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Los Alamos
NATIONAL LABORATORY

Title: CERRO GRANDE FIRE ONE YEAR AFTER:

AN UPDATE ON ER ACTIVITIES TO REDUCE THE POTENTIAL MOVEMENT OF CONTAMINATION AT POTENTIAL RELEASE SITES

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Submitted to: WATER QUALITY & HYDROLOGY GROUP (ESH-18)
ENVIRONMENTAL RESTORATION PROJECT

CERRO GRANDE FIRE: ONE YEAR AFTER
AN UPDATE ON ER ACTIVITIES TO REDUCE THE POTENTIAL MOVEMENT OF CONTAMINATION AT POTENTIAL RELEASE SITES

Introduction

One year has passed since the Cerro Grande Fire impacted the Los Alamos town-site and the Los Alamos National Laboratory (LANL or the "Laboratory"). Massive fire rehabilitation and flood mitigation efforts have been ongoing, and will continue for several years until areas prone to erosion are stabilized. This report summarizes the progress made during the past year to reduce the movement of contamination from potentially contaminated sites at LANL.

Over the past decade, the Laboratory has identified approximately 2,100 historical sites with a potential for the release of contamination. The majority of the sites have been evaluated, and a large portion have been found to contain no contamination or insignificant quantities of chemical or radioactive contamination. The sites are called "potential release sites," or PRSs, because they may or may not contain contamination.

There has been much discussion by the public and in the media regarding the possible movement of contamination off Laboratory property. Detailed analyses conducted by a number of federal and state agencies have not identified a threat to public health from the possible movement of contamination off-site. Nonetheless, the Laboratory is very aware of the public's concerns and wants to be a good neighbor. The Laboratory is working very hard to prevent (if possible) and/or minimize any movement of contamination off Laboratory property.

After the Cerro Grande fire, New Mexico Environment Department, the Department of Energy (DOE) and Laboratory crews evaluated all PRSs located in the burned area to see which ones had been touched by flame. The crews determined that 315 PRSs had been touched by flame in the fire. They then evaluated the 315 sites to determine which ones needed erosion control measures, called Best Management Practices, or BMPs. Of the 315 PRSs touched by flame, BMPs were recommended for 91 sites.

Environmental Restoration Project

Established in 1989 as part of a Department of Energy nation-wide program, the LANL Environmental Restoration (ER) Project is designed to determine whether there has been a release from a SWMU of hazardous chemical and/or radioactive wastes as a result of past LANL operations. Those sites where releases are found and that require remediation are being remediated to protect public health and the environment, in accordance with the requirements of LANL's Hazardous Waste Facility Permit.

Historical contamination at LANL originated from septic tanks and their drain lines, chemical storage areas, wastewater outfalls (the area below a pipe where wastewater drains into the environment), landfills, incinerators, machine shops, firing ranges and their impact areas, surface spills, and electric transformers.

Potential release sites are found mostly on the mesa tops at most Technical Areas and include the 26 material disposal areas at LANL. There are also potential release sites in the Los Alamos

townsite where the original Manhattan Project laboratories were located. The majority of these sites have been cleaned up such that they require no further action. Others are still being evaluated. A few PRSs are located in the canyons; however, the contaminants dispersed within the canyon bottoms are mostly found at low concentrations in the sediments. The potential release sites range in surface area from the size of a table top to several acres, to nearly the entire length of some canyons.

Contaminants found in material disposal areas include residues from high explosive manufacturing and use, low-level radioactive solid wastes, chemical wastes, and hazardous wastes. Contaminants found in potential release sites located in canyons include radioactive wastes such as plutonium, cesium, americium, tritium, and uranium, as well as non-radioactive materials including metals, polychlorinated biphenyls (PCBs), and volatile organic compounds used in research and operations. The contaminants vary from one potential release site to the next, both in types and amounts.

In general, the contaminants found in potential release sites were deposited during the 1940s and 1950s. Over the course of the last 50 years, soil and other materials have been deposited on top of the contaminants, burying them at least 12 -18 inches below the surface at many of the sites. Initial reports indicate that the fire burned only the top 3 inches of the ground in most places. Thus, it may be unlikely that contaminants would have been released from most sites that were burned.

Surface Water Site Assessments

A procedure was developed in 1997 as a tool to assess the erosion potential at PRSs. Surface Water Site Assessments involve assessing the erosion/sediment transport potential at each PRS using a rating matrix. Erosion potential factors are broken into three categories, 1) Site Setting, 2) Runoff Factors, and 3) Run-On Factors. The weight of each category is intended to reflect its relative importance for erosion potential. Accordingly, Runoff Factors have the greatest weight, 46 percent. In other words, the absence of visible erosion indicates minimal potential for sediment transport and correspondingly minimal impact on surface waters. Similarly, a defined gully clearly indicates an erosion concern. Site Setting represents a similar weight, 43 percent, reflecting well-defined site characteristics, such as ground cover, slope, and proximity to a watercourse. These characteristics have a clear relationship to erosion potential. Run-On factors have a relatively low weight, 11 percent, since run-on is of little concern unless it increases runoff. The range of weighting each site is 0 to 100. Site assessment scores are calculated automatically in a database using Microsoft Access 2.0 during the process of data entry. This creates a more objective scale by separating the act of field data collection from the process of numerical calculation.

These assessments provide a basis for prioritizing and scheduling site actions needed to control undesirable surface water runoff, and the potential for constituent-laden sediments to erode from PRSs. A multi-agency group called the Surface Water Assessment Team (SWAT) was formed to evaluate the completed assessments. The SWAT includes members from LANL, DOE/OB and the NMED/SWQB. Since this procedure was in place well before the Cerro Grande Fire, baseline information was already available for most of the areas touched by the fire. The previously gathered information was invaluable in helping to assess the impact caused by the fire.

BMP Inspection and Program

LANL is obligated, under its Hazardous Waste Facility permit and its Multi-sector Storm Water permit, to minimize the potential for contaminant release and transport from its Solid Waste Management Units (SWMUs) and other PRSs according to a schedule described in the Storm Water Pollution Prevention Plan.

The ER Project has an ongoing program to install, inspect and maintain storm water best management practices at those PRSs deemed vulnerable to contaminant release and/or transport. The Storm Water Pollution Prevention Plan for SWMUs (SWMUs are a subset of PRSs regulated by the RCRA Permit) describes many of these sites. Actions are being taken at sites identified by Surface Water Site Assessments and through recommendations made by the SWAT. This program has been ongoing since 1997.

The purpose of the BMPs is to prevent erosion of the slopes, mitigate storm water impacts on the sites and to prevent contaminant migration. Construction of BMPs follows the intent of the Storm/Surface Water Pollution Prevention Best Management Practices Guidance Document developed by the Laboratory's Water Quality & Hydrology Group. Inspection and maintenance of BMP installations is required at both pre-fire and post-fire PRSs at a frequency described in the Storm Water Pollution Prevention Plan for Solid Waste Management Units (quarterly and/or after .5" rain events).

The Cerro Grande fire put nearly 100 of the ER Project's PRSs, at increased risk of contaminant release and/or transport, by virtue of either being directly burned, or vulnerable to increased surface water runoff or erosion. Since the fire, these sites have had controls installed and are being inspected and maintained as part of the overall program. The following pages provide an update for each of the PRSs impacted by the fire.

Integrated Safety Management

This effort was completed implementing the guiding principles of the Laboratory's Integrated Safety Management (ISM) process. The goal of ISM is the systematic integration of Environmental, Safety & Health into work practices at all levels. ISM uses a 5-step process to ensure that expectations are 1) established, 2) implemented, and 3) are measured and reinforced in every work activity. A 5-step process defines the systematic approach.

- Define the Scope of the Work
- Analyze the Hazards and Environmental Aspects
- Develop and Implement the Controls
- Perform the Work
- Ensure Performance

Since the fire, approximately two-dozen people have been involved in this activity without any lost time accidents.

The map shown below reflects the geographic impact of the fire as well as the fire progression by time sequence. A majority of the damage to the Laboratory occurred from May 10th through May 13th shown on the lower portion of the map.

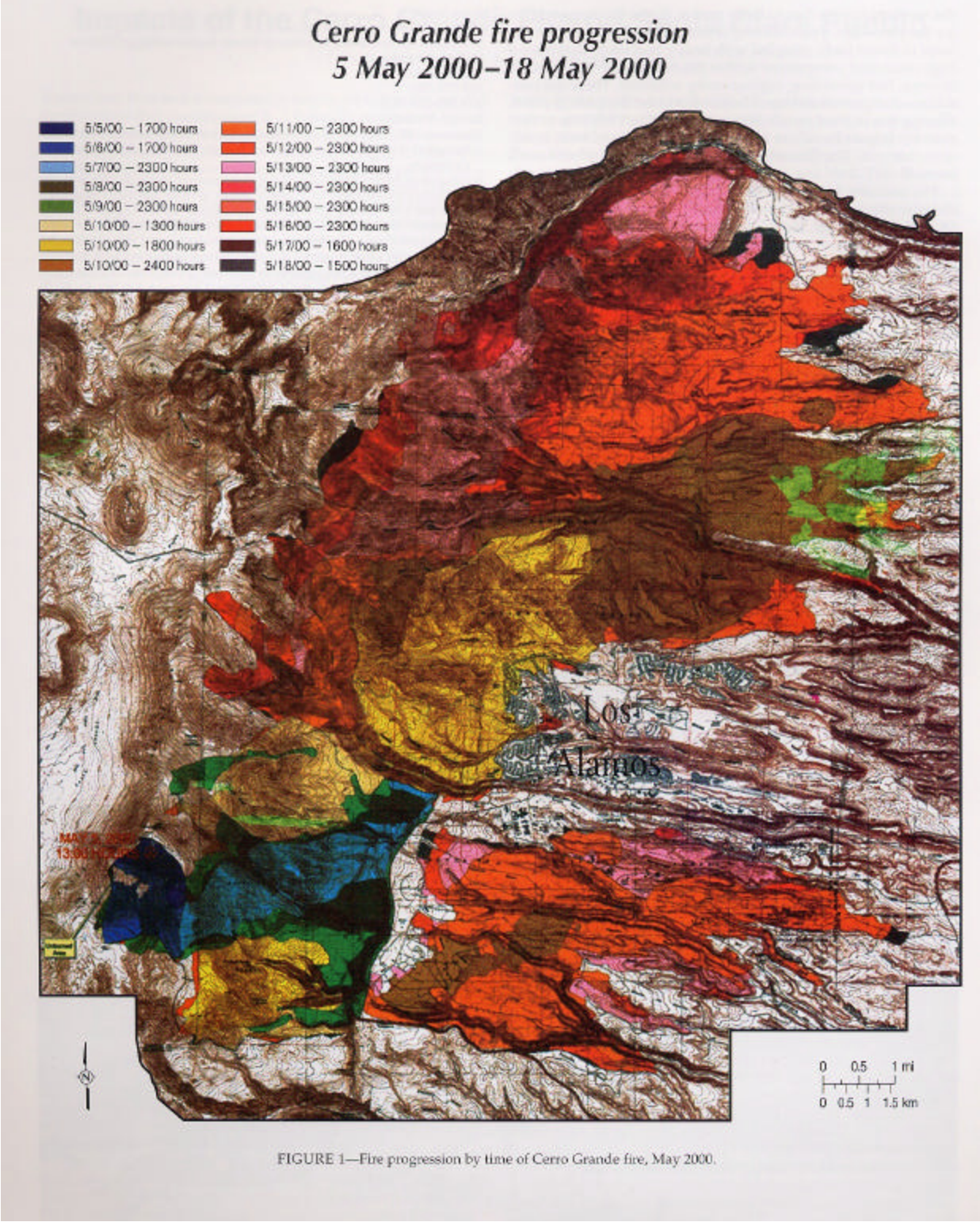


FIGURE 1—Fire progression by time of Cerro Grande fire, May 2000.

TECHNICAL AREA-4 SITES BEFORE AND AFTER THE CERRO GRANDE FIRE

4-001 – *Erosion Matrix Score 45.0*. Firing site or pit 10' x 10' with conduit and firing lines constructed in 1945 and abandoned in 1946. Located 2,000 ft. east of TA-52-1. High explosives used in shots ranging from .5 lb. to 200 lb. created high explosive, natural and depleted uranium, lead and beryllium. Potentially contaminated debris was periodically bulldozed to north edge of mesa bordering Mortandad Canyon. In August of 1985 the pit was cleaned of all debris and backfilled.

4-002 - *Erosion Matrix Score 51.5*. Shot debris from SWMU 4-001 was periodically bulldozed to the north edge of the mesa bordering Mortandad Canyon. The site consists of an area 20 ft. wide, with cables, wire, and possibly small amounts of uranium, beryllium, lead, aluminum and HE. This is a HSWA permitted site.

4-003(b) - *Erosion Matrix Score 51.5*. Drain outfall connected to the laboratory control building (former TA-4-3). A 6-inch diameter vitrified clay pipe discharged through a waste outfall 20 feet north. The outfall was inactive when TA-4-3 was abandoned in 1946, and partially removed in 1956. This is a HSWA permitted site.

CERRO GRANDE FIRE:

These sites are located on the south rim of Ten Site Canyon within the Upper Canada del Buey Watershed Aggregate. The fire damage was minor to moderate with a majority of the damage to the ground cover and undergrowth.

BMPs:

Straw wattles were installed above the site for run-on diversion at the mesa's edge, within the north facing drainage and on the lower bench for sediment retention. Spot hand raking, reseeding and straw mulch were also applied.

TECHNICAL AREA-4 SITES ONE YEAR AFTER THE CERRO GRANDE FIRE

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

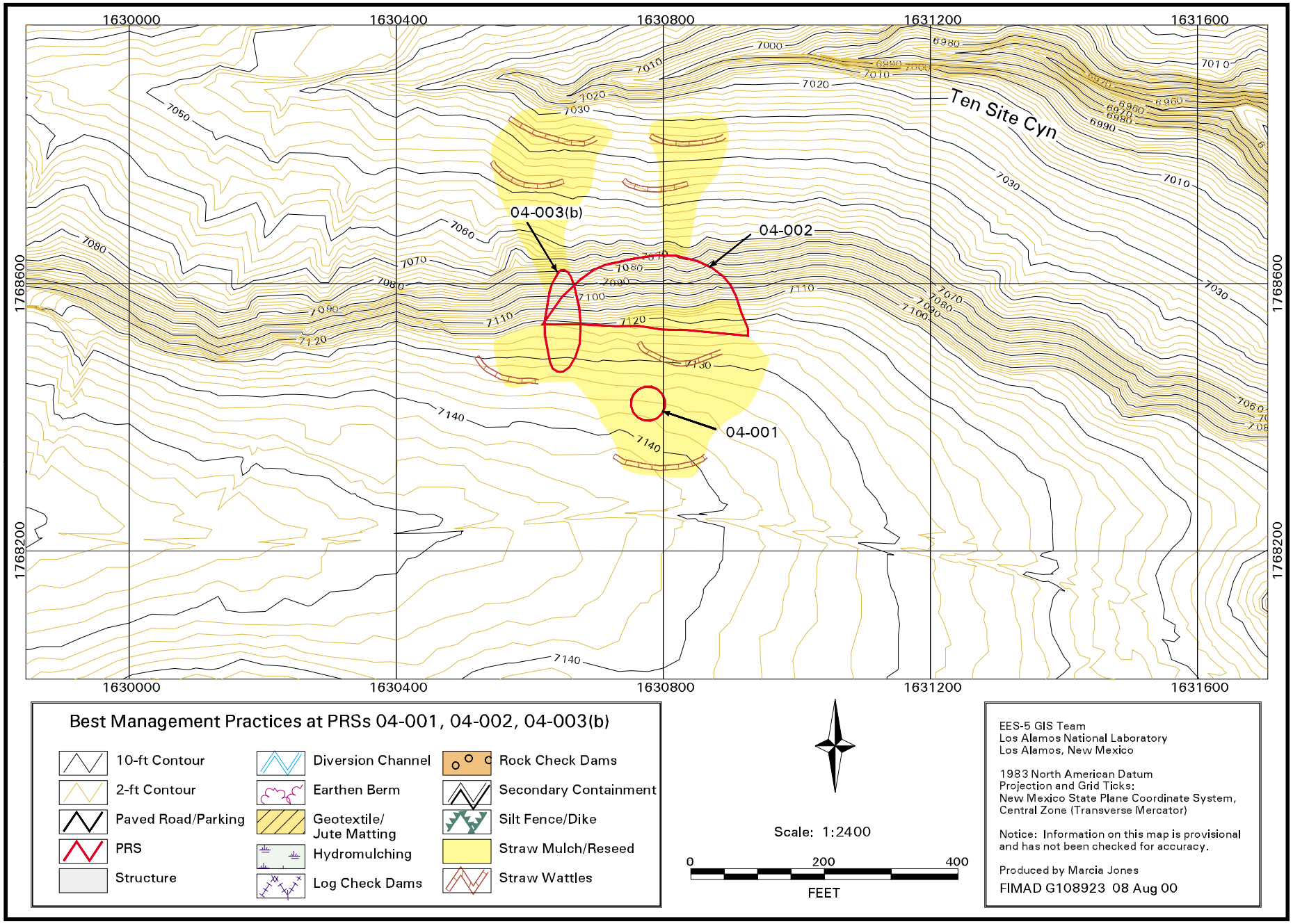
6/6/2001
5/08/2001
3/26/2001
10/27/2000
10/12/2000

Maintenance performed:

Maintenance consisted of installation of an additional 15 wattles throughout the site. Several trees were trimmed and used as sediment retention in adjacent drainage swales.

SITE STATUS

Site is in good condition, with vegetative cover of greater than 50%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRSs 04-001, 04-002, 04-003(b)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2400

0 200 400

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

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TECHNICAL AREA-5 SITES BEFORE AND AFTER THE CERRO GRANDE FIRE

5-001(a) – *Erosion Matrix Score 45.0*. A steel barricade, Firing Pit No. 1, at Beta Site was used for high explosive experimental shots from 1944 to 1947. The structure was removed in 1985. No radioactive contamination was detected on steel barricade Firing Pit No. 1 or beneath it.

5-001(b) - *Erosion Matrix Score 45.0*. Steel barricade Firing Pit No. 2 (TA-5-15) was used for high explosive experimental shots. Accumulated debris was periodically bulldozed northward to edge of Mortandad Canyon. A zone of shrapnel includes canyon sides, the canyon bottom and 200 feet around firing pit. The pit was removed in 1985. No radioactive contamination was detected, however the steel barricade itself was uranium contaminated.

5-005(a) - *Erosion Matrix Score 45.0*. A French drain that was constructed in 1945 and abandoned in 1959 at the control building (TA-5-4) at Beta Site. The drain and the affected soil was removed in 1985.

5-006(b) - *Erosion Matrix Score 45.0*. Soil contamination beneath former control building TA-5-4. Surface features of TA-5 have been removed. Building TA-5-4 was destroyed in 1960. **5-006(e)** - *Erosion Matrix Score 45.0* . Soil contamination beneath former building TA-5-19 that was used between 1953 and 1958. Building TA-5-19 was removed in 1985. Uranium was believed to have been used in the building.

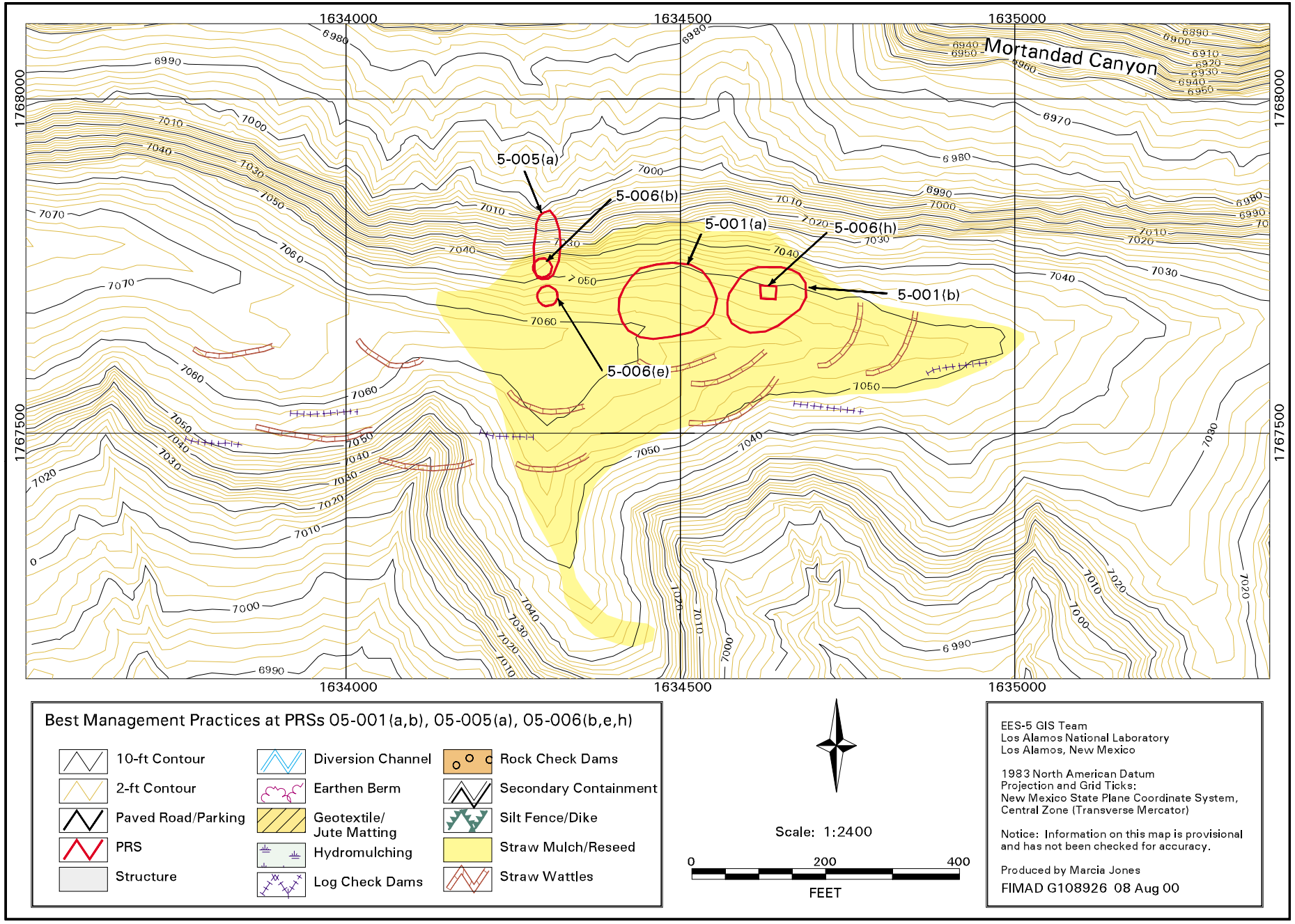
5-006(h) - *Erosion Matrix Score 45.0*. Soil contamination beneath TA-5-9. Surface features of TA-5 were removed in 1985. This site was sampled with PRS No. 5-001(b).

CERRO GRANDE FIRE:

This site is located on the south rim of Mortandad Canyon within the Upper Canada del Buey Watershed Aggregate. The fire damage was moderate to severe with nearly complete damage to the ground cover and canopy.

BMPs:

Contour tree felling was done to support erosion control on the largest slopes. Straw wattles were installed on the mesa for run-on diversion, within the north facing drainage channels and on the lower bench for sediment retention. Raking was completed by ATV implements and manually. Native seed mix and straw mulch were also applied.


1634000
1634500
1635000
1768000
1767500
Mortandad Canyon
5-005(a)
5-006(b)
5-001(a)
5-006(h)
5-001(b)
5-006(e)
Best Management Practices at PRSs 05-001(a,b), 05-005(a), 05-006(b,e,h)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/
Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:2400
0
200
400
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional
and has not been checked for accuracy.
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5-005(b) - *Erosion Matrix Score 53.7*. An outfall associated with the Beta Site shop and darkroom (TA-5-5) was presumed to be operational from 1944 to 1959, the active life of TA-5-5. **5-006(c)** - *Erosion Matrix Score 53.7*. Soil contamination beneath former building at TA-5-5. Activities were known to have used high explosives and photo processing chemicals. Building 5-5was removed in 1960. These are HSWA permitted sites.

BMPs:

Contour tree felling was done to support erosion control throughout the drainage basin. Straw wattles were installed within the south facing drainage channels and within the drainage basin for sediment retention. Raking was completed manually and native seed mix and straw mulch were also applied.

SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

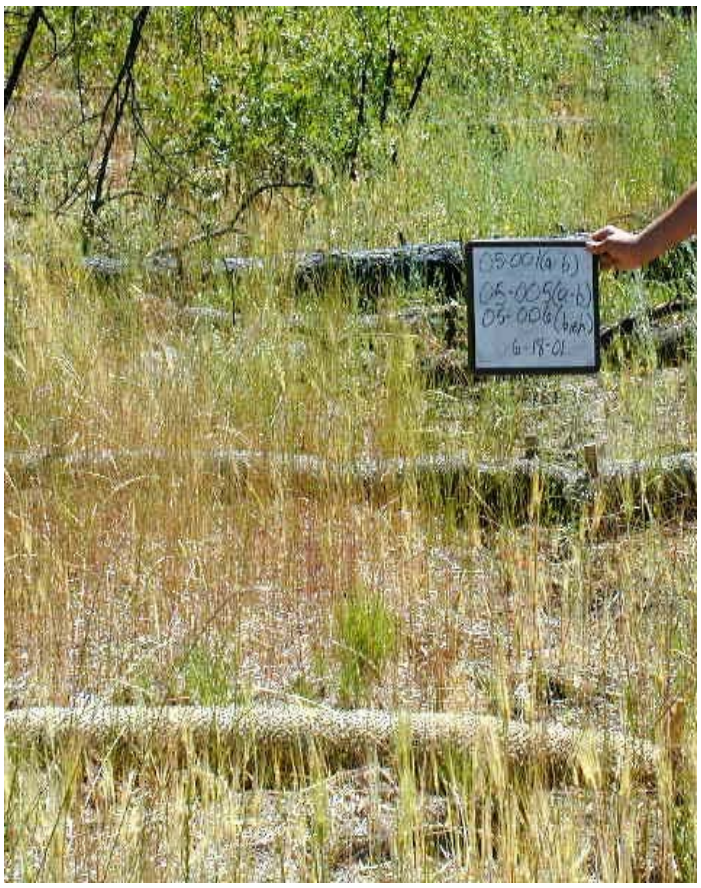
5/08/2001
3/26/2001
10/27/2000
10/12/2000

Maintenance performed:

Maintenance consisted of installation of an additional 7 wattles placed directly down gradient from existing wattles. Spot reseeding and mulch were applied where needed.

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.



SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

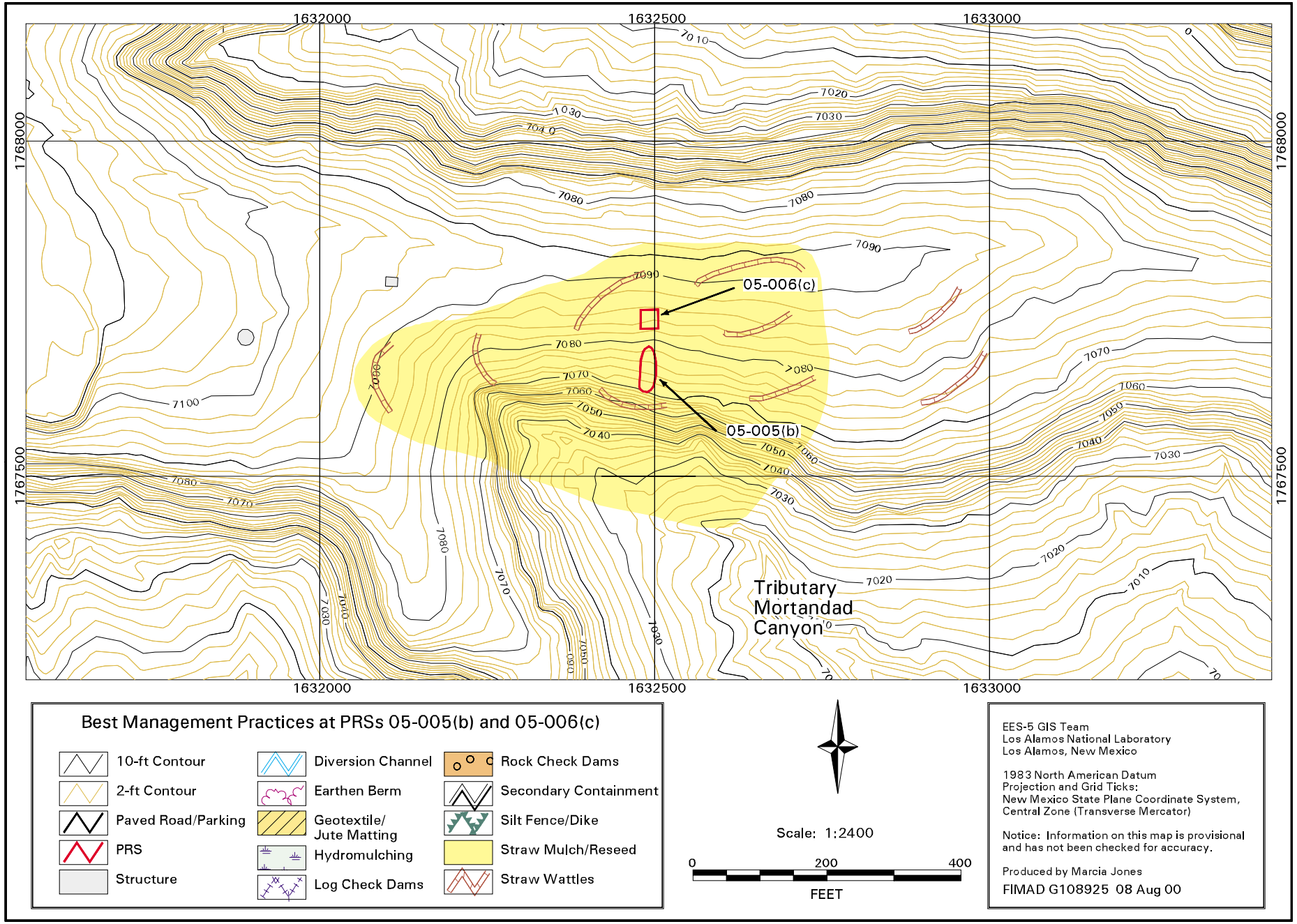
6/18/2001
5/08/2001
3/26/2001
10/27/2000
10/12/2000

Maintenance performed:

Maintenance consisted of installation of an additional 28 wattles throughout the site. A few more trees were felled within drainages and spot reseeding and mulch were applied.

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. Sediment migration is occurring in the steepest part of several drainage channels, but the straw wattles on the flatter bench appear to be keeping sediment from entering into Canada del Buey.



Best Management Practices at PRSs 05-005(b) and 05-006(c)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2400

0 200 400

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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5-003 - Erosion Matrix Score 3.6. The calibration facility, (TA-5-20), was an 8' x 12' x 8' high building built over a shaft approximately 35 feet deep. The building was used to calibrate thermoluminescent dosimeters with a sealed radium source. The Erosion Matrix Score was re-calculated to reflect the subsurface nature of the site. These are HSWA permitted sites.

5-004 - Erosion Matrix Score 49.7. An inactive septic system (TA-5-13) that received industrial waste. The septic system was removed prior to 1985. As built drawings indicate a discharge line running from TA-5-1 near the TA-5-16 barricade to TA-5-13 and south toward the canyon.

CERRO GRANDE FIRE:

This site is located on the south rim of a tributary to Mortandad Canyon within the Upper Canada del Buey Watershed Aggregate. The fire damage was moderate to severe with nearly complete damage to the ground cover and canopy.

BMPs:

Contour tree felling was done to support erosion control on the south facing slope. Straw wattles were installed within the drainage channels and within the drainage basin for sediment retention. Raking was completed manually and native seed mix and straw mulch were applied.

SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

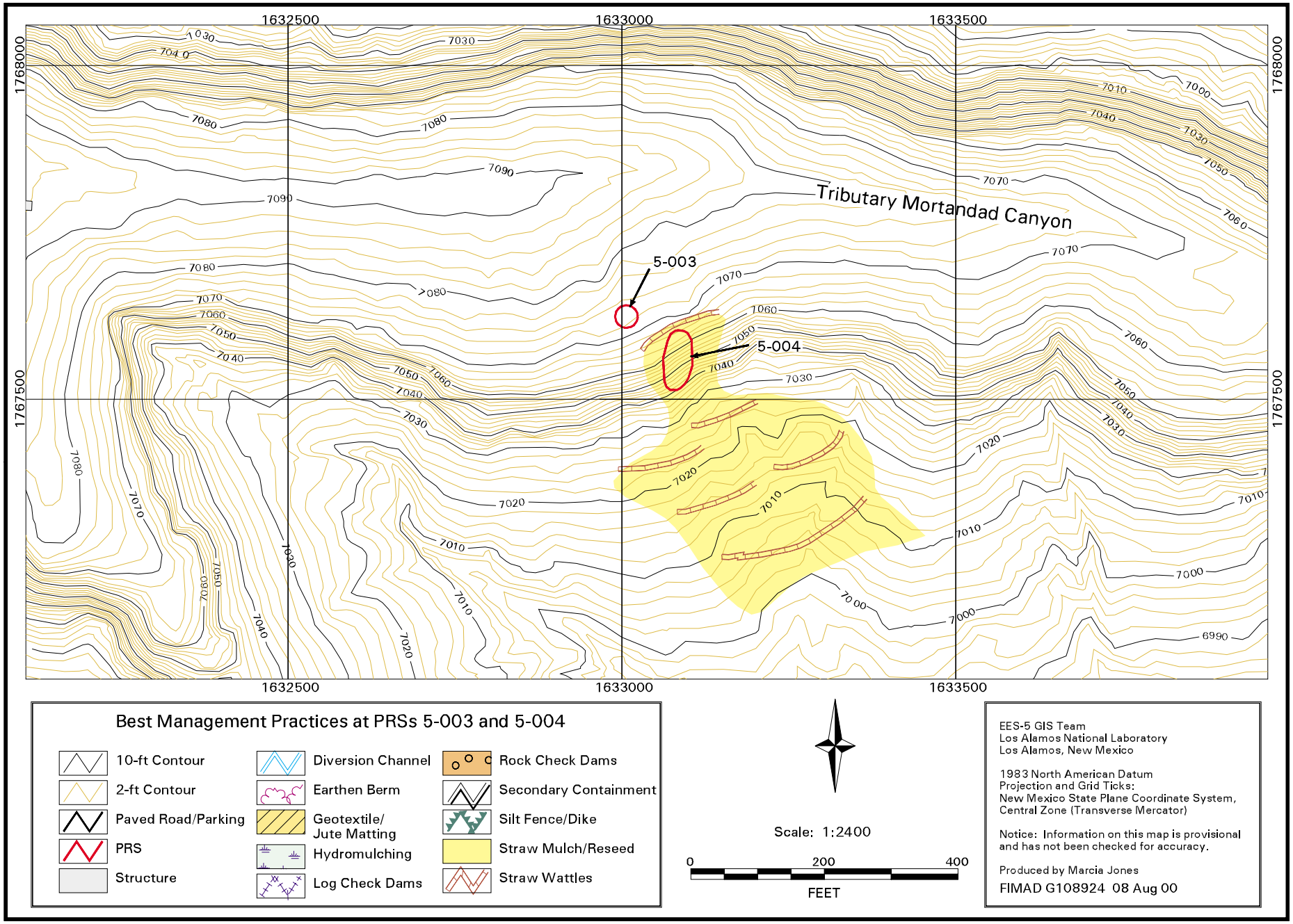
5/08/2001
3/26/2001
10/27/2000
10/12/2000

Maintenance performed:

Maintenance consisted of installation of an additional 22 wattles directly down gradient of existing wattles. Spot reseeding and mulch were applied where needed.

SITE STATUS

Site is in good condition, with vegetative cover of greater than 50%. Sediment migration is occurring in the steepest part of several drainage channels, but the straw wattles on the flatter bench appear to be keeping sediment from entering into tributary drainage.



Best Management Practices at PRSs 5-003 and 5-004

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2400

0 200 400

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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Produced by Marcia Jones

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TECHNICAL AREA-6 SITE BEFORE AND AFTER THE CERRO GRANDE FIRE

6-007(g) – *Erosion Matrix Score 50.8*. Formerly Area Of Concern C-6-004, the site of building TA-6-12. Explosives, particularly PETN, were pressed in this building, which was removed from this site in 1949.

CERRO GRANDE FIRE:

This site is located on the south side of Pajarito Canyon within the Two Mile Canyon Watershed Aggregate. The drainage channel east of building TA-6-6 has minor evidence of fire damage.

BMPs:

Wattles were installed both up and down slope within the drainage channel. Rock/log check dams were installed within the channel to dissipate surface runoff.

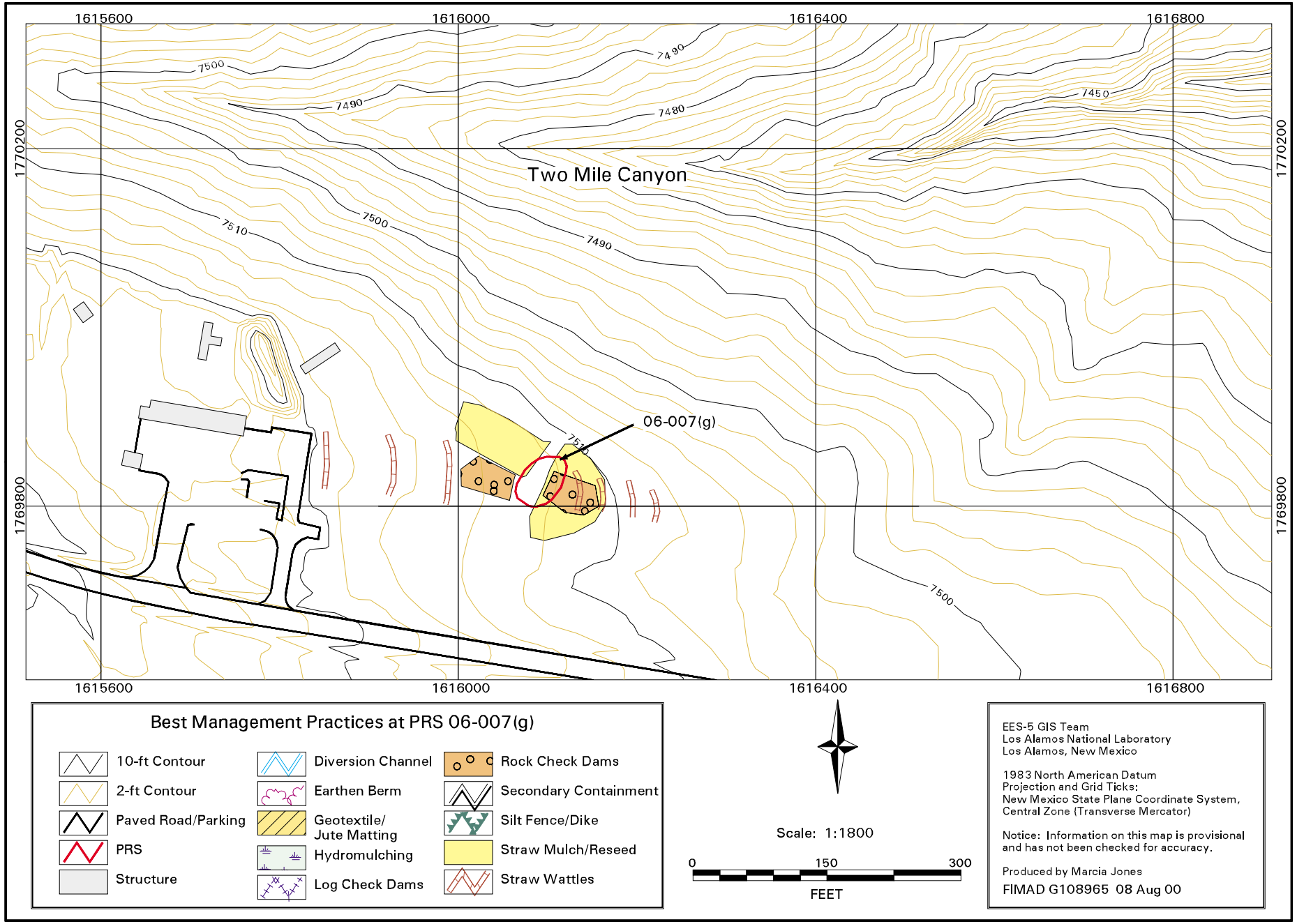
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

5/10/2001	
4/05/2001	An additional 4 straw wattles and
10/30/2000	2 cubic yards of riprap were installed.
10/28/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.


1615600
1616000
1616400
1616800
1770200
1769800
Two Mile Canyon
06-007(g)
7500
7490
7480
7450
7510
Best Management Practices at PRS 06-007(g)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1800
0
150
300
FEET
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Los Alamos, New Mexico
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Central Zone (Transverse Mercator)
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TECHNICAL AREA-9 SITES BEFORE AND AFTER THE CERRO GRANDE FIRE

9-004(o) - *Erosion Matrix Score 43.8*. Inactive NPDES outfall associated with a sump and settling tank within building TA-9-48. The reinforced concrete settling tank within building TA-9-48 (PRS 9-004(n)) is subsurface and was not impacted by the fire as originally suspected.

CERRO GRANDE FIRE:

This site is located south of Pajarito Canyon within the Starmer/Upper Pajarito Watershed Aggregate. The area received minor to moderate fire damage. The ground cover was completely burned but the canopy cover was only partially affected.

BMPs:

Straw wattles were installed within the drainage swales and rock check dams were placed within the channels to dissipate flow.

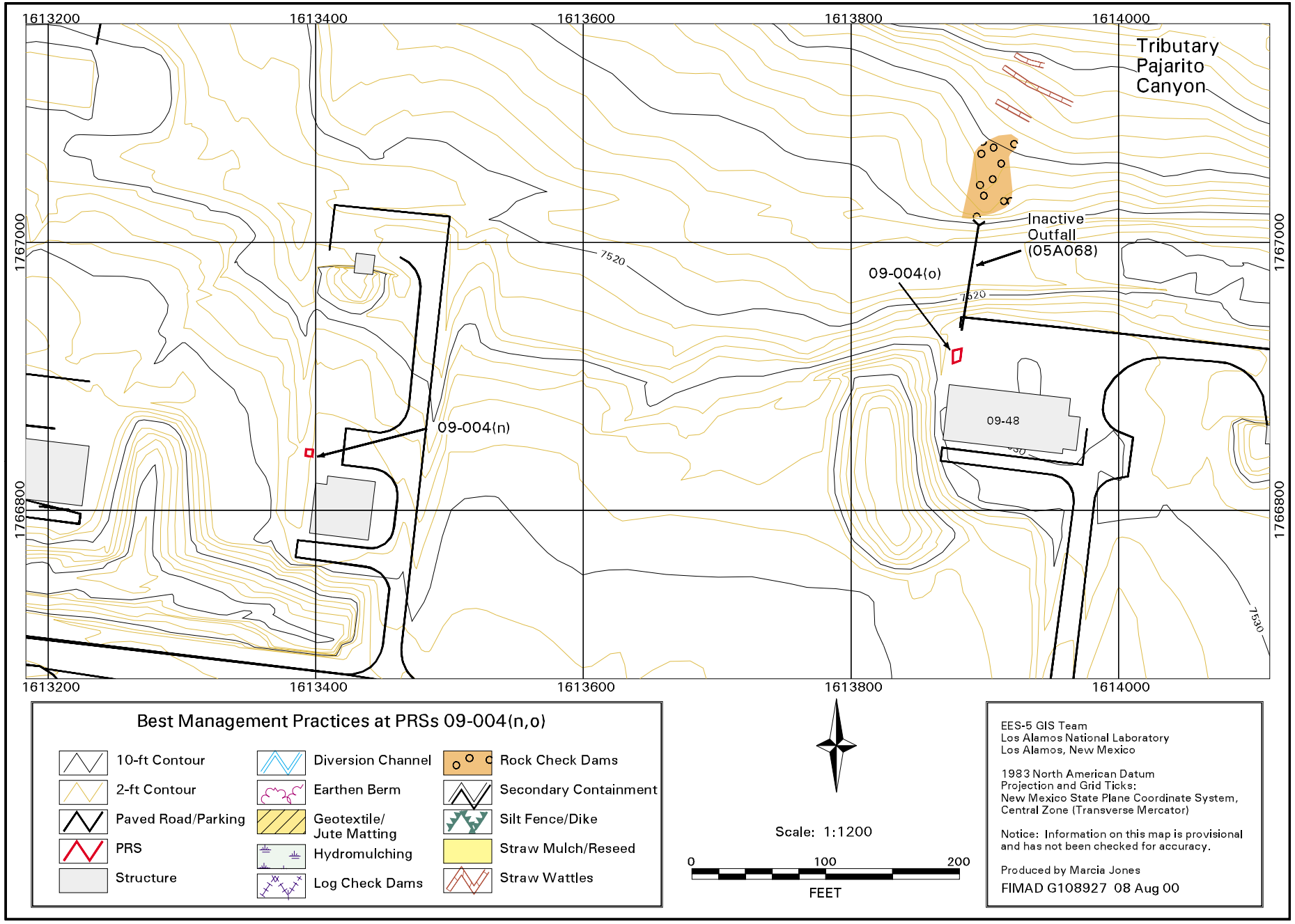
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

6/29/2001
5/10/2001
4/05/2001 An additional 2 straw wattles were
10/30/2000 installed.
6/24/2000

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRSs 09-004(n,o)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:1200

0 100 200

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

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9-009 - *Erosion Matrix Score 58.8*. A lagoon and sand filters used to treat sanitary waste. After flowing through the sand filters, effluent discharged to a currently inactive NPDES outfall (555 02S).

CERRO GRANDE FIRE:

This site is located south of Pajarito Canyon within the Starmer/Upper Pajarito Watershed Aggregate. The PRS is the former Sanitary Wastewater Treatment Facility north of TA-9. Site has moderate fire damage with ground and canopy cover being impacted.

BMPs:

Straw wattles were installed in the drainage swales and rock check dams were placed in the channels to dissipate flow (using existing materials found on-site). Wattles were also provided upslope for run-on diversion.

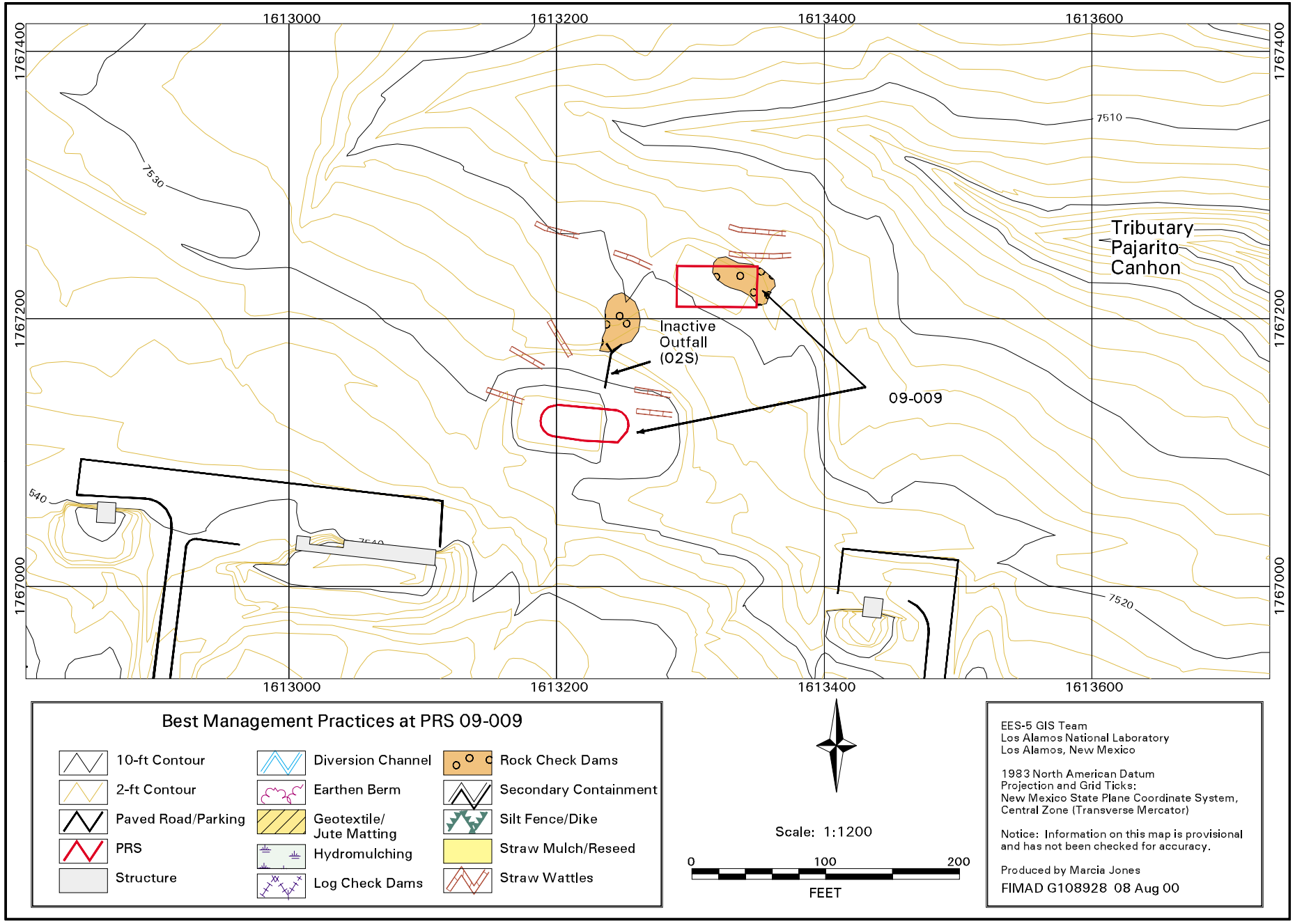
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

6/29/2001	
5/10/2001	An additional 2 straw wattles were
4/05/2001	installed
10/30/2000	
6/24/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 40%. The area appears stable with evidence of sediment migration being minimal.


1613000
1613200
1613400
1613600
1767400
1767200
1767000
7530
7510
7520
540
Tributary
Pajarito
Canhon
Inactive
Outfall
(02S)
09-009
Best Management Practices at PRS 09-009
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/
Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1200
0
100
200
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional
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Produced by Marcia Jones
FIMAD G108928 08 Aug 00

9-013 - *Erosion Matrix Score 56.0*. Material Disposal Area (MDA) M, was a surface disposal area located within TA-9. MDA-M occupied approximately 3.2 acres and was roughly circular in shape. Construction debris and solid wastes were disposed there from 1948 to 1965

CERRO GRANDE FIRE:

This site is located south of Pajarito Canyon within the Starmer/Upper Pajarito Watershed Aggregate. The area surrounding MDA M was moderately to severely burned as was a majority of the upper Pajarito Watershed. All of the existing erosion controls at the site were destroyed.

BMPs:

Run-on controls were replaced as shown below. The entire site was hand raked, reseeded and mulched. A retention basin was installed at the bottom of the slope to create a "zero discharge" area.

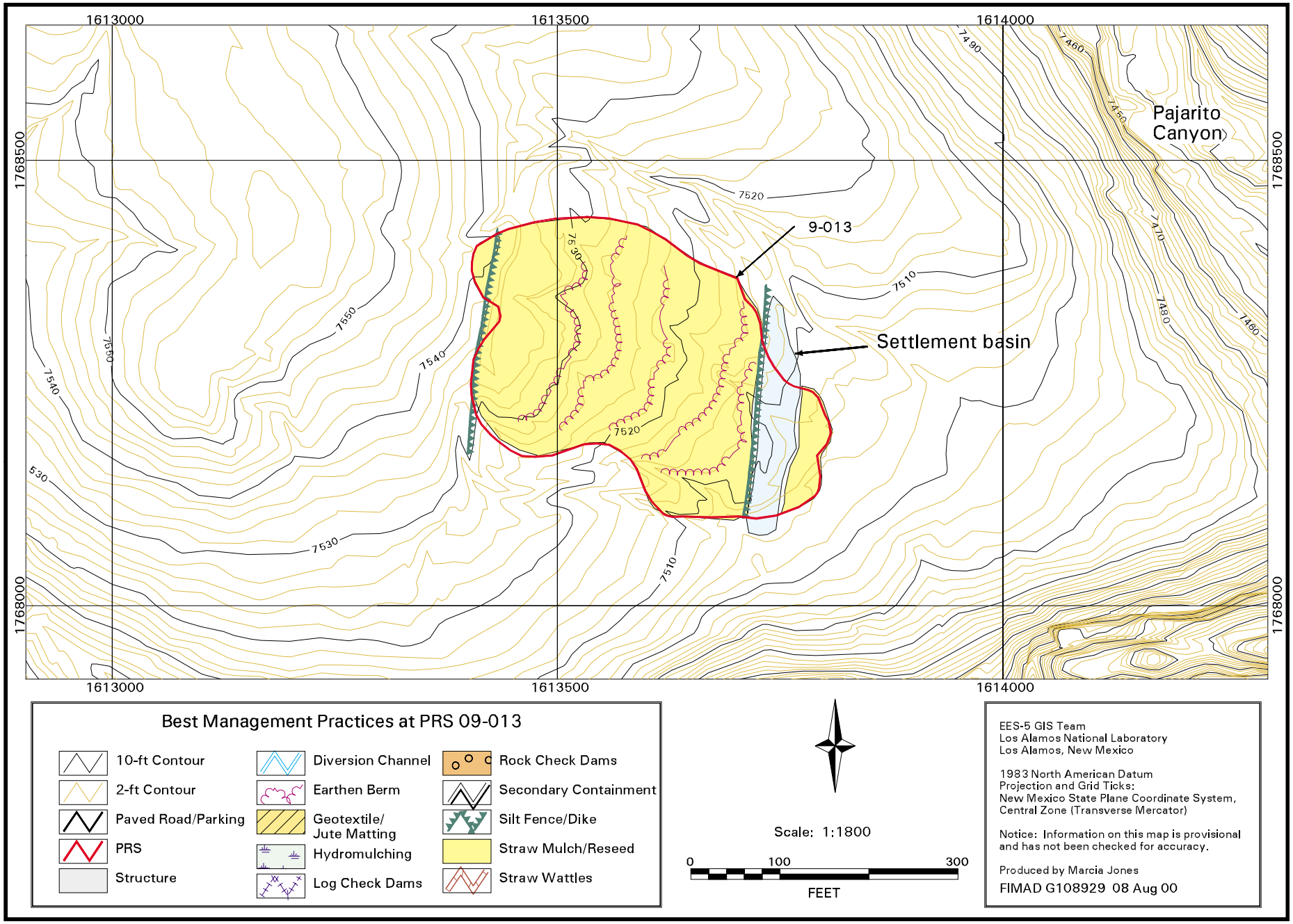
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

6/28/2001
5/10/2001
4/05/2001 No maintenance required
10/30/2000
5/24/2000

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.


1613000
1613500
1614000
1768500
1768000
Pajarito
Canyon
9-013
Settlement basin
7520
7530
7540
7550
7560
7510
7490
7460
7450
7470
7480
530
Best Management Practices at PRS 09-013
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/
Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1800
0
100
300
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
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TECHNICAL AREA-11 SITES BEFORE AND AFTER THE CERRO GRANDE FIRE

11-004(a-f) – *Erosion Matrix Score 56.0*. Active components of a drop tower (TA-11-25) complex located 180 feet east of TA-11-2 and TA-11-3.

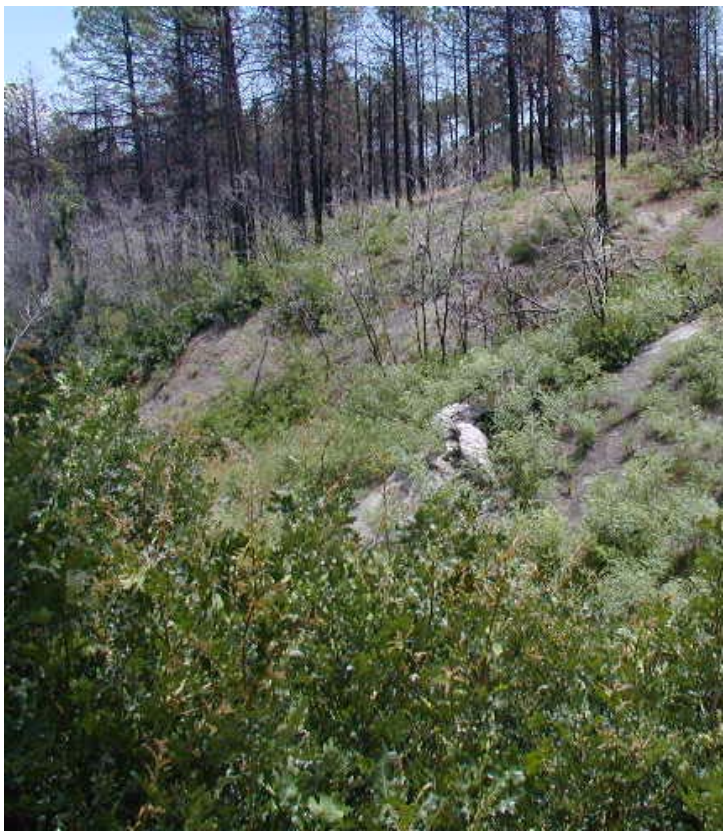
11-006(a-d) – *Erosion Matrix Scores 10.6, 52.0, 68.8 and 74.0*. An HE sump (11-006(a)) that receives drainage from the concrete pad (TA-11-26) that surrounds the drop tower (TA-11-25). The sump is located to the east of the drop tower complex. Three reinforced concrete surface water catch basins receive drainage from the sump (11-006(b-d)).

CERRO GRANDE FIRE:

This site is located north of Water Canyon within the S-Site Watershed Aggregate. The site has moderate to severe fire damage in the area surrounding the TA-11Drop Tower. Log check dams within the major drainages received partial damage. All straw barriers installed around site were destroyed.

BMPs:

The log check dams (on-site materials used) were replaced within the adjacent drainages. Straw wattles were placed on the slopes and geotextile was installed in the areas with the most erosion potential. The area surrounding the Drop Tower was hydromulched to enhance the revegetation process.



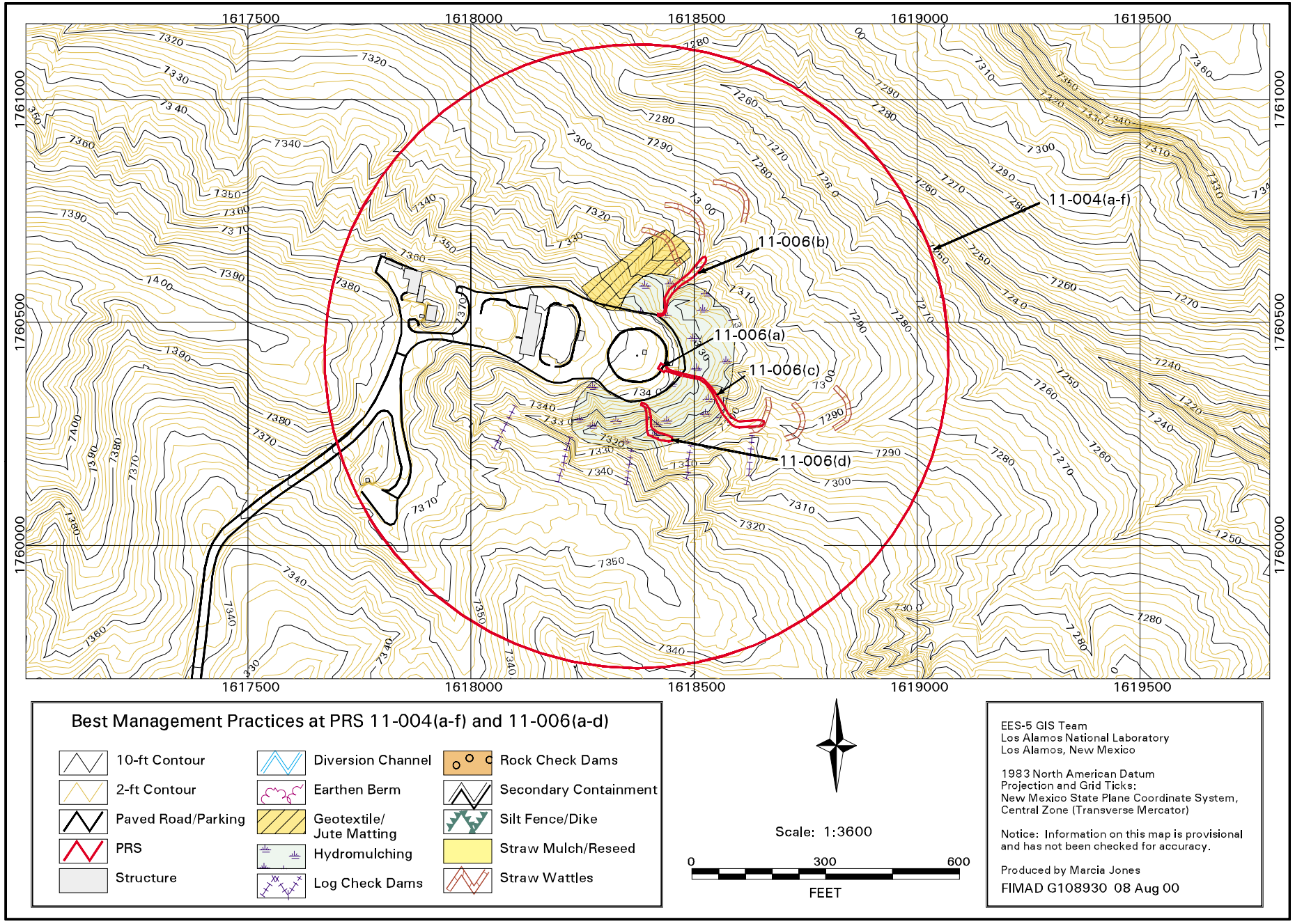
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

6/21/2001
3/12/2001
12/20/2000
11/17/2000 No maintenance required
10/12/2000
5/18/2000

SITE STATUS

Site is in good condition, with vegetative cover of greater than 60%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRS 11-004(a-f) and 11-006(a-d)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:3600

0 300 600

FEET

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Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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FIMAD G108930 08 Aug 00

TECHNICAL AREA-14 SITES AFTER THE CERRO GRANDE FIRE

14-002(a) – *Erosion Matrix Score 51.5*. Decommissioned closed firing chamber. The chamber was dismantled and removed in 1973. It was used extensively for HE tests, many using uranium-238.

14-002(c) - *Erosion Matrix Score 36.8*. A control bunker built in 1944 converted to storage in 1961. In 1965 storage contents were destroyed. The 1990 SWMU report indicated that this site was contaminated with high explosives.

14-002(d) - *Erosion Matrix Score 40.8*. Firing pad in which small explosive tests (up to 15 lbs) were photographed, some of the shots contained uranium.

14-002(e) - *Erosion Matrix Score 47.8*. Firing pad on which explosive tests were photographed. Shots were small (up to 15 pounds) and some contained uranium.

14-006 - *Erosion Matrix Score 47.1*. This PRS consists of a sump, drain line, and outfall. It was used to separate pieces of HE from liquid. The sump is now plugged and the only discharge to the outfall is rain water. HE and toxic chemicals may be present.

14-009 - *Erosion Matrix Score 53.7*. Surface disposal area consisting of ruptured sand bags which were used for containment during explosives testing activity. Sand could be contaminated with lead, uranium, HE and beryllium.

14-010 - *Erosion Matrix Score 51.5*. High explosive waste sump adjacent to TA-14-2. The site may have contained HE and other chemicals. The sump and drain-line were removed.

CERRO GRANDE FIRE:

This site is located north of Canon de Valle within the Canon de Valle Watershed Aggregate. The entire south facing slope located to the south of TA-14 stuctures was moderately burned with substantial damage to the groundcover.

PHOTOGRAPH:

This photograph was taken on June 8th, 2000. The drainage shown is located below building 14-43.

BMPs:

Straw wattles were installed across the drainage swale. The area was hand raked, reseeded and mulched. A rock check dam was installed at the lowest part of the drainage.

SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

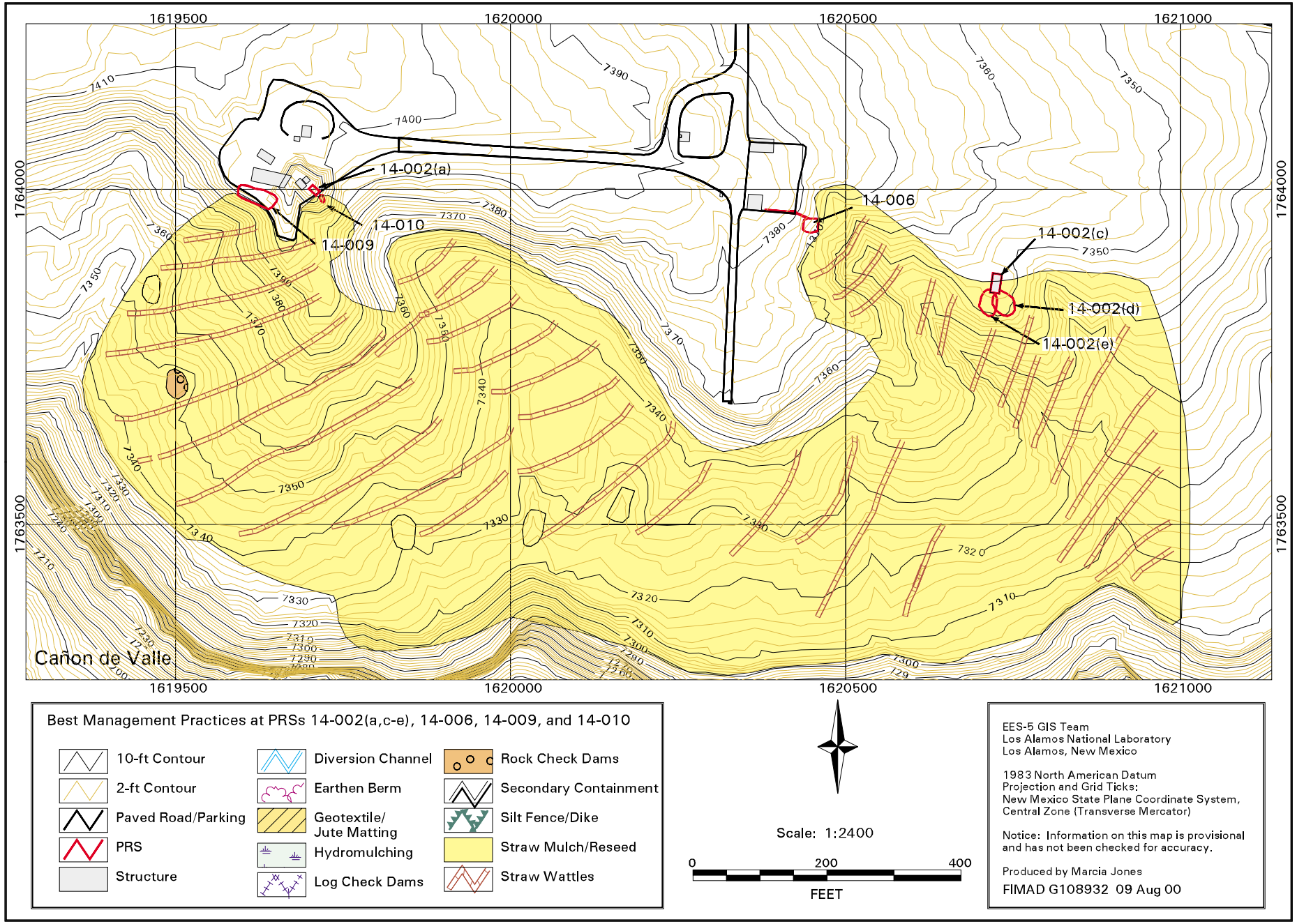
5/10/2001
4/25/2000
10/30/2000
6/9/2000

Maintenance performed:

Several more straw wattles were installed due to damage from wildlife.

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70% throughout the site. The area appears stable with evidence of sediment migration being minimal.


1619500
1620000
1620500
1621000
1764000
1763500
14-002(a)
14-010
14-009
14-006
14-002(c)
14-002(d)
14-002(e)
Cañon de Valle
Best Management Practices at PRSs 14-002(a,c-e), 14-006, 14-009, and 14-010
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:2400
0
200
400
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108932 09 Aug 00

TECHNICAL AREA-15 – INACTIVE FIRING SITE R44 BEFORE AND AFTER THE CERRO GRANDE FIRE

15-006(c) – *Erosion Matrix Score 64.5*. PRS 15-006(c) was the third most extensively used firing site at TA-15, used from the 1950s until 1992. Approximately 7,000 Kg of uranium and other materials, including lead and beryllium were expended. **15-008(b)** - *Erosion Matrix Score 67.2*. Surface disposal area north of PRS 15-006(c), R-44 Firing Site. Remnants and debris from tests were pushed over the edge of the canyon.

CERRO GRANDE FIRE:

This site is located on the south rim of Three Mile Canyon within the Three Mile Watershed Aggregate. 15-006(c) has moderate to severe burn damage with most of the damage adjacent to the former R-44 Firing Pad. A large amount of firing site related debris has been exposed throughout the site (especially towards the east).

BMPs:

Straw wattles, rock check dams and silt fencing were installed throughout the burned areas. The area was then hydrolmulched to enhance the revegetation process.

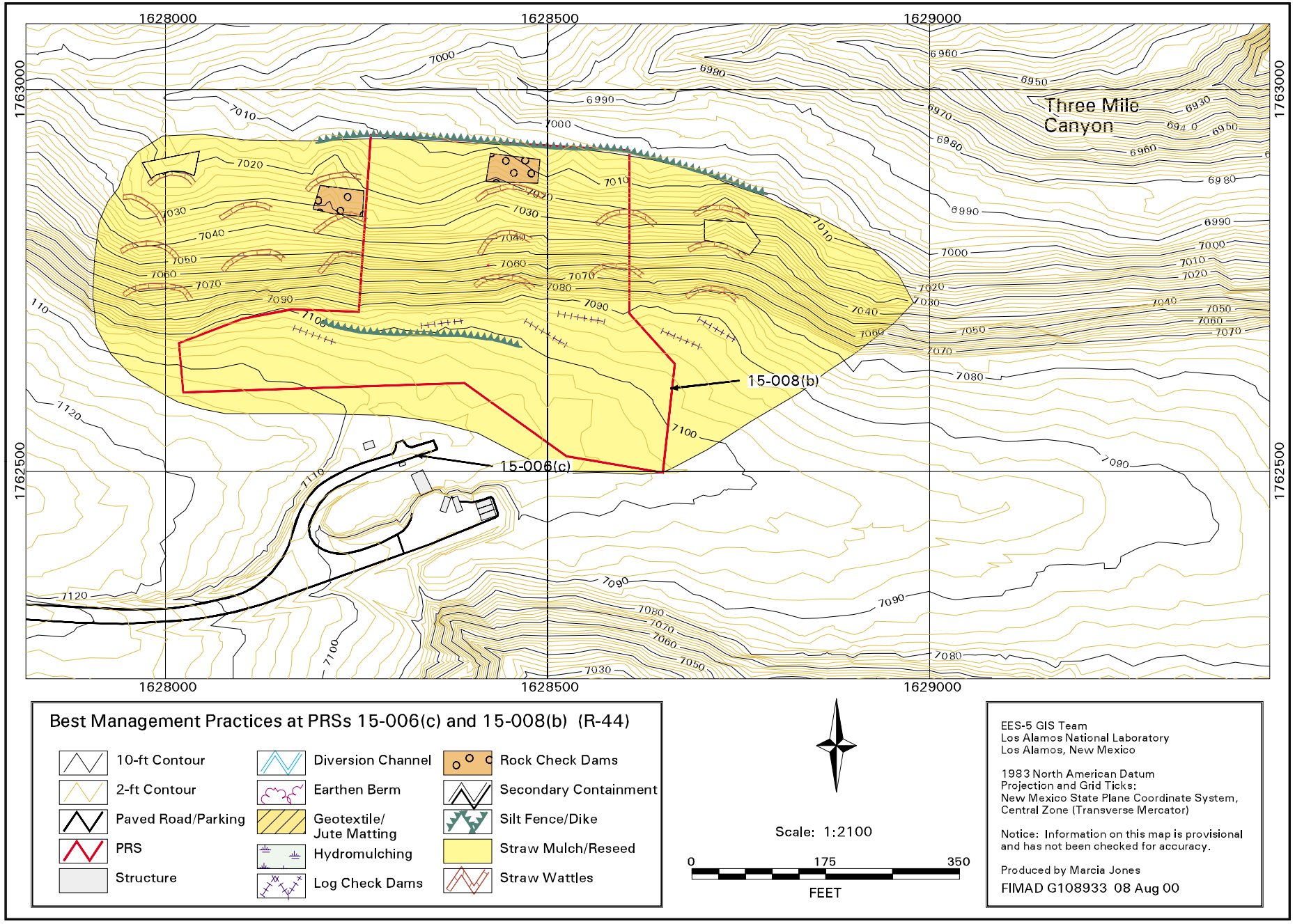
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

6/29/2001
5/10/2001
3/30/2001 No maintenance required
10/20/2000
5/24/2000

SITE STATUS

Over 20 cubic yards of firing site debris was removed from the surrounding area. Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.


1628000
1628500
1629000
1763000
1762500
Three Mile Canyon
15-008(b)
15-006(c)
Best Management Practices at PRSs 15-006(c) and 15-008(b) (R-44)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:2100
0
175
350
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108933 08 Aug 00

TECHNICAL AREA-15 – HOLLOW SITE BEFORE AND AFTER THE CERRO GRANDE FIRE

C-15-007 - *Erosion Matrix Score 51.5*. Stained soil noted during a 1988 ER site reconnaissance visit. A transportable building was placed over it. The area was sampled in 1997. **C-15-010** - *Erosion Matrix Score 8.8*. Removed inactive underground fuel storage tank. **15-014(k)** - *Erosion Matrix Score 3.6*. Concrete open trench drains. **15-011(a)** - *Erosion Matrix Score 3.6*. Concrete trench drains. **15-014(i)** – *Erosion Matrix Score* 3.6. Drain line from roof of building TA-15-194. **15-011(b)** - *Erosion Matrix Score 87.0*. Dirt drainage ditch located southwest of Building R-194. Drainage may have received degreasers, solvents containing sulfuric acid, and/or hydrochloric acid. **15-011(c)** - *Erosion Matrix Score 87.0*. Drainage, PRS 15-011(c), serves the outfalls from buildings within The Hollow that have had various uses as assembly building, laboratories, and shops. **15-014(j)** - *Erosion Matrix Score 61.3*. PRS 15-014(j) consists of three outfalls from Building R-50 and a drainage channel that is partially asphalt just below the outfall leading towards the canyon.

CERRO GRANDE FIRE:

This site is located near the confluence of Canon de Valle and Water Canyon within the Canon de Valle Watershed Aggregate. The site was moderately to severely damaged including several burned structures.

BMPs:

Straw wattles were installed along the western perimeter of the mesa. Several trees were contour felled for erosion control along the drainage channel. The site was hand-raked, reseeded and straw mulched.

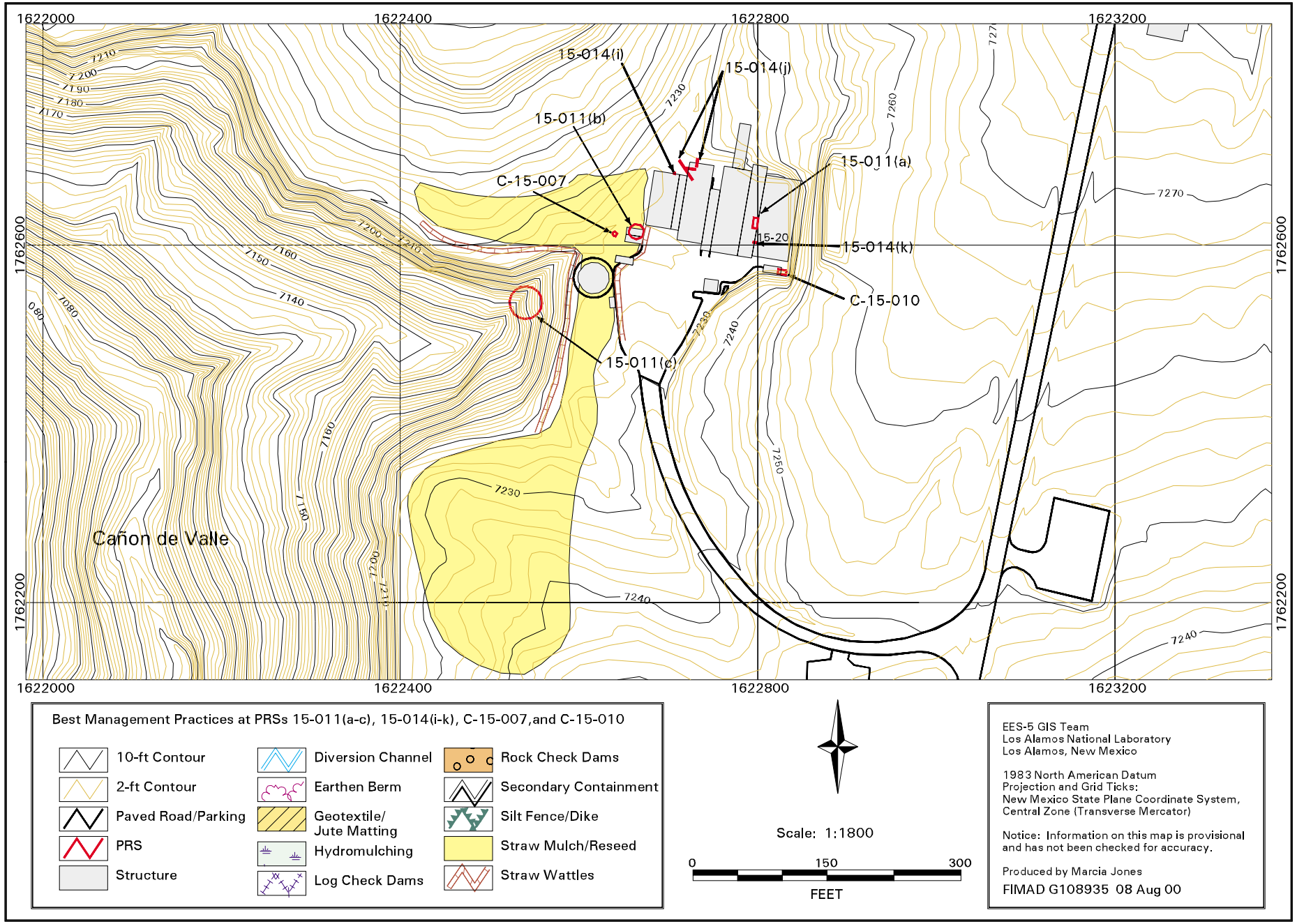
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

5/10/2001	
3/30/2001	No maintenance required
10/20/2000	
5/26/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.


1622000
1622400
1622800
1623200
1762600
1762200
15-014(i)
15-014(j)
15-011(b)
15-011(a)
C-15-007
15-20
15-014(k)
C-15-010
15-011(c)
Cañon de Valle
7210
7200
7190
7180
7170
7230
7260
7270
7150
7160
7140
7080
7090
7240
7250
Best Management Practices at PRSs 15-011(a-c), 15-014(i-k), C-15-007,and C-15-010
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1800
0
150
300
FEET
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Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
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FIMAD G108935 08 Aug 00

TECHNICAL AREA-15 - MDA-Z BEFORE AND AFTER THE CERRO GRANDE FIRE

15-007(b) – *Erosion Matrix Score 40.2*. MDA Z is an inactive disposal area that was used from 1965 to 1981 for construction debris, steel blast matting from PHERMEX, and other debris.

CERRO GRANDE FIRE:

This site is located near the confluence of Canon de Valle and Water Canyon within the Canon de Valle Watershed Aggregate. The area received minor burn damage primarily to the ground cover.

BMPs:

Straw wattles were installed above the site within the existing drainage channel and below the area with exposed debris.

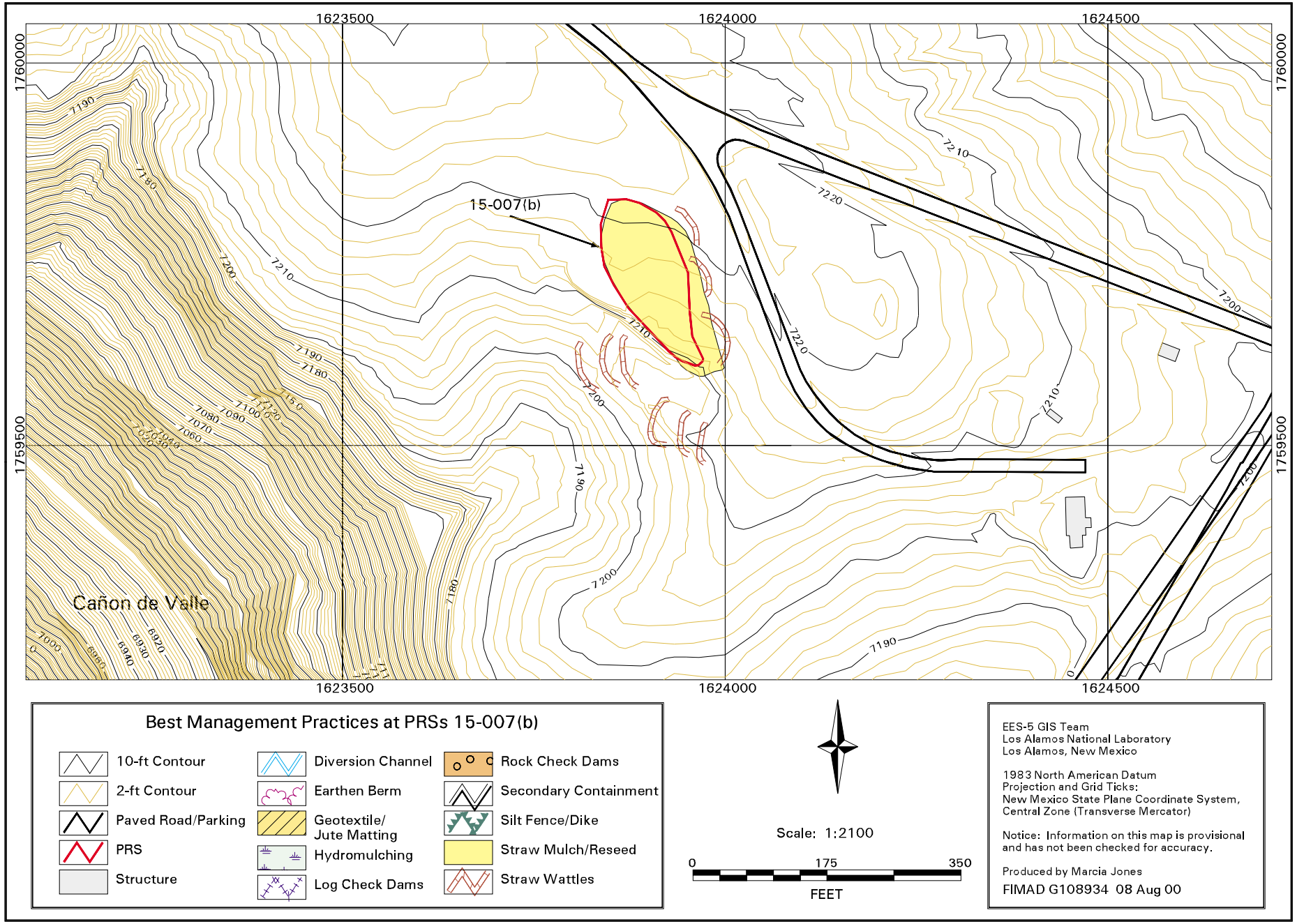
SUMMARY OF INSPECTION & MAINTENANCE

Sites inspected on:

6/29/2001
5/10/2001
3/30/2001 No maintenance required
10/30/2000
6/10/2000

SITE STATUS

Site is in good condition, with vegetative cover of greater than 50%. The area appears stable with evidence of sediment migration being minimal.


1623500
1624000
1624500
1760000
1759500
15-007(b)
Cañon de Valle
Best Management Practices at PRSs 15-007(b)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/
Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:2100
0
175
350
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
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FIMAD G108934 08 Aug 00

TECHNICAL AREA-16 SITES AFTER THE CERRO GRANDE FIRE

16-028(a) – *Erosion Matrix Score 51.5*. An active outfall drainage associated with TA-16-228 High Explosive Wastewater Treatment Facility. The discharge enters the canyon between TA-16-228 and the liquid impoundment SWMU (16-008(b).

CERRO GRANDE FIRE:

This site is located near a tributary of Water Canyon within the Canon de Valle Watershed Aggregate. The site has minimal fire damage to the west and south. Some minor burning occurred within the SWMU boundary, but consisted mostly of destroyed grasses. The HEWTF remains operational.

BMPS:

Straw barriers and rock check dams (existing materials found on site) were placed within the drainage swale to reduce sediment transport potential.

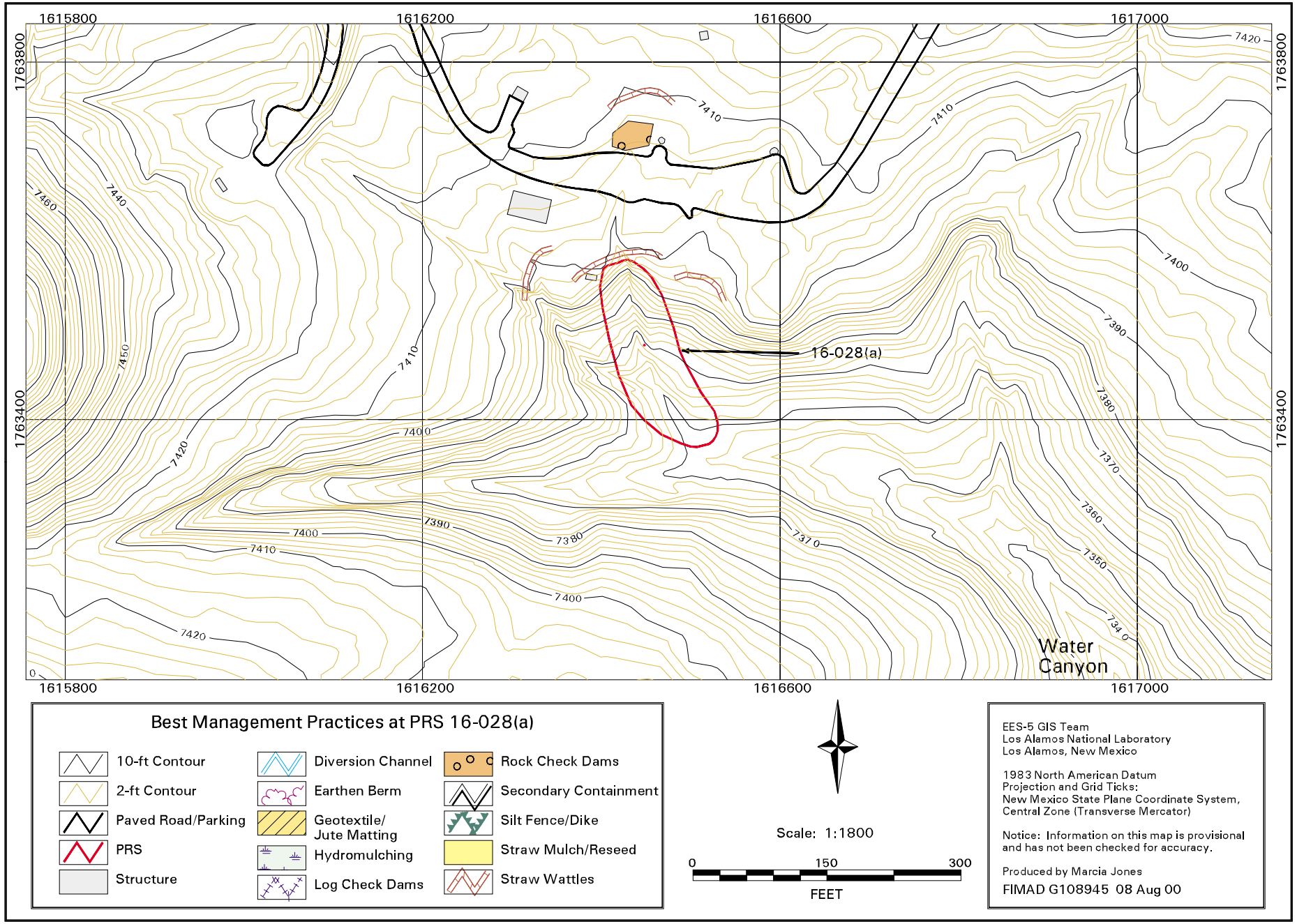
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/25/2001
5/10/2001
3/30/2001 No maintenance required
10/30/2000
6/1/2000

SITE STATUS

Site is in good condition, with vegetative cover of greater than 50%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRS 16-028(a)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:1800

0 150 300

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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16-003(f) – *Erosion Matrix Score 8.8*. An inactive HE sump associated with TA-16-304. No HE is currently used and the probability of HE in the sump is low.

CERRO GRANDE FIRE:

Site is located in a small tributary drainage to Water Canyon within the S-Site Watershed Aggregate. Site has minor to moderate fire damage within the outfall drainage.

BMPs:

Straw wattles were installed upslope from the drainage to divert and dissipate runoff. Straw barriers and rock check dams (using on-site material) were placed within the channel and the site was hand-raked, reseeded and straw mulched.

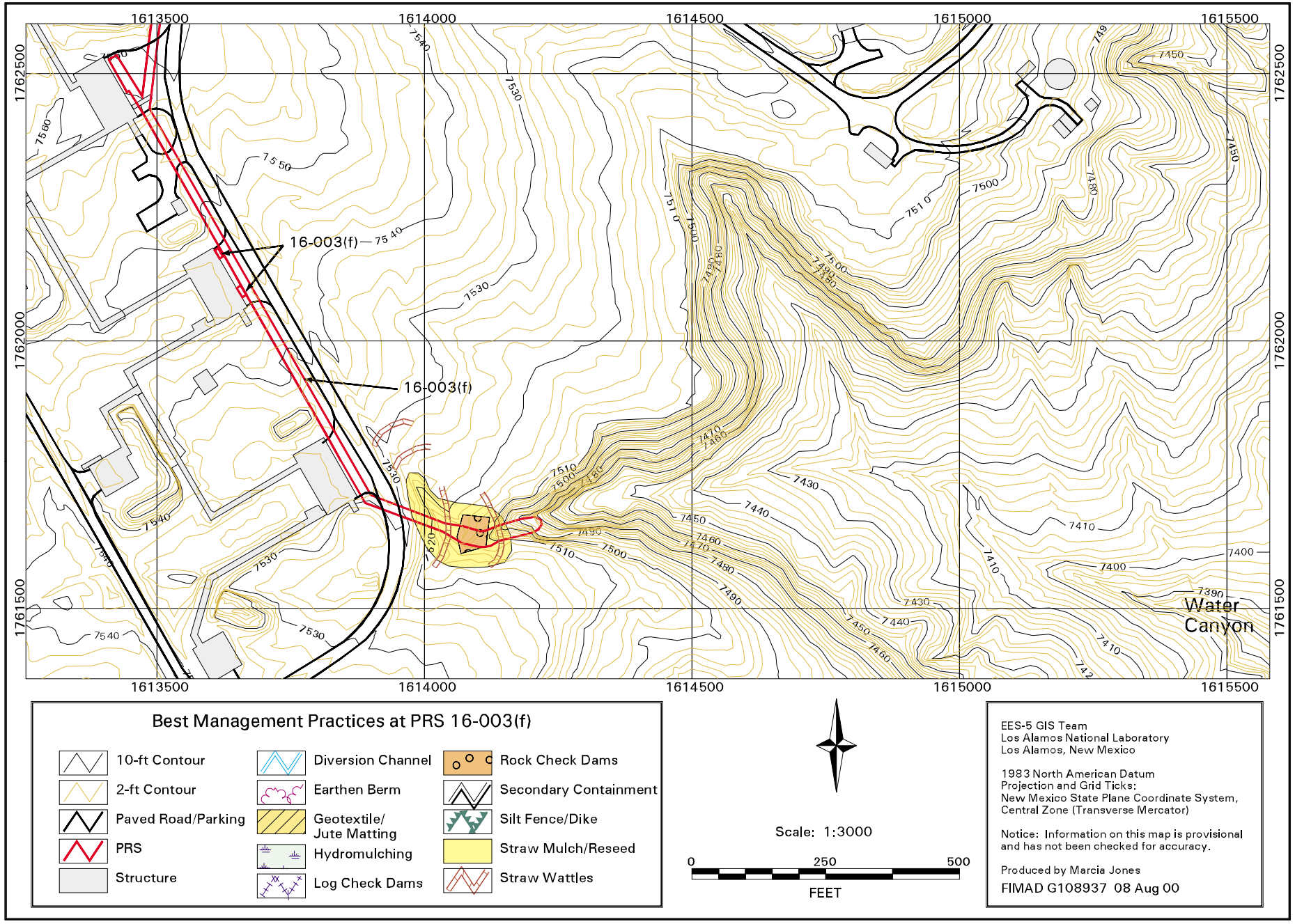
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/25/2001	
3/12/2001	
12/20/2001	No maintenance required
11/17/2000	
9/14/2000	
5/24/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRS 16-003(f)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:3000

0 250 500

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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16-021(c) – *Erosion Matrix Score 73.3*. The outfall associated with the 13 HE sumps on the northeast side of TA-16-260. The drainage channel from the outfall flows about 600 feet to the bottom of Canon de Valle. A small pond, 55 feet long is formed by a rock dam located 93 feet from the outfall. The longitudinal axis of the pond is oriented east-west. The site is undergoing an Interim Measure at this time. **16-003(k)** - *Erosion Matrix Score 38.6.* 13 HE sumps and drain lines associated with outfall.

CERRO GRANDE FIRE:

This site is located in a tributary drainage of Canon de Valle within the Canon de Valle Watershed Aggregate. Burn damage is minor to moderate within the SWMU boundary. Heavy equipment on-site was not affected by the fire, although some hoses, drums and misc. equipment were damaged. The upper drainage pond was not burned. The lower drainage received minimal damage from the fire.

BMPs:

Straw barriers were replaced within the drainage channel and jute matting was installed to protect the exposed slopes. All excavated material remains covered with HDPE liners and is surrounded by an earthen berm. The storm water retention pond was unharmed and remains effective as a retention area.

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

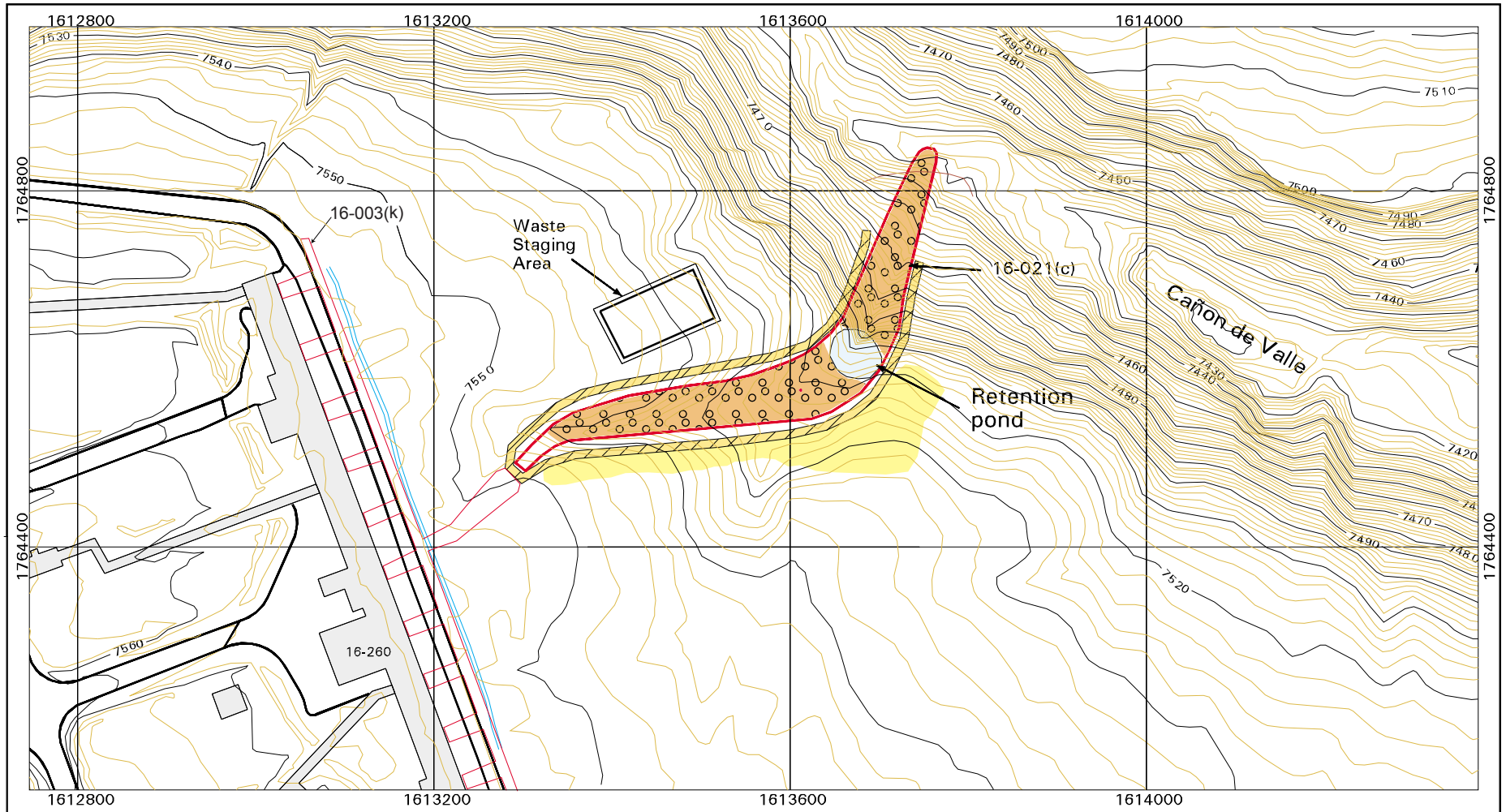
6/25/2001
3/12/2001
12/20/2000
11/17/2000
10/12/2000
5/24/2000

Maintenance Performed:

An interim measure was recently completed at the site to remove several hundred cubic yards of HE contaminated soil from the drainage channel. The excavation is complete and site restoration activities are ongoing. The site will be inspected and maintained until final stabilization is completed.

SITE STATUS

Site is in good condition, with vegetative cover of greater than 60% along the channel banks. The channel has been completely excavated of contaminated soil and river rock was placed to dissipate any future storm water runoff.



Best Management Practices at PRS 16-021(c)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2100

0 175 350

FEET

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Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
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FIMAD G108943 08 Aug 00

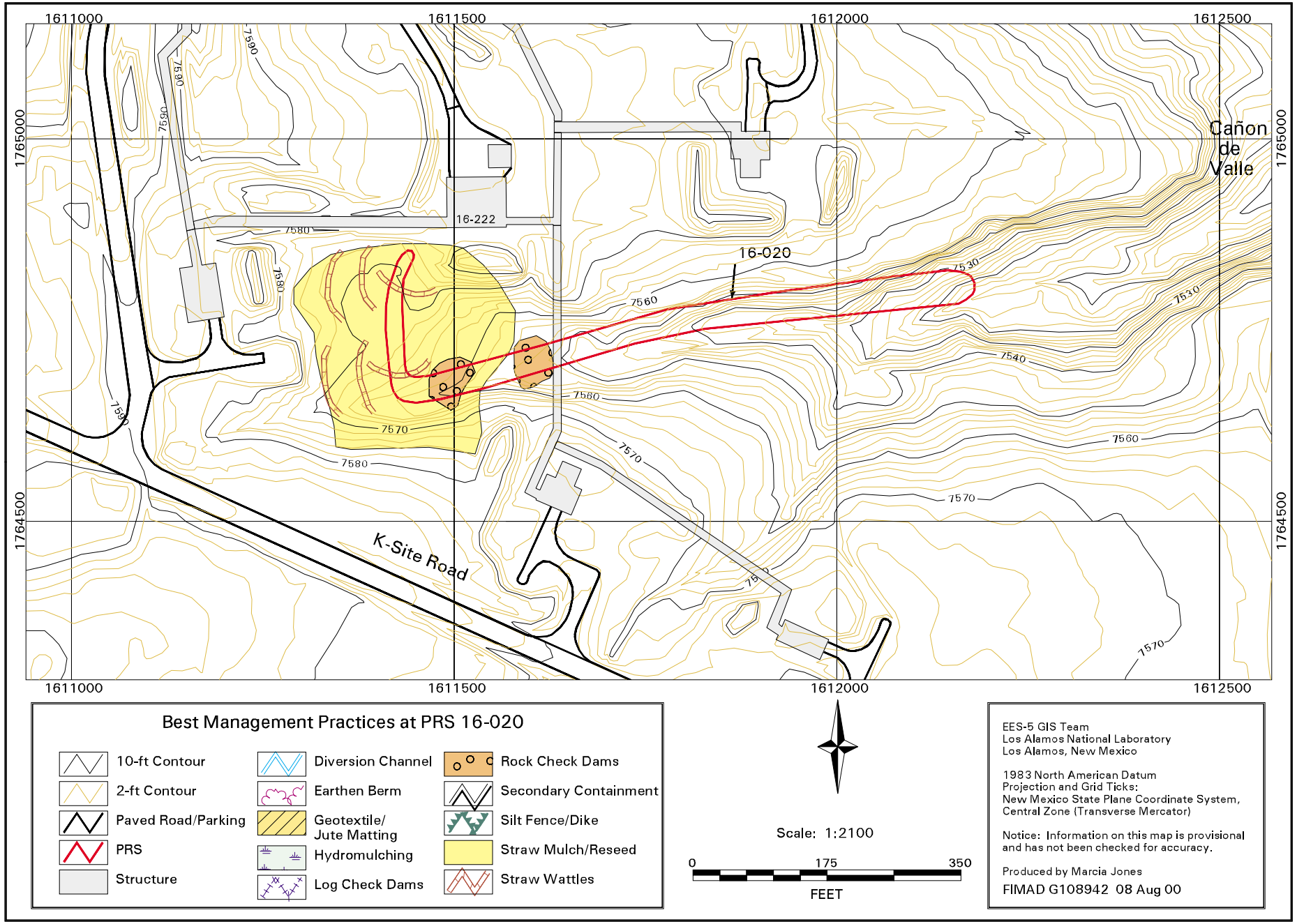
16-020 – *Erosion Matrix Score 61.3*. A small outfall within a drainage channel on the south side of TA-16-222 that slopes gently for approximately 295 ft. to a confluence with the main channel of Canon de Valle.

CERRO GRANDE FIRE:

This site is located east of S-Site Road in the upper tributary of Canon de Valle within the Canon de Valle Watershed Aggregate. No damage was observed from the outfall to the first rock check dam. Below the second rock check dam, fire damaged much of the ground cover and several of the ponderosa pine trees. All straw were destroyed.

BMPs:

Straw wattles were installed throughout the outfall area to dissipate run-on. Ashflow from run-on events have been and will continue to be a problem in this area.


1611000
1611500
1612000
1612500
1765000
1764500
Cañon de Valle
16-222
16-020
K-Site Road
7590
7580
7570
7560
7540
7530
Best Management Practices at PRS 16-020
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:2100
0
175
350
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108942 08 Aug 00

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

7/12/2001
3/12/2001
12/20/2000
11/17/2000
10/12/2000
6/1/2000

Maintenance performed:

Approximately 6 to 12 inches of soil was removed from the defined drainage channel beginning at the start of the outfall and continuing to a distance of approximately 738 feet down drainage as part of the Flood Control Immediate Action Cleanup.

SITE STATUS

The site has a vegetative cover of around 50%. The site appears stable, but evidence of sediment migration is evident after large rain events. Upstream flood control efforts have reduced the flood potential at the site, but additional work remains. The site will be inspected frequently to assure that sediment migration is minimized.

16-019 – *Erosion Matrix Score 83.0*. A material disposal area (MDA R) that consists of the WW II S-Site burning ground and its waste disposal site. This site was found smoldering on May 18th, 2000.

CERRO GRANDE FIRE:

This site is located near building TA-16-260 above Canon de Valle within the Canon de Valle Watershed Aggregate. The site has moderate to severe fire damage over a majority of the area. Miscellaneous debris was exposed on the mesa and slope above canyon channel. The dissipation controls installed within the eastern drainage were destroyed. The ground and canopy cover was completely destroyed. Ash is up to 12" deep in some areas at the toe of slope. Burning occurred in the Canon de Valle leaving severe erosion potential behind.

BMPs:

The fire smoldered for several weeks prior to being extinguished in August 2000. The site was then excavated and 95% of the debris was staged in the area. Trees were contour felled at the toe of the slope to provide sediment retention. Straw wattles were installed across the entire slope at four locations. The entire slope was hydromulched to enhance the vegetation process.

BMPs:

A storm water diversion trench was installed to prevent runoff from the area behind building TA-16-260 and its roof drains. The trench was graded at 1% slope to the west of the excavated area of MDA R.

BMPs:

The excavated soils were staged on top of the mesa. Approximately 1500 cubic yards of soil and debris were removed from the hillside. A 3-foot high clean fill earthen berm was installed around the material. Straw wattles were also placed around the berm for added protection.

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

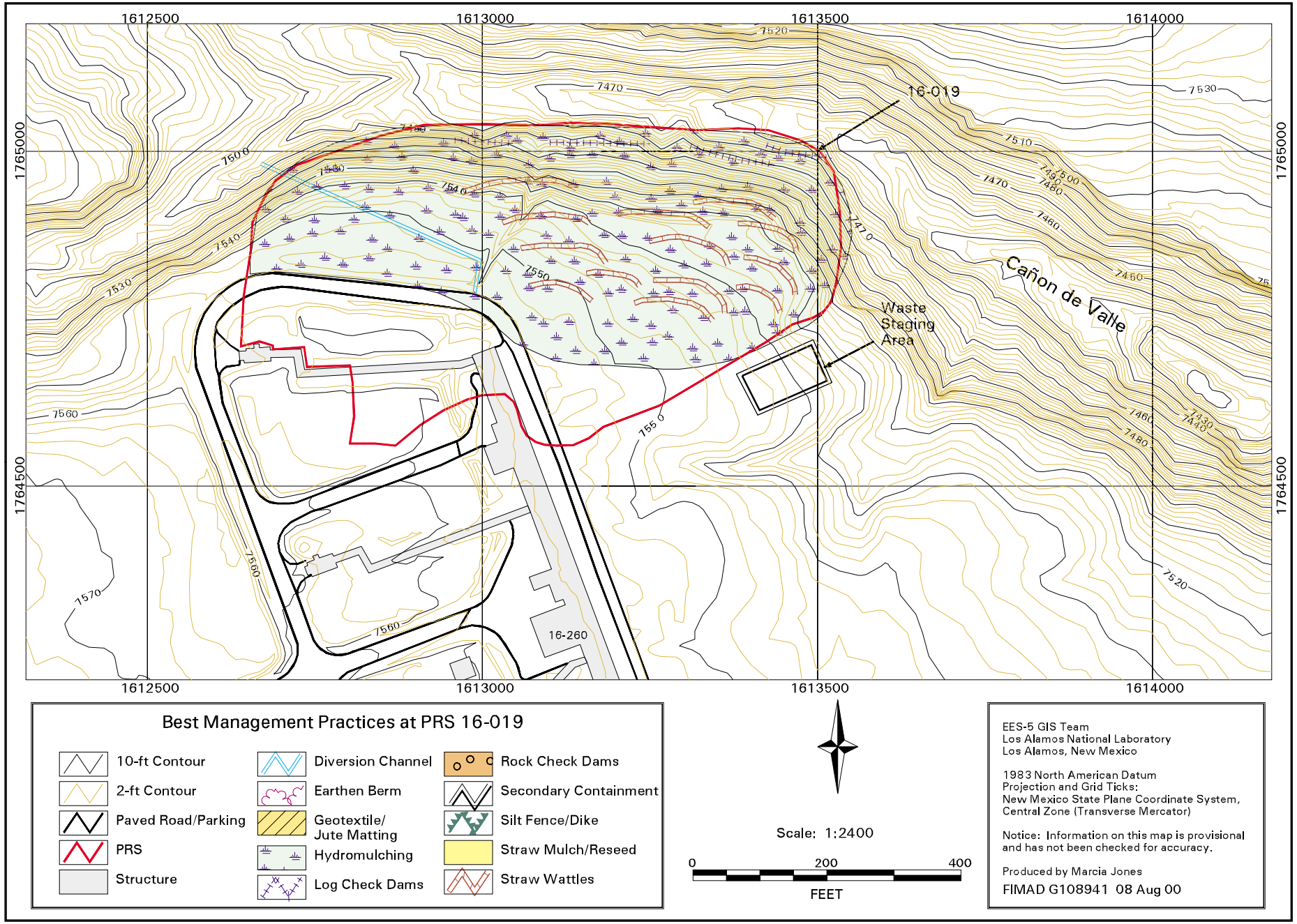
6/26/2001
3/12/2001
12/21/2000
11/17/2000
10/13/2000
9/24/2000
5/18/2000

Maintenance performed:

Several straw wattles were replaced due to wildlife damage. After the excavated soils staged on top of the mesa were removed, the area was reseeded and covered with several inches of straw mulch.

SITE STATUS

All excavated soil and debris have been removed from the site. The controls installed at the site have been very effective in stabilization of the slope. The run-on diversion trench has reduced storm water flow onto the site by more than 75%. The vegetative groundcover has reduced erosion potential on the slope and the migration of sediment at the site is minimal.



Best Management Practices at PRS 16-019

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2400

0 200 400

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones

FIMAD G108941 08 Aug 00

16-003(a) – *Erosion Matrix Score 55.5*. A single inactive HE sump and an outfall associated with TA-16-410 (former NPDES outfall 05A053).

CERRO GRANDE FIRE:

Site is located near a tributary in upper Water Canyon within the Upper Water Canyon Watershed Aggregate. The site has minor to moderate fire damage within the outfall drainage.

BMPs:

Straw wattles were installed near the outfall pipe and below the mesa's edge within the bottom of the tributary drainage. The area around the outfall was hand-raked, reseeded and straw mulched.

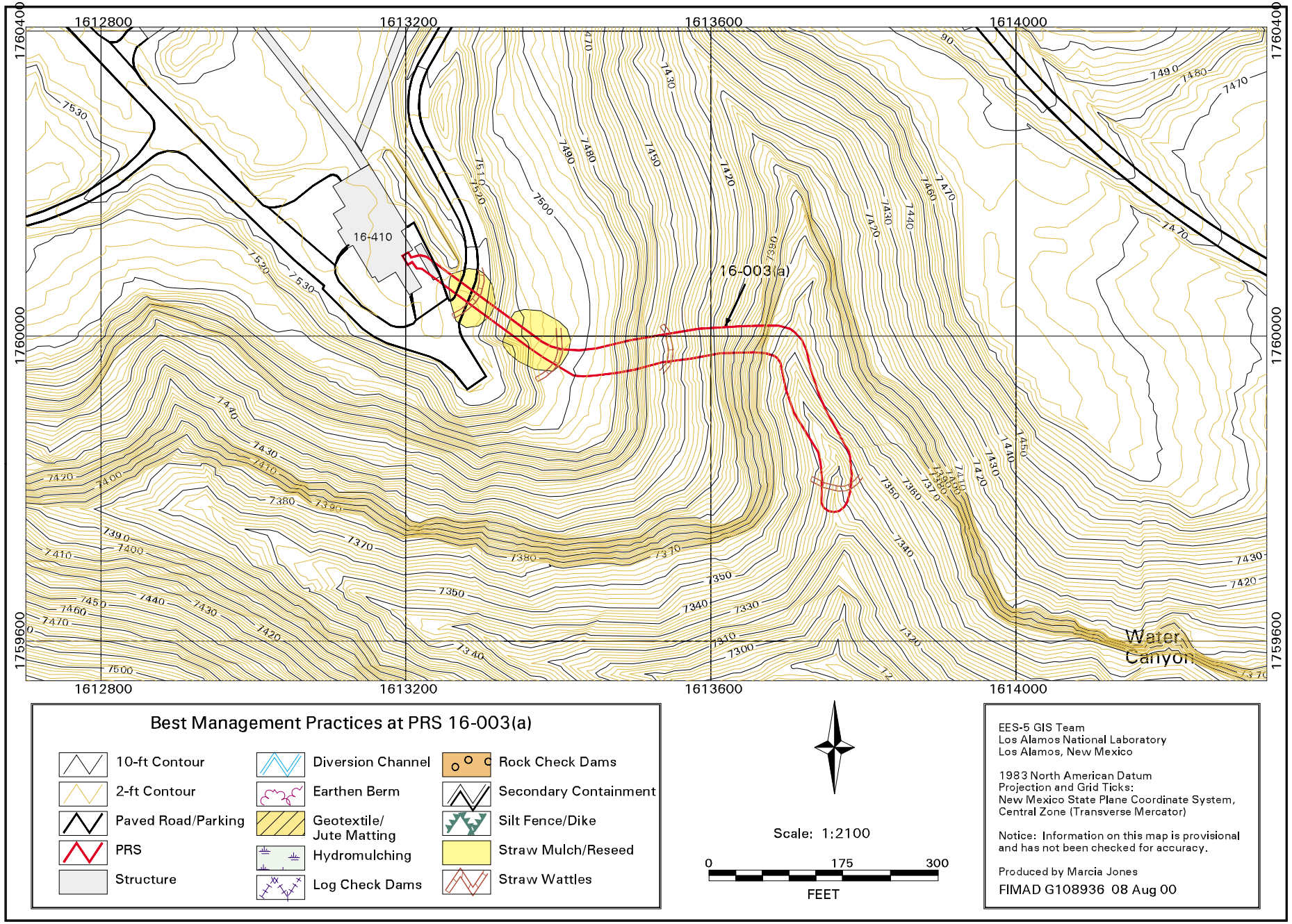
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/25/2001	
3/12/2001	
11/17/2000	No maintenance required
10/12/2000	
9/14/2000	
5/24/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRS 16-003(a)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2100

0 175 300

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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Produced by Marcia Jones

FIMAD G108936 08 Aug 00

16-003(n) – *Erosion Matrix Score 25.0*. An active HE sump associated with TA-16-342. The outfall, EPA 05A062, receives effluent from a HE sump on the northeast corner of TA-16-342. The outfall discharges into a tributary of Canon de Valle. **16-003(o)** – *Erosion Matrix Score 27.3*. Six active HE sumps associated with TA-16-340. The outfall, EPA 05A054, discharges effluent from the six HE sumps on the northeast side of TA-16-340. The effluent flows into a common drain line that discharges into a short tributary of Canon de Valle.

CERRO GRANDE FIRE:

The site is located in a tributary drainage of Water Canyon within the Canon de Valle Watershed Aggregate. The site has minor to moderate fire damage within the drainage channel down to the existing wetlands located approximately ¼ mile downstream.

BMPs:

Straw wattles were installed above and below the wetland to help control sediment transport within the channel. Rock check dams (on-site materials used) were installed for flow dissipation. Wetland vegetation has begun to re-establish itself.

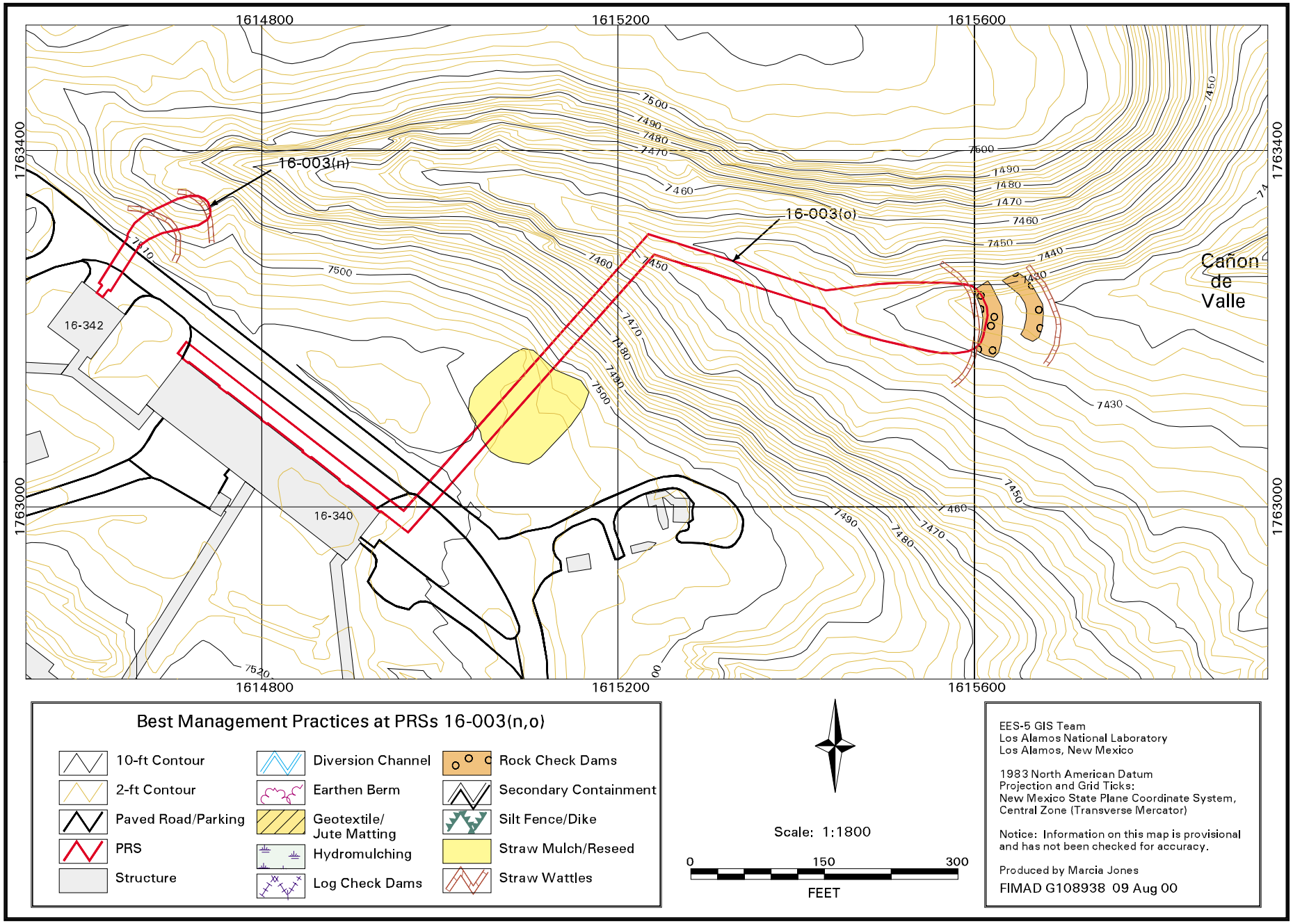
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/26/2001	
3/12/2001	
11/17/2000	
12/20/2000	No maintenance required
10/12/2000	
9/18/2000	
5/24/2000	

SITE STATUS

Revegetation efforts within the tributary drainage have been successful. The wetland grasses as well as the surrounding channel bank grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.


1614800
1615200
1615600
1763400
1763000
16-003(n)
16-003(o)
16-342
16-340
Cañon
de
Valle
7500
7490
7480
7470
7460
7450
7440
7430
7420
7410
Best Management Practices at PRSs 16-003(n,o)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/
Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1800
0
150
300
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional
and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108938 09 Aug 00

16-026(h2) – *Erosion Matrix Score 61.0*. An outfall associated with the HE sump (**PRS 16-029(e)**) at TA-16-360.

CERRO GRANDE FIRE:

The site is located in a tributary drainage of Water Canyon within the Upper Water Canyon Watershed Aggregate. The site has minor to moderate fire damage within drainage channel.

BMPS:

Straw wattles and straw bale barriers were installed within the drainage channel to retain sediment and dissipate flow. Areas adjacent to the drainage were hand-raked, reseeded and covered with straw mulch.

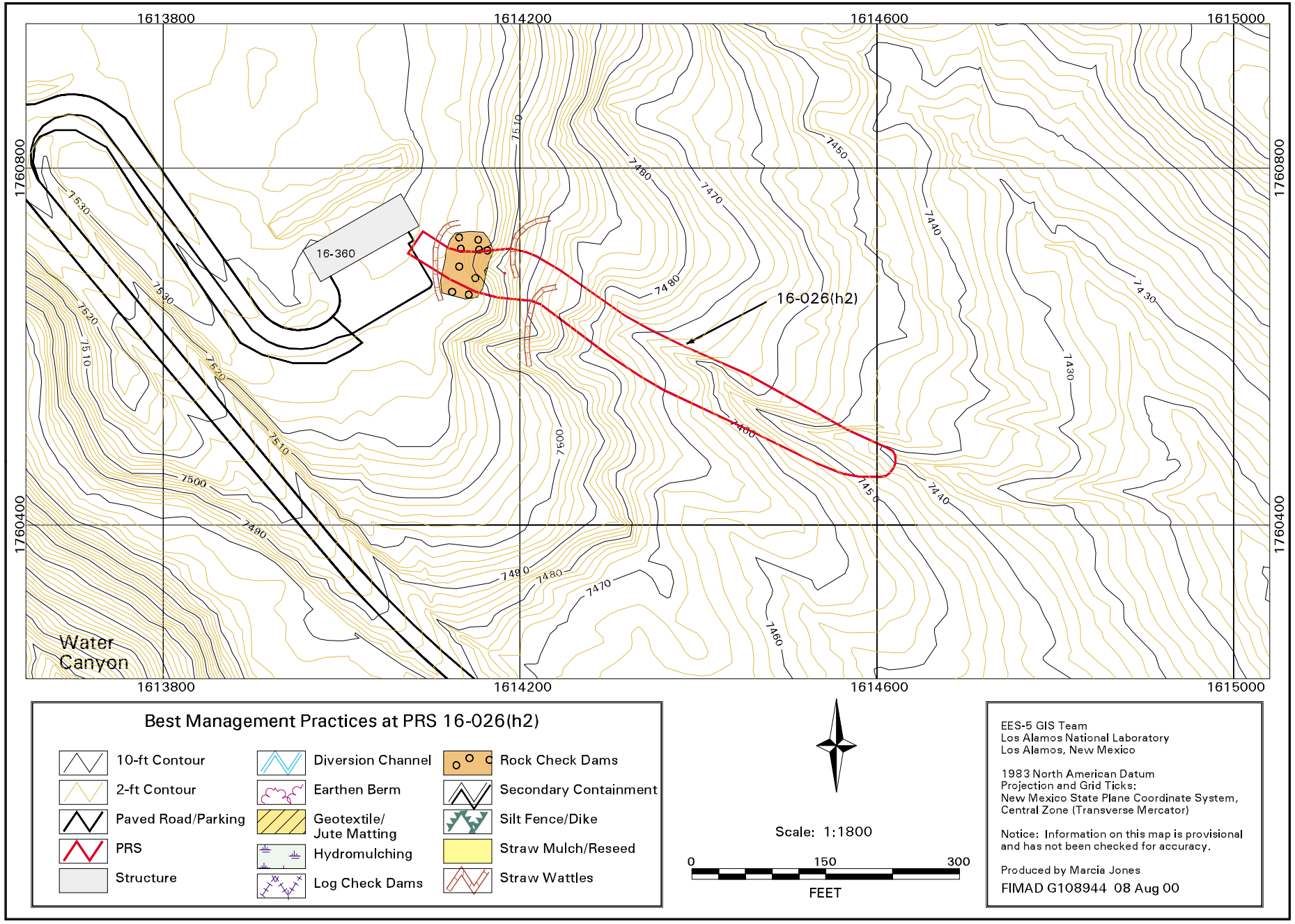
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/25/2001
3/12/2001
12/20/2000
11/17/2000 No maintenance required
10/12/2000
9/14/2000
5/24/2000

SITE STATUS

Revegetation efforts within the tributary drainage have been successful. The wetland grasses as well as the surrounding channel bank grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.


1613800
1614200
1614600
1615000
1760800
1760400
16-360
16-026(h2)
Water Canyon
7610
7600
7590
7580
7570
7560
7550
7540
7530
7520
7510
7500
7490
7480
7470
7460
7450
7440
7430
7420
7410
7400
Best Management Practices at PRS 16-026(h2)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1800
0
150
300
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108944 08 Aug 00

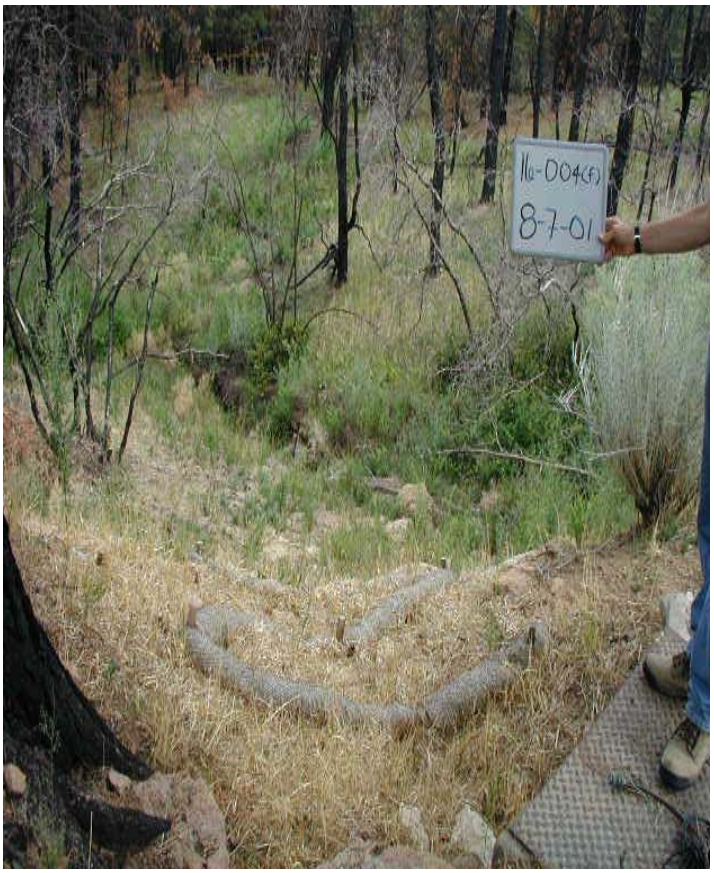
16-004(f) – *Erosion Matrix Score 31.0*. Sludge drying bed and associated outfall near Sanitary Wasterwater Treatment Facility at 16-535.

CERRO GRANDE FIRE:

The site is located in a tributary drainage of Water Canyon within the S-Site Canyon Watershed Aggregate. The site has minor to moderate fire damage within drainage channel.

BMPs:

Straw wattles and straw bale barriers were installed within the drainage channel to retain sediment and dissipate flow. Areas adjacent to the drainage were hand-raked, reseeded and covered with straw mulch.



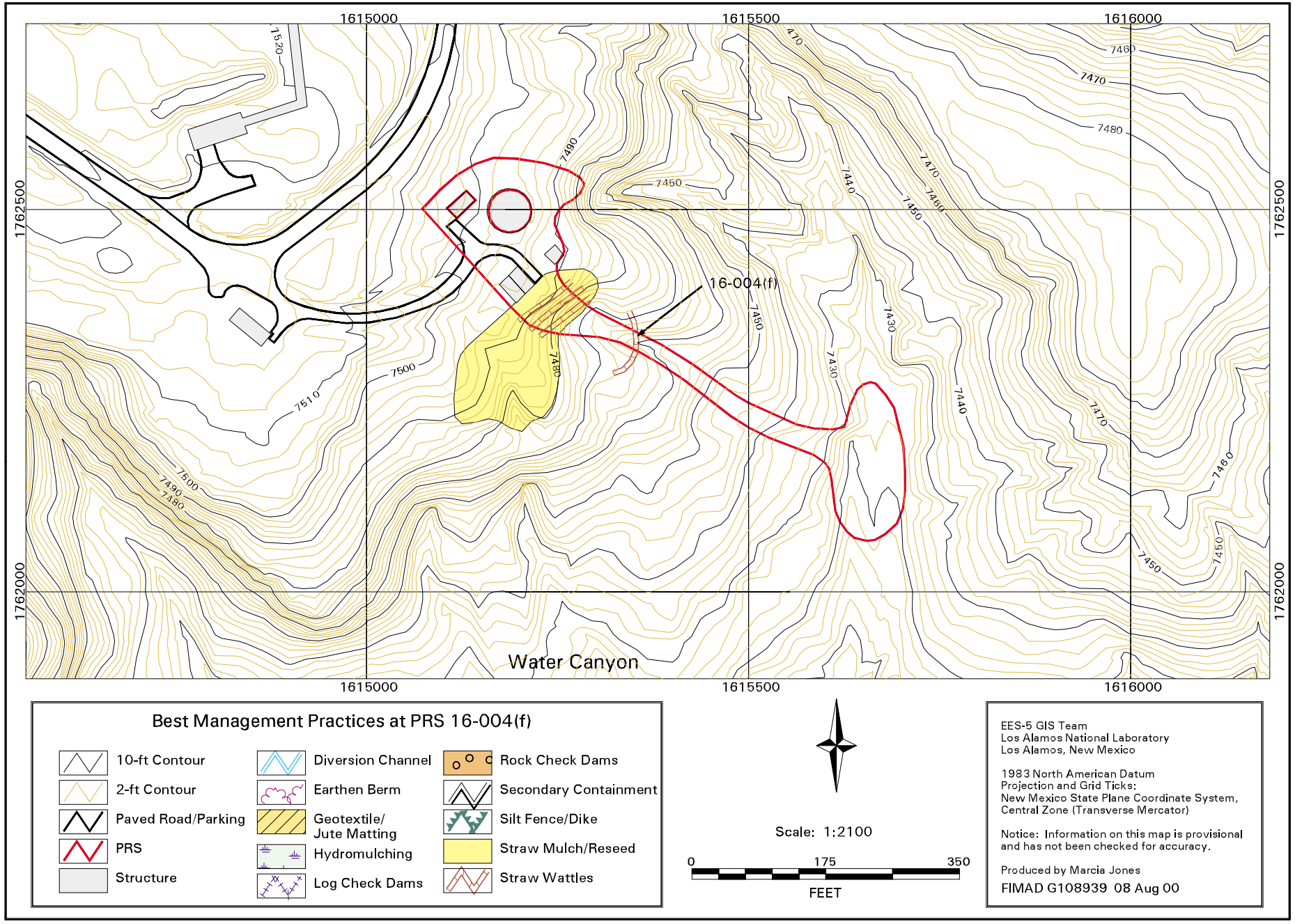
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

8/7/2001	
6/26/2001	
3/12/2001	
12/20/2000	
11/17/2000	No maintenance required
10/12/2000	
9/23/2000	
5/24/2000	

SITE STATUS

Revegetation efforts within the tributary drainage have been successful. The surrounding channel bank grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.



Best Management Practices at PRS 16-004(f)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2100

0 175 350

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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Produced by Marcia Jones

FIMAD G108939 08 Aug 00

16-028(b) – *Erosion Matrix Score 83.0*. Potentially contaminated soil from a permitted outfall at TA-16-370 (former NPDES outfall 04A092). The outfall drains from the west side of the building and daylights approximately 50 ft. south of the building in a steep, rocky area of Water Canyon.

CERRO GRANDE FIRE:

The site is located in a tributary drainage of Water Canyon within the Canon de Valle Watershed Aggregate. The site has minor to moderate fire damage within drainage channel. Debris was exposed within channel near the inactive outfall.

BMPs:

Straw wattles were installed upslope of and within the drainage channel to divert and dissipate storm flows. The debris was removed from the channel and the area was hydromulched to enhance the vegetation process.

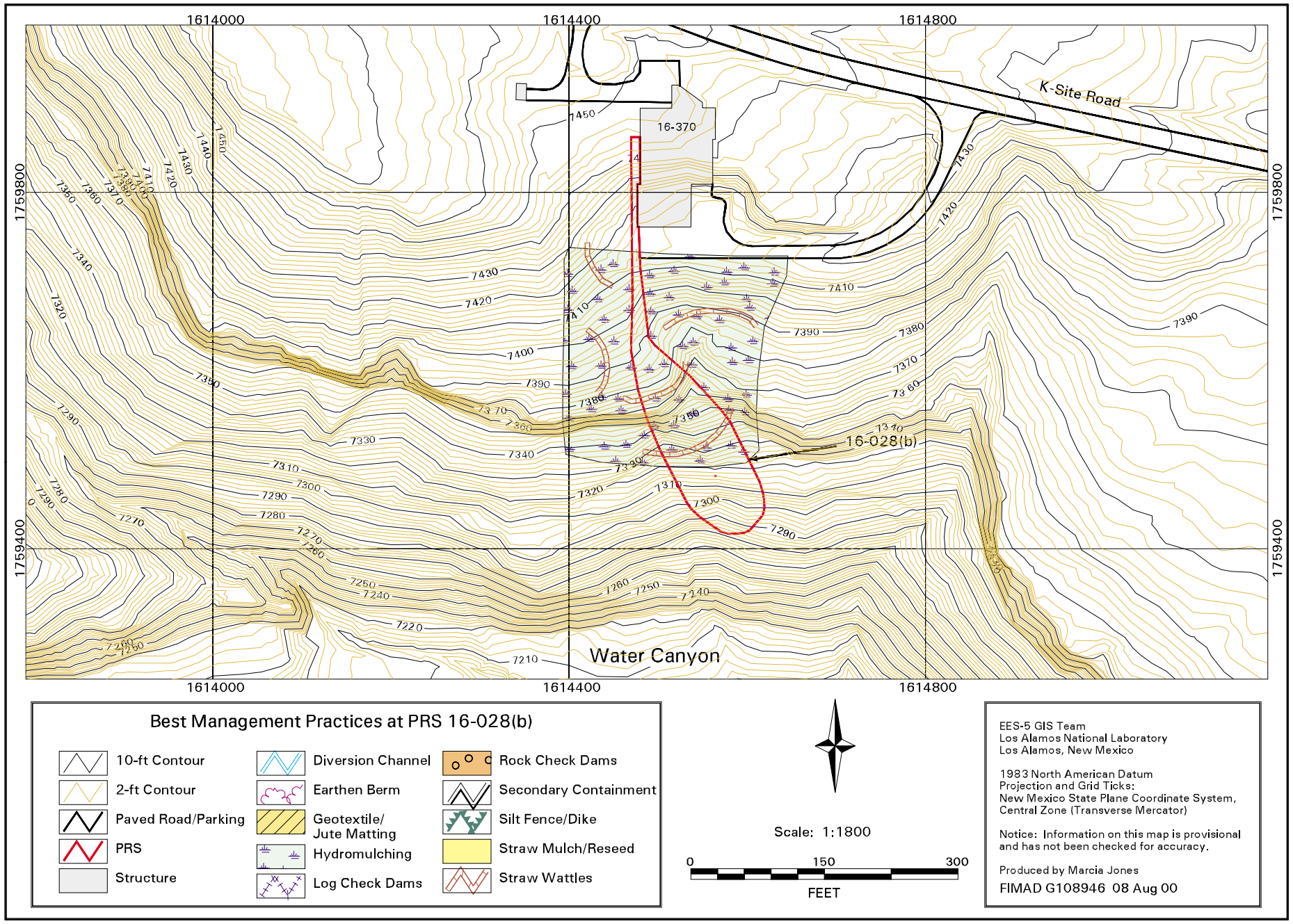
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/25/2001
3/12/2001
12/20/2000 No maintenance required
11/17/2000
9/14/2000
5/24/2000

SITE STATUS

Revegetation efforts within the tributary drainage have been successful. The surrounding channel bank grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.



Best Management Practices at PRS 16-028(b)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:1800

0 150 300

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones
FIMAD G108946 08 Aug 00

16-029(g) – *Erosion Matrix Score 21.5*. An active HE sump associated with TA-16-450. The outfall, EPA 04A091 located to the southeast of TA-16-450, receives effluent from the sump.

CERRO GRANDE FIRE:

The site is located in a tributary drainage of Water Canyon within the Upper Water Canyon Watershed Aggregate. The site has moderate fire damage of the ground cover with minor canopy damage.

BMPs:

Straw wattles were installed throughout the site for sediment retention. The area was then hand-raked, reseeded and straw mulched.

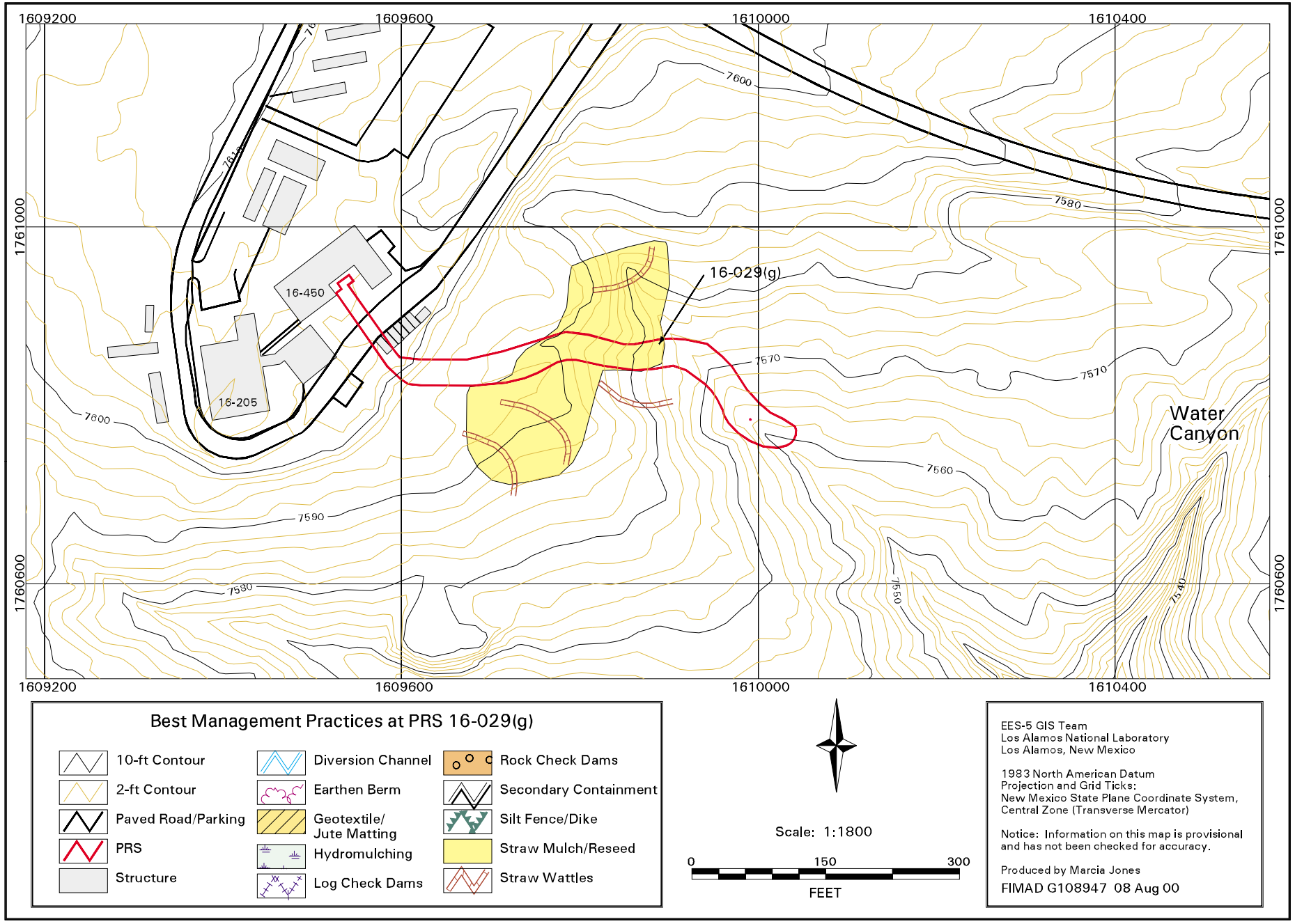
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

8/7/2001	
6/25/2001	
3/12/2001	
12/20/2000	No maintenance required
11/17/2000	
10/12/2000	
9/18/2000	
5/24/2000	

SITE STATUS

Revegetation efforts throughout the site have been successful. The surrounding grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.



Best Management Practices at PRS 16-029(g)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:1800

0 150 300

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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Produced by Marcia Jones
FIMAD G108947 08 Aug 00

16-030(h) – *Erosion Matrix Score 29.1*. Building TA-16-430 functions as a high explosives pressing facility. Plastic-bonded explosives and mock HE powders are pressed to shape. The site consists of three outfalls associated with the three HE sumps at TA-16-430.

CERRO GRANDE FIRE:

The site is located in a tributary drainage of Water Canyon within the Upper Water Canyon Watershed Aggregate. The site has moderate fire damage of the ground cover with minor canopy damage.

BMPs:

Straw barriers were installed within the drainage channel for sediment retention. The area was then hand-raked, reseeded and straw mulched.

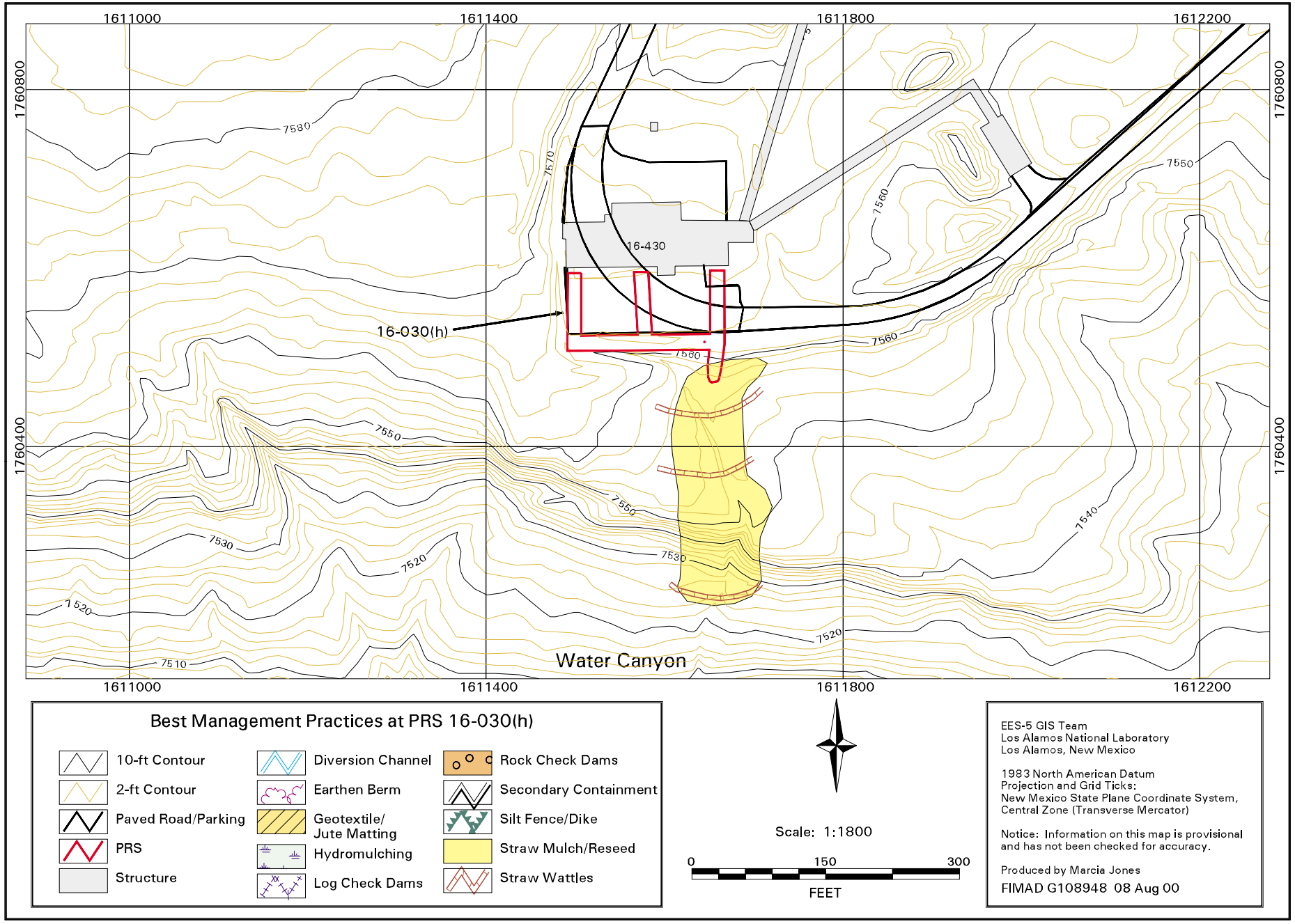
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

7/11/2001
3/12/2001
12/21/2000
11/17/2000 No maintenance required
10/12/2000
9/18/2000
5/24/2000

SITE STATUS

Revegetation efforts within the tributary drainage have been successful. The surrounding channel bank grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.


1611000
1611400
1611800
1612200
1760800
1760400
16-430
16-030(h)
Water Canyon
7530
7570
7560
7550
7540
7520
7510
Best Management Practices at PRS 16-030(h)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1800
0
150
300
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
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Central Zone (Transverse Mercator)
Notice: Information on this map is provisional and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108948 08 Aug 00

TECHNICAL AREA 16 -MDA P BEFORE AND AFTER THE CERRO GRANDE FIRE

16-018 – *Erosion Matrix Score 69.3*. A landfill that contains rubble and debris generated by the burning of HE, HE contaminated equipment and material, barium nitrate sands, building material, empty drums, bottles and trash. (MDA P). It is located in TA-16 near the south rim of Canon de Valle, just north of flash pad (TA-16-387).

16-016(c) - *Erosion Matrix Score 72.0*. A barium nitrate storage area that may have been located on or near the decommissioned burning pad (TA-16-386). **16-010(c)** - *Erosion Matrix Score 47.2*. A former burn slab converted to a burn table (structure TA-16-388).

CERRO GRANDE FIRE:

This site is located on the edge of Canon de Valle within the Canon de Valle Watershed Aggregate. MDA-P received only peripheral fire damage on the lower portion of the site. The existing straw barriers and silt fencing were destroyed. No construction equipment and project infrastructure were damaged.

BMPs:

The straw barriers and silt fencing were replaced and fortified with an earthen berm below the site. Soil-Sement (polymer based emulsion) was applied to exposed slopes to reduce sediment transport potential.

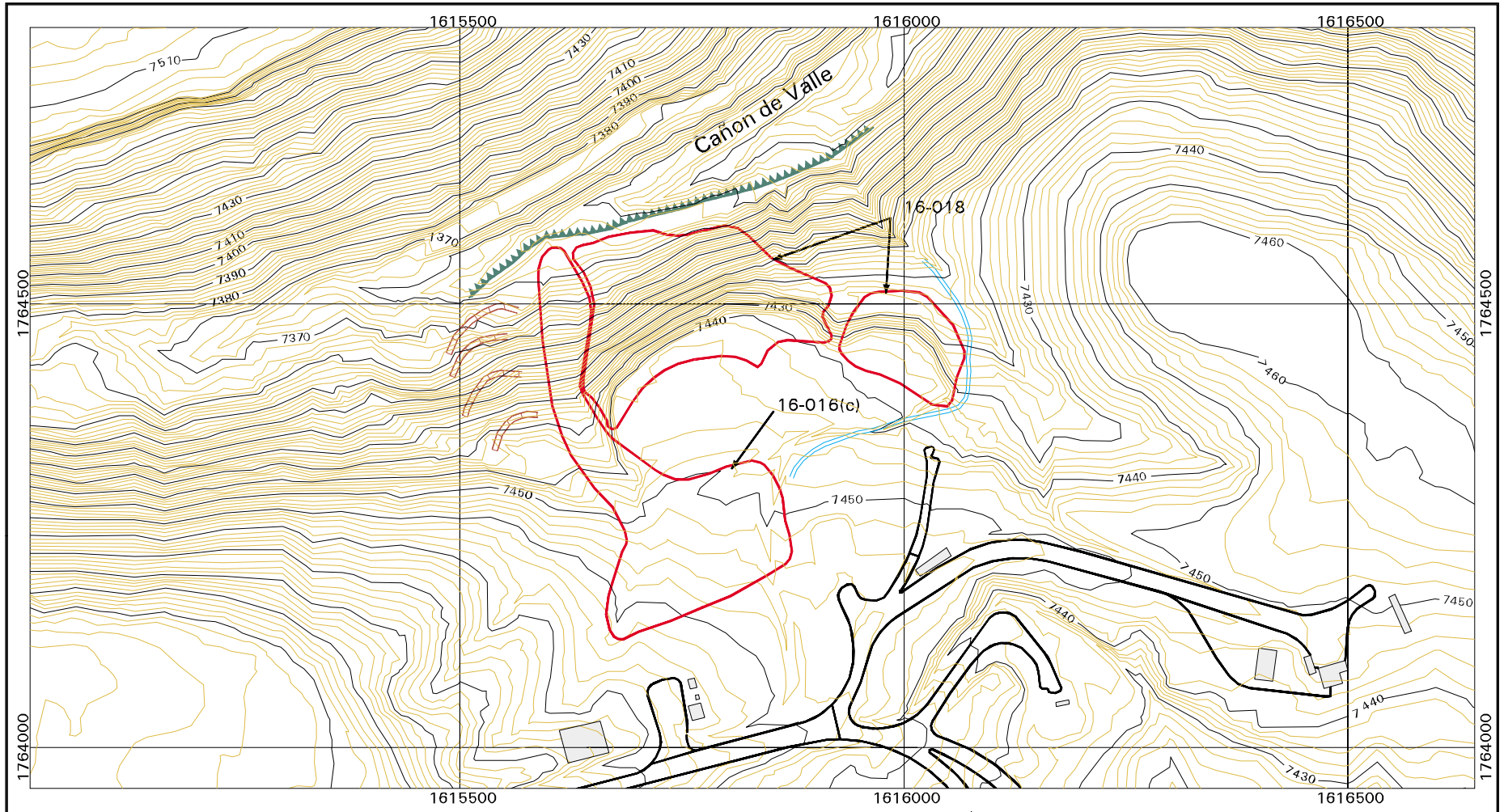
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected: Ongoing Clean Closure Project inspects on a weekly basis

Maintenance performed: Routine maintenance ongoing

SITE STATUS

Site is stable and the Clean Closure Project is near completion. Final restoration will occur at that time.



Best Management Practices at PRS 16-018 and 16-016(c)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2100

0 175 350

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones

FIMAD G108940 08 Aug 00

TECHNICAL AREA-22 SITE BEFORE AND AFTER THE CERRO GRANDE FIRE

22-015(c) – *Erosion Matrix Score 51.5.* Former outfall from plating & etching operation.

CERRO GRANDE FIRE:

The site is located in a tributary drainage of Pajarito Canyon within the Starmer's/Pajarito Canyon Watershed Aggregate. Moderate fire damage was found at 22-015(c) including the drainage swale below the inactive outfall, the pond area and stained areas leading to the mesa edge. The ground cover was severely damaged leaving little or no protection.

*Photograph is mislabeled.

BMPs:

Straw wattles were installed upslope and within the drainage swale. The area was hand-raked, reseeded and mulched. The pond area has begun to revegetate itself.

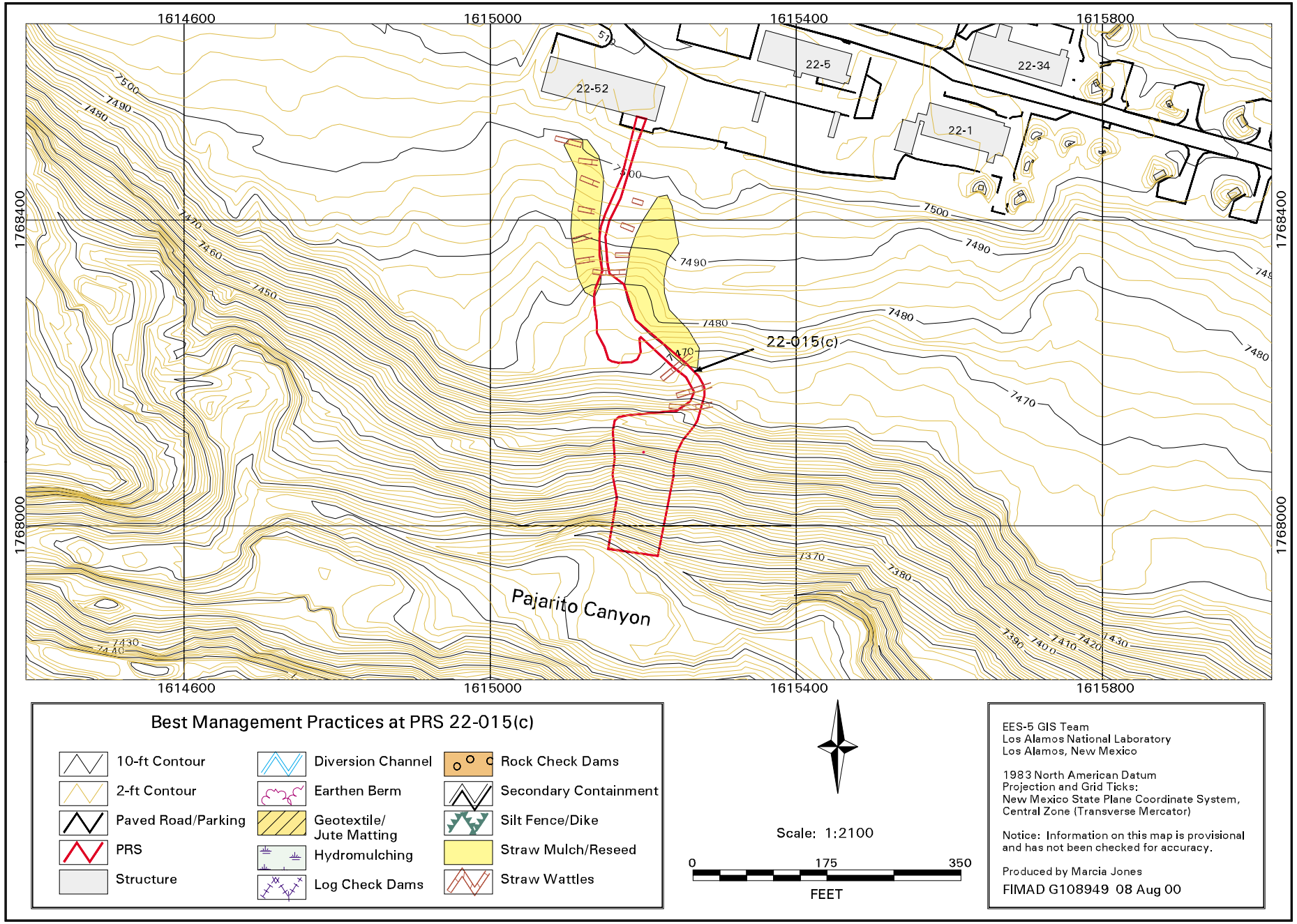
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

5/10/2001
4/18/2001 No maintenance required
10/30/2000
5/25/2000

SITE STATUS

Revegetation efforts throughout the site have been successful. The surrounding channel bank grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.



Best Management Practices at PRS 22-015(c)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2100

0 175 350

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones
FIMAD G108949 08 Aug 00

TECHNICAL AREA-36 SITE BEFORE AND AFTER THE CERRO GRANDE FIRE

C-36-003 – *Erosion Matrix Score 52.0.* This is an inactive permitted (06A106) outfall that received chemicals from a photo lab within Building TA-36-1. It discharges over the steep edge of Three Mile Canyon. It became operational in 1950. The debris that was exposed adjacent to the outfall was later identified as **PRS 36-008** - *Erosion Matrix Score 52.0* a land disposal area.

CERRO GRANDE FIRE:

The site is located on the edge of Three Mile Canyon within the Three Mile Canyon Watershed Aggregate. A backfire was set near TA-36-1 to help protect TA-18. This fire exposed miscellaneous debris on the slope and PRS 36-008 was identified.

BMPs:

Straw wattles were installed on the mesa's edge to divert storm water run-on from the parking area, within the drainage channels on the slope and at the toe of the slope. The debris that was exposed by the fire has been removed, and the area was hand-raked, reseeded and straw mulched.

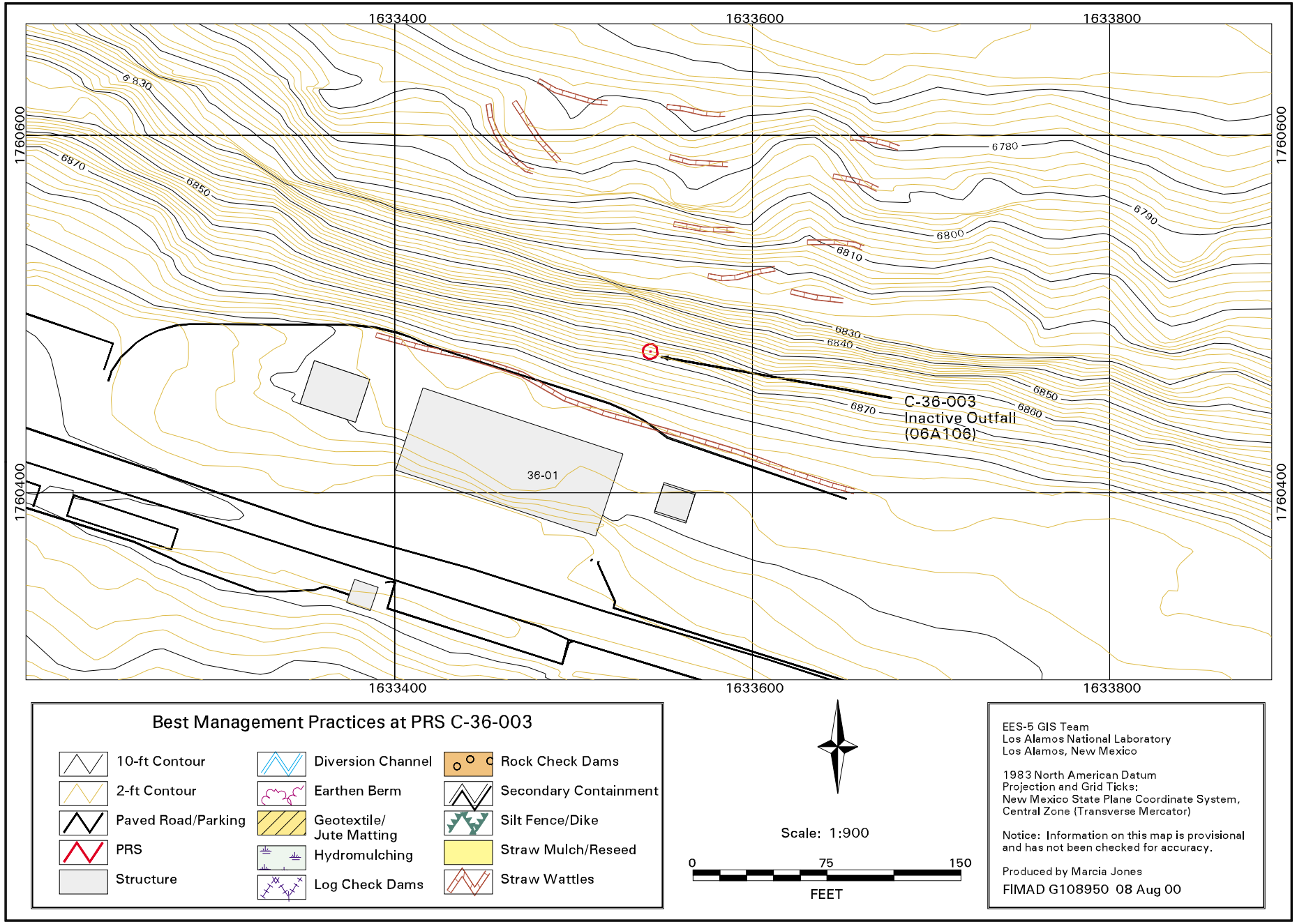
SUMMARY OF INSPECTION & MAINTENANCE

Sites were inspected on:

5/09/2001
4/19/2001 No maintenance required
10/30/2000
6/7/2000

SITE STATUS

Revegetation efforts throughout the slope have been successful. The surrounding grasses have achieved a greater than 70% cover. The site appears stable and sediment migration at the site is minimal.



Best Management Practices at PRS C-36-003

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:900

0 75 150

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones

FIMAD G108950 08 Aug 00

TECHNICAL AREA-40 SITES BEFORE AND AFTER THE CERRO GRANDE FIRE

40-006(b) – *Erosion Matrix Score 62.0*. Active firing site used only for testing and development of small explosive devices and not for waste disposal. An inactive NPDES outfall (06A081) is shown.

CERRO GRANDE FIRE:

The site is located on the edge of Pajarito Canyon within the Starmer's/Pajarito Canyon Watershed Aggregate. The fire damage was moderate to severe with several buildings destroyed near this site.

BMPs:

Straw wattles were installed on the steep portion of the slope to reduce the sediment migration potential. Wattles were also installed on the mesa's edge to divert run-on from slope.

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

7/2/2001
5/10/2001
4/19/2001
10/30/2000
5/25/2000

Maintenance performed:

Several wattles that were damaged due to wildlife were replaced.

SITE STATUS

Revegetation efforts around the site have been successful. The surrounding channel bank grasses have achieved a greater than 50% cover. The site appears stable and sediment migration at the site is minimal.

40-006(c) - *Erosion Matrix Score 62.0*. Active firing site used only for testing and development of small explosive devices and not for waste disposal. An inactive NPDES outfall (06A080) is shown at the site.

CERRO GRANDE FIRE:

Site is located on the edge of Pajarito Canyon within the Starmer's/Pajarito Canyon Watershed Aggregate. The fire damage was moderate to severe with several buildings destroyed near this site.

BMPs:

Straw wattles were installed on the steep portion of the slope to reduce the sediment migration potential. Wattles were also installed on the mesa's edge to divert run-on from the slope.

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

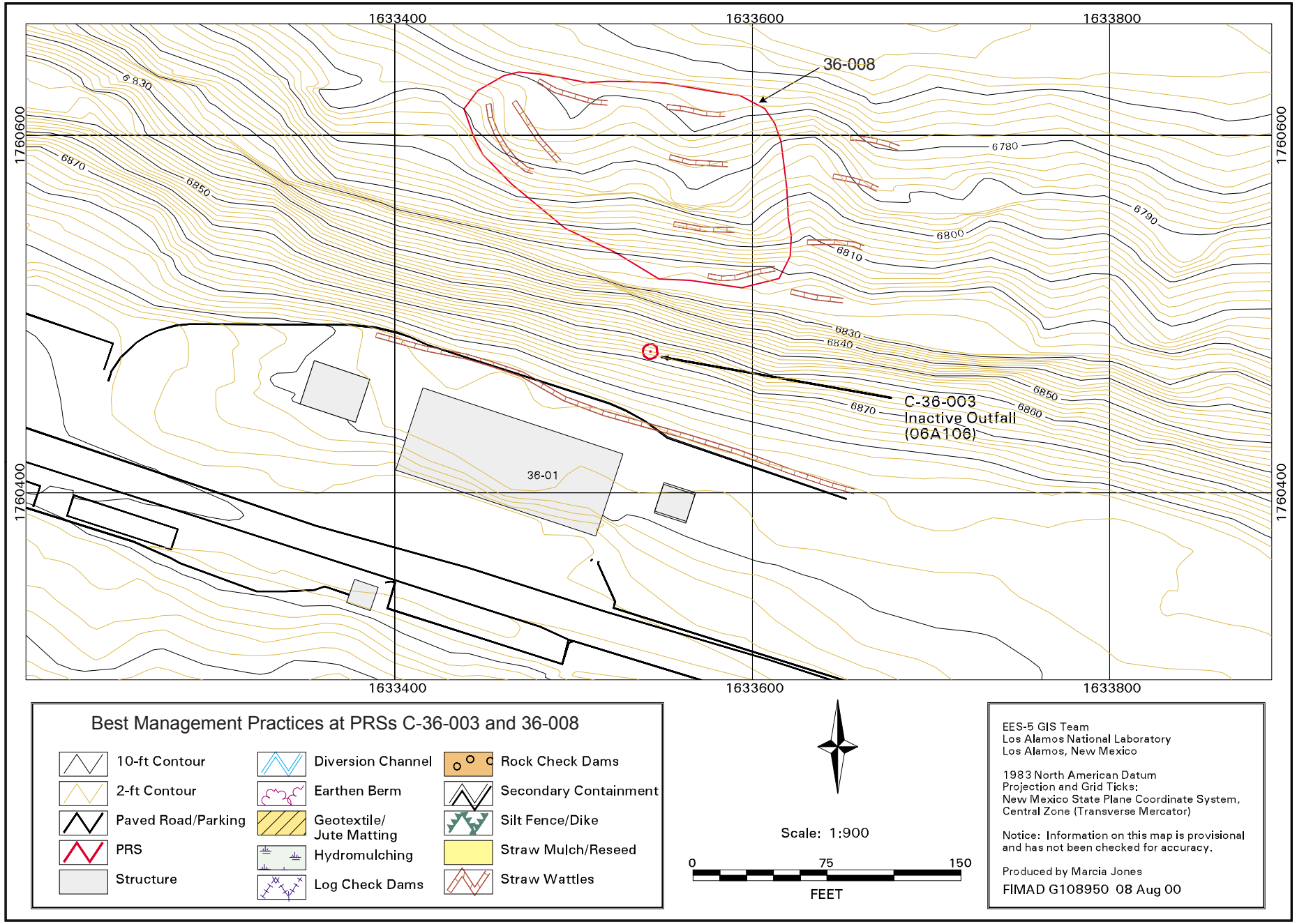
7/2/2001
5/10/2001
4/19/2001
10/30/2000
5/25/2000

Maintenance performed:

Installation of one additional wattle for sediment retention.

SITE STATUS

Revegetation efforts around the site have been successful. The surrounding channel bank grasses have achieved a greater than 50% cover. The site appears stable and sediment migration at the site is minimal.



Best Management Practices at PRSs C-36-003 and 36-008

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:900

0 75 150

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones

FIMAD G108950 08 Aug 00

40-009 - *Erosion Matrix Score 54.5.* Landfill adjacent to firing site at TA-40-9. The landfill contains debris from decommissioning of buildings at TA-15. An inactive NPDES outfall (04A101) is located nearby.

CERRO GRANDE FIRE:

The site is located on the edge of Pajarito Canyon within the Starmer's/Pajarito Canyon Watershed Aggregate. The erosion potential on this slope increased due to lack of vegetative cover as a result of the fire.

BMPs:

Straw wattles were installed along the mesa edge to divert run-on from the slope. Rock check dams (on-site materials used) were provided to dissipate flow within the drainage channels on both the east and west ends of the site.

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

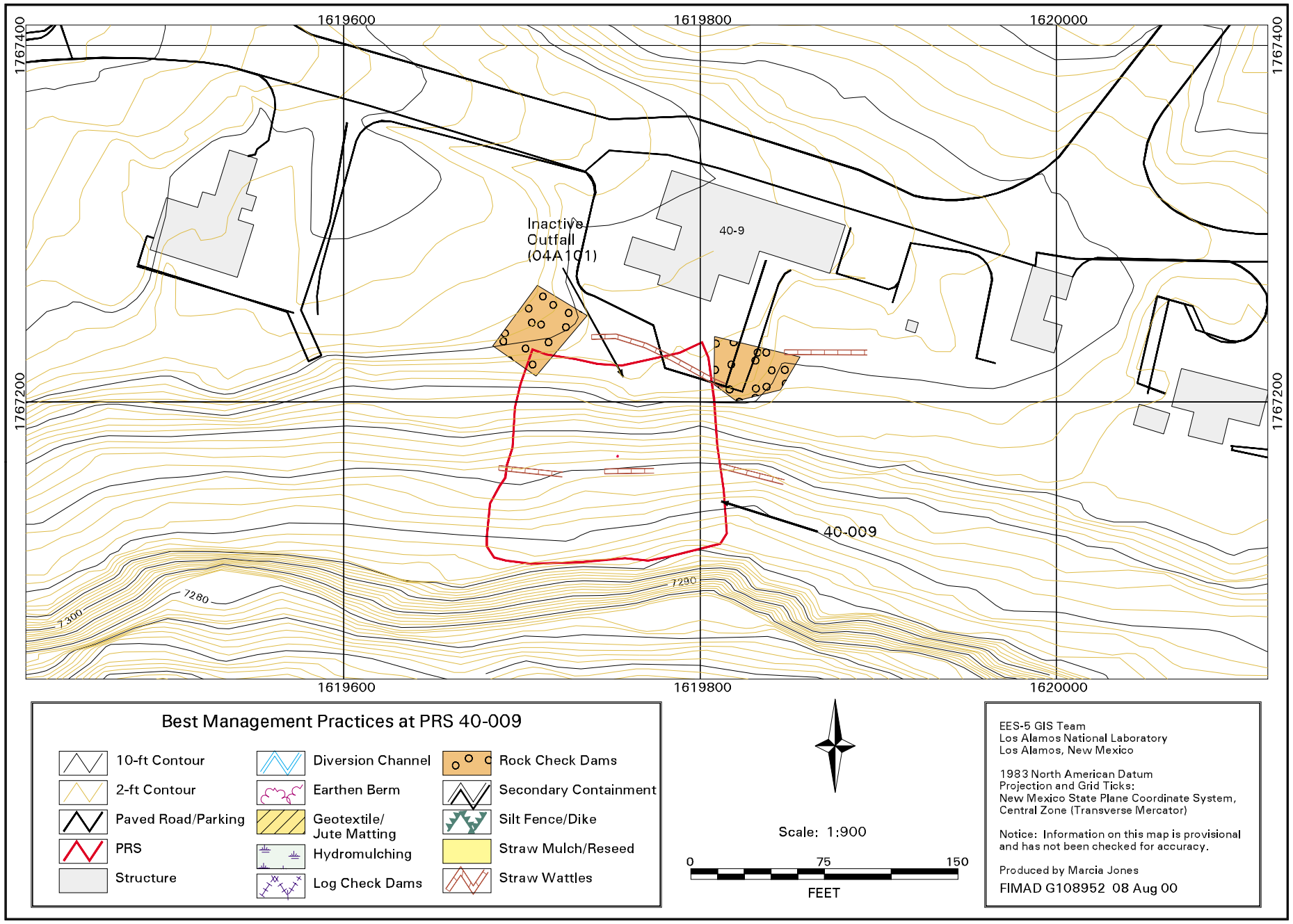
7/2/2001
5/10/2001
4/19/2001
10/30/2000
5/25/2000

Maintenance performed:

Installation of three additional straw wattles for sediment retention.

SITE STATUS

Revegetation efforts around the site have been mostly successful. The surrounding channel bank grasses have achieved a greater than 50% cover. The site appears stable and sediment migration at the site is minimal.



Best Management Practices at PRS 40-009

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:900

0 75 150

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
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Produced by Marcia Jones

FIMAD G108952 08 Aug 00

40-010 - *Erosion Matrix Score 40.2*. An area on the edge of Pajarito Canyon extending about 50-feet along the canyon edge and about 50 feet down the canyon. Debris in this area includes farm and home implements that probably predate the Manhattan Project.

CERRO GRANDE FIRE:

The site is located on the edge of Pajarito Canyon within the Starmer's/Pajarito Canyon Watershed Aggregate. Land disposal area 40-010 was exposed due to the fire, with debris consisting of industrial waste.

BMPs:

Straw wattles were installed upslope from the landfill to reduce run-on impact. Large trees were contour felled to provide run-on diversion. The area was hand-raked, reseeded and straw mulched.

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

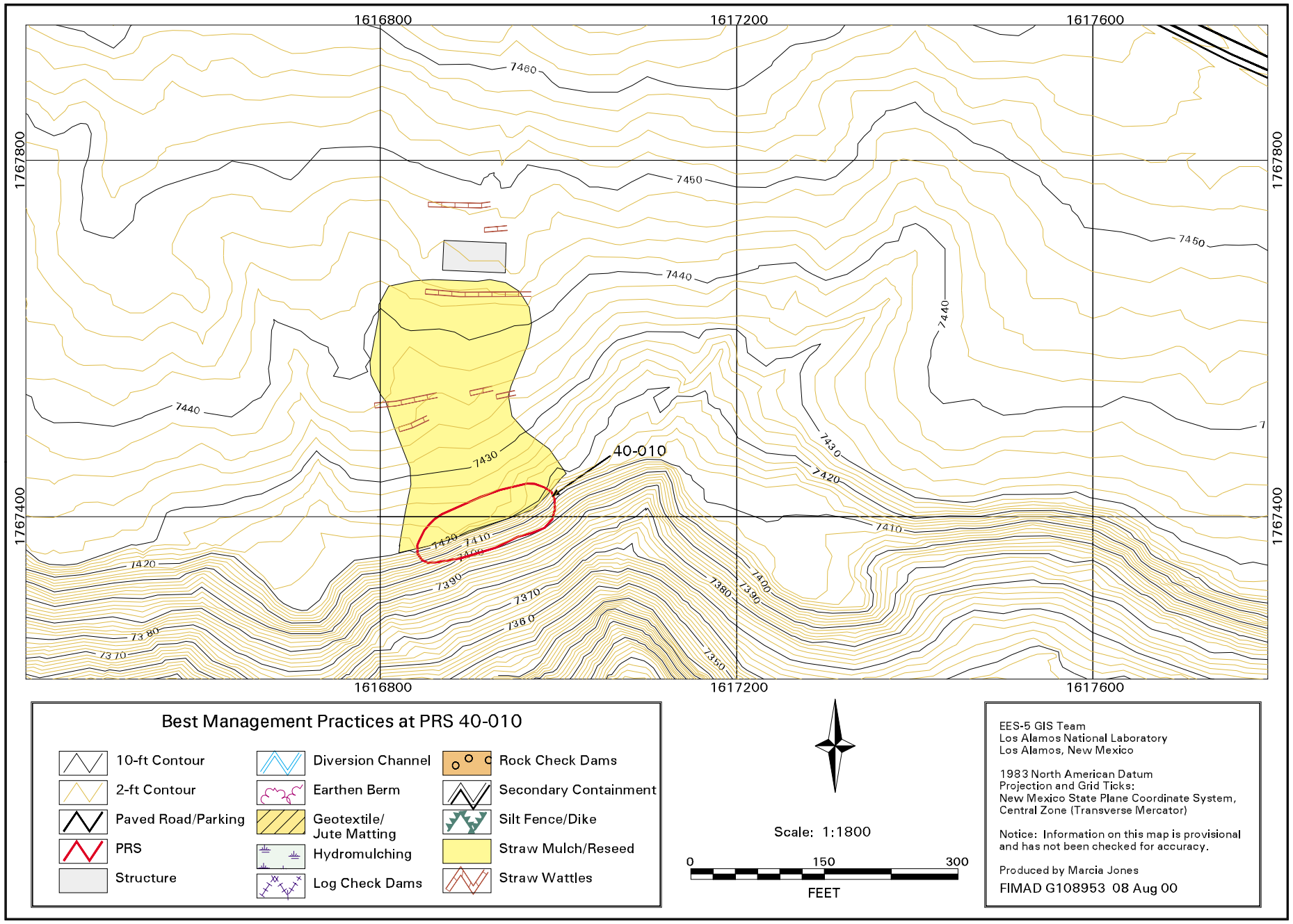
6/29/2001
5/10/2001
4/19/2001
10/30/2000
5/25/2000

Maintenance performed:

Installation of two additional straw wattles for sediment retention.

SITE STATUS

Revegetation efforts around the site have been successful. The surrounding channel bank grasses have achieved a greater than 50% cover. The site appears stable and sediment migration at the site is minimal. The debris near the mesa's edge was removed from the area and disposed of as solid waste.



Best Management Practices at PRS 40-010

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:1800

0 150 300

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

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Produced by Marcia Jones

FIMAD G108953 08 Aug 00

TECHNICAL AREA-42 SITE BEFORE AND AFTER THE CERRO GRANDE FIRE

42-004 – *Erosion Matrix Score 93.5*. A canyon disposal area at former TA-42. Some building debris including pipes, were discarded over the canyon edge north of TA-42. This area also includes the consolidated PRS 42-001(a)-99. These PRSs have been remediated and are plotted on the map provided - Soil samples collected in 1991 as part of a survey found no contaminants of concern at the site.

CERRO GRANDE FIRE:

The site is located on a tributary drainage to Mortandad Canyon within the Upper Mortandad Canyon Watershed Aggregate. The entire north facing slope below former TA-42 was moderately burned. Two distinct drainage channels bisect the area behind the new building constructed near TA-55. The run-on to the western most drainage has been diverted away from the area of concern. The other drainage receives only direct rainfall, with minimal upslope sources.

BMPs:

Straw wattles were installed around the area to divert run-on and to impede sediment transport potential. The area was hand-raked, reseeded and straw mulched.

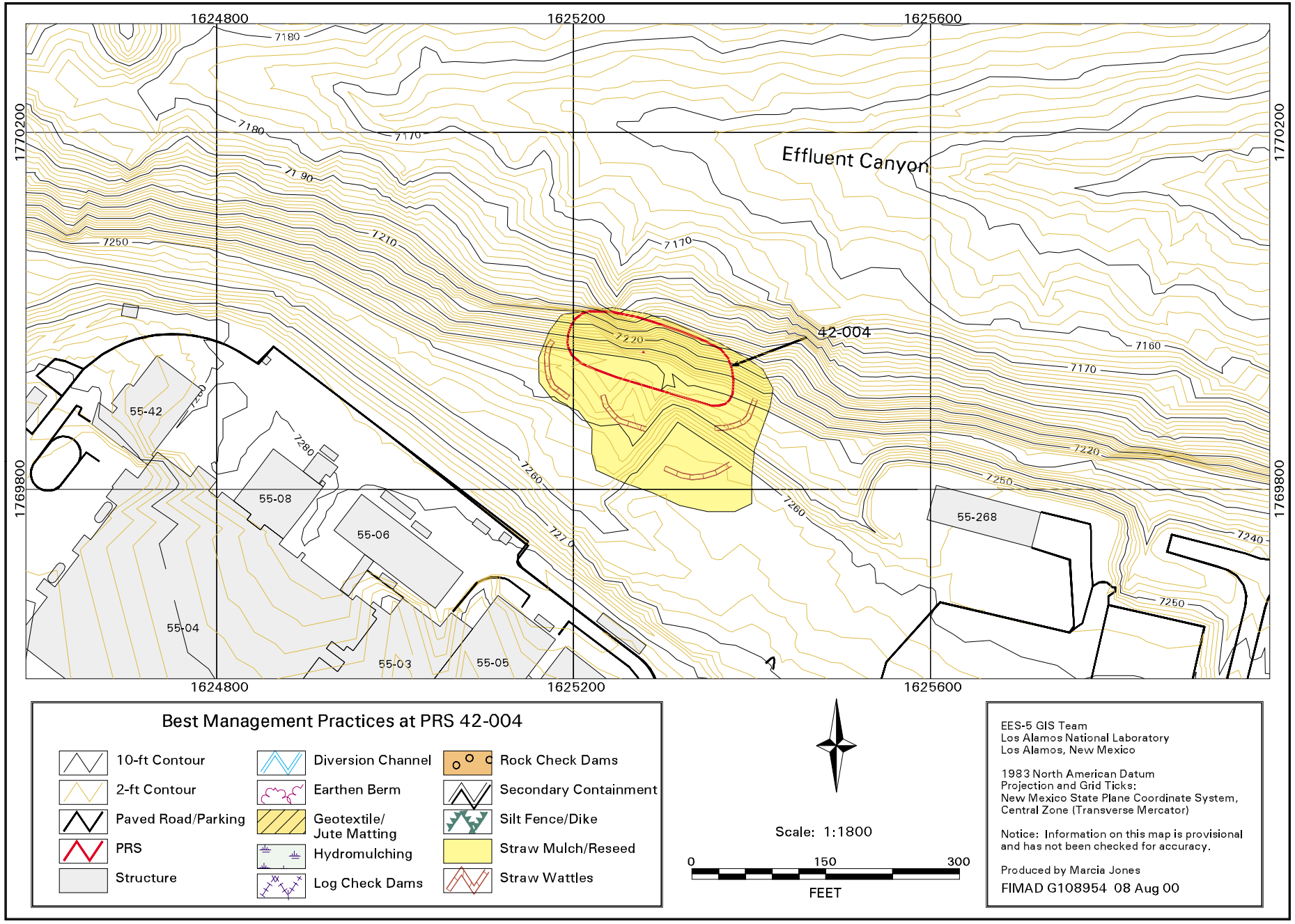
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

5/10/2001	
3/26/2001	No maintenance required
10/27/2000	
5/31/2000	

SITE STATUS

Revegetation efforts around the site have been mostly successful. The surrounding channel bank grasses have achieved a greater than 50% cover. The site appears stable and sediment migration at the site is minimal.


1624800
1625200
1625600
1770200
1769800
Effluent Canyon
42-004
55-42
55-08
55-06
55-04
55-03
55-05
55-268
7180
7190
7210
7250
7170
7220
7160
7280
7260
7270
7240
Best Management Practices at PRS 42-004
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/ Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1800
0
150
300
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
Notice: Information on this map is provisional and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108954 08 Aug 00

TECHNICAL AREA-46 SITES AFTER THE CERRO GRANDE FIRE

The PRSs that were impacted by the Cerro Grande Fire at TA-46 consisted of former industrial outfalls and storm drains. These sites are described below:

46-004(g) - *Erosion Matrix Score 56.0*. (Outfall N) is the outfall associated with the industrial drain in building 46-1. The drain is a 12-inch vitreous clay pipe (VCP) that daylights into Canada del Buey northeast of TA-46-1. Roof drains and floor drains from the central part of the building are plumbed to the outfall.

46-004(h) - *Erosion Matrix Score 56.0*. (Outfall A) is the outfall from the industrial drain in TA-46-16. The outfall is a 6-inch cast iron pipe located north of the building. Floor drains and possibly roof drains are plumbed to this outfall.

46-004(i) – *Erosion Matrix Score 49.0*. Includes Outfalls D and E, located north of TA-46-87. Outfall D served cooling tower at 46-86 (inactive NPDES outfall 03A044. Outfall E served a holding tank located east of the tower. The tank held dilute lithium hydroxide solutions - diluted further by blow down water.

46-004(j) – *Erosion Matrix Score 49.0*. Northwest of 46-1. Inactive cooling tower blow down from former NPDES outfall 03A042.

46-004(m) - *Erosion Matrix Score 49.0*. (Outfall CC) is the outfall from a non-contact cooling water system in TA-46–30. The outfall, NPDES 04A013 located north of the building, protrudes from a 10-foot deep bank cut. The effluent had flowed through a ditch at the foot of the bank into a storm drain located east of TA-46-154.

46-004(o) – Erosion Matrix *Score 49.0*. Northeast of 46-200. Inactive cooling tower blow down from former NPDES outfall 03A136.

46-004(q) - *Erosion Matrix Score 45.0*. (Outfall B) is a 6-inch cast iron pipe that discharges in Canada del Buey north of TA-46-58. The source of the outfall in unknown and is treated as an industrial drain.

46-004(s) - Erosion Matrix Score 49.0. (Outfall X) is the outfall of a 4-inch cast iron pipe located south of TA-46-1. Both floor drains and roof drains are connected to the outfall. The effluent had flowed through a ditch (SWMU 46-007), that is part of the storm drain network that discharges into Canada del Buey.

46-004(u) - *Erosion Matrix Score 45.0*. (Outfall F) is an outfall from an overflow pipe for the west concrete wet well in TA-46-87). The outfall, located north of TA-46-86, is an 8-inch cast iron pipe that discharges to Canada del Buey.

46-004(v) - *Erosion Matrix Score 45.0*. (Outfall G) is the outfall for the industrial drain from TA-46-87. The outfall is a 6-inch cast iron pipe located northwest of building and discharges to Canada del Buey. Both floor drains and roof drains are connected to the drain.

46-004(x) - *Erosion Matrix Score 49.0*. (Outfall J) may be the outfall from floor and/or roof drains in TA-46-31. The outfall is a 6-inch cast iron pipe, located northeast of building that discharges into Canada del Buey.

46-004(y) - *Erosion Matrix Score 49.0*. (Outfall K) is the blowdown outfall from the cooling tower that serves TA-46-31. The outfall is a 6-inch cast iron pipe labeled as (inactive- 03A043) located north of TA-46-31. Floor drains, sink drains, fume hoods and roof drains are plumbed to this outfall.

46-004(z) - *Erosion Matrix Score 49.0*. (Outall L) is the outfall from a second industrial drain servicing Rooms 160 through 172 in TA-46-31. The outfall is a 6-inch cast iron pipe, located northwest of building that discharges into Canada del Buey. Both floor drains and roof drains are connected to the outfall.

46-004(a2) - *Erosion Matrix Score 49.0*. (Outfall MM) is the outfall from the third industrial drain servicing Rooms 101, 103 and 105 in 46-31. The outfall is a 6-inch cast iron pipe, located southeast of TA-46-31and northwest of TA-46-25, that discharged into a ditch located between the buildings. The ditch is part of the storm drain network that discharges into Canada del Buey.

46-004(b2) - *Erosion Matrix Score 56.0*. (Outfall U) is the outfall for an additional industrial drain from TA-46-1. The outfall is a 4-inch VCP located east of building. Floor drains from the building discharged into a ditch (SWMU 46-007), that is part of the storm drain network discharging into Canada del Buey.

46-004(c2) - *Erosion Matrix Score 49.0*. (Outfall S) is the outfall from an industrial drain from building TA-46-1. The outfall is a 4-inch cast iron pipe, located northwest of the building that drains to Canada del Buey. Floor drains and equipment drains were plumbed to this outfall.

46-006(d) – *Erosion Matrix Score 49.0.* (Outfall AG) is a storm drain outfall north of 46-31 that directs runoff from the areas along the north and west side of building.

CERRO GRANDE FIRE:

The area impacted is located on the northern edge of Mesita del Buey within the Middle Mortandad/Canada del Buey Watershed Aggregate. The entire north-facing slope below TA-46 was moderately to severely burned. Several buildings along the mesa edge were destroyed. The canopy and ground cover was mostly destroyed. The northern slope is extremely steep with several inactive outfalls, pipes and old infrastructure parts exposed.

This areal photograph was taken on May 25, 2000.

CERRO GRANDE FIRE:

This photograph was taken on June 14, 2000. It shows the eastern most corner of the impacted north facing slope behind building 46-58. Several trees and power poles were cut down to protect the existing structures.

CERRO GRANDE FIRE:

This photograph was taken on June 14, 2000. It shows one of the many inactive outfalls that discharged onto the slope below.

BMPs:

Nearly 15 acres were treated below the northern boundary of TA-46. Over 150 wattles were installed on slopes and within the drainages. Rock check dams were placed within the main drainages to dissipate storm runoff from above. Trees were contour felled across a majority of the site to provide erosion and sediment control. The lower portion of the site was hand-raked, reseeded and straw mulched. The upper steep slopes were hydromulched from above. An earthen base coarse berm was installed along the access road at the toe of the slope to provide an extra "line of defense" against sediment migration.

TECHNICAL AREA-46 SITES ONE YEAR AFTER THE CERRO GRANDE FIRE

SUMMARY OF INSPECTION & MAINTENANCE

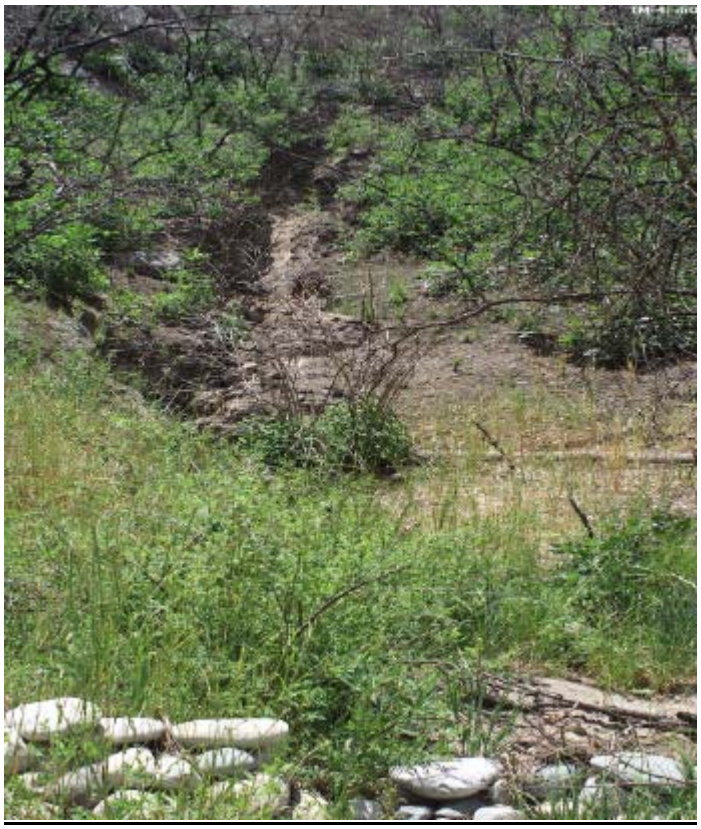
Site inspected on:

6/19/2001
4/16/2001
4/05/2001
12/21/2000
10/25/2000
9/14/2000
5/18/2000

Maintenance performed:

In April 2001, the earthen berm at the northern boundary of the site was patched in one location. Several additional straw wattles have been placed in various locations to reduce sediment migration potential.

These photographs were taken during the April 2001 and June 2001 field inspections.



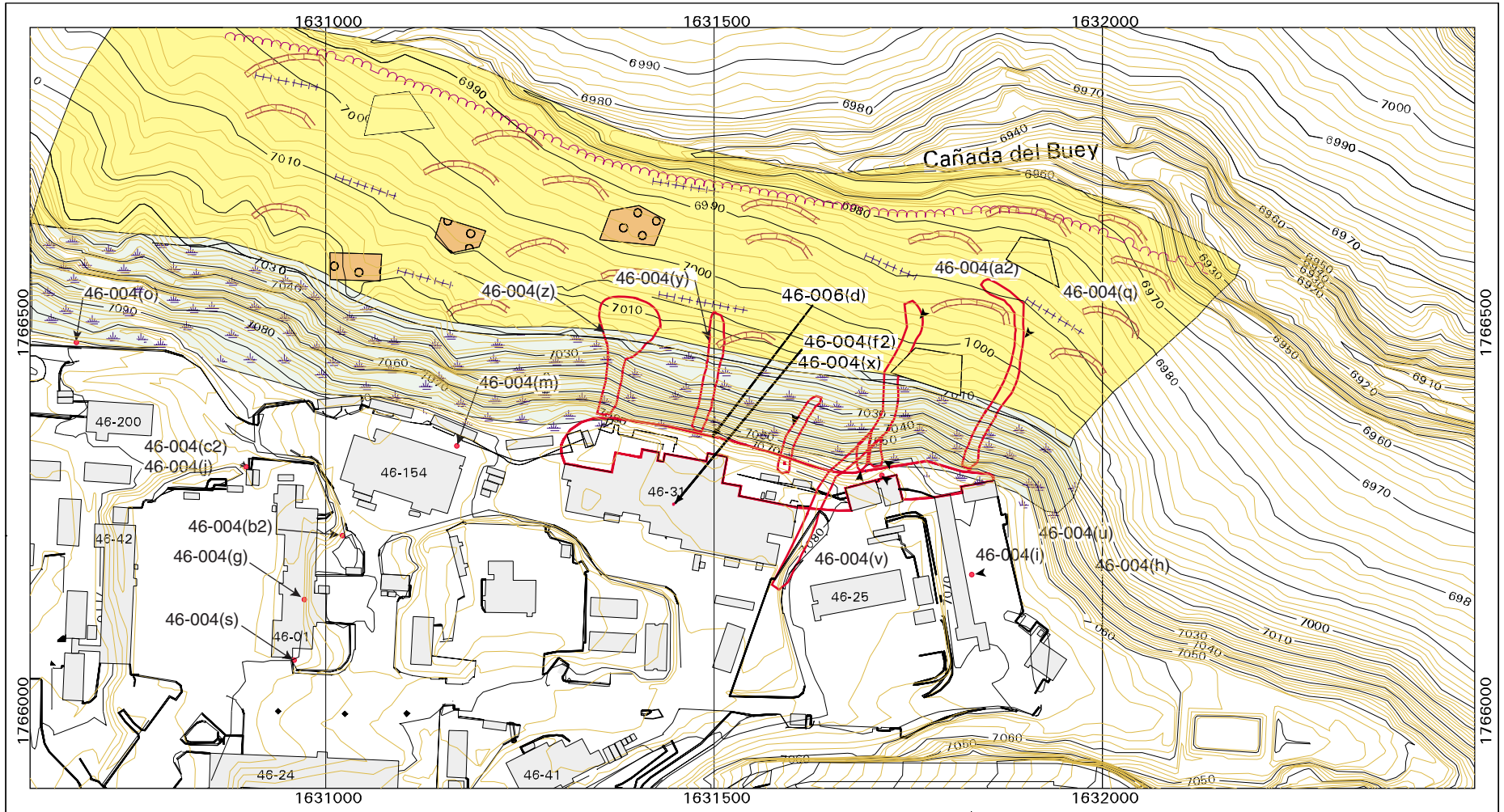
TECHNICAL AREA-46 SITES ONE YEAR AFTER THE CERRO GRANDE FIRE

SITE STATUS

The vegetation on the north-facing slope and the bench area located below TA-46 that were impacted by the Cerro Grande Fire have recovered very well. The ground cover consisting of mixed native grasses is 6" to 18" deep, and the gamble oak trees have come back thicker than ever.

The multiple levels of erosion control including; rock check dams, straw wattles, contour tree felling and an earthen berm have been very effective in keeping sediment from migrating from the site.

These photographs were taken during the April 2000 and June 2000 field inspections.



Best Management Practices at TA-46 North PRSs

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:2400

0 150 300

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones
FIMAD G108955 08 Aug 00

TECHNICAL AREA-48 SITES BEFORE AND AFTER THE CERRO GRANDE FIRE

48-003 – *Erosion Matrix Score 40.7*. Inactive septic system. The system served TA-48 from 1957 through January 1986 when it was removed from service. The septic tank and filter bed were decommissioned and removed in 1986.

CERRO GRANDE FIRE:

This site is located on the northern edge of Mortandad Canyon within the Upper Mortandad Watershed Aggregate. The northern part of TA-48 was moderately burned, with damage to ground cover and canopy.

BMPs:

Rock check dams were installed at the northeastern corner of the Technical Area to provide for flow dissipation from runoff events. Straw wattles were installed at the mesa edge. The area was hand-raked reseeded and straw mulched.

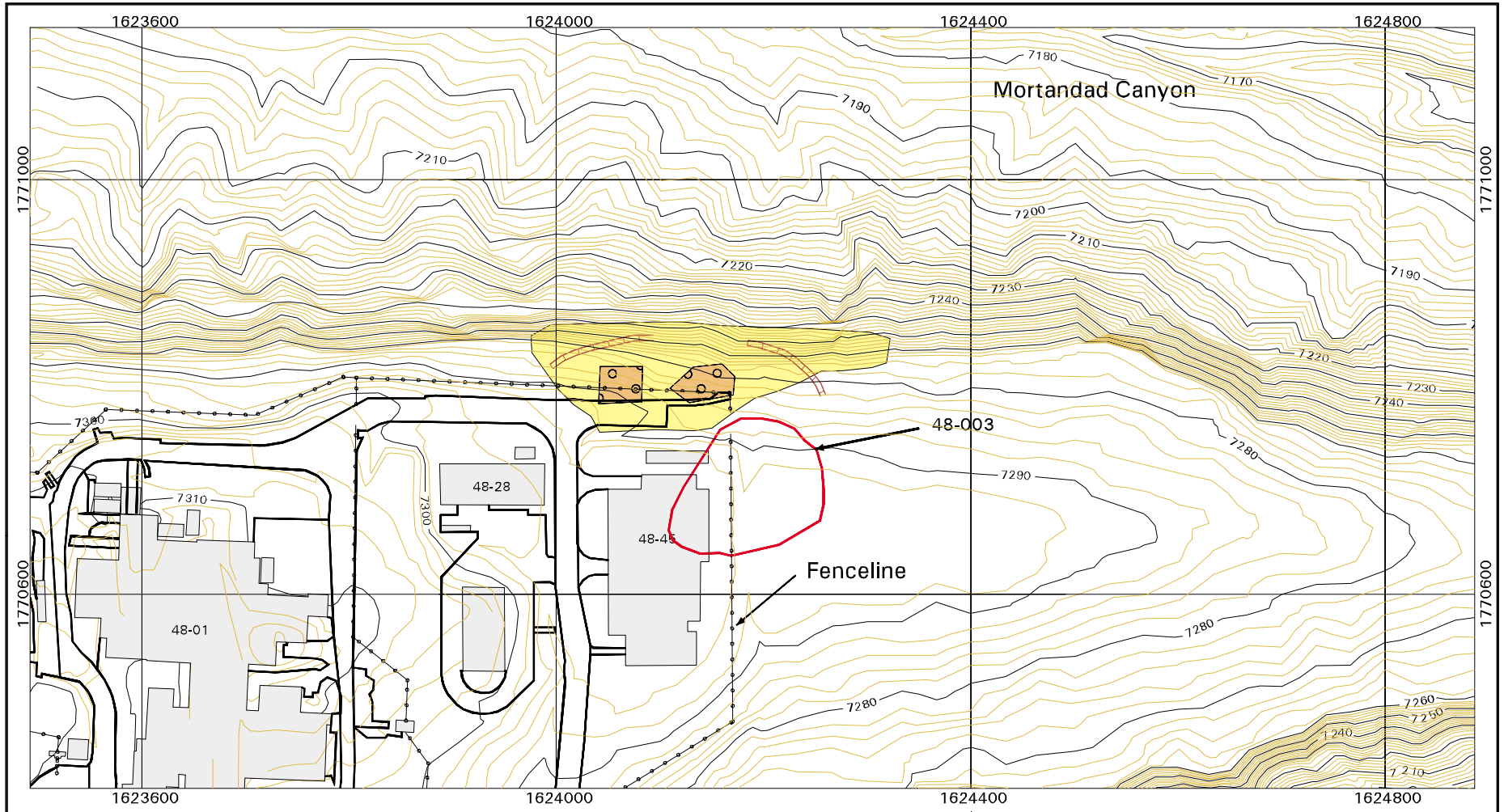
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/22/2001	
5/09/2001	
3/20/2001	No maintenance required
10/27/2000	
5/31/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 50%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRSs 48-003

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:1800

0 150 300

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
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New Mexico State Plane Coordinate System,
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Produced by Marcia Jones

FIMAD G108958 08 Aug 00

48-007(b) - *Erosion Matrix Score 49.3.* PRS No. 48-007(b) is an outfall that discharges non-contact cooling water from a magnet and a laser housed in TA-48-1; it discharges up to 4300 gallons per day into Mortandad Canyon and was grandfathered into the NPDES permit (LANL 1985, 853). It has NPDES Permit No. EPA 04A 016.

CERRO GRANDE FIRE:

This site is located on the northern edge of Mortandad Canyon within the Upper Mortandad Watershed Aggregate. The northern part of TA-48 was moderately burned, with damage to ground cover and canopy.

BMPs:

Straw wattles were installed at the mesa edge to impede sediment migration. The area was hand-raked reseeded and straw mulched to enhance the revegetation process.

SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/22/2001	
5/09/2001	
3/20/2001	No maintenance required
10/27/2000	
5/31/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.

48-007(c) - *Erosion Matrix Score 69.5*. Outfall that discharges non-contact cooling water that cools vacuum pumps housed in building TA-48-1; the outfall was submitted for inclusion under the NPDES permit in 1987 (LANL 1991, 21557). It has NPDES Permit No. EPA 04A131.

CERRO GRANDE FIRE:

This site is located on the southern edge of Mortandad Canyon within the Upper Mortandad Watershed Aggregate. The northern part of TA-48 was moderately burned, with damage to ground cover and canopy.

BMPs:

A rock check dam was installed to provide for flow dissipation from runoff events. Straw wattles were installed at the mesa edge. The area was hand-raked reseeded and straw mulched.

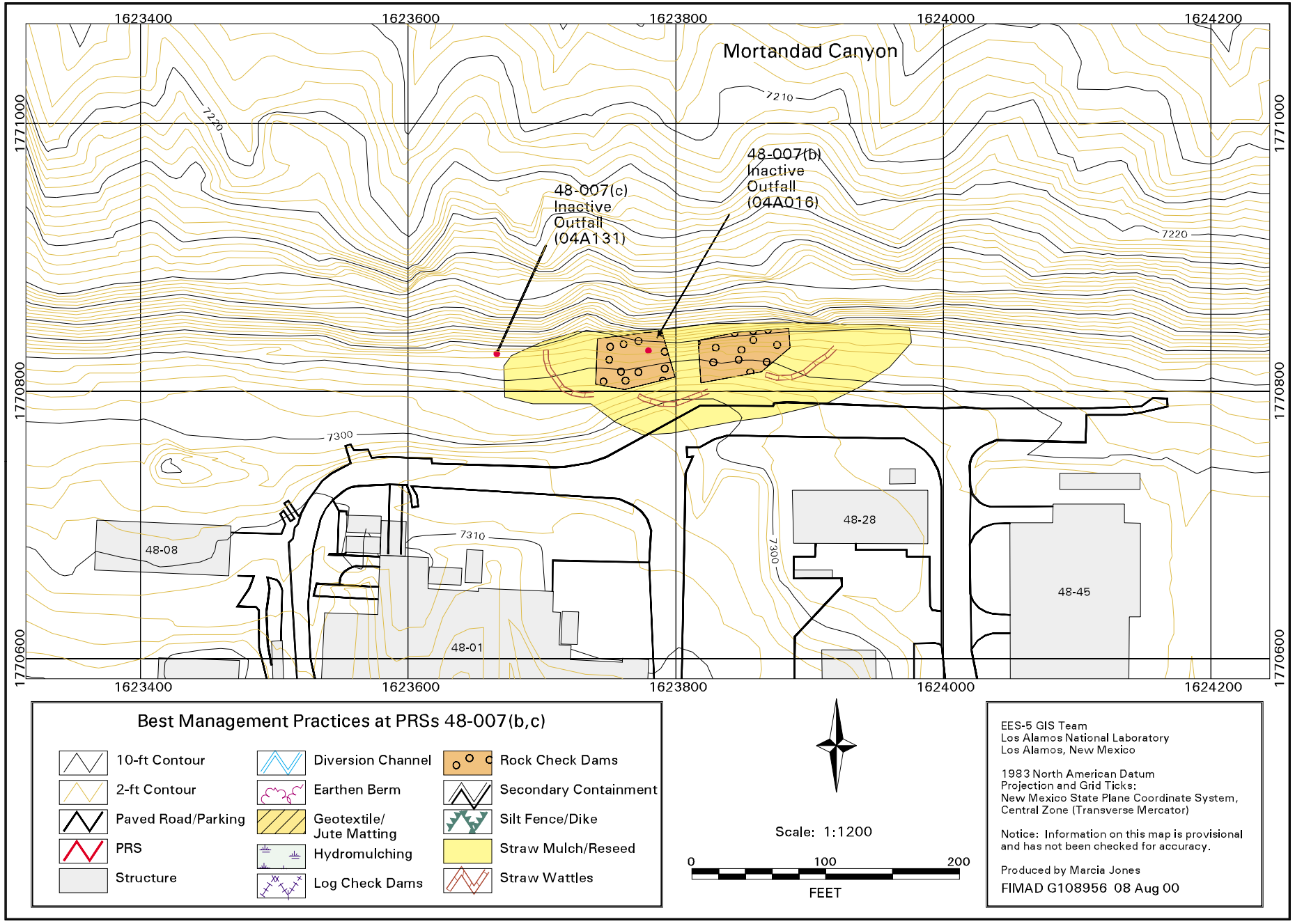
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/22/2001	
5/09/2001	No maintenance required
3/20/2001	
10/27/2000	
5/31/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.


1623400
1623600
1623800
1624000
1624200
1771000
1770800
1770600
Mortandad Canyon
7210
7220
7300
7310
48-007(c)
Inactive
Outfall
(04A131)
48-007(b)
Inactive
Outfall
(04A016)
48-08
48-01
48-28
48-45
Best Management Practices at PRSs 48-007(b,c)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/
Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:1200
0
100
200
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
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Central Zone (Transverse Mercator)
Notice: Information on this map is provisional
and has not been checked for accuracy.
Produced by Marcia Jones
FIMAD G108956 08 Aug 00

48-007(f) - *Erosion Matrix Score 76.5*. This outfall was submitted to the EPA in November 1987 for inclusion under the NPDES permit to discharge up to 100 gallons per day of non-contact cooling water from x-ray equipment located in building TA-48-46 (LANL 1990, 7511). It has Inactive NPDES 04A137.

CERRO GRANDE FIRE:

This site is located on the southern edge of Mortandad Canyon within the Upper Mortandad Watershed Aggregate. The northern part of TA-48 was moderately burned, with damage to ground cover and canopy.

BMPs:

Rock check dams were installed upslope to provide for flow dissipation from runoff events. Straw wattles were installed at the mesa edge. The area was hand-raked reseeded and straw mulched.

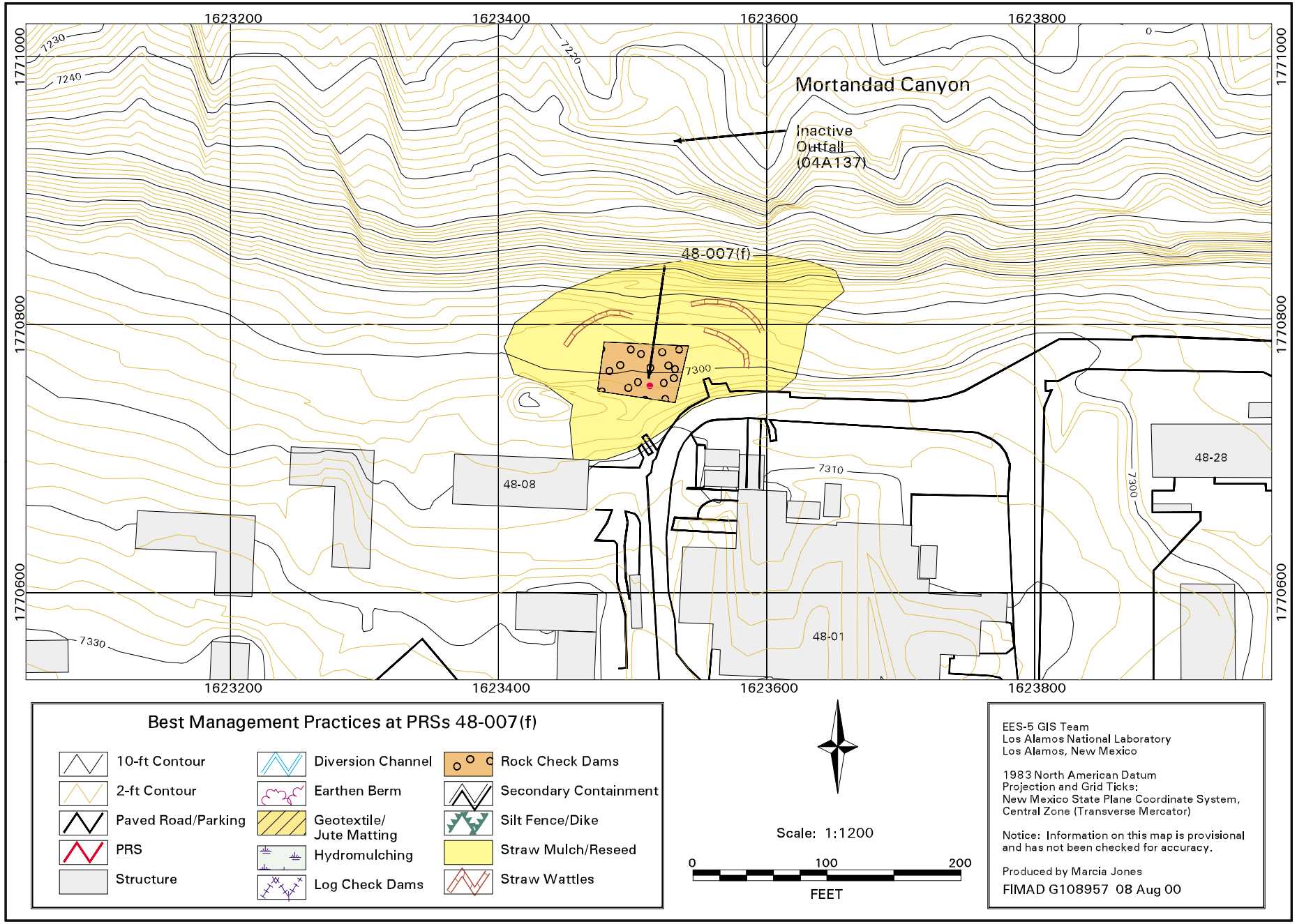
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

6/22/2001	
5/09/2001	
3/20/2001	No maintenance required
10/27/2000	
5/31/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.



Best Management Practices at PRSs 48-007(f)

- 10-ft Contour
- 2-ft Contour
- Paved Road/Parking
- PRS
- Structure
- Diversion Channel
- Earthen Berm
- Geotextile/ Jute Matting
- Hydromulching
- Log Check Dams
- Rock Check Dams
- Secondary Containment
- Silt Fence/Dike
- Straw Mulch/Reseed
- Straw Wattles

Scale: 1:1200

0 100 200

FEET

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones
FIMAD G108957 08 Aug 00

TECHNICAL AREA-49 SITE BEFORE AND AFTER THE CERRO GRANDE FIRE

49-001(g) – *Erosion Matrix Score 59.2*. Surface contamination area from MDA AB activities.

CERRO GRANDE FIRE:

This site is located on a tributary to Water Canyon within the Lower Water/Indio Watershed Aggregate. The area was lightly to moderately burned from MDA AB towards the canyon edge. All existing BMPs were destroyed

BMPs:

Trees were contour felled to provide erosion controls on the slopes. Rock check dams were installed within all main drainages for flow dissipation. Four hundred linear feet of silt fence was installed on the upper part of site below the access road.

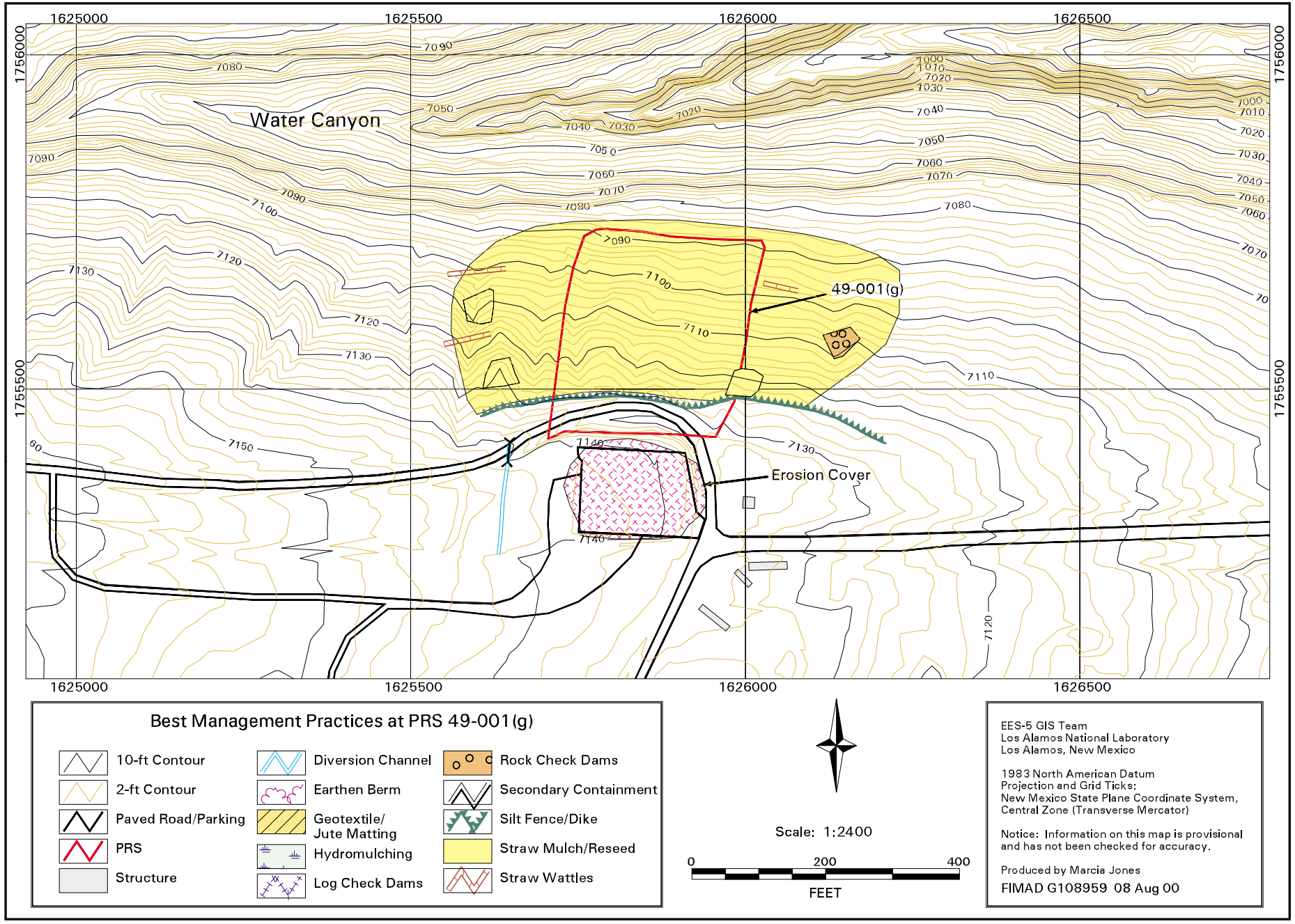
SUMMARY OF INSPECTION & MAINTENANCE

Site inspected on:

5/15/2001	
10/30/2000	No maintenance required
8/23/2000	
6/12/2000	

SITE STATUS

Site is in good condition, with vegetative cover of greater than 70%. The area appears stable with evidence of sediment migration being minimal.


1625000
1625500
1626000
1626500
1756000
1755500
Water Canyon
49-001(g)
Erosion Cover
Best Management Practices at PRS 49-001(g)
10-ft Contour
2-ft Contour
Paved Road/Parking
PRS
Structure
Diversion Channel
Earthen Berm
Geotextile/
Jute Matting
Hydromulching
Log Check Dams
Rock Check Dams
Secondary Containment
Silt Fence/Dike
Straw Mulch/Reseed
Straw Wattles
Scale: 1:2400
0
200
400
FEET
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico
1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)
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Produced by Marcia Jones
FIMAD G108959 08 Aug 00