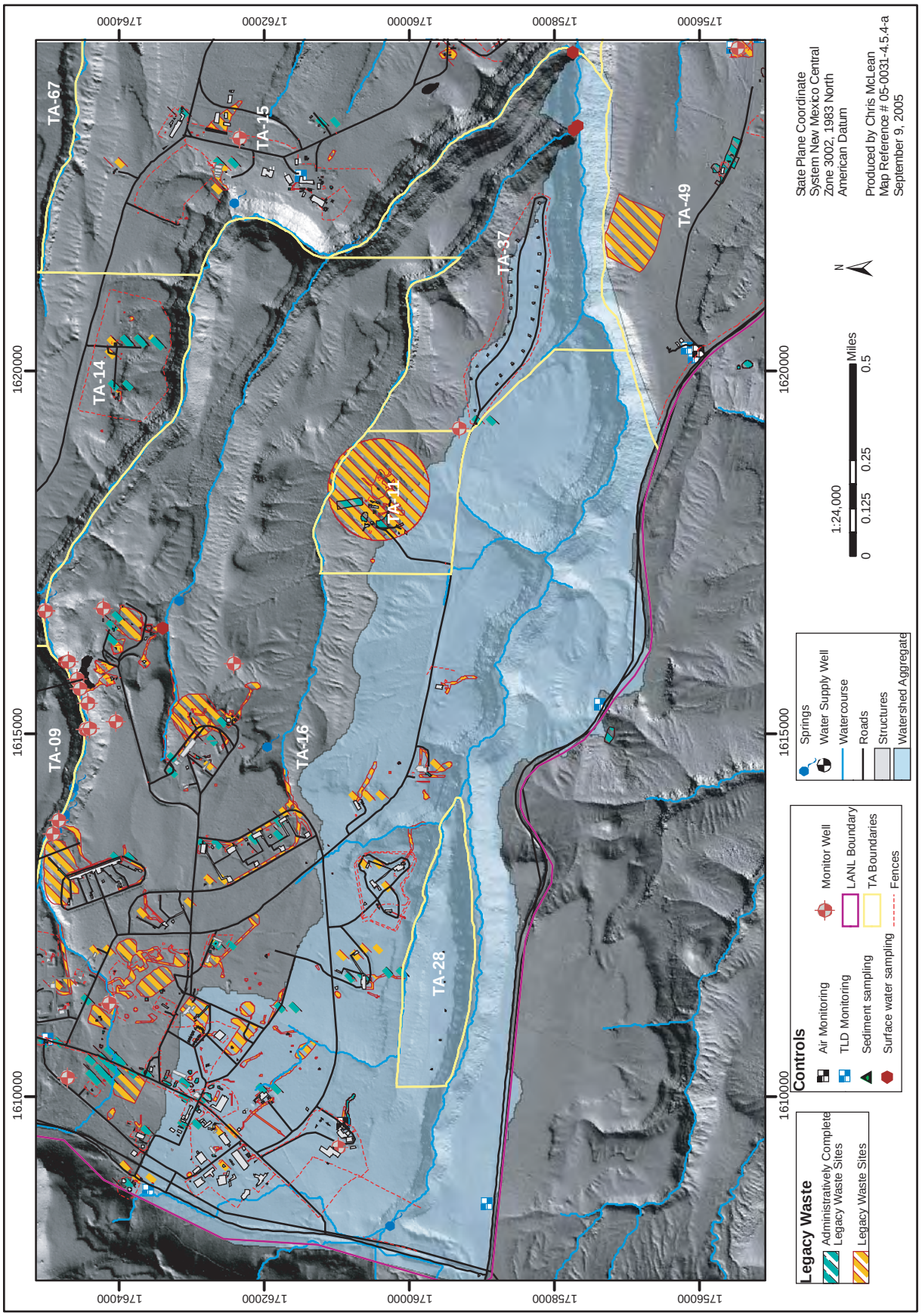
Map 4.5.3-a'. Current state: operational hazards within S-Site Aggregate



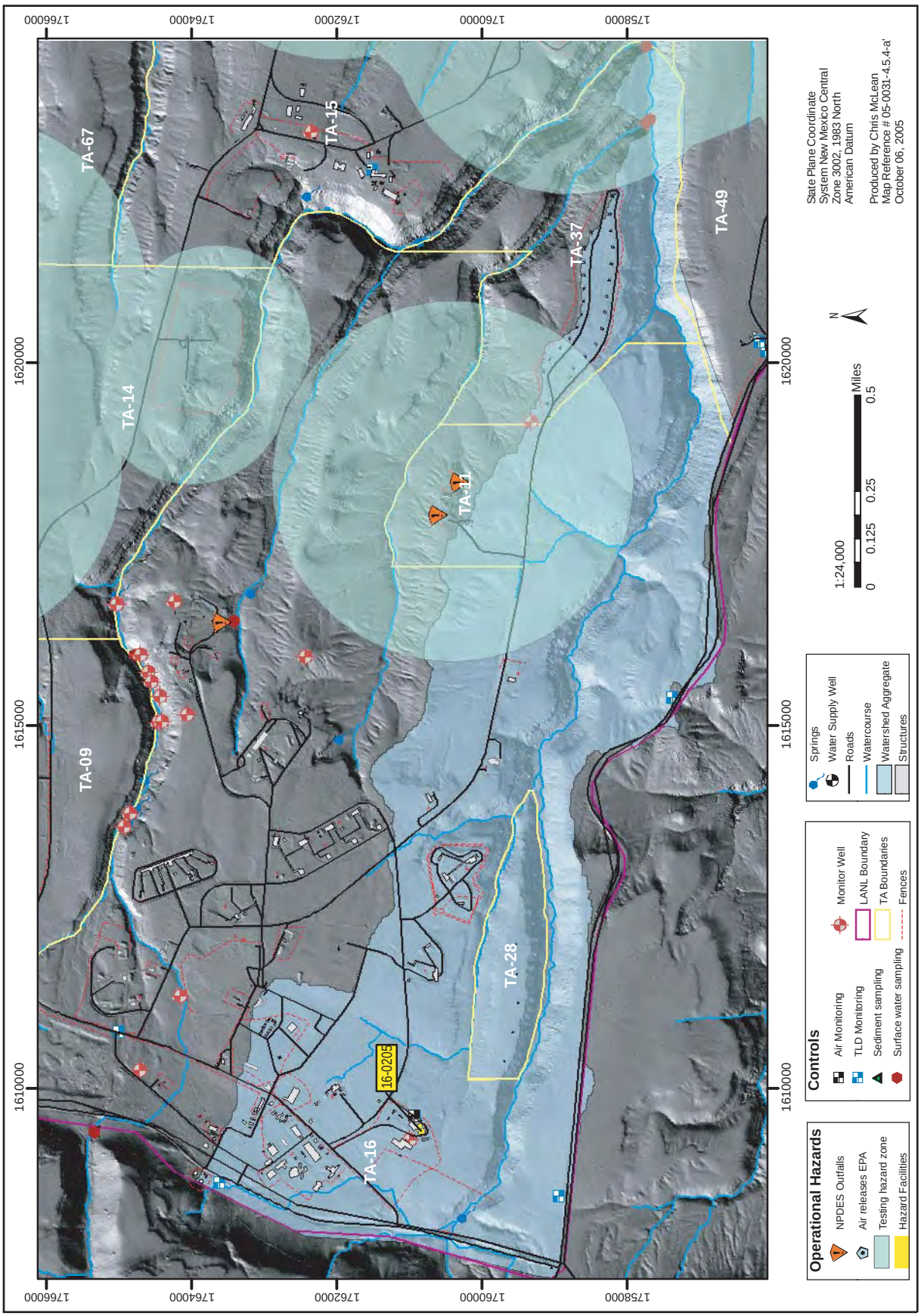
Map 4.5.3-b. Future state: legacy waste sites within S-Site Aggregate



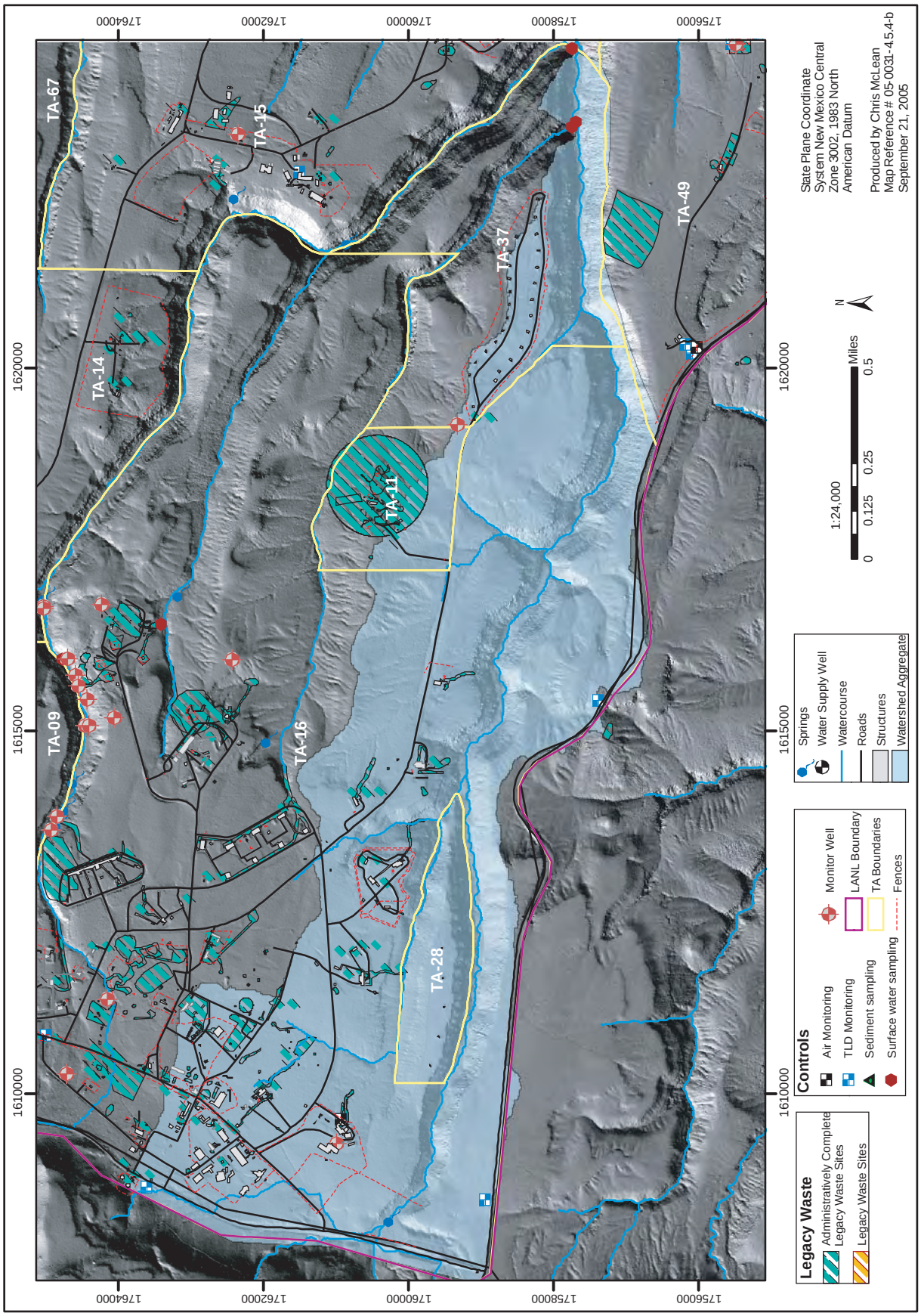
Map 4.5.3-b'. Future state: operational hazards within S-Site Aggregate



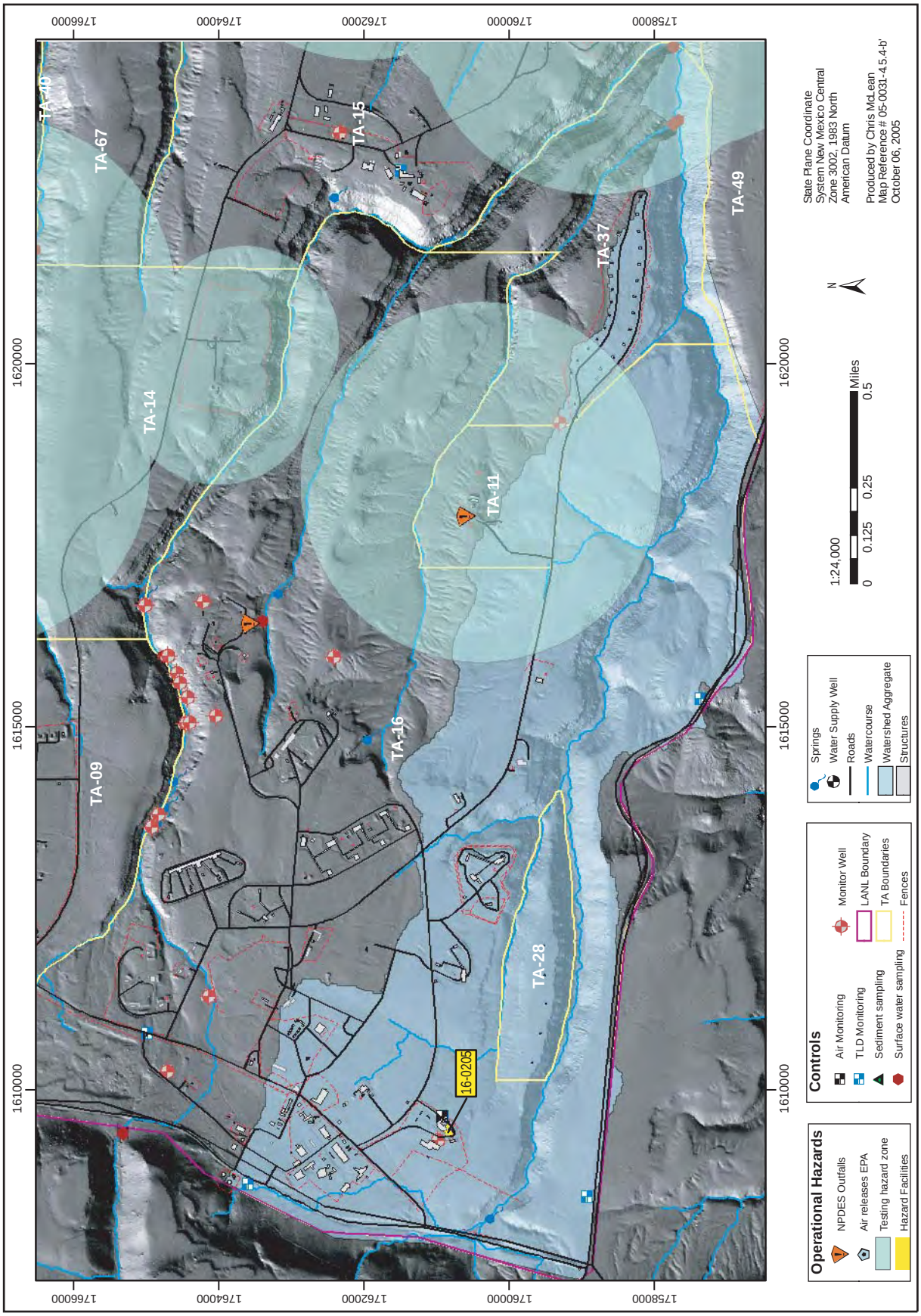
Map 4.5.4-a. Current state: legacy waste sites within Upper Water Canyon Aggregate



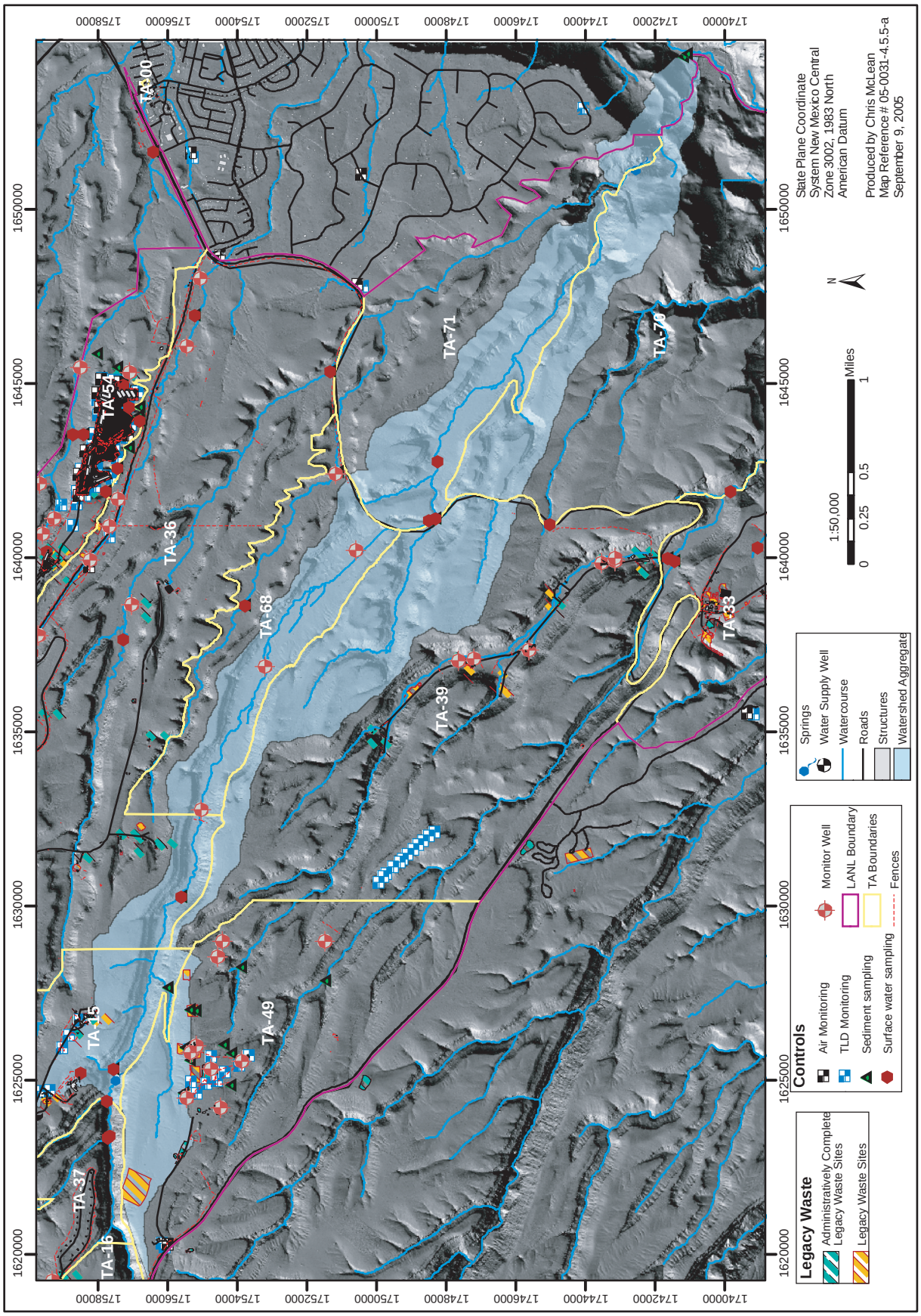
Map 4.5.4-a'. Current state: operational hazards within Upper Water Canyon Aggregate



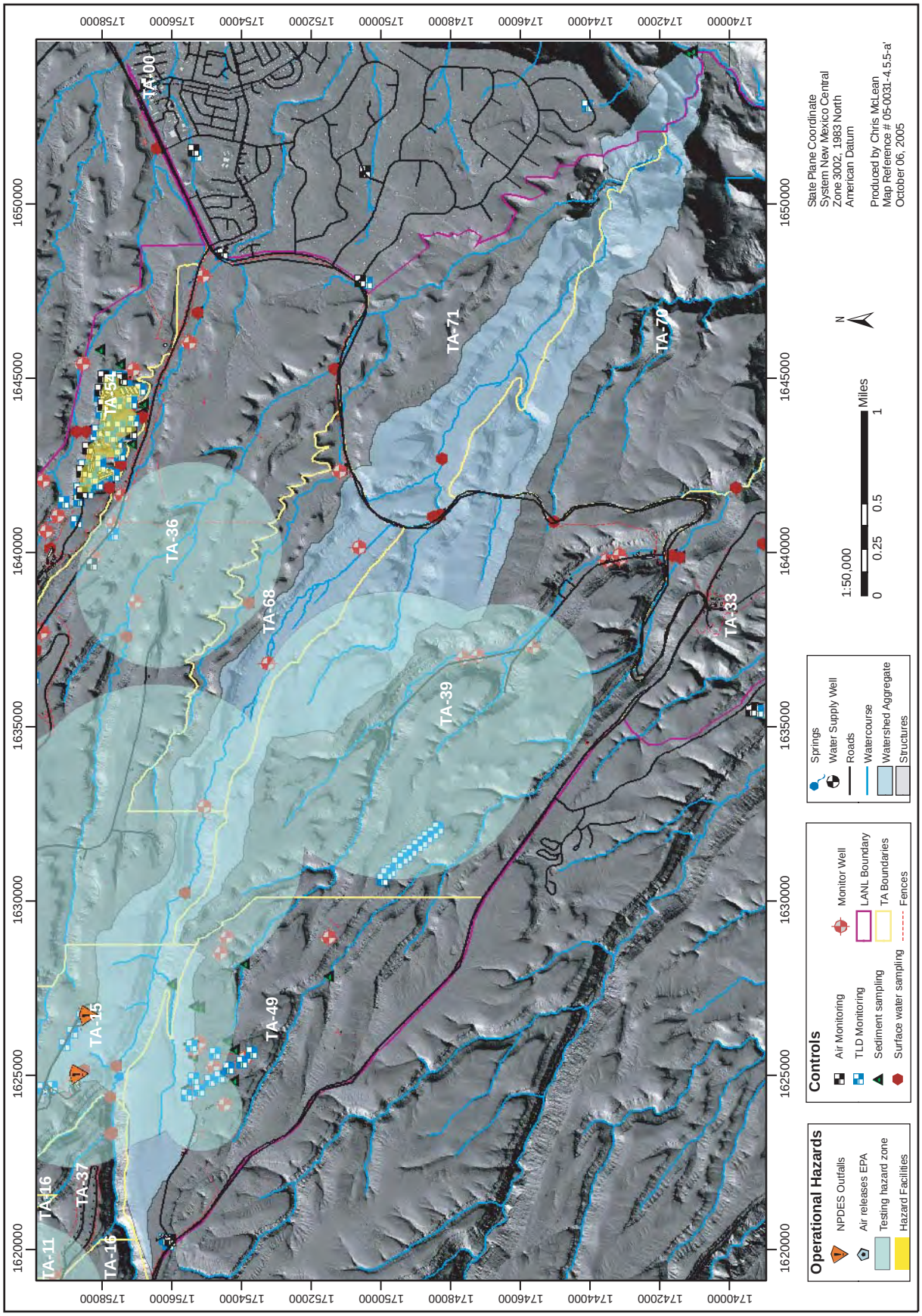
Map 4.5.4-b. Future state: legacy waste sites within Upper Water Canyon Aggregate



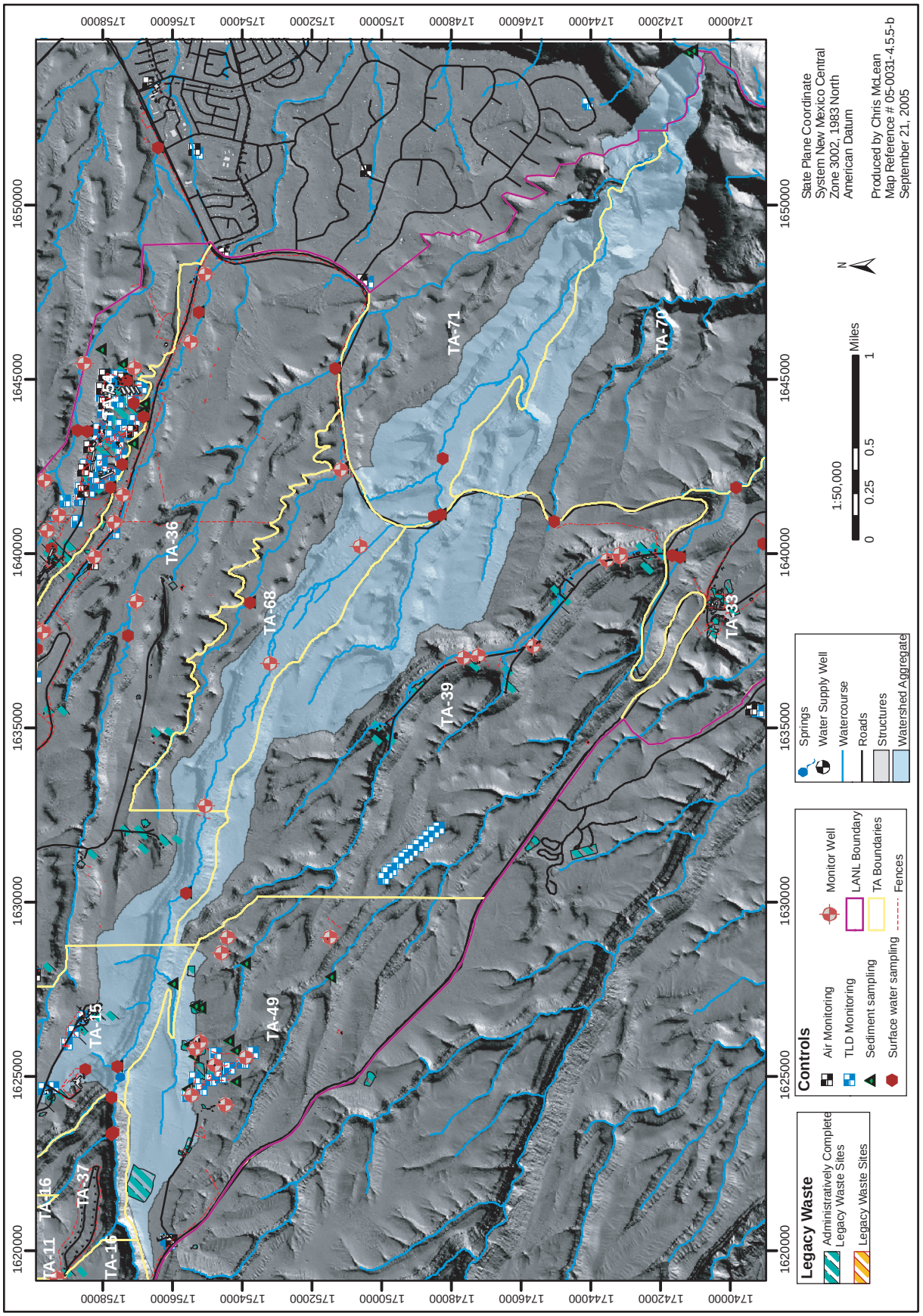
Map 4.5.4-b'. Future state: operational hazards within Upper Water Canyon Aggregate



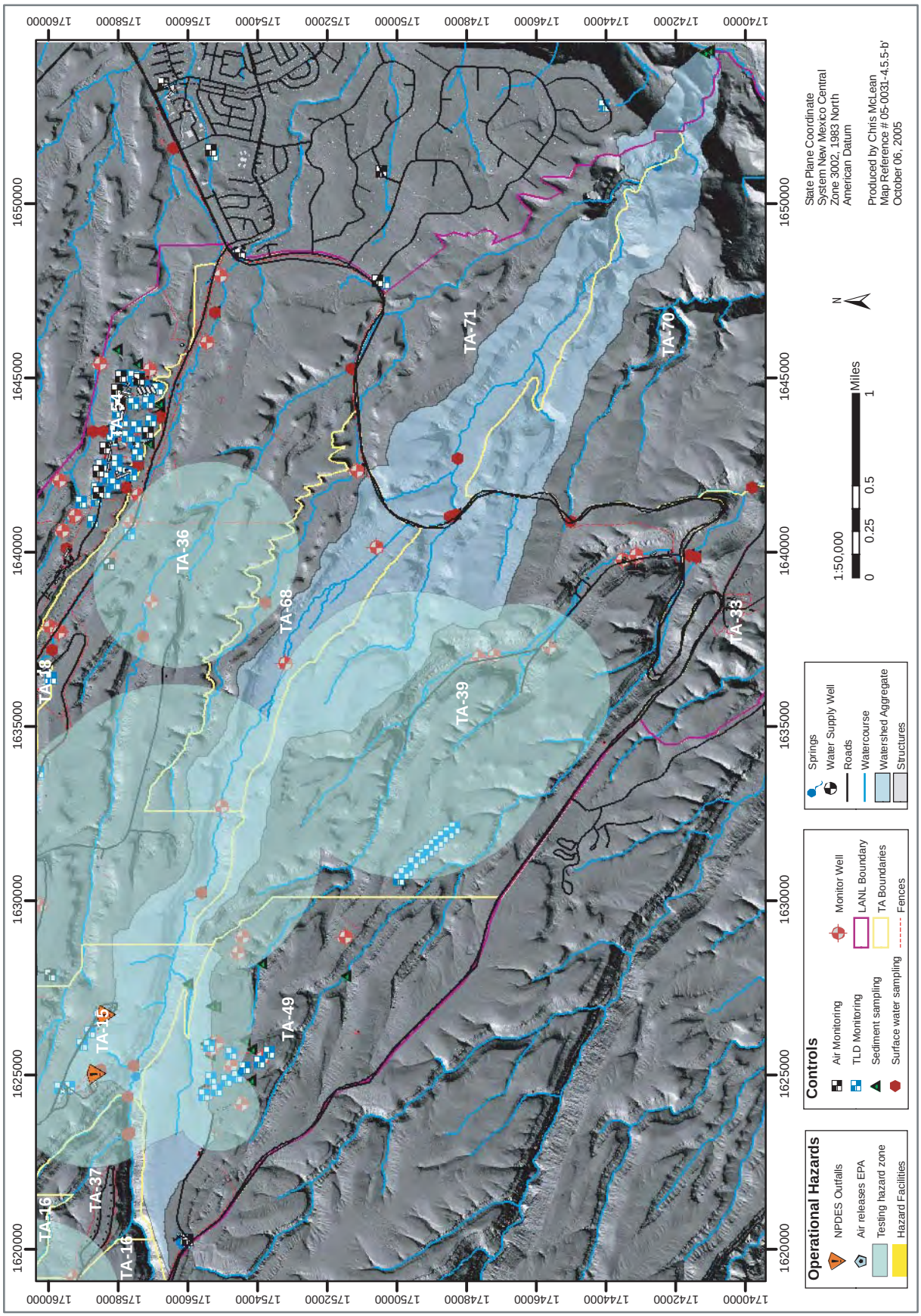
Map 4.5.5-a. Current state: legacy waste sites within Lower Water/Indio Canyons Aggregate



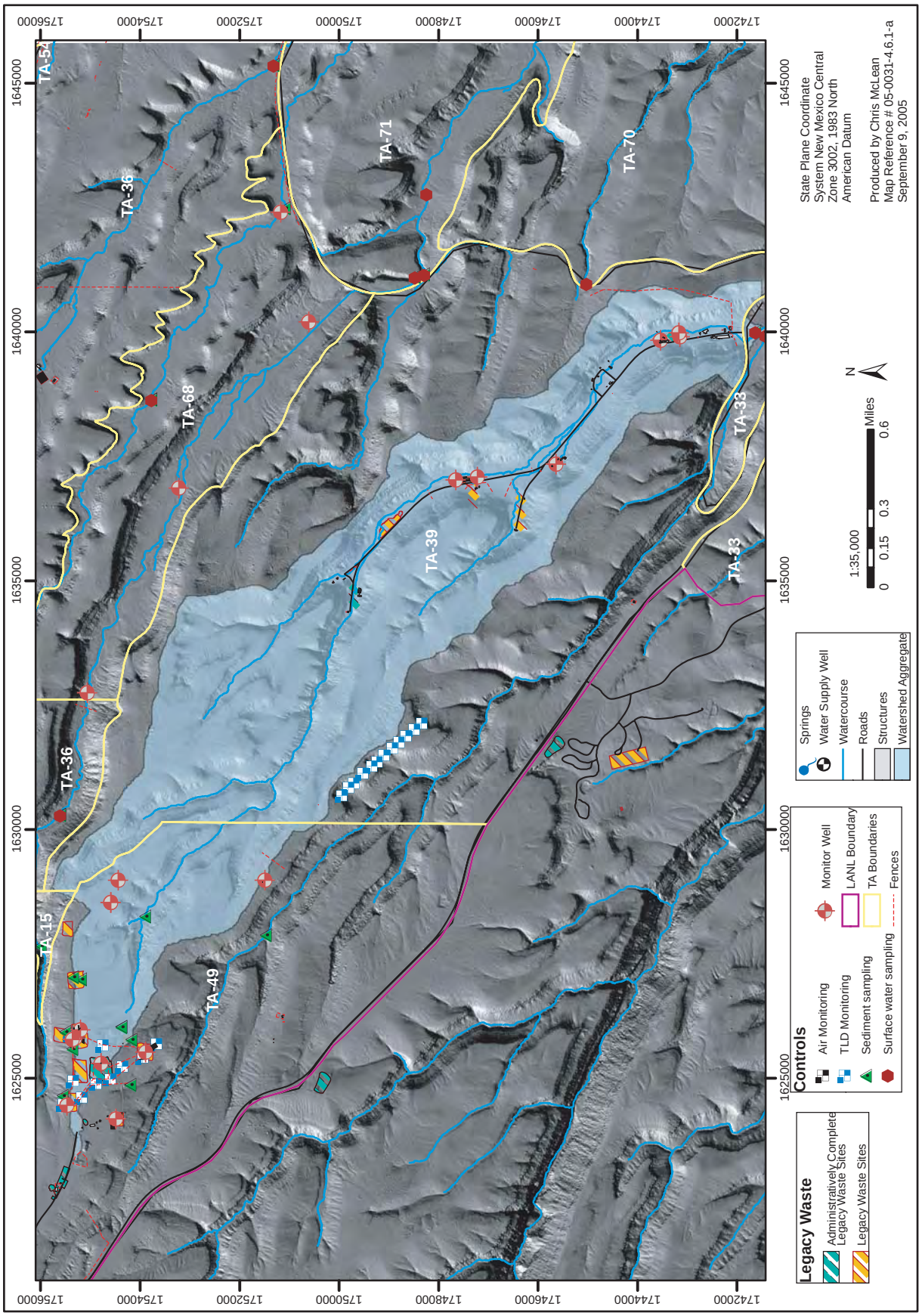
Map 4.5.5-a'. Current state: operational hazards within Lower Water/Indio Canyon Aggregate



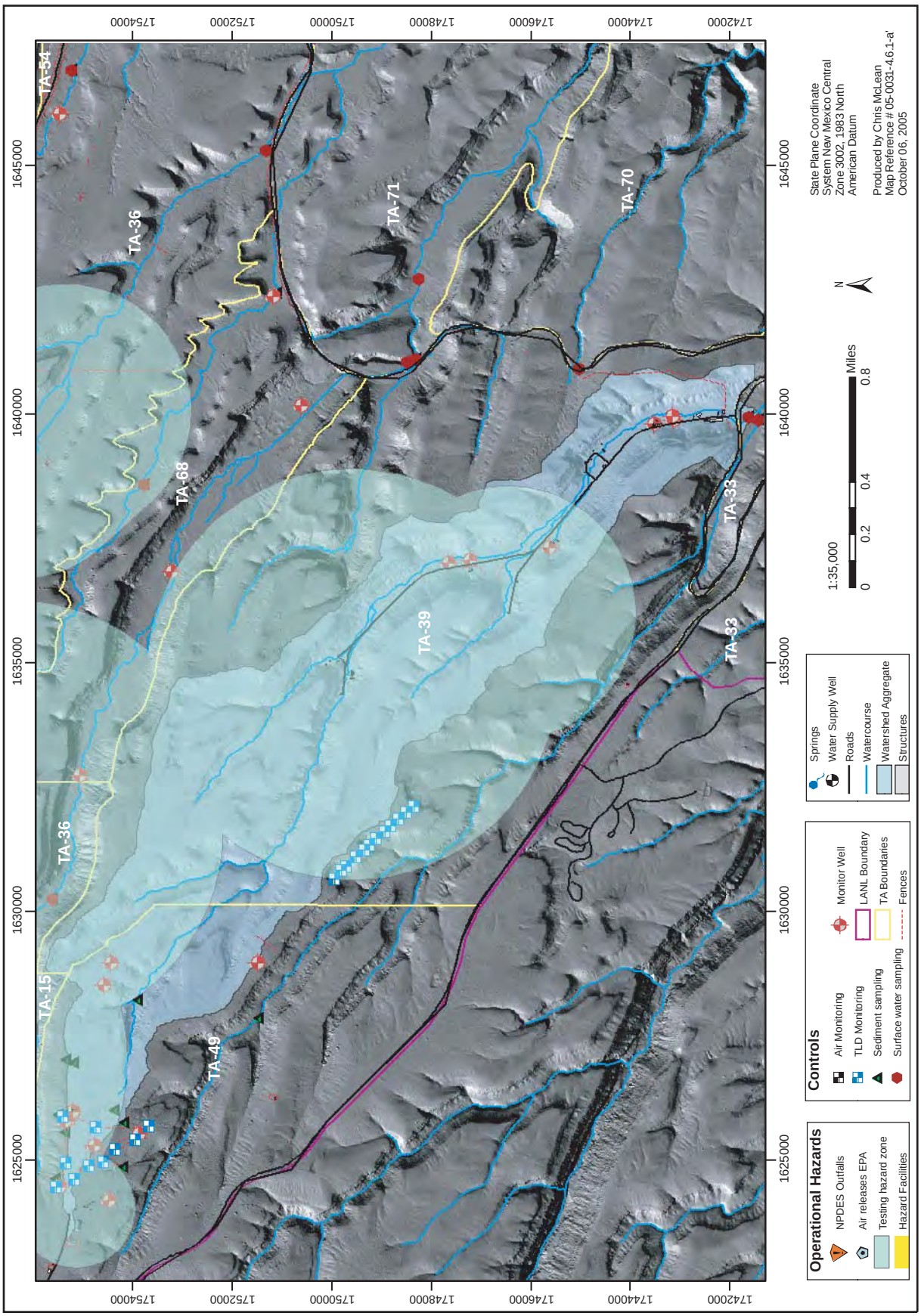
Map 4.5.5-b. Future state: legacy waste sites within Lower Water/Indio Canyons Aggregate



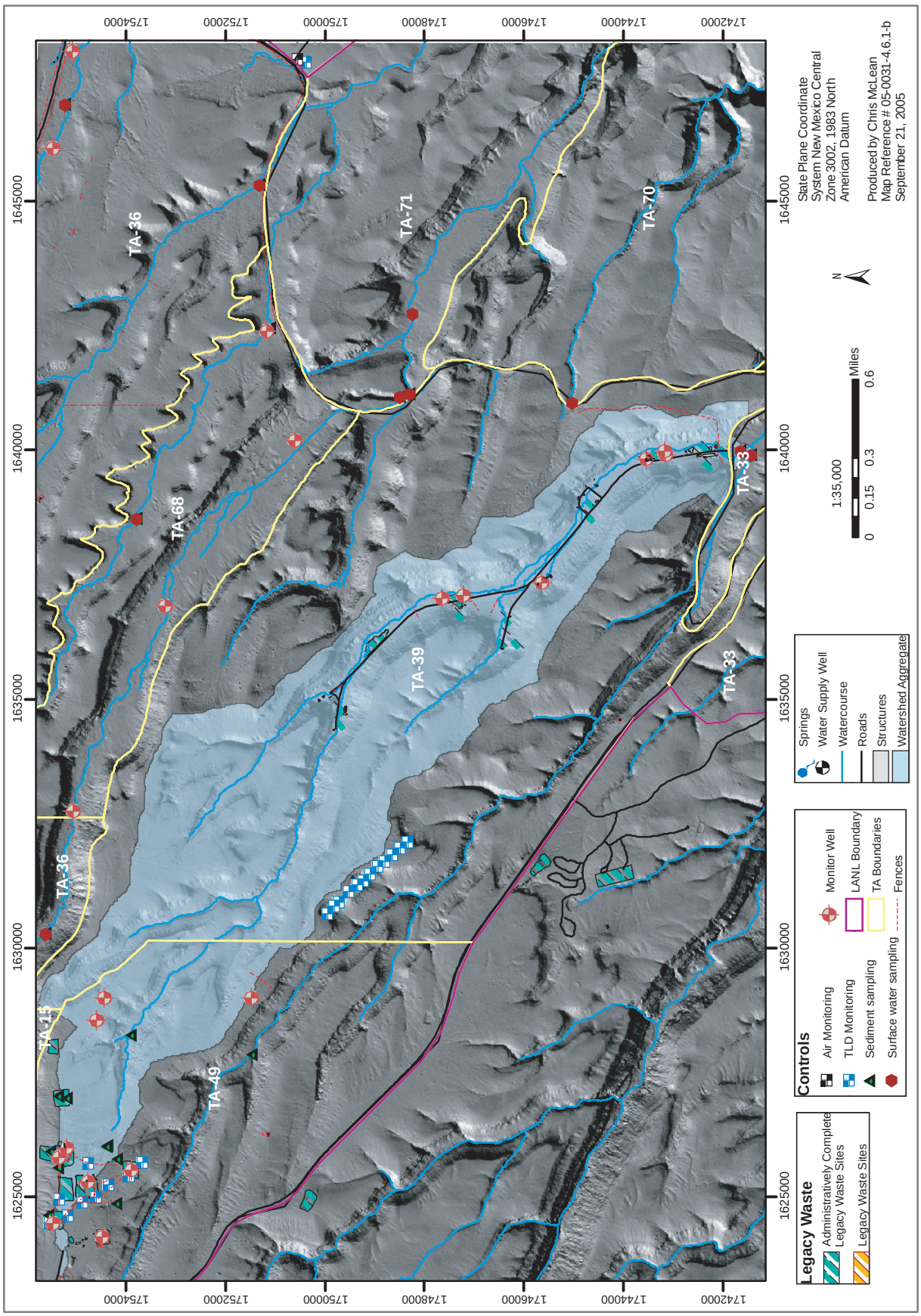
Map 4.5.5-b'. Future state: operational hazards within Lower Water/Indio Canyons Aggregate



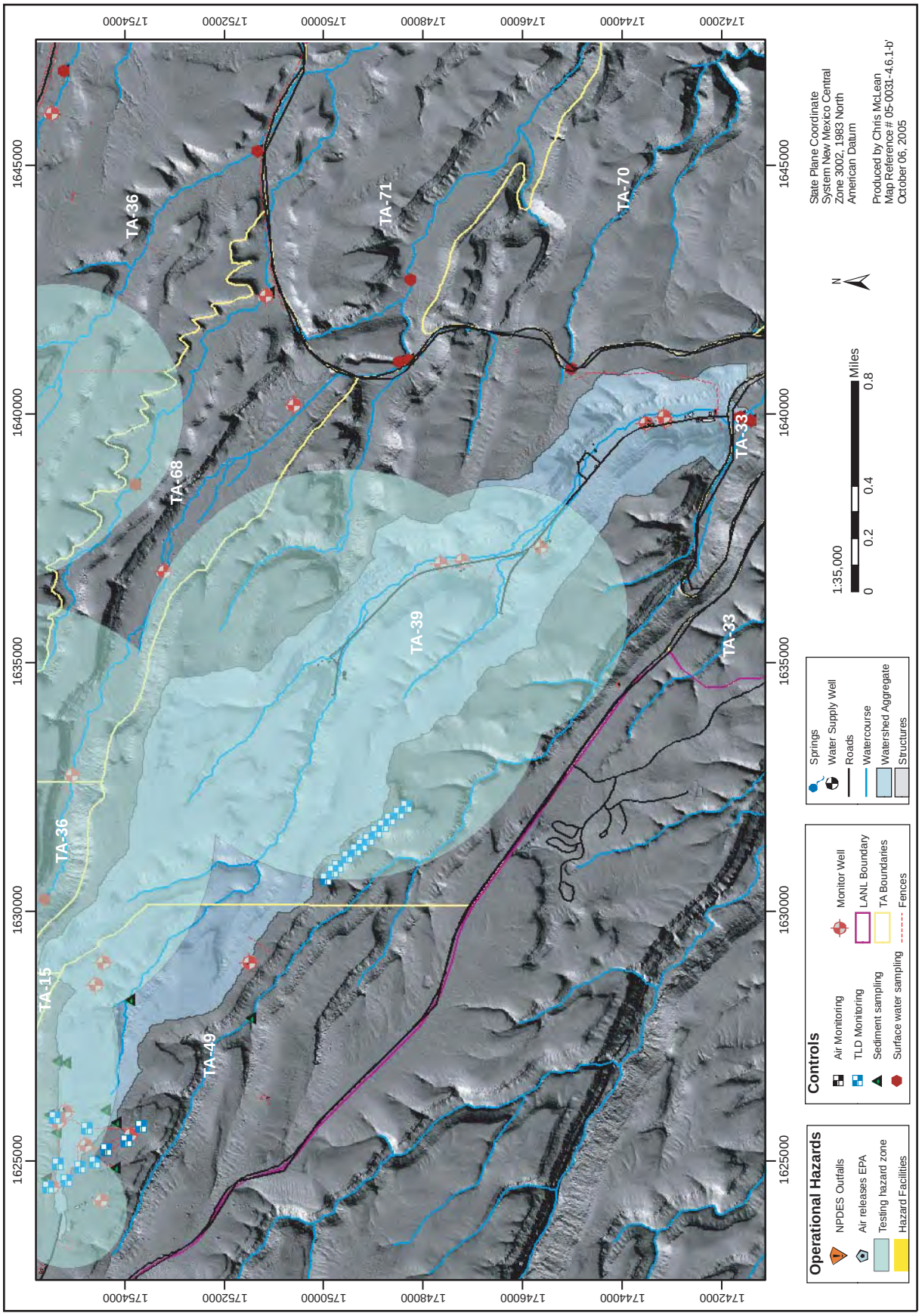
Map 4.6.1-a. Current state: legacy waste sites within North Ancho Canyon Aggregate



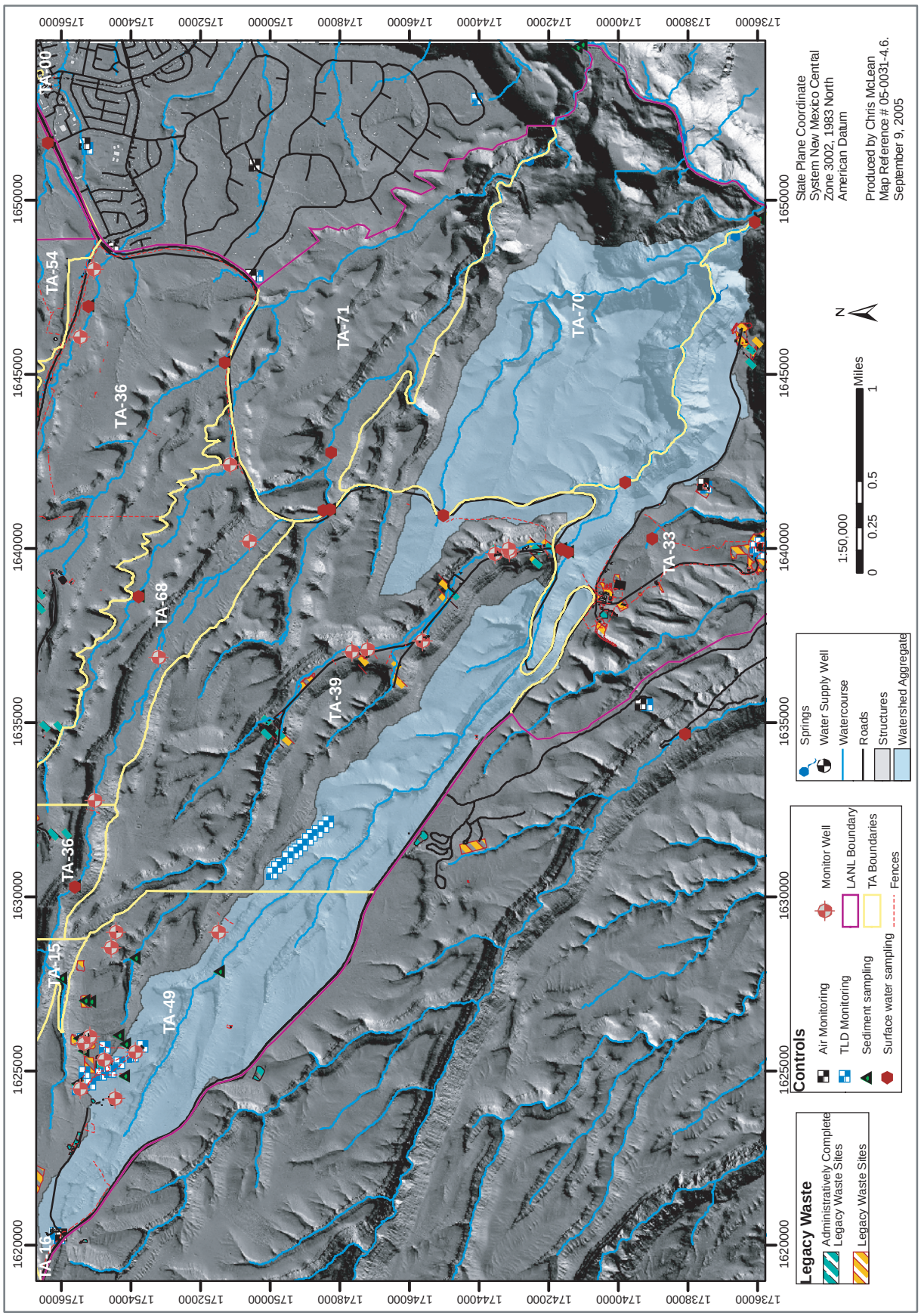
Map 4.6.1-a'. Current state: operational hazards within North Ancho Canyon Aggregate



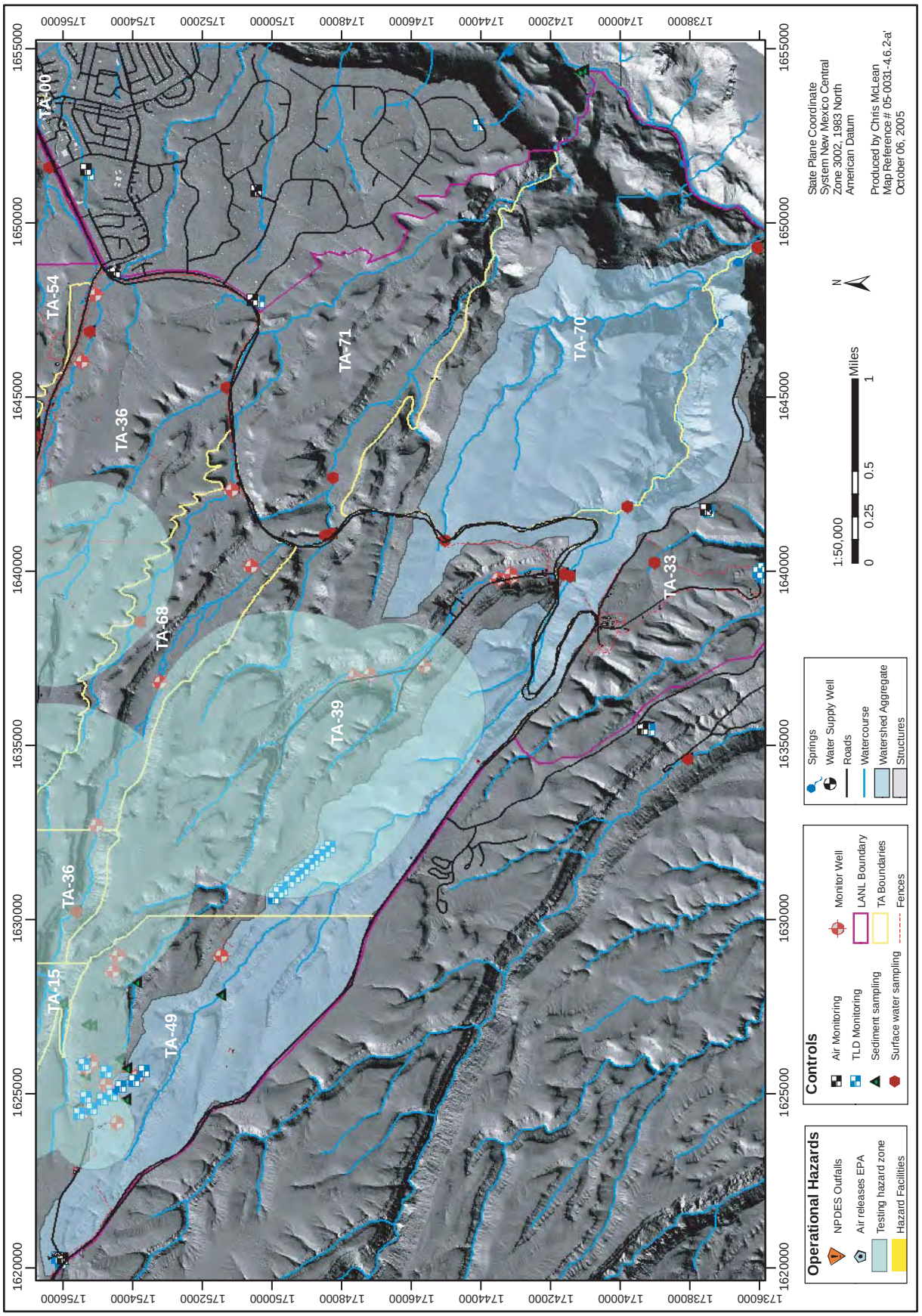
Map 4.6.1-b. Future state: legacy waste sites within North Ancho Canyon Aggregate



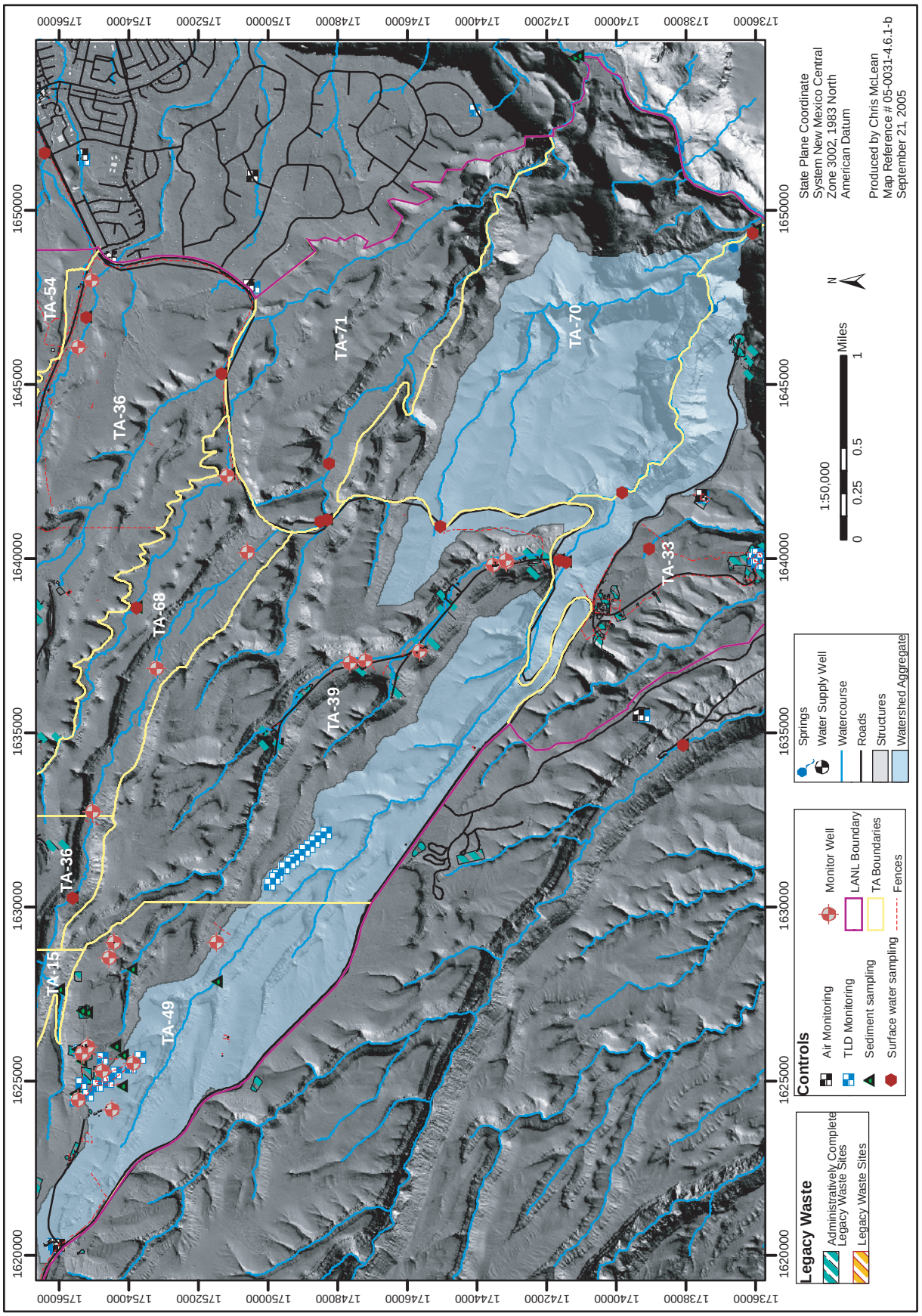
Map 4.6.1-b'. Future state: operational hazards within North Ancho Canyon Aggregate



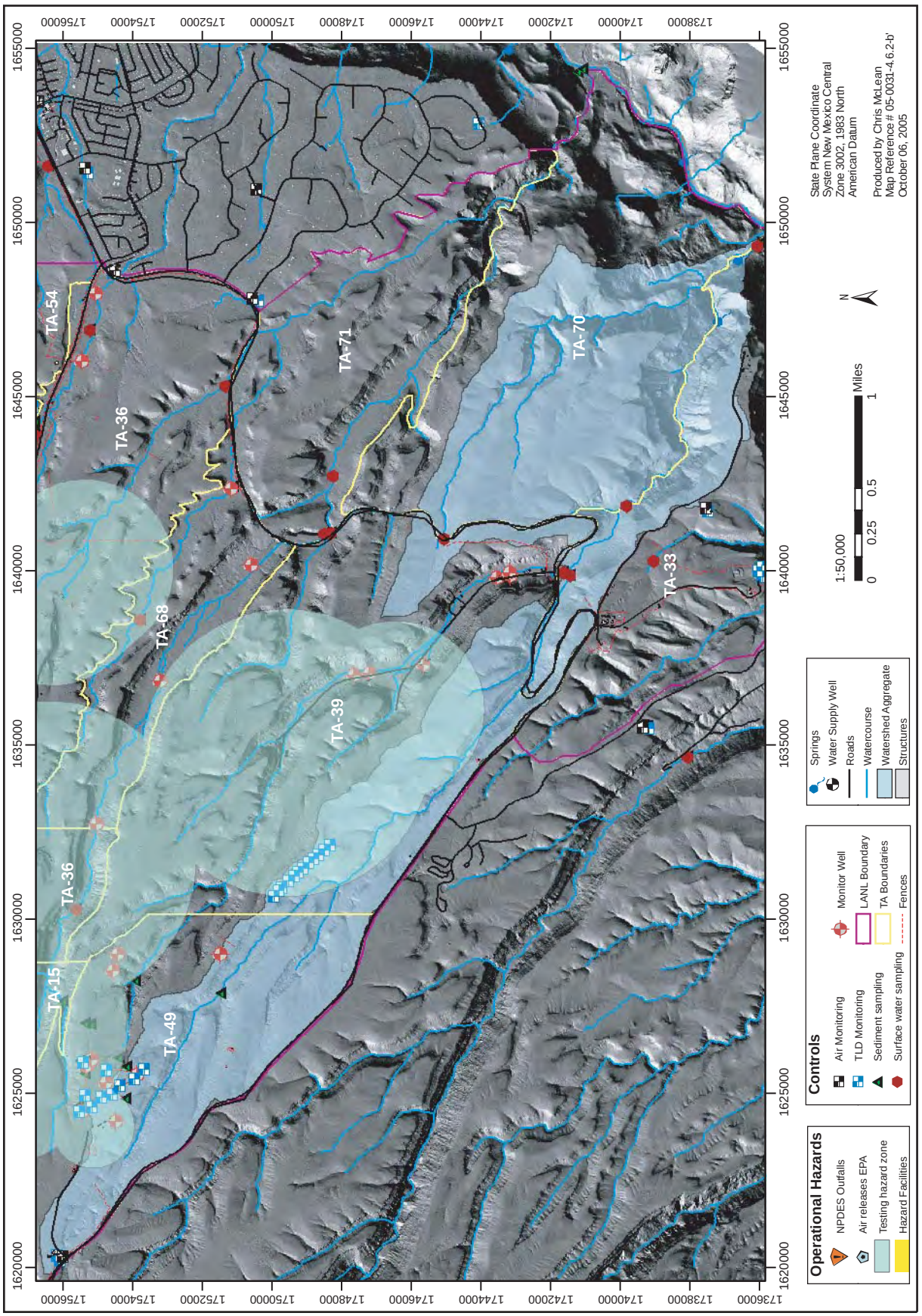
Map 4.6.2-a. Current state: legacy waste sites within South Ancho Canyon Aggregate



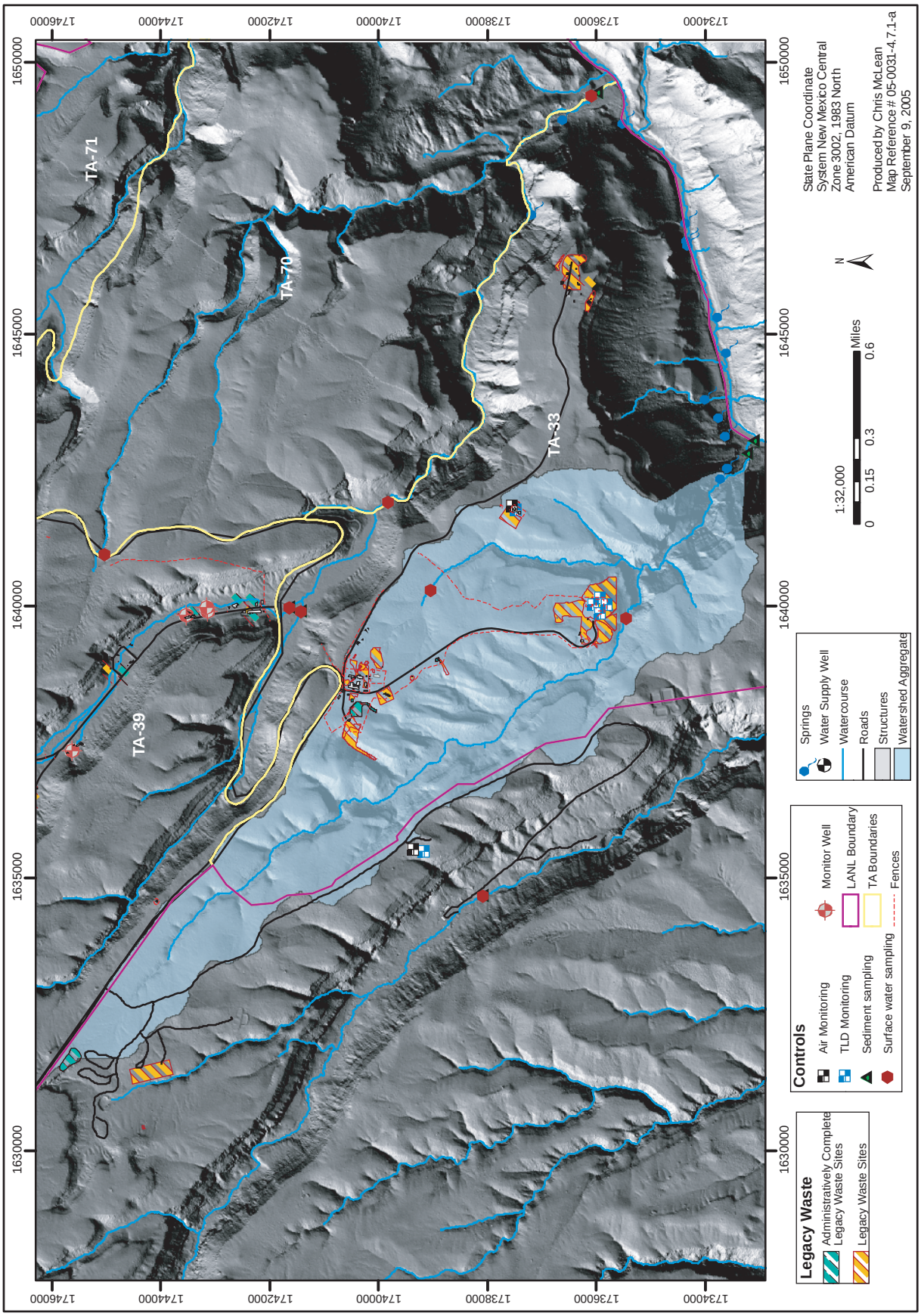
Map 4.6.2-a'. Current state: operational hazards within South Ancho Canyon Aggregate



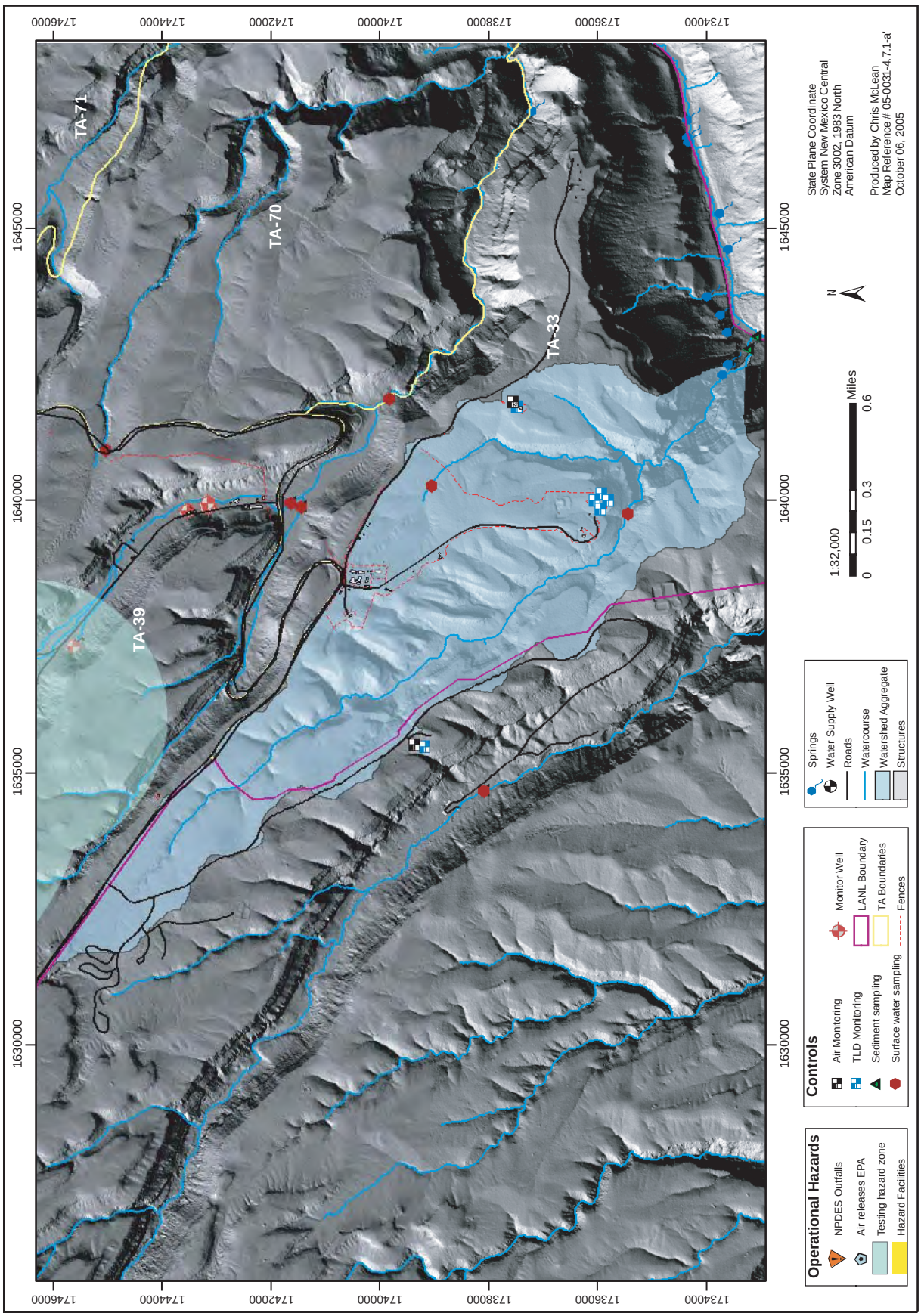
Map 4.6.2-b. Future state: legacy waste sites within South Ancho Canyon Aggregate



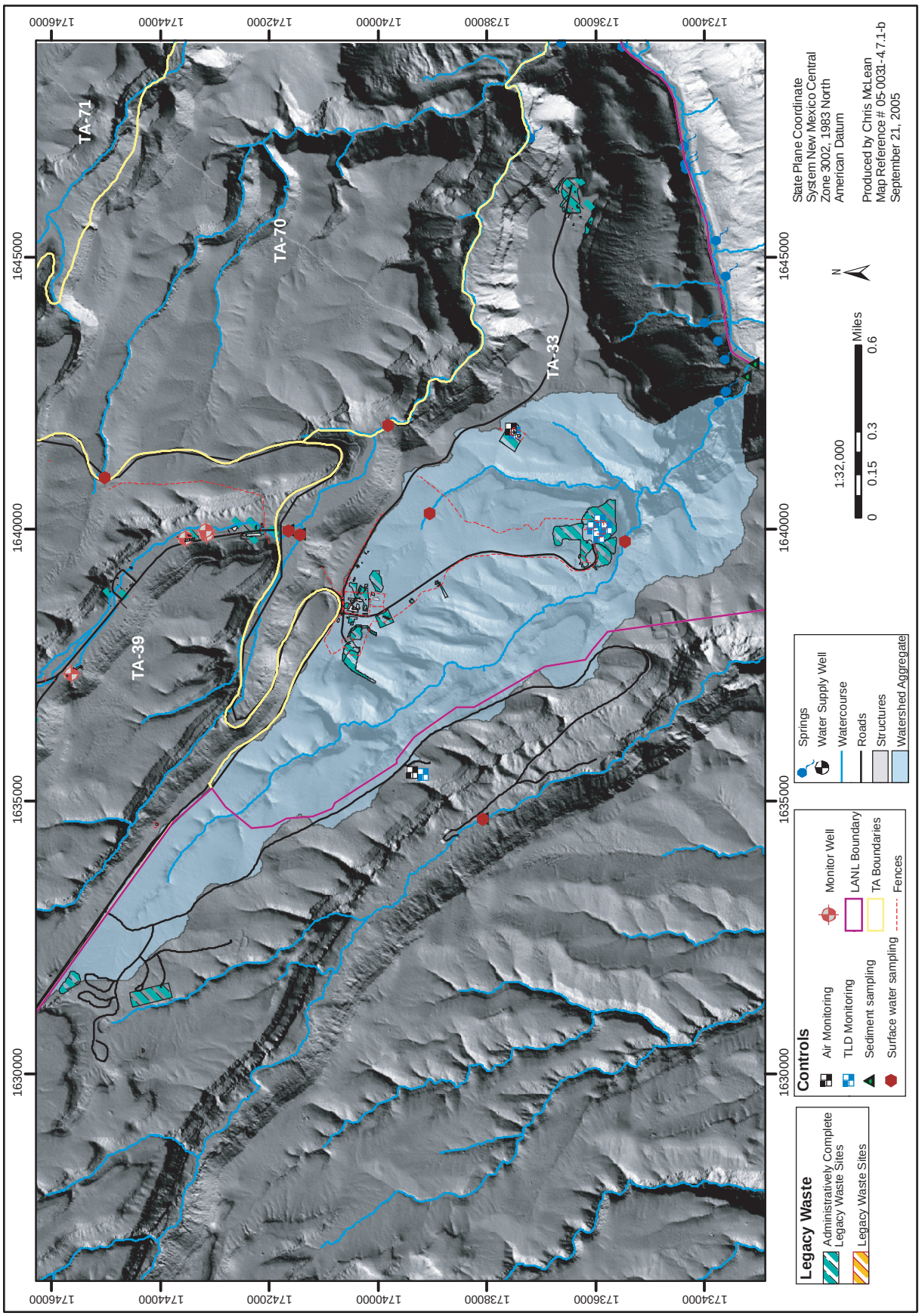
Map 4.6.2-b'. Future state: operational hazards within South Ancho Canyon Aggregate



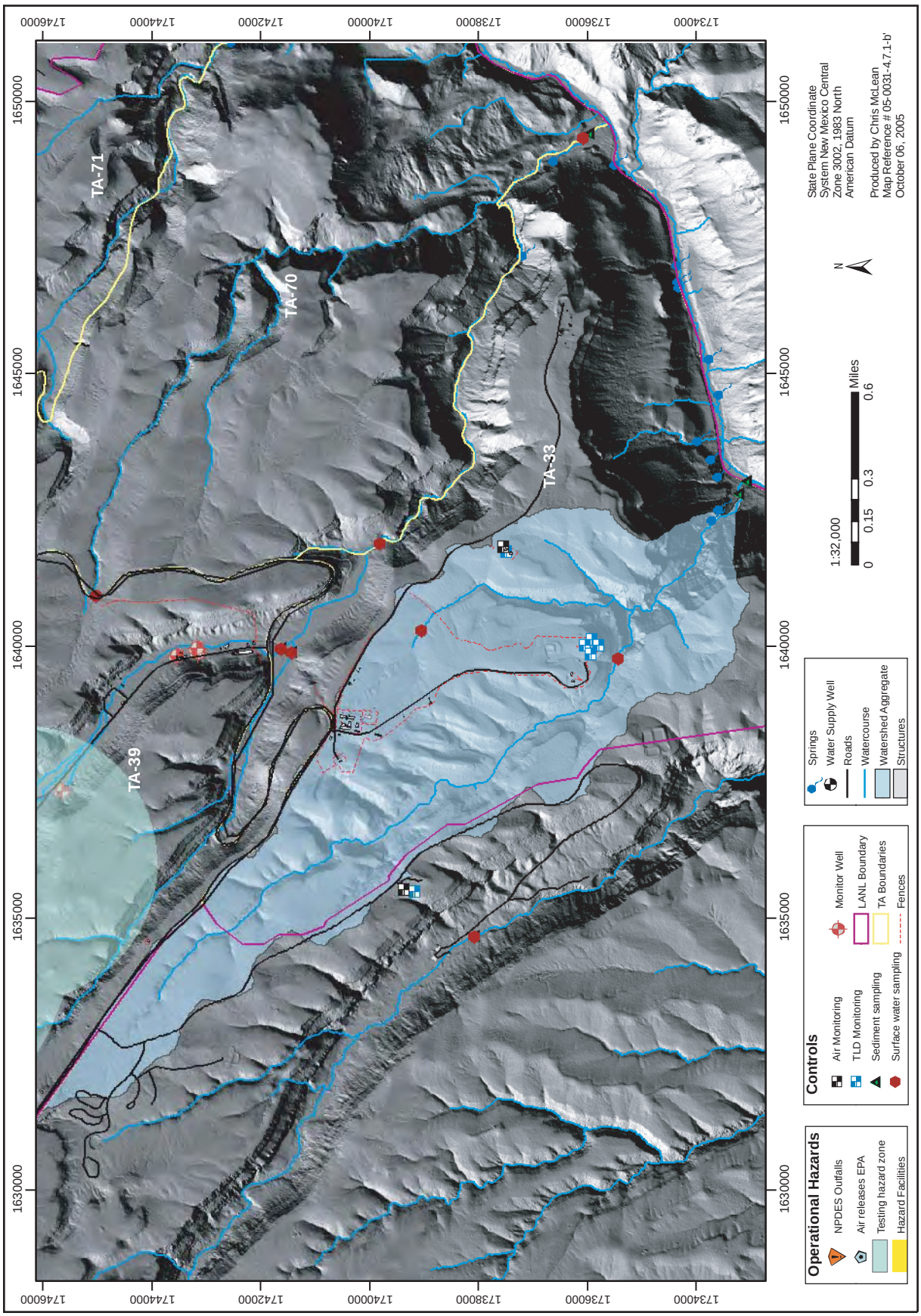
Map 4.7.1-a. Current state: legacy waste sites within Chaquehui Canyon Aggregate



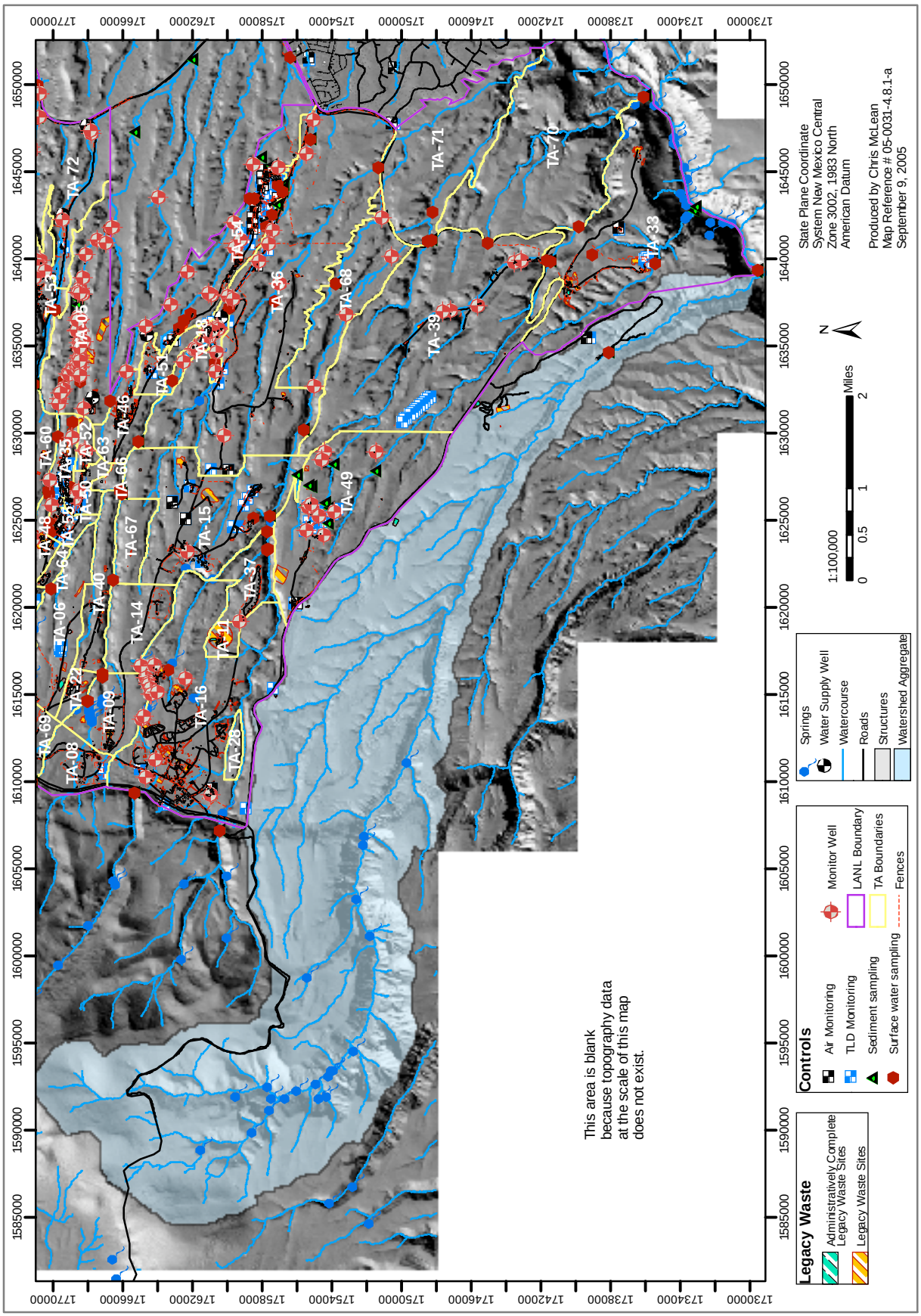
Map 4.7.1-a'. Current state: operational hazards within Chaquehui Canyon Aggregate



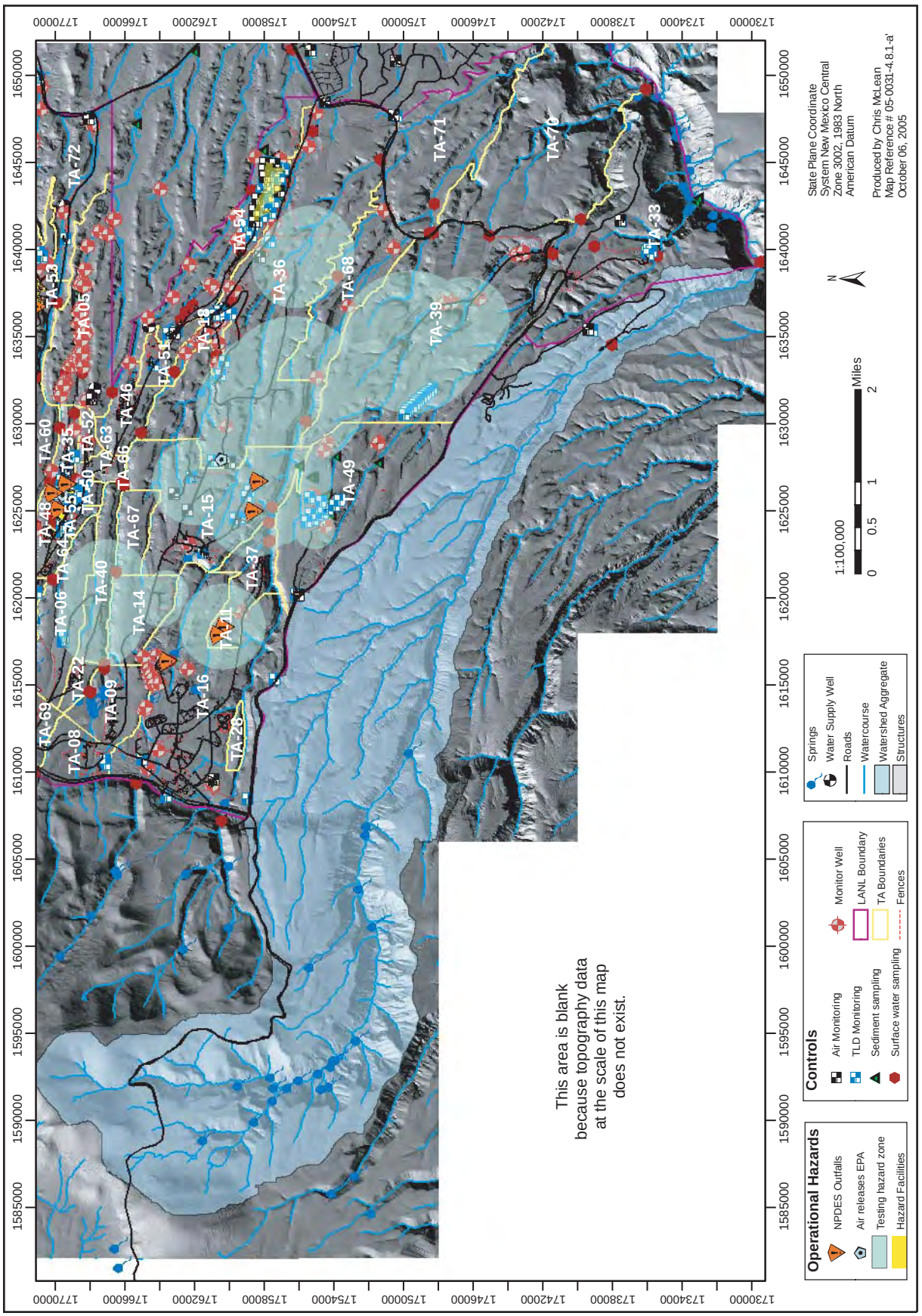
Map 4.7.1-b. Future state: legacy waste sites within Chaquehui Canyon Aggregate



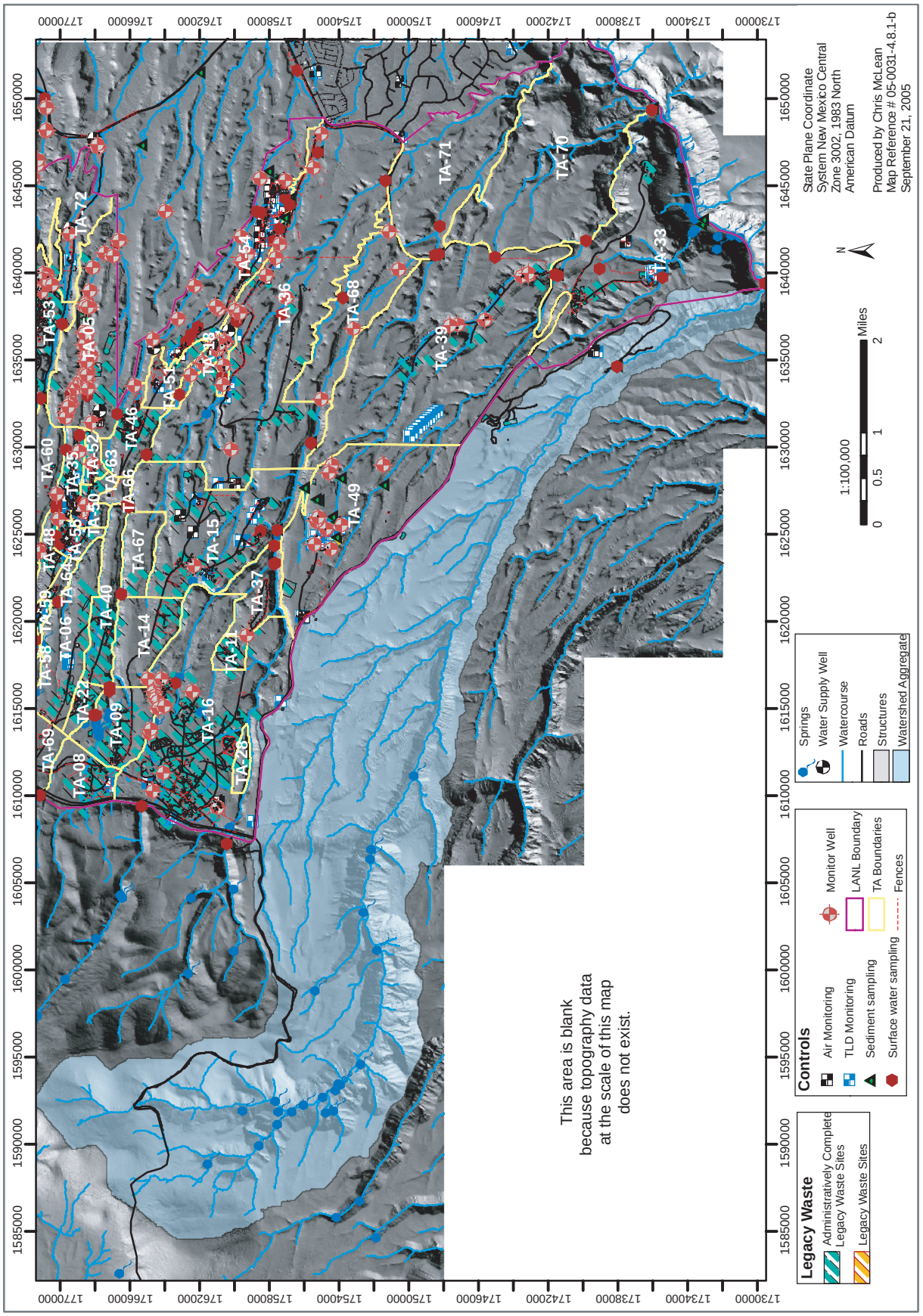
Map 4.7.1-b'. Future state: operational hazards within Chaquehui Canyon Aggregate



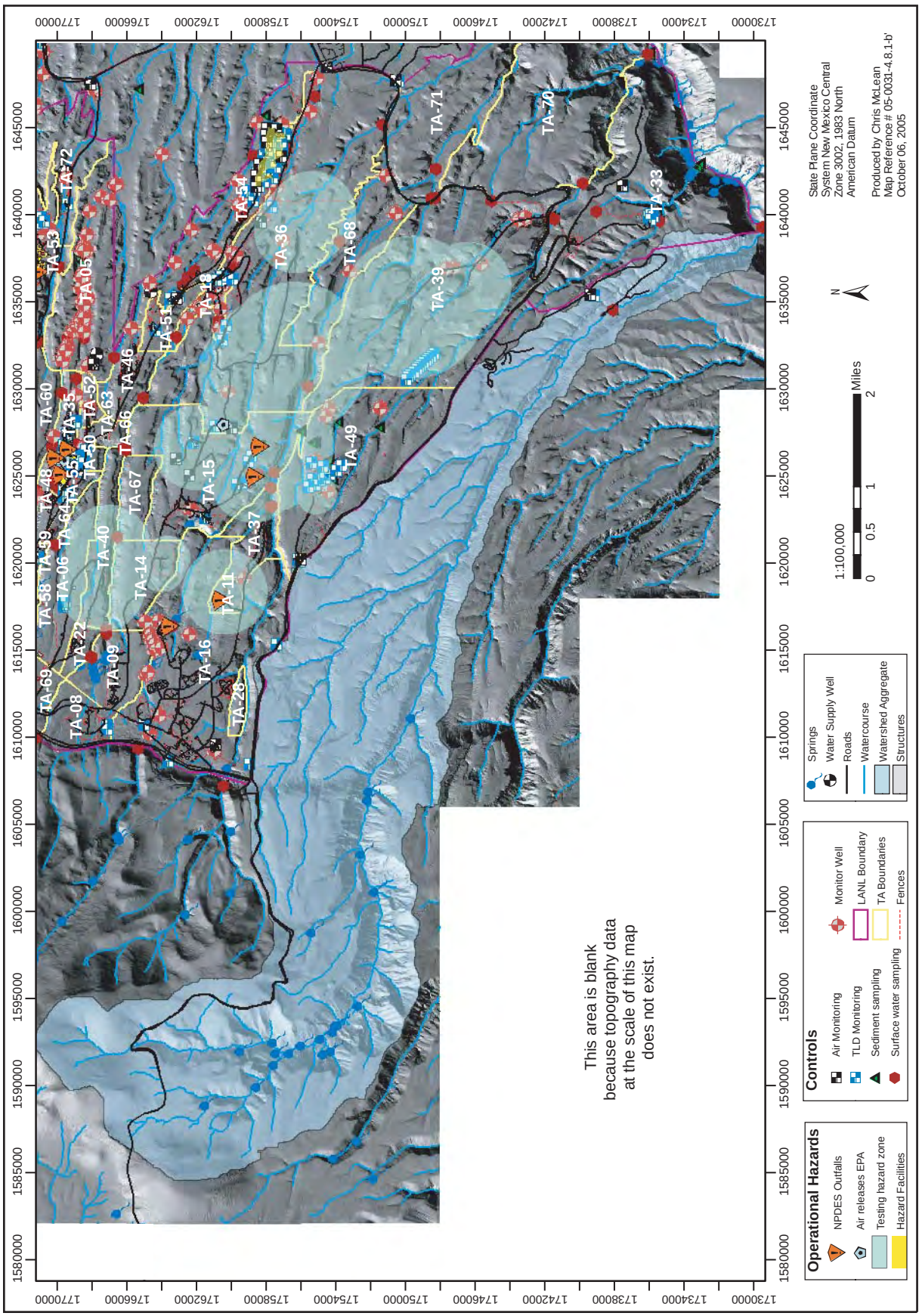
Map 4.8.1-a. Current state: legacy waste sites within Frijoles Canyon Aggregate



Map 4.8.1-a'. Current state: operational hazards within Frijoles Canyon Aggregate



Map 4.8.1-b. Future state: legacy waste sites within Frijoles Canyon Aggregate



Map 4.8.1-b'. Future state: operational hazards within Frijoles Canyon Aggregate

5.0 REFERENCES AND DATA SOURCES

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The following primary sources for text are available for *INTERNAL LABORATORY USE ONLY* or *OFFICIAL USE ONLY*:

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Watercourse; Los Alamos National Laboratory; Environmental Stewardship Division Water Quality & Hydrology; April 5, 2005.

Materials Disposal Areas; Los Alamos National Laboratory, Environmental Stewardship Division Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; April 23, 2004.

TLD Client; Los Alamos National Laboratory; Risk Reduction and Environmental Stewardship; TLD locations from various legacy sources, no release date.

LANL Air Monitoring Sites; Los Alamos National Laboratory; Risk Reduction and Environmental Stewardship, no release date.

Potential Release Sites; Los Alamos National Laboratory, Environmental Stewardship Division Environmental Remediation and Surveillance Program, ER2005-0403; 1:2,500 Scale Data; June 21, 2005.

Environmental Restoration Aggregate Areas; Los Alamos National Laboratory, Environmental Remediation and Surveillance Program, ER2005-0496; 1:2,500 Scale Data; September 22, 2005.

LANL Hillshade 2000; Los Alamos National Laboratory, 2004.

2030 Future Boundary of Department of Energy Property in and around the Los Alamos National Laboratory; Site and Project Planning Group; no release date.

2030 Future TA Boundary of Department of Energy Property in and around the Los Alamos National Laboratory; Los Alamos National Laboratory, Site and Project Planning Group; no release date.

Appendix A

Descriptions of Laboratory Technical Areas and Former Technical Areas

APPENDIX A DESCRIPTIONS OF LABORATORY TECHNICAL AREAS (TAs) AND FORMER TECHNICAL AREAS

TA-00 is the Laboratory's designator for facilities (or lands) owned or leased by the U.S. Department of Energy (DOE) that generally are not located within the former and current boundaries of the Laboratory. TA-00 facilities are used for administration and public access (such as the University of California/ Community Reading Room and the Bradbury Science Museum) or are associated with utilities such as water, gas, electric, and sewer (such as pump houses that bring potable water to the Los Alamos townsite, and pump stations that move sewage to the treatment plant in TA-46).

Former TA-01 was the Laboratory's first technical area. Beginning in 1943 it housed Laboratory administration, theoretical divisions, plutonium chemistry, and physics research. Between 1943 and 1945, much of the theoretical, experimental, and production work in developing the atomic bomb took place at TA-01. By 1965, these activities had been moved elsewhere in the Laboratory and the site underwent decontamination and decommissioning (D&D) in 1966. The site of former TA-01 lies within the current townsite of Los Alamos, on the north and south sides of Trinity Drive surrounding Ashley Pond.

TA-02, located on the north rim of Los Alamos Canyon just west of TA-21, was used to operate various research nuclear reactors from 1944 to 1993. TA-02 has recently undergone extensive D&D activities. All buildings and structures have been removed.

TA-03, located on South Mesa between Los Alamos Canyon to the north and Twomile Canyon to the south, is the Laboratory's main technical area. It contains most of the Laboratory's administrative buildings and public and corporate access facilities. In addition, TA-03 houses several Laboratory activities such as experimental sciences, special nuclear materials, theoretical/computations, and physical support operations. Security requirements at TA-03 range from buildings open to the general public to buildings that have the strictest security.

Former TA-04 lies within the current boundaries of TA-52 and -63. Used as a firing site during the early to mid-1940s, the TA became inactive in the late 1940s and underwent D&D in 1985.

TA-05 is a large area that primarily serves as a Laboratory reserve area. The TA contains no Laboratory operational areas. A very small portion of the TA contains support facilities, such as an electrical substation that regulates the electrical power coming into the Laboratory and a water storage tank and well house that are both owned and maintained by Los Alamos County. The TA includes the former Beta Site, which was used as a firing site. Beta Site was built in the 1940s in conjunction with TA-04 and underwent D&D along with TA-04 in 1985.

TA-06 is primarily a reserve area for the Laboratory. The majority of the TA is a completely undeveloped area. The Laboratory uses only a very small portion of land, located in the TA's southwest corner, for high-explosive research and development.

Former TA-07 was a small technical area that now lies within the current boundaries of TA-06. The area operated from the late 1940s through 1959 and was used for weapons stockpile storage, detonator destruction, and a few field experiments. All buildings associated with TA-07 have undergone D&D.

TA-08, also known as Anchor Site West, is a dynamic testing site that serves the entire Laboratory. Capability is maintained in all modern nondestructive testing techniques for ensuring the quality of material in items ranging from test weapons components to high-pressure dies and molds. Capabilities include radiographic and radioisotope techniques. Other activities include ultrasonic and penetrant testing and electromagnetic test methods.

TA-09, also known as Anchor Site East, is used to conduct experimental science work. Activities include exploring fabrication feasibility, investigating the physical properties of explosives, and investigating new organic compounds for possible use as explosives. Explosives storage and stability problems are also studied.

Former TA-10 was located along the streambed of Bayo Canyon. The former site of TA-10 was located just outside of what is now the present northeast corner of the Laboratory. This land is currently owned by Los Alamos County (with restricted-use provisions suggested by DOE). The area was used as a firing site from 1944 to 1963. In addition, the site included a radiochemistry laboratory that processed radioactive materials used in experiments conducted at the site. TA-10 was decommissioned from 1960 to 1963. Concrete monuments delineate the area above the disposal pits, which received liquid waste from the radiochemistry laboratory, as a Designated Restricted Area.

TA-11, known as K-Site, is the location of the Laboratory's environmental testing facilities. This TA is a remote site and can only be accessed through the high-explosive area at TA-16. TA-11's facilities are arranged so that testing may be controlled and observed remotely. Activities involve vibration analysis and drop testing materials and components under a variety of extreme physical environments. Components and assemblies undergo vibration, shock, and thermal testing.

Former TA-12, known as L-Site, was constructed in 1945 and used as a firing site and dynamic testing area through the mid-1950s. In 1960, the structures associated with TA-12 underwent decontamination and decommissioning. TA-12 is located within the current boundaries of TA-67.

Former TA-13, also known as P-Site, was constructed in 1944 for X-ray work in connection with explosives experiments. The site of former TA-13 is located within the current boundaries of TA-16. This former TA consisted of an office building that also contained a shop, laboratory and test buildings, an experimental chamber, a magazine, and a storage building. By the 1950s, most of the buildings had been removed. The three buildings that remained were absorbed into the S-Site complex at TA-16 and renumbered as Buildings 16-476, -477, and -478. These buildings are currently used during remote machining, in which tests are conducted on new processes to ensure that the machining can be safely performed during routine operations.

TA-14 is used for high explosive testing. Most operations conducted at this site are remotely controlled and involve high-explosive detonation, certain types of high explosive machining, and permitted burning. Tests are conducted on explosives charges to investigate fragmentation impact, explosives sensitivity, and thermal responses of new high explosives. No offices are located at this site, and personnel are present only during testing.

TA-15 is used for high-explosive research, development, and testing, primarily through hydrodynamic testing and dynamic experimentation. TA-15 contains the Pulsed, High-energy Radiographic Machine Emitting X-rays facility (PHERMEX), the Dual-Axis Hydrodynamic Radiographic Test facility (DARHT), and Building 15-206, all of which are or were formerly used for testing weapons that are under development. PHERMEX is now inactive and is currently in the process of being shut down. Other activities at TA-15 include the investigation of weapons functioning and systems behavior in nonnuclear testing.

TA-16, also known as S-Site, contains many of the Laboratory's high-explosive facilities, the Laboratory's state-of-the-art tritium facility, and several administrative support buildings. Activities involve fabricating and testing high explosives, plastics, and adhesives; conducting research in process development for manufacturing high explosives, plastics, adhesives and other materials; repackaging tritium to user-specified pressures; chemical purification of tritium by removing contaminants; reclaiming tritium; mixing

tritium with other gases; analyzing gas mixtures; and conducting applied research and development for boost systems. Recently, TA-16's main steam plant was closed and has been replaced by smaller local plants. In addition, several new buildings are under construction.

TA-18 is the home of the Los Alamos Critical Experiment Facility (LACEF), which has operated since 1946. LACEF is the last general-purpose nuclear experiments facility in the U.S. It supports a variety of programs that range from national security programs to the development of instrumentation for nuclear waste assay and high explosives detection. Currently, the primary activities at LACEF are the design, construction, research, development, and application of critical experiments. In addition to criticality work, activities at LACEF include teaching and training related to criticality safety and applications of radiation detection and instrumentation. The Laboratory is beginning to transition the work performed at TA-18 to its Nevada Test Site.

Former TA-19 was situated east of the current Los Alamos Airport, at the end of the mesa on which the airport is located. The TA consisted of a laboratory complex used for a variety of experiments, some of which used radiological sources and chemicals. All of the buildings associated with this former TA have been removed.

Former TA-20 is located in Sandia Canyon within the current boundaries of TA-53 and -72. The former TA was used until the late 1940s to test initiators.

TA-21, located on DP Mesa between DP and Los Alamos Canyons, is the former site of plutonium- and uranium-processing facilities and research laboratories. The Laboratory is gradually conducting D&D of the structures located within TA-21.

TA-22 is used for the research, development, fabrication, and testing of high-energy detonators and related devices. Detonators, cables, and firing systems are built here. Capabilities include detonator design, printed circuit manufacture, metal deposition, metal joining, plastic materials technology, explosives loading, initiation, diagnostics, and lasers.

Former TA-25, called V-Site, was constructed in 1944 for experimental work in connection with special assemblies. It was used for one year; then in 1945, the site underwent extensive alterations to allow process work on explosive charges to be done and also was incorporated into TA-16. Structures at the former site included laboratory buildings, an equipment building, a warehouse, and museum buildings.

Former TA-26 consisted of a storage vault for nuclear materials, a sentry station, and a guard tower, all of which were removed or demolished by 1996. This former TA is within the current boundaries of TA-73.

Former TA-27 was used during the war years by a plutonium gun assembly program. The TA included firing sites at which large shots (containing uranium or thorium and beryllium) were tested. The army also used the area as a mortar impact area. This former TA lies with the current boundaries of TA-36.

TA-28, known as Magazine Area A, is located within the boundaries of TA-16. This TA was used as an explosives storage area and contains five empty storage magazines that are slated for D&D. No other structures are located within the TA.

Former TA-30 was quite small and existed only for a brief period of time, from 1945 to 1948. It consisted of a single small building used as an electronics test area. The site of former TA-30 is located within the current boundaries of TA-03, just northwest of the intersection of East Jemez and West Roads.

Former TA-31[A1] was situated near the west end of the current Los Alamos County Airport. The TA was used as a receiving and warehousing area, including drum storage. All of the buildings associated with this former TA have been removed. Currently, the area is covered with private housing and is known as the Eastern Area of the township of Los Alamos.

Former TA-32 was a small medical research facility consisting of three laboratories, an office building, a warehouse, and a valve house. Work at the site included biological research involving radionuclides. The site of former TA-32 is located within the current townsite of Los Alamos, approximately 400 ft east of Knecht Street and 400 ft south of Trinity Drive. Various Los Alamos County buildings now occupy the space.

TA-33 is currently used for experimental research activities by earth scientists and also houses the National Radioastronomy Observatory's Very Large Array Telescope. Formerly, TA-33 was used to conduct tritium-related activities for the nuclear weapons program.

TA-35, also referred to as Ten Site, is used for nuclear-safeguards research and development (primarily in the areas of lasers, physics, fusion work, materials development, and biochemistry), physical chemistry research and development, research in reactor safety, optical science, and pulsed-power systems. Metallurgy, ceramic technology, and chemical plating also occur at this site. Formerly, the TA was used in source manufacturing, specialty-materials manufacturing, and reactor development (including the constructing and operating of several reactors).

TA-36 is located in a remote area and contains four active firing sites (Eenie, Meenie, Minie, and Lower Slobbovia) that support explosives testing. The sites and associated buildings are used for a wide variety of nonnuclear ordnance tests for the U.S. Department of Defense. Activities include shipping, receiving, transporting, and testing high explosives; developing diagnostic techniques; testing armor/antiarmor systems; and testing weapons components and guns.

TA-37 is an explosives storage area located at the eastern perimeters of TAs-11 and -16. The TA consists of 27 explosives storage magazines.

TA-39 is used primarily as a high explosives test-firing site. Experiments conducted at the site center around the behavior of nonnuclear weapons, primarily by photographic techniques. Other activities include the study of various phenomenological aspects of explosives, interactions of explosives, explosions involving other materials, shock-wave physics, equation-of-state measurements, and pulsed-power systems design.

TA-40 is used for developing special detonators for initiating high-explosives systems. Activities include investigating phenomena associated with the physics of high explosives and research in rapid-shock induced reactions. The site is also used for investigating the physics and chemistry of detonators and shock-wave propagation.

TA-41 lies within Los Alamos Canyon, between TA-43 to the west and TA-02 to the east. Built in the 1950s to house tritium work, TA-41 was used for a variety of administrative, technical, and nontritium research and development activities. In addition, tritium gas mixtures were prepared for use in nuclear testing. TA-41 has been deactivated and the Laboratory is gradually conducting D&D of the structures within this TA.

[A1] Former TA-31 lies within two watershed aggregates, straddling the boundary between the Pueblo Canyon Aggregate (to the north) and the Middle Los Alamos Canyon Aggregate (to the south). Legacy waste sites associated with former TA-31 are being investigated within the Pueblo Canyon Aggregate.

Former TA-42 lies within the current boundaries of TA-55. TA-42 was built in 1951 as an incinerator site for radionuclide contaminated waste. However, the TA was never fully operational, and all buildings were removed in 1978. In the interim, TA-42 was used for decontamination work and for storage.

TA-43 is located on East Mesa adjacent to the Los Alamos Medical Center (the Los Alamos townsite's hospital). In the past, TA-43 was used for industrial hygiene research; currently, it is used for biomedical research. The research includes structural, molecular, and cellular radiobiology; biophysics; biochemistry; and genetics.

Former TA-45 was located near the present intersection of Canyon Road and Central Avenue. The TA consisted of a facility used to treat industrial liquid radionuclide-contaminated waste. The treatment plant began operation in 1951 and operated until 1961. During the plant's period of operation, effluent was discharged into Acid Canyon.

TA-46 is one of the Laboratory's basic research areas. Over its history, activities at the site have focused on applied photochemistry operations and have included the development of technologies for laser isotope separation and laser enhancement of chemical processes. Other activities have included engineering technology; accelerator technology; solar research; and materials, electronics, and computer simulation research. The Laboratory's Sanitary Wastewater Consolidation System is located at the east end of this TA. This facility uses a mixed-oxidant process to disinfect plant effluents before releasing them into a holding pond.

TA-48 consists of a building complex used for research and development in nuclear chemistry and radiochemistry, geochemistry, production of medical radioisotopes, and chemical synthesis.

TA-49 is restricted to carefully selected Laboratory functions because of its proximity to Bandelier National Monument. The TA is used as a training area and as an isolated location for blowing up suspect packages by the Laboratory's Hazardous Devices Team. The Laboratory's Hazardous Response Group also conducts training exercises at this site. In addition, the Laboratory's Antenna and Pulse Power Outdoor Range User Facility is located at TA-49. Activities at this facility include outdoor tests on materials and equipment components, which involve generating and receiving short bursts of high-energy, broad-spectrum microwaves.

TA-50 manages various wastes for the Laboratory. Waste management activities at TA-50 include treating radioactive liquid waste, reducing the size and volume of transuranic wastes, and characterizing transuranic wastes. The TA has been in operation since 1963. The TA-50 complex supports a number of waste-management activities for several types of waste, including storing, treating, or disposing of solid and liquid, low-level radioactive waste, low-level mixed waste, transuranic waste, and hazardous waste. Major facilities at TA-50 are the Radioactive Liquid Waste Treatment Facility and the Waste Characterization, Reduction, and Repackaging Facility.

TA-51 is used for research and experimental studies on the long-term impact of radioactive materials on the environment. Various types of waste storage and coverings are also studied at this site.

TA-52, also known as the Reactor Development Site, provides a wide variety of theoretical and computational research and development activities related to nuclear reactor performance and safety, as well as to several environmental, safety, and health activities. In addition, experimental nuclear reactors formerly operated at this site.

TA-53, located on the mesa between Los Alamos Canyon and Sandia Canyon, is the site of a high-energy linear accelerator. TA-53 was originally developed as the Clinton P. Anderson Meson Physics

Facility. The facility was renamed the Los Alamos Neutron Sciences Center (LANSCE) to reflect the programs currently carried out at TA-53. LANSCE programs and activities are housed in a large complex (approximately 400 buildings) that includes the building housing the linear accelerator itself, experimental areas and laboratories, and experimental support operations and advanced technology programs. LANSCE is presently used for research in condensed-matter science and engineering, accelerator science, fundamental nuclear physics, and radiography.

TA-54, one of the largest technical areas at the Laboratory, is used for the management of radioactive solid and hazardous chemical wastes. Waste handled at the site is characterized as low-level radioactive waste, low-level mixed wasted, transuranic waste, hazardous waste, polychlorinated biphenyl (PCB) waste, and nonregulated chemical wastes. Activities include low-level radioactive waste treatment and disposal; legacy transuranic waste container exhumation, venting, and storage; newly generated transuranic waste storage; the Green-is-Clean project (identifies wastes that do not contain radionuclides and may be disposed of as solid waste); and mixed-waste certification for off-site shipment.

TA-55 serves as the plutonium center for the Laboratory. Plutonium-handling activities at TA-55 include basic and applied research in plutonium and actinide chemistry and the performance of chemical and metallurgical processes for recovering, purifying, and converting plutonium and other actinides into various compounds and forms. Additional capabilities include the means for safely and securely shipping, receiving, handling, and storing nuclear materials as well as managing the wastes and residues produced by TA-55 operations.

TA-58 is a reserve area for the Laboratory and has not been used for any Laboratory operations. It has no major structures and is reserved as a multiple-use area for future needs such as office space for industrial partners. A fitness trail passes through this TA, and often walkers, joggers, and bicyclists use the site.

TA-59, the Laboratory's Occupational Health complex, provides support services for the Laboratory in the areas of health physics, risk management, industrial hygiene and safety, policy and program analysis, air quality, water quality and hydrology, hazardous and solid waste analysis, and radiation protection. In addition, the Analytical Chemistry Group provides institutional support for environmental and bioassay samples.

TA-60, also known as Sigma Mesa Site, provides physical support and infrastructure activities for the Laboratory. Support services and physical support areas for Laboratory subcontractors are also located at TA-60. The TA includes a number of fuel tanks, a fuel pumping station, and numerous storage areas including transportainers, trailers, buildings, and outdoor storage areas. In addition, the TA contains the Nevada Test Site Test Fabrication Facility and a test tower (Buildings 60-17 and -18). Because of the moratorium on testing, Buildings 60-17 and -18 are not currently in use, but are being maintained for future use, should testing again become a part of the Laboratory's mission.

TA-61 is located on Sigma Mesa, which is bounded by Los Alamos Canyon on the north and Sandia Canyon on the south. It includes physical support and infrastructure facilities, such as a sanitary landfill, sewer pump stations, a radio repair shop, general storage sheds, and general warehouse storage for maintenance activities performed throughout the Laboratory.

TA-62 is located at the northwestern corner of the Laboratory, adjacent to lands leased for the Research Park and lands owned by the U.S. Forest Service. This site is primarily a reserve area for the Laboratory and has not been used for any Laboratory operations. It has no major structures and is reserved as a multiple-use area for future needs such as office space for industrial partners.

TA-63 serves as the localized storage and physical support facility for the surrounding portion of the Laboratory. In addition, the Facility and Waste Operations Division Office is located here.

TA-64 contains the Central Guard Facility operated by the Laboratory's subcontractor for security. This facility's primary function is to house subcontractor administrative offices. The site also provides office and storage space for the Laboratory's Hazardous Materials Response Team.

TA-66 is the former site of the Laboratory's Russian Nonproliferation Program. The only building located at this TA currently houses the Center for Homeland Security.

TA-67 is a Laboratory buffer zone. No operations or facilities are currently located at this TA. TA-67 includes the location of former TA-12, which was used from the 1940s to the mid-1950s as a firing site and dynamic testing area. The facilities associated with TA-12 activities have long been removed.

TA-68 was established in 1989 when the Laboratory redefined its technical area boundaries. The site is primarily an environmental buffer zone for high explosives testing and contains no structures of any kind.

TA-69, also known as Anchor North Site, is primarily an undeveloped technical area that serves as an environmental buffer for the high-explosives test area. The only facilities located at this site are used for physical support functions, such as a water tank for fire protection. Past operations included a building in which documents were once shredded and incinerated.

TA-70 is an undeveloped technical area that serves as an environmental buffer zone for the high-explosives test area. No facilities are located at this site, no operations have been conducted in the past, and no future operations are currently planned.

TA-71 was established in 1989 when the Laboratory redefined its technical area boundaries. The site is an undeveloped area that has never been used for Laboratory operations. This TA serves as an environmental buffer zone for high explosives testing and contains no structures of any kind.

TA-72 is the site of the Laboratory's live firing range used by protective-force personnel for required training exercises.

TA-73 is currently the Los Alamos County Airport. From 1947 to 1951 it also housed construction support activities along the north rim of DP Canyon. This area was known as Contractors' Row. This TA contains inactive municipal landfills and a former solid waste incinerator.

TA-74 was established in 1989 when the Laboratory redefined its TA boundaries. This undeveloped area primarily serves as a reserve area of the Laboratory and has not been used for any Laboratory operations. The TA contains no legacy waste sites from Laboratory operations and no Laboratory operational areas.

Appendix B

Legacy Waste Sites Included within Each Laboratory Watershed Aggregate

APPENDIX B LEGACY WASTE SITES INCLUDED WITHIN EACH LABORATORY WATERSHED AGGREGATE

The tables in Appendix B of this document have been reproduced from the tables provided in Appendices A–H of the following:

> LANL (Los Alamos National Laboratory), August 2005. "Aggregate Areas List; Maps of TAs, SWMUs/AOCs," Los Alamos National Laboratory report LA-UR-05-6234, Los Alamos, New Mexico.

The tables provided in *Aggregate Areas List: Maps of TAs, SWMUs/AOCs* (LANL, 2005; report LA-UR-05-6234) are the most current and accurate listing of the solid waste management units (SWMUs)[B1] and areas of concern (AOCs)[B1] at Los Alamos National Laboratory (the Laboratory). Report LA-UR-05-6234 fulfills the requirements in Section V.B of the March 1, 2005, Compliance Order on Consent (Consent Order) signed by the New Mexico Environment Department (NMED), the Department of Energy (DOE), and the University of California. Section V.B requires a submittal of a list of the watershed aggregates at the Laboratory and the SWMUs and AOCs within each aggregate, including those listed in Module VIII of the Laboratory's Hazardous Waste Facility Permit.

Report LA-UR-05-6234 provides one table of sites per watershed; however, this appendix provides one table of sites per watershed aggregate[B2]. Although the tables appearing in Appendix B of this document vary in format from that used in Appendices A–H of report LA-UR-05-6234, the content of the tables (i.e., the list of sites within each aggregate) does not vary. The table provided in Appendix I (Lake Fork Watershed) of report LA-UR-05-6234 has been omitted from this appendix because the Lake Fork Watershed is outside the scope of this document.[B3]

[B1] The document Aggregate Areas List: Maps of TAs, SWMUs/AOCs (report LA-UR-05-6234) uses the terms solid waste management unit (SWMU) and area of concern (AOC), which are collectively referred to in this document as legacy waste sites.

[B2] The document Aggregate Areas List: Maps of TAs, SWMUs/AOCs (report LA-UR-05-6234) uses the term aggregate area, which is equivalent in meaning to the term watershed aggregate used in this document.

[B3] The Lake Fork Watershed is situated outside the influence of the Laboratory, approximately 20 miles due west of the Laboratory's western boundary. The Lake Fork Watershed contains a single aggregate (the TA-57 Fenton Hill Aggregate). None of the eight watersheds that are potentially impacted by Laboratory operations drain into the Lake Fork Watershed and, therefore, do not influence the Lake Fork Watershed. No Laboratory hazardous facilities (as defined below) are located within the TA-57 Fenton Hill Aggregate. The six in-progress legacy waste sites within the Fenton Hill Aggregate are associated with geothermal energy experiments conducted in the Jemez Mountains by the Laboratory.

Laboratory Hazardous Facilities

The Laboratory's February 2002 *A Special Edition of the SWEIS Yearbook, Description of Technical Areas and Facilities at Los Alamos National Laboratory*, controlled publication LA-CP-02-75 (official use only) identifies the operational facilities at the Laboratory that are hazardous facilities. A facility falls within a hazard category if it typically contains a hazardous material, an energy source, or an operation with the potential to cause illness, injury, or death to personnel or damage to a facility or to the environment (without regard for the likelihood or credibility of accident scenarios or consequence mitigation).

Table B-1.1
Guaje/Barrancas/Rendija Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
00-011(a)	None	Pending	Mortar impact area
00-011(c)	None	In Progress	Mortar impact area
00-011(d)	None	In Progress	Mortar impact area
00-011(e)	None	Pending	Mortar impact area
00-015	None	In Progress	Firing range, Rendija Canyon
00-016	None	Administratively Complete	Firing range (inactive)
00-024	None	Administratively Complete	Cistern (never located)
00-025	None	Administratively Complete	Landfill
C-00-020	None	In Progress	Mortar impact area
C-00-041	None	In Progress	Asphalt and tar remnant site

Table B-1.2
Bayo Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
00-008	None	Administratively Complete	Surface disposal site
00-026	None	Administratively Complete	Landfill
10-001(a)-99	10-001(a)	In Progress	Firing sites (inactive)
	10-001(b)	In Progress	Firing sites (inactive)
	10-001(c)	In Progress	Firing sites (inactive)
	10-001(d)	In Progress	Firing sites (inactive)
	10-005	In Progress	Firing sites (inactive)
	10-008	In Progress	Firing sites (inactive)
10-001(e)	None	Administratively Complete	Detonation test area—doesn't exist
10-002(a)-99	10-002(a)	In Progress	Former liquid disposal complex
	10-002(b)	In Progress	Former liquid disposal complex
	10-003(a)	In Progress	Former liquid disposal complex
	10-003(b)	In Progress	Former liquid disposal complex
	10-003(c)	In Progress	Former liquid disposal complex
	10-003(d)	In Progress	Former liquid disposal complex
	10-003(e)	In Progress	Former liquid disposal complex
	10-003(f)	In Progress	Former liquid disposal complex
	10-003(g)	In Progress	Former liquid disposal complex
	10-003(h)	In Progress	Former liquid disposal complex
	10-003(i)	In Progress	Former liquid disposal complex
	10-003(j)	In Progress	Former liquid disposal complex
	10-003(k)	In Progress	Former liquid disposal complex
	10-003(l)	In Progress	Former liquid disposal complex
	10-003(m)	In Progress	Former liquid disposal complex
	10-003(n)	In Progress	Former liquid disposal complex
	10-003(o)	In Progress	Former liquid disposal complex
	10-004(b)	In Progress	Former liquid disposal complex
	10-007	In Progress	Former liquid disposal complex
10-004(a)	None	In Progress	Septic tank
10-006	None	In Progress	Burn site
10-009	None	In Progress	Former Bayo Canyon landfill
C-10-001	None	In Progress	Surface soil, Bayo Canyon

Table B-1.3
Pueblo Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
00-018(a)	None	In Progress	Sludge-bed wastewater treatment plant, Pueblo Canyon
00-018(b)	None	In Progress	Sludge-bed wastewater treatment plant
00-019	None	Pending	Wastewater treatment plant, central
00-028(a)-00	00-028(a)	Administratively Complete	Effluent discharge, golf course
	00-028(b)	Administratively Complete	Effluent discharge, golf course
00-030(c)	None	Administratively Complete	Septic system
00-030(d)	None	In Progress	Septic system
00-030(eN)	None	In Progress	Septic system
00-030(eS)	None	In Progress	Septic system
00-030(f)	None	In Progress	Septic system
00-030(g)	None	In Progress	Septic system (near old Catholic Church parking lot)
00-030(h)	None	In Progress	Septic system (near new Catholic Church)
00-030(j)	None	In Progress	Septic system
00-030(k)	None	Administratively Complete	Septic system
00-030(n)	None	In Progress	Septic system
00-030(o)	None	In Progress	Septic system
00-030(p)	None	In Progress	Septic system
00-030(q)	None	Administratively Complete	Septic system
00-034(a)	None	Administratively Complete	Landfill, Eastern Area
00-039	None	In Progress	Underground tanks
00-040	None	Administratively Complete	Underground tank
01-002	None	Consolidated	Outfall TA-01 SWMU to be in TA-45
19-001-99	19-001	In Progress	Former East Gate Laboratory and septic system
	19-002	In Progress	Former East Gate Laboratory and septic system
	19-003	In Progress	Former East Gate Laboratory and septic system
	C-19-001	In Progress	Former East Gate Laboratory and septic system
31-001	None	In Progress	Septic system
45-001-00	01-002(b)-00	In Progress	Wastewater treatment plant—TA-45
	45-001	In Progress	Wastewater treatment plant—TA-45
	45-002	In Progress	Wastewater treatment plant—TA-45
	45-003	In Progress	Wastewater treatment plant—TA-45
	45-004	In Progress	Wastewater treatment plant—TA-45
	C-45-001	In Progress	Wastewater treatment plant—TA-45
73-001(a)-99	73-001(a)	In Progress	Former landfill
	73-004(d)	In Progress	Former landfill
73-001(b)-99	73-001(b)	In Progress	Former landfill
	73-001(c)	In Progress	Former landfill
	73-001(d)	In Progress	Former landfill
73-002-99	73-002	In Progress	Miscellaneous airport structures
	73-003	In Progress	Miscellaneous airport structures
	73-004(a)	In Progress	Miscellaneous airport structures
	73-004(b)	In Progress	Miscellaneous airport structures
	73-006	In Progress	Miscellaneous airport structures
73-004(c)	None	Pending	Septic system
C-00-043	None	In Progress	Manhole (removed)
C-31-001	None	Administratively Complete	Buildings
C-73-001	None	Administratively Complete	Underground tank (inactive)
C-73-002	None	Administratively Complete	Underground tank (inactive)
C-73-003	None	Administratively Complete	Underground tank (inactive)
C-73-004	None	Administratively Complete	Underground tank (inactive)

Table B-1.4
Upper Los Alamos Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
00-003-99	00-003	Administratively Complete	Western Steam Plant
	00-012	Administratively Complete	Western Steam Plant
00-017	None	In Progress	Waste lines
00-030(i)	None	Administratively Complete	Septic system
00-031(a)	None	Administratively Complete	Soil contamination beneath former service station
00-031(b)	None	In Progress	Soil contamination beneath former motor pool (two USTs)
00-032	None	Administratively Complete	Soil contamination beneath former motor pool (UST)
00-034(b)	None	Administratively Complete	Landfill, Western Area
00-035(a)	None	Administratively Complete	Surface disposal
01-001(a)-99	01-001(a)	In Progress	Miscellaneous—TA-01
	01-001(b)	In Progress	Miscellaneous—TA-01
	01-001(c)	In Progress	Miscellaneous—TA-01
	01-001(d)	In Progress	Miscellaneous—TA-01
	01-001(e)	In Progress	Miscellaneous—TA-01
	01-001(f)	In Progress	Miscellaneous—TA-01
	01-001(g)	In Progress	Miscellaneous—TA-01
	01-001(o)	In Progress	Miscellaneous—TA-01
	01-001(s)	In Progress	Miscellaneous—TA-01
	01-001(t)	In Progress	Miscellaneous—TA-01
	01-001(u)	In Progress	Miscellaneous—TA-01
	01-002(a)-00	In Progress	Miscellaneous—TA-01
	01-003(a)	In Progress	Miscellaneous—TA-01
	01-003(b)	In Progress	Miscellaneous—TA-01
	01-003(e)	In Progress	Miscellaneous—TA-01
	01-004(a)	In Progress	Miscellaneous—TA-01
	01-004(b)	In Progress	Miscellaneous—TA-01
	01-005	In Progress	Miscellaneous—TA-01
	01-006(a)	In Progress	Miscellaneous—TA-01
	01-006(b)	In Progress	Miscellaneous—TA-01
	01-006(c)	In Progress	Miscellaneous—TA-01
	01-006(d)	In Progress	Miscellaneous—TA-01
	01-006(e)	In Progress	Miscellaneous—TA-01
	01-006(g)	In Progress	Miscellaneous—TA-01
	01-006(h)	In Progress	Miscellaneous—TA-01
	01-006(o)	In Progress	Miscellaneous—TA-01
	01-006(p)	In Progress	Miscellaneous—TA-01
	01-007(a)	In Progress	Miscellaneous—TA-01
	01-007(b)	In Progress	Miscellaneous—TA-01
	01-006(n)	In Progress	Miscellaneous—TA-01
	01-007(c)	In Progress	Miscellaneous—TA-01
	01-007(d)	In Progress	Miscellaneous—TA-01
	01-007(e)	In Progress	Miscellaneous—TA-01
	01-007(f)	In Progress	Miscellaneous—TA-01
	01-007(h)	In Progress	Miscellaneous—TA-01
	01-007(i)	In Progress	Miscellaneous—TA-01
	01-007(j)	In Progress	Miscellaneous—TA-01
	01-007(l)	In Progress	Miscellaneous—TA-01
	01-007(m)	In Progress	Miscellaneous—TA-01
	01-007(o)	In Progress	Miscellaneous—TA-01
01-001(h)	None	Administratively Complete	Septic Tank 142
01-001(i)	None	Administratively Complete	Septic Tank 143
01-001(j)	None	Administratively Complete	Septic Tank 149
01-001(k)	None	Administratively Complete	Septic Tank 268
01-001(l)	None	Administratively Complete	Septic Tank 269
01-001(m)	None	Administratively Complete	Septic tank
01-001(n)	None	Administratively Complete	Septic Tank 276
01-001(p)	None	Administratively Complete	Septic system
01-001(q)	None	Administratively Complete	Septic system
01-001(r)	None	Administratively Complete	Septic system
01-001(v)	None	Administratively Complete	Septic system
01-001(w)	None	Administratively Complete	Septic system

Table B-1.4 (continued)
Upper Los Alamos Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
01-003(c)	None	Administratively Complete	Surface disposal site
01-003(d)	None	In Progress	Surface disposal site
01-006(f)	None	Administratively Complete	Drainlines and outfall
01-006(i)	None	Administratively Complete	Drainlines and outfall
01-006(j)	None	Administratively Complete	Drainlines and outfall
01-006(k)	None	Administratively Complete	Drainlines and outfall
01-006(l)	None	Administratively Complete	Drainlines and outfall
01-006(m)	None	Administratively Complete	Drainlines and outfall
01-006(q)	None	Administratively Complete	Drainlines and outfall
01-006(r)	None	Administratively Complete	Drainlines and outfall
01-006(s)	None	Administratively Complete	Drainlines and outfall
01-006(t)	None	Administratively Complete	Drainlines and outfall
01-007(g)	None	Administratively Complete	Soil contamination area
01-007(k)	None	Administratively Complete	Soil contamination area
01-007(n)	None	Administratively Complete	Soil contamination area
01-007(p)	None	Administratively Complete	Soil contamination area
03-001(m)	None	Administratively Complete	Satellite accumulation area
03-008(a)	None	Administratively Complete	Firing site
03-009(b)	None	Administratively Complete	Surface disposal area
03-009(j)	None	In Progress	Surface disposal site
03-038(a)-00	03-038(a)	In Progress	Tanks and/or associated equipment
	03-038(b)	In Progress	Tanks and/or associated equipment
03-055(c)	None	In Progress	Outfall
03-055(d)	None	Administratively Complete	Storm drain (active)
30-001	None	Administratively Complete	Surface disposal and landfill
32-001	None	In Progress	Incinerator (former location)
32-002(a)	None	In Progress	Septic tank (former location); drainlines
32-002(b)	None	In Progress	Septic system
32-003	None	In Progress	Transformer site (former location)
32-004	None	In Progress	Drainline and outfall
41-001	None	In Progress	Septic system
41-002(a)-99	41-002(a)	In Progress	TA-41 Sewage Treatment Plant
	41-002(b)	In Progress	TA-41 Sewage Treatment Plant
	41-002(c)	In Progress	TA-41 Sewage Treatment Plant
41-003	None	In Progress	Sump
41-004	None	Administratively Complete	Container storage
43-001(a1)	None	In Progress	Waste lines (pre-1981)
43-001(a2)	None	In Progress	Waste lines (post-1981)
43-001(b1)	None	Administratively Complete	Outfall
43-001(b2)	None	In Progress	Outfall
43-002	None	In Progress	Incinerator
43-003	None	Administratively Complete	Carcass storage
43-004	None	Administratively Complete	Waste storage
43-005	None	Administratively Complete	Radioactive liquid storage
61-004(b)	None	Administratively Complete	Septic tank
61-007	None	In Progress	Transformer site—systematic leak - PCB only site
C-00-042	None	In Progress	Tank (formerly part of SWMU 00-032)
C-32-001	None	Administratively Complete	Buildings
C-41-001	None	Administratively Complete	Sump
C-41-002	None	Administratively Complete	Underground tank
C-41-003	None	Administratively Complete	Underground tank
C-41-004	None	In Progress	Storm drains
C-41-005	None	Administratively Complete	Underground tank
C-43-001	None	In Progress	Outfall

Table B-1.5
Middle Los Alamos Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
00-010(a)	None	Administratively Complete	Surface disposal site
00-010(b)	None	Administratively Complete	Surface disposal site, 6th Street warehouses
00-027	None	In Progress	Storage area, DP Road
00-029(a)	None	Administratively Complete	Transformer
00-029(b)	None	Administratively Complete	Transformer
00-029(c)	None	Administratively Complete	Transformer
00-030(a)	None	Pending	Septic system, DP Road
00-030(b)-00	00-004	Pending	Former structures, 6th Street warehouse
	00-030(b)	Pending	Former structures, 6th Street warehouse
	00-030(l)	Pending	Former structures, 6th Street warehouse
	00-030(m)	Pending	Former structures, 6th Street warehouse
	00-033(b)	Pending	Former structures, 6th Street warehouse
00-033(a)	None	Pending	Former UST, 6th Street Warehouses
02-001	None	Administratively Complete	Open burning ground (doesn't exist)
02-002	None	Administratively Complete	Storage area
02-003(a)	None	In Progress	Valve house and gaseous effluent line
02-003(b)	None	In Progress	Condensate trap
02-003(c)	None	In Progress	Delay system
02-003(d)	None	In Progress	Gaseous effluent line
02-003(e)	None	In Progress	Holding tank (near reactor water boiler)
02-004(a)	None	In Progress	Omega West Reactor facility
02-004(b)	None	In Progress	Reactor facility effluent storage tank
02-004(c)	None	In Progress	Reactor facility effluent storage tank
02-004(d)	None	In Progress	Reactor facility effluent storage tank
02-004(e)	None	In Progress	Reactor facility acid pit
02-004(f)	None	In Progress	Reactor facility equipment building
02-004(g)	None	In Progress	Aboveground tank
02-005	None	In Progress	Drift loss, cooling tower blowdown
02-006(a)	None	In Progress	French drain
02-006(b)	None	In Progress	Acid waste line
02-006(c)	None	In Progress	Drainline
02-006(d)	None	In Progress	Drainline
02-006(e)	None	In Progress	Sump
02-007-00	02-007	In Progress	Former structures, Omega West Reactor
	02-009(a)	In Progress	Former structures, Omega West Reactor
	02-009(b)	In Progress	Former structures, Omega West Reactor
	02-009(c)	In Progress	Former structures, Omega West Reactor
02-008(a)	None	In Progress	Outfall
02-008(b)	None	Administratively Complete	Outfall from photo processing facility, 2-4
02-008(c)	None	In Progress	Outfall
02-009(d)	None	In Progress	Nonintentional release
02-009(e)	None	In Progress	Nonintentional release [Duplicate of 02-009(c)]
02-010	None	In Progress	Former building location
02-011(a)	None	In Progress	Storm drain and outfall
02-011(b)	None	In Progress	Former drains and outfalls
02-011(c)	None	In Progress	Storm drain
02-011(d)	None	In Progress	Former NPDES-permitted outfall
02-011(e)	None	In Progress	Former NPDES-permitted outfall [duplicate of 02-008(a)]
02-012	None	In Progress	Former underground tanks
02-013	None	Administratively Complete	Storage area—SAA
21-004(b)-99	21-004(b)	In Progress	Aboveground tanks and outfall area
	21-004(c)	In Progress	Aboveground tanks and outfall area
	21-004(d)	In Progress	Aboveground tanks and outfall area
21-006(e)-99	21-006(e)	In Progress	Underground seepage pits
	21-006(f)	In Progress	Underground seepage pits
21-011(b)	None	In Progress	Sump
21-022(b)-99	21-022(b)	In Progress	Industrial waste lines and sumps
	21-022(c)	In Progress	Industrial waste lines and sumps
	21-022(d)	In Progress	Industrial waste lines and sumps
	21-022(e)	In Progress	Industrial waste lines and sumps
	21-022(g)	In Progress	Industrial waste lines and sumps

Table B-1.5 (continued)
Middle Los Alamos Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
21-028(c)	None	In Progress	Container storage building 21-3
26-001	None	In Progress	Surface disposal site
26-002(a)	None	In Progress	Former acid sump system
26-002(b)	None	In Progress	Former drainage system
26-003	None	In Progress	Septic tank
53-008	None	In Progress	Storage area, Boneyard
53-012(a)	None	Administratively Complete	Outfall
53-012(b)	None	Administratively Complete	Outfall
53-012(c)	None	Administratively Complete	Outfall
73-005-99	73-005	Administratively Complete	Surface disposal area, septic tanks, and septic pits
	73-007	Administratively Complete	Surface disposal area, septic tanks, and septic pits
	C-73-005(a)	Administratively Complete	Surface disposal area, septic tanks, and septic pits
	C-73-005(b)	Administratively Complete	Surface disposal area, septic tanks, and septic pits
	C-73-005(c)	Administratively Complete	Surface disposal area, septic tanks, and septic pits
	C-73-005(d)	Administratively Complete	Surface disposal area, septic tanks, and septic pits
	C-73-005(e)	Administratively Complete	Surface disposal area, septic tanks, and septic pits
	C-73-005(f)	Administratively Complete	Surface disposal area, septic tanks, and septic pits
C-02-001	None	Administratively Complete	Metal nugget pile
C-53-017	None	Administratively Complete	One-time spill

Table B-1.6
Delta Prime (DP) Site Aggregate

Legacy Waste Site	Subunit	Status	Description
21-002(a)	None	In Progress	Container storage areas located throughout TA-21
21-002(b)	None	In Progress	Container storage
21-003-99	21-003	In Progress	PCB container storage and surface disposal area
	21-013(f)	In Progress	PCB container storage and surface disposal area
21-005	None	Administratively Complete	Disposal pit
21-006(c)-99	21-006(a)	In Progress	Miscellaneous
	21-006(b)	In Progress	Miscellaneous
	21-006(c)	In Progress	Miscellaneous
	21-006(d)	In Progress	Miscellaneous
21-008	None	Administratively Complete	Incinerator
21-009	None	In Progress	Waste treatment laboratory
21-011(k)	None	In Progress	Outfall
21-012(a)	None	Administratively Complete	Dry well
21-012(b)	None	In Progress	Dry well
21-013(c)	None	In Progress	Surface disposal site
21-013(d)-99	21-013(d)	In Progress	Surface disposal areas
	21-013(e)	In Progress	Surface disposal areas
21-014	None	In Progress	MDA A
21-015	None	In Progress	MDA B
21-016(a)-99	21-001	In Progress	MDA T
	21-007	In Progress	MDA T
	21-010(a)	In Progress	MDA T
	21-010(b)	In Progress	MDA T
	21-010(c)	In Progress	MDA T
	21-010(d)	In Progress	MDA T
	21-010(e)	In Progress	MDA T
	21-010(f)	In Progress	MDA T
	21-010(g)	In Progress	MDA T
	21-010(h)	In Progress	MDA T
	21-011(a)	In Progress	MDA T
	21-011(c)	In Progress	MDA T
	21-011(d)	In Progress	MDA T
	21-011(e)	In Progress	MDA T
	21-011(f)	In Progress	MDA T
	21-011(g)	In Progress	MDA T

Table B-1.6 (continued)
Delta Prime (DP) Site Aggregate

Legacy Waste Site	Subunit	Status	Description
21-016(a)-99 (cont.)	21-011(h)	In Progress	MDA T
	21-011(i)	In Progress	MDA T
	21-011(j)	In Progress	MDA T
	21-016(a)	In Progress	MDA T
	21-016(b)	In Progress	MDA T
	21-016(c)	In Progress	MDA T
	21-028(a)	In Progress	MDA T
	C-21-009	In Progress	MDA T
	C-21-012	In Progress	MDA T
21-017(a)-99	21-017(a)	In Progress	MDA U
	21-017(b)	In Progress	MDA U
	21-017(c)	In Progress	MDA U
	21-022(f)	In Progress	MDA U
21-018(a)-99	21-013(b)	In Progress	MDA V
	21-013(g)	In Progress	MDA V
	21-018(a)	In Progress	MDA V
	21-018(b)	In Progress	MDA V
	21-023(c)	In Progress	MDA V
21-021-99	21-019(a)	In Progress	Surface soil contamination area
	21-019(b)	In Progress	Surface soil contamination area
	21-019(c)	In Progress	Surface soil contamination area
	21-019(d)	In Progress	Surface soil contamination area
	21-019(e)	In Progress	Surface soil contamination area
	21-019(f)	In Progress	Surface soil contamination area
	21-019(g)	In Progress	Surface soil contamination area
	21-019(h)	In Progress	Surface soil contamination area
	21-019(i)	In Progress	Surface soil contamination area
	21-019(j)	In Progress	Surface soil contamination area
	21-019(k)	In Progress	Surface soil contamination area
	21-019(l)	In Progress	Surface soil contamination area
	21-019(m)	In Progress	Surface soil contamination area
	21-020(a)	In Progress	Surface soil contamination area
	21-020(b)	In Progress	Surface soil contamination area
	21-021	In Progress	Surface soil contamination area
21-022(h)-99	21-022(h)	In Progress	Drainline and outfall
	21-022(i)	In Progress	Drainline and outfall
	21-022(j)	In Progress	Drainline and outfall
21-023(a)-99	21-023(a)	In Progress	Septic tanks and distribution lines
	21-023(b)	In Progress	Septic tanks and distribution lines
	21-023(d)	In Progress	Septic tanks and distribution lines
21-024(a)	None	In Progress	Septic system
21-024(b)	None	In Progress	Septic system
21-024(c)	None	In Progress	Septic system
21-024(d)	None	In Progress	Septic system
21-024(e)	None	In Progress	Septic system
21-024(f)	None	Pending	Septic system
21-024(g)	None	In Progress	Septic system
21-024(h)	None	In Progress	Septic system
21-024(i)	None	In Progress	Septic system
21-024(j)	None	In Progress	Septic system
21-024(k)	None	In Progress	Septic system
21-024(l)-99	21-004(a)	In Progress	Tank, sump, and outfall
	21-022(a)	In Progress	Tank, sump, and outfall
	21-024(l)	In Progress	Tank, sump, and outfall
21-024(m)	None	Administratively Complete	Drainline
21-024(n)	None	In Progress	Drainline
21-024(o)	None	In Progress	Drainline
21-025(a)	None	Administratively Complete	Operational facility
21-025(b)	None	Administratively Complete	Operational facility
21-026(a)-99	21-013(a)	In Progress	Former sewage treatment plant
	21-026(a)	In Progress	Former sewage treatment plant

Table B-1.6 (continued)
Delta Prime (DP) Site Aggregate

Legacy Waste Site	Subunit	Status	Description
21-026(a)-99 (cont.)	21-026(b)	In Progress	Former sewage treatment plant
	21-026(c)	In Progress	Former sewage treatment plant
	21-026(d)	In Progress	Former sewage treatment plant
21-027(a)	None	In Progress	Industrial or sanitary wastewater treatment
21-027(b)	None	Administratively Complete	Drainline
21-027(c)	None	In Progress	Industrial or sanitary wastewater treatment
21-027(d)-99	21-027(d)	In Progress	Aboveground storage tank and outfall
	C-21-028	In Progress	Aboveground storage tank and outfall
21-028(b)	None	Administratively Complete	Container storage
21-028(d)	None	Administratively Complete	Container storage
21-028(e)	None	Administratively Complete	Container storage
21-029	None	Pending	Soil contamination area
21-030	None	Administratively Complete	Sump
C-21-001	None	In Progress	One-time spill Building 21-17
C-21-002	None	Administratively Complete	Nonintentional release area
C-21-003	None	Administratively Complete	Nonintentional release area
C-21-004	None	Administratively Complete	Nonintentional release area
C-21-005	None	In Progress	One-time spill
C-21-006	None	In Progress	Nonintentional release area Building 21-2
C-21-007	None	In Progress	Nonintentional release area
C-21-008	None	Administratively Complete	One-time spill
C-21-010	None	Administratively Complete	Systematic leak
C-21-011	None	Administratively Complete	One-time spill
C-21-013	None	Administratively Complete	Disposal pit
C-21-014	None	Administratively Complete	Warehouse
C-21-015	None	Administratively Complete	Building
C-21-016	None	Administratively Complete	Storage area
C-21-017	None	Administratively Complete	Storage area
C-21-018	None	Administratively Complete	Storage area
C-21-019	None	Administratively Complete	Storage area
C-21-020	None	Administratively Complete	Storage area
C-21-021	None	Administratively Complete	Storage area
C-21-022	None	Administratively Complete	Laboratory
C-21-023	None	Administratively Complete	Laboratory
C-21-024	None	Administratively Complete	Warehouse
C-21-025	None	Administratively Complete	Building
C-21-026	None	Administratively Complete	Building
C-21-027	None	In Progress	Machinery
C-21-029	None	Administratively Complete	Aboveground tank
C-21-030	None	Administratively Complete	Aboveground tank
C-21-031	None	Administratively Complete	Tank
C-21-032	None	Administratively Complete	Machinery and tanks
C-21-033	None	In Progress	One-time spill
C-21-034	None	In Progress	Tank
C-21-035	None	In Progress	Aboveground tank
C-21-036	None	In Progress	Aboveground tank
C-21-037	None	In Progress	Aboveground tank

Table B-2.1
Upper Sandia Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
03-001(d)	None	Administratively Complete	Satellite accumulation area
03-001(f)	None	Administratively Complete	Less-than-90-day storage
03-001(i)	None	In Progress	Satellite accumulation area
03-001(n)	None	Administratively Complete	Satellite accumulation area
03-001(o)	None	Administratively Complete	Waste container
03-001(p)	None	Administratively Complete	Satellite accumulation area
03-001(q)	None	Administratively Complete	Satellite accumulation area

Table B-2.1 (continued)
Upper Sandia Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
03-001(r)	None	Administratively Complete	Satellite accumulation area
03-001(v)	None	Administratively Complete	Satellite accumulation area
03-001(x)	None	Administratively Complete	Satellite accumulation area
03-002(a)	None	Administratively Complete	Less-than-ninety-day accumulation area
03-002(b)	None	Administratively Complete	Satellite accumulation area
03-002(c)	None	In Progress	Storage area
03-003(c)	None	In Progress	Equipment storage area - PCB only site
03-003(d)	None	Administratively Complete	Storage area (transformers) - PCB only site
03-003(f)	None	Administratively Complete	Storage area (transformers) - PCB only site
03-003(g)	None	Administratively Complete	One-time spill (transformer) - PCB only site
03-003(m)	None	Administratively Complete	Storage area (capacitor banks) - PCB only site
03-003(o)	None	Administratively Complete	Storage area (capacitor bank) - PCB only site
03-006	None	Administratively Complete	Burn site - duplicate of SWMU 61-003
03-008(b)	None	Administratively Complete	Firing site
03-009(a)-00	03-009(a)	In Progress	Asphalt batch plant
	03-028	In Progress	Asphalt batch plant
	03-029	In Progress	Asphalt batch plant
	03-036(a)	In Progress	Asphalt batch plant
	03-036(c)	In Progress	Asphalt batch plant
	03-036(d)	In Progress	Asphalt batch plant
	03-043(b)	In Progress	Asphalt batch plant
	03-043(d)	In Progress	Asphalt batch plant
	03-043(h)	In Progress	Asphalt batch plant
	03-045(g)	In Progress	Asphalt batch plant
03-009(i)	None	In Progress	Surface disposal site
03-010(c)	None	Administratively Complete	Operational release
03-010(d)	None	Administratively Complete	Operational release
03-012(b)-00	03-012(b)	In Progress	Miscellaneous - TA-03 power plant
	03-014(q)	In Progress	Miscellaneous - TA-03 power plant
	03-045(b)	In Progress	Miscellaneous - TA-03 power plant
	03-045(c)	In Progress	Miscellaneous - TA-03 power plant
03-013(a)-00	03-013(a)	In Progress	Drainlines and outfalls
	03-052(f)	In Progress	Drainlines and outfalls
03-013(b)	None	In Progress	Operational release
03-013(c)	None	Administratively Complete	Operational release
03-013(d)	None	Administratively Complete	Operational release
03-013(e)	None	Administratively Complete	Operational release
03-013(f)	None	Administratively Complete	Operational release
03-013(i)	None	In Progress	Operational release
03-014(a)-99	03-014(a)	In Progress	Wastewater treatment plant
	03-014(b)	In Progress	Wastewater treatment plant
	03-014(b2)	In Progress	Wastewater treatment plant
	03-014(c)	In Progress	Wastewater treatment plant
	03-014(c2)	In Progress	Wastewater treatment plant
	03-014(d)	In Progress	Wastewater treatment plant
	03-014(e)	In Progress	Wastewater treatment plant
	03-014(f)	In Progress	Wastewater treatment plant
	03-014(g)	In Progress	Wastewater treatment plant
	03-014(h)	In Progress	Wastewater treatment plant
	03-014(i)	In Progress	Wastewater treatment plant
	03-014(j)	In Progress	Wastewater treatment plant
	03-014(k)	In Progress	Wastewater treatment plant
	03-014(l)	In Progress	Wastewater treatment plant
	03-014(m)	In Progress	Wastewater treatment plant
	03-014(n)	In Progress	Wastewater treatment plant
	03-014(o)	In Progress	Wastewater treatment plant
	03-014(p)	In Progress	Wastewater treatment plant
	03-014(u)	In Progress	Wastewater treatment plant
	03-056(d)	In Progress	Wastewater treatment plant
03-014(r)	None	In Progress	Wastewater treatment facility
03-014(s)	None	In Progress	Wastewater treatment facility

Table B-2.1 (continued)
Upper Sandia Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
03-014(v)	None	In Progress	Wastewater treatment facility
03-014(y)	None	In Progress	Wastewater treatment facility
03-015-00	03-015	In Progress	Drainlines and outfall
	03-053	In Progress	Drainlines and outfall
03-016(b)	None	Administratively Complete	Septic system
03-016(c)	None	Administratively Complete	Septic system
03-016(d)	None	Administratively Complete	Septic system
03-016(e)	None	Administratively Complete	Septic system - duplicate of 3-014(s)
03-016(f)	None	Administratively Complete	Septic system - duplicate of 3-014(s)
03-020(a)	None	Administratively Complete	Disposal pit
03-020(b)	None	Administratively Complete	Surface disposal site
03-021	None	In Progress	Surface disposal site
03-023	None	Administratively Complete	Sump
03-024	None	Administratively Complete	Tank and/or associated equipment
03-026(b)	None	Administratively Complete	Sumps (active)
03-027	None	In Progress	Separation site
03-032	None	Administratively Complete	Tank and associated equipment
03-035(a)	None	Administratively Complete	Underground storage tank
03-035(b)	None	Administratively Complete	Underground storage tank
03-036(b)	None	In Progress	Aboveground tanks
03-036(e)	None	Administratively Complete	Aboveground tank
03-036(f)	None	Administratively Complete	Aboveground tank
03-036(g)	None	Administratively Complete	Aboveground tank
03-036(h)	None	Administratively Complete	Aboveground tanks
03-036(i)	None	Administratively Complete	Aboveground tank
03-036(j)	None	Administratively Complete	Aboveground tanks
03-037	None	In Progress	Underground tank
03-038(c)	None	Administratively Complete	Waste lines
03-038(d)	None	Administratively Complete	Waste lines
03-039(a)	None	Administratively Complete	Silver recovery unit
03-039(b)	None	Administratively Complete	Silver recovery unit
03-039(d)	None	Administratively Complete	Silver recovery unit
03-039(e)	None	Administratively Complete	Silver recovery unit
03-040(b)	None	Administratively Complete	Storage area
03-043(a)	None	Administratively Complete	Aboveground tank
03-043(e)	None	Administratively Complete	Underground storage tank
03-043(f)	None	Administratively Complete	Aboveground tank
03-043(g)	None	Administratively Complete	Aboveground tank
03-044(a)	None	Administratively Complete	Container storage area
03-045(a)	None	In Progress	Outfall (industrial or sanitary wastewater treatment)
03-045(d)	None	Administratively Complete	Storage tank (aboveground)
03-045(e)	None	In Progress	Outfall (industrial or sanitary wastewater treatment)
03-045(f)	None	In Progress	Outfall (industrial or sanitary wastewater treatment)
03-045(i)	None	Administratively Complete	Outfall
03-046	None	Pending	Aboveground wastewater treatment tank
03-047(a)	None	Administratively Complete	Storage area
03-047(b)	None	Administratively Complete	Storage area
03-047(c)	None	Administratively Complete	Drum storage
03-047(d)	None	Pending	Storage area
03-047(e)	None	Administratively Complete	Storage area
03-047(f)	None	Administratively Complete	Storage area
03-047(g)	None	Administratively Complete	Drum storage
03-047(h)	None	Administratively Complete	Storage area
03-047(i)	None	Administratively Complete	Satellite accumulation area
03-049(c)	None	Administratively Complete	Outfall (active)
03-050(c)	None	Administratively Complete	Exhaust emissions, off-gas scrubber, HEPA filter system
03-051(c)	None	In Progress	Soil contamination (vacuum pump leaking)
03-052(b)	None	In Progress	Storm drainage
03-052(c)	None	Administratively Complete	One-time release
03-052(d)	None	Administratively Complete	Storm drainage (non-PCB transformers /capacitors)
03-054(c)	None	In Progress	Outfall

Table B-2.1 (continued)
Upper Sandia Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
03-056(a)	None	In Progress	Storage area
03-056(b)	None	Administratively Complete	Container storage area
03-056(c)	None	In Progress	Transformer storage area - PCB only site
03-056(h)	None	Administratively Complete	Transformer storage area - PCB only site
03-056(i)	None	Administratively Complete	Drum storage
03-056(k)	None	In Progress	Container storage area
03-056(l)	None	In Progress	Drum storage
03-056(n)	None	Administratively Complete	Container storage area
03-057	None	Administratively Complete	Sump/grease trap
03-059-00	03-003(n)	In Progress	Storage area
	03-059	In Progress	Storage area
60-001(a)	None	Administratively Complete	Storage area (active)
60-001(b)	None	Administratively Complete	Storage area (active)
60-001(c)	None	Administratively Complete	Storage area (active)
60-001(d)	None	Administratively Complete	Storage area, pesticide shed
60-002	None	In Progress	Storage area
60-003	None	Administratively Complete	Oil-water separator
60-004(a)	None	Administratively Complete	Storage area
60-004(b)	None	In Progress	Storage area
60-004(d)	None	In Progress	Storage area
60-004(f)	None	In Progress	Storage area
60-005(b)	None	Administratively Complete	Drilling mud pit
60-006(a)	None	In Progress	Septic system
60-006(c)	None	Administratively Complete	Septic tank
60-007(a)	None	In Progress	Systematic or intent. prod. release
60-007(b)	None	In Progress	Systematic or intent. prod. release
61-001	None	Administratively Complete	Storage area
61-002	None	In Progress	Transformer storage area - PCB only site
61-003	None	Administratively Complete	Burn sites
61-004(a)	None	Administratively Complete	Former septic tank
61-004(c)	None	Administratively Complete	Septic system
61-005	None	In Progress	Landfill (Los Alamos municipal)
61-006	None	In Progress	Waste oil tank
C-03-001	None	Administratively Complete	Gas trap
C-03-002	None	Administratively Complete	One-time spill, leak from asphalt machine
C-03-004	None	Administratively Complete	Miscellaneous debris
C-03-005	None	Administratively Complete	Oil Spill
C-03-009	None	Administratively Complete	Storage area
C-03-011	None	Administratively Complete	Waste oil tank
C-03-015	None	Administratively Complete	Underground storage tank
C-03-016	None	In Progress	Oil metal bin
C-03-017	None	Administratively Complete	Underground storage tank
C-03-018	None	Administratively Complete	Underground storage tank
C-03-020	None	Administratively Complete	Storage tanks
C-03-022	None	Administratively Complete	Kerosene tanker trailer
C-60-001	None	Administratively Complete	Underground tank
C-60-003	None	Administratively Complete	One-time spill at pesticide shed
C-60-004	None	Administratively Complete	Underground tank
C-61-001	None	Administratively Complete	Leak from transformer storage area - PCB only site
C-61-002	None	In Progress	Subsurface contamination

Table B-2.2
Lower Sandia Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
20-001(a)	None	In Progress	Landfill
20-001(b)-00	20-001(b)	In Progress	Firing site
	20-002(c)	In Progress	Firing site
	20-003(c)	In Progress	Firing site
20-001(c)-00	20-001(c)	In Progress	Landfill

Table B-2.2 (continued)
Lower Sandia Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
20-001(c)-00 (cont.)	20-002(a)	In Progress	Landfill
20-001(c)-00	20-002(b)	In Progress	Landfill
20-002(d)	None	Pending	Firing site
20-003(a)	None	Pending	Control building at a firing site
20-003(b)	None	Pending	Firing site
20-003(d)	None	Administratively Complete	Firing site
20-004	None	In Progress	Septic system
20-005	None	In Progress	Septic tank
53-001(a)	None	In Progress	Storage area - PCB only site
53-001(b)	None	In Progress	Storage area
53-001(c)	None	Administratively Complete	Storage area
53-001(d)	None	Administratively Complete	Storage area
53-001(e)	None	Administratively Complete	Storage area
53-001(f)	None	Administratively Complete	Storage area
53-001(g)	None	Administratively Complete	Storage area
53-001(h)	None	Administratively Complete	Storage area
53-001(i)	None	Administratively Complete	Storage area
53-001(j)	None	Administratively Complete	Storage area
53-001(k)	None	Administratively Complete	Storage area
53-001(l)	None	Administratively Complete	Storage area
53-001(m)	None	Administratively Complete	Storage area
53-001(n)	None	Administratively Complete	Storage area
53-001(o)	None	Administratively Complete	Storage area
53-002(a)-99	53-002(a)	In Progress	Former surface impoundment
	53-002(b)	In Progress	Former surface impoundment
53-003	None	Administratively Complete	Septic tank
53-004	None	Administratively Complete	Operational facility
53-005	None	In Progress	Disposal pit
53-006(b)-99	53-006(a)	In Progress	Underground tank
	53-006(b)	In Progress	Underground tank
	53-006(c)	In Progress	Underground tank
53-006(d)-99	53-006(d)	In Progress	Underground tank
	53-006(e)	In Progress	Underground tank
53-006(f)	None	In Progress	Underground tank
53-007(a)	None	In Progress	Aboveground neutralizer tank
53-007(b)	None	Administratively Complete	Aboveground storage tanks
53-009	None	In Progress	Aboveground tanks (3)
53-010	None	In Progress	Container storage
53-011(a)	None	Administratively Complete	Transformer - PCB only site
53-011(b)	None	Administratively Complete	Transformer - PCB only site
53-011(c)	None	Administratively Complete	Transformer - PCB only site
53-011(d)	None	Administratively Complete	Transformer - PCB only site
53-011(e)	None	Administratively Complete	Transformer - doesn't exist
53-012(d)	None	Administratively Complete	Outfall
53-012(e)	None	In Progress	Outfall
53-012(f)	None	Administratively Complete	Outfall
53-012(g)	None	Administratively Complete	Outfall
53-012(h)	None	Administratively Complete	Outfall
53-013	None	In Progress	Soil Contamination -lead storage site I
53-014	None	Administratively Complete	Soil Contamination, lead storage site II
53-015	None	In Progress	Radioactive Liquid Waste Treatment System
72-001	None	In Progress	Firing range
72-002	None	Administratively Complete	Firing site
72-003(a)	None	Administratively Complete	Septic system
72-003(b)	None	Administratively Complete	Septic system
C-20-001	None	Administratively Complete	Storage building
C-20-002	None	Administratively Complete	Storage building
C-20-003	None	Administratively Complete	Building
C-53-001	None	Administratively Complete	Transformer - PCB only site
C-53-002	None	Administratively Complete	Transformer - PCB only site
C-53-003	None	Administratively Complete	Transformer - PCB only site

Table B-2.2 (continued)
Lower Sandia Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
C-53-004	None	Administratively Complete	Transformer - PCB only site
C-53-005	None	Administratively Complete	Transformer - PCB only site
C-53-006	None	Administratively Complete	Transformer - PCB only site
C-53-007	None	Administratively Complete	Transformer - PCB only site
C-53-008	None	Administratively Complete	Transformer - PCB only site
C-53-009	None	Administratively Complete	Transformer - PCB only site
C-53-010	None	Administratively Complete	Transformer - PCB only site
C-53-011	None	Administratively Complete	Transformer - PCB only site
C-53-012	None	Administratively Complete	Transformer - PCB only site
C-53-013	None	Administratively Complete	Transformer - PCB only site
C-53-014	None	Administratively Complete	Transformer - PCB only site
C-53-015	None	Administratively Complete	Transformer - PCB only site
C-53-016	None	Administratively Complete	Transformer - PCB only site
C-53-018	None	Administratively Complete	One-time spill
C-53-019	None	Administratively Complete	One-time spill

Table B-3.1
Upper Mortandad Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
03-001(h)	None	Administratively Complete	Satellite accumulation area
03-001(j)	None	Administratively Complete	Satellite accumulation area
03-001(y)	None	Administratively Complete	Satellite accumulation area
03-003(e)	None	Administratively Complete	Storage area (transformers) - PCB only site
03-003(i)	None	Administratively Complete	Storage area (transformer) - PCB only site
03-004(a)	None	Administratively Complete	Container storage
03-004(b)	None	Administratively Complete	Container storage
03-004(c)	None	In Progress	Storage area
03-004(d)	None	In Progress	Storage area
03-004(e)	None	Administratively Complete	Storage area
03-004(f)	None	Administratively Complete	Storage area
03-007	None	In Progress	Firing site
03-009(c)	None	Administratively Complete	Construction debris area
03-009(e)	None	Administratively Complete	Surface disposal area
03-009(h)	None	Administratively Complete	Surface disposal area
03-010(b)	None	Administratively Complete	Operational release
03-012(a)	None	Administratively Complete	Controlled operational release
03-014(w)	None	In Progress	Wastewater treatment facility
03-014(x)	None	In Progress	Wastewater treatment facility
03-025(a)	None	Administratively Complete	Tank and associated equipment (oil trap sump)
03-026(a)	None	In Progress	Sump
03-026(c)	None	In Progress	Tank and/or associated equipment
03-030	None	Administratively Complete	Surface impoundment
03-031	None	In Progress	Tanks and/or associated equipment
03-034(a)	None	In Progress	Radioactive liquid waste tanks
03-034(b)	None	In Progress	Tank and/or associated equipment
03-041	None	Administratively Complete	Underground tank
03-045(h)-00	03-045(h)	In Progress	Drainlines and outfalls
	03-049(a)	In Progress	Drainlines and outfalls
03-048	None	Administratively Complete	Satellite accumulation area
03-049(b)-00	03-049(b)	In Progress	Miscellaneous
	C-03-014	In Progress	Miscellaneous
03-049(d)	None	Administratively Complete	Outfall (active)
03-049(e)	None	In Progress	Outfall
03-050(b)	None	Administratively Complete	Exhaust emissions, off-gas scrubber, HEPA filter system
03-054(e)	None	In Progress	Outfall
03-056(e)	None	Administratively Complete	Satellite accumulation area
03-058	None	Administratively Complete	Container storage
42-001(a)-99	42-001(a)	In Progress	TA-42 incinerator complex
	42-001(b)	In Progress	TA-42 incinerator complex

Table B-3.1 (continued)
Upper Mortandad Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
	42-001(c)	In Progress	TA-42 incinerator complex
42-001(a)-99 (cont.)	42-002(a)	In Progress	TA-42 incinerator complex
	42-002(b)	In Progress	TA-42 incinerator complex
	42-003	In Progress	TA-42 incinerator complex
42-004	None	Administratively Complete	Canyon disposal
48-001	None	In Progress	Air exhaust system
48-002(a)	None	In Progress	Container storage area
48-002(b)	None	In Progress	Container storage area
48-002(c)	None	Administratively Complete	Container storage area
48-002(d)	None	Administratively Complete	Container storage
48-002(e)	None	In Progress	Container storage
48-003	None	In Progress	Septic system
48-004(a)-99	48-004(a)	In Progress	Sumps and tanks
	48-004(b)	In Progress	Sumps and tanks
	48-004(c)	In Progress	Sumps and tanks
48-004(d)	None	Administratively Complete	Sumps and tanks
48-005	None	In Progress	Waste lines
48-006	None	Administratively Complete	Septic system
48-007(a)-00	48-007(a)	In Progress	Drainlines and outfalls
	48-007(d)	In Progress	Drainlines and outfalls
	48-010	In Progress	Drainlines and outfalls
48-007(b)	None	In Progress	Drains and outfalls
48-007(c)	None	In Progress	Drains and outfalls
48-007(e)	None	Administratively Complete	Outfall
48-007(f)	None	In Progress	Drains and outfalls
48-008	None	Administratively Complete	Transformer leak - PCB only site
48-009	None	Administratively Complete	Soil contamination
48-011	None	In Progress	Disposal shaft
48-012	None	In Progress	Soil contamination
50-001(a)	None	In Progress	Waste treatment facility TA-50-1 - RCRA Unit (active)
50-001(b)	None	In Progress	Waste lines and manholes
50-002(a)	None	In Progress	Underground tanks
50-002(b)-00	50-002(b)	In Progress	Vaulted underground tanks for TA-55 wastes
	50-002(c)	In Progress	Vaulted underground tanks for TA-55 wastes
50-002(d)	None	In Progress	Aboveground storage tank
50-003(a)	None	In Progress	Container storage area
50-003(b)	None	Administratively Complete	Storage area
50-003(c)	None	Administratively Complete	Storage area
50-003(d)	None	Administratively Complete	Storage area
50-003(e)	None	Administratively Complete	Storage area
50-004(a)-00	50-004(a)	In Progress	Historical waste lines and underground vault, Radioactive Liquid Waste Treatment Facility
	50-004(b)	In Progress	Historical waste lines and underground vault, Radioactive Liquid Waste Treatment Facility
	50-004(c)	In Progress	Historical waste lines and underground vault, Radioactive Liquid Waste Treatment Facility
50-005	None	Administratively Complete	Waste treatment facility
50-006(a)	None	In Progress	Operational release
50-006(b)	None	Administratively Complete	Operational release
50-006(c)	None	In Progress	Operational release
50-006(d)	None	In Progress	Effluent discharge
50-006(e)	None	Administratively Complete	Aboveground tank
50-007	None	In Progress	Incinerator
50-008	None	In Progress	Reduction site
50-009	None	In Progress	MDA C
50-010	None	In Progress	Decontamination facility
50-011(a)	None	In Progress	Septic system
50-011(b)	None	In Progress	Lift stations
55-001	None	Administratively Complete	Cement plant
55-002(a)	None	Administratively Complete	Rad waste storage area
55-002(b)	None	Administratively Complete	Rad waste storage area
55-002(c)	None	Administratively Complete	Container storage area

Table B-3.1 (continued)
Upper Mortandad Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
55-003	None	Administratively Complete	Containment area
55-004	None	Administratively Complete	Evaporator
55-005	None	Administratively Complete	Filtration unit
55-006	None	Administratively Complete	Glass breaker
55-007	None	Administratively Complete	Thermal combustion unit
55-008	None	In Progress	Sumps and tanks
55-009	None	Pending	Concrete enclosure
55-010	None	Administratively Complete	Solvent spills
55-011(a)	None	Administratively Complete	Storm drain
55-011(b)	None	Administratively Complete	Storm drain
55-011(c)	None	Administratively Complete	Storm drain
55-011(d)	None	Administratively Complete	Storm drain
55-011(e)	None	Administratively Complete	Storm drain
55-012	None	Administratively Complete	Container storage area
55-013(a)	None	Administratively Complete	Storage area
55-013(b)	None	Administratively Complete	Storage area
C-03-006	None	In Progress	One-time spill
C-03-007	None	Administratively Complete	Storage area
C-03-012	None	Administratively Complete	Satellite accumulation area
C-60-002	None	Administratively Complete	Underground tank

Table B-3.2
Middle Mortandad/Ten Site Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
00-001	None	In Progress	Sediment traps in Mortandad Canyon
00-005	None	Administratively Complete	Landfill
04-001-99	04-001	In Progress	Firing site - Alpha Site
	04-002	In Progress	Firing site - Alpha Site
	04-003(b)	In Progress	Firing site - Alpha Site
05-001(a)-99	05-001(a)	In Progress	Firing site - Beta Site
	05-001(b)	In Progress	Firing site - Beta Site
	05-002	In Progress	Firing site - Beta Site
	05-006(h)	In Progress	Firing site - Beta Site
05-005(a)-00	05-005(a)	In Progress	Firing site - Beta Site
	05-006(b)	In Progress	Firing site - Beta Site
	05-006(e)	In Progress	Firing site - Beta Site
05-006(d)	None	Administratively Complete	Former building location
05-006(f)	None	Administratively Complete	Former building location
05-006(g)	None	Administratively Complete	Former building location
35-001	None	Administratively Complete	MDA W
35-002	None	In Progress	MDA X
35-003(a)-99	35-003(a)	In Progress	Wastewater treatment plant
	35-003(b)	In Progress	Wastewater treatment plant
	35-003(c)	In Progress	Wastewater treatment plant
	35-003(e)	In Progress	Wastewater treatment plant
	35-003(f)	In Progress	Wastewater treatment plant
	35-003(g)	In Progress	Wastewater treatment plant
	35-003(h)	In Progress	Wastewater treatment plant
	35-003(m)	In Progress	Wastewater treatment plant
	35-003(misc)	In Progress	Wastewater treatment plant
	35-003(n)	In Progress	Wastewater treatment plant
	35-003(o)	In Progress	Wastewater treatment plant
	35-003(p)	In Progress	Wastewater treatment plant
35-003(d)-00	35-003(d)	In Progress	Wastewater treatment plant - Pratt Canyon
	35-003(l)	In Progress	Wastewater treatment plant - Pratt Canyon
	35-003(q)	In Progress	Wastewater treatment plant - Pratt Canyon
	35-003(r)	In Progress	Wastewater treatment plant - Pratt Canyon
35-003(i)	None	Administratively Complete	Wastewater treatment facility
35-003(j)-99	35-003(j)	In Progress	Former structures

Table B-3.2 (continued)
Middle Mortandad/Ten Site Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
35-003(j)-99 (cont.)	35-003(k)	In Progress	Former structures
	35-014(b)	In Progress	Former structures
	35-014(d)	In Progress	Former structures
	35-015(b)	In Progress	Former structures
35-004(a)	None	In Progress	Storage areas
35-004(b)	None	In Progress	Storage areas
35-004(c)	None	Administratively Complete	Storage areas
35-004(d)	None	Administratively Complete	Container storage area
35-004(e)	None	Administratively Complete	Container storage area
35-004(f)	None	Administratively Complete	Container storage area
35-004(g)-00	35-004(g)	In Progress	Septic system
	35-009(b)	In Progress	Septic system
35-004(h)	None	In Progress	Container storage area
35-004(i)	None	Administratively Complete	Container storage area
35-004(j)	None	Administratively Complete	Container storage area
35-004(k)	None	Administratively Complete	Container storage area
35-004(l)	None	Administratively Complete	Container storage area
35-004(n)	None	Administratively Complete	Container storage area
35-004(o)	None	Administratively Complete	Container storage area
35-005(a)	None	Administratively Complete	Surface impoundment (closure) Bldg 85 dupe of 35-006
35-005(b)	None	Administratively Complete	Surface impoundment (closure) building 125
35-006	None	Administratively Complete	Surface impoundment
35-007	None	Administratively Complete	Waste oil treatment
35-008-00	35-008	In Progress	Surface disposal
	35-014(e)	In Progress	Surface disposal
35-009(a)	None	In Progress	Septic system
35-009(c)	None	In Progress	Septic system
35-009(d)	None	In Progress	Septic system
35-009(e)	None	In Progress	Septic system
35-010(a)-99	35-010(a)	In Progress	Former surface impoundment
	35-010(b)	In Progress	Former surface impoundment
	35-010(c)	In Progress	Former surface impoundment
	35-010(d)	In Progress	Former surface impoundment
	35-010(e)	In Progress	Former surface impoundment
35-011(a)	None	Administratively Complete	Aboveground storage tanks
35-011(b)	None	Administratively Complete	Underground storage tank
35-011(c)	None	Administratively Complete	Underground storage tank
35-011(d)	None	Administratively Complete	Underground storage tank
35-012(a)	None	Administratively Complete	Underground storage tank
35-012(b)	None	Administratively Complete	Underground storage tank (inactive)
35-013(a)	None	In Progress	Sump
35-013(b)	None	In Progress	Sump
35-013(c)	None	In Progress	Sump
35-013(d)	None	Administratively Complete	Floor drains
35-014(a)	None	In Progress	Operational release
35-014(c)	None	Administratively Complete	Operational release
35-014(e3)	None	Administratively Complete	Operational release
35-014(f)	None	In Progress	Soil contamination
35-014(g)-00	35-004(m)	In Progress	Soil contamination area
	35-014(g)	In Progress	Soil contamination area
	35-014(g2)	In Progress	Soil contamination area
	35-016(n)	In Progress	Soil contamination area
35-014(g3)	None	In Progress	Soil contamination
35-015(a)	None	In Progress	Soil contamination
35-016(a)-00	35-016(a)	In Progress	Drains and outfalls
	35-016(q)	In Progress	Drains and outfalls
35-016(b)	None	In Progress	Outfall
35-016(c)-00	35-016(c)	In Progress	Drainlines and outfall
	35-016(d)	In Progress	Drainlines and outfall
35-016(e)	None	In Progress	Outfall
35-016(f)	None	In Progress	Storm drain
35-016(g)	None	In Progress	Outfall

Table B-3.2 (continued)
Middle Mortandad/Ten Site Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
35-016(h)	None	In Progress	Storm drain
35-016(i)-00	35-014(e2)	In Progress	Drainlines and outfalls
	35-016(i)	In Progress	Drainlines and outfalls
35-016(j)	None	In Progress	Storm drain
35-016(k)-00	35-016(k)	In Progress	Drainlines and outfalls
	35-016(l)	In Progress	Drainlines and outfalls
35-016(m)	None	In Progress	Drains and outfalls
35-016(o)	None	In Progress	Drains and outfalls
35-016(p)	None	In Progress	Outfall
35-017	None	Administratively Complete	Soil contamination from reactor
35-018(a)	None	In Progress	Transformer
35-018(b)	None	Administratively Complete	Former transformer site - PCB only site
52-002(a)	None	In Progress	Septic system
52-002(c)	None	Administratively Complete	Septic system
52-002(d)	None	Administratively Complete	Septic system
52-002(e)	None	Administratively Complete	Septic tank and seepage pit
52-003(a)	None	In Progress	Waste treatment facility
52-003(b)	None	Administratively Complete	Industrial waste line
60-004(c)	None	In Progress	Storage area
60-004(e)	None	In Progress	Storage area
60-005(a)	None	In Progress	Surface impoundment -formerly SWMU 03-029(a)
60-006(b)	None	Administratively Complete	Septic system
63-001(a)	None	In Progress	Septic system
63-001(b)	None	In Progress	Septic system
63-002	None	Administratively Complete	Container storage area
C-04-001	None	Administratively Complete	Former building location
C-05-001	None	Administratively Complete	Former building location
C-35-001	None	Administratively Complete	Former underground storage tank site
C-35-002	None	Administratively Complete	Former underground storage tank site
C-35-003	None	Administratively Complete	Former underground storage tank site
C-35-004	None	Administratively Complete	Operational release
C-35-005	None	Administratively Complete	Operational release
C-35-006	None	Administratively Complete	Operational release
C-35-007	None	In Progress	Soil contamination
C-35-008	None	Administratively Complete	Leaking transformer - PCB only site

Table B-3.3
Lower Mortandad/Cedro Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
05-001(c)	None	In Progress	Former firing site
05-003	None	In Progress	Former calibration chamber
05-004	None	In Progress	Former septic system
05-005(b)-00	05-005(b)	In Progress	Former structures
	05-006(c)	In Progress	Former structures
05-006(a)	None	Administratively Complete	Former building location

Table B-3.4
Upper Cañada del Buey Aggregate

Legacy Waste Site	Subunit	Status	Description
04-003(a)-00	04-003(a)	In Progress	Alpha Site photoprocessing bldg, drainlines, & outfall
	04-004	In Progress	Alpha Site photoprocessing bldg, drainlines, & outfall
46-001	None	Administratively Complete	Aboveground tank
46-002	None	In Progress	Surface impoundment
46-003(a)	None	In Progress	Septic system
46-003(b)	None	In Progress	Septic system

Table B-3.4 (continued)
Upper Cañada del Buey Aggregate

Legacy Waste Site	Subunit	Status	Description
46-003(c)	None	In Progress	Septic system
46-003(d)	None	In Progress	Septic system
46-003(e)	None	In Progress	Septic system
46-003(f)	None	In Progress	Septic system
46-003(g)	None	In Progress	Septic system
46-003(h)	None	In Progress	Operational release
46-004(a)	None	In Progress	Waste line
46-004(a2)	None	In Progress	Outfall
46-004(b)	None	In Progress	Operational release
46-004(b2)	None	In Progress	Operational release
46-004(c)	None	In Progress	Sump
46-004(c2)	None	In Progress	Outfall
46-004(d)-99	46-004(d)	In Progress	Dry wells
	46-004(e)	In Progress	Dry wells
46-004(d2)-99	46-004(d2)	In Progress	Stack emissions/outfalls
	46-004(g)	In Progress	Stack emissions/outfalls
	46-004(h)	In Progress	Stack emissions/outfalls
	C-46-002	In Progress	Stack emissions/outfalls
	C-46-003	In Progress	Stack emissions/outfalls
46-004(e2)	None	In Progress	Outfall from Building 46-42
46-004(f)	None	In Progress	Outfall
46-004(f2)	None	In Progress	Outfall from Building 46-31
46-004(i)	None	Administratively Complete	Outfall
46-004(j)	None	Administratively Complete	Outfall
46-004(k)	None	Administratively Complete	Outfall
46-004(l)	None	Administratively Complete	Outfall
46-004(m)	None	In Progress	Outfall
46-004(n)	None	Administratively Complete	Outfall
46-004(o)	None	Administratively Complete	Outfall
46-004(p)	None	In Progress	Sump
46-004(q)	None	In Progress	Outfall
46-004(r)	None	In Progress	Outfall
46-004(s)	None	In Progress	Outfall
46-004(t)	None	In Progress	Outfall
46-004(u)	None	In Progress	Outfall
46-004(v)	None	In Progress	Outfall
46-004(w)	None	In Progress	Outfall
46-004(x)	None	In Progress	Outfall
46-004(y)	None	In Progress	Outfall
46-004(z)	None	In Progress	Outfall
46-005	None	In Progress	Surface impoundment
46-006(a)	None	In Progress	Operational release
46-006(b)	None	In Progress	Operational release
46-006(c)	None	In Progress	Operational release
46-006(d)	None	In Progress	Operational release
46-006(e)	None	Administratively Complete	Surface disposal
46-006(f)	None	In Progress	Storage area
46-006(g)	None	In Progress	Operational release
46-007	None	In Progress	Operational release
46-008(a)	None	In Progress	Storage area
46-008(b)	None	In Progress	Storage area
46-008(c)	None	Administratively Complete	Storage area
46-008(d)	None	In Progress	Storage area
46-008(e)	None	In Progress	Storage area
46-008(f)	None	In Progress	Storage area
46-008(g)	None	In Progress	Storage area
46-008misc	None	Administratively Complete	Storage area - doesn't exist
46-009(a)	None	In Progress	Surface disposal
46-009(b)	None	In Progress	Surface disposal
46-010(a)	None	Administratively Complete	Storage area
46-010(b)	None	Administratively Complete	Storage area
46-010(c)	None	Administratively Complete	Storage area

Table B-3.4 (continued)
Upper Cañada del Buey Aggregate

Legacy Waste Site	Subunit	Status	Description
46-010(d)	None	In Progress	Operational release SAA
46-010(e)	None	Administratively Complete	Storage area
46-010(f)	None	Administratively Complete	Storage area
46-010misc	None	Administratively Complete	Storage area - doesn't exist
52-001(a)	None	Administratively Complete	UHTREX equipment
52-001(b)	None	Administratively Complete	UHTREX equipment
52-001(c)	None	Administratively Complete	UHTREX equipment
52-001(d)	None	Pending	UHTREX equipment
52-002(b)	None	Administratively Complete	Septic system
52-002(f)	None	Administratively Complete	Septic system
52-002(g)	None	Administratively Complete	Septic system
52-004	None	Administratively Complete	Evaporator
C-46-001	None	In Progress	One-time spill
C-52-001	None	Administratively Complete	Former transformer site - PCB only site
C-52-002	None	Administratively Complete	Former transformer site - PCB only site

Table B-3.5
Middle Cañada del Buey Aggregate

Legacy Waste Site	Subunit	Status	Description
18-005(b)	None	Administratively Complete	Storage area
18-005(c)	None	Administratively Complete	Storage area
51-001	None	In Progress	Septic system
51-002(a)	None	Administratively Complete	Usage site (environmental research caisson)
51-002(b)	None	Administratively Complete	Usage site (environmental research caisson)
54-001(a)	None	In Progress	Storage area
54-001(b)	None	In Progress	Storage area
54-001(c)	None	Administratively Complete	Storage area
54-001(d)	None	In Progress	Storage area
54-001(e)	None	In Progress	Storage area
54-002	None	In Progress	Storage area (gas cylinder storage area)
54-004	None	In Progress	MDA H
54-005	None	Pending	MDA J (Pits 1-5, Shafts 1-4)
54-006	None	In Progress	MDA L (all subsurface units such as Pit A, SI B,C,D, Shafts 1-28, 29-34)
54-007(c)-99	54-007(c)	Administratively Complete	Former septic systems
	54-007(e)	Administratively Complete	Former septic systems
54-007(d)	None	In Progress	Septic system
54-013(a)	None	Administratively Complete	Decontamination facility
54-015(h)	None	Administratively Complete	Drum storage area
54-016(a)	None	Administratively Complete	Sump
C-18-002	None	Administratively Complete	Building
C-51-001	None	Administratively Complete	Storage area
C-51-002	None	Administratively Complete	Buildings

Table B-4.1
Twomile Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
03-001(a)	None	Administratively Complete	Less-than-ninety day storage
03-001(b)	None	Administratively Complete	Satellite accumulation area
03-001(c)	None	Administratively Complete	Less-than-ninety day storage
03-001(e)	None	In Progress	Less-than-90-day storage
03-001(g)	None	Administratively Complete	Satellite accumulation area
03-001(k)	None	In Progress	Less-than-90-day-storage area
03-001(l)	None	Administratively Complete	Less-than-ninety day storage
03-001(s)	None	Administratively Complete	Satellite accumulation area

Table B-4.1 (continued)
Twomile Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
03-001(t)	None	Administratively Complete	Satellite accumulation area
03-001(u)	None	Administratively Complete	Satellite accumulation area
03-001(w)	None	Administratively Complete	Satellite accumulation area
03-002(d)	None	Administratively Complete	Former storage area
03-003(a)	None	In Progress	Storage area
03-003(b)	None	In Progress	Storage area
03-003(h)	None	Administratively Complete	Storage area (transformers) - PCB only site
03-003(j)	None	Administratively Complete	Storage area (transformers) - PCB only site
03-003(k)	None	Administratively Complete	Storage area (transformer) - PCB only site
03-003(l)	None	In Progress	Storage area
03-003(p)	None	In Progress	Storage area
03-009(d)	None	Pending	Surface disposal site
03-009(f)	None	Administratively Complete	Surface disposal
03-009(g)	None	Administratively Complete	Soil fill area
03-010(a)	None	In Progress	Vacuum repair shop (former location)- systematic release
03-011	None	Pending	Systematic product release
03-013(g)	None	Administratively Complete	Operational release
03-013(h)	None	Administratively Complete	Operational release
03-014(a2)	None	In Progress	Wastewater treatment facility
03-014(t)	None	In Progress	Wastewater treatment facility
03-014(z)	None	In Progress	Wastewater treatment facility
03-016(a)	None	Administratively Complete	Septic system
03-018	None	Administratively Complete	Septic system
03-019	None	Administratively Complete	Septic tank
03-022	None	In Progress	Sump
03-025(b)	None	In Progress	Sumps (two, inactive and active)
03-025(c)	None	In Progress	Tank and/or associated equipment
03-026(d)	None	In Progress	Tank and/or associated equipment
03-033	None	In Progress	Sump
03-038(e)	None	Administratively Complete	Waste lines
03-038(f)	None	In Progress	Waste lines
03-039(c)	None	Administratively Complete	Silver recovery unit
03-040(a)	None	Administratively Complete	Storage area
03-042	None	In Progress	Sump
03-043(c)	None	In Progress	Tank and/or associated equipment
03-043(i)	None	Administratively Complete	Aboveground tank
03-044(b)	None	Administratively Complete	Container storage
03-047(j)	None	Administratively Complete	Drum storage
03-047(k)	None	Administratively Complete	Drum storage
03-050(a)-00	03-050(a)	In Progress	Soil contamination
	03-050(d)	In Progress	Soil contamination
	03-050(f)	In Progress	Soil contamination
	03-050(g)	In Progress	Soil contamination
03-050(e)	None	Administratively Complete	Filter unit (inactive)
03-051(a)	None	Administratively Complete	Soil contamination (oil from leaking compressor)
03-051(b)	None	Administratively Complete	Soil contamination (oil from leaking compressor)
03-051(d)	None	Administratively Complete	Soil contamination (oil from leaking compressor)
03-052(a)-00	03-052(a)	In Progress	Drainlines and outfalls
	03-052(e)	In Progress	Drainlines and outfalls
	03-054(b)	In Progress	Drainlines and outfalls
03-054(a)-00	03-054(a)	In Progress	Drainlines and outfalls
	03-054(d)	In Progress	Drainlines and outfalls
03-055(a)	None	In Progress	Outfall
03-055(b)	None	Administratively Complete	Outfall
03-056(f)	None	Administratively Complete	Drum storage
03-056(g)	None	Administratively Complete	Satellite accumulation area
03-056(j)	None	Administratively Complete	Storage area
03-056(m)	None	Administratively Complete	Drum storage area (inactive)
06-001(a)	None	In Progress	Septic system
06-001(b)	None	In Progress	Septic system
06-002-00	06-002	In Progress	Firing site - eastern aggregate
	06-003(c)	In Progress	Firing site - eastern aggregate

Table B-4.1 (continued)
Twomile Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
06-002-00 (cont.)	C-06-005	In Progress	Firing site - eastern aggregate
	C-06-006	In Progress	Firing site - eastern aggregate
	C-06-016	In Progress	Firing site - eastern aggregate
	C-06-020	In Progress	Firing site - eastern aggregate
06-003(a)-99	06-003(a)	In Progress	Former firing site
	06-008	In Progress	Former firing site
	C-06-019	In Progress	Former firing site
06-003(b)	None	Administratively Complete	Firing site (inactive)
06-003(d)	None	In Progress	Firing site (inactive)
06-003(e)	None	In Progress	Firing site (inactive)
06-003(f)	None	In Progress	Firing site (inactive)
06-003(g)-00	06-003(g)	Administratively Complete	Firing site - western aggregate
	C-06-003	Administratively Complete	Firing site - western aggregate
	C-06-007	Administratively Complete	Firing site - western aggregate
	C-06-008	Administratively Complete	Firing site - western aggregate
	C-06-009	Administratively Complete	Firing site - western aggregate
	C-06-010	Administratively Complete	Firing site - western aggregate
	C-06-011	Administratively Complete	Firing site - western aggregate
	C-06-012	Administratively Complete	Firing site - western aggregate
	C-06-013	Administratively Complete	Firing site - western aggregate
	C-06-014	Administratively Complete	Firing site - western aggregate
	C-06-015	Administratively Complete	Firing site - western aggregate
	C-06-017	Administratively Complete	Firing site - western aggregate
	C-06-018	Administratively Complete	Firing site - western aggregate
	C-06-021	Administratively Complete	Firing site - western aggregate
06-003(h)	None	In Progress	Firing site (inactive)
06-004	None	Administratively Complete	Sump
06-006	None	In Progress	Storage area
06-007(a)-99	06-005	In Progress	MDA F
	06-007(a)	In Progress	MDA F
	06-007(b)	In Progress	MDA F
	06-007(c)	In Progress	MDA F
	06-007(d)	In Progress	MDA F
	06-007(e)	In Progress	MDA F
06-007(f)	None	In Progress	Surface disposal
06-007(g)	None	In Progress	Building and surface disposal
07-001(a)-99	07-001(a)	In Progress	Former firing sites
	07-001(b)	In Progress	Former firing sites
	07-001(c)	In Progress	Former firing sites
	07-001(d)	In Progress	Former firing sites
07-003(c)	None	Administratively Complete	Typographical error
07-003(d)	None	Administratively Complete	Typographical error
22-003(a)	None	Administratively Complete	Satellite accumulation area
22-003(b)	None	Administratively Complete	Satellite accumulation area
22-003(c)	None	Administratively Complete	Satellite accumulation area
22-003(d)	None	Administratively Complete	Satellite accumulation area
22-003(e)	None	Administratively Complete	Satellite accumulation area
22-003(f)	None	Administratively Complete	Satellite accumulation area
22-003(g)	None	Administratively Complete	Satellite accumulation area
22-010(a)	None	In Progress	Septic system
22-013	None	Administratively Complete	Liquid waste treatment/storage
22-014(a)	None	In Progress	Industrial or sanitary wastewater treatment
22-014(b)	None	In Progress	Sump
22-015(a)	None	In Progress	Drainlines and dry wells
22-015(b)	None	In Progress	Sump and outfall
40-001(a)	None	Administratively Complete	Septic system
40-001(b)	None	In Progress	Septic system
40-002(a)	None	Administratively Complete	Satellite accumulation area inside bldg 40-23
40-005	None	In Progress	Sump
40-007(e)	None	Administratively Complete	Storage area
59-001	None	Administratively Complete	Decommissioned septic system
59-002	None	Administratively Complete	Container storage area

Table B-4.1 (continued)
Twomile Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
59-003	None	Administratively Complete	Sump
59-004	None	In Progress	Outfall
64-001	None	Administratively Complete	Storage area
69-001	None	In Progress	Incinerator and associated equipment
69-002(a)	None	Administratively Complete	Septic system
69-002(b)	None	Administratively Complete	Septic system
C-03-003	None	Administratively Complete	One-time spill, stained asphalt
C-03-008	None	Administratively Complete	Storage area/rad contaminated
C-03-010	None	Administratively Complete	Outfall
C-03-019	None	Administratively Complete	Underground storage tank
C-03-021	None	Administratively Complete	Underground storage tank
C-06-001	None	In Progress	Building
C-50-001	None	In Progress	Transformer - PCB only site
C-59-001	None	Administratively Complete	PCB containing capacitors & transformer - PCB only site

Table B-4.2
Starmer/Upper Pajarito Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
08-001(a)	None	In Progress	Off-gas system
08-001(b)	None	In Progress	Off-gas system
08-002	None	In Progress	Firing site
08-003(a)-00	08-003(a)	In Progress	Septic system, drainlines, and outfall
	08-004(a)	In Progress	Septic system, drainlines, and outfall
	08-004(b)	In Progress	Septic system, drainlines, and outfall
	08-009(a)	In Progress	Septic system, drainlines, and outfall
08-003(b)	None	Administratively Complete	Septic system
08-003(c)	None	Administratively Complete	Septic system
08-004(c)	None	In Progress	Floor drain
08-004(d)	None	In Progress	Drain
08-005	None	Pending	Container storage area
08-006(a)	None	In Progress	MDA Q
08-006(b)	None	Administratively Complete	Landfill
08-007	None	Administratively Complete	Silver recovery unit
08-008(a)	None	Administratively Complete	Storage area
08-008(b)	None	Administratively Complete	Storage area
08-008(c)	None	Administratively Complete	Storage area
08-008(d)	None	Administratively Complete	Storage area
08-009(b)	None	Administratively Complete	Industrial or sanitary wastewater treatment
08-009(c)	None	In Progress	Storm drain and outfall
08-009(d)	None	In Progress	Industrial or sanitary wastewater treatment
08-009(e)	None	In Progress	Industrial or sanitary wastewater treatment
08-009(f)	None	In Progress	Outfall
08-010(a)	None	Administratively Complete	Storage area
08-010(b)	None	Administratively Complete	Storage area
08-010(c)	None	Administratively Complete	Storage area
08-011(a)	None	Administratively Complete	Underground tank
08-011(b)	None	Administratively Complete	Underground tank
09-001(a)-99	09-001(a)	In Progress	Former firing site structures
	09-001(b)	In Progress	Former firing site structures
	C-09-005	In Progress	Former firing site structures
09-001(c)	None	In Progress	Firing site (inactive)
09-001(d)	None	In Progress	Firing sites (inactive)
09-002	None	In Progress	Burn pit
09-003(a)-99	09-003(a)	In Progress	Settling tanks & basket pit associated with Bldg 09-14
	09-003(b)	In Progress	Settling tanks & basket pit associated with Bldg 09-14
	09-003(e)	In Progress	Settling tanks & basket pit associated with Bldg 09-14
09-003(c)	None	Administratively Complete	Manhole
09-003(d)	None	In Progress	Settling tank

Table B-4.2 (continued)
Starmer/Upper Pajarito Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
09-003(f)	None	Administratively Complete	Settling tank
09-003(g)	None	In Progress	Potentially contaminated soil
09-003(h)	None	In Progress	Potentially contaminated soil
09-003(i)	None	In Progress	Potentially contaminated soil
09-004(a)-99	09-004(a)	In Progress	Settling tanks
	09-004(b)	In Progress	Settling tanks
	09-004(c)	In Progress	Settling tanks
	09-004(d)	In Progress	Settling tanks
	09-004(e)	In Progress	Settling tanks
	09-004(f)	In Progress	Settling tanks
	09-004(h)	In Progress	Settling tanks
	09-004(i)	In Progress	Settling tanks
	09-004(j)	In Progress	Settling tanks
	09-004(k)	In Progress	Settling tanks
	09-004(l)	In Progress	Settling tanks
	09-004(m)	In Progress	Settling tanks
	09-004(n)	In Progress	Settling tanks
09-004(g)	None	In Progress	Settling tank
09-004(o)	None	In Progress	Settling tank
09-005(b)	None	Administratively Complete	Septic system
09-005(c)	None	Administratively Complete	Septic system
09-005(e)	None	Administratively Complete	Septic system
09-005(f)	None	Administratively Complete	Septic system
09-005(g)	None	In Progress	Septic tank
09-005(h)	None	Administratively Complete	Septic system
09-006	None	In Progress	Septic tank
09-007	None	Administratively Complete	Basket pit
09-008(a)	None	Administratively Complete	Surface impoundment
09-008(b)-99	09-005(a)	In Progress	Septic tanks and sewage oxidation pond
	09-005(d)	In Progress	Septic tanks and sewage oxidation pond
	09-008(b)	In Progress	Septic tanks and sewage oxidation pond
09-009	None	In Progress	Surface impoundment
09-010(a)	None	In Progress	Storage area
09-010(b)	None	In Progress	Storage area
09-010(c)	None	Administratively Complete	Storage area
09-011(a)	None	Administratively Complete	Storage area
09-011(b)	None	Administratively Complete	Storage area
09-011(c)	None	In Progress	Storage area
09-012	None	In Progress	Disposal pit
09-013	None	In Progress	MDA M
09-014	None	Pending	Camera mount
09-015	None	Administratively Complete	Manhole
09-016	None	Administratively Complete	Underground tank
22-001	None	Administratively Complete	Building
22-011	None	In Progress	Disposal pit
22-014(c)	None	Administratively Complete	Unit does not exist
22-015(c)	None	In Progress	Outfall
22-015(d)-99	22-010(b)	In Progress	Septic system
	22-012	In Progress	Septic system
	22-015(d)	In Progress	Septic system
	22-015(e)	In Progress	Septic system
	22-016	In Progress	Septic system
40-001(c)	None	In Progress	Septic system
40-002(b)	None	Administratively Complete	Satellite accumulation area inside bldg 40-23
40-002(c)	None	Administratively Complete	Satellite accumulation area inside bldg 40-05
40-003(a)	None	In Progress	Scrap burn site - completed RCRA closure
40-003(b)	None	In Progress	Burning area/open detonation (closure)
40-004	None	In Progress	Operational release
40-006(a)	None	In Progress	Firing site (active)
40-006(b)	None	In Progress	Firing site (active)
40-006(c)	None	In Progress	Firing site (active)
40-007(a)	None	Administratively Complete	Storage area

Table B-4.2 (continued)
Starmer/Upper Pajarito Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
40-007(b)	None	Administratively Complete	Storage area
40-007(c)	None	Administratively Complete	Storage area
40-007(d)	None	Administratively Complete	Storage area
40-008	None	Administratively Complete	HE storage area decommissioned
40-009	None	In Progress	Landfill
40-010	None	In Progress	Surface disposal site
C-08-001	None	Administratively Complete	Building
C-08-002	None	Administratively Complete	Building
C-08-003	None	Administratively Complete	Building
C-08-004	None	Administratively Complete	Building
C-08-005	None	Administratively Complete	Building
C-08-006	None	Administratively Complete	Building
C-08-007	None	Administratively Complete	Building
C-08-008	None	Administratively Complete	Building
C-08-009	None	Administratively Complete	Building
C-08-010	None	Pending	Building
C-08-011	None	Administratively Complete	Building
C-08-012	None	Administratively Complete	Building
C-08-013	None	Administratively Complete	Building
C-08-014	None	In Progress	Laboratory
C-08-015	None	Administratively Complete	Building
C-08-016	None	Administratively Complete	Building
C-08-017	None	Administratively Complete	Storage area
C-08-018	None	Administratively Complete	Storage area
C-08-019	None	Administratively Complete	Storage area
C-08-020	None	Administratively Complete	Disposal area
C-09-001	None	In Progress	Soil contamination
C-09-002	None	Administratively Complete	Buildings
C-09-003	None	Administratively Complete	Buildings
C-09-004	None	Administratively Complete	Building
C-09-006	None	Administratively Complete	Buildings
C-09-007	None	Administratively Complete	Building
C-09-008	None	Administratively Complete	Underground tank
C-09-009	None	Administratively Complete	Nonintentional release
C-09-010	None	Administratively Complete	Burn site - doesn't exist
C-09-011	None	Administratively Complete	Burn site
C-40-001	None	Administratively Complete	Usage site

Table B-4.3
Threemile Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
12-001(a)-99	12-001(a)	In Progress	Former firing site
	12-001(b)	In Progress	Former firing site
	12-002	In Progress	Former firing site
	C-12-005	In Progress	Former firing site
12-003	None	Administratively Complete	Storage area
12-004(a)	None	In Progress	Radiation test facility
12-004(b)	None	In Progress	Pipe
15-004(a)	None	Pending	Firing Site C (inactive)
15-004(d)	None	Administratively Complete	Firing Site C (inactive)
15-004(e)	None	Administratively Complete	Manhole bunker - mistakenly called firing site
15-005(c)	None	In Progress	Container storage area (R-41)
15-006(b)	None	Pending	Firing Site Ector (active)
15-006(c)-99	15-006(c)	In Progress	R-44 firing site (inactive)
	15-008(b)	In Progress	R-44 firing site (inactive)
15-006(d)-99	15-006(d)	In Progress	R-45 firing site
	15-008(g)	In Progress	R-45 firing site
15-007(c)-00	15-007(c)	Pending	Shafts

Table B-4.3 (continued)
Threemile Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
15-007(c)-00 (cont.)	15-007(d)	Pending	Shafts
15-009(b)	None	In Progress	Septic system
15-009(c)	None	In Progress	Septic tank
15-009(d)	None	Administratively Complete	Septic tank
15-009(h)	None	In Progress	Septic tank
15-010(b)	None	In Progress	Septic system
15-014(f)	None	Administratively Complete	Industrial or sanitary wastewater treatment
15-014(h)	None	In Progress	Outfall
15-014(m)	None	Administratively Complete	Drainline and outfall (active)
18-007	None	Administratively Complete	Buried armored vehicle
36-002	None	In Progress	Sump
36-003(a)	None	In Progress	Septic system
36-003(d)	None	Administratively Complete	Septic system
36-008	None	In Progress	NEW SWMU-Surface disposal area located near TA-36-1
C-12-001	None	In Progress	Building
C-12-002	None	In Progress	Building
C-12-003	None	In Progress	Building
C-12-004	None	In Progress	Building
C-12-006	None	Administratively Complete	Pole - duplicate of 12-004(a)
C-14-006	None	In Progress	Building
C-15-003	None	Administratively Complete	Surface disposal
C-15-009	None	Administratively Complete	Underground tank
C-36-003	None	In Progress	Storm drainages

Table B-4.4
Lower Pajarito Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
18-001(a)-00	18-001(a)	In Progress	Industrial or sanitary wastewater treatment
	18-001(b)	In Progress	Industrial or sanitary wastewater treatment
18-001(c)-00	18-001(c)	In Progress	Tanks, sumps, outfalls
	18-012(b)	In Progress	Tanks, sumps, outfalls
18-002(a)	None	Pending	Firing site (inactive)
18-002(b)	None	Pending	Firing site (inactive)
18-002(c)	None	In Progress	Drop tower
18-003(a)-00	18-003(a)	In Progress	Tanks, sumps, and outfalls
	18-003(b)	In Progress	Tanks, sumps, and outfalls
18-003(c)	None	In Progress	Septic system
18-003(d)	None	In Progress	Septic system
18-003(e)	None	In Progress	Septic system
18-003(f)	None	In Progress	Septic system
18-003(g)	None	In Progress	Septic system
18-003(h)	None	In Progress	Septic system
18-004(a)-00	18-004(a)	In Progress	Tanks, sumps, outfalls
	18-004(b)	In Progress	Tanks, sumps, outfalls
18-005(a)	None	In Progress	Storage area
18-006	None	Administratively Complete	Storage pipe
18-008	None	Administratively Complete	Underground tank TA 18-26
18-009(a)	None	Administratively Complete	Transformer - PCB only site
18-009(b)	None	Administratively Complete	Transformer - PCB only site
18-009(c)	None	Administratively Complete	Transformer - PCB only site
18-009(d)	None	Administratively Complete	Transformer - PCB only site
18-009(e)	None	Administratively Complete	Transformer - PCB only site
18-010(a)	None	Administratively Complete	Outfall
18-010(b)	None	In Progress	Outfall
18-010(c)	None	In Progress	Outfall
18-010(d)	None	In Progress	Outfall
18-010(e)	None	In Progress	Outfall
18-010(f)	None	In Progress	Outfall

Table B-4.4 (continued)
Lower Pajarito Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
18-011	None	In Progress	Soil containment
18-012(a)	None	In Progress	Outfall
18-012(c)	None	In Progress	Sump and drainlines
18-012(d)	None	Administratively Complete	Drainline
18-013	None	In Progress	Waste tank
27-001	None	Administratively Complete	Buried naval guns
27-002	None	In Progress	Firing sites (inactive)
27-003	None	In Progress	Bazooka impact area
27-004	None	Administratively Complete	Former control building
54-001(f)	None	Administratively Complete	Storage area
54-007(a)	None	Pending	Septic system
54-007(b)	None	Administratively Complete	Septic system (inactive)
54-008	None	Administratively Complete	Underground tank
54-009	None	In Progress	Aboveground tanks (treatment tanks)
54-010	None	Administratively Complete	Underground tank (supply wash-water tank)
54-012(a)	None	In Progress	Former reduction site (drum compactor)
54-012(b)	None	In Progress	Reduction site
54-013(b)-99	54-013(b)	In Progress	MDA G subsurface waste management units
	54-014(b)	In Progress	MDA G subsurface waste management units
	54-014(c)	In Progress	MDA G subsurface waste management units
	54-014(d)	In Progress	MDA G subsurface waste management units
	54-015(k)	In Progress	MDA G subsurface waste management units
	54-017	In Progress	MDA G subsurface waste management units
	54-018	In Progress	MDA G subsurface waste management units
	54-019	In Progress	MDA G subsurface waste management units
	54-020	In Progress	MDA G subsurface waste management units
54-014(a)	None	In Progress	MDA G subsurface waste management units
54-015(a)	None	In Progress	Storage area (surface corrosive inhibitor)
54-015(b)	None	In Progress	Pit 39- LLW disposal area (former transuranic surface storage)
54-015(c)	None	In Progress	Storage area, transuranic Pad 1
54-015(d)	None	In Progress	Storage area, transuranic Pad 2
54-015(e)	None	In Progress	Storage area, transuranic Pad 3
54-015(f)	None	In Progress	Storage area, transuranic Pad 4
54-015(g)	None	Administratively Complete	Storage area (Pb casks near shaft 4)
54-015(i)	None	Administratively Complete	Storage area -forklift battery
54-015(j)	None	In Progress	Storage area (Dome #49, mixed waste sludge)
54-016(b)	None	In Progress	Sump
54-021	None	Administratively Complete	Aboveground oil storage tanks (6) (inactive)
54-022	None	Administratively Complete	Transformer spill (PCB) - PCB only site
C-18-001	None	Administratively Complete	Laboratory
C-18-003	None	Administratively Complete	Storage area

Table B-5.1
Potrillo/Fence Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
15-002-00	15-002	In Progress	Firing site - R40
	15-007(a)	In Progress	Firing site - R40
15-003-00	15-003	Pending	Phermex firing site
	15-006(a)	Pending	Phermex firing site
15-004(b)-99	15-004(b)	Pending	Firing sites A and B (inactive)
	15-004(c)	Pending	Firing sites A and B (inactive)
15-004(f)-99	15-004(f)	In Progress	Firing site E-F (inactive)
	15-008(a)	In Progress	Firing site E-F (inactive)
15-005(b)	None	In Progress	Container storage area
15-006(e)	None	Administratively Complete	I-J Site at TA-36 - duplicate of C-36-006(e)
15-008(f)	None	In Progress	I-J Firing Site mounds at TA-36 (active)
15-009(e)	None	In Progress	Septic system, E/F Site
15-009(j)	None	Administratively Complete	Septic tank

Table B-5.1 (continued)
Potrillo/Fence Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
15-010(a)	None	In Progress	Septic system
15-012(b)	None	Administratively Complete	Surface disposal site
15-013(b)	None	Administratively Complete	Underground tank
15-014(c)	None	Administratively Complete	Industrial or sanitary wastewater treatment
36-001	None	In Progress	MDA AA
36-003(b)	None	In Progress	Septic system, I-J Site
36-003(c)	None	Administratively Complete	Septic system
36-004(b)	None	Pending	Firing site (active)
36-004(c)	None	Pending	Firing site - open detonation (active)
36-004(d)	None	In Progress	Firing site (Lower Slobbovia, skunk works, burn pit) (active)
36-004(e)	None	Pending	I-J Firing Site (active)
36-004(f)	None	Administratively Complete	Firing site (active)
36-005	None	In Progress	Surface disposal site
36-006-99	36-004(a)	In Progress	Former firing site
	36-006	In Progress	Former firing site
36-007(a)	None	Administratively Complete	Storage area
36-007(b)	None	Administratively Complete	Storage area
36-007(c)	None	Administratively Complete	Storage area
36-007(d)	None	Administratively Complete	Storage area
36-007(e)	None	Administratively Complete	Storage area
36-007(f)	None	Administratively Complete	Storage area
C-15-004	None	In Progress	Transformers - PCB only site
C-15-005	None	In Progress	Former laboratory and building
C-15-006	None	In Progress	Building
C-15-012	None	Administratively Complete	Underground tank (active)
C-15-013	None	Administratively Complete	Underground tank
C-36-001	None	Administratively Complete	Containment vessel
C-36-002	None	Administratively Complete	Surface disposal
C-36-006(e)	None	In Progress	I-J Firing Site, projectile test area [dup of 15-006(e)] (active)

Table B-5.2
Cañon de Valle Aggregate

Legacy Waste Site	Subunit	Status	Description
14-001(a)	None	Administratively Complete	Firing site (active)
14-001(b)	None	Administratively Complete	Firing site (active)
14-001(c)	None	Administratively Complete	Firing site (active)
14-001(d)	None	Administratively Complete	Firing site (active)
14-001(e)	None	Administratively Complete	Firing site (active)
14-001(g)	None	Pending	Firing site - Open Burn/Open Detonation (active)
14-002(a)-99	14-001(f)	In Progress	Former firing site
	14-002(a)	In Progress	Former firing site
	14-002(b)	In Progress	Former firing site
	14-002(f)	In Progress	Former firing site
	14-009	In Progress	Former firing site
	14-010	In Progress	Former firing site
	C-14-008	In Progress	Former firing site
14-002(c)-99	14-002(c)	In Progress	Former firing site
	14-002(d)	In Progress	Former firing site
	14-002(e)	In Progress	Former firing site
14-003	None	Pending	Open burning ground
14-004(a)	None	Administratively Complete	Storage area (active)
14-004(b)	None	Administratively Complete	Satellite accumulation area
14-004(c)	None	Administratively Complete	Storage area
14-005	None	In Progress	Incinerator (active)
14-006	None	In Progress	Tank and/or associated equipment
14-007	None	In Progress	Septic system
14-008	None	Administratively Complete	Landfill and surface disposal
15-004(g)-00	15-004(g)	In Progress	Firing site G (inactive)
	15-008(c)	In Progress	Firing site G (inactive)

Table B-5.2 (continued)
Cañon de Valle Aggregate

Legacy Waste Site	Subunit	Status	Description
15-004(i)	None	In Progress	The Gulch firing site (inactive)
15-005(a)	None	Administratively Complete	Storage area
15-005(d)	None	Administratively Complete	Storage area
15-007(b)	None	In Progress	MDA Z landfill
15-008(d)	None	In Progress	Surface disposal
15-008(e)	None	Administratively Complete	Surface disposal
15-009(a)-00	15-009(a)	In Progress	Former structures - the Hollow
	15-011(a)	In Progress	Former structures - the Hollow
	15-011(b)	In Progress	Former structures - the Hollow
	15-011(c)	In Progress	Former structures - the Hollow
	15-014(i)	In Progress	Former structures - the Hollow
	15-014(j)	In Progress	Former structures - the Hollow
	15-014(k)	In Progress	Former structures - the Hollow
15-009(f)-00	15-009(f)	In Progress	Firing site and septic systems
	15-009(k)	In Progress	Firing site and septic systems
15-009(i)	None	In Progress	Septic tank
15-012(a)	None	Administratively Complete	Surface disposal (not located) - doesn't exist
15-014(a)-00	15-014(a)	In Progress	Outfalls
	15-014(b)	In Progress	Outfalls
15-014(g)	None	In Progress	Industrial or sanitary wastewater treatment
16-001(a)-99	16-001(a)	In Progress	Former steam plant
	16-001(b)	In Progress	Former steam plant
	16-001(c)	In Progress	Former steam plant
16-003(h)-99	16-003(h)	In Progress	Inactive sump, drainline, and outfall
	16-030(d)	In Progress	Inactive sump, drainline, and outfall
16-003(i)	None	In Progress	Sump 16-265
16-003(j)	None	In Progress	Sump 16-267
16-003(n)-99	16-003(n)	In Progress	HE sump
	16-029(i)	In Progress	HE sump
16-003(o)	None	In Progress	Sump- fish ladder
16-005(b)	None	Administratively Complete	Septic system (removed)
16-005(f)	None	Administratively Complete	Decommissioned septic system
16-005(n)	None	In Progress	Septic system
16-006(a)	None	In Progress	Septic system
16-006(b)	None	Administratively Complete	Septic system
16-007(a)-99	16-007(a)	In Progress	Machining buildings and settling ponds
	16-024(d)	In Progress	Machining buildings and settling ponds
	16-024(e)	In Progress	Machining buildings and settling ponds
	16-025(e)	In Progress	Machining buildings and settling ponds
	16-025(f)	In Progress	Machining buildings and settling ponds
16-007(b)	None	Administratively Complete	Surface disposal site - doesn't exist
16-008(a)-99	16-008(a)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-017(a)-99	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-017(b)-99	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-017(c)-99	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-017(d)-99	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-017(e)-99	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-026(m)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-026(n)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-026(o)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-026(p)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-029(k)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-029(l)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-029(s)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-029(t)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	16-029(u)	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
	C-16-067	In Progress	90s-Line: 16-89, 16-90, 16-91, 16-92, 16-93
16-008(b)	None	Administratively Complete	Surface impoundment at the TA-16 burning grounds
16-009(a)	None	In Progress	Burn site
16-010(b)	None	In Progress	Flash pad; RCRA unit (undergoing closure)
16-010(c)	None	In Progress	Burn site 16-388 - RCRA Unit (active)
16-010(d)	None	In Progress	Burn site 16-399 - RCRA unit (active)

Table B-5.2 (continued)
Cañon de Valle Aggregate

Legacy Waste Site	Subunit	Status	Description
16-010(e)	None	In Progress	HE filter vessel; RCRA unit (active)
16-010(f)	None	In Progress	HE filter vessel; RCRA unit (active)
16-010(g)	None	Administratively Complete	Wastewater treatment facility
16-010(h)-99	16-005(g)	In Progress	Former burning ground structures
	16-010(h)	In Progress	Former burning ground structures
	16-010(i)	In Progress	Former burning ground structures
	16-010(j)	In Progress	Former burning ground structures
	16-010(k)	In Progress	Former burning ground structures
	16-010(l)	In Progress	Former burning ground structures
	16-010(m)	In Progress	Former burning ground structures
	16-010(n)	In Progress	Former burning ground structures
16-012(a)	None	Administratively Complete	Container storage, rest house
16-012(a2)	None	Administratively Complete	Container storage
16-012(b)	None	Administratively Complete	Container storage - rest house
16-012(c)	None	Administratively Complete	Container storage - rest house
16-012(d)	None	Administratively Complete	Satellite accumulation area
16-012(e)	None	Administratively Complete	Container storage - rest house
16-012(f)	None	Administratively Complete	Container storage - rest house
16-012(g)	None	Administratively Complete	Container storage - rest house
16-012(h)	None	Administratively Complete	Container storage - rest house
16-012(n)	None	Administratively Complete	Satellite accumulation area
16-012(o)	None	Administratively Complete	Container storage - rest house
16-012(p)	None	Administratively Complete	Less-than-ninety-day storage
16-012(q)	None	Administratively Complete	Container storage - rest house
16-012(r)	None	Administratively Complete	Container storage - rest house
16-012(z)	None	Administratively Complete	Container storage - rest house
16-016(b)	None	In Progress	Landfill
16-016(c)-99	16-006(e)	In Progress	Burning ground
	16-010(a)	In Progress	Burning ground
	16-016(c)	In Progress	Burning ground
16-016(d)	None	In Progress	Surface disposal site
16-017(g)-99	None	In Progress	Former HE structure
16-017(i)-99	C-16-025	In Progress	Storage building
	C-16-026	In Progress	Storage building
16-018	None	In Progress	MDA P; RCRA unit (currently undergoing RCRA closure)
16-019	None	In Progress	MDA R
16-020	None	In Progress	Silver recovery unit
16-021(c)-99	16-003(k)	In Progress	16-260 Sumps, drainlines, and outfall
	16-021(c)	In Progress	16-260 Sumps, drainlines, and outfall
16-023(a)	None	Administratively Complete	Incinerator – does not exist
16-024(b)	None	In Progress	Magazine
16-024(c)	None	Administratively Complete	Magazine
16-024(f)	None	Administratively Complete	Magazine
16-024(g)	None	Administratively Complete	Magazine
16-024(h)	None	In Progress	Magazine
16-024(v)	None	In Progress	Magazine
16-025(a)	None	In Progress	Abandoned radiography building, 16-39
16-025(b)	None	In Progress	Abandoned radiography building, 16-40
16-025(c)	None	Administratively Complete	Abandoned utility building and appurtenances
16-025(e2)	None	Pending	Abandoned building, 16-106
16-025(f2)	None	Pending	Abandoned building, 16-107
16-026(g)	None	In Progress	Outfall
16-026(g2)	None	Pending	Outfall from 16-285
16-026(h)	None	Pending	Outfall from 16-281
16-026(i)	None	In Progress	Outfall
16-026(i2)	None	Administratively Complete	Outfall
16-026(j)	None	In Progress	Outfall, 16-226
16-026(j2)	None	In Progress	Outfall
16-026(k)	None	Pending	Outfall and associated drainline
16-026(l)-00	16-026(l)	In Progress	Drainlines and outfall
	16-028(c)	In Progress	Drainlines and outfall
16-026(r)	None	In Progress	Outfall, 16-180

Table B-5.2 (continued)
Cañon de Valle Aggregate

Legacy Waste Site	Subunit	Status	Description
16-027(a)	None	Administratively Complete	Transformer - PCB only site
16-027(b)	None	Administratively Complete	Transformer - PCB only site
16-028(a)	None	In Progress	South drainage channel
16-029(f)	None	In Progress	Sump from building 16-345
16-029(h2)-99	16-025(d)	In Progress	HE machining line buildings and associated structures
	16-025(g)	In Progress	HE machining line buildings and associated structures
	16-025(h)	In Progress	HE machining line buildings and associated structures
	16-025(i)	In Progress	HE machining line buildings and associated structures
	16-025(j)	In Progress	HE machining line buildings and associated structures
	16-029(h2)	In Progress	HE machining line buildings and associated structures
	16-029(m)	In Progress	HE machining line buildings and associated structures
	16-029(n)	In Progress	HE machining line buildings and associated structures
	16-029(o)	In Progress	HE machining line buildings and associated structures
	16-029(p)	In Progress	HE machining line buildings and associated structures
16-029(j)-99	16-026(k2)	In Progress	16-260 Bay 25 outfalls
	16-029(j)	In Progress	16-260 Bay 25 outfalls
16-029(q)-99	16-017(f)-99	In Progress	HE machining building and associated structures
	16-029(q)	In Progress	HE machining building and associated structures
	C-16-064	In Progress	HE machining building and associated structures
16-030(a)	None	In Progress	Outfall from 16-344, chemical storage building
16-030(b)	None	Pending	Outfall and associated drainline
16-030(c)	None	Pending	16-222 outfall
16-030(e)	None	Pending	Outfall and associated drainline
16-030(f)	None	Pending	Outfall and associated drainline
16-031(b)	None	In Progress	Industrial or sanitary wastewater treatment, 16-262
16-033(e)	None	In Progress	Underground tank
16-033(f)	None	Administratively Complete	Underground tank
16-033(g)	None	Administratively Complete	Underground tank
16-033(h)	None	Administratively Complete	Underground tank
16-034(b)-99	16-005(j)	In Progress	Former structures, T-Site
	16-005(m)	In Progress	Former structures, T-Site
	16-025(m)	In Progress	Former structures, T-Site
	16-025(n)	In Progress	Former structures, T-Site
	16-025(o)	In Progress	Former structures, T-Site
	16-034(b)	In Progress	Former structures, T-Site
	16-034(c)	In Progress	Former structures, T-Site
	16-034(d)	In Progress	Former structures, T-Site
	16-034(e)	In Progress	Former structures, T-Site
	16-034(f)	In Progress	Former structures, T-Site
16-034(h)	None	In Progress	Soil contamination area, 16-137
16-034(i)	None	In Progress	Soil contamination area
16-034(j)	None	In Progress	Soil contamination area
16-034(k)	None	In Progress	Soil contamination area
16-037	None	Administratively Complete	Aboveground tank - doesn't exist
C-14-001	None	In Progress	Building
C-14-002	None	Administratively Complete	Building
C-14-003	None	In Progress	Building
C-14-004	None	In Progress	Building
C-14-005	None	In Progress	Building
C-14-007	None	In Progress	Building
C-14-009	None	In Progress	Building
C-15-001	None	In Progress	Surface disposal
C-15-002	None	Administratively Complete	Surface disposal
C-15-007	None	In Progress	Nonintentional release
C-15-008	None	Administratively Complete	Nonintentional release
C-15-010	None	In Progress	Former underground tank
C-16-001	None	Administratively Complete	Building
C-16-002	None	In Progress	Building 16-262
C-16-003	None	Administratively Complete	Septic system - see 16-005(n)
C-16-008	None	Administratively Complete	Building
C-16-009	None	Administratively Complete	Building
C-16-010	None	Administratively Complete	Building

Table B-5.2 (continued)
Cañon de Valle Aggregate

Legacy Waste Site	Subunit	Status	Description
C-16-011	None	In Progress	Building TA-16-132
C-16-012	None	Administratively Complete	Building
C-16-013	None	Administratively Complete	Storage area
C-16-014	None	Administratively Complete	Building
C-16-015	None	Administratively Complete	Building
C-16-016	None	Administratively Complete	Building
C-16-017	None	Administratively Complete	Building
C-16-018	None	Administratively Complete	Aboveground tank
C-16-023	None	Administratively Complete	Warehouse
C-16-036	None	Administratively Complete	Septic system
C-16-038	None	Administratively Complete	Storage area
C-16-041	None	Administratively Complete	Building
C-16-042	None	Administratively Complete	Steam manhole
C-16-043	None	Administratively Complete	Steam manhole
C-16-044	None	Administratively Complete	Manhole
C-16-051	None	Administratively Complete	Transport area
C-16-052	None	Administratively Complete	Steam manhole
C-16-053	None	Administratively Complete	Water manhole
C-16-054	None	Administratively Complete	Steam manhole
C-16-055	None	Administratively Complete	Switch box
C-16-061	None	Administratively Complete	Building
C-16-066	None	Administratively Complete	Storage area
C-16-070	None	Administratively Complete	Underground tank
C-16-072	None	Administratively Complete	Tank - doesn't exist
C-16-075	None	In Progress	Spill location near Building 16-340

Table B-5.3
S-Site Aggregate

Legacy Waste Site	Subunit	Status	Description
11-001(b)	None	Pending	Firing site (inactive)
11-003(a)	None	Administratively Complete	Mortar impact area
11-003(b)	None	Pending	Air gun
11-004(a)-99	11-004(a)	Pending	Drop test tower and related structures
	11-004(b)	Pending	Drop test tower and related structures
	11-004(c)	Pending	Drop test tower and related structures
	11-004(d)	Pending	Drop test tower and related structures
	11-004(e)	Pending	Drop test tower and related structures
	11-004(f)	Pending	Drop test tower and related structures
11-005(a)	None	In Progress	Septic system
11-005(b)	None	In Progress	Septic system
11-005(c)	None	In Progress	Outfall (inactive)
11-006(a)-99	11-001(a)	In Progress	Former firing site
	11-002	In Progress	Former firing site
	11-006(a)	In Progress	Former firing site
	11-006(b)	In Progress	Former firing site
	11-006(c)	In Progress	Former firing site
	11-006(d)	In Progress	Former firing site
	C-11-001	In Progress	Former firing site
11-007	None	Administratively Complete	Surface disposal
11-008	None	Administratively Complete	Surface disposal
11-009	None	In Progress	MDA S
11-010(a)	None	Administratively Complete	Container storage area
11-010(b)	None	Administratively Complete	Container storage
11-011(a)-00	11-011(a)	In Progress	Outfalls
	11-011(b)	In Progress	Outfalls
11-011(c)	None	Administratively Complete	Boiler discharge
11-011(d)	None	In Progress	Industrial or sanitary wastewater treatment
11-012(c)	None	In Progress	Building
11-012(d)	None	In Progress	Building

Table B-5.3 (continued)
S-Site Aggregate

Legacy Waste Site	Subunit	Status	Description
13-001-99	13-001	In Progress	Firing site, landfill, and soil contamination
	13-002	In Progress	Firing site, landfill, and soil contamination
	16-035	In Progress	Firing site, landfill, and soil contamination
	16-036	In Progress	Firing site, landfill, and soil contamination
13-003(a)-99	13-003(a)	In Progress	TA-13 septic system (inactive)
	13-003(b)	In Progress	TA-13 septic system (inactive)
13-004	None	In Progress	Disposal pit - existence not determined
16-003(d)-99	16-001(e)	In Progress	Sumps and associated dry well
	16-003(d)	In Progress	Sumps and associated dry well
	16-003(e)	In Progress	Sumps and associated dry well
	16-003(f)	In Progress	Sumps and associated dry well
	16-003(g)	In Progress	Sumps and associated dry well
16-004(a)-99	16-004(a)	In Progress	Wastewater treatment plant
	16-004(b)	In Progress	Wastewater treatment plant
	16-004(c)	In Progress	Wastewater treatment plant
	16-004(d)	In Progress	Wastewater treatment plant
	16-004(e)	In Progress	Wastewater treatment plant
	16-004(f)	In Progress	Wastewater treatment plant
16-005(i)	None	Administratively Complete	Septic tank
16-012(i)	None	Administratively Complete	Satellite accumulation area
16-012(j)	None	Administratively Complete	Satellite accumulation area
16-012(k)	None	Administratively Complete	Container storage - rest house
16-012(l)	None	Administratively Complete	Satellite accumulation area
16-012(m)	None	Administratively Complete	Satellite accumulation area
16-013-99	16-006(h)	In Progress	V-Site courtyard
	16-013	In Progress	V-Site courtyard
	16-017(q)-99	In Progress	V-Site courtyard
	16-017(r)-99	In Progress	V-Site courtyard
	16-017(s)-99	In Progress	V-Site courtyard
	16-017(t)-99	In Progress	V-Site courtyard
	16-017(u)-99	In Progress	V-Site courtyard
	16-029(g2)	In Progress	V-Site courtyard
	C-16-068	In Progress	V-Site courtyard
	C-16-074	In Progress	V-Site courtyard
16-017(p)-99	None	In Progress	Former structure - storage magazine
16-017(w)-99	None	In Progress	Former structure - storage magazine
16-024(a)	None	In Progress	Magazine
16-024(m)	None	In Progress	Magazine
16-024(n)	None	In Progress	Magazine
16-024(u)	None	In Progress	Magazine
16-025(d2)	None	In Progress	Abandoned building, 16-480
16-026(b)-99	16-026(b)	In Progress	300s-Line (west side) sumps and outfalls
	16-026(c)	In Progress	300s-Line (west side) sumps and outfalls
	16-026(d)	In Progress	300s-Line (west side) sumps and outfalls
	16-026(e)	In Progress	300s-Line (west side) sumps and outfalls
	16-029(a)	In Progress	300s-Line (west side) sumps and outfalls
	16-029(b)	In Progress	300s-Line (west side) sumps and outfalls
	16-029(c)	In Progress	300s-Line (west side) sumps and outfalls
	16-029(d)	In Progress	300s-Line (west side) sumps and outfalls
16-026(f)	None	Pending	Outfall
16-026(z)	None	In Progress	Outfall
16-029(h)-99	16-003(p)	In Progress	Sump, drainlines, and outfall
	16-029(h)	In Progress	Sump, drainlines, and outfall
16-029(x)-99	16-006(g)	In Progress	V-Site: Buildings 16-100, 16-515 & associated structures
	16-017(v)-99	In Progress	V-Site: Buildings 16-100, 16-515 & associated structures
	16-025(x)	In Progress	V-Site: Buildings 16-100, 16-515 & associated structures
	16-029(w)	In Progress	V-Site: Buildings 16-100, 16-515 & associated structures
	16-029(x)	In Progress	V-Site: Buildings 16-100, 16-515 & associated structures
	16-031(c)	In Progress	V-Site: Buildings 16-100, 16-515 & associated structures
16-031(h)	None	In Progress	Industrial or sanitary wastewater treatment at P-Site
16-034(g)	None	Administratively Complete	Soil contamination
16-034(m)	None	In Progress	Soil contamination area

Table B-5.3 (continued)
S-Site Aggregate

Legacy Waste Site	Subunit	Status	Description
16-034(n)	None	In Progress	Soil contamination area
25-001	None	Administratively Complete	Pit
C-11-002	None	In Progress	Laboratory
C-11-003	None	Administratively Complete	One-time release site - never located
C-16-007	None	Administratively Complete	Tank stand
C-16-049	None	Administratively Complete	Building
C-16-050	None	Administratively Complete	Building
C-16-056	None	Administratively Complete	Steam manhole
C-16-057	None	Administratively Complete	Steam manhole
C-16-059	None	Administratively Complete	Electrical pit
C-16-060	None	In Progress	Soil contamination area
C-16-062	None	Administratively Complete	Generation area
C-16-063	None	Administratively Complete	Generation area
C-25-001	None	Administratively Complete	Building

Table B-5.4
Upper Water Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
11-001(c)	None	In Progress	Firing site (inactive)
11-012(a)	None	Administratively Complete	Building
11-012(b)	None	In Progress	Building
16-001(d)	None	In Progress	Dry well
16-003(a)	None	In Progress	Sump
16-003(b)	None	In Progress	Sump
16-003(c)-99	16-003(c)	In Progress	Sump, associated drainline, and outfall
	16-026(v)	In Progress	Sump, associated drainline, and outfall
16-003(l)-99	16-003(l)	In Progress	Sumps, drainlines, and outfalls (inactive)
	16-030(h)	In Progress	Sumps, drainlines, and outfalls (inactive)
16-003(m)-99	16-003(m)	In Progress	Sump, outfall, and septic system
	16-006(d)	In Progress	Sump, outfall, and septic system
	16-030(g)	In Progress	Sump, outfall, and septic system
16-003(q)	None	Administratively Complete	Sump
16-005(a)	None	In Progress	Septic tank
16-005(h)	None	In Progress	Septic tank
16-005(k)	None	In Progress	Septic tank
16-005(l)	None	In Progress	Grease trap
16-005(o)	None	Administratively Complete	Septic system
16-006(c)-00	16-006(c)	In Progress	Septic system
	16-026(a)	In Progress	Septic system
16-006(f)	None	Administratively Complete	Septic system
16-006(i)	None	Administratively Complete	Septic tank
16-012(s)	None	Administratively Complete	Container storage - rest house
16-012(t)	None	Administratively Complete	Satellite accumulation area
16-012(u)	None	Administratively Complete	Satellite accumulation area
16-012(v)	None	Administratively Complete	Container storage - rest house
16-012(w)	None	Administratively Complete	Container storage - rest house
16-012(x)	None	Administratively Complete	Satellite accumulation area
16-012(y)	None	Administratively Complete	Container storage - rest house
16-015(a)	None	In Progress	Men's locker room and laundry facility
16-015(b)	None	In Progress	Steam-washing facility
16-016(a)	None	In Progress	Landfill - buried metal site
16-016(e)	None	In Progress	Surface disposal site
16-016(f)	None	In Progress	Landfill
16-016(g)	None	In Progress	Surface disposal site
16-017	None	Consolidated	Former HE machining building, 16-92
16-017(j)-99	None	In Progress	Former structure - storage magazine
16-017(k)-99	None	In Progress	Former structure - storage magazine
16-017(l)-99	None	In Progress	Former structure - storage magazine
16-017(m)-99	None	In Progress	Former structure - storage magazine
16-017(n)-99	None	In Progress	Former structure - storage magazine

Table B-5.4 (continued)
Upper Water Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
16-017(o)-99	None	In Progress	Former structure - storage magazine
16-021(b)	None	Administratively Complete	Systematic leak
16-022(a)	None	Administratively Complete	Underground tank
16-022(b)	None	In Progress	Underground tank
16-024(i)	None	In Progress	Magazine
16-024(j)	None	In Progress	Magazine
16-024(k)	None	In Progress	Magazine
16-024(l)	None	In Progress	Magazine
16-024(o)	None	In Progress	Magazine
16-024(p)	None	Administratively Complete	Magazine
16-024(q)	None	In Progress	Magazine
16-024(r)	None	Administratively Complete	Magazine
16-024(s)	None	In Progress	Magazine
16-024(t)	None	In Progress	HE magazine
16-025(c2)	None	In Progress	Abandoned building, 16-56
16-025(g2)	None	Administratively Complete	Magazine
16-025(h2)	None	Pending	Abandoned building, 16-109
16-025(w)	None	In Progress	Abandoned building, 16-81
16-025(y)-99	16-025(y)	In Progress	Former building
	16-029(a2)	In Progress	Former building
16-026(a2)	None	Pending	Outfall from 16-200
16-026(b2)-00	16-026(b2)	In Progress	Outfalls
	16-028(d)	In Progress	Outfalls
16-026(c2)	None	In Progress	Outfall, 16-462
16-026(d2)	None	Pending	Outfall from 16-435
16-026(e2)	None	Pending	Outfall from 16-415
16-026(f2)	None	Pending	Outfall and associated drainline
16-026(q)-99	16-005(d)	In Progress	20s-Line and associated structures
	16-017(h)-99	In Progress	20s-Line and associated structures
	16-017(x)-99	In Progress	20s-Line and associated structures
	16-025(k)	In Progress	20s-Line and associated structures
	16-025(l)	In Progress	20s-Line and associated structures
	16-026(q)	In Progress	20s-Line and associated structures
	16-029(f2)	In Progress	20s-Line and associated structures
	16-029(r)	In Progress	20s-Line and associated structures
	16-031(d)	In Progress	20s-Line and associated structures
	16-032(c)	In Progress	20s-Line and associated structures
	16-034(a)	In Progress	20s-Line and associated structures
	C-16-006	In Progress	20s-Line and associated structures
	C-16-065	In Progress	20s-Line and associated structures
16-026(s)	None	In Progress	Outfall, 16-5
16-026(t)	None	Pending	Outfall and associated drainline
16-026(u)	None	In Progress	Outfall, 16-195
16-026(x)	None	Pending	Outfall and associated drainline
16-026(y)	None	In Progress	Outfall
16-027(c)	None	Administratively Complete	Transformer - PCB only site
16-027(d)	None	Administratively Complete	Transformer - PCB only site
16-028(b)	None	In Progress	Industrial or sanitary wastewater treatment, 16-370
16-029(b2)-99	16-029(b2)	In Progress	Former structures (GMX-2 HE processing building)
	C-16-005	In Progress	Former structures (GMX-2 HE processing building)
16-029(c2)-99	16-005(e)	In Progress	Former structures
	16-015(c)	In Progress	Former structures
	16-025(z)	In Progress	Former structures
	16-029(c2)	In Progress	Former structures
16-029(e)-99	16-026(h2)	In Progress	Sump and outfall, 16-360
	16-029(e)	In Progress	Sump and outfall, 16-360
16-029(g)-99	16-021(a)	In Progress	Sump and outfall, 16-450
	16-028(e)	In Progress	Sump and outfall, 16-450
	16-029(g)	In Progress	Sump and outfall, 16-450
16-029(v)-99	16-015(d)	In Progress	Building footprints, drainlines, and sumps
	16-025(a2)	In Progress	Building footprints, drainlines, and sumps
	16-025(b2)	In Progress	Building footprints, drainlines, and sumps

Table B-5.4 (continued)
Upper Water Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
16-029(v)-99 (cont.)	16-029(d2)	In Progress	Building footprints, drainlines, and sumps
	16-029(e2)	In Progress	Building footprints, drainlines, and sumps
	16-029(v)	In Progress	Building footprints, drainlines, and sumps
	16-034(o)	In Progress	Building footprints, drainlines, and sumps
16-029(y)-99	16-025(t)	In Progress	Experimental casting bldg, associated drainlines & sumps
	16-029(y)	In Progress	Experimental casting bldg, associated drainlines & sumps
16-029(z)-99	16-005(c)	In Progress	Former structures, 40s-Line
	16-011	In Progress	Former structures, 40s-Line
	16-023(b)	In Progress	Former structures, 40s-Line
	16-025(p)	In Progress	Former structures, 40s-Line
	16-025(q)	In Progress	Former structures, 40s-Line
	16-025(r)	In Progress	Former structures, 40s-Line
	16-025(s)	In Progress	Former structures, 40s-Line
	16-025(u)	In Progress	Former structures, 40s-Line
	16-025(v)	In Progress	Former structures, 40s-Line
	16-026(w)	In Progress	Former structures, 40s-Line
	16-029(z)	In Progress	Former structures, 40s-Line
	16-032(a)	In Progress	Former structures, 40s-Line
	16-034(l)	In Progress	Former structures, 40s-Line
	16-034(p)	In Progress	Former structures, 40s-Line
16-031(a)	None	In Progress	Industrial or sanitary wastewater treatment, 16-372
16-031(e)	None	In Progress	Outfall, industrial or sanitary wastewater treatment
16-031(f)	None	In Progress	Outfall, industrial or sanitary wastewater treatment
16-031(g)	None	Administratively Complete	Cooling tower outfall
16-032(b)	None	Administratively Complete	Decommissioned HE sump
16-032(d)	None	Administratively Complete	Decommissioned HE sump
16-032(e)	None	Administratively Complete	Decommissioned HE sump
16-033(a)	None	In Progress	Underground tank
16-033(b)	None	In Progress	Underground tank
16-033(c)	None	Administratively Complete	Underground tank
16-033(c)	None	Administratively Complete	Underground tank
16-033(d)	None	Administratively Complete	Tank and/or associated equipment
16-033(i)	None	Administratively Complete	Underground tank
16-033(j)	None	Administratively Complete	Underground tank
16-033(k)	None	In Progress	Underground storage tank <100 gallons
37-001	None	Administratively Complete	Septic system
C-16-004	None	Administratively Complete	Building
C-16-019	None	Administratively Complete	Building
C-16-020	None	Administratively Complete	Building
C-16-021	None	Administratively Complete	Building
C-16-022	None	Administratively Complete	Building
C-16-024	None	Administratively Complete	Building
C-16-027	None	Administratively Complete	Building
C-16-028	None	In Progress	Former structure
C-16-029	None	Administratively Complete	Building
C-16-030	None	In Progress	Former structure
C-16-031	None	In Progress	Building
C-16-032	None	Administratively Complete	Building
C-16-033	None	Administratively Complete	Warehouse
C-16-034	None	Administratively Complete	Aboveground tank
C-16-035	None	Administratively Complete	Aboveground tank
C-16-037	None	Administratively Complete	Storage area
C-16-039	None	Administratively Complete	Building
C-16-040	None	Administratively Complete	Building
C-16-045	None	Administratively Complete	Manhole
C-16-046	None	Administratively Complete	Manhole
C-16-047	None	Administratively Complete	Transport area
C-16-048	None	Administratively Complete	Steam manhole
C-16-058	None	Administratively Complete	Transport area
C-16-069	None	In Progress	Media contamination area
C-16-071	None	Administratively Complete	One-time spill
C-16-073	None	In Progress	Underground tank

Table B-5.5
Lower Water/Indio Canyons Aggregate

Legacy Waste Site	Subunit	Status	Description
15-001	None	In Progress	Surface disposal
15-004(h)	None	In Progress	Firing site H (inactive)
15-009(g)	None	In Progress	Septic tank (active)
15-010(c)	None	Pending	Drainline
15-013(a)	None	Administratively Complete	Underground tank
15-014(d)	None	Administratively Complete	Industrial or sanitary wastewater treatment
15-014(e)	None	Administratively Complete	Industrial or sanitary wastewater treatment
15-014(l)	None	Pending	NPDES-permitted outfall (active)
49-004	None	In Progress	Burn site and landfill (Area 6)
49-007(a)	None	Administratively Complete	Septic system (Area 6)
C-15-011	None	In Progress	Former underground tank

Table B-6.1
North Ancho Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
39-001(a)	None	In Progress	Landfill
39-001(b)-00	39-001(b)	In Progress	MDA Y
	39-008	In Progress	MDA Y
39-002(a)	None	In Progress	Storage area
39-002(b)	None	In Progress	Storage area
39-002(c)	None	In Progress	Storage area
39-002(d)	None	Administratively Complete	Storage area
39-002(e)	None	Administratively Complete	Storage area
39-002(f)	None	Administratively Complete	Storage area
39-002(g)	None	Administratively Complete	Storage area (active)
39-003	None	Administratively Complete	Incinerator
39-004(a)	None	Pending	Firing site
39-004(b)	None	Pending	Firing site
39-004(c)	None	Pending	Firing site 39-6 (open detonation) - RCRA Unit (active)
39-004(d)	None	Pending	Firing site 39-57 (open detonation) - RCRA Unit (active)
39-004(e)	None	Pending	Firing site (active)
39-005	None	In Progress	Seepage pit
39-006(a)	None	In Progress	Septic system
39-006(b)	None	Administratively Complete	Septic system
39-007(a)	None	In Progress	Storage area
39-007(b)	None	Administratively Complete	Storage area
39-007(c)	None	Administratively Complete	Storage area
39-007(d)	None	Administratively Complete	Storage area
39-007(e)	None	Administratively Complete	Storage area
39-009	None	Administratively Complete	Outfall
39-010	None	In Progress	Excavated soil dump
49-001(a)-00	49-001(a)	In Progress	MDA AB
	49-001(b)	In Progress	MDA AB
	49-001(c)	In Progress	MDA AB
	49-001(d)	In Progress	MDA AB
	49-001(e)	In Progress	MDA AB
	49-001(f)	In Progress	MDA AB
	49-001(g)	In Progress	MDA AB
49-002	None	In Progress	Operational facility (Area 10 underground chamber)
49-003	None	In Progress	Leach field (Area 11 rad/chem and small shot area)
49-005(a)	None	In Progress	Landfill (east of Area 10)
49-005(b)	None	Administratively Complete	Landfill (Area 5)
49-006	None	In Progress	Sump (Area 5)
49-007(b)	None	Administratively Complete	Septic system (HDT area)
49-008(a)	None	In Progress	Soil contamination (Area 5)
49-008(b)	None	Administratively Complete	Soil contamination (Area 6)
49-008(c)	None	In Progress	Soil contamination (Area 11)
49-008(d)	None	In Progress	Bottle House firing sites soil contam. & undrgrnd chamber (inactive)
49-009	None	Administratively Complete	Aboveground tank (former location)

Table B-6.2
South Ancho Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
33-003(a)-99	33-003(a)	In Progress	MDA D
	33-003(b)	In Progress	MDA D
33-004(c)	None	In Progress	Septic system
33-004(k)	None	In Progress	Outfall
33-004(l)	None	Administratively Complete	Outfall
33-006(b)-00	33-006(b)	In Progress	Firing site - East Site
	33-007(a)	In Progress	Firing site - East Site
	33-008(b)	In Progress	Firing site - East Site
	33-010(a)	In Progress	Firing site - East Site
33-010(b)	None	In Progress	Surface disposal
33-010(d)	None	In Progress	Surface disposal
C-33-002	None	In Progress	Transformer

Table B-7.1
Chaquehui Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
33-001(a)-99	33-001(a)	In Progress	MDA E
	33-001(b)	In Progress	MDA E
	33-001(c)	In Progress	MDA E
	33-001(d)	In Progress	MDA E
	33-001(e)	In Progress	MDA E
33-002(a)-99	33-002(a)	In Progress	MDA K
	33-002(b)	In Progress	MDA K
	33-002(c)	In Progress	MDA K
	33-002(d)	In Progress	MDA K
	33-002(e)	In Progress	MDA K
	33-010(f)	In Progress	MDA K
33-004(a)-00	33-004(a)	In Progress	Main Site
	33-004(h)	In Progress	Main Site
	33-004(i)	In Progress	Main Site
	33-011(d)	In Progress	Main Site
	33-015	In Progress	Main Site
	33-017	In Progress	Main Site
33-004(b)	None	In Progress	Septic system
33-004(d)	None	In Progress	Septic system
33-004(e)	None	Administratively Complete	Seepage pit
33-004(f)	None	Administratively Complete	Septic system
33-004(g)-00	33-004(g)	In Progress	Firing site - Area 6
	33-007(c)	In Progress	Firing site - Area 6
33-004(j)-00	33-004(j)	In Progress	Firing site - South Site
	33-006(a)	In Progress	Firing site - South Site
	33-007(b)	In Progress	Firing site - South Site
	33-008(a)	In Progress	Firing site - South Site
	33-010(c)	In Progress	Firing site - South Site
	33-010(h)	In Progress	Firing site - South Site
	33-011(c)	In Progress	Firing site - South Site
	33-014	In Progress	Firing site - South Site
33-004(m)	None	In Progress	Septic system
33-004(n)	None	Administratively Complete	Septic system
33-005(a)-00	33-005(a)	In Progress	Former structures - Main Site
	33-005(b)	In Progress	Former structures - Main Site
	33-005(c)	In Progress	Former structures - Main Site
	33-011(a)	In Progress	Former structures - Main Site
33-008(c)	None	In Progress	Landfill
33-009	None	In Progress	Surface disposal - PCB only site
33-010(e)	None	Administratively Complete	Surface disposal (Area 6)
33-010(g)	None	In Progress	Surface disposal
33-011(b)	None	In Progress	Storage area

Table B-7.1 (continued)
Chaquehui Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
33-011(e)	None	In Progress	Drum storage
33-012(a)	None	In Progress	Drum storage - PCB only site
33-012(b)	None	Administratively Complete	Satellite accumulation area
33-012(c)	None	Administratively Complete	Satellite accumulation area
33-012(d)	None	Administratively Complete	Satellite accumulation area
33-013	None	In Progress	Storage area
33-016	None	In Progress	Sump
C-33-001	None	In Progress	Transformer
C-33-003	None	In Progress	Soil contamination area

Table B-8.1
Frijoles Canyon Aggregate

Legacy Waste Site	Subunit	Status	Description
C-00-036(a)	None	Administratively Complete	Borrow pit 1, Bandelier NM
C-00-036(b)	None	Administratively Complete	Borrow pit 2, Bandelier NM
C-00-036(c)	None	Administratively Complete	Borrow pit 3, Bandelier NM
C-00-036(d)	None	Administratively Complete	Borrow pit 4, Bandelier NM
C-00-037	None	In Progress	Landfill, Bandelier NM
C-00-038	None	In Progress	Surface disposal, Bandelier NM

Appendix C

Supplemental Maps of
Laboratory Legacy Waste Sites

APPENDIX C SUPPLEMENTAL MAPS OF LABORATORY LEGACY WASTE SITES

The maps in Appendix C of this document have been reproduced from the maps provided in the *Maps Section* of the following:

> LANL (Los Alamos National Laboratory), August 2005. "Aggregate Areas List; Maps of TAs, SWMUs/AOCs," Los Alamos National Laboratory report LA-UR-05-6234, Los Alamos, New Mexico.

The maps provided in *Aggregate Areas*[C1] *List: Maps of TAs, SWMUs/AOCs* (LANL, 2005; report LA-UR-05-6234) are the most current and accurate representation of aggregate areas and their associated solid waste management units (SWMUs)[C2] and areas of concern (AOCs)[C2] at Los Alamos National Laboratory (the Laboratory). Report LA-UR-05-6234 fulfills the requirements in Section V.B of the March 1, 2005 Compliance Order on Consent (Consent Order) signed by the New Mexico Environment Department (NMED), the Department of Energy (DOE), and the University of California. Section V.B requires a submittal of a list of the watershed aggregates at the Laboratory and the SWMUs and AOCs within each aggregate, including those listed in Module VIII of the Laboratory's Hazardous Waste Facility Permit.

Map 29 [TA-57 (Fenton Hill)] aggregate of the Lake Fork Watershed in Report LA-UR-05-6234 has been omitted from this Appendix C of this document because the Fenton Hill aggregate is outside the scope of this document.[C3]

[C1] The document *Aggregate Areas List: Maps of TAs, SWMUs/AOCs* (report LA-UR-05-6234) uses the term *aggregate area*, which is equivalent in meaning to the term *watershed aggregate* used in this document.

[C2] The document Aggregate Areas List: Maps of TAs, SWMUs/AOCs (report LA-UR-05-6234) uses the terms solid waste management unit (SWMU) and area of concern (AOC), which are collectively referred to in this document as legacy waste sites.

[C3] The Lake Fork Watershed is situated outside the influence of the Laboratory, approximately 20 miles due west of the Laboratory's western boundary. The Lake Fork Watershed contains a single aggregate (the TA-57 Fenton Hill Aggregate). None of the eight watersheds that are potentially impacted by Laboratory operations drain into the Lake Fork Watershed and, therefore, do not influence the Lake Fork Watershed. No Laboratory hazardous facilities (as defined below) are located within the TA-57 Fenton Hill Aggregate. The six in-progress legacy waste sites within the Fenton Hill Aggregate are associated with geothermal energy experiments conducted in the Jemez Mountains by the Laboratory.

Laboratory Hazardous Facilities

The Laboratory's February 2002 *A Special Edition of the SWEIS Yearbook, Description of Technical Areas and Facilities at Los Alamos National Laboratory*, controlled publication LA-CP-02-75 (official use only) identifies the operational facilities at that Laboratory that are hazardous facilities. A facility falls within a hazard category if it typically contains a hazardous material, an energy source, or an operation with the potential to cause illness, injury, or death to personnel or damage to a facility or to the environment (without regard for the likelihood or credibility of accident scenarios or consequence mitigation).

Appendix D

Acronyms and Glossary

APPENDIX D ACRONYMS AND GLOSSARY

ACRONYMS

AOC	area of concern
asl	above sea level
CASA	Critical Assembly Storage Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMR	Chemistry and Metallurgy Research
CMS	corrective measure study
COPC	chemical of potential concern
CSM	conceptual site model
D&D	decontamination and decommissioning
DARHT	Dual-Axis Hydrodynamic Radiographic Test (facility)
DOE	(U.S.) Department of Energy
DP	Delta Prime
EPA	(U.S.) Environmental Protection Agency
ER	Environmental Restoration (Project)
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	fiscal year
GIS	geographic information system
HSWA	Hazardous and Solid Waste Amendments of 1984
LACEF	Los Alamos Critical Experiment Facility
LANL	Los Alamos National Laboratory
LANSCE	Los Alamos Neutron Science Center
LTES	long-term environmental stewardship
MDA	material disposal area
NEPA	National Environmental Policy Act
NMED	New Mexico Environmental Department
NPDES	National Pollutant Discharge Elimination System
PCB	polychlorinated biphenyl
PHERMEX	Pulsed, High-Energy, Radiographic Machining Emitting X-Rays (facility)
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
SWEIS	Site-Wide Environmental Impact Statement
SWMU	solid waste management unit
TA	technical area
TLD	thermoluninescent dosimeter
TRU	transuranic
TYCSP	Ten-Year Comprehensive Site Plan

GLOSSARY

accelerated corrective action—A cleanup process used to implement presumptive remedies at small-scale and relatively simple sites where groundwater contamination is not a component of the accelerated cleanup, where the remedy is considered to be the final remedy for the site, and where the fieldwork will be accomplished within 180 days of the start of field activities. Accelerated corrective actions may be implemented before the approval of the accelerated corrective action work plan by the New Mexico Environment Department.

action level—(1) A numerical value that has been established by statistical analysis or has been set according to regulatory limits and is used as a criterion for action. Contamination found in a particular medium below an appropriate action level is not generally subject to remediation or further study.(2) A health- and environment-based concentration derived using chemical-specific toxicity information and standardized exposure assumptions. An action level can be developed on a facility-specific basis or can be taken from standardized lists.

administrative authority—For Los Alamos National Laboratory, one or more regulatory agencies, such as the New Mexico Environment Department, the U.S. Environmental Protection Agency, or the U.S. Department of Energy, as appropriate.

administrative controls—Nonphysical or nonengineered mechanisms for managing risks to human health and the environment.

adsorption—The surface retention of solid, liquid, or gas molecules, atoms, or ions by a solid.

aggregate—At the Los Alamos National Laboratory, an area within a *watershed* containing solid waste management units (SWMUs) and/or areas of concern (AOCs), and the media affected or potentially affected by releases from those SWMUs and/or AOCs. Aggregates are designated to promote efficient and effective corrective action activities.

alluvial—Pertaining to geologic deposits or features formed by running water.

alluvium—Soil deposited by a river or other running water.

alpha radiation—A form of particle radiation that is highly ionizing and has low penetration. Alpha radiation consists of two protons and two neutrons bound together into a particle that is identical to a helium nucleus and can be written as He2+.

analysis—A critical evaluation, usually made by breaking a subject (either material or intellectual) down into its constituent parts, then describing the parts and their relationship to the whole. Analyses may include physical analysis, chemical analysis, toxicological analysis, and knowledge-of-process determinations.

analyte—The element, nuclide, or ion a chemical analysis seeks to identify and/or quantify; the chemical constituent of interest.

anthropogenic—Of, relating to, or resulting from, the influence of human beings.

aquifer—An underground geological formation (or group of formations) containing water that is the source of groundwater for wells and springs.

area of concern—(1) A release that may warrant investigation or remediation and is not a solid waste management unit (SWMU). (2) An area at Los Alamos National Laboratory that may have had a release of a hazardous waste or a hazardous constituent but is not a SWMU.

assessment—(1) The act of reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. (2) An evaluation process used to measure the performance or effectiveness of a system and its elements. In this glossary, assessment is an all-inclusive term used to denote any one of the following: audit, performance evaluation, management system review, peer review, inspection, or surveillance.

background value (BV)—A statistically derived concentration (i.e., the upper tolerance limit [UTL]) of a chemical used to represent the background data set. If a UTL cannot be derived, either the detection limit or maximum reported value in the background data set is used.

barrier—Any material or structure that prevents, or substantially delays, the movement of solid-, liquid-, or gaseous-phase chemicals in environmental media.

baseline risk assessment—A site-specific analysis of the potential adverse effects of hazardous constituents that have been released from a site in the absence of any controls or mitigating actions. A baseline risk assessment consists of the following four steps: data collection and analysis, exposure assessment, toxicity assessment, and risk characterization.

beta radiation—High-energy electrons emitted by certain types of radioactive nuclei, such as potassium-40. The beta particles emitted are a form of ionizing radiation also known as beta rays.

borehole—(1) A hole drilled or bored into the ground, usually for exploratory or economic purposes. (2) A hole into which casing, screen, and other materials may be installed to construct a well.

caldera—A large crater formed by a volcanic explosion or by the collapse of a volcanic cone.

calibration—A process used to identify the relationship between the true analyte concentration or other variable and the response of a measurement instrument, chemical analysis method, or other measurement system.

canyon—A stream-cut chasm or gorge, the sides of which are composed of cliffs or a series of cliffs rising from the chasm's bed. Canyons are characteristic of arid or semiarid regions where downcutting by streams greatly exceeds weathering.

cap—A modern engineered landfill cover that is designed and constructed to minimize or eliminate the release of constituents into the environment.

catchment—(1) A structure, such as a basin or reservoir, used for collecting or draining water. (2) The amount of water collected in such a structure. (3) A catching or collecting of water, especially rainwater.

certification—A signed statement required by permits, or certain enforcement documents (e.g., a compliance order), that is submitted with reports and other information requested by the administrative authority. Certification ensures that a document and all of its attachments were prepared under the direction or supervision of an authorized person in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Known violations of certification carry significant penalties.

chemical—Any naturally occurring or human-made substance characterized by a definite molecular composition.

chemical analysis—A process used to measure one or more attributes of a sample in a clearly defined, controlled, and systematic manner. Chemical analysis often requires treating a sample chemically or physically before measurement.

chemical of potential concern (COPC)—A detected chemical compound or element that has the potential to adversely affect human receptors as a result of its concentration, distribution, and toxicity.

cleanup—A series of actions taken to deal with the release, or threat of a release, of a hazardous substance that could affect humans and/or the environment. The term cleanup is sometimes used interchangeably with the terms remedial action, removal action, or corrective action.

cleanup levels—Media-specific contaminant concentration levels that must be met by a selected corrective action. Cleanup levels are established by using criteria such as the protection of human health and the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through treatment; long- and short-term effectiveness; implementability; and cost.

Code of Federal Regulations (CFR)—A document that codifies all rules of the executive departments and agencies of the federal government. The code is divided into 50 volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) covers environmental regulations.

colluvium—A loose deposit of rock debris accumulated through the action of gravity at the base of a cliff or slope.

Compliance Order on Consent (Consent Order)—For the Environmental Remediation and Surveillance Program, an enforcement document signed by the New Mexico Environment Department, the U.S. Department of Energy, and the Regents of the University of California on March 1, 2005, which prescribes the requirements for corrective action at Los Alamos National Laboratory. The purposes of the Consent Order are (1) to define the nature and extent of releases of contaminants at, or from, the facility; (2) to identify and evaluate, where needed, alternatives for corrective measures to clean up contaminants in the environment and prevent or mitigate the migration of contaminants at, or from, the facility; and (3) to implement such corrective measures. The Consent Order supersedes the corrective action requirements previously specified in Module VIII of the Laboratory's Hazardous Waste Facility Permit.

conceptual model—See site conceptual model.

confluence—A place where two or more streams or canyons meet; the point where a tributary meets the main stream.

Consent Order—See Compliance Order on Consent.

consolidated unit—A group of legacy waste sites (solid waste management units and areas of concern), which generally are geographically proximate and have been combined for the purposes of investigation, reporting, or remediation.

contaminant—(1) Chemicals and radionuclides present in environmental media or on debris above background levels. (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any hazardous waste listed or identified as characteristic in 40 Code of Federal Regulations (CFR) 261 (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]); any hazardous constituent listed in 40 CFR 261 Appendix VIII (incorporated by 20.4.1.200 NMAC) or 40 CFR 264 Appendix IX (incorporated by 20.4.1.500 NMAC); any groundwater contaminant listed in the Water Quality Control Commission (WQCC) Regulations at 20.6.3.3103 NMAC; any toxic pollutant listed in the WQCC Regulations at 20.6.2.7 NMAC; explosive compounds; nitrate; and perchlorate. (Note: Under the Consent Order, the term "contaminant" does not include radionuclides or the radioactive portion of mixed waste.)

corrective action—(1) In the Resource Conservation and Recovery Act, an action taken to rectify conditions potentially adverse to human health or the environment. (2) In the quality assurance field, the process of rectifying and preventing nonconformances.

corrective measure—An action taken at a solid waste management unit or area of concern to protect human health or the environment in the event of a release of contaminants into the environment, or to prevent a release of contaminants into the environment.

corrective measures study—A formal process for identifying and evaluating alternative remedies for releases at a facility.

decommissioning—The permanent removal of facilities and their components from service after the discontinued use of structures or buildings that are deemed no longer useful. Decommissioning must take place in accordance with regulatory requirements and applicable environmental policies.

decontamination—The removal of unwanted material from the surface of, or from within, another material.

detect (detection)—An analytical result, as reported by an analytical laboratory, which denotes a chemical or radionuclide to be present in a sample at a given concentration.

discharge—The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into, or on, any land or water.

disposal—The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into, or on, any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

dose (dosage)—(1) The actual quantity of a chemical that is administered to an organism or to which it is exposed. (2) The amount of a substance that reaches a specific tissue (e.g., the liver). (3) The amount of a substance that is available for interaction with metabolic processes after it has crossed an organism's outer boundary.

dose equivalent—The product of the absorbed dose from ionizing radiation and factors that account for biological differences as a result of the radiation type and its distribution in the body.

effluent—Wastewater (treated or untreated) that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

future state—The physical state of a site after agreed-upon remediation activities have been completed.

environmental assessment—An environmental analysis that is prepared, pursuant to the National Environmental Policy Act, to determine whether a particular federal action would significantly affect the environment and thus require a more detailed environmental impact statement.

environmental impact statement (EIS)—A document required of federal agencies by the National Environmental Policy Act when those agencies are considering major projects or legislative proposals that could significantly affect the environment. Designed as a decision-making tool, an EIS describes the positive and negative effects of an undertaking and cites alternative actions.

Environmental Restoration (ER) Project—A Los Alamos National Laboratory project established in 1989 as part of a U.S. Department of Energy nationwide program, and precursor of today's Environmental Remediation and Surveillance Program. This program is designed (1) to investigate hazardous and/or radioactive materials that may be present in the environment as a result of past Laboratory operations, (2) to determine if the materials currently pose an unacceptable risk to human health or the environment, and (3) to remediate (clean up, stabilize, or restore) those sites where unacceptable risk is still present.

environmental surveillance—The collection and analysis of samples from air, water, soil, foodstuffs, biota, and other media to determine the environmental quality of an industry or community. Environmental surveillance is performed commonly at sites that contain nuclear facilities.

ephemeral—Pertaining to a stream or spring that flows only during, and immediately after, periods of rainfall or snowmelt.

ER database (ERDB)—A database housing analytical and other programmatic information for the Environmental Remediation and Surveillance Program. The ERDB currently contains about 3 million analyses in 300 tables.

evapotranspiration—(1) The discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces and by transpiration from plants. (2) The loss of water from the soil by evaporation and/or by transpiration from the plants growing in the soil.

exposure pathway—Any path from the sources of contaminants to humans and other species or settings through air, soil, water, or food.

facility—All contiguous land (and structures, other appurtenances, and improvements on the land) used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units. For the purpose of implementing a corrective action, a facility is all the contiguous property that is under the control of the owner or operator seeking a permit under Subtitle C of the Resource Conservation and Recovery Act.

fallout radionuclides— Radionuclides that are present at globally elevated levels in the environment as a result of fallout from worldwide atomic weapons tests. The Los Alamos National Laboratory (the Laboratory) background data sets consist of environmental surveillance samples taken from marginal and regional locations for the following radionuclides associated with fallout: tritium, cesium-137, americium-241, plutonium-238, plutonium-239/240, and strontium-90. Samples were collected from regional and marginal locations in the Laboratory's vicinity that were (1) representative of geological media found within Laboratory boundaries, and (2) were not impacted by Laboratory operations.

fallout value—The concentration of fallout radionuclides in surface soil (0-6 in.) that represent deposition from atmospheric fallout (resulting from world-wide atomic weapons tests) and are unrelated to Laboratory activities.

Federal Register—The official daily publication for Rules, Proposed Rules, and Notices from federal agencies and organizations, as well as Executive Orders and other presidential documents.

gamma radiation—A form of electromagnetic, high-energy ionizing radiation emitted from a nucleus. Gamma rays are essentially the same as x-rays (though at higher energy) and require heavy shielding, such as concrete or steel, to be blocked.

groundwater—Interstitial water that occurs in saturated earth material and is capable of entering a well in sufficient amounts to be used as a water supply.

Hazardous and Solid Waste Amendments (HSWA)—Public Law No. 98-616, 98 Stat. 3221, enacted in 1984, which amended the Resource Conservation and Recovery Act of 1976 (42 United States Code § 6901 et seq).

hazardous constituent (hazardous waste constituent)—According to the March 1, 2005, Compliance Order of Consent (Consent Order), any constituent identified in Appendix VIII of Part 261, Title 40 Code of Federal Regulations (CFR) (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]) or any constituent identified in 40 CFR 264, Appendix IX (incorporated by 20.4.1.500 NMAC).

hazardous waste—(1) Solid waste that is listed as a hazardous waste, or exhibits any of the characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity, as provided in 40 CFR, Subpart C). (2) According to the March 1, 2005, Compliance Order of Consent (Consent Order), any solid waste or combination of solid wastes that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, meets the description set forth in New Mexico Statutes Annotated 1978, § 74-4-3(K) and is listed as a hazardous waste or exhibits a hazardous waste characteristic under 40 CFR 261 (incorporated by 20.4.1.200 New Mexico Administrative Code).

Hazardous Waste Facility Permit—The authorization issued to Los Alamos National Laboratory (the Laboratory) by the New Mexico Environment Department that allows the Laboratory to operate as a hazardous waste treatment, storage, and disposal facility.

holding time—The maximum elapsed time a sample can be stored without unacceptable changes in analyte concentrations. Holding times apply under prescribed conditions, and deviations from these conditions may affect the holding times. Extraction holding time refers to the time lapsed between sample collection and sample preparation. Analytical holding time refers to the time lapsed between sample preparation and analysis.

"Hydrogeologic Workplan"—The document that describes the activities planned by Los Alamos National Laboratory (the Laboratory) to characterize the hydrologic setting beneath the Laboratory and to enhance the Laboratory's groundwater monitoring program.

hydrogeology—The science dealing with the occurrence of surface water and groundwater, their uses, and their functions in modifying the earth, primarily by erosion and deposition.

industrial scenario—A land-use condition in which current Los Alamos National Laboratory operations or industrial/commercial operations within Los Alamos County are continued or planned. Any necessary remediation involves cleanup to standards designed to ensure a safe and healthy work environment for workers.

infiltration—(1) The penetration of water through the ground surface into subsurface soil. (2) The technique of applying large volumes of wastewater to land to penetrate the surface and percolate through the underlying soil.

inspection—The critical examination or measurement of an item or activity to determine its conformance to applicable quality standards or specifications.

institutional controls—Controls that prohibit or limit access to contaminated media. Institutional controls may include use restrictions, permitting requirements, standard operating procedures, laboratory implementation requirements, laboratory implementation guidance, and laboratory performance requirements.

interim measure—An action that can be implemented to minimize or prevent the migration of contaminants and to minimize or prevent actual or potential human or ecological exposure to contaminants, while long-term final corrective action remedies are evaluated and, if necessary, implemented.

intermittent stream—A stream that flows only in certain reaches as a result of the channel bed's losing and gaining characteristics.

interrupted stream—A stream whose flow is discontinuous as a result of human-made structures.

leaching—The process by which soluble constituents are dissolved and filtered through the soil by a percolating fluid.

long-term environmental stewardship—All the activities required to maintain an adequate level of protection for human health and the environment from risks posed by nuclear and/or chemical materials, waste, and contamination that remain after cleanup is complete.

Los Alamos unlimited release (LA-UR) number—A unique identification number required for all documents or presentations prepared for distribution outside Los Alamos National Laboratory (the Laboratory). LA-UR numbers are obtained by filling out a technical information release form (http://enterprise.lanl.gov/alpha.htm) and submitting the form together with 2 copies of the document to the Laboratory's Classification Group (S-7) for review.

material disposal area (MDA)—A subset of the solid waste management units at Los Alamos National Laboratory (the Laboratory) that include disposal units such as trenches, pits, and shafts. Historically, various disposal areas (but not all) were designated by the Laboratory as MDAs.

matrix—Relatively fine material in which coarser fragments or crystals are embedded; also called "ground mass" in the case of igneous rocks.

medium (environmental)—Any material capable of absorbing or transporting constituents. Examples of media include tuffs, soils and sediments derived from these tuffs, surface water, soil water, groundwater, air, structural surfaces, and debris.

migration—The movement of inorganic and organic chemical species through unsaturated or saturated materials.

mitigation—(1) Minimizing environmental impacts by limiting the degree or magnitude of an action and its implementation, (2) Rectifying an environmental impact by repairing, rehabilitating, or restoring the affected environment, (3) Reducing or eliminating an environmental impact over time by preservation and maintenance operations during the life of the action, (4) Compensating for an environmental impact by replacing or providing substitute resources or environments.

mixed waste—Waste containing both hazardous and source, special nuclear, or byproduct materials subject to the Atomic Energy Act of 1954.

Module VIII—Module VIII of the Los Alamos National Laboratory (the Laboratory) Hazardous Waste Facility Permit. This permit allows the Laboratory to operate as a hazardous-waste treatment, storage, and disposal facility. From 1990 to 2005, Module VIII included requirements from the Hazardous and Solid Waste Amendments. These requirements have been superseded by the March 1, 2005, Compliance Order on Consent (Consent Order).

monitoring well—(1) A well used to obtain water-quality samples or to measure groundwater levels, (2) A well drilled at a hazardous waste management facility or Superfund site to collect groundwater samples for the purpose of physical, chemical, or biological analysis and to determine the amounts, types, and distribution of contaminants in the groundwater beneath the site.

National Pollutant Discharge Elimination System—The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits to discharge wastewater or storm water, and for imposing and enforcing pretreatment requirements under the Clean Water Act.

neutralize—To render a toxic chemical agent harmless by chemical action.

no further action—Under the Resource Conservation and Recovery Act, a corrective-action determination whereby, based on evidence or risk, no further investigation or remediation is warranted.

outfall—A place where effluent is discharged into receiving waters.

perched water—A zone of unpressurized water held above the water table by impermeable rock or sediment.

perennial stream—Water in a channel or bed that flows continuously throughout the year.

permit—An authorization, license, or equivalent control document issued by the U.S. Environmental Protection Agency or an approved state agency to implement the requirements of an environmental regulation.

permit modification—A change to a condition in a facility's permit, initiated by either a request from the permittee or by the administrative authority's action.

polychlorinated biphenyls (PCBs)—Any chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees, or any combination that contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and other animals.

population—(1) A group of interbreeding organisms occupying a particular space. (2) The number of humans or other living creatures in a designated area.

preliminary remediation goals—Acceptable exposure levels (protective of human health and the environment) that are used as a risk-based tool for evaluating remedial alternatives.

radiation—A stream of particles or electromagnetic waves emitted by atoms and molecules of a radioactive substance as a result of nuclear decay. The particles or waves emitted can consist of neutrons, positrons, alpha particles, beta particles, or gamma radiation.

radioactive material—For purposes of complying with U.S. Department of Transportation regulations, any material having a specific activity (activity per unit mass of the material) greater than 2 nanocuries per gram (nCi/g) and in which the radioactivity is evenly distributed.

radioactive tracer—A radionuclide added to, or induced in, a sample for the purpose of monitoring chemical or physical losses of target analytes. The tracer is assumed to behave in the same manner as the target analytes.

radioactive waste—Waste that, by either monitoring and analysis, or acceptable knowledge, or both, has been determined to contain added (or concentrated and naturally occurring) radioactive material or activation products, or that does not meet radiological release criteria.

radioactivity (radioactive decay; radioactive disintegration)—The spontaneous change in an atom by the emission of charged particles and/or gamma rays.

radionuclide—Radioactive particle (human-made or natural) with a distinct atomic weight number.

RCRA facility investigation (RFI)—A Resource Conservation and Recovery Act (RCRA) investigation that determines if a release has occurred and characterizes the nature and extent of contamination at a hazardous waste facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

reach—A specific length of a canyon that is treated as a single unit for sampling and analysis. Reaches tend to be internally uniform with respect to geomorphic setting and land use.

receptor—A person, other animal, plant, or geographical location that is exposed to a chemical or physical agent released to the environment by human activities**.**

record—Any book, paper, map, photograph, machine-readable material, or other documentary material, regardless of physical form or characteristics.

recreational scenario—A land-use condition under which individuals may be exposed to contaminants for a limited amount of time as a result of outdoor activities such as hiking, camping, hunting, or fishing.

regional aquifer—Geologic material(s) or unit(s) of regional extent whose saturated portion yields significant quantities of water to wells, contains the regional zone of saturation, and is characterized by the regional water table or potentiometric surface.

regulatory standard—Media-specific contaminant concentration levels of potential concern that are mandated by federal or state legislation or regulation (e.g., the Safe Drinking Water Act, New Mexico Water Quality Control Commission regulations).

release—Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous waste or hazardous constituents into the environment.

remediation—(1) The process of reducing the concentration of a contaminant (or contaminants) in air, water, or soil media to a level that poses an acceptable risk to human health and the environment. (2) The act of restoring a contaminated area to a usable condition based on specified standards.

residential scenario—The land use condition under which individuals may be exposed to contaminants as a result of living on or near contaminated sites.

Resource Conservation and Recovery Act—The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (Public Law [PL] 94-580, as amended by PL 95-609 and PL 96-482, United States Code 6901 et seq.).

restricted area—Any area to which access is controlled by a licensee to protect individuals from exposure to radiation and radioactive materials. The “restricted area” shall not include areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

risk analysis—In the quality assurance field, a qualitative evaluation of the probability and the potential consequences associated with noncompliant documents or work activities.

risk assessment—See baseline risk assessment.

risk characterization—The last phase in the risk assessment process which estimates the potential for adverse health or ecological effects to occur as a result of exposure to a stressor, and which evaluates the uncertainty involved.

risk management—The process of evaluating and selecting alternative regulatory and nonregulatory responses to risk. The selection process necessarily requires the consideration of legal, economic, and behavioral factors.

runoff—The portion of the precipitation on a drainage area that is discharged from the area.

run-on—Surface water that flows onto an area as a result of runoff occurring higher up on a slope.

sample—A portion of a material (e.g., rock, soil, water, or air), which, alone or in combination with other portions, is expected to be representative of the material or area from which it is taken. Samples are typically either sent to a laboratory for analysis or inspection or are analyzed in the field. When referring to samples of environmental media, the term field sample may be used.

screening action level (SAL)—A radionuclide's medium-specific concentration level; it is calculated by using conservative criteria below which it is generally assumed that no potential exists for a dose that is unacceptable to human health. The derivation of a SAL is based on conservative exposure and on land-use assumptions. However, if an applicable regulatory standard exists that is less than the value derived, it is used in place of the SAL.

screening risk assessment—A risk assessment that is performed with few data and many assumptions in order to identify exposures that should be evaluated more carefully for potential risk.

sediment—(1) A mass of fragmented inorganic solid that comes from the weathering of rock and is carried or dropped by air, water, gravity, or ice. (2) A mass that is accumulated by any other natural agent and that forms in layers on the earth's surface (e.g., sand, gravel, silt, mud, fill, or loess). (3) A solid material that is not in solution and is either distributed through the liquid or has settled out of the liquid.

site characterization—Defining the pathways and methods of migration of hazardous waste or constituents, including the media affected; the extent, direction and speed of the contaminants; complicating factors influencing movement; or concentration profiles.

site conceptual model—A qualitative or quantitative description of sources of contamination, environmental transport pathways for contamination, and receptors that may be impacted by contamination and whose relationships describe qualitatively or quantitatively the release of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of contaminants by the receptors.

soil—(1) A material that overlies bedrock and has been subject to soil-forming processes. (2) A sample media group that includes naturally occurring and artificial fill materials.

solid waste—Any garbage, refuse, or sludge from a waste treatment plant, water-supply treatment plant, or air-pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows; industrial discharges that are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended; or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended.

solid waste management unit (SWMU)—(1) Any discernible site at which solid wastes have been placed at any time, whether or not the site use was intended to be the management of solid or hazardous waste. SWMUs include any site at a facility at which solid wastes have been routinely and systematically released. This definition includes regulated sites (i.e., landfills, surface impoundments, waste piles, and land treatment sites), but does not include passive leakage or one-time spills from production areas and sites in which wastes have not been managed (e.g., product storage areas). (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any discernible site at which solid waste has been placed at any time, and from which the New Mexico Environment Department determines there may be a risk of a release of hazardous waste or hazardous waste constituents (hazardous constituents), whether or not the site use was intended to be the management of solid or hazardous waste. Such sites include any area in Los Alamos National Laboratory at which solid wastes have been routinely and systematically released; they do not include one-time spills.

spring—Groundwater seeping out of the earth where the water table intersects the ground surface.

stakeholder—Any organization, governmental entity, or individual that has a stake in, or may be impacted by, a given approach to environmental regulation, pollution prevention, or energy conservation.

standard operating procedure—A document that details the officially approved method(s) for an operation, analysis, or action, with thoroughly prescribed techniques and steps.

Superfund—Another term for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The two terms are used interchangeably.

surface sample—A sample taken at a collection depth that is (or was) representative of the medium's surface during the period of investigative interest. A typical depth interval for a surface sample is 0 to 6 in. for mesa-top locations, but may be up to several feet in sediment-deposition areas within canyons.

target analyte—A chemical or parameter, the concentration, mass, or magnitude of which is designed to be quantified by a particular test method.

technical area (TA)—At Los Alamos National Laboratory, an administrative unit of operational organization (e.g., TA-21).

topography—The physical or natural features of an object or entity and their structural relationships.

transuranic (TRU) waste—Transuranic waste is waste that meets the following four criteria: (1) the waste emits alpha particles; (2) the atomic number of the waste is greater than 92; (3) the half life of the waste is greater than 20 years; (4) the activity of the waste is greater than 100nCi/g [within the waste stream; not to include the container].

tracer—A substance, usually a radioactive isotope, that is added to, or induced in, a sample for the purpose of monitoring chemical or physical losses of the target analytes. The tracer is assumed to behave in the same manner as the target analytes.

transport (transportation)—(1) The movement of a hazardous waste by air, rail, highway, or water. (2) The movement of a contaminant from a source through a medium to a receptor.

transport pathway—A route (e.g., a stream or subsurface flow path) for the potential movement of contaminants to environmental receptors (plants, humans, or other animals).

treatment—Any method, technique, or process, including elementary neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, recover energy or material resources from the waste, or to render such waste nonhazardous or less hazardous; safer to transport, store, or dispose of; or amenable for recovery or storage; or reduced in volume.

treatment, storage, and disposal facility—An interim-status or permitted facility in which hazardous waste is treated, stored, or disposed.

tuff—Consolidated volcanic ash, composed largely of fragments produced by volcanic eruptions.

unconfined aquifer—An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

underground storage tank—A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals.

unrestricted area—Any area, whose access is not controlled by a licensee for purposes of protecting individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

vadose zone—The zone between the land surface and the water table within which the moisture content is less than saturation (except in the capillary fringe) and pressure is less than atmospheric. Soil pore space also typically contains air or other gases. The capillary fringe is included in the vadose zone.

watershed—A region or basin drained by, or contributing waters to, a river, stream, lake, or other body of water and separated from adjacent drainage areas by a divide, such as a mesa, ridge, or other geologic feature.

water table—The top of the regional saturated zone; the piezometric surface associated with an unconfined aquifer.

work plan— A document that specifies the activities to be performed when implementing an investigation or remedy. At a minimum, the work plan should identify the scope of the work to be performed, specify the procedures to be used to perform the work, and present a schedule for performing the work. The work plan may also present the technical basis for performing the work.