

Tevatron / Main Ring Area

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Revision History

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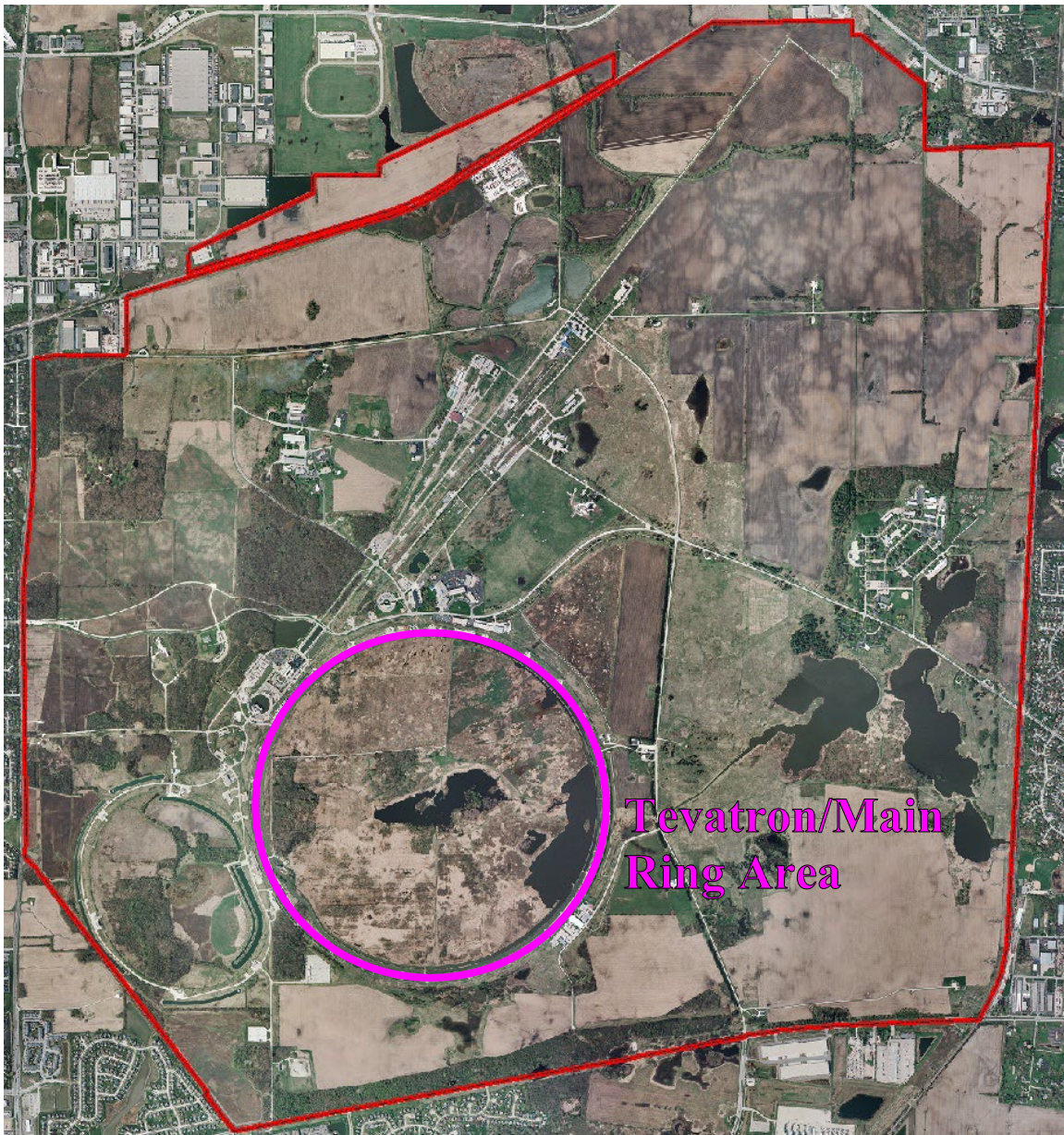
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II - 12 Tevatron / Main Ring Area

II - 12.1 Tevatron / Main Ring Areas Location on Fermi National Accelerator (Fermilab) Site

The following aerial photograph shows the location of the Tevatron / Main Ring Area in relation to the Fermilab site.



II - 12.2 Inventory of Hazards

The following table lists the identified hazards found in the Tevatron / Main Ring Area enclosures and support buildings. All hazards with an asterisk (*) have been addressed in Chapters 1-10 of the Fermilab SAD and are not addressed in this section of the SAD.

Radiation Residual activation Radioactive waste	Kinetic Energy Power tools * Pumps and motors *
Toxic Materials Lead shielding * Beryllium components *	Potential Energy Crane operations * Compressed gases * Vacuum / pressure vessels * Vacuum Pumps *
Flammable & Combustible Materials Cables *	Magnetic Fields Fringe fields *
Electrical Energy Stored energy exposure * High voltage exposure * Low voltage, high current exposure *	Gaseous Hazards Confined spaces *
Thermal Energy (none)	Access / Egress Life Safety Egress *

II - 12.3 Introduction

This Section II, Chapter 15 of the Fermilab SAD, covers the Tevatron / Main Ring Areas. The chapter has been prepared by the staff of the Fermilab Accelerator Division (AD) External Beam Delivery Department and Fermilab Environment, Safety, Health and Quality Section (ESH&Q) Radiation Physics Operations Department.

II - 12.3.1 *Description of the Tevatron / Main Ring Area*

The Tevatron / Main Ring Area consist of the unused portion of the Tevatron / Main Ring enclosure (sections A24 through E47, inclusive), and the associated service buildings. (The F Sector portion of the Tevatron / Main Ring enclosures is still in use for Switchyard operations, see SAD Section II Chapter 14.) The portion of the Tevatron / Main Ring Area discussed in this Chapter is being decommissioned, except for the C0 region, which has been repurposed for radioactive storage. Beam transport is no longer possible in the Tevatron / Main Ring Area. The remainder of the geographic area houses legacy equipment associated with the Tevatron program.

II - 12.4 **Safety Assessment**

This section analyzes the legacy accelerator-specific hazards associated with the Tevatron / Main Ring Area. The Tevatron / Main Ring Area is being decommissioned or has been repurposed; beam transport is no longer possible. These hazards include residual activation and legacy radioactive material.

II - 12.4.1 *Radiological Hazards*

The Tevatron / Main Ring Area presents radiological hazards in the form of residual radiation due to activation of beam line components and legacy radioactive material from previous operation of the beam transport systems.

II - 12.4.1.1 **Residual Activation**

Residual radiation due to past activation of beam line components remains. Residual radiation can give rise to radiation exposures to personnel during accesses to the beam enclosures for repair, maintenance, decommissioning and inspection activities.

In most situations, general RWP for accesses will suffice. A job-specific RWP and/or an ALARA (“as-low-as-reasonably-achievable”) plan will be required for work on any highly activated or contaminated equipment per Fermilab Radiological Control Manual (FRCM) requirements. These tasks will be supervised by members of the Radiological Control Organization under the direction of the assigned Radiation Safety Officer (RSO).

II - 12.4.1.2 **Radioactive Waste**

Tevatron / Main Ring Area radioactive waste hazards and waste disposal will be managed within the program established for the Fermilab accelerator complex and as prescribed

in the FRCM. Waste minimization is an objective of the equipment design and operational procedures. Although production of radioactive material is not an operational function of the Tevatron / Main Ring Area, legacy radioactive material remains. Activated items will be reused when feasible. Activated items that cannot be reused will be disposed of as radioactive waste according to the FRCM requirements.

II - 12.4.2 *Electrical Hazards*

The AD DSO has applied administrative locks on the power supplies to limit the ability to send power into the tunnel.

II - 12.5 Assessment of Potential Credited Controls

II - 12.5.1 *Passive Controls*

All hazards are managed in accordance with FESHM and FRCM requirements. There are no passive controls that qualify for inclusion in the Accelerator Safety Envelope (ASE).

II - 12.5.2 *Active Controls*

Active engineered controls are systems designed to reduce the risks from accelerator operations to acceptable levels. These automatic systems limit operations, shut down operations, or provide warning alarms when operating parameters are exceeded. The radiation safety interlock system (RSIS) is no longer active in the portions of the Tevatron / Main Ring Area covered in this SAD Chapter. An RSIS is active in the Tevatron F Sector for Switchyard beam operations, and will inhibit beam transport to the Switchyard Fixed-Target Beam Lines if access is attempted from the Tevatron / Main Ring Area to the Switchyard Fixed-Target Beam Lines area. This system is described in Section 2, Chapter 14. There are no active controls for the areas covered in this SAD Chapter that qualify for inclusion in the ASE.

II - 12.5.3 *Administrative Controls*

All hazards are managed in accordance with FESHM and FRCM requirements. There are no administrative controls that qualify for inclusion in the ASE.

II - 12.6 Decommissioning

Decommissioning activities in the Proton Area follow the requirements of FESHM Chapter 7050, Demolition and Decommissioning.

II - 12.7 Summary and Conclusion

Specific hazards associated with the operation of the Tevatron / Main Ring Area enclosures are identified and assessed in this chapter of the Fermilab SAD. The designs, controls, and procedures to mitigate Tevatron / Main Ring Area specific hazards are identified and described. The Tevatron / Main Ring Area is subject to the safety requirements, controls and procedures outlined in Section I of the Fermilab SAD.

The preceding discussion of the hazards presented by Tevatron / Main Ring Area operations and the credited controls established to mitigate those hazards demonstrate that the area can be operated in a manner that will produce minimal hazards to the health and safety of Fermilab workers, researchers, members of the public, as well as to the environment.

II - 12.8 Glossary, Acronyms

AD	Accelerator Division
ASE	Accelerator Safety Envelope
Ci	Curie
ESH&Q	Environment, Safety, Health, and Quality
Fermilab	Fermi National Accelerator Laboratory
FESHM	Fermilab Environment, Safety, and Health Manual
FRCM	Fermilab Radiological Control Manual
GeV	Giga-electron volt
³ H	tritium
hr	hour
MeV	Mega-electron volt
mrاد	milli-radian
mrem	milli-rem
mrem/hr	milli-rem per hour
²² Na	sodium-22
pCi/ml	pico-Curie per milliliter
RRM	Repetition Rate Monitor
RSIS	Radiation Safety Interlock System
RSO	Radiation Safety Officer
RWP	Radiological Work Permit
SAD	Safety Assessment Document

II - 12.9 References

¹Fermilab Environment, Safety, and Health Manual, March, 2015. ESHQ DocBD link:
<http://esh.fnal.gov/xms/FESHM>

²Fermilab Radiological Control Manual, March, 2015. ESHQ DocBD link:
<http://esh.fnal.gov/xms/FRCM>