



ADDENDUM

Five-Year Review Report

for

Brookhaven National Laboratory Superfund Site
Town of Brookhaven, Hamlet of Upton
Suffolk County, New York

November 16, 2011

PREPARED FOR:
The United States Department of Energy
Office of Environmental Management

PREPARED BY:
Environmental Protection Division
Brookhaven National Laboratory
Upton, New York 11973



Registered to
ISO 14001

This addendum has been prepared to address regulatory comments on the Five-Year Review Report for Brookhaven National Laboratory Superfund Site, Town of Brookhaven, Hamlet of Upton, Suffolk County, New York dated March 31, 2011.

On August 9, 2011, the United States Environmental Protection Agency (USEPA) provided concurrence with the protectiveness determinations made in the March 31, 2011 Report (see attached letter from W. Mugdan to J. Sattler and M. Holland). It was agreed that any comments from the regulators on this Report would be responded to and any issues clarified and documented separately. Since none of the comments altered the protectiveness determinations, USEPA accepted the March 31, 2011 Report as written. Comment letters were received from the following regulatory organizations:

- New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH), letter from C. Ng to J. Sattler and M. Holland, dated May 31, 2011.
- Suffolk County Department of Health Services (SCDHS), letter from A. Rapiejko to M. Holland, dated July 24, 2011.
- United States Environmental Protection Agency (USEPA), letter from J. Malleck to T. Kneitel, dated September 7, 2011.
- Suffolk County Department of Health Services (SCDHS), email from A. Rapiejko to W. Medeiros, dated September 26, 2011.

The responses to regulatory comments were reviewed by the regulators and found acceptable. The responses are included in this Addendum, as well as copies of the letters and email identified above.

BNL Groundwater Protection Group
*Responses to NYSDEC and NYSDOH Bureau of Environmental Radiation Protection (BERP) May 31, 2011 Comments on the March 31, 2011
 Five Year Review Report*

Comment Number	Section/ Page	Comment	Response
NYSDEC Letter from C. Ng to J. Sattler and M. Holland, dated May 31, 2011. Comments for Brookhaven National Laboratory (ID: 152009) 2011 Five-Year Review Report Dated March 30, 2011			
1	NA	The report fails to address the future disposition for structures and areas which have been identified as requiring remedial action. At a minimum, the report should identify these locations and give a short description for the final disposition of the location.	Future disposition of structures and areas with potential environmental liabilities does not automatically equate to a CERCLA action requiring environmental remediation under the DOE, EPA, and NYSDEC Interagency Agreement (IAG). However future environmental remediation would be coordinated with the regulatory agencies as required. Some of the “excess facilities” and “orphaned lines” such as the HFBR and AB waste lines are already included in the Five Year Review. Further information on other facilities was provided via email from R. Lee to C. Ng on May 19, 2011 (see attached).
2	NA	The report gives the recommendations for the plumes, buildings, etc. listed in the document. It is assumed that these recommendations will be followed. The report	DOE and BSA intend to implement the recommendations in a timely manner, regardless of changes in

BNL Groundwater Protection Group

Responses to NYSDEC and NYSDOH Bureau of Environmental Radiation Protection (BERP) May 31, 2011 Comments on the March 31, 2011
Five Year Review Report

Comment Number	Section/ Page	Comment	Response
		should address what changes would be necessary should there be changes in budget and/or management.	management. As mentioned at the May 2 nd briefing, the milestone dates were meant primarily for internal BSA/DOE commitment tracking purposes. However, the regulators will be kept informed of changes resulting from budget availability.
3	Tables E-1 and 9-1	In Tables E-1 and 9-1, the milestone dates are given for each pending issue. It was mentioned in the footnote that <i>“the recommendations are subject to regulatory review, and implementation will be based on the availability of funding”</i> . It is the Laboratory’s responsibility to track these items, and any departure from the milestone date(s) should be communicated with the Regulators for each issue listed in these two tables.	Please see response to Comment 2. The regulators will be kept informed of changes to the milestone dates resulting from budget availability.

BNL Groundwater Protection Group
Responses to SCDHS July 24, 2011 Comments on the March 31, 2011 Five Year Review Report

Comment Number	Section/ Page	Comment	Response
SCDHS Letter from A. Rapiejko to M. Holland, dated July 24, 2011. Comments on Five-Year Review Report for Brookhaven National Laboratory Superfund Site, March 31, 2011			
The Suffolk County Department of Health Services (SCDHS) has reviewed the above referenced document and is generally satisfied with the overall progress and effort put forth in the cleanup of the various Operable Units at the site. The SCDHS offers the following specific comments indicated below:			
1	Section 3.3 Land and Resource Use and Institutional Controls Page 9, 3 rd paragraph. <i>"This brings the number of homes not connected to public water to eight ...Annually, DOE formally offers those homeowners free testing of their private drinking water wells."</i>	<p>In April of 2011, the Agency for Toxic Substances and Disease Registry (ATSDR) finalized their Public Health Assessment for Brookhaven National Laboratory. A recommendation in this report addresses the homes referenced above that are still using private wells in the hook up area as follows, <i>"DOE should continue to sample the wells of the seven residents who declined the public water hookup to determine whether the contaminant plumes are affecting wells in the areas. If any of the seven wells are found to contain contaminants at levels above drinking water standards in the future, residents should immediately cease using the wells and DOE should provide alternative water sources to those individuals until the private well data are found to meet drinking water standards."</i></p> <p>The SCDHS supports ATSDR's recommendation and encourages connections to public water supplies when feasible. We recommend that the DOE implement this recommendation, to the extent practicable.</p>	<p>Per the Operable Unit III Record of Decision, DOE will continue to offer to sample the wells of those homeowners within the designated hookup area that are not connected to public water.</p> <p>The statement by ATSDR must be considered in context: As responsible stewards of taxpayer resources, DOE must justify its expenditures and ensure expenditures are made in accordance with the law. If contamination is found in a drinking water well and that contamination does not come from BNL, the DOE cannot technically justify spending taxpayer dollars to remedy the situation and would not attempt to do so.</p>

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Responses to SCDHS July 24, 2011 Comments on the March 31, 2011 Five Year Review Report

Comment Number	Section/ Page	Comment	Response
2	Section 3.6 Basis for Taking Action, page 12, Operable Unit V, Groundwater	At least one private well was impacted by site related volatile organic compounds (VOCs) at concentrations exceeding NYS maximum contaminant levels (MCLs). This home was provided a carbon filtration system by DOE, and was subsequently connected to the public water supply by DOE. This should be mentioned in this section.	Agreed. Although this action was not performed as part of a CERCLA remedy under the BNL Federal Facilities Agreement, it did help support the basis for investigation of the groundwater in OU V. This information will be included in the next Five Year Review Report.
3	<p>Section 4.1 Remedy Selection Operable Unit V Sewage Treatment Plant ROD, signed 2002 (BNL 2001b) OUV STP Remedy Components Page 17, 2nd bullet. <i>“Implement Suffolk County's Sanitary Code regarding limitations of private well installations.”</i></p> <p>Operable Unit VI ROD, signed March 2001 (BNL 2000b) OU VI Remedy Components Page 17, 4th bullet. <i>“...continued implementation of Suffolk County sanitary Code Article 4 that</i></p>	Article 4 of the Suffolk County Sanitary code does not explicitly prohibit <i>“the installation of additional residential wells where public water mains exist”</i> . Article 4 §760-408 of the Suffolk County Sanitary Code states <i>“Application for permit or certificate of approval to construct a private water system must include evidence satisfactory to the Department that there is no public water supply available”</i> . There is a subtle, but important distinction between the two statements, specifically, a water main can exist on a particular street, but if the applicant can demonstrate the public water is not available, the construction can be approved with an on-site well. This can occur if the applicant's property is located a sufficient distance from the water main, or if a water supplier states that they are unable to connect new customers in a particular area (e.g., due to pressure or capacity issues). Also, should an applicant be denied approval because the Department has determined that a public water supply is available, the applicant has a right to request a variance from the standard to the Board of	Agreed, the wording will be revised in future reports. Future references will state that Article 4 of the Suffolk County Sanitary Code regulates the installation of private drinking water wells.

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Responses to SCDHS July 24, 2011 Comments on the March 31, 2011 Five Year Review Report

Comment Number	Section/ Page	Comment	Response
	<i>prohibits the installation of additional residential wells where public water mains exist.</i>	Review, which has the authority to grant the variance request. Considering the above, references to Article 4 of the Suffolk County Sanitary Code as a means to prohibit new private well installations in areas downgradient of OU V and OU VI should be removed.	
4	Section 4.2 Remedy Implementation Operable Unit I Page 20, 2 nd paragraph <i>“...potential exposure to workers and future site residents is less than the 15 milliRem(mRem)/year above background criteria.”</i>	New York State Department of Environmental Conservation's (NYSDEC's) Radioactive Materials Guidance Document DSHM-RAD-05-01 indicates that the total effective dose equivalent to the maximally exposed individual of the general public, from radioactive material remaining at a site after cleanup, shall be as low as reasonably achievable and less than 10 mRem above that received from background levels of radiation in anyone year. This should be mentioned.	Agreed. The NYSDEC guidance of 10 mRem/yr above background has been adopted as an ALARA goal for the BNL cleanup. The landscape soil cleanup that is referenced in your comment did meet this ALARA goal. Future Five Year Review Reports will also reference the ALARA goal.
5	Cleanup Levels Used for Soils Contaminated with Radionuclides.	The soil cleanup levels developed for radionuclides were established in the OU I ROD and assumed an institutional control period of 50 years, the time period after which BNL might reasonably be available for public use. When the OU I ROD was signed in 1999, in effect the parties agreed that a reasonable date in which BNL would no longer be a National Laboratory under federal control use was the year 2049 (1999 plus 50 years). Since 12 years have passed since the signing of the ROD, the assumed end of the institutional control period is now 38 years hence. Based on the above, the SCDHS believes it would be appropriate to use 2049 as the end date for current and	The OU I ROD identified radionuclide soil cleanup levels to meet residential land use in 50 years for all areas except for the Former Hazardous Waste Management Facility, which is 100 years. The institutional control timeframe does not begin when the ROD is signed, but rather following the actual cleanup for a given area. All of the radiological soil cleanups under the OU I ROD or the HFBR ROD (which references the OU I cleanup goals) have been

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		<p>new cleanup projects and that new soil cleanup levels should be established that are now based upon the assumption of 38 years of institutional control. This will allow for new cleanup projects to be consistent with the OU I ROD assumption for the end of institutional controls at BNL in the year 2049.</p>	<p>completed. In many cases, the cleanups have already exceeded the goals. For example, all of the recent HFBR soil cleanups, except for the Waste Loading Area, have already exceeded the goals at the time of cleanup. For future soil cleanups, the cleanup goals will be negotiated with the regulators at the time of the cleanup.</p>

BNL Groundwater Protection Group
Responses to USEPA September 7, 2011 Comments on the March 31, 2011 Five Year Review Report

Comment Number	Section/ Page	Comment	Response
USEPA Letter from J. Malleck to T. Kneitel, dated September 7, 2011. Comments on Five-Year Review, Brookhaven National Lab, March, 2011			
Per our letter dated August 9, 2011, to John Sattler and Michael Holland, while the U.S. Environmental Protection Agency (EPA) concurred with the protectiveness determination made by the Department of Energy (DOE) in the CERCLA Five-Year Review Report, there are several matters in regard to the report that need to be clarified. Clarification by written response is requested. Additionally, such clarification should be incorporated into future reports. As a reminder, these matters do not alter EPA's protectiveness determination and EPA accepts the March, 2011 Report as submitted. Enclosed are our comments on the Five-Year Review Report.			
General Comments:			
1a	NA	When discussing monitoring events, it would be helpful to provide a reference to the report in which the monitoring data can be found.	Agreed. The intent of the Five Year Review Report was to summarize the monitoring data from the previous five years that was described in detail in the annual reports. Future Five Year Review Reports will include more references and links to these detailed reports. These reports can be found on the BNL website at: http://www.bnl.gov/gpg/reports.asp
1b	NA	While discussing wells in the report, include the following when appropriate: i) identify which wells are new and which are decommissioned. ii) include the number of new wells. iii) provide concentration trend graphs for all wells with each OU assessed or provide justification for the wells selected for inclusion in the figures. iv) clarify the changing plume conditions that	i) For future reports, pertinent monitoring and extraction wells that were installed or abandoned during the five year review timeframe will be identified. ii) See response to i above. iii) Inclusion of all wells in the

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		<p>v) warranted installation of additional wells. Provide a brief summary, table or figure documenting the changes made to the well network</p>	<p>trend graphs is not practical due to the large number of wells in the monitoring program. The annual Groundwater Status Report provides trend graphs for key monitoring wells by plume.</p> <p>iv) The conditions that warrant the installation of additional extraction wells are discussed in the annual Groundwater Status Reports.</p> <p>v) Changes to the monitoring well network for each plume are summarized in the annual Groundwater Status Reports. The 2016 Five Year Review will include a reference to the annual Groundwater Status Reports.</p>
2a	Section 5.0, Page 24, Operable Unit 1, Groundwater Remediation	<p>The second bullet of this section states that "Updated groundwater modeling using the 2010 characterization data predicts that SR-90 concentrations will be less than the 8pCi/L MCL upon reaching the site boundary." However, a reference has not been provided for the updated groundwater modeling and a figure has not been provided showing the location of the area of SR-90 contamination in the Upper Glacial aquifer south of the former HWMF.</p>	<p>The second bullet of this section should read "Updated groundwater modeling using the 2009 characterization...". The groundwater modeling was performed for the 2009 Groundwater Status Report and is summarized in that report. Figure 4-2 in the Five Year Review shows</p>

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			the Sr-90 contamination in this area that exceeds the drinking water standard.
2b	Section 5.0, Page 24 , Operable Unit 1, Groundwater Remediation	The last bullet of this section states that "Several VOCs continue to be detected at levels above MCLs at the Current Landfill along with evidence of low-level leachate generation." The VOCs and the wells in which they were detected need to be identified. Additionally, Section 5.0 should provide and/or reference information to support the statement that groundwater quality downgradient of the capped landfills continues to improve.	This data is summarized in the annual Groundwater Status reports and in the annual Environmental Monitoring Reports for the Current and Former Landfill Areas.
3	Section 5.0, page 25, last paragraph	The text states "It is possible that SR-90 contamination below the facility structures in the vadose zone is being periodically released to the aquifer by water-table elevation increases. This water-table flushing process has been observed at several other BNL source areas including the HFBR and g-2." Clarify how the indicated "flushing process" will impact the groundwater treatment systems and associated timeframes for meeting ROD cleanup goals.	The issue for the BGRR source area is the continued high Sr-90 concentrations currently observed downgradient of the source area. These concentrations are higher than what had been predicted during the design of the treatment system which did not assume a continuing source. Based on the continued elevated source area concentrations, the active pumping of this plume may have to be extended for a longer period of time than originally forecast. BNL will evaluate this potential continuing source and the possibility of any additional source area remediation. At this time, achieving the ROD cleanup goal is not considered to be at risk. The

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			ROD cleanup goals are also expected to be achieved for both the g-2 and HFBR plumes.
4	Page 53 - First bullet	<p>The text states "The buried waste is contained, and groundwater monitoring results indicate that the caps have achieved the objective to minimize the further leaching of contaminants from the soil into the groundwater." However, metals (i.e., iron, sodium, arsenic) and VOCs (i.e., chloroethane and benzene) continue to be detected at concentrations above the MCLs in several downgradient wells. It is unclear if leaching of contaminants from the soil into the groundwater continues to occur at the Current Landfill.</p> <p>Clarification as to whether decreasing trends are still noted, or if any decreasing trend has leveled off is not presented.</p>	<p>Concentrations of VOCs and metals have stabilized in most wells. VOC decreases of up to an order of magnitude have been noted since cap installation. VOCs slightly above standards are only detected in wells adjacent to the landfill. Downgradient wells have not had VOC detects since 2004. Metals continue to be detected, but do not indicate increasing trends. See trend graph for VOCs in Figure 6-1 of the Five Year Review Report and other trend graphs for iron and other compounds located in the 2010 Annual Landfill Reports at: http://www.bnl.gov/gpg/files/Landfills/2010_Landfill_Report.pdf</p>
5	Chapter 7	<p>The Technical Assessment includes responses to Question B for each of the Operable Units. The responses to Question B do not identify the ongoing updates of the toxicity values for several of the chemicals of concern. The text should be modified to indicate that the toxicity values for PCBs, tetrachloroethylene, trichloroethylene and ethyl benzene are being updated through the EPA's Integrated</p>	<p>Any significant changes to the toxicity values should be reflected in a change to the applicable standard. While we do not review changes to the toxicity values, we do identify and respond to changes to standards.</p>

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		Risk Information System process. The document should be annotated to indicate the ongoing review of these toxicity values and that any changes in the toxicity values will be evaluated in the next five year review.	
6a	Figure 6-9	Discuss how the plume boundary was determined, include concentrations at existing and closed wells.	The plume boundary is delineated on an annual basis based on review of the permanent and temporary well data during preparation of the annual Groundwater Status Report. Figure 6-9 only presents location and trends for select monitoring wells within the plume. A figure identifying the specific monitoring well data for all of the plume wells and more detailed concentration contours is presented in the annual Groundwater Status Report. See Figure 3.2.15-1 for the BGRR/WCF Sr-90 plume: http://www.bnl.gov/gpg/files/Annual_Reports/2010pdf/fig_3-02-15-01.pdf
6b	Figure 6-9	Historical trends show fluctuations and steady increases of SR-90 in the WCF plume. Clarify whether or not the WCF plume has been controlled.	The monitoring wells immediately downgradient of extraction wells SR-1 and SR-2 have been displaying a declining trend over the past several years which demonstrate hydraulic control of the plume. A downgradient area of higher than expected Sr-90

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			<p>concentrations in the vicinity of the HFBR was characterized in 2008. Four new extraction wells were installed in 2010 and are presently operational to control this downgradient high concentration segment of the plume.</p>
7	Attachment 6	<p>There are several handwritten values but they are not explained. For example, page 4, Site ID 085-41, has a 3,000 value but this value is not related to the table. These values should be clarified.</p>	<p>Agreed. Those hand-written notes should not have been shown. They referred to screening levels from the EPA Subsurface Vapor Intrusion Guidance document.</p>

BNL Groundwater Protection Group
Responses to SCDHS September 26, 2011 Supplemental Comments on the March 31, 2011 Five-Year Review Report

Comment Number	Section/ Page	Comment	Response
SCDHS email from A. Rapijko to S. Medeiros, dated September 26, 2011.			
Skip, As per our conversation this morning, I have the following comments on the proposed reductions for future Peconic River sampling. Let me know if you have any questions. Thanks, Andy			
1	NA	Since the Manor Road area was included for sediment removal due to mercury, and some surface water sampling has indicated mercury concentrations elevated when compared with nearby locations, sampling station PR-WCS-04 should be kept as a surface water station.	A maximum mercury concentration of 24.7 ng/L was identified in two samples in 2006 and 2007 at location PR-WCS-04. Mercury concentrations in the remaining nine samples ranged from 4.9 ng/L to 17.5 ng/L. These concentrations are consistent with mercury identified in locations immediately upstream of the Sewage Treatment Plant and are consistent with precipitation concentrations. However, we will continue to sample this location through 2012, then evaluate the need for continued monitoring.
2	NA	Area C should be kept as a contingent fish sampling location in the event sufficient fish cannot be collected from Area D.	Agreed.
3	NA	Fish monitoring should be conducted annually until 2014 whereupon changes to the BNL STP discharge may significantly influence the amount of fish available in some areas. Reducing fish monitoring to every other year should occur after the STP change in 2014.	From 2006 through 2010, 482 fish mercury samples have been collected as part of the post-cleanup monitoring program. The average annual mercury concentrations have remained consistent and ranged from 0.26 mg/kg to 0.31 mg/kg. This is significantly below the pre-cleanup average mercury concentration of 0.58 mg/kg. We believe a significant sample of fish has been collected annually over the last five years to establish an adequate trend that supports the conclusion that the 2004/2005 cleanup continues to remain effective. By scheduling the next planned collection in 2013 instead of 2012, this will provide additional opportunity for the fish population to expand and increase. We will continue to evaluate the fish collection results and discuss the data with the regulators.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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AUG 09 2011

Mr. John Sattler
Brookhaven Project Director
Office of Environmental Management
Department of Energy
Brookhaven Site Office
P.O. Box 5000
Upton, New York 11973

Mr. Michael D. Holland
Site Manager
Department of Energy
Brookhaven Site Office
P.O. Box 5000
Upton, New York 11973

Re: CERCLA Five-Year Review
Brookhaven National Lab

Dear Mr. Sattler and Mr. Holland:

I am writing in regard to Department of Energy's (DOE) March, 2011 Five-Year Review Report for Brookhaven National Lab (BNL). My office has reviewed the subject report on behalf of the U.S. Environmental Protection Agency (EPA), and I am pleased to advise you that EPA concurs with the protectiveness determinations made in the report. Our review was conducted in accordance with EPA's "Comprehensive Five-Year Review Guidance" (OSWER Directive No. 9355.7-03B-P). Pursuant to 40 CFR 300.430(f)(4)(ii), reviews, no less often than every five years, are required of any remedial actions that have been selected in Records of Decision that do not allow for unlimited use and unrestricted exposure.

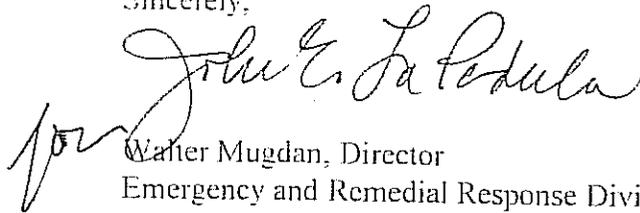
Beyond the remedial actions evaluated in this review, DOE is also proceeding with additional studies that may be necessary to protect public health and the environment at other areas of BNL. Remedies at these remaining areas are yet to be selected and EPA will work with DOE to establish land use controls at sites where residual contamination exists that would not allow for unrestricted use. Please note that until such time as all such remedy decisions have been made, a comprehensive base-wide protectiveness determination must be reserved. Such a protectiveness determination must also be reserved for sites where the remedy has been implemented, but the protectiveness of the remedy is still being evaluated.

Notwithstanding the above, EPA concurs that the remedies selected and implemented to date, as reported on in this Five-Year Review, are protective.

While EPA concurs with the protectiveness determination made by the Navy, our respective staffs have discussed several matters in regard to the report that I understand will be clarified and documented separately. As these matters do not alter this protectiveness determination, EPA accepts the March 2011 Report as submitted.

If you have any questions, please call me at 212-637-4390 or have your staff contact Jessica Mollin, EPA Project Manager at 212-637-3921.

Sincerely,

A handwritten signature in black ink, appearing to read "Walter Mugdan". The signature is written in a cursive style with a large initial "W".

Walter Mugdan, Director
Emergency and Remedial Response Division

cc: R. Lee, BSA
W. Dorsch, BSA
T. Kneitel, EM-BHSO
S. Kumar, BSA
A. Rapiejko, SCDHS
C. Ng, NYSDEC

New York State Department of Environmental Conservation
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Joe Martens
Commissioner

Mr. John Sattler
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P.O. Box 5000
Upton, NY 11973

Mr. Michael D. Holland
Site Manager
Department of Energy
Brookhaven Site Office
P.O. Box 5000
Upton, NY 11973

May 31, 2011

Re: Brookhaven National Laboratory 2010 Five-Year Review Report (Site ID: 152009)

Dear Mr. Sattler and Mr. Holland:

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health's Bureau of Environmental Radiation Protection (BERP) reviewed the above document dated March 31, 2011.

Comments regarding the recommendations and follow-up actions are included in the attachment to this letter. Any comments from New York State Department of Health's Bureau of Environmental Exposure Investigation (BEEI) will be sent directly from Mr. Steven Karpinski.

If you have any questions in connection with this matter, please contact me at (518) 402-9620 or cbng@gw.dec.state.ny.us.

Sincerely yours,

Chek Beng Ng, P.E.
Environmental Engineer 2
Remedial Bureau A

Attachment

cc: D. O'hehir
C. Ng
J. Swartwout
R. Quail
S. Karpinski, DOH
J. Collins, DOH
A. Rapiejko, SCDHS
J. Mollin, EPA
S. Kumar, BSA
T. Kneitel, DOE

COMMENTS FOR BROOKHAVEN NATIONAL LABORATORY (ID: 152009)
2011 FIVE-YEAR REVIEW REPORT DATED MARCH 30, 2011

1. The report fails to address the future plans and disposition for structures and areas which have been identified as requiring remedial action. At minimum, the report should identify these locations and give a short description for the final disposition of the location.
2. The report gives recommendations for the plumes, buildings, etc. listed in the document. It is assumed that these recommendations will be followed. The report should address what changes would be necessary should there be changes in budget and/or management.
3. In Tables E-1 and 9-1, the milestone dates are given for each pending issue. It was mentioned in the footnote that "*the recommendations are subject to regulatory review, and implementation will be based on the availability of funding*". It is the Laboratory's responsibility to track these items, and any departure from the milestone date(s) should be communicated with the Regulators for each issue listed in these two tables.

COUNTY OF SUFFOLK



STEVE LEVY
SUFFOLK COUNTY EXECUTIVE

DEPARTMENT OF HEALTH SERVICES

JAMES L. TOMARKEN, MD
MSW, MPH, MBA, FRCPC, FACP
Commissioner

July 24, 2011
Mr. Michael Holland
U.S. Department of Energy
Brookhaven Site Office
P.O. Box 5000
Upton, New York 11973

**Re: Comments on Five Year Review Report for Brookhaven National Laboratory Superfund Site
March 31, 2011**

Dear Mr. Holland,

The Suffolk County Department of Health Services (SCDHS) has reviewed the above referenced document and is generally satisfied with the overall progress and effort put forth in the cleanup of the various Operable Units at the site. The SCDHS offers the following specific comments indicated below:

1) **Section 3.3 Land and Resource Use and Institutional Controls**
Page 9, 3rd paragraph

"This brings the number of homes not connected to public water to eight...Annually, DOE formally offers those homeowners free testing of their private drinking water wells."

In April of 2011, the Agency for Toxic Substances and Disease Registry (ATSDR) finalized their Public Health Assessment for Brookhaven National Laboratory. A recommendation in this report addresses the homes referenced above that are still using private wells in the hook up area as follows, *"DOE should continue to sample the wells of the seven residents who declined the public water hookup to determine whether the contaminant plumes are affecting wells in the areas. If any of the seven wells are found to contain contaminants at levels above drinking water standards in the future, residents should immediately cease using the wells and DOE should provide alternative water sources to those individuals until the private well data are found to meet drinking water standards."*

The SCDHS supports ATSDR's recommendation and encourages connections to public water supplies when feasible. We recommend that the DOE implement this recommendation, to the extent practicable.



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OFFICE OF WATER RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY – 360 YAPHANK AVENUE, SUITE 1C – YAPHANK, NY 11980
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2) Section 3.6 Basis for Taking Action

Page 12, Operable Unit V, Groundwater:

At least one private well was impacted by site related volatile organic compounds (VOCs) at concentrations exceeding NYS maximum contaminant levels (MCLs). This home was provided a carbon filtration system by DOE, and was subsequently connected to the public water supply by DOE. This should be mentioned in this section.

3) Section 4.1 Remedy Selection

Operable Unit V Sewage Treatment Plant ROD, signed 2002 (BNL 2001b)

OUV STP Remedy Components

Page 17, 2nd bullet

"Implement Suffolk County's Sanitary Code regarding limitations of private well installations."

Operable Unit VI ROD, signed March 2001 (BNL 2000b)

OU VI Remedy Components

Page 17, 4th bullet

"...continued implementation of Suffolk County sanitary Code Article 4 that prohibits the installation of additional residential wells where public water mains exist."

Article 4 of the Suffolk County Sanitary code does not explicitly prohibit *"the installation of additional residential wells where public water mains exist"*. Article 4 §760-408 of the Suffolk County Sanitary Code states *"Application for permit or certificate of approval to construct a private water system must include evidence satisfactory to the Department that there is no public water supply available"*. There is a subtle, but important distinction between the two statements, specifically, a water main can exist on a particular street, but if the applicant can demonstrate the public water is not available, the construction can be approved with an on-site well. This can occur if the applicant's property is located a sufficient distance from the water main, or if a water supplier states that they are unable to connect new customers in a particular area (e.g., due to pressure or capacity issues). Also, should an applicant be denied approval because the Department has determined that a public water supply is available, the applicant has a right to request a variance from the standard to the Board of Review, which has the authority to grant the variance request. Considering the above, references to Article 4 of the Suffolk County Sanitary Code as a means to prohibit new private well installations in areas downgradient of OU V and OU VI should be removed.

4) Section 4.2 Remedy Implementation

Operable Unit I

Page 20, 2nd paragraph

"...potential exposure to workers and future site residents is less than the 15 milliRem (mRem)/year above background criteria."

New York State Department of Environmental Conservation's (NYSDEC's) Radioactive Materials Guidance Document DSHM-RAD-05-01 indicates that the total effective dose equivalent to the maximally exposed individual of the general public, from radioactive material remaining at a site

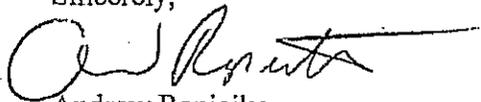
after cleanup, shall be as low as reasonably achievable and less than 10 mrem above that received from background levels of radiation in any one year. This should be mentioned.

5) Cleanup Levels Used for Soils Contaminated with Radionuclides

The soil cleanup levels developed for radionuclides were established in the OUI ROD and assumed an institutional control period of 50 years, the time period after which BNL might reasonably be available for public use. When the OUI ROD was signed in 1999, in effect the parties agreed that a reasonable date in which BNL would no longer be a National Laboratory under federal control use was the year 2049 (1999 plus 50 years). Since 12 years have passed since the signing of the ROD, the assumed end of the institutional control period is now 38 years hence. Based on the above, the SCDHS believes it would be appropriate to use 2049 as the end date for current and new cleanup projects and that new soil cleanup levels should be established that are now based upon the assumption of 38 years of institutional control. This will allow for new cleanup projects to be consistent with the OUI ROD assumption for the end of institutional controls at BNL in the year 2049.

Should you have any questions concerning these comments, please contact me at (631) 852-5786.

Sincerely,



Andrew Rapiejko
Associate Hydrogeologist
Office of Water Resources

cc: D. Feldman, P.E., SCDHS
C. Ng, P.E., NYSDEC
J. Mollin, USEPA
S. Karpinski, NYSDOH
A. Juchatz, SCDEE



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1886

September 7, 2011

Ms. Terri Kneitel, P.E., PMP
EM Waste Management Program Manager
Surface and Groundwater Remediation Projects Manager
Brookhaven Area Office
Building 464
P.O. Box 5000
Upton, New York 11973

Re: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
Five-Year Review, March 2011 Brookhaven National Lab

Dear Ms. Kneitel:

Per our letter dated August 9, 2011, to John Sattler and Michael Holland, while the U.S. Environmental Protection Agency (EPA) concurred with the protectiveness determination made by the Department of Energy (DOE) in the CERCLA Five-Year Review Report, there are several matters in regard to the report that need to be clarified. Clarification by written response is requested. Additionally, such clarification should be incorporated into future reports. As a reminder, these matters do not alter EPA's protectiveness determination and EPA accepts the March, 2011 Report as submitted.

Enclosed are our comments on the Five-Year Review Report.

If you have any questions, please call me at 212-637-4332 or have your staff contact Jessica Mollin, EPA Project Manager at 212-637-3921.

Sincerely,

A handwritten signature in cursive script, appearing to read "John Malleck".

John Malleck, Section Chief
Federal Facilities Section

Enclosure

cc: B. Howe, BSA
R. Lee, BSA
W. Dorsch, BSA
T. Kneitel, EM-BHSO
A. Rapiejko, SCDHS
C. Ng, NYSDEC

Enclosure

Comments on Five-Year Review, Brookhaven National Lab, March, 2011

1) General Comments

- a) When discussing monitoring events, it would be helpful to provide a reference to the report in which the monitoring data can be found.
- b) While discussing wells in the report, include the following when appropriate:
 - i) identify which wells are new and which are decommissioned.
 - ii) include the number of new wells.
 - iii) provide concentration trend graphs for all wells with each OU assessed or provide justification for the wells selected for inclusion in the figures.
 - iv) clarify the changing plume conditions that warranted installation of additional wells
 - v) provide a brief summary, table or figure documenting the changes made to the well network.

2) Section 5.0, Page 24 , Operable Unit 1, Groundwater Remediation–

- a) The second bullet of this section states that “Updated groundwater modeling using the 2010 characterization data predicts that SR-90 concentrations will be less than the 8pCi/L MCL upon reaching the site boundary.” However, a reference has not been provided for the updated groundwater modeling and a figure has not been provided showing the location of the area of SR-90 contamination in the Upper Glacial aquifer south of the former HWMF.
- b) The last bullet of the this section states that “Several VOCs continue to be detected at levels above MCLs at the Current Landfill along with evidence of low-level leachate generation.” The VOCs and the wells in which they were detected need to be identified. Additionally, Section 5.0 should provide and/or reference information to support the statement that groundwater quality downgradient of the capped landfills continues to improve.

3) Section 5.0, page 25, last paragraph – The text states “It is possible that SR-90 contamination below the facility structures in the vadose zone is being periodically released to the aquifer by water-table elevation increases. This water-table flushing process has been observed at several other BNL source areas including the HFBR and g-2.” Clarify how the indicated “flushing process” will impact the groundwater treatment systems and associated timeframes for meeting ROD cleanup goals.

4) Page 53 - First bullet, the text states “The buried waste is contained, and groundwater monitoring results indicate that the caps have achieved the objective to minimize the further leaching of contaminants from the soil into the groundwater.” However, metals (i.e., iron, sodium, arsenic) and VOCs (i.e., chloroethane and benzene) continue to be detected at concentrations above the MCLs in several downgradient wells. It is unclear if leaching of contaminants from the soil into the groundwater continues to occur at the Current Landfill. Clarification as to whether decreasing trends are still noted, or if any decreasing trend has leveled off is not presented.

5) Chapter 7 – The Technical Assessment includes responses to Question B for each of the

Operable Units. The responses to Question B do not identify the ongoing updates of the toxicity values for several of the chemicals of concern. The text should be modified to indicate that the toxicity values for PCBs, tetrachloroethylene, trichloroethylene and ethylbenzene are being updated through the EPA's Integrated Risk Information System process. The document should be annotated to indicate the ongoing review of these toxicity values and that any changes in the toxicity values will be evaluated in the next five year review.

6) Figure 6-9

- a) Discuss how the plume boundary was determined, include concentrations at existing and closed wells.
- b) Historical trends show fluctuations and steady increases of SR-90 in the WCF plume. Clarify whether or not the WCF plume has been controlled.

7) Attachment 6 – There are several handwritten values but they are not explained. For example, page 4, Site ID 085-41, has a 3,000 value but this value is not related to the table. These values should be clarified.

Howe, Robert F

From: Rapiejko, Andrew <Andrew.Rapiejko@suffolkcountyny.gov>
Sent: Monday, September 26, 2011 11:10 AM
To: Medeiros, William
Cc: Dorsch, William R; Howe, Robert F; Kneitel, Terri E; Chek Ng; Jessica Mollin
Subject: Peconic River Sampling Comments

Skip,

As per our conversation this morning, I have the following comments on the proposed reductions for future Peconic River sampling.

- 1) Since the Manor Road area was included for sediment removal due to mercury, and some surface water sampling has indicated mercury concentrations elevated when compared with nearby locations, sampling station PR-WCS-04 should be kept as a surface water station.
- 2) Area C should be kept as a contingent fish sampling location in the event sufficient fish cannot be collected from Area D.
- 3) Fish monitoring should be conducted annually unit 2014 whereupon changes to the BNL STP discharge may significantly influence the amount of fish available in some areas. Reducing fish monitoring to every other year should occur after the STP change in 2014.

Let me know if you have any questions.

Thanks.

Andy

Andrew Rapiejko
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