DOE/EA-0896

ENVIRONMENTAL ASSESSMENT

CENTER FOR NUCLEAR MEDICINE RESEARCH IN ALZHEIMER'S DISEASE
HEALTH SCIENCES CENTER - WEST VIRGINIA UNIVERSITY

PREPARED BY

U.S. Department of Energy.

April 1994

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1.0 DOCUMENT SUMMARY

1.1. Description

The Department of Energy proposes to authorize West Virginia University to construct and equip the Center for Nuclear Medicine Research in Alzheimer's Disease and Related Disorders (CNMR). The CNMR would be located in the basement and on the ground and first floor levels of the existing multi-story Health Sciences Center.

1.2 Alternatives

Alternatives include not authorizing construction. This would leave the University without a major portion of funding for the project, but might not prevent the University from proceeding with other funding. However, since the University is committed to construct the project irrespective of the source of funding the project would eventually be built and the impacts of the project would be the same as described in this EA. Alternative sites at the University were considered prior to the DOE appropriations to the project and the DOE took no part in the site selection process.

1.3 Affected Environment

The affected environment is an existing university and hospital campus. The only wildlife is associated with typical urban habitat that includes trees, lawns and gardens.

1.4 Construction Impacts

Construction would consist of renovation of an existing basement space. Environmental impacts would be limited to minor traffic, demolition dust, and some noise typical of building renovation.

1.5 Operating Impacts

The proposed project would use equipment posing a potential radiation hazard, material containing radionuclides, and various hazardous materials in conducting clinical studies and patient treatment. Waste storage, removal and disposal would be managed under existing University programs which comply with Federal and state requirements. Radiological safety programs conducted pursuant to Nuclear Regulatory Commission license to use equipment producing radiation and radioactive materials, and to applicable EPA and OSHA regulations governing hazardous materials in the work place would similarly be applied to the proposed project. Risks of radiological, toxic and other hazardous exposures to personnel appear to be very low. The proposed project would not require any new permits, and existing waste management and safety programs would accommodate the proposed project. Radioactive air emissions would be in compliance with EPA limits. Based on the information provided by the University, the building which houses the project would be in compliance with all applicable environmental laws and regulations such as those protecting the air, water and land environments.

2.0 PURPOSE AND NEED FOR AGENCY ACTION

Congress has provided funds to DOE to assist in the construction of the CNMR at West Virginia University. DOE's purpose is to carry out this congressional interest (described below) and to contribute to its own mission by supporting research programs such as the CNMR at West Virginia University's (WVU) Health Sciences Center (HSC).

3.0 DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

3.1 Description of the Proposed Action

The Department of Energy (DOE) proposes to authorize WVU to proceed with the detailed design, and construction of the CNMR. The report (S. Rep. No. 101-378) accompanying the FY 1991 Energy and Water Appropriations Act (Pub. L. No. 101-514), indicated that $10,000,000 had been included in DOE's fiscal year 1991 appropriation to assist West Virginia University with construction of the CNMR. A grant was executed with the University on August 5, 1991, and grant funds are available to the University for the limited purpose of performing preliminary studies, including analysis necessary to prepare this environmental assessment. However, under the terms of the grant, the grantee may not initiate construction or take any other action which would affect the environment or limit alternatives until the DOE NEPA process has been completed and DOE has determined that such action should proceed.

3.2 Project Description

[Additional project details are presented with the impact analysis in Chapter 5.]

3.2.1 Construction Activities

The CNMR would occupy space within one of the existing buildings of the Health Sciences Center complex on the Evansdale Campus of the West Virginia University located in Morgantown, West Virginia. This structure is a 1.1 million square foot, semi-fireproof concrete and steel structure built in the late 1950s. Accordingly, the project entails no foundation or structural work. The construction of the CNMR would involve renovation of existing hospital-related space. The CNMR would be housed in the existing radiation therapy unit Space (RTU). The RTU is being relocated to another building. Interior walls and partitions of this space would be demolished to facilitate the renovation. (Ref 4)

Approximately 26,040 gross square feet of the basement, the ground floor and the first floor level have been allocated to house the equipment and supporting activities of the CNMR. Approximately 15,350 gross square feet of this space would house the PET Scanner, the cyclotron, the electronics room, operator's room quality control area, radioactive source storage, laboratories and patient preparation rooms. The balance of approximately 10,690 gross square feet has been allocated to access and administrative support facilities to the PET scanner, including main lobby corridors, elevators to the basement level and offices for the director, facility and research staff. The Construction would last about one year after the start. (Ref 4)

The Health Sciences Campus Center is part of the West Virginia University as shown on Figure 1, and includes the following buildings: Health Science Center - North & South including the Mary Babb Cancer Center, Ruby Memorial Hospital, Physicians Office Center, Chestnut Ridge Hospital, and the Ambulatory Care Center. Figure 2 shows these facilities. Figure 3 shows the location of the proposed CNMR within the Health Sciences Center. CNMR would employ approximately 15 persons.

3.2.2 Operation Activities

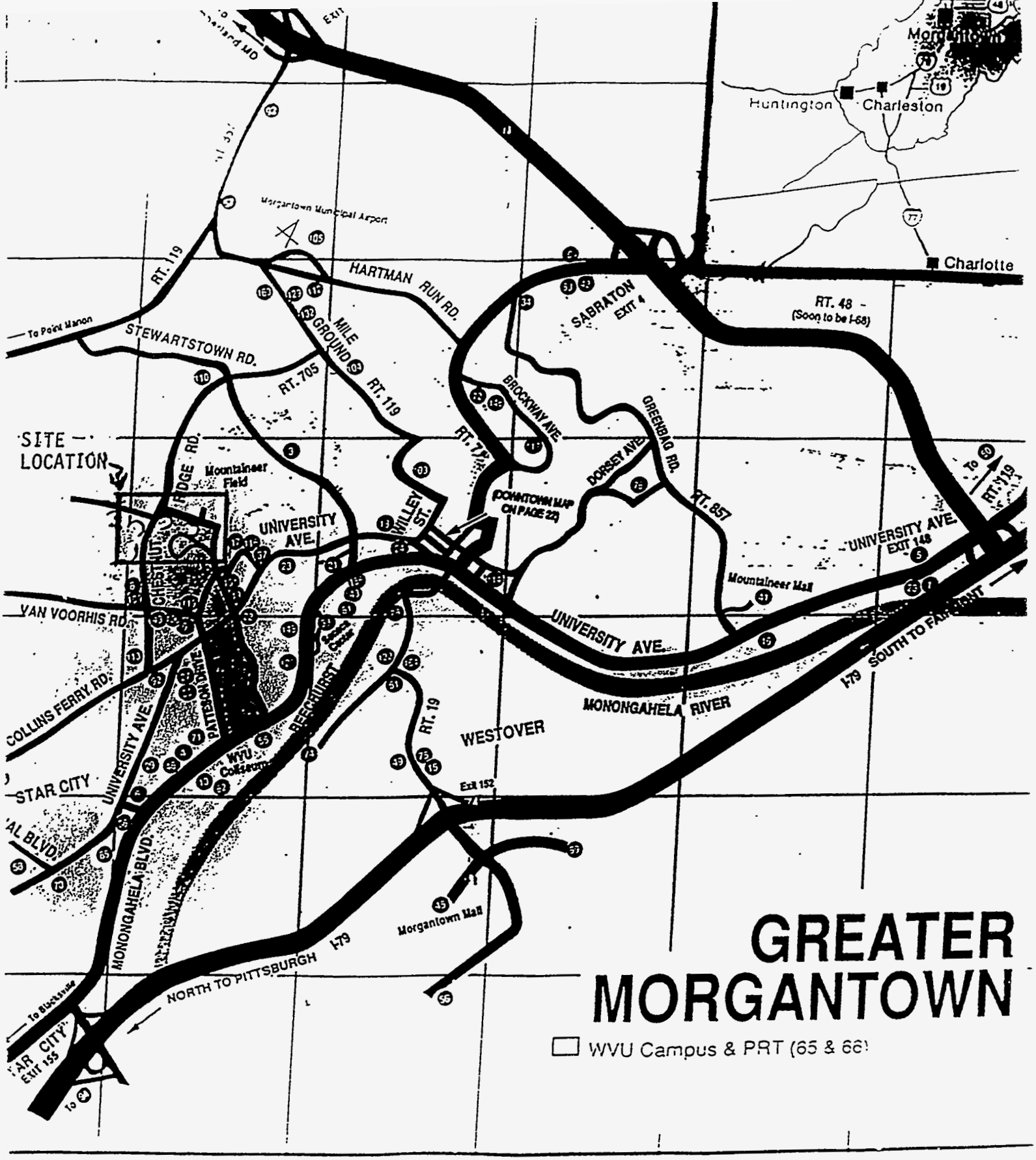
The purpose of the PET Scanner and Cyclotron is to research unique alterations in regional glucose metabolism and regional blood flow specific to Alzheimer's disease. PET holds promise for distinguishing Alzheimer's disease from other causes of dementia, such as Pick's disease and multi-infarct dementia.

The CNMR would provide additional clinical services, as well as research activities at the Health Sciences Center. Various pharmaceutical chemicals, including some radionuclides would be used in both therapy and research (Ref 4,5).

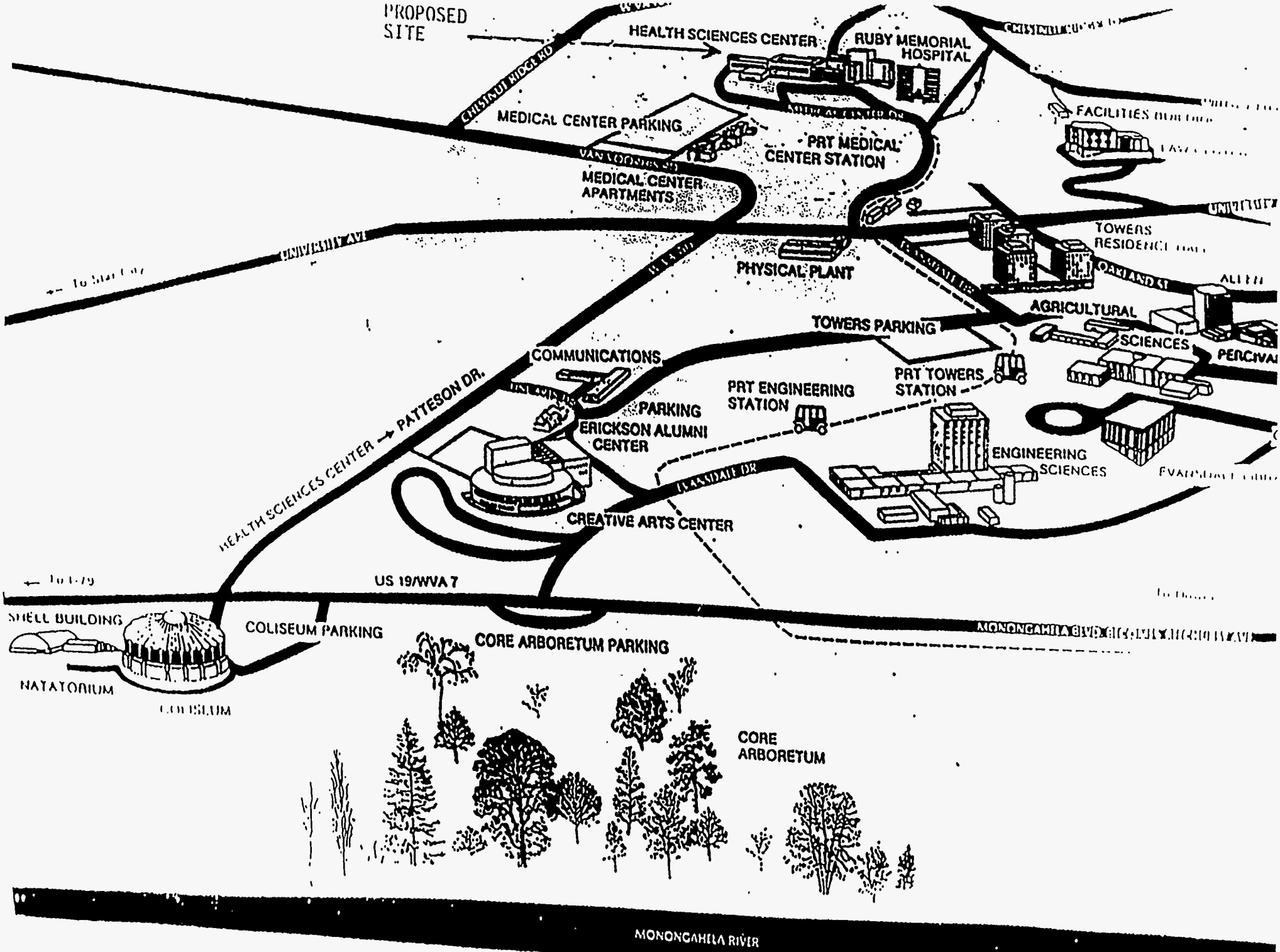
3.3 The No Action Alternative

Under the no action alternative, DOE would not authorize the expenditure of funds to proceed with construction or any other action which would affect the environment or limit alternatives. No action would mean that the WVU would be without a large amount of the funding required to construct this state-of-the-art research facility, inhibiting its ability to significantly increase the level and quality of biomedical research.

Construction and operation of the proposed facility could occur as a result of other funding mechanisms, could be delayed or might not occur. If the facility was constructed and operated as a result of another funding mechanism or occurred later, i.e., delayed schedule, the minor environmental impacts described in this EA would still occur. If a decision was made by the University not to construction and operate the facility, the environmental impacts ascribed to this project would not occur.



gure 1. Site Location Map



Proposed site in relation to the Evansdale Campus - West Virginia U...

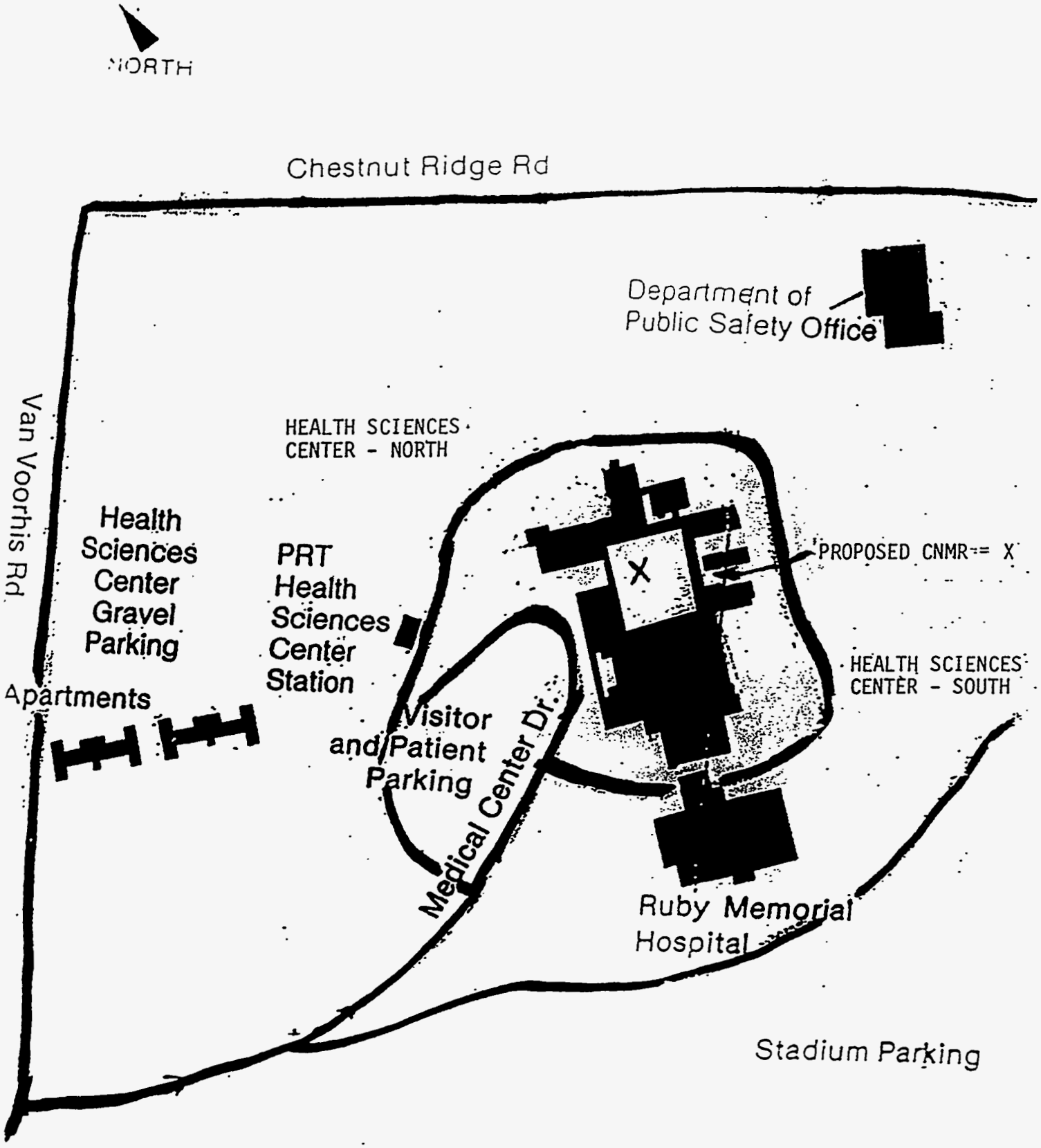


Figure 3. Location of the proposed CNMR within the Health Sciences Center

3.4 Site Alternatives

The University has considered other sites and locations on their campus for the proposed facility in the early planning for the project as part of a master planning process in 1988 (Ref 19), but found none that were feasible for further planning and design. The proposed basement space of the Health Sciences Center uniquely met criteria of economy and suitability for the proposed activities, as well as proximity to related research programs within the same building (Ref 5).

4.0 THE AFFECTED ENVIRONMENT

The proposed CNMR would be located within the existing Health Sciences Center, which is part of a combined university and hospital campus. (Figure 3). The campus environment is characterized by several high-rise buildings, roads, walkways, parking areas, and open space. Flora typical of such built up areas includes grass, trees, shrubs and landscape plantings. Fauna includes common insects, birds and small mammals such as pigeons and squirrels.

The Health Sciences Center occupies 145 acres, has 1.1 million square feet of occupied building space, and serves a community of over 3000 students, faculty and workers.

5.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

5.1 Construction Impacts

5.1.1 Sensitive Resources

None of the following sensitive resources would be involved or adversely affected by the project: historical/archeological (Ref 1,2), Federal/State-Listed or Proposed Protected Species or Critical Habitats (Ref 2,28), Floodplains/Wetlands (Ref 3), National Forests, Parks, Trails (Ref 4), Prime Farmland (Ref 4), Special Sources of Water (Ref 4).

5.1.2 Erosion/Run-Off

The proposed action is an interior renovation only and would not cause erosion or runoff (Ref 4).

5.1.3 Demolition/Construction Waste Disposal

5.1.3.1 Asbestos

Asbestos removal from the space to be occupied by the CNMR and disposal will have been completed following standard regulatory procedures, prior to the renovation and construction, as part of a University-wide program and independent of DOE funding or involvement. Accordingly, the project contractor would receive the buildings and site asbestos free (Ref 4).

5.1.3.2 Excavation Waste / Disturbance of Contaminated Soil

There would be no excavation involved in the project.

5.1.3.3 Demolition/Construction Waste Disposal

Approximately 250 cubic yards of general construction waste would be generated in the process of renovation. This would be removed and disposed of by the general contractor in an approved landfill. Pliable lead shielding would be removed and recycled.

5.1.4 Air Quality Impacts (Dust, Equipment Emissions)

Air quality impacts of construction would be low-level intermittent and transient impacts routinely resulting from the coming and going of trucks, on-site machinery, and dust created by renovation. Dust created in renovating the basement space would partially settle and be disposed of as trash, while the remainder would be vented to the outdoors. Data on the amount of dust and ultimate fate is not available. However, this would be a very transient effect and extremely unlikely to cause adverse effects. The contractor would likely require personnel to wear protective breathing apparatus if interior dust levels warrant. (Ref. 5)

5.1.5 Noise

Noise common to building construction would result from truck traffic, on-site diesel machinery, natural gas driven machinery, electric generators, motors, pumps and compressors. Typical noise levels during construction of commercial buildings which integrate the effect of all noise sources range from 77 decibels (dB) to 89 dB depending on phase of the construction, measured at the building site and dissipating with distance - by approximately 2/3 at 400 feet, or approximately to 55-60 dB, which is below the annoyance level. (Ref 8)

Criteria for average acceptable outdoor sound levels range from 55 dB for residential land use to 70 dB for office buildings and outdoor recreation areas (these are day-night integrated values) (Ref 15). Actual noise levels for the project would be less than above because most construction activity would be indoors.

Since all of the construction would be concentrated in the basement level (and there would not be any patients on this level) only construction workers would be partially affected by any construction noise. The construction contractor would provide ear protection, if required, for its workers if noise becomes a problem or is irritating. For office personnel in the building, construction noise is expected to be minimal due to the remote location of construction in the basement of the facility.

5.1.6 Transportation Impacts

Local parking would not be affected nor would the traffic flow patterns be affected. The renovation would generate approximately 50 auto or truck trips per day at the peak of the schedule. (Ref 5).

5.2 Operations Impacts

5.2.1 Domestic Waste

Domestic solid waste would consist largely of packaging materials, approximately 25-30 pounds per day. This would be merged with approximately 10,000 pounds per day of domestic solid waste already generated by the building for licensed disposal. The amount of domestic waste generated by operation is minor and will not challenge the total capacity of the licensed disposal facility (Ref 5).

5.2.2 Sanitary Waste

Building sanitary liquid waste systems are already connected to the West Virginia University Health Sciences Center sanitary effluent which discharges directly to an existing public sanitary sewer that has ample capacity (Ref 5). Discharge from the CNMR would approximate 3000 gallons per day of the approximately 300,000 gallons per day for the Center. (Ref 5).

5.2.3 Hazardous Waste

Approximately 20 liters per day or 364kg per month of hazardous wastes would be generated by the CNMR in the form of solvents, alcohols and ethers commonly used in hospital clinical activities (Ref 4). These would be collected at least weekly to be stored with similar waste from the Health Science Center under the supervision of a WVU Hazardous Waste Specialist, with the assistance of a WVU Hazardous Material Technician. The storage area is approximately 12 by 24 ft, and is screened off on the Health Science Center loading dock area and is sufficient to handle the waste from the proposed action. Hazardous wastes from all Health Science Center sources are collected for transport and disposal by Rollins Chem Pack Inc., an EPA licensed contractor approximately 4-5 times per year (Ref 5). The Health Science Center of which the proposed CNMR would be a part currently generates approximately 95 kg/month.

The West Virginia University has been classified by the EPA as a small quantity waste generator. The Health Science EPA identification registration number is WVD073129942. (Ref 4). WVU has an on-site hazardous waste management program which would provide coverage to the new facility (Ref 4, 6). The increment of about 364 kg/month would not effect the "small generator" status of the Health Science Center (Ref 4). {40 CFR 260.10 defines a "small quantity generator" as "a generator who generates less than 1,000 kg of hazardous waste in a calendar month".

5.2.4 Biological/Medical Waste

Biological and medical wastes of the CNMR would consist of about 5 gallons per day (about 23 kg per day) of discarded needles, syringes, and blood (Ref 4). This waste stream would be merged with the existing 1818 kg of waste per day at two existing on-site facilities: an incinerator and an autoclave (Ref 4). This small increment of biological/medical wastes would be well within the capactiy of the current incinerator/autoclave operations. The incinerator is a Cleaver-Brooks Model # MN-600, operating under a permit issued by the West Virginia Air Pollution Control Commission #R-X111-845. The incinerator is in the basement of the Health Sciences Center. The University maintains three autoclaves in a separate room of the Health Sciences Center basement which are used as alternatives to incineration. Biological wastes are managed in accordance with the University's Infectious Medical Waste Management Plan (Ref 12).

5.2.5 Radioactive Waste

The radioisotopes to be used at the CNMR produce very low levels of radiation and have very short half lives so that within routine waste storage times there is no significant residual radiation (Ref 4). The estimated volume of radioactive waste from the proposed facility would be less than one gallon per day. This would include essentially all of the radionuclides that are produced and not either administered to patients or vented through the hood. Two radioactive isotopes are involved:

(1) Approximately 5 Ci of C-11 having a half life of 20 minutes would be placed in storage each day. Residence time prior to pick up for disposal would be in excess of 24 hours. Residual radioactivity at 24 hours would be about 6.5×10^{-22} Curies, or about 0.65 pico-curie - essentially negligible.

(2) Approximately 300 mCi of F-18 having a 1.8 hour half life would be placed in storage each day. Residence time prior to pick up for disposal would be in excess of 60 hours (Ref 5). By that time the residual radioactivity level would be approximately 2.8×10^{-11} Curies or 280 nanocuries - essentially negligible.

These levels may be compared with Nuclear Regulatory Commission requirements for labelling of licensed materials (Ref 9) - 10^{-3} Ci for C-11 or F-18. Residual levels would be many orders of magnitude below these requirements. (The governing half life decay law is $A_1 = A_0 \ e^{-Lt}$, where A_0 = initial radioactivity in Curies (Ci), A_1 = level after time t, and L = .693 / $T_{1/2}$, $T_{1/2}$ = half life, Ref 13). The proposed facility would generate no radioactive mixed waste.

5.2.6 Radioactive Exposures

Exposure of staff and public to radiation induced by the PET scanner or created by the cyclotron is regulated by 10 CFR 20.101 (Ref 15). Staff exposure limits are 1.25 rems/quarter whole body, 18.75 rems/quarter hands, forearms, feet and ankles, 7.25 rems/quarter skin of whole body. Public

exposure limits are 0.5 rems/year (10 CFR 20.105). Compliance with these limits would be assured by proper design (which includes adequate lead shielding) and by proper operating procedures under the supervision of the University's Radiation Safety Officer. Patients treated with the PET scanner or radionuclides from the cyclotron would receive prescribed levels of radiation as appropriate to diagnostic and therapeutic procedures, for which there are no regulatory limits (Ref 4,5,15).

5.2.6.1 Radionuclides

Radionuclides would be produced by the cyclotron for radio-medical research and treatment applications (Ref 21). Use of radioactive medicines on the WVU campus is in accordance with Nuclear Regulatory Commission regulations 10 CFR 35 "Medical Use of By-product Material", and the University possesses a license for the use of such materials pursuant thereto. (Ref 5). The principal radionuclides used would be Fluorine 18 and Carbon 11, with respective half lives of 1.8 hours and 20 minutes (Ref 4). Exposure of personnel to radioactivity at WVU is under the supervision of Radiation Safety Officer who follows the WVU Radiation Program Policies and Procedures using ALARA practices (Ref 5, 15).

5.2.6.2 PET Scanner

The PET scanner is a commercially manufactured device by GE Medical Systems. It uses a Germanium-68 Photon Line Source with a maximum activity level of 30 millicuries. Each unit is subject to extensive testing prior to customer delivery and includes a Certificate of Sealed Source Test pursuant to ANSI Standard N542-1977 (Ref 22).

Exposure of staff and public to radiation induced by the PET scanner or the cyclotron is regulated by 10 CFR 20.101 (Ref 15). Staff exposure limits are 1.25 rems/quarter whole body, 18.75 rems/quarter hands, forearms, feet and ankles, 7.25 rems/quarter ankles. Public exposure limits are 0.5 rems/years.

Compliance with these limits would be assured by proper design (which inlcudes adequate lead shielding) and by proper operating procedures under the supervision of the Unversity's Radiation Safety Officer. Patients treated with the PET scanner or the cyclotron would receive prescribed levels of radiation as appropriate to diagnostic and therapeutic procedures, and there are no regulatory limits (Ref 4, 5, 15).

The dose delivered to a patient at 30 cm from the source would be 9.3 mREM per hour from the Ge-68 line source (Ref 22). Operating personnel would be at least one meter from this source, and intensity of radiation from a line source decreases by the square of the distance yielding a dose rate at 1 meter of 0.0084 mREM/hr.

Assuming an operator at one meter spent 24 hours per day over the calendar quarter, and did not wear lead shielding per radiation safety procedures, the exposed time would be approximately 2500 hours, the cumulative quarter

dose would be approximately 22 mREM or 0.022 REMS, and the annual exposure 0.0088 REMS. Assuming an 8 hour, five day per week operation reduces estimated exposure by a factor of 5. Allowing for the fact that operators would be in excess of 1 meter from the source, and that shielding would be used per radiation safety regulations, it can be reasonably estimated that annual exposure would not exceed 0.0088 REMS.

The health consequences of 0.0088 REMS/year to the 4-6 workers potentially exposed because of their work, would be 2×10^{-5} deaths/year (Source: NRC, Preamble to Standards for Protection Against Radiation, 56FR23363, May 21, 1991). The health consequences to the general public would be inconsequential.

5.2.7 Air Emissions

5.2.7.1 Criteria Pollutants

The proposed project would not add to the existing building's heating and air conditioning load. Accordingly, the project would not be an incremental source of criteria pollutants.

5.2.7.2 Radioactive Emissions

The proposed facility is expected to have an annual production of 100 curies (Ci) of Fluorine-18 (F-18) and 14.4 Ci of Carbon-11 (C-11), with half lives of 1.8 hours and 20 minutes, respectively.

Radioactive releases to the atmosphere from the proposed facility would be as follows (Ref 21):

RADIOISOTOPE	PRODUCTION Ci/yr	ANTICIPATED RELEASE Ci/yr	EXTREMELY CONSERVATIVE RELEASE Ci/yr
Fluorine 18	100	0.300	0.600
Carbon 11	14.4	0.400	2.000

These emission estimates do not assume the use of venturi or packed bed scrubbers which could reduce emission levels and subsequent doses by 90% and 99% respectively (per Ref 7, Appendix D, Table 1). While the University does not propose to install scrubbers at this time they report: "Nevertheless, if necessary, use of other measures will be considered" (Ref 21).

The above estimate of annual releases for F-18 is based on the following assumptions:

- o The proposed Center would require a production of 100 mCi per day.

- To assure this yield the PET center will have to produce 400 mCi per day.

- Assuming 5 day per week production, approximately 100 Ci per year of annual production would be required.

- The University cites data from the Biomedical Cyclotron Facility (BCF) at the University of California-Los Angeles (UCLA) reporting that approximately 3% of the production run at the BCF is released to the atmosphere. This would result in a projected emission of 3.0 Ci per year for the proposed Center.

- The University proposes the following measures which were shown to reduce BCF emission of F-18 by a factor of 10 to 0.3 Ci per year shown on the above table (Ref 21):

  (1) House the synthesis box (of the PET) in a hot cell.

  (2) Install two particulate filter units prior to the exit port for the gas ventilation.

  (3) Exhaust the ventilation duct through the room's fume hood, rather than directly to the atmosphere.

The mechanism for reduced emissions would be as follows:

- Placing the unit in a hot cell increases the residence time of F-18 prior to release by an order of magnitude, resulting in at least a five-fold reduction in the Ci level at time of release from the hot cell.

- While particulate filters are not designed to entrap gas emissions, Fluorine is extremely reactive and will cost itself to any surface it comes in contact with (this was reported at the BCF). The University reports that a double filter unit would reduce emissions by an additional factor of 2.

- The University reports that this two step approach to reducing F-18 emissions is used at the PET Center at Duke University confirming the expectation of 10-fold reduction.

The above estimate for C-11 emissions is based on 3% of the annual production of 14.4 Ci per year without any reduction credit. This is a very conservative assumption, because even though Carbon will not react with filter medium, the increased residence time in the hot cell would result in relatively greater than the five-fold reduction for Fluorine because of its very short (20 minute) half life.

The Fluorine trapped on the filter would rapidly decay to insignificant levels of residual activity, so that after an appropriate storage time the filter could be discarded as a non-radioactive waste.

Non-DOE facilities licensed by the Nuclear Regulatory Commission must meet the following standard: "Emissions of radionuclides to the ambient air from facilities subject to this subpart shall not cause an effective dose equivalent of 10 mrem/year to any member of the public...To determine compliance with the standard, radionuclide emissions shall be determined and an effective dose equivalent to members of the public shall be calculated using EPA approved procedures, EPA codes AIRDOSE-EPA and RADRISK or other environmental measurements that EPA has determined to be suitable" (Ref 7).

Each of the radioactive release scenarios was analyzed using a version of EPA's COMPLY model to determine the effect on potentially exposed members of the public as a function of distance from the stack. The closest receptor of concern would be a fresh air intake on the building itself, a distance of 24.2 meters from the stack. Receptor exposure beyond this distance would decrease exponentially. The results of this analysis for a receptor at the fresh air intake are summarized as follows (Ref 21):

SCENARIO	DOSE FROM F-18 mrem/yr	DOSE FROM C-11 mrem/yr	CUMULATIVE
BASE CASE	1.83	1.31	3.31
WORST CASE	3.66	5.44	9.10

[The table shows both results based upon anticipated emissions, as well as exposure results for an extremely conservative higher possible release scenario of 600 millicuries of F-18 and 2000 millicuries of C-11.]

As noted earlier in this section, the emission level for C-11 has been considerably overestimated, probably by an order of magnitude. Accordingly the above dose from C-11 is greater that would likely occur by a factor of ten, and the cummulative dose estimate would be correspondingly smaller.

These scenarios would not threaten violation of the NESHAPS 10 mrem/year exposure standards. Monitoring of releases and enforcement of the standard would be carried pursuant to EPA's NESHAPS regulations.

Two additional modelling exercises were used in preparing this EA. One was a preliminary screening using EPA's AIRDOS model with Pittsburgh meteorological dose valid beyond 100 meters which demonstrated no threatened violations (Ref 10). The other was a more detailed combination of models (ISC2ST and CAP88PC) with Morgantown surface meteorological data and Pittsburgh upper air data (Ref 11) representing building wake cavity

effects, valid from close to the stack to 100 meters. That model exercise erroneously assumed release of the entire production run to the air via hood exhauset. Proportioning those results, using actual emission estimates, the results were within 1-2% of those shown in the above table, confirming the newly reported estimate.

The cancer death rate associated with exposure of members of the general public to the 10 mrem NESHAPS standards would be 5 E-4 deaths/person rem (5 chances in 10 thousand population). The rates associated with the two above scenarios would be proportionately lower according to dose. For the anticipated release scenario this would mean 1.7 chances in 10 thousand and for the extremely conservative case scenario it would be 4.6 chances in 10 thousand.

5.2.7.3 Toxic Compounds Released to the Air

The use of hazardous chemicals in fume hoods in the laboratory would have a potential for emissions of toxic compounds to the atmosphere. Although the laboratory has not been sufficiently designed to know the specific solvent chemicals and their quantities which would be used, it is likely that they would include standard laboratory chemicals such as xylene, formaldehyde, toluene, methanol, and ethanol. The 8-hour Threshold Limit Values (TLV) for these chemicals, established by the American Council of Government Industrial Hygienists (ACGIH), are 100 ppm, 18 ppm, 50 ppm, 200 ppm, and 1880 ppm, respectively (Ref 17). The most restricted exposure standard defined by the American Council of Government Industrial Hygienists is for formaldehyde. The maximum average emission over a year which would meet the ACGIH TLV for formaldehyde is 2873 grams/second, or 545,500 pounds per year (Ref 17, 18). In comparison, the anticipated hazardous waste generation for the facility (20 litters/month) is 9600 pounds per year. Therefore, even if all the hazardous waste generated per month by the facility was formaldehyde and the entire volume of hazardous waste were volatilized and vented to the atmosphere, that amount would be less than 2% of the TLV.

Characterization and specification of these materials would be documented in the design, and appropriate technical measures taken (such as hoods, filters, scrubbers, etc.) to assure that any applicable OSHA standards are met for indoor air quality. (Ref. 5,14)

5.2.8 Noise

There would be very low external noise emission from the operation of the proposed project from external ventilation ports. Indoor noise would be associated with operation of some of the equipment, but such noise levels would be both intermittent and of low level (Ref 5).

5.2.9 Socioeconomic Impacts

The CNMR would create approximately 15 new jobs involving a payroll of approximately $600,000. This compares to the $137 million in economic activities currently generated by the Health Sciences Center (Ref 19).

5.2.10 Off-normal Operations (Accident Analysis)

It is possible that accidents resulting in exposure to hazardous materials, radioactive materials, and biological hazards could occur. WVU has a hazardous waste management program which serves to minimize both the risk and consequences of potential accidents. (Ref 6)

No specific risk data are available for the PET Scanner nor cyclotron during operation; however, no reasonably foreseeable significant adverse effects are expected during operations. The availability of data will not affect the reasoned choice among the proposed alternatives. The WVU will follow a number of procedures in their hazardous waste management program to prevent potential risks (See 5.2.7.2 Radioactive Emissions).

The staff associated with the PET Scanner and cyclotron would be wearing film badges. The badges would be collected on a monthly basis and developed. The radiation safety is governed by the state regulatory agency.

WVU Health Sciences Center (WVU HSC) has not received or had any reportable accidents involving radioactive, hazardous, or biological waste material over the ten years in which its accident/incident reporting system has been in place. WVU HSC follows all rules and regulations as outlined in the WVU Hazardous Waste Management Program (Ref 6) which incorporates all appropriate Federal and State Regulations regarding all forms of hazardous waste. This program includes all forms, phone numbers and where and what to do. (Ref 5)

5.2.11. Utilities

The project would utilize existing University utility services such as electric power connections, water supply and telecommunication linkages. These have been planned and would have no adverse effects on the respective existing service capacities.

5.2.12 Traffic and Parking

The CNMR would generate approximately 40-50 additional auto trips per day, compared with the several thousand total University auto trips per day. On-campus parking would be only minimally affected.

5.2.13 Cumulative Impacts

The Health Sciences Center and other buildings on the Campus currently vent on the order of several microcuries per day to the atmosphere. One such source of microcurie radioactive emissions is from incineration of

animal carcasses and liquid scintillation fluids (to which the proposed CNMR would contribute a small increment). Another source is I-125 and Xenon-133 from various laboratory facilities equipped with suitable filters and traps that assure residual airborne releases in the microcurie range. (Ref 16)

The current and anticipated Health Sciences Center levels of emissions with the additional of emissions from the CNMR, would be well within EPA standards.

Summary Of Waste Types and Amounts Released

WASTE TYPE	CNMR INCREMENT	HEALTH SCIENCES TOTAL
DOMESTIC	25-30 Ibs/day	10,000 lbs/day
SANITARY	3,000 gal/day	300,000 gal/day
HAZARDOUS	364 kg/month (solvents, alcohol, ethers)	95 kg/month
BIOLOGICAL	23 kg/day	1818 kg/day
RADIOLOGICAL	5 Ci C-11/day 300 Ci C-F18/day	negligible picoCi range negligible picoCi range

5.3 Compliance With Regulations

The Center would require a "new source" preconstruction review and approval by the EPA in relation to radioactive emissions per 40 CFR 1061.07 & .08 (Ref 7). The Center would require no other new or modified permits or licenses with respect to any environmental regulation, as it would be covered by the overall environmental compliance requirements for the Health Sciences Center (Ref 4).

6.0 RELATIONSHIP OF THE PROPOSED ACTION TO OTHER ACTIONS AND ACTIONS BEING CONSIDERED UNDER OTHER NEPA REVIEWS

The proposed action is not related to other actions or to actions being considered under other NEPA reviews.

7.0 RELATIONSHIP OF THE PROPOSED ACTION TO ANY OTHER APPLICABLE FEDERAL, STATE, REGIONAL OR LOCAL LAND USE PLANS AND POLICIES LIKELY TO BE AFFECTED

There is no relationship of the proposed action to any applicable Federal, state, regional or local land use plans, other than that which applies to the University as a whole. (Ref 4)

8.0 LIST OF AGENCIES AND PERSONS CONSULTED

Department of the Army, Pittsburgh Corps of Engineers, Mr. John M. Miklaucic, P.E., Chief Flood Plain Management Services Branch, Planning Division

Department of Education and the Arts, Division of Culture and History, State of West Virginia, William G. Farrar, Deputy State Historic Preservation Officer

State of West Virginia, Department of Commerce, Labor and Environmental Resources, Division of Natural Resources, Operations Center, Barbara Sargent, Coordinator, National Heritage Program, Wildlife Resources Section, May 6, 1991

United States Department of the Interior, Fish and Wildlife Service, West Virginia Field Office, Christopher M. Clower, Supervisor, May 17, 1993

Environmental Protection Agency, Region III, Mr. William Belanger

9.0 REFERENCES

1 Department of Education and the Arts, Division of Culture and History, State of West Virginia, Letter from William G. Farrar, Deputy State Historic Preservation Office, May 10, 1992

2 State of West Virginia, Department of Commerce, Labor and Environmental Resources, Division of Natural Resources, Operations Center, Letter from Barbara Sargent, Data Coordinator, National Heritage Program, Wildlife Resources Section, May 6, 1991

3 Department of the Army, Pittsburgh District, Corps of Engineers, Letter from John M. Mikluacic, Chief, Flood Plain Management Services Branch, Planning Division, May 30, 1991

4 Environmental Report for Center for Nuclear Medicine Research in Alzheimer's Disease and Related Disorders, Clayton Environmental Consultants, May 10, 1992

5 Representations to DOE contractor, LATA, by David Powell, Health & Safety Specialist, Health Sciences Center Facilities, Telefacs of December 3, 1992 and subsequent phone discussions.

6 West Virginia University Hazardous Waste Management Program, Ronald L. Collins, Hazardous Waste Specialist, March 30, 1991 and June 5, 1992 Draft by David W. Powell

7 Code of Federal Regulations, 40 CFR 1061, Subpart I, National Emission Standards for Radionuclide Emissions from Facilities Licensed by the Nuclear Regulatory Commission (NRC) and Federal Facilities Not Covered by Subpart H (Subpart H applies to Department of Energy facilities only).

8 Environmental Impact Data Book, Chapter 8 - Noise, Tables 8-1 to 8-4, Anne Arbor Science, 1979,

9 10 CFR Pt 20. Appendix C, Quantities of Licensed Material Requiring Labelling

10 Radiological Dose Assessment for Health Science Center Releases, AIRDOS-EPA Model Calculations, Matt Pope, Los Alamos Technical Associates, December 10, 1992

11 Radiological Dose Assessment for the PET Scanner Project at the Health Sciences Center, Monty Saran, Environmental Engineer, March 1993

12 Infectious Medical Waste Management Plan, West Virginia University, October 8, 1993

13 Radioecology: Nuclear Energy and the Environment, Volume 1, p 44, F. Ward Whicker and Vincent Schultz, CRC Press, 1982

14 Statement of Mitigation Planning, West Virginia University, David W. Powell, April 28, 1993

15 10 CFR Pt 20, Section 20.101 Radiation dose standards for individuals in restricted areas, Section 20.105 Permissible levels of radiation in unrestricted areas, and 20.107 Medical diagnosis and therapy.

16 Representations to DOE contractor, LATA, by S.T. Slack, Radiation Safety Officer, Health Sciences Center Facilities, Telefacs of April 1, 1993

17 American Conference of Governmental Industrial Hygienists, 1993-94, Threshold Limit Values for Chemical Substances and Biological Exposure Indices,

18 Air Pollution Hazard Analysis for the Louisiana Tech University Institute for Micromanufacturing, Geraughty & Miller Inc., December 15, 1992

19 West Virginia University, Health Science Center Master Plan, 1988

20 U.S. Fish and Wildlife Service, from Christopher M. Clower, Supervisor, West Virginia Field Office, May 16, 1993

21 Harold Harper, Special Assistant to the Vice President for Health Science, Health Science Center of West Virginia University, Letter Report, December 1, 1993

22 GE Medical Systems, PET Facility Planning Guidebook, August 13, 1993

APPENDIX I
SUPPORTING DOCUMENTS

Corps of Engineers, Pittsburgh District, Statement on non-involvement of wetlands or floodplains, May 10, 1991

U.S. Fish and Wildlife Service, Statement on non-involvement of rare or endangered species or habitat, May 17, 1993

State of West Virginia, Department of Commerce, Labor and Environmental Resources, Division of Natural Resources, Statement on non-involvement of rare species or rare species habitat, May 6, 1991

State of West Virginia, Department of Education and the Arts, Division of Culture and History, Statement on non-involvement of historic, architectural, or archeological sites listed for inclusion of the National Register of Historic Places, May 10, 1991

DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE, PITTSBURGH, PA 15222

May 10, 1991

REPLY TO
ATTENTION OF

FPMS Branch

Mr. Guy Varchetto
West Virginia University
Health Sciences Center
Maintenance Engineering Department
139 Health Sciences North
Morgantown, West Virginia 26506

Dear Mr. Varchetto:

This is in response to your letter of April 30, 1991 requesting a flood hazard and wetland analysis for the West Virginia University Health Science Center located in the City of Morgantown, Monongalia County, West Virginia. As stated in your letter, the school is in the process of receiving a grant for the installation of a Positron Emission Tomography (PET) Scanner. The PET scanner will be located in the basement of the existing Health Science Center Building.

Using the maps furnished with your letter, available topographic mapping of the site and the Flood Insurance Rate Map published for the City of Morgantown, no flood plains have been delineated in the immediate vicinity of the Health Science Center Building. In addition, based on District mapping of wetland areas and to our knowledge, no wetlands have been identified in your area of interest.

Sincerely,

John M. Miklaucic, P.E.
Chief, Flood Plain Management
Services Branch, Planning Division

Copies Furnished:

Mr. David W. Robinson
Division of Water Resources
Department of Natural Resources
Charleston, West Virginia 25305

Mr. Al Lisko
Office of Emergency Services
E.B.-80
Capitol Complex
Charleston, West Virginia 25305

United States Department of the Interior

FISH AND WILDLIFE SERVICE

West Virginia Field Office
Post Office Box 1278
Elkins, West Virginia 26241

May 17, 1993

Mr. David W. Powell
WVU Environmental,
Health and Safety Specialist
110-H Health Sciences North
Post Office Box 9004
Morgantown, West Virginia 26506-9004

Dear Mr. Powell:

This responds to your information request of May 3, 1993, regarding the potential impacts of your project proposal on wetlands or Federally listed or proposed endangered and threatened species. The proposal consists of the construction and placement of a Positron Emission Tomography (PET) scanner and a Cyclotron in the Health Science Center at West Virginia University, Morgantown, West Virginia.

Except for occasional transient species, no Federally listed or proposed threatened or endangered species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 Consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required with the Fish and Wildlife Service (Service). Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of Federally listed endangered and threatened species in West Virginia is enclosed for your information.

Sincerely,

Christopher M. Clower

Christopher M. Clower
Supervisor

Enclosure

STATE OF WEST VIRGINIA
DEPARTMENT OF COMMERCE, LABOR AND ENVIRONMENTAL RESOURCES
DIVISION OF NATURAL RESOURCES
OPERATIONS CENTER
P.O. Box 67
Elkins, West Virginia 26241
Telephone (304)637-0245 - Fax (304)637-0250

GASTON CAPERTON
Governor

J. EDWARD HAMRICK III
Director

ANN A. SPANER
Deputy Director

May 6, 1991

Mr. Harold H. Harper
West Virginia University
Office of the Vice President for Health Services
1157 Health Sciences North
Morgantown, WV 26506

Dear Mr. Harper:

We have reviewed our files for information on rare/threatened/endangered (RTE) species species and wetlands for the area of your proposed Center for Nuclear Medecine Research in Alzheimer's Disease and Related Disorders project at West Virginia University, Morgantown.

We have no records of any RTE species or wetlands within your project area. The Wildlife Resources Section knows of no rare species surveys that have been conducted in the area of this proposed project site. Consequently it is not known if any rare species or rare species habitat exists.

This response is based on information currently available and should not be considered a total or comprehensive survey of the area under review.

Thank you for your inquiry and should you have any questions, please feel free to call upon us.

Sincerely,

Barbara Sargent

Barbara Sargent
Data Coordinator
Natural Heritage Program
Wildlife Resources Section

BS:jc

DEPARTMENT OF EDUCATION AND THE ARTS • DIVISION OF CULTURE AND HISTORY

STATE OF WEST VIRGINIA
GASTON CAPERTON, GOVERNOR

DR. STEPHEN E. HAID, SECRETARY

WILLIAM M. DRENNEN, JR., COMMISSIONER

May 10, 1991

Mr. Harold Harper
WVU
Office of the Vice Pres.
for Health Sciences
1157 Health Sciences N.
Morgantown, WV 26506

RE: Renovations to establish a Center
of Nuclear Medicine Research
Morgantown
FR#: 91-819-MG

Dear Mr. Harper:

We have reviewed the above-referenced project to determine effects to cultural resources as required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties."

No known historical, architectural, or archaeological sites listed on or eligible for inclusion in the National Register of Historic Places will be affected by this project. No further consultation is required.

We appreciate the opportunity to be of service. If you have any questions regarding our comments or the Section 106 process, please call Susan M. Pierce, Director of Review and Compliance.

Sincerely,

William G. Farrar,
Deputy State Historic
Preservation Officer

WGF:so

Public Notice
September 7, 1994

REFERENCE: DOE-EA-0896 ENVIRONMENTAL ASSESSMENT (EA) AND FINDING OF NO SIGNIFICANT IMPACT (FONSI)

U. S. DEPARTMENT OF ENERGY ENVIRONMENTAL DOCUMENTS AVAILABLE ON THE CENTER FOR NUCLEAR MEDICINE RESEARCH IN ALZHEIMER'S DISEASE BUILDING PROJECT

Two documents related to construction of the Center for Nuclear Medicine Research in Alzheimer's Disease (CNMR) at the Health Sciences Center, at West Virginia University in Morgantown, West Virginia, are now available from the U. S. Department of Energy (DOE) for public information.

The Environmental Assessment (EA) and Finding Of No Significant Impact (FONSI) documents for the building's construction and operation were prepared by DOE. The EA documents analysis of the environmental and socioeconomic impacts that might occur as a result of these actions, and characterizes potential impacts on the environment. In the EA, DOE presents its evaluation of potential impacts of construction and operation of the CNMR on health and safety of both workers and the public, as well as on the external environment. Construction impacts include the effects of erosion, waste disposal, air emissions, noise, and construction traffic and parking. Operational impacts include the effects of waste generation (domestic, sanitary, hazardous, medical/biological, radioactive and mixed wastes), radiation exposures, air emissions (radioactive, criteria, and air toxics), noise, and new workers. No sensitive resources (wetlands, special sources of groundwater, protected species) exist in the area of project effect.

The FONSI documents DOE's determination that the proposed actions would cause

no significant environmental impacts.

DOE, in accordance with the wish of Congress, has executed a grant with the West Virginia University to partially fund the Center for Nuclear Medicine Research in Alzheimer's Disease, which will occupy approximately 26,000 square feet. This area will house operations and support facilities along with administrative areas and would extend clinical services and expand research activities at the Health Sciences Center at West Virginia University. Funding for the project was included by Congress in DOE's FY91 appropriation to assist with construction of the CNMR.

The EA and FONSI are available to the public for perusal at the West Virginia University Library in Morgantown, West Virginia and at the DOE Chicago Operations Office reading room. Copies of the documents are also available from:

Frederick W. Wysk
U. S. Department of Energy
Chicago Operations Office
Programs and Facilities Management
Division
9800 S. Cass Avenue
Argonne, IL 60439
(708) 252-8618

Questions on the DOE NEPA process should be directed to:

Carol M. Borgstrom, Director
Office of NEPA Oversight
U. S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585
(202) 596-4600 or (800) 472-2756

U.S. Department of Energy

Finding of No Significant Impact

for the Proposed

Center for Nuclear Medicine Research in Alzheimer's Disease

at the Health Sciences Center, West Virginia University

Morgantown, West Virginia

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: The Department of Energy (DOE) has prepared an Environmental Assessment, DOE/EA-0896, evaluating the construction and operation of the Center for Nuclear Medicine Research in Alzheimer's Disease and Related Disorders (CNMR) which would be located within the existing Health Science Center (Center) on the campus of West Virginia University. The purpose of the proposed action is to acquire a positron emission tomography (PET) scanner and cyclotron. PET technology enhances physiologic information gathering and the identification of topographic localization of metabolic activities of the brain beyond computed tomography (CT) methodology or magnetic resonance imaging (MRI) technology. Based on the analysis in the EA, the DOE has determined that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (NEPA). Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

DESCRIPTION OF THE PROPOSED ACTION: The report (S. Rep. No. 101-378) accompanying the Energy and Water Appropriations Act (Pub. L. No. 101-514) recommended that $10,000,000 in the DOE fiscal year 1991 appropriation be

provided to assist the University in construction of the CNMR. The CNMR facility would occupy 26,040 square feet of the Center's basement, ground and first floors. Approximately 15,350 square feet would house operations and support facilities; the remaining 10,690 square feet would consist of administrative space. The facility would extend clinical services provided at the Center and expand research activities. Pharmaceutical chemicals and radionuclides would be used in both therapy and research. A grant was executed by the DOE with CNMR on August 5, 1991, for the limited purpose of performing preliminary studies. However, under the terms of the grant, the University may not initiate construction or take any action which would affect the environment or limit alternatives until a determination has been made on the need for an EIS and the DOE has determined that the action should proceed.

ALTERNATIVES: Two alternatives were considered: (1) siting the CNMR within the Center, and (2) no action. The University is committed to construction of the CNMR with or without Federal funding. Therefore, the environmental impacts of the no action alternative, in which no Federal funding would occur, would be largely the same as the impacts of the proposed action. However, the absence of Federal funding would delay the project. The University considered other siting alternatives in planning for the project, but found none that were feasible.

ENVIRONMENTAL IMPACTS: The EA analyzes the impacts of construction and operation of the CNMR on health and safety concerns for both workers and the public, as well as examining potential impacts on the external environment. Construction impacts evaluated include the effects on sensitive resources, erosion, waste disposal, air quality, noise, traffic and parking. Operational

impacts evaluated include the effects of waste generation (domestic, sanitary, hazardous, medical/biological, radioactive and mixed wastes), radiation exposures, air emissions (radioactive, criteria, and air toxins), noise, socioeconomic impacts, and other direct, indirect and cumulative impacts.

No significant environmental impacts associated with proposed CNMR construction or operations are anticipated. This finding of no significant impact for the proposed action is based on information and analysis in the EA.

Impacts of Construction/Installation: None of the categories of sensitive resources cited above would be affected by the project as they do not occur on or near the site. The installation consists of interior renovation of a basement, parts of ground and first floors, consequently erosion would not occur. Waste generation would include removal of lead shielding and asbestos prior to the renovation and construction, as part of a University-wide program and independent of DOE funding or involvement. These materials would be disposed of following regulatory standards and procedures. Air quality impacts would be associated with delivery trucks and on-site construction machinery, and would be low level and transient. Noise levels would be those conventionally associated with daytime construction activities in a basement space, and are not likely to disturb patients, workers or outdoor recreation. Traffic impact would not significantly affect local circulation or parking.

Impacts of Operations:

Waste Generation: Domestic and sanitary waste would be a small increment on the existing building waste and managed in a conventional manner. Hazardous

waste would include solvents, alcohols and ethers typical of a hospital setting, and would be managed in accordance with the University's existing hazardous waste management program under an existing Environmental Protection Agency registration as a small quantity generator under the Resource Conservation and Recovery Act. Biological and medical wastes would represent a small increment to University-wide wastes currently routed to an existing on-site incinerator/autoclave operating under a permit issued by the West Virginia Air Pollution Control Commission. Radioactive wastes would consist of short half-life isotopes (Fluorine 18 and Carbon 11) which would decay to negligible radioactivity levels prior to disposal as conventional or hazardous waste. The proposed facility would not generate radioactive mixed waste.

Radiation Exposure: Radiation exposures as may be associated with a PET Scanner/cyclotron facility, and with medical radioisotopes would be regulated by the University's Radiation Safety Officer under appropriate federal and state regulatory programs to assure that exposures of personnel and the public are within safe limits as prescribed by Federal and state regulation.

Air Quality: Radioactive air emissions (Fluorine 18 and Carbon 11) would be controlled so as to ensure compliance with EPA's National Emission Standards for Hazardous Air Pollutants. The project would result in no net increase in building energy utilization so that existing emissions of criteria pollutants (from boilers) would not be affected. Very low level emissions of toxic fumes from laboratory solvents, alcohols, and ethers, while not subject to regulatory standards, are likely to be several orders of magnitude less than 8 hour Threshold Limit Values, as defined by the American Council of Government Industrial Hygienists.

DETERMINATION: Based on the analysis in the EA, the DOE has determined that the proposed Center for Nuclear Medicine Research in Alzheimer's Disease and Related Disorders does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969. Therefore, an Environmental Impact Statement on the proposed action is not required.

PUBLIC AVAILABILITY: Copies of this EA (DOE/EA-0896) are available from:

Bohdan Bodnaruk
Programs and Facility Management Division
U.S. Department of Energy
Chicago Operations Office
9800 South Cass Avenue
Argonne, Illinois 60439
(708) 252-2823

For further information regarding the DOE NEPA process contact:

Carol M. Borgstrom, Director
Office of NEPA Oversight
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585
(202) 586-4600 or (800) 472-2756

Issued in Washington, D.C., this 18th day of April 1994.

Tara O'Toole, M.D., M.P.H.
Assistant Secretary
Environment, Safety and Health

DISTRIBUTION OF NEPA DOCUMENTS {PUBLIC NOTICE, ENVIRONMENTAL ASSESSMENT (DOE-EA-0896), FINDING OF NO SIGNIFICANT IMPACT} FOR THE CENTER FOR NUCLEAR MEDICINE RESEARCH IN ALZHEIMER'S DISEASE, WEST VIRGINIA UNIVERSITY, MORGANTOWN, WEST VIRGINIA.

Mr. William W. Reeves, Director,
Office of Sponsored Programs
West Virginia University
P.O. Box 6845
Morgantown, W.V 26506-6845

Morgantown City Library
373 Spruce Street
Morgantown, W.V 26505

The Wise Library
West Virginia University
P.O. Box 6069
Morgantown, W.V 26505-6069

The Dominion Post
1251 Earl L. Core Road
Morgantown, W.V 26505

The Daily Athenaeum
West Virginia University
P.O. Box 6427
Morgantown, W.V 26506-6427

U.S. Environmental Protection Agency
841 Chestnut Bldg.
Philadelpia, PA. 19107
Attn: Mr. William Belanger
EPA Region III
Technical Assistance Section
3AT12