

summarized in an annual report that is due to USFWS by December 1 each year. Although the 2011 results are not discussed in this annual report, they are available in the *2011 U.S. Fish and Wildlife Biological Opinion Reports for the Rocky Flats Site* (DOE 2011g).

3.2.4.2 Wetland Mitigation Monitoring

During the cleanup and closure of the Site, approximately 7.8 acres of wetlands were disturbed. In order to maintain a “no net loss” of wetlands at the Site, several mitigation wetlands were constructed to create or reestablish 7.8 acres of wetlands. Additionally new seeps and wet areas have developed at several locations throughout the COU where wetlands are developing naturally. DOE also paid for the Standley Lake Wetland Mitigation Bank that could be used if in situ wetland mitigation did not provide the total number of needed acres onsite. The *Rocky Flats, Colorado, Site Wetland Mitigation Monitoring and Management Plan* (DOE 2006b) provides guidance for monitoring the mitigation wetlands and reporting. During 2011, a total of 30 potential wetland locations were monitored. Of these, 29 had all three wetland indicators present. The 2011 results are not presented here, but are found in the *Rocky Flats, Colorado, Site, 2011 Annual Wetland Mitigation Monitoring Report* (DOE 2012b). This report is due to EPA by March 1 each year.

3.2.5 Summary

The Ecology Program at the Site conducts monitoring of the ecological resources to ensure regulatory compliance and to preserve, protect, and manage those resources. Proactive management of the natural resources is critical to the long-term sustainability of the ecosystems at the Site. Noxious weeds continue to be a top priority, as does the revegetation of the COU. Data from 2011 documented the continuing establishment of vegetation at revegetation locations; several met success criteria. Noxious weed control activities and additional revegetation activities were conducted during 2011 to improve and enhance the vegetation at the Site. The monitoring results continue to provide useful information for management activities. Full, detailed reports and analyses for each field monitoring effort are presented as stand-alone reports on the Ecology DVD included with this report.

3.3 Data Management

3.3.1 Water Data

Data from samples submitted to an analytical laboratory are received in both hard copy and electronic data deliverable formats. The electronic data are loaded into an Oracle-based relational database. The environmental monitoring data are accessible using the Site Environmental Evaluation for Projects (SEEPro) application. The hard-copy analytical reports are archived in the records library in Grand Junction, Colorado, along with the original field data forms and other relevant hard-copy forms or documents containing project data. Well construction and lithology logs are maintained for previously drilled wells and are produced for all new wells drilled. These logs are archived in the records library and can also be accessed electronically via the SEEPro database and the Geospatial Environmental Mapping System.

SEEPro uses Oracle software for data management and Microsoft Access for data retrieval and display. It compiles water quality, air quality, field parameter, sample-tracking, sample location,

and water-level data for groundwater, surface water, boreholes, soils, and sediment samples. Field parameter data include such information as sample location, sample date, pH, turbidity, conductivity, and temperature. Chemical information (Chemical Abstracts Service registry numbers, analytical results, and detection limits) is also included. Data managers follow specific procedures for verification of database information received from subcontractors or verification of data input directly into SEEPro. These procedures provide quality assurance (QA) documentation, which ensures that available data have been incorporated and entered or uploaded properly into SEEPro. Data integrity is maintained with standardized error-checking routines used when loading data into SEEPro. Other procedures address database system security and software change control.

The Site field data are entered through the FieldPar field data entry system. This system is a data entry module that is compatible with the SEEPro database and is used in the office by field personnel. The samplers verify data entered into FieldPar before loading the data into the main SEEPro database.

Spatial information for air and water data features is located in the LM GIS database. Some of the data features included are monitoring locations, potentiometric surfaces, plume configurations, streams/creeks, lakes/ponds, topographic contours, and historical Site facilities. This system uses an ESRI ArcGIS suite of software to store and present data. Automated monitoring locations and other sample location data features are derived from location information stored in the SEEPro database.

Analytical results for water samples for the fourth quarter of CY 2011 are provided in Appendix B.

3.3.2 Ecology Data

Ecological data have been collected at the Site for many years. Since the early 1990s, ecological data have been kept in electronic files for easier access, retrieval, and analysis. In the mid-1990s, the Sitewide Ecological Database (SED) was established as a master data set for the various types of ecological data collected at the Site. The SED is a Microsoft Access database that contains all quality-assured ecological data for RFETS from early 1993 through the end of 2001. Data that did not meet the QA objectives are not included in the database. Ecology data in the SED include vegetation monitoring, weed control and controlled burn vegetation monitoring, wildlife surveys (including birds, small mammals, frogs, insects, and fish), Preble's mouse habitat characterization and telemetry tracking, a small amount of soil characterization survey data (for revegetation issues), and a few other types of ecological data. The SED does not contain data on potential contaminants, nor is it linked to any GIS or other geospatial tool. The data in the SED are primarily observational or catch-and-release; they are considered raw data taken directly from field logbooks and datasheets. The SED is not intended as a reference for the layperson. It is a repository of quality-assured raw field data collected by Site ecologists and cannot be taken out of context of the methods used to collect the data. Data collection methods are not stored in the database, they are described in reports and field sampling plans.

From 2002 to the present, the ecology data have been stored as separate data sets by sample type, event, and year. Depending on the data set, the data may be in a Microsoft Access database or in a Microsoft Excel spreadsheet format. The nonspatial electronic ecology data are stored on the servers at the Site in Westminster, Colorado, or on backup electronic media.

Spatial ecology data for the Site are available for several data types and are stored in the GIS on the servers in Grand Junction, Colorado. The types of ecological spatial data that are available include annual weed distribution data (for selected species), annual weed control locations, biocontrol release locations, vegetation and wildlife monitoring locations (transect endpoints and sample points), vegetation community classifications, Preble's mouse habitat, wetland locations, wildfire/prescribed burn locations, Preble's mouse and wetland mitigation work, and rare plant locations. These data are available in various ArcGIS-compatible formats. In addition to these types of spatial data, orthorectified aerial and satellite imagery is also available for the Site for different time frames, including pre- and post-closure.

3.4 Validation and Data Quality Assessment

Data validation and verification (V&V) during CY 2011 was performed by Legacy Management Support contractor personnel at the Grand Junction, Colorado, office. Data quality assessment (DQA) is performed by personnel at the Site. The following section distinguishes DQA from data validation and discusses the technical basis, equations, and criteria used in the DQA of the water sampling analytical data.

3.4.1 General Discussion

Data validation is the principal means of assessing the usability of water analytical data. Validation also improves overall data quality by allowing the laboratory coordinator to closely monitor laboratory performance and to provide feedback to each laboratory regarding its ability to produce quality data that meets subcontract requirements. The laboratory coordinator may also use the results of data validation to direct analytical work to laboratories that demonstrate superior performance by generating timely, high-quality analytical data for the Site.

Data validation is a rigorous data review performed by the laboratory coordinator or designee on all of the water analytical data generated by the Site. Additionally, the Site lead may request a secondary detailed validation on a case-by-case basis. Data validation is currently performed as specified in the *Environmental Procedures Catalog* (LMS/PRO/S04325), "Standard Practice for Validation of Laboratory Data." This procedure is based on the following EPA documents:

- EPA 2010b, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, USEPA-540-R-10-011, January;
- EPA 2008, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, USEPA-540-R-08-01, June;
- EPA 2001, USEPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review, EPA-540-R-00/006, June; and
- DOE 1997, Evaluation of Radiochemical Data Usability, Office of Environmental Management, ES/ER/MS-5, April.

All water analytical data collected by the Site are considered valid unless analytical problems are identified during data validation that require data qualification. When it is necessary to qualify individual data records, standard qualifier codes are applied.