

April 26, 2006

Robert Johnson, Interim Chair, and Commissioners
BERKELEY LANDMARKS PRESERVATION COMMISSION
c/o J. Homrighausen
Planning & Development Department
2120 Milvia Street, 1st Floor
Berkeley, CA 94704

Dear Mr. Johnson and Commissioners:

I welcome the opportunity to provide the Landmarks Preservation Commission with information about Building 51 and the Bevatron. From 1989 through the closure of the Bevatron, in 1993, I managed the Bevatron facility for Lawrence Berkeley National Laboratory. From my point of view, the most meaningful landmark for the Bevatron is the record of outstanding science that was performed there, not the building nor the accelerator. The greatest tribute to the Bevatron would be to build a facility at the site that enabled new outstanding science. Of course, a monument or permanent display that commemorated the people and discoveries made at the Bevatron should be provided, either at the Lawrence Hall of Science, with excellent accessibility, or at the new facility on the site of the Bevatron.

The attached material provides additional information about some important issues regarding your consideration of landmark status for Building 51. The key points include the following:

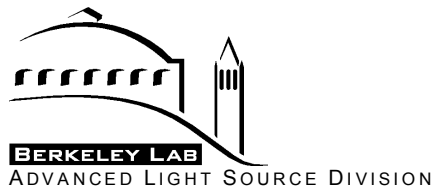
- The US Department of Energy's present commitment to fund the project requires steps to be taken now, or future funding might be jeopardized. It is important, therefore, to consider Building 51 issues, safety and hazard status.
- The facility's structure and function was, and is, similar to other cyclotrons, accelerator structures, and/or light sources throughout the world. Enclosed are several examples for your review.
- The original Building 51 and Bevatron apparatus are no longer present: several alterations, removals, or additions have changed both Building 51 and the Bevatron as originally conceived and built.
- This site is not available for public viewing or touring: Lawrence Berkeley National Laboratory is an active and ongoing scientific research facility, managed by the University of California. Public access is not permitted and visitors are required to have prior arrangements, approval, and an employee host or sponsor. For reasons of safety, Building 51 is not accessible to the public.

Please feel free to contact me at 510-486-7725 if you have any questions. I look forward to seeing you at the Landmarks Preservation Commission meeting on May 4, 2006.

Sincerely,

Dr. Benedict Feinberg
Deputy Director, Advanced Light Source Division

Enclosures



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Letter from Benedict Feinberg to Robert Johnson, Interim Chair, and Commissioners
BERKELEY LANDMARKS PRESERVATION COMMISSION

Enclosures:

1. Information on LBNL's Building 51 and the Bevatron:
Structure, Apparatus and Associated Historical Review Issues

2. Photos of Light Sources throughout the World:

Name, Title, Location, Year Constructed

- a. KEK-Photon Factory, Tsukuba, Japan 1982
- b. Triumf Cyclotron, Vancouver, BC, Canada 1968-1974
- c. Brookhaven National Laboratory, Alternating Gradient Synchrotron (AGS) and Cosmotron, Long Island, New York, 1957, 1953
- d. Swiss Light Source, Paul Scherrer Institute, Villigen, Switzerland, 2001
- e. European Synchrotron Radiation Facility (ESRF). Grenoble, France, 1988-1992
- f. Lawrence Berkeley National Laboratory, 184-inch Cyclotron, Berkeley, California, 1940
– now the Advanced Light Source
- g. Lawrence Berkeley National Laboratory, Building 51 & Bevatron, 1955 and 1969

Information on LBNL's Building 51 and the Bevatron: Structure, Apparatus and Associated Historical Review Issues

What is the Status for U.S. DOE funding of the Building 51 and Bevatron demolition?

During the 13 years since the Bevatron was closed down in 1993, funding has been sought repeatedly. The U.S. Department of Energy has now committed to provide \$11 million in FY 2006 for the commencement of demolition of the Lab's Building 51 and the Bevatron. This includes the planning, design, and beginning demolition activities. While DOE funds these types of projects on an annual basis, the commitment reflects DOE support for the multi-year demolition of the building and its apparatus.

The Laboratory seeks this action as the right thing to do for its site, the environment, and the community. With demolition of Building 51 and the Bevatron, the waste materials will be removed and disposed of at safe, approved and appropriate locations. The site will be cleared and cleaned up. The Berkeley City Council has supported the clean-up of the site, taking recent actions in 2003 and 2005 to encourage DOE funding of the clean-up and demolition of Building 51 and the Bevatron.

A restored site will support Lawrence Berkeley National Lab's competitive bid, if proposed sometime in the future, for a new scientific research facility that might be funded by DOE or the University. However, there is no such active proposal at this time.

Is Building 51 and the Bevatron a one-of-a-kind Facility or unique?

Many light sources - accelerator systems, cyclotrons, and synchrotrons – have been built since the 1950s throughout the world. Selected examples that reflect similar types of buildings, similar types of cyclotrons, synchrotrons or accelerator systems, and similar present-day facilities are presented in attached photographs for your viewing. More information can be reviewed at: www.lightsources.org/imagebank/

Examples include:

- KEK – Photon Factory, Tsukuba, Japan 1982
- University of British Columbia – Triumf, the world's largest cyclotron, Vancouver, British Columbia, Canada, built in 1968 - 1974
- Brookhaven National Laboratory – Alternating Gradient Synchrotron (AGS), and the cosmotron, Long Island, New York, built in 1957
- Paul Scherrer Institute – Swiss Light Source (SLS) – Villigen, Switzerland, built in 2001
- European Synchrotron Radiation Facility (ESRF)- synchrotron X-Ray source - Grenoble, France, built in 988 – 1992
- Lawrence Berkeley National Lab – former 184-inch Cyclotron – Berkeley, California, built in 1940-1942
- Lawrence Berkeley National Lab – Building 51 & the Bevatron – Berkeley, California, built in 1949-1954, and operated from 1954 – 1993
- Lawrence Berkeley National Lab – Building 51 & the Bevatron with the External Proton Beam Hall – Berkeley, California, added in 1965-1969

How has the original Building 51 structure changed since its original construction in 1953?

Building 51 "has become more complicated, more machine-like as it has been modified over the years..." (Source: The Historic Architectural Evaluation Report, 1994, which identified the many changes, additions, alterations, and some demolitions to accompany changing research programs of the Bevatron during its 39 years of operation.) A brief chronology of these changes includes:

- 1949-1954 - original structure completed
- 1951 – cooling tower added
- 1957 – Bldg. 51 Addition: a major addition of (B51A)
- 1957 – Bldg. 59, detector, for the Bubble Chamber

- 1961-1963 – major Bevatron apparatus improvements & modernizations (primarily inside & underground)
- 1965-1969 – External Proton Beam (EPB) Hall, a major external structure that also altered the apparatus to accommodate different research focus

- 1971-1974 – linking of the Bevatron with SuperHILAC (in Building 71) to become the Bevalac, a major alteration of the building structure and apparatus' functions
- 1979 – HISS users building

- 1980 – Earthquake strengthening
- 1983 – Experimental Computer Enclosure (Bldg. 51L)
- 1987 – Bevalac Patient Facility (51N)

The historical architectural aspect of the original building has been substantially modified. As the chronology reveals, it has been remodeled, augmented with additions and interconnections to other structures, and changed to the extent that it no longer has historical integrity. The addition of Building 51A, the External Proton Beam Hall and the linking of the Bevatron with the HILAC to become a different facility, the Bevalac, reflect significant architectural and scientific research alterations. From an architectural standpoint, any one of these major additions/renovations significantly altered the original building.

What has been changed or altered in the Bevatron apparatus?

The original machinery of the Bevatron included the 120-foot diameter magnet, accelerating electrodes, injectors, a control system, and motor generators. Over the lifetime of the facility operation, several upgrades to equipment were made, which included:

- New injection system
- External proton beam & its facilities
- Concrete shielding
- Movable targets
- Controls' improvements

The Bevatron's original support equipment is no longer there, and the "historical Bevatron" no longer exists.

Most obvious is the change that occurred in the early 1970s when the Heavy Ion Accelerator (HILAC) at a nearby building up the hill (Building 71) was interlinked with the Bevatron. The result is that the apparatus' historical integrity no longer exists for this facility. When the

Bevatron was incorporated into the Bevalac, to accelerate heavy ions, it was substantially changed. The experimental process equipment was changed so much that it could no longer repeat the original experiments that led to the discovery of the antiproton and the resonance particles which generated two Nobel prizes. The original experimental equipment that was used in these Nobel Prize experiments has been removed. What remains is a portion of the Bevalac, which had been created by combining the SuperHILAC and a substantially modified and upgraded Bevatron.

Would Building 51 and the Bevatron be accessible to the public as an historical landmark?

Public access is not generally permitted at the Lawrence Berkeley National Laboratory. The Lab is an active and ongoing scientific research facility of some 200 acres, located on the hills above the University of California Berkeley campus. Its research, in approximately 100 buildings, may involve sensitive chemicals, delicately calibrated instruments, large and costly equipment, as well as competitively scheduled scientific research at four user facilities.

Especially since the 2001 destruction of the New York World Trade Center and damage to the Washington, D.C. Pentagon by terrorists, security efforts at the Laboratory have carefully controlled access. Today, employee sponsorship and host authorization is required for all visitors. Safety training is mandatory for all staff and guests. Furthermore, because the public would be at risk around hazardous materials or facilities, public access is not permitted to LBNL without prior arrangements and a sponsor. Because the public would be at risk around hazardous materials at Building 51, no public access is permitted. Therefore, even if the building and apparatus were preserved, the public would not be able to view the Building 51 and Bevatron area.

1-5-06

KEK – Photon Factory

Tsukuba, Japan



- **High Energy Accelerator Research Organization**
- **Same type of accelerator system as the Bevatron**
- **Constructed 1982**

Triumph, Canadian National Laboratory, UBC, Vancouver, British Columbia

- **World's Largest Cyclotron**
- **Proton Beam Accelerator**
- **Particle & Nuclear Physics Research**
- **Constructed between 1968 - 1974**



Brookhaven National Lab Alternating Gradient Synchrotron (AGS) and Cosmotron, Long Island, New York

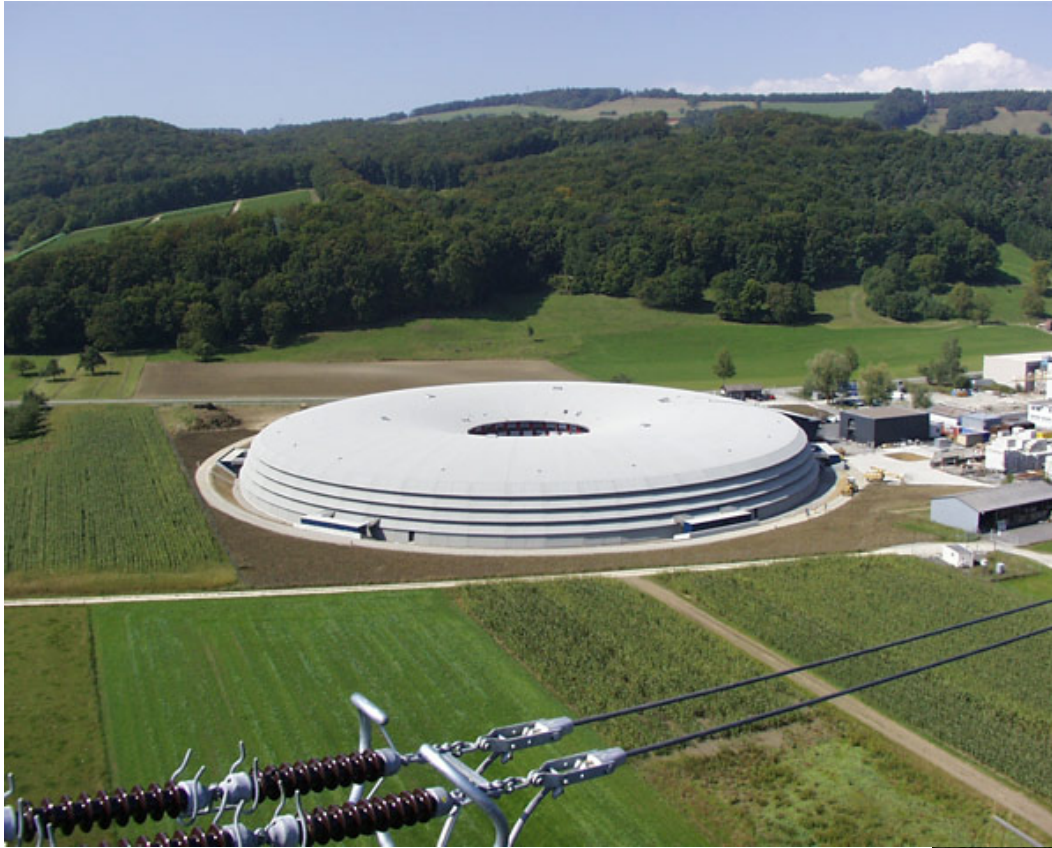


AGS - highest energy proton accelerator
- built in 1957



Cosmotron – proton synchrotron
– operated from 1953 - 1968

Paul Scherrer Institute, Swiss Light Source Villigen, Switzerland



- Third generation synchrotron photon light source
- Operations began in 2001

European Synchrotron Radiation Facility Grenoble, France



- An advanced synchrotron X-Ray source
- Shared by 18 European countries
- Built 1988 – 1992

Lawrence Berkeley National Laboratory, University of California Former 184-inch Cyclotron



- Particle accelerator
- Built in 1940-1942



**Building 51 & Bevatron 1955
Lawrence Berkeley National Laboratory
University of California**



Building 51 & the Bevatron Lawrence Berkeley National Laboratory University of California



Bevatron 1955



Bevatron with External Proton Beam Hall, post-1969