

Environmental Review Question – 9/27/06

General

1. Site tour including a general tour of the reactor and experimental facilities, waste management facilities, cooling tower, and fuel storage area.

Response

Wade, Tom, and Dave will escort the tour.

2. Original electronic files for figures used in Environmental Report (ER).

Response

Electronic files used in the ER will be provided as identified by you.

3. If possible, better maps of the site with directional arrows included.

Response

Better site maps will be provided as identified by you.

4. Provide a list of the authorizations from Federal, State and local authorities for current operations as well as environmental approvals and consultations associated with NIST license renewal.

Response

The NIST Center for Neutron Research (NCNR) is part of a federal laboratory and is therefore subject to federal law concerning the operation of the NBSR. The NBSR operating license is granted by the U.S. Nuclear Regulatory Commission (NRC). The NRC requires that an Environmental Impact Statement (EIS) be approved before operation can begin. The NBSR EIS was approved during the last reactor relicensing in 1986. No other authorizations beyond the NRC license is required for the NBSR to operate

5. Do you know of any upcoming major equipment changes or plant modifications?

Response

With the proposed NCNR expansion there are a number of major equipment changes that will be made to the reactor system. These changes include;

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- Modification to the reactor secondary piping system
- Upgrading of the reactor electrical distribution system
- Upgrading of the spent fuel pool
- Upgrading of the reactor console.

Each of these proposed changes will require a change to the Final Safety Analysis Report (FSAR) and will therefore be reported to the licensing agency (NRC). None of the above proposed modifications is expected to have an impact on the environment.

Hydrology

1. Provide how much water is being used for evaporative cooling.

Response

Approximately 42,500,000 gal/normal operating year.

2. If using over 100 gpm, provide where the city water actually comes from.

Response

The Washington Suburban Sanitary Commission provides water to NIST from the Potomac River.

3. Provide copy of NPDES discharge permit.

Response

Copy is attached to this memo

4. Provide name of the person responsible for issuing the permit for the state.

Response

While the name of the individual is listed on the permit, he is: Michael S. Armorer, Group Leader Regulatory Services Group, Washington Suburban Sanitary Commission.

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Land Use and Alternatives

1. Provide alternatives to proposed action per 10CFR 51.45(b)(3). The discussion of alternatives should be sufficiently complete to aid the Commission in developing and exploring, pursuant to section 102(2)(E) of NEPA, “appropriate alternatives to recommended courses of action in any proposal with involves unresolved conflicts concerning alternative uses of available resources.” To the extent practicable, the environmental impacts of the proposal and the alternatives should be presented in comparative form. “Proved an analysis of alternatives to the proposed action per 10 CFR 51.45(c).

Response

In accordance with 51.45(c) "Environmental reports prepared at the license renewal stage pursuant to 10CFR 51.53 (c) need not discuss the economic or technical benefits and costs of either the proposed action or alternatives except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation.

2. Provide any Department of Commerce NEPA documentation for the NIST reactor.

Response

The NIST reactor is a federal reactor and regulated by the U.S. Nuclear Regulatory Commission. We are not aware of a DOC NEPA document for the NIST reactor.

3. Provide the zoning at the NIST campus and the name of the zoning agency.

Response

The property is zoned R-200. The responsible agency is the Maryland National Capital Park and Planning Commission (MNCPPC).

4. Section 2.1.1.1 of the ER indicates the campus is within the incorporated area of Gaithersburg. Provide confirmation that the campus is within an incorporated or unincorporated area.

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Response

While the NIST campus is surrounded (bounded on all sides) by the City of Gaithersburg, Maryland, it is not within the incorporated city limits. It is an enclave within the maximum expansion limits of the City. The campus remains within the unincorporated area of Montgomery County.

5. Per 10 CF 51.45(d), provide a list of all Federal permits, licenses, approvals and other entitlements which must be obtained in connection with the proposed action and describe the status of compliance with these requirements. Discuss the status of compliance with applicable environmental quality standards and requirements including, but not limited to, applicable zoning and land-use regulations, and thermal and other water pollution limitations or requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection. Include a discussion of whether the alternatives will comply with such applicable environmental quality standards and requirements.

Response

As changing condition arise NIST obtains the permits, licenses, approvals and entitlements as required for the task. If you want specific documents please let us know.

6. Provide additional information to meeting 10CFR 51.45(b) (4,5)

Response

10CFR 51.45(b)(4,5) reads:

(4) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and

(5) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

(4) Short-Term Use Versus Long-Term Productivity

An initial balance between short-term use and long-term productivity of the environment at the NCNR site was set when the reactor was approved and construction began in the 1960's. That balance is now well established. Renewal of the NBSR license and continued operation of the NCNR will not alter the existing balance, but may postpone the availability of the site for other uses. Denial of the application to renew the license will lead to the shutdown of the

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reactor and will alter the balance in a manner that depends on subsequent uses of the site. For example, the environmental consequences of turning the site in to a park or an industrial facility are quite different.

(5) Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of the NCNR during the current license renewal term was made when the reactor went from 10 to 20 MW. The resource commitments to be considered in this license renewal are associated with continued operation of the reactor for an additional 20 years. These resources include materials and equipment required for reactor maintenance and operation, the reactor fuel used, and permanent offsite storage space for the spent fuel.

The most significant resource commitments related to operation during the license renewal term are the fuel and the permanent storage space. The NCNR uses approximately 28 fuel assemblies per year. Fuel shipments are made approximately every 5-7 years to an approved storage site.

The impact of ceasing operation of the NCNR would be the loss of the only Major U.S. Neutron Scattering Center in the U.S. The Office of Science and Technology Policy (OSTP) Report XXXXX states how important the NCNR is to the national research goals.

Socioeconomics/EJ

The NCNR appears to be a “user-facility” where “outside” visiting scientists are welcome. (Nearly 2000 engineers and scientists visited in 2002)

1. How many scientists visit the facility on average? How long do they visit (on average – are they usually very quick visits or typically more lengthy visits)? Do they have a policy in place to help house these visiting scientists or do they stay at the local hotels? If so where are the housing facility/hotels?

Response

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The average number of scientists and engineering visitors is 1500/yr. The average length of their visit is 40 days (this corresponds to a reactor run cycle). There is no policy for housing visiting researchers. The visiting researchers stay at the local hotels in the area. There are too many hotels in this area to list.

2. Are the 3500 employees/contractors mentioned on page 2-3 all full-time on-site employees? If not what is their status?

Response

At the present time NIST has 3000-3500 full time employees.

3. Where do most of these employees reside? Provide a list of where current employees reside (generally –cities or counties)?

Response

The NIST employees reside in the following areas:

Gaithersburg

Montgomery County

Fredrick County

Howard County

Prince George County

Fairfax County

Loudon County

et al.

Cultural Resources

1. Provide a resource to obtain cultural and historic resource information, or names of people/organization to contact to obtain this information.

Response

1. Historic Preservation Advisory Committee-City of Gaithersburg, Maryland.
Patricia Patula-Planning Staff Liaison
Telephone: (301)-258-6330
ppatula@gaitthersburgmd.gov

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2. Planning Department-City of Gaithersburg, Maryland
Jacqueline Marsh-Planner
Telephone: (301) 258-6330

3. Montgomery County Historical Society
Mary Kay Harper, Executive Director
Telephone: (301) 340-2825
info@montgomeryhistory.org

4. Maryland National Capitol Park and Planning Commission
(MNCPPC)-Historic Preservation
Gwen Marcus Wright, Preservation Coordinator
Telephone: (240) 314-5000
Gwen.wright@mncppc-mc.org

5. Historic District Commission –City of Rockville
Judy Christensen, Staff Liaison
Telephone: (240) 313-5000
JChriste@ci.rockville.md.us

6. Peerless Rockville Historic Preservation, Ltd.
Eileen McGuckian, Executive Director
Telephone: (301) 762-0096
info@peerlessrockville.org

Aquatic and Terrestrial Ecology

1. Pages 4-5 and 4-6 of the FES state:

“Blowdown of 22gpm for the cooling tower basin with a concentration of 1 to 2 ppm Zinc(for corrosion control) and 600ppm of dissolved solids will result in an annual discharge of about 100 lbs of zinc and 20 tons of dissolved solids to the sanitary sewer system. These discharges will not cause detectable changes in the composition of the Washington Suburban Sanitary commission sanitary sewer system waste, where the average daily capacity is 180 mpd”.

Is this still the case – or have any changes been made that would change the type/amount of chemicals/solids discharged? Describe changes.

Response

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This has changed in the last year. February 9, 2005. Chemtreat will be here to discuss proprietary information. We have the hazard evaluations for each product added from Chemtreat.

2. Have there been/are any impacts on vegetation from the cooling tower drift? Describe impacts.

Response

No visible impacts noted over the last 20 year period.

3. Provide the total loss of water due to evaporation and cooling tower drift.

Response

42,500,000 gallons per year.

4. Are there any wetlands onsite? If so, what are the species that frequently use these.

Respond

Yes, Geese, fish, turtles, and ducks.

5. Are maintenance activities reviewed for potential resource issues (nesting birds, etc)?

Response

The NBSR reactor is located on a federal site. The federal laws governing protected resources are followed. NIST works with the U.S. Humane Society on Deer Populations and Geese Police for the geese population.

6. Provide the best management practices or procedures in place to deal with threatened and endangered species/migratory bird treaty act issues.

Response

There are no known threatened or endangered species on the NIST site. We work with the U.S. Humane Society to control the geese population.

7. What are the dominant features of the terrestrial environment? Common wildlife.

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Response

Cattails and Lilies and Geese, ducks, turtles and fish.

8. Are there any know Threatened and Endangered species that may occur on the NIST site? Have there ever been surveys (informal or formal) of the wildlife on the site?

Response

None known. Yes, NIST works with the Humane Society of the United States (USHS) on deer population.

9. Are there any native/unique habitats onsite? Or managed wildlife areas/activities? If so please provide a description.

Response

No. Yes. NIST also works with USHS and they do a study on the wild life, mainly the deer population. NIST also works with Geese Police for the geese population.

10. Are there any joint projects etc. with state/fed wildlife agencies or private wildlife groups (Nature Conservancy, Audubon etc)?

Response

Yes. With USHS

11. In the event of a breach between the primary and secondary cooling systems, does the process water get discharged into the sewer?

Response

Yes. It would be highly diluted. For normal operating conditions over a single day, a dilution factor of approximately 32,000 could be applied to process water being discharged to the sanitary sewer discharge from NIST.

12. Are there any records of the federal-listed dwarf wedge mussel in the Muddy Branch?

Response

Not to our knowledge. NIST did a stream bank restoration project in 2000, but did not see anything.

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13. Are there any records of the federal-listed bald eagle or small whorled pogonia on the NIST campus? And is there suitable habitat on the campus?

Response

No, NIST has no record of either species being found onsite. Yes, the small whorled pogonia likes acid soil and with the woodlots that are here on site and the leaves that compost in these areas, the site would make a nice home for them. As for the bald eagle, we would probably have a suitable habitat but are not positive we have the necessary acreage on the NIST campus. And the two ponds that we stock with fish would probably not provide enough of a food supply for them.

14. Are there any activities planned related to NBSR that would require new construction or habitat removal?

Response

There is no construction that would require habitat removal

Health Physics/ Rad Issues

PLANT SYSTEMS

1. What is the cooling tower make-up water source? Provide the annual volumes used.

Response

Washington Suburban Sanitary Commission, from the Potomac River, at 42,500,000 gallons per year.

2. Describe any additives to cooling tower water for control of corrosion, microbial growth, etc.

Response

Biocide added is 2,2-Dibromo-3-nitrilopropionamide

Corrosion control added as a single additive is:

2-Phosphono-1,2,4-butanetricarboxylic acid

Tolytriazole, sodium salt

Potassium hydroxide

Quadrasperse® copolymer (proprietary)

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ENVIRONMENTAL MONITORING

- 1. Provide a general program description of the environmental monitoring program.**
- 2. Provide results of the environmental monitoring (summary or previously prepared report preferred, raw data as a last resort).**

Response

Answer to both questions provided below is excerpted from the “2005 NIST Health Physics Annual Report”;

ENVIRONMENTAL MONITORING

Water, soil, and grass are sampled to assess the impact of NIST operations on the environment. Depending on season and access, monthly samples are taken from five soil, or five grass plots on-site, from two off-site ground water sources, from two on-site surface water sources, and from four off-site surface water sources. (Access is occasionally impeded due to hard freezes or snow cover. Locked doors and access on private property for the off-site wells have also, on occasion, precluded gathering samples.) Analytical techniques include liquid scintillation and gamma spectroscopy. None of these routine samples has shown any radioactive material other than that normally found in the environment due to natural sources; fall out from weapons testing; or dispersion from the Chernobyl accident twenty years ago.

Monitoring for gamma radiation is performed at the fence line using TLDs and a real-time environmental monitoring system, trade named GammaTracer. Figure 11 presents the gross annual TLD readings at the fence line for the last five years. Monitoring using TLDs is performed quarterly at 16 locations on the fence line and at 7 locations offsite. The offsite locations are used to determine the natural ambient background levels for this region. Figure 12 shows the net value (difference) between the average of the measured values at fence line locations and the average of the measured values from offsite background locations, for a given monitoring period. For statistical reasons a net value may be less than, equal to, or

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greater than zero. The data shows the exposure at the fence line is indistinguishable from the natural background.

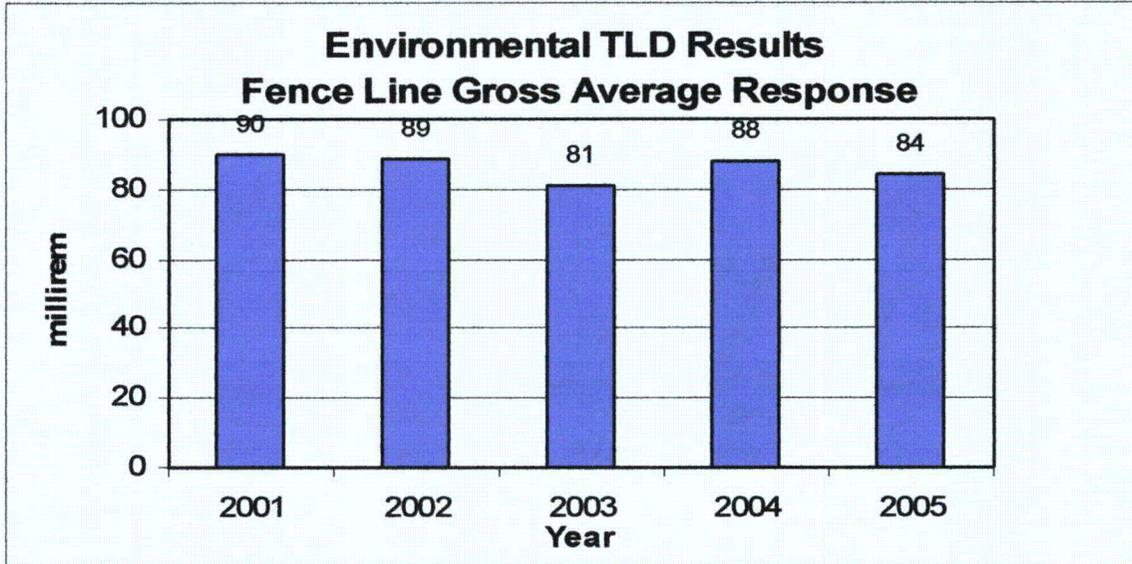


Figure 11: Gross TLD readings at the fence line.

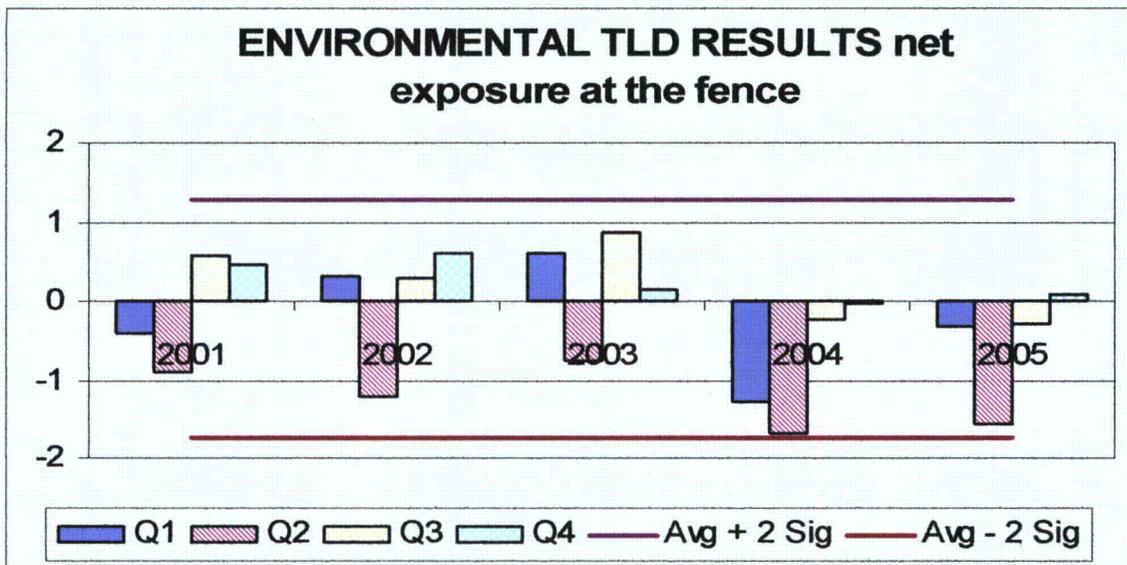


Figure 12. Net exposure for TLD's about the NIST fence.

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Monitoring using GammaTracers is performed at 16 locations on the NIST boundary fence line which coincide with the TLD locations. Figure 13 shows the weekly mean dose rate at the fence line averaging data from all the GammaTracers. The low readings in February 2003 were a result of large amounts of snow on the ground for an extended period, which shielded the detectors from naturally occurring radioactive materials in the soil, and inhibited the release of radon into the air. The blank period in 2002 occurred while the units were returned to the manufacturer for battery replacements.

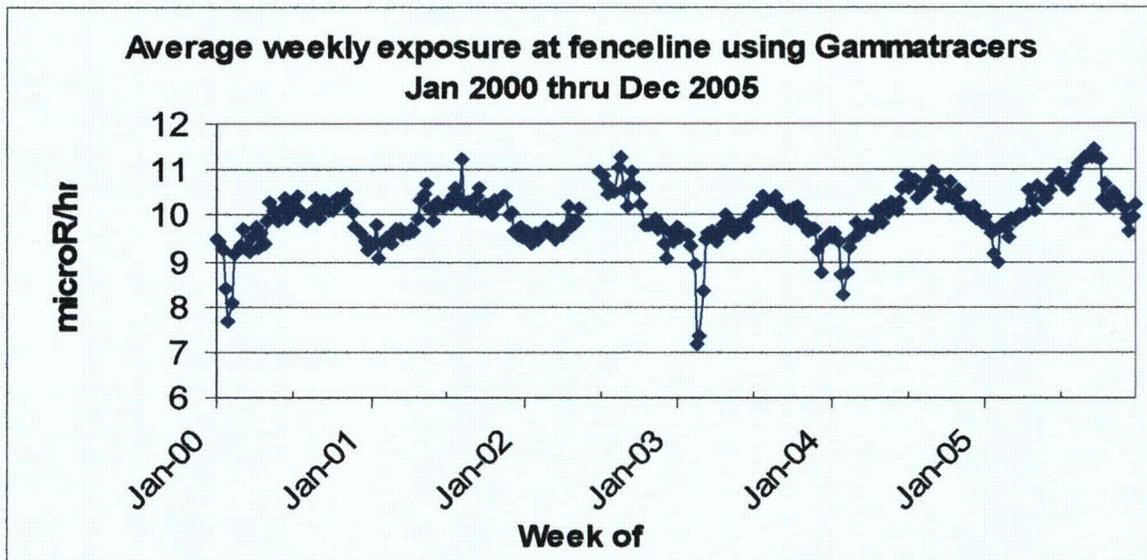


Figure 13. Average weekly exposure rate at the fence line using GammaTracers.

Figure 14 shows a comparison between the gross TLD results in mR and the integrated GammaTracer results in mR for those locations where they are co-located. The data shows no statistically significant systematic difference between the active response Gamma Tracer results and the passive response integrated dose TLD results.

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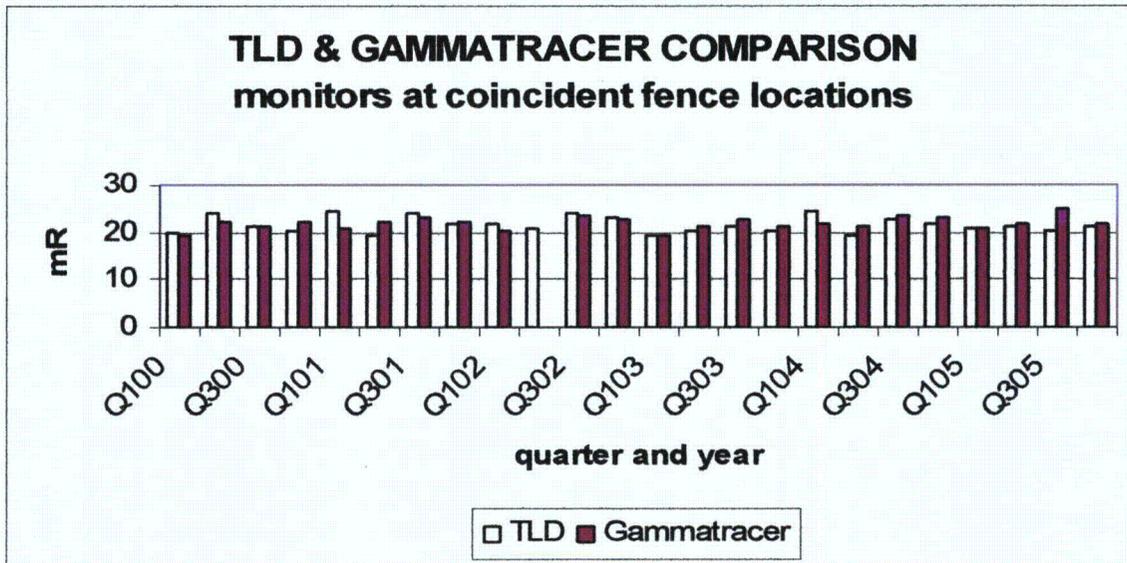


Figure 14. Average Quarterly Exposure (mR) for TLD and Gamma Tracer Monitors.

In summary, the environmental monitoring program indicates no measurable direct exposure beyond normal environmental background at the NIST boundary. The environmental sampling of grass, soil, and water also showed no indication of anything other than those normally found in the environment.

CONCLUSIONS

Dosimetry records indicate all exposures were well within regulatory limits. Area monitoring indicated all operations were conducted safely and in compliance with the regulatory requirements. Environmental monitoring showed no measurable results beyond normal background.

Effluent monitoring

2. Provide results of dose estimates to members of the public from airborne effluents (COMPLY calculations or summary).

Summary of annual dose calculations reported by COMPLY, using Screening Level 4, see full reports, attached;

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Calendar Year	mrem/year
2001	0.6
2002	0.8
2003	0.7
2004	0.7
2005	0.8

3. Provide estimated dose from liquid effluents released to sanitary sewer.

Summary of Liquid Radioactive Effluents from NBSR			
Year	H-3 Ci	Beta-Gamma mCi	Est. Annual Dose to an individual - mrem*
2001	2.57	0.26	0.4
2002	4.79	0.32	0.7
2003	4.61	0.12	0.7
2004	4.87	0.45	0.7
2005	4.75	0.51	0.7

- derived from values and basis provided in 10CFR20 Appendix B, Table 3, and average NIST sewer effluent of 2.63e5 gallons per day (CY 2005).

4. Provide collective doses to members of the public.

It is not absolutely clear to me what is being asked for here. If it is the total possible dose, from all sources, delivered to the population around the NIST site, we do not currently have the data required for this estimate. As stated above in the Environmental Monitoring excerpt from the 2005 Health Physics Annual Report, the measured “net” dose at the NIST fence line is reported as zero for the last many years. Known effluents do establish a calculable dose to a population offsite, though much more data would be needed to ascertain a realistic collective dose value.

Radioactive waste management

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CY 2004 Radwaste Shipment totals The first four shipments were all 10CFR61 Class A waste. The shipment on 11/15/2004 to Barnwell, SC was 10CFR61 Class C waste.

Radioactive Waste Shipments

Date	Manifest No.	Consignee	Cubic feet	Pounds	mCi
9/9/04	40906	NSSI, Houston, TX	22.0	830.7	18.03
9/27/04	T043855	Duratek, Oak Ridge, TN	316.5	15,503.0	61.151
9/29/04	40927-05	Duratek, Oak Ridge, TN	22.7	1,399.3	15.18
9/29/04	40927-04	RACE, Memphis TN	126.7	10,517.4	5.483
11/15/04	NIST 01-01	Barnwell CNSI, SC	85.8	2,510.0	
703,617.93					
CY 2004 totals:			573.8 cf	30,760.4 lb	
703,718 mCi			16.247 m³	13,952.7 kg	2,6037,560
MBq					

CY 2005 Radwaste Shipment totals

Volumes and weights are net waste. 5 shipments in CY 2005. All waste was 10CFR61 Class A.

Radioactive Waste Shipments

Date	Manifest No.	Consignee	Cubic feet	Pounds	mCi
7/21/05	50718-09	Duratek, Oak Ridge, TN	15	930	1.271
7/21/05	50718-10	Permafix, Gainesville, FL	15	381	1.516
7/27/05	T053511	Duratek, Oak Ridge, TN	158.2	6,837	131.34
7/27/05	50718-25	RACE, Memphis TN	138.8	21,634	1.393
9/21/05	50919-09	Duratek, Oak Ridge, TN	112.5	1,041	0.091
CY 2005 totals:			439.5 cf	30,823 lb	135.61
mCi			12.45 m³	13,981 kg	
5017.6 MBq					

NIST CY 2001 – CY 2005 shipment consignees

Allied Technology Group (ATG), 2025 Battelle Blvd., Richland, WA 99352
 Contact: Bob Denne (509) 375-5160

Barnwell Waste Mgmt Facility, run by Chem-Nuc Sys Inc (CNSI), 740 Osborne Rd,
 Barnwell, SC 29812
 Contact: Licensing Dept. (803) 259-1781

Duratek Inc, 1560 Bear Creek Rd, Oak Ridge, TN 37831-2530
 Contact: Donnie Bracket (865) 220-1526

NSSI/Recovery Services Inc., 5711 Etheridge Rd, Houston, TX 77087
 Contact: Bob Gallagher (713) 641-0391

Permafix of Florida, Inc, 1940 NW 67th Place, Gainesville, FL 32653
 Contact: Raymond Whittle (352)373-6066

RACE, LLC 2550 Channel Ave, Memphis, TN 38113

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Contact: Bobby Newell (901) 775-0690

US Ecology NMMC, 109 Flint Rd, Oak Ridge, TN 37830
Contact: Chuck Wallace (865) 220-5283

2. Provide the volumes and activities for occasional high activity waste shipments.

Once every ~ 3.5 years, with normal reactor operating cycles (no extended shutdowns for major maintenance), we ship one package of 10CFR61 Class C waste directly to Barnwell, SC for burial. It is shipped in a 10CFR71 Type B shielded cask.

The last shipment of this type:

Date	Activity(MBq)				
	Activity(mCi)				
shipped nuclides	vol (m ³)	vol(ft ³)	wt (kg)	wt (lb)	all nuclides all
11/15/2004	2.4296	85.8	1138.5	2510.0	2.60E+07
	703617.93				

The Barnwell, SC disposal facility will no longer accept waste from outside their Compact (SC & NJ) after June 30, 2008,...so we plan to ship one last time to them in ~ May, 2008. With our current storage pool arrangement, we have capacity to store ~ 4 operating-years volume of this type of waste,...so that means we need an alternate disposal option for this type of waste beyond the summer of 2012.

3. Is any MLLW, GTCC, TRU waste generated? Provide volumes and activities.

MLLW:

For this category, MLLW must be broken-down into contact-handled vs. remote-handled waste sub-categories.

At our facility, contact-handled Mixed Low Level Waste (CH-MLLW) generally is waste that is irradiated and/or contaminated external to the biological shield that surrounds the reactor vessel.

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CH-MLLW is almost always < 1 mR/hr contact, and is usually < 0.1 mR/hr contact.

Our CH-MLLW consists of:

- Activated Cadmium from experiment masks. (< 0.01 cubic feet/year)
- Contaminated Lead from shielding. (~ 2 cubic feet/year)
- Routine LSC cocktail solutions resulting from sampling analyses. ($\sim 2 \times 55$ -gal drums/year)
- Very seldom: contaminated cleaning solvents. (~ 1 liter/year)

There are disposal options available for all of these CH-MLLW waste streams. Our CH-MLLW is all 10CFR61 Class A waste. Solid Class A MLLW can generally be treated for acceptance at the Envirocare facility in Clive, Utah. Solutions of MLLW can generally be incinerated at several licensed facilities.

Remote-handled MLLW (RH-MLLW) are irradiated within the volume of the biological shield surrounding the reactor vessel. The EPA RCRA regulated substances are Cadmium and Lead.

Cadmium RH-MLLW:

Cadmium is incorporated into our reactor reactivity control blades as an Aluminum-Cadmium-Aluminum rolled sandwich. The cadmium-loaded sections of the blades are cut off from their hubs. These blades decay to Class A waste after seven years, whereupon they conform to the acceptance criteria for treatment and disposal at the Envirocare, Utah facility. Four blades are removed from the reactor once every four years. We load eight blades into a two cubic foot storage container. We have dedicated shielded storage capacity for the next forty years.

Lead RH-MLLW:

The Lead utilized in the NIST reactor is at least 99.9% pure, and probably greater than 99.99% pure, as evidenced by the lack of activation products seen in gamma spectroscopy. Pure lead does not become activated. The lead bearing components become MLLW because the lead is either bonded to or cast within an activated component and is inseparable from that component.

1. Lead is bonded to carbon steel to form the Thermal Shield which envelopes and supports the reactor vessel. A two-inch thickness of lead is bonded to an eight-inch thickness of steel, with a total mass of $\sim 250,000$ lbs. which will have to be disposed of upon reactor decommissioning. The

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lead-carbon steel matrix is Class A waste. Since the isotopes produced within the steel are already at saturation, continued operation of the reactor for any amount of time will not affect the activity or waste classification of the lead-carbon steel matrix.

2. Lead is incorporated into the neutron beam-port shutters, and is cast within the volume of neutron guide shields and plugs. The guide shields that contain stainless alloys are exposed to higher neutron fluxes than the Thermal Shield, so they are Class B waste and can have dose-rates as high as 100 R/hr @ 30 cm upon removal from the reactor. They are transferred to shielded permanent storage at our facility, to be disposed of at reactor decommissioning. We currently have ~ 90 cubic feet of waste in storage that was ~ 100 R/hr upon removal from reactor, plus ~ 60 cubic feet of waste that was < 10 R/hr upon removal and transfer to storage.

GTCC:

There has never been any GTCC waste generated as a result of any activity performed under the reactor license, nor will any GTCC waste result from any eventual decommissioning activities, including disposal of the reactor vessel and all internal components.

TRU:

There has never been any TRU waste generated as a result of any activity performed under the reactor license, nor will any TRU waste result from any eventual decommissioning activities. Note: This specifically excludes the management of the reactor spent fuel.

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Non-radiological waste management

1. Provide volume and destination of routine non-radwaste

Estimate about 50 ton of garbage per annum from entire NIST Site. This is taken to the Montgomery County transfer station, 16101 Frederick Road, Derwood, Maryland.

2. Describe any waste management, recycling facilities that are on site.

Answer provided in email by Mr. James M. Blackmon, Environmental Compliance Group, NIST Safety, Health and Environment Division:

NIST is classified as a Large Quantity Generator of hazardous waste by the U.S. EPA. At the Gaithersburg Site, NIST operates a waste processing facility (Building 312) at which hazardous waste is temporarily stored (< 90 days) and packaged for off-site disposal/recycling. NIST does not treat, permanently store or dispose of hazardous waste on-site.

NIST does not dispose of any non-hazardous solid waste on-site. The following items were sent off-site to be recycled in FY 2005:

	<u>AMOUNT RECYCLED FY2005 (Tons)</u>
• Scrap metal	677.4
• Computers, electric equipment	68.4
• Paper/cardboard	72.0
• Cans, glass, plastic	3.6
• Lead acid batteries	9.4
• Fluorescent bulbs	2.5
• Waste oils	1.5
• Mercury	1.0
• Various chemicals	<u>0.9</u>

Total Off-Site Recycling NIST Gaithersburg 2005: 836.7 Tons

Tree limbs, shrubs and etc. are chipped, stockpiled and reused as mulch.

The remainder of NIST's non-hazardous solid waste is sent off-site to Montgomery County solid waste processing facilities.

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Occupational radiation protection

1. Provide the doses to facility staff and other monitored individuals (external researchers, etc). If appropriate, provide routine reports to NRC for previous 5 years that include standard data on number of monitored staff, number of monitored staff with measurable dose, collective dose, average dose to individual worker, highest dose to individual worker, number of workers by dose range.

Information excerpted from "2005 NIST Health Physics Annual Report";

REACTOR BADGED WORKERS

Term: calendar year annual dose equivalents

DE type: total effective dose equivalent

NIST DE Range (rem)	2001		2002		2003		2004		2005	
	#W	CD-rem								
0.000	262	0.000	279	0.000	198	0.000	337	0.000	488	0.000
0.001-0.049	354	3.131	385	3.149	623	5.837	400	3.498	372	2.912
0.050-0.099	15	1.081	26	1.892	27	1.915	15	1.001	23	1.524
0.100-0.149	9	1.073	10	1.224	18	2.219	6	0.754	13	1.561
0.150-0.199	5	0.896	3	0.495	10	1.666	3	0.492	11	1.863
0.200-0.249	1	0.211	1	0.200	3	3.627	5	1.098	5	1.129
0.250-0.499	16	6.223	17	6.212	4	1.272	16	5.155	2	0.636
0.500-0.749	7	4.122	4	2.469			1	0.619		
0.750-0.999	6	4.930	2	1.568						
1.000-1.249										
1.250-1.499										
1.500-1.999	1	1.939								
2.000-2.499										
2.500-2.999										
3.000-3.499										
3.500-3.999										
4.000-4.499										
4.500-4.999										
Total 0.001 to 4.999rem	414	12.615	448	14.060	685	13.532	445	11.998	426	9.625
Totals > 0.50 rem	14	10.991	6	3.149	0	0.000	1	0.619	0	0.000
Max dose to individual rem		1.939		0.795		0.377		0.619		0.357
TOTALS	676	23.606	745	17.209	883	13.532	783	12.617	914	9.625

Environmental Review Question – 9/27/06

Industrial Safety

1. Provide the number of recordable injuries/illnesses per worker-year.

Response

From 1996 to 2006 there have been 17 incidents. Sixteen of this were minor with no loss of time and one was a loss of time injury. There were no injuries in 2006 and there was one injury in 2005.

Meteorology

1. NIST has been operating a weather station since 2002. Provide the data available and any preliminary comparison with nearby National Weather Service (NWS) stations.

Response

We commit to keeping one year of data for wind speed and direction. We ran both our old system and the AWA system together, looked at the data and then took the old system out of service. I am not aware of any comparisons with NWS stations (Dulles or National), as it was previously demonstrated that the old system provided accurate indication of wind speed and direction.

*2. Is an operating permit (Title V permit) for pollutant emissions required, or is the NIST site considered a minor source and so one is not needed? Are emission sources from generators only?

Response

Response will be from Dennis