Environmental & Waste Management Services Division

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Managed by Brookhaven Science Associates
for the U.S. Department of Energy

Memo

Date: *August 5, 2008*

To: *N. Gmur*

From: *Mark C. Davis, NEPA/NHPA Coordinator*

Subject: *DOE Concurrence - NSLS-II EA Vs Title II Design Specifications*

Re: *NEPA Evaluation of National Synchrotron Light Source-II (NSLS-II) Environmental Assessment (EA) Vs Title II Design Specifications*, dated 6/20/08

The subject National Environmental Policy Act (NEPA) evaluation, submitted to the Department of Energy Brookhaven Site Office (DOE-BHSO) on 7/7/08, compares the Title II Design specifications with information included in the original Environmental Assessment for NSLS-II (DOE/EA-1558) dated October 2006. The evaluation determined that no new adverse environmental impacts have been identified and the Title II Design specifications for NSLS-II are within the scope of the existing Environmental Assessment for NSLS-II (DOE/EA-1558). The DOE-BHSO has concurred with this NEPA evaluation. Please feel free to contact me with any questions.

Cc: T. Green, R. Lee, G. Goode, S. Hoey, C. Polanish

EC51ER.08

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Memo

Date: *June 20, 2008*

To: *C. Polanish*

From: *Mark C. Davis, NEPA/NHPA Coordinator*

Subject: *NSLS-II EA Vs Title II Design Specifications*

The attached correspondence (Gmur/Davis to Casey/Fallier/Hoey 6/18/08) compares the latest NSLS-II Title II Design specifications with information included in the original Environmental Assessment for NSLS-II (DOE/EA-1558) dated October 2006. I have reviewed the revised information and have determined that no new adverse environmental impacts have been identified. Based on this evaluation I have determined that the 2008 Title II Design specifications for NSLS-II are within the scope of the existing Environmental Assessment for NSLS-II (DOE/EA-1558) dated October 2006. This review is respectfully submitted for your review/concurrence. Please feel free to contact me with any questions.

Attachment
Cc: T. Green, R. Lee, G. Goode, N. Gmur

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BROOKHAVEN NATIONAL LABORATORY

NATIONAL SYNCHROTRON LIGHT SOURCE II PROJECT

MEMORANDUM

DATE: June 18, 2008

TO: W. Robert Casey, Marty Fallier and Steven Hoey

FROM: Nicholas F. Gmür and Mark Davis

SUBJECT: Comparison of NSLS-II 2006 NSLS-II Environmental Assessment and 2008 Title II Design (nslsnas\users\gmur\NSLS-2\EA Comparison 2006-2008.doc)

The NSLS-II Conventional Facilities Advisory Committee requested that the 2006 NSLS-II Environmental Assessment (EA) be compared to the NSLS-II 2008 Title II design to determine what items in the EA have changed. The list below explains those changes. The original EA text wording is provided for each item, along with the associated section number. These will be presented to DOE/BHSO under Mark Davis' cover letter to determine if any change(s) affects the EA and its associated Finding of No Significant Impact (FONSI).

1. Total area affected by construction "disturbance"
   - Original text in EA Section 4.1.1: *The 10-12 acre (4.0- 4.9 hectares) area immediately south and east of the existing NSLS would be proposed for construction of NSLS-II.* This indicates the footprint of the actual buildings and parking areas.
   - Follow-up memo by Mark Davis (November 2006) indicated that the 10-12 acres was only the size of the proposed building ring footprint and parking/road areas, and the environmental impact analysis was based on the actual area of potential impact, estimated to be ~30 acres. (Potentially impacted area as shown on Figures 3 and 5 of EA).
   - New = ~46.9 acres of land disturbed by construction at full build-out (including area cleared, regraded, or covered by new paving and buildings; it would not include areas that are used for laydown, staging, or contractor trailers where the existing use of the land is not changed).

   Environmental Impact: The expanded area of potential impact is immediately adjacent to and comprised of the same types of current land use as that originally evaluated. In addition, no new impacts have been identified. Therefore, the revised acreage would not result in any new significant environmental consequences.

2. Accelerator circumference
   - Original EA text in Table 2: *Circumference is 780 meters.*
   - New = Circumference is 792 meters. The increase was done to accommodate the selection of RF equipment.

Environmental Impact: The accelerator operating parameters would remain the same. Therefore, the increased circumference would not result in any new significant consequences.

3. Building footprint
   - Original text in EA Section 4.1.2: *The proposed NSLS-II building would require an estimated circular footprint of 400,000 square feet (37,000 square meters).*
   - New = 502,000 sq ft at full build out due to the addition of the RF, Injection, Compressor and Cooling Tower Buildings as well as an increase of 10 meters in the Ring Building's width to accommodate longer beamlines within the Ring Building.

   Environmental Impact - See summary after item # 6 below.

4. Parking
   - Original text in EA Section 4.1.2: *Parking space of up to 100,000 square feet (9,300 square meters) would be required around the building perimeter.*
   - New parking space area = 251,840 sq ft at full build out.

   Environmental Impact - See summary after item # 6 below.

5. Central Lab Office Building (CLOB)
   - Original text in EA Section 4.1.2: *The larger "bump-out" in the building's foreground shows the location of the main entrance and administrative offices.*
   - New = The current design calls for a smaller Front Lobby as a main entrance. The offices originally planned for the CLOB will now be located in the original NSLS building (#725).

   Environmental Impact - See summary after item # 6 below.

6. Booster and Linac
   - Original text in EA Section 4.1.2: *Figure 3 shows the linear accelerator (LINAC bldg.). The booster ring and the storage ring are located along the inner circumference of the building.*
   - New = The Booster and Linac will be co-located in a separate Injection Building. The revised design provides the ability to enter the Storage Ring tunnel even if the Booster is operating (the previous design would not have allowed this). It also results in an increase in impermeable area. Shielding will be the same as originally described for the Storage Ring (concrete block, lead, and soil berm).

Environmental Impact: The revised design parameters described in items 3-6 above would each result in an increase in impermeable surface area, along with a corresponding potential for increased storm water runoff, except for item 5, which would result in a decrease in impermeable surface area. Environmental and engineering personnel have evaluated the potential increase in storm water runoff and

determined that it would be within the planned expanded capacity for existing collection basins. Therefore, no significant environmental consequences would be expected. Please see attached memo from Robert Lee (BNL).

Stormwater Mgmt 11Jun2008.pdf

7. Compressor Building & Liquid Nitrogen Storage Tanks
   - Original EA text: no reference to a Compressor Building or storage tanks, but liquid helium and nitrogen are mentioned in EA Section 6.1.3: *Liquid nitrogen and liquid helium would be used for keeping experimental samples, such as protein crystals, cold. These cryogens would also be used to cool beamline equipment, such as detectors, and in closed-loop systems to cool accelerator components such as magnetic insertion devices.* The EA also contains numerous references throughout for cryogens and liquid nitrogen.
   - New = A Compressor Building will be located near the RF building. This building will now separately house the helium liquefaction equipment for the Storage Ring RF system. Helium gas will be recaptured to minimize emissions into the atmosphere and to save the costly loss of He. Three 1100-gallon gaseous helium storage tanks will be located inside the Ring Building area; one 790-gallon liquid helium tank will be located inside the Ring Building itself.
   - New = Two 12,000 gallon liquid nitrogen tanks will be located outside the Ring Building circumference to supply LN2 to the helium liquefaction system and to the experimental stations

   Environmental Impact: The new Compressor Building and nitrogen storage tanks would result in an increase in impermeable surface area – reference Environmental Impact discussion in Item 6 above. As stated in the original EA, Administrative programs would ensure that potential emission sources are reviewed in accordance with applicable air emissions SBMS Subject Areas. Therefore, no new significant environmental consequences would be expected as a result of these design changes.

8. Cooling Tower Building in center of Ring Building open area
   - Original text: no reference to this building.
   - New = A Cooling Tower Building will be located near the geographic center of the Ring Building. This building will centralize equipment that formerly resided in the five separate Service Buildings (referred to as mechanical equipment rooms in EA Section 4.1.2). This improves efficiency, eliminates redundancy, facilitates maintenance, and reduces costs

   Environmental Impact: The centralization of cooling tower equipment is not expected to result in an increase in water usage or discharge rate, as compared to the original EA. The new Cooling Tower Building would result in an increase in impermeable surface area – reference Environmental Impact discussion in Item 6

above. Therefore, no new significant environmental consequences would be expected as a result of this design change.

9. Standard Beamlines and Insertion Device Beamlines
   - Original text in EA Section 4.1: *...with beamlines on the order of 200 feet (60 meters) in length.*
   - Original text in EA Section 4.1.4: *The NSLS-II storage ring would consist of an estimated 25 insertion device beamlines.*
   - Original text in EA Section 4.1.5: *Initial NSLS-II construction would include five beamlines on the storage ring.*
   - New = Standard beamlines will now be 66 meters long. This design change strengthens the baseline scientific program by providing additional space for researchers and allowing installation of additional equipment.
   - New = 27 insertion device beamlines would be constructed to improve the diversity of scientific research possible around the Storage Ring.

   Environmental Impact: The increased length and number of beamlines (standard and insertion device) would not introduce any new environmental impacts and would not result in any new significant environmental consequences.

10. Construction
    - Original text in EA Section 6.1.1: *Approximately 20,000 cubic yards (15,300 cubic meters) of soil/sand may be required for the NSLS-II building to be used as fill under the floor slab. An estimated 10,000 cubic yards (7,650 cubic meters) of additional sand may be used for concrete for the building structure.*
    - Original text in EA Table 1: *Approximately 6000 gpd water usage for dust mitigation and potential use for temporary concrete-mixing plant.*
    - New = 94,200 cu yds of sand under the slab; 16,800 cubic yards of sand obtained from off-site purchase; the need for a concrete mixing plant on the BNL site is unlikely.

    Environmental Impact: Engineers have determined that the NSLS-II construction site and planned recharge basin enlargement projects can support a majority of the estimated volume of sand required under the floor slab. Therefore, the potential impacts associated with an on site concrete plant (emission controls, water usage/discharge) and "mining" sand from other on site areas (NYSDEC Mined Land Reclamation Permit) would not be realized. The increase in construction vehicle traffic (cement trucks) was considered in the original EA Section 6.1.7 Transportation. Therefore, there would be no new or increased environmental consequences as a result of purchasing concrete from an offsite commercial plant.

11. SPDES General Permit GP-02-01 for construction site stormwater runoff
    - Original text in EA Section 6.1.2: *Storm water runoff from the construction site would be controlled using standard erosion control measures, including silt-fencing and hay-bales. Due to the potential for runoff to regulated surface water,*

the need for a SPDES General Permit #GP-02-01 for Construction Activity would be evaluated and applied for, if necessary.

- New = Further engineering evaluation has determined that storm water runoff to a regulated surface water is not expected. Therefore, a SPDES General Permit #GP-02-01 for Construction Activity will not be needed (Reference email correspondence below between Robert Lee (BNL) and Kathy Haas (NYSDEC)).

FW (NSLS-II)
Construction Project.

Environmental Impact: This revision represents a reduction in potential environmental consequences associated with NSLS-II construction.

12. Overlap of construction site with Tiger Salamander 1000 ft buffer area
    - Original text in EA Section 6.1.4: *The current footprint for the Proposed Action would overlap the northeast quadrant of the 1,000 foot NYSDEC buffer area surrounding recharge basin HW (also known as TS-7), by about 400 feet (122 meters). The majority of this overlap region has been previously disturbed from activities extending from 1917 to the present. It is expected that any disturbance from construction would not increase the disturbed area and there would be no net decrease in the amount of habitat available to the tiger salamander. Based on the amount of existing impervious surfaces located in the overlap region, and that no additional area would be disturbed, the proposed construction would likely have only a minor or not any impact on the tiger salamander.*
    - New = Construction footprint extends 600 feet into the 1000 foot buffer zone.

    Environmental Impact: The area encompassed by the additional 200 ft of construction zone expansion into the buffer zone currently consists of existing impervious surfaces (i.e., asphalt roadway and parking areas). Any disturbance from construction would not impinge on previously undisturbed areas and there would be no net decrease in the amount of habitat available to the tiger salamander. Based on the amount of existing impervious surfaces located in the overlap region, and that no additional area would be disturbed, the proposed 200 foot increase of construction area into the buffer zone would not have an adverse impact on the tiger salamander.

13. Groundwater impact by construction
    - Original text in EA Section 5.3: *The BNL site is situated over a U.S. EPA-designated sole source aquifer that is the primary source of drinking water for both on- and off-site private and public supply wells, and water for industrial use such as cooling and steam generation. In the area proposed for NSLS-II, ground surface is 73 feet (22 meters) above sea level and the top of the groundwater table ranges from 38-47 feet (11-14 meters) above sea level.*

AND

    - Original text in EA Section 6.1.2: *Depth to the water table in the proposed construction area would be approximately 26-35 feet (7.9-10.7 meters). None of the proposed structures would be deeper than 18 feet (5.5 meters) thus no direct impacts to groundwater or dewatering actions would be anticipated.*

- New = Consists of more detailed information. Historical groundwater high is 47 feet above mean sea level. Current construction maximum depth will be to 50 feet above MSL for the water piping under the vehicle access tunnel; next maximum depth will be to 56 feet above MSL for in-ground concrete utility manholes.

Environmental Impact: The revised information provides additional detail on the depth of building structures. Even with the revised depth of the tunnel water piping, there would be no direct impacts to groundwater and the need for dewatering actions would not be anticipated. Therefore, there would be no new or increased environmental consequences.

14. LEED
    - Original text in EA Section 4.1.2: *The NSLS-II facility would include sustainable design principles with the goal of obtaining Leadership in Energy and Environmental Design (LEED) certification.*
    - New = Likely to achieve LEED Silver level.

Environmental Impact: Design efforts have resulted in improved conformance to LEED requirements; with the likelihood that Silver level will be reached. Achieving the Silver level would result in improved energy efficiency, thereby reducing potential impacts to the environment.

15. Utility demand changes
    - Original text and changes in EA Table 5:

Table 5. NSLS-II Utility Needs and During Limited Simultaneous Operation with the Existing NSLS*

Utilities	NSLS-II FY2013 - Estimated	NSLS Existing (FY2005)	Simultaneous Operations - Estimated*	NSLS-II Full Ops. -Estimated
Electrical Demand (MW)	~~13~~ 7-8	5	18	~~17~~ 15
Steam (lbs)	46×10^6	23×10^6	69×10^6	46×10^6
Chilled Water (Tons)	~~2,300~~ 2,500	1,100	3,400	3,400

Environmental Impact: Electrical demand has been recalculated as a result of engineering changes and results in a decrease in demand. Chilled water demand rises slightly. The overall reduction in utility needs would result in a corresponding reduction in potential environmental consequences (e.g., reduced emissions associated with off site electrical generation).

16. Storm water runoff due to 2" storm
    - Original text in EA Section 6.1.2: *Due to the increase in impermeable surfaces, storm water discharge may increase by an estimated 500,000 gallons (1,893,000 liters) per the traditional construction standard 2-inch storm event.*

- New = For a *2-inch storm event, storm water discharge may increase by an estimated* 936,489 gallons. The table below presents the values used in estimating the storm water volume (data supplied by HDR; Architect/Engineers for the NSLS-II design). The new estimate includes all buildings and paved surfaces at full build out.

Estimated Storm Water Discharge Due to 2-Inch Rainfall Event for NSLS-II

	Original Estimate (2006)	Revised Estimate 2008 Title II Design
NSLS-II New Impervious Surface Area	(2006 value included building footprint & parking) 500,000 sq. ft.	(2008 value includes all buildings and paved surfaces at full build out) 1,231,462 sq. ft.
Existing Impervious Surface Area	100,000 sq. ft.	495,000 sq. ft. *
Net Impervious Surface Area – (Increase above existing conditions)	400,000 sq. ft.	736,462 sq. ft.
Storm water volume from 2-inch rainfall event	68,000 cu. ft. = 508,640 gal increase over existing storm water volume	125,199 cu. ft. = 936,489 gal increase over existing storm water volume

* 2008 value includes all existing pavement/building in warehouse area

Environmental Impact: Environmental and engineering personnel have evaluated the potential increase in storm water runoff and determined that it would be within the planned expanded capacity for existing collection basins. Therefore, no significant environmental consequences would be expected. Please see attached memo from Robert Lee (BNL) inserted in item #6 above.

Summary/Conclusion:

The information presented above compares the 2008 NSLS-II Title II Design specifications with information included in the original Environmental Assessment for NSLS-II (DOE/EA-1558) dated October 2006. The revised information was evaluated and it is determined that no new adverse environmental impacts have been identified. Based on this evaluation it is determined that the Title II Design specifications for NSLS-II are within the scope of the existing Environmental Assessment for NSLS-II (DOE/EA-1558) dated October 2006. This review will be submitted to DOE-BHSO for review/concurrence.

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Memo

Date: *June 12, 2008*

To: *S. Hoey*

From: *R. Lee* R Lee 6/12/08

Subject: *Stormwater Management – NSLS-II*

As discussed during our meetings with HDR Architecture and the NSLS-II Project staff, storm water runoff from the NSLS-II both during and post construction must be managed to ensure flow is maintained to the two existing recharge basins at all times. As you are aware, Recharge Basins HW, located along Weaver Road, and HS, located south of Princeton Ave. receive storm water and snow melt runoff from the warehouse area. The continuous discharge of water and the build up of silt within these basins, results in their extended retention of water. The permanence of water within these basins and the absence of predatory fish make them ideal habitat for the Eastern Tiger Salamander. Failure to maintain adequate flow to these basins will cause the basins to dry out and impact the propagation of the salamander.

The tiger salamander uses many of the BNL storm water recharge basins as breeding pools. Since the recharge basins were originally constructed to receive storm water runoff from roads, parking areas and roofs, the continued release of storm water from the NSLS-II will not have a detrimental impact on these organisms. The NSLS-II project is therefore directed to continue with designs that directly discharge storm water run-off to these two basins. However, during construction and during landscape stabilization periods, erosion control measures must be implemented to prevent the discharge of sediment to the basins. The NSLS-II Project can take this opportunity to enhance these habitats by enlarging the recharge basins, removing impermeable surfaces (e.g., Weaver Drive) and planting appropriate plants that the salamander can use for egg-mass attachments. The project is encouraged to consider applying for LEED credits should it choose to enhance these habitats.

The only concern with the use of the recharge basins is the potential impact to groundwater plumes passing through the area. To minimize potential impact on the plume flow direction, discharge to Basin HW (a.k.a Blue's Pond) should be maintained near its current rate of flow; excess water should be directed to Basin HS. It is extremely important that no new basins be installed to the south or south-west as originally proposed in the 30% design drawings. If a new basin is needed, it should be located to the east or southeast of the

construction site. The Long-Term Response Actions group is available to review appropriate locations for new basins.

If there are any questions regarding this issue, please don't hesitate to contact me at extension 3148.

cc: D. Bauer
W. Dorsch
M. Fallier
N. Gmur
G. Goode
T. Green
D. Paquette
J. Remien

EC110ER.08

Gmur, Nicholas

From: Davis, Mark
Sent: Wednesday, June 18, 2008 10:59 AM
To: Davis, Mark
Subject: FW: (NSLS-II) Construction Project

-----Original Message-----
From: Cathy Haas [mailto:cahaas@gw.dec.state.ny.us]
Sent: Tuesday, October 30, 2007 12:44 PM
To: Lee, Robert J
Subject: (NSLS-II) Construction Project

Bob,

Region 1 finds no fault with your interpretation of the Construction Stormwater General Permit requirements. However, please keep the Department informed of any changes to your individually permitted industrial wastewater treatment system or the wastewater it receives.

Thank you

Cathy A. Haas, P.E.
Environmental Engineer II
New York State Department of Environmental Conservation SUNY @ Stony Brook 50 Circle Road
Stony Brook, NY 11790-3409
631-444-0427

>>> "Lee, Robert J" < blee@bnl.gov > 10/12/2007 10:46 AM >>>
Dear Ms. Haas:

BNL is planning the construction a new major user facility; the National Synchrotron Light Source II (NSLS-II). This is a major construction initiative which will impact up to 40 acres. The proposed site primarily consists of a previously developed site (currently and formerly used for warehousing operations) and a large open grassy field, a portion of which was utilized for softball fields.

Storm water runoff from the warehousing area is collected and recharged via drywells and permitted SPDES outfalls. Discharge post construction will be routed to these existing recharge basins and possibly new basins constructed as part of the landscape of the site. There are no surface waters within the proposed construction area. The nearest wetland is approximately 3000 feet to the east. This consists of a small channel (typically dry during summer months) and two small local wetlands.
During periods of heavy or sustained rain, the wetlands overflow via the channel which then joins with the Peconic River approximately 1 mile away. Topography for the site gradually rises as you traverse the construction site from west to east, such that we do not expect any discharge to the wetlands during construction. All storm water runoff should be to the south and west. Per the NYSDEC website regarding construction permits, a permit for this proposed activity should not be required (see below). In discussions with Dave Gaspar of NYSDEC Albany, documentation for "no permit" is left up to the regional offices. Due to the magnitude of this project, I want to ensure that all permit requirements are addressed as soon as possible.

Demolition of the remaining existing warehouses is expected to occur in the spring of 2008 with formal construction of the NSLS-II staring in the spring of 2009.

You are more than welcome to visit the site. Please contact me at the number below to discuss this project.

Is permit coverage required if there is no discharge to surface waters; i.e. runoff infiltrates into the ground?

A: If the owner can adequately demonstrate that there is no potential for a discharge from their construction site to Waters of the United States or to a municipal separate storm sewer system that discharges to Waters of the United States, the answer generally is no. Discharges of storm water to groundwaters are exempt from permitting requirements unless the Department determines that such discharges (or class of discharges) are significant contributors of pollution.

To date, the Department has not determined that construction site discharges to groundwater are significant contributors of pollution.

In order to demonstrate that there is no potential for a discharge from a construction site, the owner must perform the necessary modeling and site assessments (soil testing, infiltration test, hydrology, etc.) to support their position. The Department will require that this information be submitted for all construction sites we encounter that have not gained coverage under the general permit.

When making the demonstration that all discharges from the site would be to groundwater, the owner must consider each of the following:

* All phases of construction, including the commencement of soil disturbance with no post construction controls in place.

* Runoff from all recorded storm events (1yr, 10 yr, 100 yr, etc.).

* Frozen ground conditions if soil disturbance is possible during periods when the ground is frozen.

* Changes in site topography resulting from grading operations (cuts and fills).

Permitted or not permitted, any such discharge that causes or contributes to a violation of a water

quality standard (including a groundwater standard) is a violation of State law

Robert J. Lee, P.E.

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