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Date: DEC 1 2 2016
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LA-UR: 16-29160
Locates Action No.: N/A

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environmental Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87595-6303

Subject: Supplemental Environmental Project, Storm Water Engineering Structure Work Plan Regarding Settlement Agreement and Stipulated Final Order HWB-14-20, Addendum 2

Dear Mr. Kieling:

This letter transmits the work plan associated with a supplemental environmental project as directed in the Settlement Agreement and Stipulated Final Order HWB-14-20, Addendum 2, entered into by the New Mexico Environment Department (NMED) (Complainant), the U.S. Department of Energy (DOE), and Los Alamos National Security, LLC (LANS) (Respondents) on January 22, 2016. Paragraph 39 of the Stipulated Final Order requires the Department of Energy to expend $7.5 million to design and install engineering structures in canyons in and around Los Alamos National Laboratory (LANL) to slow storm water flow and decrease sediment load to improve water quality in the area, allowing surface water management at a watershed scale.

The *Addendum 2 Storm Water Engineering Structure Work Plan* and Enclosure 1, provides a description of proposed subprojects, preferred engineering structures, locations, a strategy and schedule for implementation of the subprojects. The Respondents would be pleased to meet with Hazardous Waste Bureau personnel to discuss and explain the documentation included herein.

If you have comments or questions regarding this submittal, please contact John C. Bretzke (LANS) at (505) 665-3867 or Peter Maggiore (DOE, NA-LA) at (505) 665-5025.

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety & Health
Los Alamos National Security, LLC
Los Alamos National Laboratory

Sincerely,

Kimberly Davis Lebak
Manager
Los Alamos Field Office
U.S. Department of Energy

MTB/JCB/ARG:eim

Enclosure 1: Addendum 2 Storm Water Engineering Structure Work Plan

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ENCLOSURE 1

Addendum 2 Storm Water Engineering StructureWork Plan

ADESH: 16-214

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Date: DEC 1 2 2016

Addendum 2

Storm Water Engineering Structure Work Plan

I. Introduction

This work plan has been developed pursuant to the Settlement Agreement and Stipulated Final Order (Settlement Agreement) between the New Mexico Environment Department (NMED), and the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS), collectively, the Parties, for the purposes of resolving Compliance Order No. HWB-14-20 (the Compliance Order), issued on December 6, 2014, related to Los Alamos National Laboratory (LANL or the Laboratory).

As one of the five Supplemental Environmental Projects (SEPs), Section II, B, 39 of the Settlement Agreement requires DOE to expend $7.5 M to design and install engineering structures in canyons in and around LANL to slow storm water flow and decrease sediment load to improve water quality in the area, allowing surface water management at a watershed scale.

II. Purpose/Objectives of Project

The purpose of the Storm Water Engineering Structure SEP is to comply with the requirements of the Settlement Agreement and the Compliance Order. The objective of this SEP is to implement a number of subprojects to slow storm water flow and decrease sediment load to improve water quality and allow surface water management at the watershed scale. These subprojects are expected to be above and beyond current storm water and sediment management actions required under existing permits and federal and state regulations. These projects will be completed in a manner that complies with applicable federal and state laws and regulations.

III. Description of Project Core Teams

This SEP has been developed through a project core team led by the NMED DOE Oversight Bureau (DOE-OB) with designees from the following entities:

- NMED Surface Water Quality Bureau
- NMED Hazardous Waste Bureau
- DOE/National Nuclear Security Administration Los Alamos Field Office
- Los Alamos County (LAC)
- Pueblo de San Ildefonso
- LANS organizations, including the Associate Directorate of Environmental Management and the Associate Directorate for Environment, Safety, and Health

The technical meetings focused on the development of specific objectives to be accomplished under the SEP. Before project team meetings, NMED DOE-OB developed and submitted an agenda to all members. During the project team meetings, agenda items were discussed. At the end of each project team meeting, action items were reviewed and clear assignments made. Between project team meetings, notes from the previous meeting were submitted to all members for review and comment. Meeting minutes were then updated and, if there were no objections, were finalized in the subsequent meeting.

In general, the project team technical meeting process was collaborative with decisions reached by consensus. Project team members' professional backgrounds were multidisciplinary and when specific expertise was needed but not available within the team, technical experts were invited to project team meetings to provide information.

At various times, other entities, including the U.S. Army Corps of Engineers (USACE), the New Mexico Office of the State Engineer, and the NMED Solid Waste Bureau, have participated in core team discussions. While developing potential subprojects, the project core team formally designated this SEP as the Watershed Enhancement (WE) Project.

IV. Justification for Each Project

The core team developed the strategy and approach for the WE Project through a well-documented cooperative and multidisciplinary planning process. Because the requirements in the Settlement Agreement and the Compliance Order for the WE Project are more conceptual than prescriptive, the core team adopted a qualitative graded approach to identify the storm water control and sediment management structures (i.e., subprojects). The subprojects were evaluated against a well-defined set of scope selection and prioritization criteria to ensure the proposed projects directly addressed the SEP. Throughout the planning process, each core team representative was given the opportunity to identify issues, preferences, and priorities that contributed to the selection and prioritization criteria and overall scope of the WE Project.

Specifically, subprojects were evaluated using two groups of selection criteria. Group A is considered key criteria and was used to distinguish proposed subprojects that could proceed in the planning process from those eliminated for further consideration. For example, when considering regulatory requirements, a number of federal and state laws and regulatory requirements apply to the planning, construction, and maintenance of subprojects. If any of the anticipated requirements were likely to delay the subproject completion beyond the scheduled completion date identified in Section VII, it was not selected for further consideration. Group A Criteria include the following, in no particular order of importance:

- Compliance with Settlement Agreement and Compliance Order
- Cost
- Schedule
- Land ownership
- Compliance implications
- Regulatory requirements
- Land use
- Impacts to other resources
- Project planning status

Following Group A criteria evaluation, watersheds in and around LANL were evaluated with respect to (1) pollutant loading and (2) flow frequency/discharge (see Figure 1). Those watersheds with the highest potential of either (1) or (2) above proceeded to prioritization ranking by core team members using Group B criteria. These criteria include the following:

- Regulatory constraints for new subprojects
- Operations and maintenance requirements

- Runoff potential and impervious surfaces
- Undesirable impacts to resources
- Maximum benefits to stakeholders and resources
- Public safety
- Full watershed approach
- Cost (rough orders of magnitude [ROMs] within the Integrated Project List [IPL])

Figure 1
Flow Frequency/Discharge versus Pollutant Loading

Pollutant Loading	Flow Frequency/Discharge: Low	Moderate	High
Low	Twomile Canyon Canada del Buey Ancho Canyon Chaquehui Canyon	Pajarito Canyon Water Canyon	
Moderate	Potrillo Canyon Fence Canyon	Pueblo Canyon	DP Canyon Los Alamos Canyon Cañon de Valle
High	Mortandad Canyon	Acid Canyon Sandia Canyon North Ancho Canyon	

Using the WE project criteria summarized above, a final list of subprojects was selected and core team members were asked to prioritize them. The project core team leader consolidated all core team member contributions and provided the results to the team for further review and consensus. The recommended prioritized subproject list presented provides the basis for the Integrated Project List (IPL) in Table 1. Figure 2 shows the approximate location of each subproject.

Table 1
Integrated Priority List

Feature ID	Subproject Title	Watershed	ROM ($K)	Cumulative ROM ($K)
1	Institutional Low-Impact Development (LID) Master Plan	Multiple	1120	1120
9	Wetland enhancement	Mortandad	270	1390
12	Upper Cañon de Valle run-on controls	Cañon de Valle	1040	2430
13	North Ancho controls	Ancho	1,710	4140
5	DP dissipater	Los Alamos (DP)	240	4380
8	Lower watershed control	Sandia	990	5370
10	Mid-Mortandad controls	Mortandad	1340	6710
7	Lower Sandia enhanced infiltration zone	Sandia	1040	7750
4	Upper Los Alamos Canyon watershed improvements	Los Alamos	2140	9890
14	Upper Ten Site	Mortandad (Ten-site)	450	10,340
6	Floodplain enhancement	Sandia	400	10,740
11	Floodplain improvement	Mortandad	580	11,320
2	Flow dissipation/run-on diversion	Pueblo	600	11,920
15	Los Alamos Reservoir	Los Alamos	890	12,810
3	Bank armoring	Pueblo (Acid)	680	13,490

Notes: Unshaded rows indicate subprojects are above current IPL funding line as detailed in Section V. Grey-shaded rows indicate subprojects are below current IPL funding line as detailed in Section V.

V. Project/Scope

The planning process has established an IPL that identifies the prioritized list of subprojects to be implemented to fulfill the requirements identified in Section II, B, 39 of the Settlement Agreement. A funding threshold line has been established in the IPL based on the funding specified in the Settlement Agreement. Only those subprojects above the approved IPL funding threshold line will be implemented, as described in Section VI below. These subprojects have been selected for more detailed planning, and during subproject design a refined cost estimate will be developed to allow reassessment of the IPL funding threshold line to determine if additional or fewer subprojects can be completed. If reassessment of the IPL funding threshold is necessary, NMED will be notified of the status, and additional discussions with the project core team will be held to discuss. Deviations agreed to by the project core team will be submitted to NMED for approval.

Details of the subproject scope identified below will be compiled in a supplemental information document before members of the project team implement the scope. The supplemental information, which is separate from, and not part of this addendum, was generated and provided for informational purposes only and is not enforceable. In the event that specific scope changes are required within each subproject, the supplemental information will be updated and discussed with the project team at periodic status meetings.

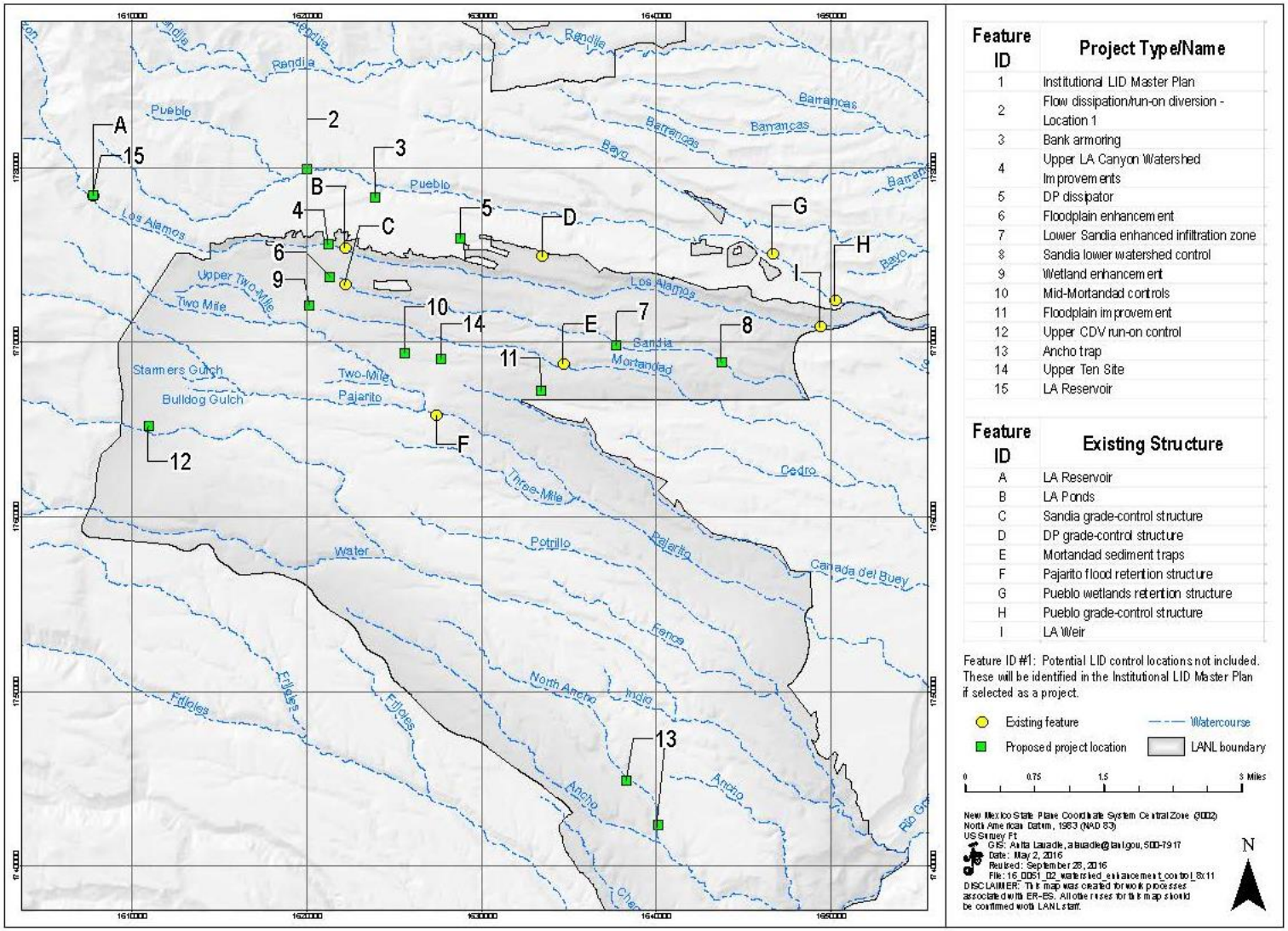

Figure 2 Approximate location of subprojects included in the IPL

Since many of the subprojects are located in canyon bottoms, it is anticipated that USACE 404 permit coverage will be required, and additional wetland and/or floodplain assessments may be necessary. Depending upon subproject size, compliance with the National Pollutant Discharge Elimination System Construction General Permit may be required. Construction may be limited during wet periods for subprojects located near developed areas that experience flow events during periods of precipitation and snow melt. Some subprojects are also located within threatened and endangered species habitat and may require National Environmental Policy Act (NEPA) review, which may impose additional limits on potential construction periods.

A short description of the subprojects at this planning stage that are above the IPL funding threshold follows.

a. Institutional LID Master Plan

   Storm water from impervious developed areas throughout LANL is collected by the local storm sewer system and discharged directly into the nearest canyon. Storm water from developed areas potentially contain contaminants associated with automobiles, building materials, and industrial processes. In addition, the unnaturally high volume and rate of discharge can damage riparian vegetation, erode channels, and result in downstream flooding. This subproject consists of identifying opportunities to use LID storm water controls to minimize sediment and other contaminant transport, minimize total volume of storm water discharged to the canyons, and reduce peak velocities/flows entering the canyons from developed areas. This project contains three distinct tasks. Task 1: develop a LID Master Plan for LANL; Task 2: develop LID standards for LANL that will also be provided to LAC; and Task 3: design and construct three to five (within the LID funds allocated) LID projects within Technical Area 03 (TA-03), TA-55, TA-35, and/or TA-53.

b. Wetland Enhancement – Mortandad Watershed

   The upper portion of Mortandad Canyon receives runoff from a heavily urbanized area in TA-03. In one area, this conveyance is well vegetated with a relatively flat gradient. At the downstream portion of this reach, channel/headcut formation is occurring. This subproject consists of installing a structure below both the Individual Permit (IP) sampler M-SMA-1 and the downstream flatter hydraulic grade area with established vegetation. The structure will arrest headcut formation and improve wildlife habitat in this area. In addition, the sediment-control structure immediately upstream of the M-SMA-1 IP sampler will be used to manage sediment upstream of the proposed subproject.

c. Upper Cañon de Valle Run-on Controls – Cañon de Valle Watershed

   This location, a former borrow pit area, receives storm water runoff from undeveloped land upstream of LANL. Following the Cerro Grande and Las Conchas fires, significant flows with greater velocities than pre-fire, entered the Laboratory boundary at this location resulting in property damage to LANL infrastructure and increased sediment transport. Currently, the former borrow pit area is stabilized and vegetated and storm water within the area is conveyed under Anchor Ranch Road through a tributary to Cañon de Valle. This subproject focuses on managing runoff from upstream areas by stabilizing the existing channel or potentially rerouting portions of the run-on flows through the former borrow pit area and constructing associated storm water management

structures. The subproject will provide additional infiltration/detention time, resulting in decreased sediment transport and reduced peak storm water flows in the downstream portion of the watershed.

d. North Ancho Controls – Ancho Watershed

Most of this portion of the North Ancho watershed is undeveloped, with isolated pockets of highly developed areas associated with TA-39 operations. This drainage receives occasional intense precipitation and subsequent high flows with the potential for significant contaminant transport. This subproject consists of installing two structures upstream of NM 4 in the middle and lower portions of North Ancho Canyon. The upstream structure will detain low channel flows, reduce downstream sediment transport by capturing some sediment, and reduce peak flows during low and moderate storm events. The downstream structure will slow storm water flows conveyed under NM 4 and reduce downstream peak flows during low and moderate storm events.

The proposed downstream structure is in close proximity to New Mexico Department of Transportation (NMDOT) right of way (ROW). During design, a detailed site survey will be completed and may result in relocating the proposed structure to avoid NMDOT ROW. If NMDOT ROW cannot be avoided, either a ROW permit or airspace agreement may be required.

e. DP Dissipater – Los Alamos (DP) Watershed

The upper portion of the DP watershed receives runoff from a heavily urbanized portion of the Los Alamos town site. Storm water is conveyed into the canyon bottom and onto LANL property via an established incised channel immediately south of the Verde Ridge housing development at the head of DP Canyon. This subproject consists of slowing storm water flows into DP Canyon and onto LANL property by installing controls within the incised channel immediately south of the Verde Ridge development at the head of DP Canyon. These controls will provide multiple checks and pooling areas to curb/reduce peak discharges downstream during smaller storm events. Reducing peak flows in these storm events will reduce the potential for storm water flows to cross the lower LANL boundary and reduce the potential for downstream sediment transport. The Laboratory would be responsible for long term inspection/maintenance of this structure through current access agreements with LAC.

f. Lower watershed control – Sandia Watershed

Development in the upper watershed has increased flow frequency and associated sediment transport. As a result of the increased flows, channelization is becoming more evident along this reach. This portion of Sandia Canyon has fine alluvial deposits and contains well-established vegetation in areas, with other areas exhibiting sediment movement and less vegetation present. Channelization does not occur throughout the reach. In some areas, the flow channel is not readily evident, and in other areas multiple low-flow pathways are evident. This subproject will increase bed elevation and reduce sediment load related head cuts within TA-72. To accomplish these goals, one structure will be installed to increase floodplain utilization. Two structures will be installed to arrest head cuts. All three structures will reduce sediment load in the reach.

Direct access to the site does not exist, and site access will most likely be directly from East Jemez Road. If this access point is not available, access from an upstream LAC utility site may be evaluated. If access will be via LAC property, an access agreement with LAC will be obtained.

g. Middle Mortandad Controls – Mortandad Watershed

This subproject is located in Middle Mortandad Canyon and receives storm water runoff from urbanized areas within TA-55 and TA-48. Although the channel in this reach is well vegetated, during storm events sediment transport through this channel is evident. In addition, storm water is discharged into Effluent Canyon from a detention pond that collects storm water from the majority of TA-55. This discharge location shows evidence of active erosion on the cliff side. This subproject consists of routing storm water from the mesa top TA-55 detention pond to a storm water control in the bottom of Effluent Canyon which would prevent further erosion and downstream sediment transport.

VI. Acquisition Strategy

a. General description of acquisition strategy evaluated.

Settlement Agreement expenditures for this SEP will be managed by DOE through the Management and Operations (M&O) contract. LANS staff will self-perform most of the project scope with additional technical support and fieldwork assistance from existing LANS subcontracts using a design-build approach. Subcontractor support may be utilized for construction phases on several of the subprojects. In the first phase, LANS will complete the design of each subproject, and in the second phase may either award a construction contract for execution of the design or self-perform the scope. If a subcontractor completes the construction phase, LANS will provide construction field engineering support.

b. Description of option(s) chosen and justification

Once the design phase reaches 60% review, a refined cost estimate will be developed to allow reassessment of the IPL funding threshold line and determine if adjustments are necessary. If adjustments are necessary for a subproject's scope/objectives or to the IPL funding threshold line, the NMED will be notified and a meeting will be held to discuss with project core team. Any changes will be documented in the supplemental information to this work plan.

LANS will execute project management activities by using established project controls methods.

c. Cost breakdown for the project

Table 1 in Section IV provides the individual subproject cost breakdown. This cost breakdown totals $7,500K, including $790K of contingency, and consists of design, project management, and construction. Any remaining contingency will be applied to funding additional subprojects as identified in Section VI.b above.

VII. Schedule

The schedule outlines a series of interim milestones. Interim milestones are for progress tracking between DOE and NMED and are not enforceable. DOE may adjust the interim milestones dates.

For those subprojects currently above the IPL funding threshold line, the anticipated schedule requirement by phase is described below. Once a subproject's design phase is completed, a refined cost estimate will also be completed. Based on the refined cost estimates, the IPL list may need to be adjusted as identified in Section V above. Deliverables related to this SEP are identified in Section VII.b below.

a. Interim Milestones

i.	Work plan approved	
ii.	Planning phase complete for all subprojects	i +28 wks.
iii.	Complete design and construction estimate	ii +28 wks.
iv.	Complete make/buy award construction contracts	iii +48 wks.

Routine status meetings of the project core team will be held as necessary. Project team members will be invited to the status meetings and be provided with meeting notes. The supplemental information will be updated and provided to NMED to support final certification of the SEP.

b. Deliverables

The final construction scope and schedule will be submitted to NMED for approval no later than 72 wks. after the work plan is approved. The approved construction scope and schedule will be attached as Attachment A to Addendum 2, posted to the Laboratory Electronic Public Reading Room, and shall be fully enforceable in accordance with paragraph 45 of the Settlement Agreement. DOE will request an extension from NMED, as needed, per Settlement Agreement Section III, I, 58. DOE and LANS shall submit a signed and sworn Certification of Completion, executed by their authorized representatives, including the pertinent attachments and data related to the final implementation of each SEP, to NMED for approval within thirty (30) calendar days after the completion of this SEP.