



**BILL RICHARDSON**  
GOVERNOR

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*State of New Mexico*  
**ENVIRONMENT DEPARTMENT**

*Hazardous Waste Bureau*  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
Telephone (505) 428-2500  
Fax (505) 428-2567  
[www.nmenv.state.nm.us](http://www.nmenv.state.nm.us)



**RON CURRY**  
SECRETARY

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

May 15, 2006

David Gregory  
Federal Project Director  
Los Alamos Site Office  
Department of Energy  
528 35<sup>th</sup> Street, Mail Stop A316  
Los Alamos, NM 87544

David McInroy  
Remediation Services Deputy Program Director  
Los Alamos National Laboratory  
P.O. Box 1663, Mail Stop A100  
Los Alamos, NM 87545

**RE: INTENT TO PUBLIC NOTICE  
REMEDY SELECTION FOR THE SOLID WASTE MANAGEMENT  
UNIT 16-021(c)  
LOS ALAMOS NATIONAL LABORATORY, EPA ID #NM0890010515  
HWB-LANL-03-021**

Dear Messrs. Gregory and McInroy:

The New Mexico Environment Department (NMED) is issuing a Public Notice with the intent to select a remedy for solid waste management unit (SWMU) 16-021(c) at Los Alamos National Laboratory (LANL). This proposed remedy was selected based on the information provided in the *Corrective Measures Study Report for Solid Waste Management Unit 16-021(c)-99*.

NMED will begin a 60-day public notice period on the proposed remedy selection on **May 15, 2006**. The Department of Energy and the University of California (collectively, the Permittees) may submit any comments on the proposed remedy to NMED no later than **July 14, 2006 at 5:00 P.M.** NMED will give due consideration and the weight it deems appropriate to all comments received during the public comment period. At the time any final decision is made, NMED will issue a response to all comments submitted during the public notice period.

Enclosed for your review is a copy of the Public Notices and the Fact Sheet. These documents and all supporting information will also be available for public review at the NMED Hazardous



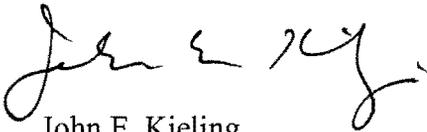
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Messrs. Gregory and McInroy  
May 15, 2006  
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Waste Bureau office in Santa Fe and on the NMED webpage at <http://www.nmenv.state.nm.us/hwb/lanlperm.html> under SWMU 16-021(c). Procedures for submitting comments are contained in the Public Notice.

Should you have any questions, please feel free to contact Darlene Goering of my staff at (505) 428-2542.

Sincerely,



John E. Kieling  
Manager  
Permits Management Program

JEK:dxg

Enclosures

cc: D. Goering, NMED HWB  
S. Yanicak, NMED DOE OB, MS J993  
L. King, EPA 6PD-N  
J. Ordaz, DOE OLASO, MS A316  
K. Hargis, LANL RRES/DO, MS M591  
N. Quintana, LANL RRES-RS, MS M992  
File: Reading and LANL 2006



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**RON CURRY**  
SECRETARY

May 15, 2006

**SUBJECT: PUBLIC COMMENT PERIOD FOR PROPOSED REMEDY SELECTION FOR SOLID WASTE MANAGEMENT UNIT 16-021(c) LOS ALAMOS NATIONAL LABORATORY**

Dear Interested Citizen:

Enclosed is a **Public Comment Notice** regarding the intent to select a remedy for solid waste management unit (SWMU) 16-021(c) at Los Alamos National Laboratory (LANL). LANL is owned by the U.S. Department of Energy (DOE), is co-operated by the DOE and the Regents of the University of California (collectively, the Permittees). LANL is located within the counties of Los Alamos and Santa Fe, New Mexico about 60 miles north-northeast of Albuquerque and about 25 miles northwest of Santa Fe. The Permittees are located at the following addresses: LANL, P.O. Box 1663, Mail Stop M992, Los Alamos, New Mexico, 87545; and National Nuclear Security Administration (NNSA)/DOE, Los Alamos Site Office, 528 35<sup>th</sup> Street, Los Alamos, New Mexico 87544. The Permittees' primary contact for this action is: Mr. Lance Woodworth, NNSA/DOE, Los Alamos Site Office, 528 35<sup>th</sup> Street, Los Alamos, New Mexico 87544.

The enclosed Notice provides locations where the administrative record for this action can be reviewed, and provides procedures for submitting comments and procedures regarding the public hearing. Public comment will be received through **5:00 p.m. on July 14, 2006.**

Any person seeking additional information regarding this notice may contact either:

Mr. John E. Kieling, Program Manager  
New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
E-mail: john.kieling@state.nm.us  
Telephone: (505) 428-2535  
Fax: (505) 428-2567

Ms. Darlene Goering, Project Leader  
New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
E-mail: darlene.goering@state.nm.us  
Telephone: (505) 428-2542  
Fax: (505) 428-2567

Sincerely,

John E. Kieling  
Program Manager  
Permits Management Program  
Hazardous Waste Bureau



**BILL RICHARDSON**  
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**RON CURRY**  
SECRETARY

**PUBLIC NOTICE NO. 06-07**  
**NEW MEXICO ENVIRONMENT DEPARTMENT**  
**HAZARDOUS WASTE BUREAU**  
**Santa Fe, NM 87505**  
**May 15, 2006**

**NOTICE OF OPPORTUNITY FOR PUBLIC COMMENT AND REQUEST FOR PUBLIC  
HEARING ON THE PROPOSED REMEDY SELECTION FOR  
SOLID WASTE MANAGEMENT UNIT 16-021(c)  
LOS ALAMOS NATIONAL LABORATORY  
LOS ALAMOS, NEW MEXICO  
EPA ID NO. NM0890010515**

Under authority of the New Mexico Hazardous Waste Act (Section 74-4-1 to 74-4-14 NMSA 1978, as amended, 1992) and the New Mexico Hazardous Waste Management Regulations (HWMR, 20.4.1 NMAC), the New Mexico Environment Department (NMED) can approve or deny hazardous waste permits, closure plans, permit modifications, and amendments. Under this authority, the NMED proposes to approve, pending public input into this decision, a modification to the Los Alamos National Laboratory (LANL) Resource Conservation and Recovery Act hazardous waste management Permit (RCRA Permit) issued to the U.S. Department of Energy (DOE) and the University of California (UC) (collectively, the Permittees), Los Alamos, New Mexico, EPA ID No. NM0890010515.

On November 8, 1989, a RCRA Permit was issued to the Permittees to operate a hazardous waste treatment and storage facility at LANL pursuant to the HWA § 74-4-4.2. On January 15, 1999, DOE/LANL applied to the NMED to renew their RCRA Permit. The 1989 Permit remains in effect until a final decision is made on the renewal request.

NMED announces the availability of the proposed remedy selection for Solid Waste Management Unit (SWMU) 16-021(c) and opportunity for the public to provide comment and request a public hearing. NMED has made available a Fact Sheet that sets forth the basis for modification of the Permit.

LANL is a research laboratory owned by DOE and co-operated with UC. The Facility began operations in 1943 when the United States Army Manhattan Engineer District was established for the research and development of the atomic bomb. The principal mission of LANL includes the research, design, development, and analysis of weapons components for the nation's nuclear arsenal. Current and historic operations include nuclear physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; biology; medium-energy physics; space nuclear systems; controlled thermonuclear fusion; laser research; environmental research; geothermal, soil, and fossil energy research; nuclear safeguards; biomedical research; space physics; electrical research and development; laser design and development; and photographic processing.

LANL is located in Los Alamos County, an incorporated county, in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe.

LANL occupies an area of approximately 40 square miles situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep west to east trending canyons. The mesa tops range in elevation from approximately 7,800 feet above mean sea level at the flank of the Jemez Mountains, located to the west of Los Alamos, to about 6,200 feet above mean sea level at their eastern extent, where they terminate above the Rio Grande.

The Permittees are located at the following address: DOE, National Nuclear Security Administration (NNSA), Los Alamos Site Office, 528, 35<sup>th</sup> Street, Los Alamos, NM 87544; and LANL/University of California, P. O. Box 1663, Los Alamos, New Mexico, 87545. The Permittees' primary contact for this action is: Mr. Lance Woodworth, NNSA/DOE, Los Alamos Site Office, 528 35<sup>th</sup> Street, Los Alamos, New Mexico 87544.

In the late 1980's, the Permittees identified for EPA "Potential Release Sites," including SWMUs and areas of concern (AOCs), where hazardous waste, hazardous constituents, solid waste, or mixed waste may have been placed and released to the environment. Of those sites, EPA identified over 1,200 as sites to be investigated and included on the Hazardous and Solid Waste Amendments (HSWA) portion of LANL's RCRA Permit. The HWMR requires corrective action at SWMU 16-021(c) where releases of hazardous waste have occurred. The Permittees must comply with the HWA, the HWMR, the Order, and the LANL RCRA Permit for this corrective action.

#### **PUBLIC REVIEW OF THE ADMINISTRATIVE RECORD**

Availability of Additional Information: The Administrative Record for this proposed action consists of a Fact Sheet, this public notice, the draft Permit, and other relevant correspondence and documents. The Administrative Record may be reviewed at the following location during the public comment period:

New Mexico Environment Department - Hazardous Waste Bureau  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
Phone: (505) 428-2500  
Monday – Friday: 8:00 a.m. to 5:00 p.m.

The Fact Sheet, Public Notice, and draft Permit are also available on the NMED website at [www.nmenv.state.nm.us/HWB/lanlperm.html](http://www.nmenv.state.nm.us/HWB/lanlperm.html) under 16-021(c) Remedy Selection (5-15-2006). To obtain a copy of the Administrative Record or a portion thereof, please contact Pam Allen at (505) 428-2531, via e-mail at [pam.allen@state.nm.us](mailto:pam.allen@state.nm.us), or at the NMED address given above. NMED will provide copies, or portions thereof, of the Administrative Record at a cost to the requestor.

**Comment Period and Environment Department Contact:** The NMED issued a public notice on Monday, May 15, 2006, to announce the beginning of a 60-day comment period that will end at 5:00 p.m., Friday, July 14, 2006. Any person who wishes to comment on this action should submit written or electronic mail (e-mail) comment(s) with the commenter's name and address to the address below. Only comments received on or before 5:00 p.m., Friday, July 14, 2006 will be considered.

John E. Kieling, Program Manager  
Hazardous Waste Bureau - New Mexico Environment Department  
Public Notice No. 06-07 May 15, 2006 Page 3

2905 Rodeo Park Drive East, Building 1

Santa Fe, NM 87505-6303

Phone: (505) 428-2500

Or via e-mail: john.kieling@state.nm.us

Reference: LANL Remedy Selection for 16-021(c) (May 15, 2006)

Written comments must be based on available information for review and include, to the extent practicable, all referenced factual materials. Documents in the administrative record need not be re-submitted if expressly referenced by the commenter. Members of the public may request a public hearing on the proposed action. Requests for a public hearing must provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the draft permit, including specific references to any conditions being addressed; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Request for public hearing must be submitted on or before 5:00 p.m., Friday, July 14, 2006 to be considered. The NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

**Final Decision:** The NMED must ensure that the approved draft permit is consistent with the Hazardous Waste Act and the Hazardous Waste Management Regulations. All written comments submitted on this matter will become part of the administrative record, be considered in formulating a final decision, and may cause the draft permit to be modified. The NMED will respond in writing to all written public comments. The NMED's response to comments will specify which provisions, if any, of the draft permit have been changed in the final Permit decision, the reasons for the change, and will briefly describe and respond to all public comments on the draft permit or the permit application raised during the public comment period. The NMED's response to comments will also be posted on the NMED website in addition to being sent to all persons who submitted written comments.

After consideration of all the written public comments received, the NMED will either issue or modify and issue the Permit. If the NMED modifies and issues the Permit, then the Permittee will be provided by certified mail a copy of the modified permit and a detailed written statement of reasons for the modifications. The NMED will make the final Permit decision publicly available.

The Environment Department Secretary's final permit decision will constitute a final agency decision and become effective thirty days after notice of the decision has been served on the Permittees, or such later time as the Secretary may specify. All persons on the facility mailing list, and persons that presented written comments, or who requested notification in writing, will be notified of the Secretary's final decision by mail. The final agency decision may be appealed as provided by the Hazardous Waste Act, Section 74-4-14, NMSA 1978.

**Arrangements for Persons with Disabilities:** Any person with a disability requiring assistance or auxiliary aid to participate in this process should contact Judy Bentley at the following address: New Mexico Environment Department, Room N-4030, P.O. Box 26110, 1190 St. Francis Drive, Santa Fe, New Mexico 87502-6110, (505) 827-2844. TDD or TDY users please access Judy Bentley's number via the New Mexico Relay Network. Albuquerque users may access Ms. Bentley's number at (505) 275-7333.



**BILL RICHARDSON**  
GOBERNADOR

*Estado de Nuevo México*  
**DEPARTAMENTO DEL MEDIO  
AMBIENTE**

*Oficina de Desperdicios Peligrosos*  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303

**Teléfono (505) 428-2500**

**Fax (505) 428-2567**

[www.nmenv.state.nm.us](http://www.nmenv.state.nm.us)



**RON CURRY**  
SECRETARIO

15 de mayo, 2006

**RE: PLAZO PARA COMENTARIOS DEL PUBLICO EN CUANTO A LA SELECCIÓN  
ENTRE REMEDIOS PROPUESTOS PARA LA UNIDAD DE MANEJO DE  
DEPERDICIOS 1601-021 (c)**

Estimado Ciudadano Interesado:

Anexa a la presente se encuentra una **Solicitud de Comentarios del Público** sobre la intención a seleccionar un remedio para la unidad de manejo de desperdicios sólidos (SWMU) 16-021 (c) en el Laboratorio Nacional de Los Alamos (LANL). LANL pertenece al Departamento de Energía de los Estados Unidos (DOE) y lo opera el DOE en cooperación con los Regentes de la Universidad de California (colectivamente los Permisarios). LANL se encuentra en los Condados de Los Alamos y Santa Fe, Nuevo México, a una distancia aproximada de 60 millas a norte-noreste de Albuquerque y a unas 25 millas al noroeste de Santa Fe. Las direcciones de los Permisarios son las siguientes: LANL, P.O. Box 1663, Mail Stop M992, Los Alamos, New Mexico, 87545; y National Nuclear Security Administration (NNSA)/DOE, Los Alamos Site Office, 528 35<sup>th</sup> Street, Los Alamos, New Mexico 87544. El contacto principal de los permisarios para este proyecto es: Mr. Lance Woodworth, NNSA/DOE, Los Alamos Site Office, 528 35<sup>th</sup> Street, Los Alamos, New Mexico 87544.

La Solicitud anexa indica los lugares dónde se puede repasar el acta administrativa correspondiente al proyecto actual e indica los procedimientos para la presentación de comentarios y los procedimientos relacionados a la audiencia pública. La fecha límite para recibir comentarios del público es **14 de julio, 2006 a las 5 de la tarde a más tardar.**

Cualquiera que busca más información en cuanto a esta solicitud puede dirigirse a la personas siguientes:

Mr. John E. Kieling, Encargado de Programa  
Departamento del Medio Ambiente de Nuevo México  
Oficina de Desperdicios Peligrosos  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
E-mail: [john.kieling@state.nm.us](mailto:john.kieling@state.nm.us)  
Teléfono: (505) 428-2535  
Fax: (505) 428-2567

Ms. Darlene Goering, Lider del Proyecto  
Departamento del Medio Ambiente de Nuevo México  
Oficina de Desperdicios Peligrosos  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
E-mail: [darlene.goering@state.nm.us](mailto:darlene.goering@state.nm.us)  
Teléfono: (505) 428-2542  
Fax: (505) 428-2567

Atentamente,

John E. Kieling  
Encargado de Programa  
Programa Administrativo de Permisos  
Oficina de Desperdicios Peligrosos



**BILL RICHARDSON**  
GOVERNOR

*State of New Mexico*  
**ENVIRONMENT DEPARTMENT**

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**RON CURRY**  
SECRETARY

**AVISO PUBLICO NRO. 06-07**

**Departamento del Medio Ambiente  
Oficina de Desperdicios Peligrosos  
Santa Fe, NM 87505  
Mayo 15, 2006**

**AVISO DE OPORTUNIDAD PARA COMENTARIOS PÚBLICOS  
Y SOLICITUD DE AUDIENCIA PUBLICA SOBRE LA SELECCIÓN  
DE REMEDIOS PROPUESTOS PARA LA UNIDAD  
DE MANEJO DE DESPERDICIOS SÓLIDOS 16-021 (c)**

**LABORATORIO NACIONAL DE LOS ALAMOS  
LOS ALAMOS, NUEVO MEXICO  
NRO. DE IDENTIFICACIÓN NM 0890010515 DE LA EPA**

Bajo la autoridad del Decreto de Nuevo México sobre Desperdicios Peligrosos (Sección 74-4-1 a 74-4-14 NMSA 1978 , con las enmiendas de 1992) y los Reglamentos de Nuevo México para el Manejo de Desperdicios Peligrosos (HWMR, 20.4.1 NMAC), el Departamento del Medio Ambiente de Nuevo México (NMED) puede aprobar o denegar permisos relacionados con desperdicios peligrosos, planes de cierre, modificaciones de permisos, y enmiendas. Haciendo uso de esta autoridad, NMED propone aprobar, en espera de la participación del público en esta decisión, una modificación del Permiso para el manejo de desperdicios peligrosos concedido en apego al Decreto sobre la Conservación y Recuperación (Permiso RCRA) al Departamento de Energía de los Estados Unidos (DOE) y a la Universidad de California (UC) (en conjunto los Permisionarios) para el Laboratorio Nacional de Los Alamos (LANL), Los Alamos, Nuevo México, Nro. de Identificación del Departamento del Medio Ambiente de los Estados Unidos Nro. 0890010515.

El 8 de noviembre de 1989, se emitió un Permiso RCRA a los Permisionarios para operar una instalación de tratamiento y almacenamiento de desperdicios peligrosos en LANL bajo el Decreto de Desperdicios Peligrosos (HWA) § 74-4-4.2. El 15 de enero, 1999, DOE/LANL solicitó a NMED renovar su Permiso RCRA. El Permiso de 1989 sigue vigente hasta la toma de una decisión sobre la renovación solicitada.

NMED anuncia la disponibilidad de la selección de un remedio propuesto para la Unidad de Manejo de Desperdicios Sólidos (SWMU) 16-021(c) así como una oportunidad para comentarios del público y para solicitar una audiencia pública. Tiene disponible NMED una Hoja de Datos que expone los hechos que sirven de base para la modificación del Permiso.

LANL es un laboratorio de investigaciones científicas que pertenece a DOE que lo opera en cooperación con UC. La Instalación inició sus operaciones en 1943 cuando fue establecido el Distrito de Ingeniería del Ejército de los Estados Unidos para la investigación y desarrollo de la bomba atómica. La misión principal de LANL incluye la investigación, diseño, desarrollo y análisis de componentes del arsenal nacional de armas nucleares. Las operaciones actuales e históricas incluyen: física nuclear; hidrodinámica; explosivos convencionales; química; metalurgia; radioquímica; biología, física de energía mediana; sistemas nucleares en el espacio; fusión termonuclear

controlada; investigaciones láser; investigaciones ecológicas; investigaciones energéticas de geotermia, suelos y materias fósiles; medidas de seguridad nuclear; investigaciones biomédicas; investigación y desarrollo eléctricos; diseño y desarrollo de equipos de láseres; y procesamiento fotográfico.

LANL se encuentra en el Condado de Los Alamos a aproximadamente 60 millas al norte-noreste de Albuquerque y a 25 millas al noroeste de Santa Fe. LANL ocupa unas 40 millas cuadradas de la Mesa del Pajarito que integra una serie de mesetas estrechas separadas por cañones que se extienden del oeste hacia el este. Las elevaciones de las superficies superiores de las mesetas varían entre 7,800 pies sobre el nivel promedio del mar en la falda de las Montañas Jémez al poniente de Los Alamos y unos 6,200 pies sobre el nivel promedio del mar en sus extensiones orientales donde terminan arriba del cauce del Río Grande.

Las direcciones de los Permisarios son: DOE, National Nuclear Safety Administration (NNSA), Los Alamos Site Office, 528, 35th Street, Los Alamos, NM 87544; y LANL University of California, P.O. Box 1663, Los Alamos, New Mexico, 87545. El contacto principal de los Permisarios en el asunto actual es: Mr. Lance Woodworth, NNSA/DOE, Los Alamos Site Office, 528 35th Street, Los Alamos, New Mexico 87544.

A fines de la década del los 1980, los Permisarios identificaron para EPA los "Sitios con Potencial de Fugas" incluyendo las unidades SWMU y zonas preocupantes (AOC) donde puedan haberse colocado y pasado al medio ambiente desperdicios peligrosos, constituyentes peligrosos, desperdicios sólidos o desperdicios mixtos. EPA identificó más de 1,200 de estos sitios para ser investigados e incluidos en la sección de Enmiendas sobre Desperdicios Peligrosos y Sólidos (HWSA) del Permiso RCRA del LANL. Los reglamentos HWMR requieren medidas correctivas en SWMU 16-021 (c) donde ocurrieron fugas de desperdicios peligrosos. Los Permisarios deben acatar al decreto HWA, los HWMR, la Orden y el Permiso RCRA para esta medida correctiva.

## REPASO PUBLICO DEL ACTA ADMINISTRATIVA

**Disponibilidad de Información Adicional:** El Acta Administrativa para la acción propuesta consiste de una Hoja de Datos, el presente anuncio al público, el Permiso en borrador, y otra correspondencia y documentos que vienen al caso. El Acta Administrativa se encuentra disponible para ser examinada en el lugar siguiente durante el plazo para comentarios del público:

Departamento del Medio Ambiente de Nuevo Mexico - Oficina de Desperdicios Peligrosos  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, Nuevo Mexico 87505-6303  
Telefono: (505) 4428-2500  
Lunes a viernes desde la 8 a.m. hasta las 5 p.m.

La Hoja de Datos, el Anuncio al Público, y el Permiso en borrador también se encuentran disponibles en el sitio web de NMED: <http://www.nmenv.state.nm.us/HWB/lanlperm.html> bajo Selección de Remedio 16-021 (c). Para obtener una copia del expediente administrativo o una porción de eso, entre en contacto con por favor Pam Allen en (505) 428-2531, vía E-mail en [pam.allen@state.nm.us](mailto:pam.allen@state.nm.us), o en la dirección de NMED dada arriba. NMED proporcionará copias, o porciones de eso, del expediente administrativo en un coste al solicitante.

**Plazo para Comentarios y Contacto con el Departamento del Medio Ambiente:** El NMED publicó un aviso público el lunes, de mayo el 15 de 2006, de anunciar el principio de un período que terminará en 5:00 P.M., viernes, de julio el 14 de 2006 del comentario 60-day. Cualquier persona que desee comentar respecto a esta acción debe someter el comment(s) del correo escrito o electrónico (E-mail) con el nombre y la dirección de los comentar a la dirección abajo. Solamente los comentarios recibidos en o antes de 5:00 P.M., viernes, de julio el 14, 2006 serán considerados.

John E. Kieling, Gerente del Programa  
Departamento del Medio Ambiente de Nuevo M<sup>x</sup>ico - Oficina de Desperdicios Peligrosos  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, Nuevo Mexico 87505-6303  
Teléfono: (505) 4428-2500  
O por e-mail a: john.kieling@state.nmn.us  
Referente a: Selección de Remedio para 16-021 (c) (15 de mayo, 2006)

Los comentarios por escrito deben basarse en la información disponible para la inspección, incluyendo al grado que sea factible referencias a todos los materiales sustanciales citados. No hay necesidad de volver a presentar Documentos del Acta Administrativa a los cuales el comentarista hace referencia expreso.

Los miembros del público pueden solicitar una audiencia pública sobre la acción propuesta. Las solicitudes de audiencia pública deben proporcionar: (1) una declaración clara y escueta de los hechos que definen la naturaleza y alcance del interés que tiene la persona que solicita la audiencia; (2) nombres y direcciones de todas la personas que representa el solicitante; (3) una declaración de inconformidad en cuanto a cualquier objeción que tenga al permiso en borrador, incluyendo referencias específicas a cualquier condición mencionada; y (4) una indicación de parte del solicitante de los temas que quiere que se considere en la audiencia. Para ser consideradas, las solicitudes de audiencias públicas deben presentarse a más tardar a **las 5 de la tarde del 14 de julio, 2006**. NMED anunciará cualquier audiencia pública que calendariza con 30 días de anticipación.

**Decisión Final:** NMED debe asegurar que sea consistente el borrador del permiso aprobado con el Decreto sobre Desperdicios Peligrosos y los Reglamentos para el Manejo de Desperdicios Peligrosos. Todos los comentarios que se presente por escrito sobre el asunto formarán parte del acta administrativa para tomarse en cuenta al formular una decisión final y podrían resultar en modificaciones al permiso en borrador. NMED responderá por escrito a todos los comentarios escritos del público. Las respuestas de NMED especificarán cuáles son los cambios que se hayan hecho a disposiciones del permiso en borrador al tomar la decisión final sobre el Permiso, explicando las razones para los cambios, y describirá y responderá brevemente a todos los comentarios del público sobre el permiso en borrador o la solicitud de permiso que se hayan ventilado durante el plazo para comentarios del público. Las respuestas de NMED a los comentarios también se encontrarán en el sitio web de NMED además de ser remitidas a todas las personas que presentaron comentarios por escrito.

Después de considerar todos los comentarios recibidos por escrito del público, NMED o bien emitirá, o modificará y emitirá, el Permiso. Si NMED modifica y emite el Permiso, entonces el Permisionario recibirá por correo certificado una copia del permiso modificado junto con una declaración detallada de las razones para las modificaciones. NMED pondrá su decisión final sobre el Permiso a la disposición del público.

La decisión final del Secretario del Medio Ambiente representará la decisión final de la dependencia y entrará en vigor treinta días después de darle aviso a los Permisionarios de la decisión o en fecha posterior a criterio del Secretario. Todas las personas en la lista de correo de la instalación, así como las que presentaron comentarios por escrito, recibirán aviso de la decisión del Secretario por correo. La decisión final de la dependencia puede ser apelada según las disposiciones del Decreto sobre Desperdicios Peligrosos, Sección 74-4-14, NMSA 1978.

**Arreglos para personas discapacitadas:** Cualquiera que tenga una discapacitacion y que necesite ayuda o apoyo auxiliar para participar en este proceso debe comunicarse con Judy Bentley en la direccion siguiente: New Mexico Environment Department, Room N-4030, P.O. Box 26110, 1190 St. Francis Drive, Santa Fe, New Mexico 87502-6110, (505) 827-2844. Los usuarios de TDD or TDY pueden acceder el numero de Judy Bentley's en la red New Mexico Relay Network. Los usuarios de Albuquerque pueden acceder el numero de Ms. Bentley al (505) 275-7333.



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SECRETARY

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**SANTA FE, NM 87505**  
**May 15, 2006**

**PUBLIC COMMENT PERIOD AND PROCEDURES TO REQUEST A  
PUBLIC HEARING ON THE INTENT TO APPROVE A  
CLASS 3 PERMIT MODIFICATION REQUEST FOR CORRECTIVE MEASURES FOR  
THE PROPOSED REMEDY SELECTION FOR  
SOLID WASTE MANAGEMENT UNIT 16-021(c)  
LOS ALAMOS NATIONAL LABORATORY  
LOS ALAMOS, NEW MEXICO  
EPA ID NO. NM0890010515**

**ACTION:** The New Mexico Environment Department (NMED) is proposing to modify the United States Department of Energy (DOE) and University of California (Collectively, the Permittees) Resource Conservation and Recovery Act (RCRA) Permit for Los Alamos National Laboratory (LANL). This modification would incorporate into the RCRA Permit requirements for corrective measures for Solid Waste Management Unit 16-021(c). NMED is announcing the availability of a draft permit for public comment.

**FACILITY:** Los Alamos National Laboratory, Los Alamos, New Mexico

**PERMITTEES:** DOE, facility owner and co-operator, and University of California, facility co-operator (Permittees). The Permittees are located at the following addresses: DOE/National Nuclear Security Administration (NNSA), Los Alamos Site Office, 528 35<sup>th</sup> Street, Los Alamos, New Mexico 87544; and Los Alamos National Laboratory, P.O. Box 1663, MS M992, Los Alamos, New Mexico 87545. The Permittees' primary contact for this action is: Mr. Lance Woodworth, DOE/NNSA, Los Alamos Site Office, 528 35<sup>th</sup> Street, Los Alamos, New Mexico, 87544.

**EPA ID NO.:** NM0890010515

## **REGULATORY BACKGROUND**

The Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 to 6992(k), provides for the regulation of hazardous waste. Congress waived the immunity of the United States for actions brought under state hazardous and solid waste laws as well as under RCRA. Pursuant to Section 3006 of RCRA, 42 U.S.C § 6926, the United States Environmental Protection Agency (EPA) delegated to NMED, on January 25, 1985, the authority to enforce the New Mexico Hazardous Waste Act (HWA) and its implementing regulations, the New Mexico Hazardous Waste Management Regulations (HWMR), in lieu of EPA enforcement through RCRA. NMED has maintained its delegation from EPA over hazardous waste management in New Mexico and has amended its state program to conform to statutory or regulatory changes in RCRA.

## **FACILITY OPERATIONS**

Los Alamos National Laboratory (LANL) is owned by the Department of Energy (DOE) and is co-operated by the DOE and the University of California (collectively, the Permittees). LANL is located in Los Alamos, Los Alamos County, New Mexico. In operation since 1943, LANL was established by the United States Army Manhattan Engineer District for the development and assembly of an atomic bomb. Current and historic operations include nuclear weapons design and testing; high explosives research, development, fabrication, and testing; chemical and material science research; electrical research and development; laser design and development; and photographic processing.

On November 8, 1989, NMED's predecessor issued a RCRA Permit to the Permittees to operate a hazardous waste treatment and storage facility at LANL pursuant to the HWA § 74-4-4.2. On January 15, 1999, the Permittees applied to the NMED to renew their Resource Conservation and Recovery Act (RCRA) Permit. The 1989 Permit remains in effect until a final decision is made on the renewal request.

## **DESCRIPTION, HISTORY AND SITE INVESTIGATION OF SWMU 16-021(c)**

In the late 1980's, the Permittees identified for EPA "Potential Release Sites," including solid waste management units (SWMU) and areas of concern (AOC), where hazardous waste, hazardous constituents, solid waste, or mixed waste may have been placed and released to the environment. Of those sites, EPA identified over 1,200 as sites to be investigated and included on the Hazardous and Solid Waste Amendments (HSWA) portion of LANL's RCRA Permit. The HWMR require corrective action at SWMUs where releases of hazardous waste have occurred. The Permittees must comply with the HWA, the HWMR, the March Compliance Order on Consent, and their RCRA Permit for corrective action at SWMUs 16-021(c).

SWMU 16-021(c) is located at Technical Area (TA) 16. TA-16 was established to develop explosive formulations, to cast and machine explosive charges, and to assemble and test explosive components. In operation since 1951, Building TA-16-260 is a machining facility that

processes large quantities of high explosives. Machine turnings and wastewater containing explosive compounds are routed to 13 sumps and, historically, were discharged to an outfall in volumes up to several million gallons a year. The outfall was permitted by the EPA as Outfall No. 05A056 under the Laboratory's National Pollutant Discharge Elimination Program Permit until 1998 when it was removed from the permit, although discharges ceased in 1996. Today, the wastewater is pumped from the sumps and treated at the TA-16 high explosives wastewater treatment plant. Known hazardous constituents in the wastewater historically and currently include barium, and explosive compounds hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), 2,4,6-trinitrotoluene (TNT), and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX). SWMU 16-021(c) consists of the outfall associated with Building TA-16-260, a well-defined upper drainage channel fed directly by the outfall, a settling pond, and a lower drainage channel leading to Cañon de Valle. The settling pond measured approximately 50 feet by 20 feet and was located approximately 45 feet down drainage of the outfall. The upper and lower drainages trend approximately 600 feet northeast from the outfall to the bottom of Cañon de Valle. The sumps and approximately 1,200 feet of drainlines that connect the outfall to Building TA-16-260 are designated as SWMU 16-003(k). Except for the part of the drainline that enters the drainage channel, SWMU 16-003(k) will be investigated separately.

The geologic stratigraphy beneath TA-16 consists of several units that were encountered during drilling activities and is documented in several LANL reports. The Bandelier Tuff at TA-16 outcrops on the mesa top and is exposed in canyon walls. The Bandelier Tuff is composed of two members (the uppermost is the Tshirege Member and the lowermost is the Otowi Member) that were erupted as a series of ash flows. The Tshirege Member consists primarily of densely welded and fractured tuff (LANL 1998a). Several surge bed deposits (fast-moving, horizontal volcanic flows consisting of water and solid particles found at the base of some vertical eruption columns) separating individual flow units are found within the Tshirege Member (LANL 2003). Properties of surge beds such as porosity, thickness, and sorting and the intrinsic properties of fractures are important because they influence groundwater flow and contaminant migration. The hydraulic conductivity (the rate at which water can move through a permeable medium) of surge beds is directly related to these properties. The thickness of surge beds typically ranges from approximately one to 12 feet at TA-16, as observed in Phase II RCRA Facility Investigation (RFI) borings. Between the Tshirege and the Otowi Members is a series of volcanoclastic sediment deposits originating from the flanks of the Sierra de los Valles termed the Cerro Toledo Interval (LANL 1998a and 2003). These deposits tend to consist of unconsolidated sands and sandy gravels and are approximately 100 feet thick (LANL 1998a). The Otowi Member is primarily a nonwelded tuff (LANL 1998a). The Puye Formation underlies the Otowi Member and consists of sands and boulder-rich gravels (LANL 1998a). These alluvial deposits are the result of erosion of the Sierra de los Valles located west of TA-16. The lower part of the Puye Formation contains the top of the regional aquifer, which is the drinking water source for Los Alamos and White Rock, at depths greater than 1000 feet below the mesa top (LANL 1998a).

Groundwater in the Los Alamos area occurs in three forms: 1) alluvial, 2) perched intermediate, and 3) regional. Alluvial groundwater is found in the shallow alluvium and underlying tuff. The

thickness of the alluvium in Cañon de Valle ranges from 5 to 6.5 feet. Localized perched intermediate groundwater may exist where a sufficient water source is present to maintain saturation and where a less permeable stratigraphic unit impedes water infiltration. Perched groundwater can be maintained through infiltration from surface water and alluvial groundwater. The regional groundwater aquifer is believed to be recharged mainly from sources west of LANL, with minor contributions from mesa top and canyon infiltration (LANL 1998b). Within the canyon, areas of potential groundwater infiltration from the alluvial system to deeper groundwater were identified through a series of geophysical surveys (LANL 2003a).

There are two springs in Cañon de Valle: SWSC Spring and Burning Ground Spring. Martin Spring is located in Martin Spring Canyon. Data collected during a bromide tracer study in 1997 suggests that the flow in the Cañon de Valle springs is dominated by fracture flow (LANL 1998a). Based on the bromide tracer study, there is a rapid (less than six months) pathway between the settling pond and SWSC and Burning Ground springs (LANL 1998a). There is also a rapid response in all three springs following precipitation events (LANL 1998a). Based on Martin Spring's chemistry and flow compared to SWSC Spring and Burning Ground Spring, it appears that the contaminants in Martin Spring may come from a source other than SWMU 16-021(c).

During an interim measures cleanup in 2000 and 2001, approximately 1,500 cubic yards of contaminated surface and near surface soil were excavated from the outfall area, settling pond, and the upper and lower drainage areas. However, residual RDX, HMX, TNT, and barium contamination above clean up levels remains in small pockets in the drainage channel. As part of site restoration activities following the interim measure, a cap consisting of crushed tuff and bentonite was placed in the settling pond area to prevent surface water infiltration.

Contamination from SWMU 16-021(c) is found in channel sediment at the outfall discharge point, in the channel sediment in the drainage areas below the outfall, in the 17-foot surge bed, and in the Cañon de Valle alluvial sediment. Contamination is also found in the sediment in Martin Spring Canyon. Past sampling in Cañon de Valle indicates that surface contamination does not extend laterally beyond the well-defined drainage from the outfall to Cañon de Valle. Known primary contaminants that remain in the sediment following the interim measures cleanup include barium, HMX, RDX, and TNT. Sediment sampling data collected in Cañon de Valle in 2002 for barium indicate concentrations ranging from 34.9 parts per million (ppm) in an upstream tributary to 3,900 ppm just below Material Disposal Area (MDA) P. Sediment sampling data collected in Martin Spring Canyon in 2000 for barium indicate a maximum concentration of 1,700 ppm. Samples collected from the 17-foot surge bed indicate an RDX concentration of 4,500 ppm, an HMX concentration of 1,700 ppm, and a TNT concentration of 3,500 ppm.

Contamination from SWMU 16-021(c) is also present in the alluvial, intermediate, and regional groundwater zones, and the springs and surface water. Known primary contaminants in water include barium, manganese, HMX, RDX, MNX and TNT. During the most recent RFI sampling

(November 2000 through August 2002), barium and RDX were detected in Cañon de Valle spring water at concentrations of 837 parts per billion (ppb) and 23 ppb, respectively, but have been as high as 1,310 ppb and 140 ppb in previous samples. Barium and RDX were detected in the most recent Cañon de Valle surface water samples at concentrations of 10,400 ppb and 270 ppb, respectively, but have been as high as 16,300 ppb and 290 ppb in previous samples. The maximum concentration of barium in surface water was detected upstream of the Building TA-16-260 drainage and the concentrations generally decrease downstream. However, the concentrations increase again at MDA P, possibly indicating a source other than SWMU 16-021(c) for barium. Barium and RDX were also detected in the most recent Cañon de Valle alluvial groundwater samples at concentrations of 12,400 ppb and 19.6 ppb, respectively, but have been as high as 18,000 ppb and 759 ppb in previous samples.

Other SWMUs that may have contributed contaminants to Cañon de Valle include MDA P, also known as SWMU 16-018, and MDA R, also known as SWMU 16-019, and SWMU 16-020. MDA P was used to dispose of debris generated by burning explosive compounds, and other material contaminated with explosives. The waste at MDA P has been removed. Waste generated during clean up activities included explosive compounds, barium, and small amounts of radioactive and mixed waste. Samples collected following clean up confirmed the absence of any radionuclides above background levels. The closure certification report for MDA P was approved by NMED on November 10, 2005. MDA R is located directly upstream of SWMU 16-021(c) on the edge of the mesa. MDA R was a burning ground and associated waste disposal for explosives. The Permittees have reported high levels of barium, moderate levels of explosive compounds and lead, and low levels of other metals at MDA R. Following the Cerro Grande fire in May 2002, the Permittees performed an interim cleanup. SWMU 16-020 was an outfall from an x-ray film processing laboratory. The outfall discharged solutions containing silver thiosulfate complexes in concentrations greater than 12g/L into a tributary to Cañon de Valle just upgradient of SWMU 16-021(c). This SWMU was subject to an expedited cleanup in 1996 and a voluntary cleanup following the Cerro Grande Fire. Approximately 200 cubic yards of soil were excavated and disposed of at an off-site facility. To-date, radionuclides have not been considered contaminants of concern in Cañon de Valle. There is no evidence of radionuclide material use in this area. More importantly, the Permittees have analyzed extensively for uranium in the past at these sites.

Corrective action is proposed for the contamination associated with the outfall source area (Component 1); the settling pond below the outfall and the underlying surge bed (Component 2); and the Cañon de Valle and Martin Spring Canyon springs, alluvial groundwater, and alluvial sediment (Component 3). Corrective action is also proposed for an area in Cañon de Valle known as the Sanitary Wastewater System Consolidation (SWSC) Cut. The alluvial sediment associated with the SWSC Cut has been shown to contain elevated silver and barium among other constituents. Even though Martin Spring Canyon may be hydrogeologically separate from Building TA-16-260 and SWMU 16-021(c) releases, it has been included as part of the remedy because it has historically been investigated as part of the SWMU. Additionally, Martin Spring Canyon water has already been subject to treatment as part of a pilot study performed for the

SWMU 16-021(c) corrective measures study (CMS). The corrective action is proposed to extend from the outfall down the drainage to the confluence with Cañon de Valle, and approximately 4,000 feet down canyon from the confluence to the eastern extent of alluvial saturation. Based on the data (geophysical, stream profile, piezometer, and monitoring well) collected to support the Phase III RFI, the extent of the alluvial saturation has been estimated (LANL 2003a). The remaining portion of the canyon will not be subject to corrective action under this proposed remedy selection and will be investigated during characterization activities that are part of the Water Canyon/Cañon de Valle Investigation Work Plan.

On July 16, 1998, the Permittees requested use of the industrial land use exposure scenario for the SWMU 16-021(c) human health risk assessment. The request was based on future use of this area of LANL remaining industrial, the present operations at Building TA-16-260 continuing, and the very low potential of exposure to any receptors other than the industrial site worker (including the environmental worker, construction worker, and worker trail user). NMED approved the industrial exposure risk scenario for use with this CMS on October 15, 1998.

On September 30, 1998, the Permittees submitted a Corrective Measures Plan to NMED to identify, develop, and evaluate corrective measures alternatives for SWMU 16-021(c). The results of the evaluation were documented in a CMS Report submitted to NMED on November 26, 2003. In the CMS Report, the Permittees proposed contaminant-specific media cleanup standards (MCS) for media in each of the three components. The proposed MCSs are based on the results of sampling and the risk assessment conducted during the Phase III RFI. Even though there are no explosive compound MCSs as a result of the risk assessment for canyon surface and alluvial waters, groundwater, and sediment, the Permittees propose corrective action for these media because of the potential for these contaminants to adversely impact the regional groundwater. In addition, any corrective action proposed in the CMS Report for remediation of contaminants in the springs and alluvial water will consequently remediate explosive compounds. More importantly, the corrective actions taken to remediate all of these contaminants will be viewed as source control for the regional aquifer, an important aspect of any future remedy undertaken for the regional groundwater. The regional aquifer is currently being investigated and will be the subject of a separate CMS.

The proposed MCSs listed below are either an existing standard (New Mexico Water Quality Control Commission [WQCC]) or were calculated based on the results of the risk assessment (LANL 2004 and LANL 2005). The results of the risk assessment were compared to NMED's selection of a human health target risk level of  $10^{-5}$  or a hazard index of one. The WQCC standards are proposed for all site waters because of the interchange between the springs, surface water, and alluvial water. NMED proposes to defer development of risk-based MCSs for explosive compounds for all site waters to the regional groundwater CMS. There are no proposed MCSs for the contamination in the surge bed because the Permittees proposed complete removal or isolation.

The proposed MCSs for the outfall source area are the following:

- RDX - 36.9 ppm (calculated)
- TNT – 135 ppm (calculated)
- Barium – 10,000 ppm (calculated)

The lower of the MCSs for RDX and TNT (36.9 ppm) will be used as the site MCS.

The proposed MCSs for the canyon springs, alluvial groundwater, and surface water are the following:

- Barium – 1,000 ppb in water interacting with sediment (WQCC standard)
- Manganese – 200 ppb (WQCC standard)

Because the results of the risk assessment did not show unacceptable risk to the industrial site worker from any of the explosive compounds, there are no proposed MCSs for these contaminants.

The proposed MCSs for alluvial sediment are the following:

- Barium – 1,000 ppb (WQCC standard)
- *Chironomus tentans* – Level at which ecological tests fail

The proposed MCS for barium is based on protecting surface water and groundwater from contamination at the point of withdrawal. Analytical testing to determine compliance with the standard is proposed using standard leaching procedures to estimate what portion of the barium is dissolved in the water. Because the results of the risk assessment did not show unacceptable risk to the industrial site worker from any of the explosive compounds, there are no proposed MCSs for these contaminants.

## **CORRECTIVE MEASURES ALTERNATIVES**

### ***Component 1: Outfall Source Area***

The Permittees proposed one corrective measure for the outfall source area. The corrective measure consists of soil removal and off-site treatment and disposal. NMED proposes to select this remedy. In addition to the activities proposed by the Permittees, NMED proposes removal of the existing outfall pipe (from the road to the discharge point in the drainage) and any contaminated soil beneath and adjacent to it.

Complete removal is considered the most protective of human health and the environment because it eliminates the possibility of future exposure and eliminates further environmental degradation. Complete removal of contaminated soil is also effective at achieving the MCSs established as part of the CMS. This remedy was selected because it involves removing the source of contamination, making it effective and reliable in the short-term (during construction and remedy implementation) and long-term (following remedy implementation). The remedy does not require any future monitoring or maintenance. The implementation of this remedy poses few risks to workers' health or the environment because the primary hazards were identified and resolved during the interim measure soil removal (for example, potentially reactive soils with high explosive concentrations greater than 5 weight percent were robotically

excavated). Removal is easily implemented, would require no additional permits and, as previously stated, has already been implemented at this site. Source removal is a practical remedy and is considered an effective presumptive remedy. The remedy can be implemented in a relatively short timeframe (compared to the other proposed corrective measures for the other components). The Permittees are assuming the waste generated will be non-hazardous and will be disposed of in an industrial waste landfill. The selected remedy should pose minimal negative ecological effects as the proposed area of soil removal was disturbed during a previous soil removal operation. Few, if any, additional trees would need to be felled and additional reduction of contaminant levels would improve the surrounding forest habitat. Finally, the cost of implementation, operation, and maintenance of the remedy is relatively low compared to the other proposed corrective measures for the other components.

### ***Component 2: Settling Pond and Surge Bed***

The Permittees proposed three corrective measure alternatives for the settling pond and surge bed. The three alternatives are excavation, *in-situ* grouting, and no action. The Permittees' preferred alternative is to inject grout into the shallowest and most contaminated (17 feet below ground surface) surge bed and maintain the existing settling pond cap. The remedy consists of pressure injecting a clay-based grout into boreholes that intersect the surge bed. The grout would preferentially flow into the more permeable surge bed and create a barrier. NMED proposes to select this remedy. In addition to the activities proposed by the Permittees, NMED proposes extending the existing cap (once the extent of the contaminated surge bed is determined) and regrading the surface of the banks to divert storm water away from the drainage.

In order to determine the extent of the contaminated surge bed, NMED will require the Permittees install soil borings in the vicinity of the drainage channel (where the upper surge bed was previously found). The boring log for the Phase II RFI boring 16-2711 documents interbedded surge bed units between the depths of 15 and 53 feet. Contamination in surge beds deeper than the 17-foot surge bed will be addressed as part of the groundwater CMS.

This remedy would be highly effective at reducing further environmental degradation and protecting human health because it would control contaminant releases from the source (surge bed) by isolating the contaminated surge bed from groundwater. Isolation of the surge bed is intended to prevent further contamination of the alluvial, intermediate, and regional groundwater. It will also control any contaminated shallow groundwater movement through fractures thought to recharge the canyon springs because the grout will incidentally fill fractures in the tuff surrounding the surge bed. It would reduce contaminant toxicity (concentrations) in the groundwater and contaminant mobility. The remedy has been shown to be effective and reliable over the long-term at other sites around the country (MSE 1997 and Sandia 1994). The remedy would be effective in the short-term because isolation will occur as the grout is injected. NMED would consider the remedy effective over the long-term because the hydraulic conductivity of the surge bed ( $3.8 \times 10^{-3}$ ) is higher than surrounding tuff ( $1.7 \times 10^{-8}$ ) (LANL 2005). The difference in permeability of the surge bed and the surrounding tuff is the preferable situation for using horizontal grout barriers (Sandia 1994). However, the effectiveness will be dependent on

successfully determining the extent of the contaminated surge bed. There are no hazards associated with implementing the remedy except those associated with drilling activities. The corrective measure is easily implemented because the Permittees would not have to apply for a permit from NMED, it involves techniques and procedures (for example, drilling and excavation) that have already been performed by the Permittees and, as previously stated, this remedy has already been implemented at other sites. The remedy will take a relatively moderate amount of time to implement compared to the alternative of just maintaining the cap. Periods of activity are limited to those times when Building TA-16-260 is not operating (evenings and weekends).

The remedy should pose minimal ecological effects. No trees will need to be removed, and the soils in the surrounding area would be impacted only by the manipulation of heavy equipment in the area. The character and function of the local habitat should remain unchanged. Finally, the cost of implementation, operation, and maintenance of the remedy is moderate (compared to the other corrective measures for this component).

The Permittees' second proposed alternative is to excavate the surge bed and replace and maintain the settling pond cap. This remedy consists of installing explosives in borings located in the intact tuff overlying the surge bed. After the tuff is removed, the surge bed will be removed and disposed off site.

This remedy is considered very effective because it would remove the contamination source. Complete removal is considered very protective of human health and the environment because it eliminates the possibility of future exposure and further environmental degradation. NMED would consider the remedy very reliable and effective over both the short-term and long-term if the extent of the contaminated surge bed can be defined and if subsequent surface water infiltration is controlled. The Permittees would not have to apply for a permit from NMED and the remedy involves some procedures (for example, drilling and excavation) that have already been performed by the Permittees. However, the level of difficulty for implementing this corrective measure is high because it involves the use of explosives to remove to a depth of between 15 and 20 feet of soil and tuff in some areas. Based on experience from the interim measure, explosives are necessary to expedite excavation of the densely welded tuff. Compared to the Permittees' preferred alternative, this alternative has the potential to be more invasive and more dangerous to implement. Additional hazards associated with implementing this corrective measure (compared to the Permittees' preferred alternative) are inherent with the use of explosives for excavation. This remedy would reduce contaminant volume at the site but would create waste that will require off-site disposal. The Permittees are assuming the generated waste will be non-hazardous. This waste will be disposed of in a manner similar to that used during the interim measures, which would ensure that the Permittees are complying with all applicable waste management standards. The remedy will take a relatively moderate amount of time to implement compared to the alternate corrective measure of just maintaining the cap. Periods of excavation are limited to those times when Building TA-16-260 is not operating (evenings and weekends).

Potential ecological effects from this alternative could be much larger than any of the other alternatives. This alternative would have a greater potential to impact local terrestrial habitats. If the surge bed is extensive, many trees would need removal, significantly altering the nature of the local forest habitat. Blasting could have negative effects on threatened and endangered species that nest and forage in the surrounding area, specifically the spotted owl that nest in Cañon de Valle. Finally, the cost of implementation, operation, and maintenance is relatively high compared to the other alternate corrective measures for this component mainly due to field labor, equipment, materials, the blasting contractor, and waste management.

The Permittees' third proposed alternative is to maintain the existing cap and conduct no action for the surge bed. Even though the cap would act as a barrier to infiltrating surface water, this alternative will not be effective at controlling the contaminant source, preventing future exposure, or preventing further environmental degradation. This remedy will not be effective because contaminant migration may occur through the surge beds and by fracture flow, and contaminants would possibly remain a continuing source to deeper groundwater. The remedy will also not be effective at protecting the regional groundwater in the long-term because the remedy does not involve source removal or control and only involves controlling surface water infiltration. The remedy will not be protective of human health because of potential contaminant migration to the regional aquifer. The remedy is not considered reliable because any migrating groundwater may mobilize existing contamination. The remedy would be easy to implement and there are no hazards associated with remedy implementation because the cap already exists. Finally, the cost of operating and maintaining the remedy is relatively low compared to the other alternate corrective measures for this component.

### ***Component 3: Springs and Alluvial System***

The Permittees propose four corrective action alternatives for the canyon springs and alluvial system. The alternatives include sediment excavation, groundwater treatment through permeable reactive barriers (PRBs) coupled with spring water treatment through storm water filters, groundwater treatment through a central treatment system, and excavation of the SWSC Cut area. The Permittees' preferred alternative is to couple the use of a stormwater filter on each spring with four PRBs (three in Cañon de Valle and one in Martin Spring Canyon) to treat surface water, alluvial sediment (through natural flushing), and alluvial groundwater. PRBs allow remediation of groundwater either by immobilization or chemical transformation as it flows through reactive media. The PRBs will be designed to intercept and treat alluvial groundwater using, as the active medium, either granular activated carbon (GAC) to adsorb explosive compounds or zero valent iron (ZVI) to degrade explosive compounds. To treat barium, calcium sulfate will be used as the active medium in the PRB to form immobile barium sulfate. The proposed locations for the PRBs are designed to treat contaminated alluvial groundwater prior to potential infiltration to deeper groundwater. NMED proposes to select this remedy.

This remedy (PRBs coupled with stormwater filters) is designed to control additional releases from contaminated sediment, spring water, surface water, and groundwater. However, this remedy would be protective of human health and would prevent further environmental

degradation because it would decrease the contaminant concentrations potentially migrating toward deeper groundwater. This remedy would be effective in the long-term if the media in the PRBs are properly maintained. The long-term effectiveness and reliability of this remedy may be affected by the inability of the PRBs to easily change with time and changing conditions. Conditions that may impact the effectiveness and reliability may include changes in groundwater flow rates, changes in PRB flow-through rates due to fouling, PRB degradation, or changing contaminant concentrations resulting from storm surges or drought. The long-term effectiveness and reliability will be affected by fluctuating water levels and because flushing may not remove barium (thought to have an irreversible affinity for clay minerals present in the alluvial sediment). However, PRBs have been shown to be effective at reducing the mobility and the toxicity of RDX, TNT, and barium at other sites over time (Shaw 2005 and Wilkens *et al.*). This remedy will not be effective at achieving MCSs in the short-term because water will not be diverted through the PRBs until construction is complete. The time needed to achieve MCSs will be relatively longer than the other two alternatives for this component.

The PRBs will be designed to extend the width of the alluvium and will be, at a minimum, as deep as the saturated alluvium. The PRBs will be placed upstream of identified locations where infiltration of alluvial groundwater to deeper zones is known to occur and at the downstream extent of alluvial saturation. As indicated in the results of the geophysical survey, there may be areas of the canyon bottom where surface water is infiltrating into the alluvium and alluvial groundwater is infiltrating into the tuff (LANL 2003a). PRBs will also be much less invasive than the other proposed alternatives because there is less excavation in the canyon (four trenches vs. six with the central treatment plant alternative) and no excavation on the mesa top associated with installation.

The volume of explosives contamination will be reduced if ZVI is used (vs. GAC) in the PRB because it will be degraded as the iron oxidizes. The volume of barium contamination will remain the same because it is adsorbed by the calcium sulfate barrier. The only waste created with the preferred alternative will be the barium sulfate, which will be disposed offsite when the media are replaced, and the HE-contaminated stormwater filters.

The projected useful lifetime of the PRBs is estimated by the Permittees to be 15 years. Potential problems that may affect long-term performance and decrease the projected lifetime of the PRBs are mineral precipitation, ZVI cementation/fouling, and decreasing ZVI reactivity over time (Gu *et al.*). These problems may decrease the estimated lifetime of a PRB to between five and ten years (Gu *et al.*). However, compared to the Cornhusker Army Ammunition Plant in Grand Island, Nebraska, where a PRB has been treating RDX and TNT contaminated groundwater since 2003, the conditions in Cañon de Valle and Martin Spring Canyon are more favorable and are much less likely to cause these problems early on (based on data obtained since 2003) (Shaw 2005). The more favorable conditions that exist in both canyons are lower sulfate and alkalinity concentrations, and a low carbon load (LANL 2004 and Shaw 2005).

This remedy will be easier to implement than the sediment excavation alternative because it involves significantly less excavation and less site restoration of a sensitive ecosystem. In addition, the potential for adverse and/or irreversible impacts to the riparian environment is lower than the other proposed alternatives. This remedy will be easier to implement than the central treatment plant alternative because it would involve less construction over a smaller area, less trenching in the canyon bottom, less impact to the perennial stream flow, and no construction or excavation on the mesa top. The ease of implementation of this remedy and its potential for less impact makes it more favorable than the sediment excavation and the central treatment plant alternatives. The only hazards in implementing this remedy are those associated with excavation in the canyon bottom and drilling. There are additional minor worker safety hazards associated with monitoring and changing the stormwater filters.

This alternative has the potential to impact the aquatic community temporarily during the installation phase but those impacts can be minimized during construction by implementation of best management practices to prevent introduction of disturbed sediment into the stream channel. Any impacts would be localized and restricted to the immediate area surrounding the PRB location. PRBs are favored because the treatment systems are passive, noiseless, and should have few disturbance issues related to maintenance once installed.

Finally, the cost of this remedy (total cost of installation, operation, and maintenance) is relatively low compared to the other alternate corrective measures for this component, considering the Martin Spring canyon stormwater filter is already in place.

As part of a pilot study conducted by the Permittees in Martin Spring Canyon, a stormwater filter containing GAC was installed in the spring. The system was shown to be effective and reliable in the short- and long-term at removing RDX. Although there is no proposed MCS for RDX in spring water (because the current risk levels are acceptable), the filter has proven effective at reducing the levels of RDX to levels that are more protective of human health and the environment. Although the filter does not control contaminant releases, it reduces the toxicity, mobility, and volume of contaminants discharging from the spring. The source of contamination in Martin Spring Canyon has not been identified and will be more thoroughly investigated as part of the S-Site Aggregate Area investigation. This part of the remedy is easily implemented at Martin Spring because it is already in place. The filters would be easy to install at the springs in Cañon de Valle.

The Permittees will monitor the PRBs to determine if the remedy is effective at achieving the MCSs. The Permittees will use the existing alluvial monitoring wells in Cañon de Valle and Martin Spring Canyon as points of compliance. Samples from these wells will be collected on a quarterly basis to demonstrate eight consecutive quarters of compliance. If the contaminant concentrations do not appear to be attaining the MCS after the third year, the Permittees will be required to identify contingency procedures for the alluvial system.

The Permittees' second proposed alternative for the canyon springs and alluvial system is to recover and treat spring, surface, and groundwater using a central treatment plant and six (five in Cañon de Valle and one in Martin Spring Canyon) groundwater interceptor trenches. All intercepted alluvial groundwater, surface water, and storm water from the trenches and any spring water captured in catch basins would be pumped to a central treatment plant and then discharged to six injection wells in the canyon bottoms. The natural and injected water (also referred to as induced flushing) would flush contamination from the alluvial sediments. The treatment media that would be used in the treatment plant are GAC for RDX and an ion exchange material for barium.

This remedy would be protective of human health and would prevent further environmental degradation because it would decrease the contaminant concentrations potentially migrating toward deeper groundwater. This remedy is likely to achieve the MCSs quicker than the preferred remedy because natural flushing is supplemented by induced flushing of the contaminated alluvial sediments. However, this remedy is not favored because the volume of and the hydraulic conditions created by the injected water have the potential of increasing the mobility and volume of contaminants infiltrating to the regional aquifer.

This remedy controls, but does not eliminate, further releases from contaminated sediment, surface (for RDX) of surface water and alluvial groundwater contamination because the GAC filters will be thermally treated offsite. This remedy will be effective at reducing the mobility of barium because the ion exchange resin will render the barium immobile. This remedy will be more effective and reliable in the long-term compared to the preferred alternative because it will be easier to modify with time and changing conditions. Changes may occur in filter flow-through rates due to fouling, filter degradation, or changing contaminant concentrations from storm surges or drought. It will be easier (compared to the PRBs) to change effectiveness by changing filters or increasing the number of filters in the system. This remedy is also more reliable in the long-term compared to the preferred alternative because its projected life is virtually infinite, given that only the filters would need to be changed once the system is constructed. The long-term effectiveness and reliability, may be affected by the ability to capture all of the contaminated sediments through flushing and because flushing may not remove barium (thought to have an irreversible affinity for clay minerals present in the alluvial sediment). However, this remedy will take longer to construct than the preferred alternative and will not be effective in the short-term because treatment will not occur until construction is completed. In addition, there would be significantly more operation and maintenance activities. Similar to the preferred alternative, this remedy would rely on successfully locating the interceptor trenches to capture water prior to infiltration.

This remedy will be easier to implement than the sediment excavation alternative because it involves less excavation and more straightforward site restoration activities. In addition, the potential for adverse and/or reversible impacts to the riparian environment is higher with sediment excavation. However, this remedy is not favored because it will be harder to implement than the PRB/stormwater filter alternative. It would involve much more construction

over a larger area in the canyon bottom and on the mesa top, more trenches (five vs. three in Cañon de Valle) in the canyon bottom, and more impact to the perennial stream flow. It would also involve obtaining a groundwater discharge permit from NMED, unlike the preferred remedy.

The hazards in implementing this remedy are those associated with excavation, construction, and drilling.

This alternative (compared to the preferred alternative) has a greater potential to impact the aquatic community temporarily during the installation phase due to the five trenches (vs. three trenches) but those impacts can be minimized during construction by implementation of best management practices to prevent introduction of disturbed sediment into the stream channel. Unlike the preferred alternative, this alternative may result in the dewatering of stretches of the stream channel between interceptor trench and injection well location, thus having the potential of further adversely impacting the aquatic community. The additional trenching for the piping system to the treatment facility and the construction activities associated with the treatment facility itself would also adversely impact terrestrial habitats.

Finally, the total cost is approximately the same as the preferred alternative but less compared to the other sediment excavation alternative. However, the 30-year estimated operation and maintenance costs are much greater than those for the preferred alternative.

The Permittees' third proposed alternative is to excavate contaminated alluvial sediment and to use stormwater filters on the springs. Approximately 25,000 cubic meters of sediment would be removed from approximately 6,600 feet of Cañon de Valle. Sediment removal is not proposed for Martin Spring Canyon because the contaminant levels are below the MCSs. This remedy does not include any surface or groundwater treatment other than that associated with the stormwater filters.

This remedy would be protective of human health and would prevent further environmental degradation because it would decrease the contaminant concentrations potentially migrating toward deeper groundwater. This remedy would achieve MCSs easily because it involves source removal and spring water treatment using a proven technology. This remedy would reduce the toxicity, mobility, and volume of contaminants. This remedy eliminates further releases from contaminated sediment, assuming future contamination does not occur. This remedy is very reliable and effective in the short-term if all contaminated sediments are identified and removed.

Once the permitting and other institutional constraints are resolved, this remedy would be difficult to implement. Soil removal itself is straightforward, but restoring the canyon bottom ecosystem would be difficult. The potential for adverse and/or irreversible impacts to the riparian environment is higher with the sediment excavation. In addition, full removal of contaminated sediments from Cañon de Valle is not preferred because Cañon de Valle is habitat for the endangered Mexican Spotted Owl and is known to have a nesting pair of these owls on occasion. Full removal would disturb or alter sensitive habitat for the owl as well as for other

animals. If an environmental impact study period is needed, it may be lengthy. Finally, the cost is relatively high compared to the other alternatives for this component.

The Permittees' fourth proposed alternative involves resampling and possibly excavating the SWSC Cut alluvial sediments. In September 2001, sediment sampling and toxicity testing conducted as part of an ecological risk assessment revealed a high mortality rate of the genus *chironomus tentans*, an organism that is well documented for its toxicity responses to contaminants (LANL 2003a). Subsequent sampling and testing conducted in December 2002 was not able to replicate the previous results. NMED proposes to perform additional sampling and toxicity testing to verify the December 2002 results. If any of the toxicity tests fail, NMED proposes to remove the contaminated sediments. This alternative is not comparable to the others because it is an independent activity.

This remedy will be protective of the environment because it will be focused on eliminating the adverse effects found in the SWSC Cut area. This remedy will achieve the MCS easily because soils associated with the failed toxicity test will be excavated. The contamination resulting in the observed adverse effects will be removed. The Permittees anticipate the waste will be managed as nonhazardous waste and will be disposed of in an industrial waste landfill. The remedy will reduce the mobility of contaminants at the SWSC Cut area and is practical because it is source removal. This remedy has a potential to impact the aquatic community temporarily during any excavation phase but those impacts can be minimized during excavation by implementation of best management practices to prevent introduction of disturbed sediment into the stream channel. The SWSC Cut area is a previously disturbed area and excavation of contaminated sediments will not alter the local aquatic and terrestrial habitats. This remedy will be very effective in the short-term and long-term because the primary contributors of contamination have been removed (the TA-16-260 outfall and SWMU 16-020). The remedy would be easy to implement because that part of the canyon is accessible to heavy equipment and poses few risks to workers.

### **PROPOSED ACTION**

As stated above, the New Mexico Hazardous Waste Regulations, 20.4.1.900 NMAC, incorporating 40 CFR § 270.42, allow a facility to request modification of an existing RCRA permit. Modification of the LANL RCRA Permit is necessary to establish the framework to complete corrective action at SWMU 16-021(c). NMED is therefore issuing a draft permit for public comment. NMED proposes to insert language into Module VIII of the Permit that:

- a.) Incorporates the CMS Report, prepared by the Permittee, Corrective Measures Study Report for Solid Waste Management Unit 16-021(c)-99 and Revision 1, LA-UR-05-4379 and LA-UR-05-4381, dated June 2005 (LANL 2005), by reference.
- b.) Selects as the remedies for SWMU 16-021(c) the following: soil removal at the outfall source area and transport of the excavated soil for off-site treatment and disposal; pressure injection of a clay-based grout into boreholes that intersect the surge bed at

the settling pond location; and installation of permeable reactive barriers to treat groundwater in the alluvial system, coupled with stormwater filters for impacted springs.

- c.) Requires a Corrective Measures Implementation (CMI) Plan for SWMU 16-021(c) that incorporates the final remedies. The plan is to be submitted to NMED for approval within 180 days of following remedy selection. The plan would contain implementation schedules.
- d.) Requires a CMI Report for the landfill to be submitted to NMED for approval within 180 days after implementation of the remedies is complete.
- e.) Requires that the Permittees submit to NMED progress reports during implementation of the remedies.
- f.) Requires a long-term monitoring and maintenance plan to be submitted by the Permittees to the NMED for approval.

### **PUBLIC REVIEW OF THE ADMINISTRATIVE RECORD**

**Availability of Additional Information:** The Administrative Record for this proposed action consists of a Fact Sheet, this public notice, the draft Permit described above, and other relevant correspondence and documents. The Administrative Record may be reviewed at the following location during the public comment period:

New Mexico Environment Department - Hazardous Waste Bureau  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
Phone: (505) 428-2500  
Monday – Friday: 8:00 a.m. to 5:00 p.m.

The Fact Sheet, Public Notice, and draft Permit are also available on the NMED website at [www.nmenv.state.nm.us/HWB/lanlperm.html](http://www.nmenv.state.nm.us/HWB/lanlperm.html) under SWMU 16-021(c) Remedy Selection (5-15-2006). To obtain a copy of the Administrative Record or a portion thereof, please contact Pam Allen at (505) 428-2531, via e-mail at [pam.allen@state.nm.us](mailto:pam.allen@state.nm.us), or at the NMED address given above. NMED will provide copies, or portions thereof, of the Administrative Record at a cost to the requestor.

**Comment Period and Environment Department Contact:** The NMED issued a public notice on **Monday, May 15, 2006**, to announce the beginning of a 60-day comment period that will end at **5:00 p.m., Friday, July 14, 2006**. Any person who wishes to comment on this action should submit written or electronic mail (e-mail) comment(s) with the commenter's name and address to the address below. Only comments received on or before **5:00 p.m., Friday, July 14, 2006** will be considered.

John E. Kieling, Program Manager  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505-6303  
Phone: (505) 428-2500  
Or via e-mail: john.kieling@state.nm.us  
Reference: LANL SWMU 16-021(c) Remedy Selection (May 15, 2006)

Written comments must be based on available information for review and include, to the extent practicable, all referenced factual materials. Documents in the administrative record need not be re-submitted if expressly referenced by the commenter. Members of the public may request a public hearing on the proposed action. Requests for a public hearing must provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the draft permit, including specific references to any conditions being addressed; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Request for public hearing must be submitted on or before **5:00 p.m., Friday, July 14, 2006** to be considered. The NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

**Final Decision:** The NMED must ensure that the approved draft permit is consistent with the Hazardous Waste Act and the Hazardous Waste Management Regulations. All written comments submitted on this matter will become part of the administrative record, be considered in formulating a final decision, and may cause the draft permit to be modified. The NMED will respond in writing to all written public comments. The NMED's response to comments will specify which provisions, if any, of the draft permit have been changed in the final Permit decision, the reasons for the change, and will briefly describe and respond to all public comments on the draft permit or the permit application raised during the public comment period. The NMED's response to comments will also be posted on the NMED website in addition to being sent to all persons who submitted written comments.

After consideration of all the written public comments received, the NMED will either issue or modify and issue the Permit. If the NMED modifies and issues the Permit, then the Permittee will be provided by certified mail a copy of the modified permit and a detailed written statement of reasons for the modifications. The NMED will make the final Permit decision publicly available.

The Environment Department Secretary's final permit decision will constitute a final agency decision and become effective thirty days after notice of the decision has been served on the Permittees, or such later time as the Secretary may specify. All persons on the facility mailing list, and persons that presented written comments, or who requested notification in writing, will be notified of the Secretary's final decision by mail. The final agency decision may be appealed as provided by the Hazardous Waste Act, Section 74-4-14, NMSA 1978.

**Arrangements for Persons with Disabilities:** Any person with a disability requiring assistance or auxiliary aid to participate in this process should contact Judy Bentley at the following address: New Mexico Environment Department, Room N-4030, P.O. Box 26110, 1190 St. Francis Drive, Santa Fe, New Mexico 87502-6110, (505) 827-2844. TDD or TDY users please access Judy Bentley's number via the New Mexico Relay Network. Albuquerque users may access Ms. Bentley's number at (505) 275-7333.

## REFERENCES

Gu, Baohua, David B. Watson, Debra H. Phillips, and Liyuan Liang, Biochemical, Mineralogical, and Hydrological Characteristics of an Iron Reactive Barrier Used for Treatment of Uranium and Nitrate, Academic Press (Gu *et al.*)

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*Draft Permit for the remedy selection of Solid Waste Management Unit 16-021(c)*

S. CORRECTIVE MEASURES FOR SWMU 16-021(c)

1. The Corrective Measures Study Report for Solid Waste Management Unit 16-021(c)-99 and Revision 1, LA-UR-05-4379 and LA-UR-05-4381, dated June 2005 (LANL 2005), is incorporated herein by reference.

2. The remedy to be implemented by Permittees for Solid Waste Management Unit 16-021(c) shall be defined as the following: soil removal at the outfall source area and transport of the excavated soil for off-site treatment and disposal; pressure injection of a clay-based grout into boreholes that intersect the surge bed at the settling pond location; and installation of permeable reactive barriers to treat groundwater in the alluvial system, coupled with stormwater filters for impacted springs.

3. A Corrective Measures Implementation (CMI) Plan that incorporates the final remedies described in Section S.2 of this section shall be submitted by the Permittees for Solid Waste Management Unit 16-021(c) for the Administrative Authority's approval no later than 180 days following the selection of the remedy by the Administrative Authority. The CMI Plan shall provide details on the design, construction, operation, maintenance, and performance monitoring for the selected remedy, and a schedule for implementation. The CMI Plan shall, at a minimum, include:

- a. A description of the selected remedies;
- b. A description remedy objectives;
- c. An identification and description of the qualifications of key persons, consultants, and contractors that will be implementing the remedies;
- d. Detailed engineering design drawings and systems specifications for all elements of the remedies;
- e. A construction and construction quality assurance work plan;
- f. An operation and maintenance plan;
- g. The results of any pilot tests, such as grout injection pilot test;
- h. A schedule for implementation of remedies;
- i. A schedule for submission to the Administrative Authority of periodic progress reports; and
- j. Contingency procedures that must be implemented by the Permittees if the remedy set forth in Section S.2 above fails to be protective of human health and the environment.

4. A CMI Report for Solid Waste Management Unit 16-021(c) shall be submitted by the Permittees to the Administrative Authority for approval within 180 days after implementation of the remedies is complete. The CMI Report shall, at a minimum, include:

- a. A summary of the work completed;
- b. A statement signed by a registered professional engineer, that the remedy has been completed in full satisfaction of the specifications in the CMI Plan;
- c. As-built drawings and specifications signed and stamped by a registered professional engineer;

d. Copies of the results of all monitoring, including sampling and analysis, and other data generated during the remedy implementation, if not already submitted in a progress report; and

e. A certification, signed by a responsible Permittee official stating: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

5. The Permittees shall submit to the Administrative Authority progress reports during implementation of the remedies in accordance with a schedule approved in the CMI Plan for Solid Waste Management Unit 16-021(c). Each of the progress reports shall, at a minimum, include the following information.

- a. A description of the work completed during the reporting period;
- b. A summary of all problems, potential problems, or delays encountered during the reporting period;
- c. A description of all actions taken to eliminate or mitigate problems, potential problems, or delays;
- d. A discussion of the work projected for the next reporting period, including all sampling events; and
- e. Copies of the results of all monitoring, including sampling and analysis, and other data generated during the reporting period.

6. A long-term monitoring and maintenance plan, which includes all necessary physical and institutional controls to be implemented in the future shall be submitted by the Permittees to the Administrative Authority for approval within 180 days after the Administrative Authority's approval of the CMI Report. The Administrative Authority may require monitoring, maintenance, and physical and institutional controls based on the performance of the selected remedies.