4.2.1 Hanford Reach National Monument

On June 9, 2000, portions of the Hanford Site including ALE, Saddle Mountain Wildlife Refuge, Wahluke Slope, White Bluffs, the sand dune area northwest of the Energy Northwest Site, historic structures (including homesteads from small towns established along the riverbanks in the early 20th century), and land 0.4 km (¼ mi) inland on the south and west shores of the 82-km (51-mi) long Hanford Reach, the last free-flowing, non-tidal stretch of the Columbia River, were designated as a National Monument (Figure 4.3) by President Clinton (65 FR 37253). Also included in the 78,900-hectare (195,000-acre) monument were the McGee Ranch and Riverlands areas and the federally owned islands within that portion of the Columbia River.

On June 14, 2001, U.S. Department of Energy–Richland Operation Office (DOE-RL) and the FWS signed an amended Memorandum of Understanding (MOU) addressing management responsibilities for the Hanford Reach National Monument. As a result of the MOU, the FWS is the lead agency in producing a Comprehensive Conservation Plan (CCP) for management of the Hanford Reach National Monument. Development of the CCP will be a public process, including input from local governments, Native American Tribes, stakeholders, and others, including a Federal Advisory Committee for the Hanford Reach National Monument. The DOE will participate in writing the CCP and, in cooperation with the FWS, approve the plan. Under the MOU, which is intended to remain in effect for 25 years, DOE and the FWS will produce agreements for site access, security, emergency preparedness, mutual assistance, wildland fire response, and cultural and biological resource management.

4.2.2 200 Areas

The focus of the HSW EIS is on waste storage, treatment, and disposal activities. For a description of the facilities, refer to Section 2. The Central Waste Complex (CWC) is located in the 200 West Area (Figure 4.4). Low-level waste (LLW), mixed low-level waste (MLLW), and transuranic (TRU) waste from onsite and offsite generators are stored in CWC pending treatment or disposal.

The Waste Receiving and Processing Facility (WRAP) is located in the 200 West Area. It began operations in 1997 and can process TRU waste, certify TRU waste and LLW for disposal, and provide limited treatment of MLLW. The 4,800 m^2 (52,000 ft^2) facility is located near the CWC, and is designed to process 6,800 drums and 70 boxes of waste annually for 30 years (Poston et al. 2001).

T Plant Complex, located in the northeast corner of the 200 West Area, consists of two major facilities: T Plant canyon and 2706-T Facility. T Plant Complex is used for waste verification, decontamination of equipment, repackaging of radioactive wastes, and storage of pressurized water reactor spent fuel from an offsite reactor. It is also capable of macroencapsulation of debris and

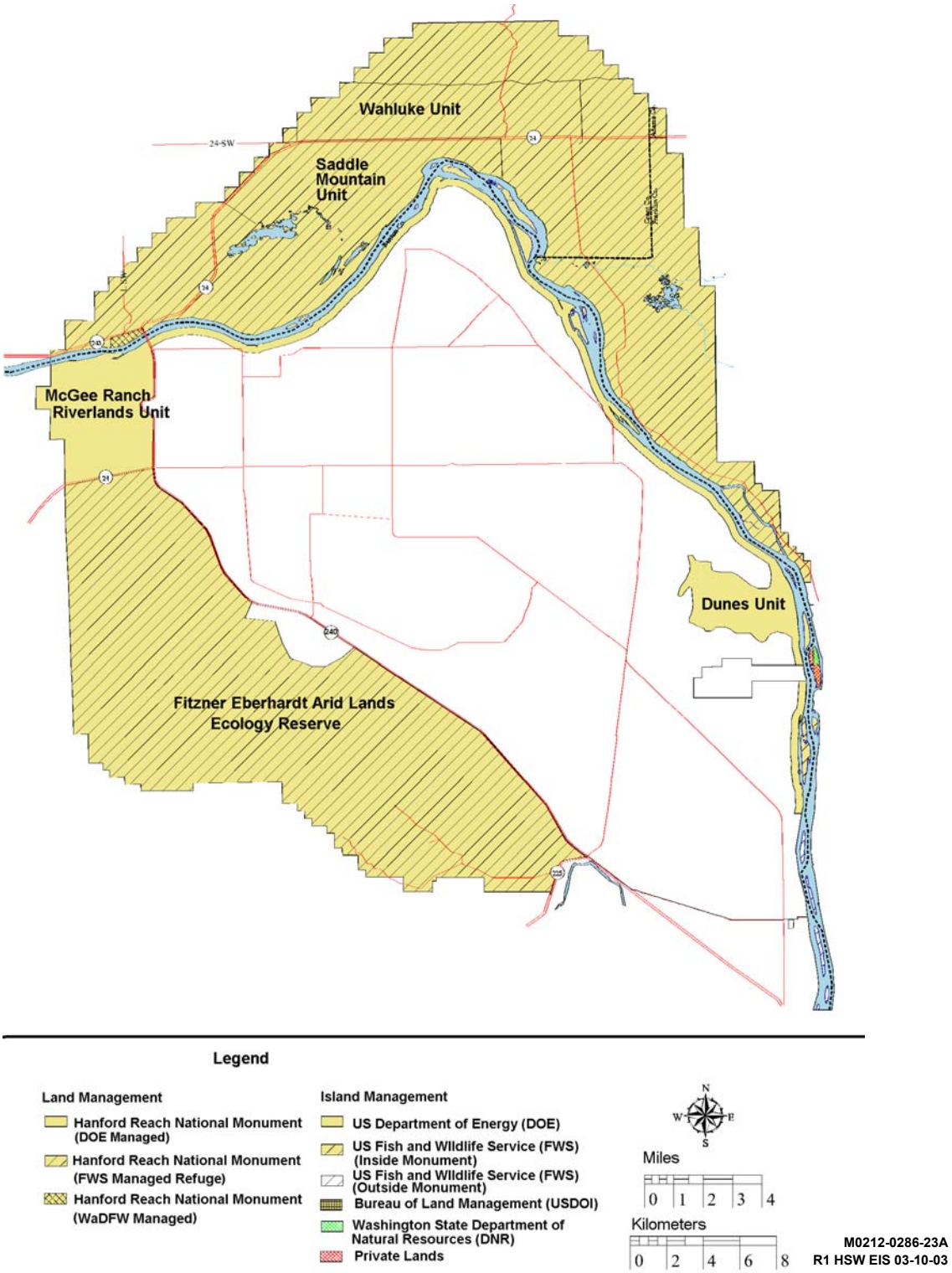

Figure 4.3. Hanford Reach National Monument

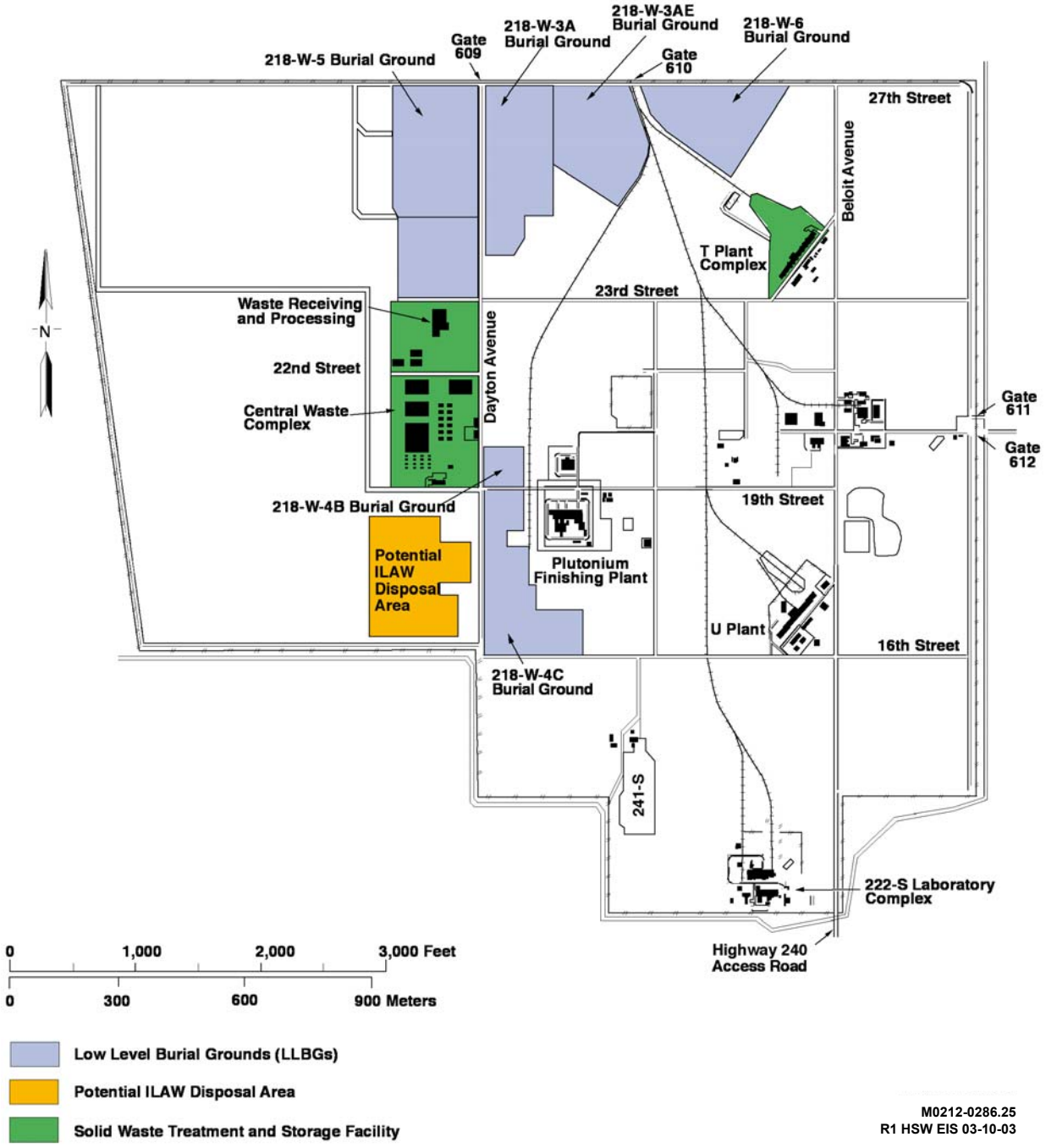

Figure 4.4. 200 West Area

contaminated equipment, and neutralization and repackaging of organic and inorganic lab packs. Twenty-seven metric tons (30 tons) of spent nuclear reactor fuel from Shippingport, Pennsylvania, stored at T Plant Complex, are being moved to the Hanford Canister Storage Building. DOE ultimately plans to ship this fuel to Yucca Mountain. K Basins sludge will be moved to T Plant and stored in cells.

The 200 Areas Effluent Treatment Facility (ETF), located in the 200 East Area (Figure 4.5), provides treatment and storage for hazardous and radioactive liquid waste. Liquid effluents are treated to remove metals, radionuclides, and ammonia, as well as to destroy organic compounds. The facility, in operation since 1995, is capable of treating 570 L (150 gal) per minute. Treated effluent is stored in verification tanks, sampled and analyzed, and discharged via pipeline to the State-Approved Land Disposal Site (SALDS), north of the 200 West Area or to the Treated Effluent Disposal Facility (TEDF) east of the 200 East Area (Poston et al. 2002).

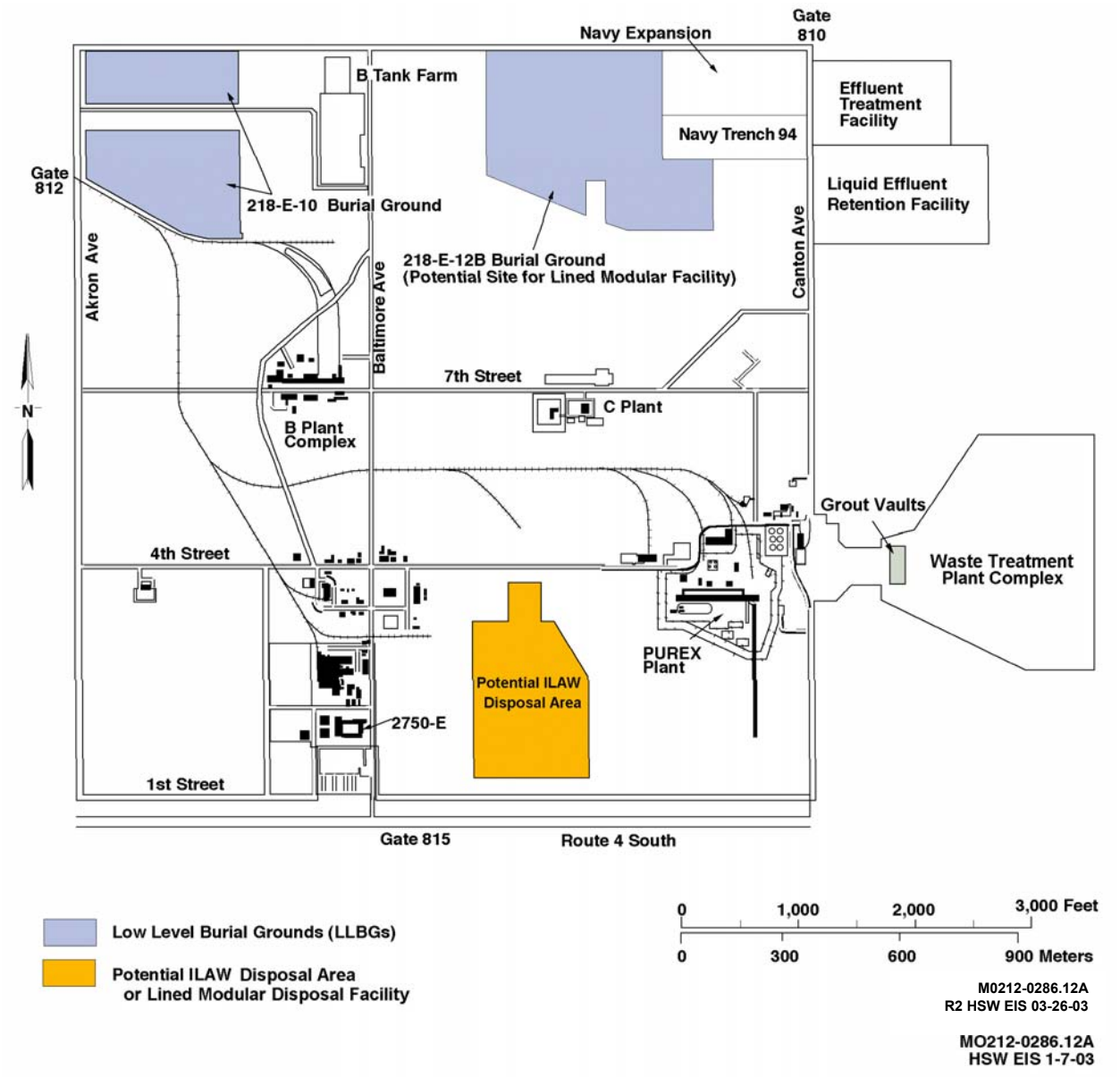

Figure 4.5. 200 East Area

The Liquid Effluent Retention Facility (LERF), located in the 200 East Area, consists of three surface impoundments for the temporary storage of process condensate from the 242-A evaporator and other aqueous wastes. Each basin has a capacity of 29.5 million L (7.8 million gal) and is constructed of two flexible high-density polyethylene membrane liners. Beneath the secondary liner is a soil/bentonite barrier. Each basin is covered by a mechanically tensioned floating membrane cover, designed to minimize evaporation of the contents and screen unwanted material from entering the basin. The facility began operation in 1994 and receives liquid waste from the RCRA- and CERCLA-regulated cleanup activities.

The 200 Areas Treated Effluent Disposal Facility (TEDF) began operation in 1995 and is a collection and disposal system for permitted waste streams. TEDF has a capacity of 12,900 L/min (3,400 gal/min). Effluent to the ponds must meet drinking water standards before discharge.

The Low Level Burial Grounds (LLBGs) are eight separate waste disposal areas located in the 200 Areas. Information summarizing specifics concerning the LLBGs are found in Appendix D.

The Biological Control Program was established in 1999 to control the growth of deep-rooted vegetation over contaminated and potentially contaminated waste sites. Deep-rooted vegetation growing on or near contaminated waste sites can take up radionuclides and other contaminants into their roots and transport them to the surface. Those contaminants can subsequently spread outside controlled areas as the plants are eaten by animals or are transported by weather. As part of the Biological Control Program, herbicides are applied to kill deep-rooted plants and noxious weeds. The effectiveness of the program is directly related to the timeliness of herbicide application. Spraying herbicides is typically performed in all seasons of the year except deep winter, although the early spring application is most critical, as all later applications depend on it for effectiveness. The elimination of contaminated plant species reduces the number of potential mechanisms for spreading contaminants, as well as reducing biological uptake by insects, small mammals, and birds. Selective herbicides are sometimes applied to minimize deep-rooted vegetation, while allowing shallow-rooted vegetation to remain for erosion control and evapotranspiration (soil water removal). The 200 Areas, including some LLBGs, contain relatively small areas of surface contamination as a result of biotic intrusion by deep-rooted plants or burrowing animals. Surface contamination is present in three of the older LLBGs (218-E-10, 218-E-12B, and 218-W-3AE) and amounts to less than 0.1 ha (0.25 ac) of contaminated surface area compared to a total of about 100 ha (250 ac) in the 200 East and 200 West Areas. As part of the Biological Control Program, areas of underground contamination, such as the LLBGs, cribs, ponds, ditches, trenches, and inactive disposal sites, are cleaned up and stabilized as needed to prevent further spread of surface contamination. Areas of surface contamination are posted, monitored, and surveyed at least annually to document their radiological status. Personal protective clothing and special procedures are required for entry into these surface contamination areas. However, surveys of the 200 Area contaminated soil sites during 2001 indicated that radionuclide concentrations were below soil concentration limits established to protect onsite workers (Poston et al. 2002).

The Environmental Restoration Disposal Facility (ERDF) for CERCLA cleanup wastes is located in the 200 Area Plateau between the 200 East and 200 West Areas (Figure 4.1). It is used for the disposal of radioactive, hazardous, dangerous, and mixed wastes generated during waste management and

remediation activities at the Hanford Site. ERDF began operation in July 1996 and currently consists of 4 cells, covering an area of approximately 20 hectares (50 acres). Two cells received wastes until September 2000 and are no longer active. The third cell began receiving wastes in June 2000, and the fourth cell has not been used to date (Poston et al. 2002). Alternatives proposed in the HSW EIS include the use of ERDF for the treatment and disposal of operational wastes.

Alternatives for ILAW disposal include disposal in newly constructed trenches southwest of the Plutonium-Uranium Extraction (PUREX) Facility in the 200 East Area (Figure 4.5) or the construction of new trenches on a site just south of the CWC (Figure 4.4).

Area C, a large polygonal area approximately 368 ha (909 ac) located adjacent to the south side of State Route (SR) 240 and centered approximately on the intersection of Beloit Avenue and SR 240, has been identified as a borrow-use area for the fine-grade silt loam and coarse-grade basalt needed to cap the LLBG (Figure 4.1).

4.3 Meteorology and Air Quality

Air resources addressed in this section include climate and meteorology, atmospheric dispersion, and ambient air quality.

4.3.1 Climate and Meteorology

The Hanford Site is categorized as a mid-latitude semiarid region. Summers are warm and dry, while winters are cool with occasional precipitation. Intense heating during the day and nocturnal cooling produce large diurnal temperature variations. The Cascade Mountain range, beyond Yakima to the west, greatly influences the climate of the Hanford area by means of its rain shadow effect. The Cascade Mountains limit the Pacific Ocean maritime influence by blocking the passage of frontal systems and causing less rain and cloud-cover on the lee (east) side of the mountains. This mountain range also serves as a source of cold air drainage with a considerable effect on the wind regime at the Hanford Site.

Climatological data for the Hanford Site are compiled at the Hanford Meteorology Station (HMS). The HMS is located just outside the northeast corner of 200 West Area and about 4 km (3 mi) west of the 200 East Area. Data from the HMS are representative of the general climatic conditions for the region and describe the specific climate of the 200 Area Plateau. Meteorological measurements have been made at the HMS since late 1944. Prior to the establishment of the HMS, local meteorological observations were made at the old Hanford townsite (1912 through late 1943) and in Richland (1943-1944). A climatological summary for Hanford is provided in Hoitink et al. (2002). To accurately characterize meteorological differences across the Hanford Site, the HMS operates a network of automated monitoring stations. These stations, which currently number 30, are located throughout the site and in neighboring areas (Figure 4.6). A 124-m (408-ft) instrumented meteorological tower operates at the HMS, station 21. A 61-m (200-ft) instrumented tower operates at each of the 100-N, 300, and 400 Area meteorology-monitoring sites. Most of the other network stations utilize short-instrumented towers with heights of about 9 m (30 ft). Instrumentation on each tower is described in Table 4.1. Data are collected and processed at each monitoring site and key information is transmitted to the HMS every 15 minutes. This monitoring network has been in full operation since the early 1980s.