**21000-SWPPP**

# STORM WATER POLLUTION PREVENTION PLAN

Rocky Flats Environmental Technology Site

Golden, Colorado

April, 2001

Rev 0

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# 1. INTRODUCTION

## 1.1 Purpose of the *Storm Water Pollution Prevention Plan*

The *Storm Water Pollution Prevention Plan* (SWPPP) purpose is to minimize pollution associated with storm water runoff from the Rocky Flats Environmental Technology Site (RFETS) (also referred to as the Site). This SWPPP is prepared in support of the National Pollutant Discharge Elimination System (NPDES) Permit for the Site.

Federal, state, and local storm water management programs have the common goal of improving water quality by reducing the pollutants contained in storm water discharges (EPA, 1992b). According to the *Code of Federal Regulations* (CFR) (40 CFR 122.26(a)(14)), storm water discharge associated with industrial activity means "the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant." This applies to the RFETS.

This SWPPP complies with requirements of the RFETS NPDES Permit (CO-0001333), concerning SWPPP development and implementation and certifies compliance. The approach taken in preparing this SWPPP, as outlined in the Environmental Protection Agency (EPA) guidance manual, *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices*, was first to recognize potential storm water pollutant sources and pathways (EPA, 1992b). Second, the Site assessed pre-existing storm water pollution prevention measures and Best Management Practices (BMPs). Third, recommendations for additional BMPs were made in conjunction with a method for implementation. In accordance with EPA guidance, the SWPPP must be revised "whenever there is a change in design, construction, operation or maintenance, which may impact the potential for pollutants to be discharged" or if the plan proves not to be effective (EPA, 1992b). This SWPPP provides for periodic Site inspections, an ongoing evaluation of storm water pollution control measures and an annual review of the SWPPP.

## 1.2 Engineer's Certification

I certify that I have reviewed this plan and am familiar with the requirements of 40 CFR 122.26; that I am familiar with the facilities described; and that, based on the information provided, this *Storm Water Pollution Prevention Plan* has been prepared in accordance with good engineering practices.

Melissa A. van der Poel — 4/24/01

Melissa van der Poel, P.E.
Registered Professional Engineer
State of Colorado, #35110

Date

COLORADO REGISTERED PROFESSIONAL ENGINEER
Melissa Anne van der Poel
35110

## 1.3 Definitions

**Agreement in Principle (AIP).** An agreement between the State of Colorado and the Department of Energy (DOE). Signed on June 28, 1989, the intent was to assure the citizens of Colorado that discharges from the Site do not adversely affect public health and safety. See text for further discussion.

**As Low As Reasonably Achievable (ALARA).** The approach to radiation protection to manage and control exposures (both individual and collective) to the work force and to the general public to as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. As used in 10 CRF 835, ALARA is not a dose limit but a process which has the objective of attaining doses as far below the applicable limits of 10 CFR as is reasonably achievable.

**Ancillary Equipment.** Equipment essential to a facility, process, or another more significant piece of equipment to which it is physically connected.

**Auxiliary Equipment.** Equipment used to assist in ordinary use of a facility, process, or other equipment that is not physically attached.

**Best Management Practices (BMPs).** Those measures or combination of measures which prevent or minimize the potential for release of toxic and hazardous pollutants in significant amounts to navigable waters. The potential sources of toxic and hazardous pollutants are those associated with or ancillary to the industrial manufacturing or treatment process. BMPs are often programmatic or administrative in nature and identify specific spill prevention measures or structures.

**Buffer Zone.** The land surrounding the 384-acre Controlled Area in which no production activities occur. The outer boundary of the Buffer Zone is fenced and is posted with “No Trespassing” signs. The total area of the Buffer Zone is approximately 5,878 acres.

**Continuous Release.** A release that is constantly occurring such as evaporation from the Site’s detention ponds.

**Controlled Area.** The developed portion of the Site on which the major production, research, development, administrative, and support facilities are located. This portion of the Site consists of approximately 384 acres located near the center of the 6,262 acres that comprise the Site.

**Environmental Incident.** Any release of chemicals, solid materials, particulates, or gases from the containment systems caused by Site operations that may be harmful to the surrounding environment. The release may be within, leading to or from, or outside the boundaries of the Site.

**Facility Manager (FM).** A senior manager with responsibility for the conduct of all operations within a building.

**Foundation Drain.** A drain near a foundation footing of a building that collects groundwater, incidental water, leakage from inside the building including liquids from spills, and any other liquid that seeps to the footing. These drains are sometimes equipped with sump pumps to remove the water.

**Hazardous Material.** A substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported, and which is designated as such in 49 CFR 172.101, or the appendix to 172.101, or that meets the definition of a hazardous waste as identified in 40 CFR 261.

**High Risk Area.** An area in which current conditions or operational history indicates that a reasonable potential for a release exists. An area in which adequate BMPs have been implemented is not a high-risk area.

**Limiting Condition for Operation (LCO).** The lowest functional capability or performance levels of safety-related structures, systems components, and their support systems, as identified in Technical Safety Requirements, or Operational Control documents, that are required for normal, safe operation of a facility.

**National Pollutant Discharge Elimination System (NPDES).** A permitting system promulgated under the Clean Water Act that sets limits on concentrations of pollutants that may be discharged by a facility regulated under this law. NPDES permits also stipulate the monitoring, reporting, and discharge requirements for the facility. The NPDES Permit for the Site is administered by Region VIII of the U.S. Environmental Protection Agency.

**Occurrence.** A condition or event that:

- Adversely affects, or may adversely affect, DOE or contractor personnel, the public, property, the environment, or the DOE mission.
- Is a non-emergency abnormal or unplanned event that adversely affects, potentially affects, or is indicative of degradation in the safety, security, or environmental and health protection performance or operation of a facility (Off-Normal Occurrence).
- A non-emergency event that exceeds the Off-Normal threshold, is related to safety, safeguards and security, environmental or health protection, performance or operation of a facility (Unusual Occurrence).

**Permitted Release.** A release of material, either airborne or waterborne, that is controlled or allowed under the conditions of a permit granted by a regulatory agency.

**Process Waste.** For the purposes of this document, wastewater associated directly with industrial activities at the Site. Sanitary waste such as liquids from restroom and kitchen facilities are not process waste.

**Process Waste Treatment Plant, Building 374.** The facility used to treat process wastes that have a radioactivity level below 200,000 picoCuries per liter (pCi/L).

**Process Waste Treatment Plant, Building 774.** The facility used to treat higher level process wastes prior to treatment in the Building 374 Process Waste Treatment Plant. Building 774 also has processes for treatment of organic waste streams.

**Protected Area (PA).** The north-central portion of the Controlled Area of the Site that is located within several physical security boundaries and in which the plutonium was historically machined, processed, and stored.

**Raschig Ring.** Glass rings impregnated with boron which are placed in tanks containing radioactive solutions to absorb neutrons and thereby protect against criticality.

**Resource Conservation and Recovery Act (RCRA).** An act promulgated in 1976 with subsequent amendments that are codified in 42 U.S.C. §§ 6901 et seq.; RCRA regulations are codified in Title 40 CFR Parts 260-270. The regulations and act provide for the protection of human health and the environment through proper management and minimization of hazardous wastes.

**Regulated Substance.** Any substance, whether raw material or waste, that: (1) is listed in Table 302.4, 40 CFR §302.4; (2) is defined as a hazardous waste in 40 CFR Part 261; (3) has a hazard rating greater than or equal to two; or (4) spontaneously emits ionizing radiation.

**Release.** Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, ejecting, leaching, dumping, or disposing of a material into the environment. Any activity that involves the placement of a hazardous substance into any unenclosed containment structure is considered a release. An unenclosed containment structure may allows the hazardous substance to be exposed to the environment. An unenclosed containment structure may allow the hazardous substance to emit or escape into the air, water, or soil. An unenclosed containment structure does not include industrial tanks that have vents or piping systems to prevent over-pressurization or to provide for material transfer or treatment as stated in 40 CFR Parts 302 and 355. Site personnel have been trained and instructed to report to their management all unplanned releases.

**Reportable Quantity (RQ).** That quantity of a compound, the release of which, requires the notification of off-Site agencies such as the EPA, the Colorado Department of Public Health and Environment (CDPHE), the National Response Center, the Department of Transportation (DOT), the Colorado State Oil Inspector, or the U.S. Coast Guard. Listings of the compounds for which RQs exist can be found in the DOT regulations, the Clean Water Act (CWA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), the Clean Air Act (CAA), and the Superfund Amendments and Reauthorization Act (SARA) regulations. The various regulations cited above do not necessarily have the same reporting requirements, the same RQs, nor the same compounds listed as potential RQs.

**Reportable Release.** Any release that involves a reportable quantity (as defined above). The presence of a reportable quantity of a hazardous substance in an unenclosed

containment structure, whether the material was placed in the structure by design or due to an unplanned event, constitutes a reportable release whether or not a reportable quantity of the hazardous substance actually volatilizes into the air or migrates into surrounding water or soil as defined in 40 CFR Parts 302 and 355. Some materials have no reportable quantity and may not require reporting to off-Site agencies.

**Safety Limits.** Limits on process variables associated with those physical barriers, generally passive, that are necessary for the intended facility functions and which are found to be required to guard against the uncontrolled release of radioactivity and other hazardous materials.

**Secondary Containment.** Physical structures provided for the purpose of containing the contents of a tank or other primary containment should the primary containment fail. Secondary containment may be composed of various substances including solids, concrete, and asphalt and may be coated or lined.

**Sewage Treatment Plant (STP).** - A term synonymous with Wastewater Treatment Plant.

**Shift Superintendent.** That person occupying the position at the Site which is staffed 24-hours a day that has the responsibility for routine Site stewardship and management of Sitewide operational problems and emergency situations.

**Spill.** Any release of materials from a primary containment structure that is not specifically intended or controlled. A spill may or may not constitute a release.

**Spill Control.** Those activities and actions related to controlling a spill that has already occurred.

**Spill Prevention.** Those measures or structures that help to prevent the occurrence of a spill. Spill prevention activities are considered best management practices.

**Wastewater Treatment Plant (WWTP).** The facility that treats liquid sanitary wastes, cooling tower blowdown, evaporative cooler blowdown, photographic waste solutions pretreated to remove silver, and stainless-steel rinse water. This facility does not treat wastes that are directly associated with production processes involving radionuclides.

# 2. BACKGROUND

## 2.1 Facility Information

| | |
|---|---|
| Name of Facility: | Rocky Flats Environmental Technology Site |
| Type of Facility: | Government-owned and integrating contractor operated facility. Part of the nuclear weapons complex administered by the U.S. Department of Energy. |
| Location of Facility: | The Site is located in northern Jefferson County, Colorado, almost equidistant from the Cities of Arvada, Boulder, and Golden. The facility, located at 105 degrees, 11 minutes and 30 seconds west longitude and 39 degrees 53 minutes and 30 seconds north latitude, is about 16 miles northwest of Denver. The Site is located in Sections 1 through 4 and 9 through 15 of Township 2 South, Range 70 West, 6th Principal Meridian. |
| Mailing Address: | U.S. Department of Energy<br>Rocky Flats Field Office<br>10808 Highway 93, Unit A<br>Golden, CO 80403-8200 |
| Name and Address of Owner/Operator/Permittee: | Owned and permitted by the U.S. Department of Energy (address above). NPDES co-permitted and co-operated on behalf of DOE and by the Site's Integrating Management Contractor:<br><br>Kaiser-Hill, L.L.C.<br>Rocky Flats Environmental Technology Site<br>10808 Highway 93, Unit B<br>Golden, CO 80403-8200<br><br>NPDES co-permittee with DOE and Kaiser-Hill:<br><br>Rocky Flats Closure Site Services, L.L.C.<br>Rocky Flats Environmental Technology Site<br>10808 Highway 93, Unit B<br>Golden, CO 80403-8200 |
| Designated Person Responsible for the Site: | Barbara A. Mazurowski<br>Operations Manager, DOE, Rocky Flats Field Office<br>303-966-2025 |

| | |
|---|---|
| SWPPP Contacts: | Joseph Legare (DOE,RFFO ) 303-966-5918<br>Nancy Tuor (Kaiser-Hill) 303-966-9819<br>John L. Motes (RFCSS) 303-966-2411 |
| NPDES Permit Number: | CO-0001333 |
| Mission: | RFETS was previously a defense production facility whose current missions include:<br>• environmental restoration;<br>• waste management; and,<br>• accelerated decontamination, decommissioning, and demolition. |

## 2.2 Historical Overview of Site Activities

Site construction was approved in 1951 with the primary mission of producing nuclear weapons components. Limited operations began in 1952 and the first components were completed and shipped offsite in 1953.

Operation of the Site began under the administration of the United States Atomic Energy Commission from 1951 until the Commission was dissolved in January 1975. Responsibility for the plant was then transferred to the Energy Research and Development Administration, which was succeeded by the DOE in 1977. Within DOE, administrative responsibility was delegated to the Albuquerque Operations Office (DOE, AL) that established the Rocky Flats Area Office for day-to-day contact at RFETS. In 1989, the Rocky Flats Area Office was upgraded to the Rocky Flats Field Office (RFFO), accountable directly to DOE Headquarters in Washington, D.C.

The Dow Chemical Company was the first prime contractor for Site operations. Rockwell International replaced Dow in 1975 and operated the plant through 1989. EG&G Rocky Flats, Inc. assumed operations on January 1, 1990 and was the prime contractor until July 1, 1995, at which time Kaiser-Hill Company, L.L.C. assumed control as the Integrating Management Contractor for the Site.

Historically, workers at the Site fabricated components for nuclear weapons from plutonium, uranium, beryllium, and stainless steel. Support activities included chemical recovery and purification of recyclable transuranic radionuclides, and research and development in metallurgy, machining, nondestructive testing, coatings, remote engineering, chemistry, and physics (EG&G, 1993c).

The Site's plutonium mission was officially discontinued in January 1992 when the President cancelled further production of the W-88 nuclear warhead and its associated Trident II missile program. The Site began transition to a new mission focusing on environmental restoration, waste management, decontamination and decommissioning

(D&D) of facilities. Landlord responsibility for most of the Site was transferred on September 15, 1993 from DOE's Office of Defense Programs to the Office of Environmental Restoration and Waste Management. The Site developed a *Closure Project Baseline* in June, 2000 that outlined a strategy and schedules for preparing facilities for cleanup, deactivation, decontamination, consolidation of special nuclear material, and alternate uses. Waste and environmental facilities are continuing to operate in support of transition efforts, including decontamination of facilities.

## 2.3 Location and Setting

The Site occupies approximately 6,262 acres of federally-owned land in northern Jefferson County, Colorado, and is bounded on the north by State Highway 128, on the west by a parcel of land east of State Highway 93, on the south by a parcel of land north of State Highway 72, and on the east by Jefferson County Highway 17 (Indiana Street). Access to RFETS is gained from an east access road exiting from Indiana Street and a west access road exiting from State Highway 93 (Figure 2-1).

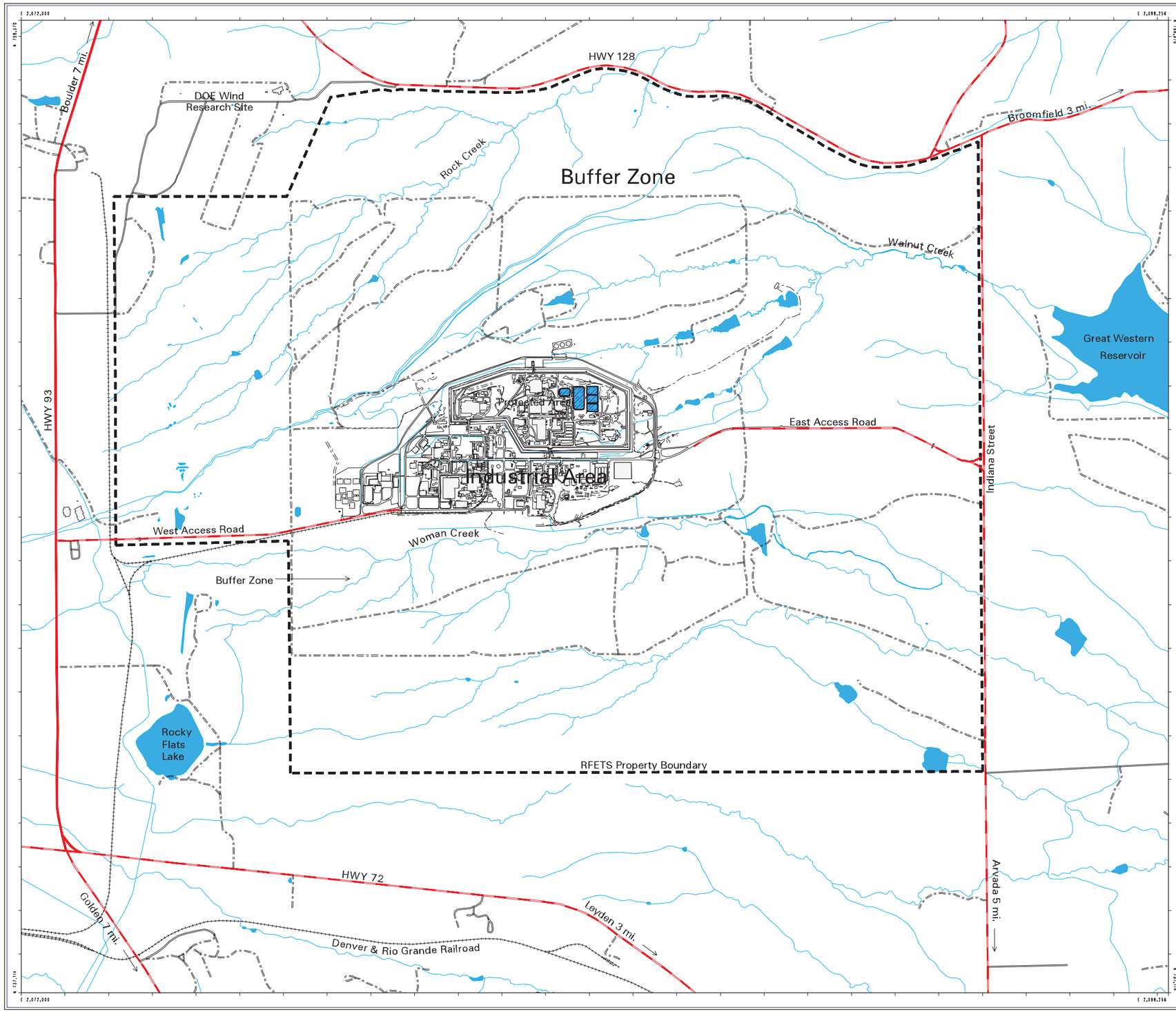
Near the center of the Site is a zone of approximately 384 acres, the Industrial Area (IA), where the major production, research, development, administrative, and support facilities are located. The IA is surrounded by a 5,878 acre buffer zone of undeveloped land (with the exception of the landfill, guard posts, and a few administrative buildings) enclosed by a three-strand barbed wire fence marked with no trespassing signs. Within the IA is a further secured zone, the Protected Area (PA), where facilities and processes related to Special Nuclear Material are located

RFETS is situated at an elevation of approximately 6,000 feet, approximately 16 miles northwest of downtown Denver. It lies on the eastern edge of an extensive and relatively flat terrace deposit known as the Rocky Flats Alluvium. The terrace is approximately five miles wide and flanks the eastern edge of the foothills of the Rocky Mountains. Water flows from west to east across the Site through three primary drainages: Rock Creek, Walnut Creek, and Woman Creek. Historically, the manufacturing, processing, and waste handling and storage activities—and therefore potential contaminant source areas—have been restricted to areas within the boundaries of the Walnut Creek and Woman Creek drainages. Water in Walnut Creek and Woman Creek flows toward two reservoirs used for municipal water supply—Great Western Reservoir and Standley Lake; however, water diversion projects in place since 1989 redirect discharges from the Site around these reservoirs.

## 2.4 Surface Water Features

### *2.4.1 Drainages*

The Site is situated within two regional drainage basins: Boulder Creek basin and Big Dry Creek basin. Three intermittent streams within these basins drain the Site: Walnut Creek, Woman Creek, and Rock Creek. Walnut Creek and Woman Creek




# Figure 2-1

## Rocky Flats Environmental Technology Site Map

### RFETS Location and Setting

**EXPLANATION**

**Standard Map Features**

- Buildings
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Heavy duty paved roads
- Medium duty paved roads
- Light duty paved roads
- Dirt roads
- Railroads

*DATA SOURCE BASE FEATURES:*
*Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95*

Scale = 1 : 28720
1 inch represents approximately 2393 feet

700 0 1400 2800ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by: DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER•HILL COMPANY

MAP ID: rfca-rpt

April 05, 2001

Original map contents are preserved. Logo and date have changed.

NT_Svr d:/projects/fy2001/01-0437/sitemap/sitemapb-v1.aml

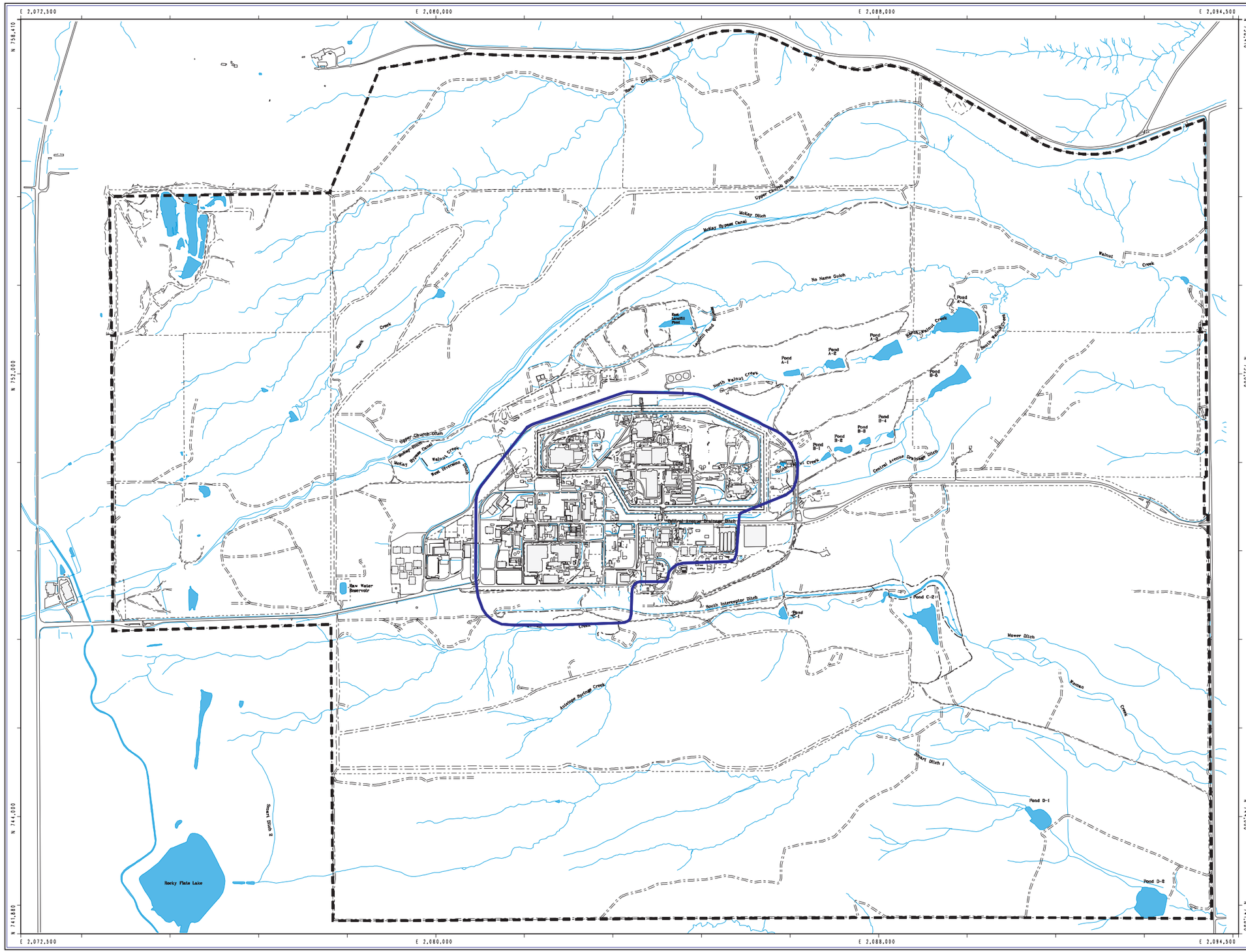
flow eastward across the central and southern portions of the Site, respectively, and are within the Big Dry Creek basin. Rock Creek drains the northern portion of the Site and flows northeastward into the Boulder Creek basin.

Past production and disposal activities at the Site have influenced Walnut Creek and Woman Creek. The Rock Creek basin is located entirely outside the limits of the Industrial Area and has remained essentially undisturbed. Figure 2-2 depicts the creeks and basins at the Site. In general, streams at the Site gain water during the spring due to precipitation, recharge, and rising ground water levels. Streams lose water during late summer and autumn due to diminished precipitation, infiltration into unsaturated channel material, and falling ground water levels (EG&G, 1993b). Stream channels at the Site are often dry in the late summer and autumn.

The majority of the soils of the Rocky Flats drainage basins are characterized by high infiltration rates and have uniform vegetative cover. Consequently, the times of concentration (tc)[1] for drainage basins are on the order of about an hour, indicating the loss of significant quantities of runoff to subsurface flow and the production of little overall surface runoff. Additionally, various wetlands and detention ponds attenuate most runoff, reducing peak flows and increasing travel times. Water enters these drainages through precipitation, groundwater seepage, and anthropogenic features such as ditches (EG&G, 1993b). Figure 2-2 shows the network of streams, interceptor ditches and ponds described below.

- North and South Walnut Creek join to form Walnut Creek, which previously flowed into Great Western Reservoir. However, water is rerouted by the City of Broomfield through the Broomfield Diversion Ditch around the reservoir and eventually into Big Dry Creek, which flows to the South Platte River.
- Woman Creek originates west of RFETS and originally flowed either eastward into Standley Lake or was diverted to Mower Reservoir. The DOE funded the Standley Lake Protection Project to protect Standley Lake water quality, and included construction of Woman Creek Reservoir along Woman Creek just east of Indiana Street. Water discharged from Pond C-2 and water in Woman Creek flow into Woman Creek Reservoir. After testing, the water is transferred by pipeline to Walnut Creek below Great Western Reservoir, thereby bypassing Standley Lake altogether.
- Rock Creek drains the northwest portions of the Buffer Zone as it flows northeast into Coal Creek. Coal Creek flows west and north of RFETS into Boulder Creek, then St. Vrain Creek, and eventually to the South Platte River.

[1] The time required for overland and channel flow to reach the basin outlet from the hydraulically most distant part of the catchment (Dunne and Leopold, 1978).




# Figure 2-2

## Rocky Flats Environmental Technology Site

## Industrial Area

### EXPLANATION

Industrial Area Boundary

**Standard Map Features**

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Rocky Flats boundary
- Paved roads
- Dirt roads

***DATA SOURCE BASE FEATURES:***

*Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95*

*Data Source:*
*Industrial Area Boundary data - Approved by Nick Demos (RMRS, 303-966-4605).*

N

Scale = 1 : 21430
1 inch represents approximately 1786 feet

500 0 1000 2000ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:
DynCorp
THE ART OF TECHNOLOGY

Prepared for:
KAISER•HILL COMPANY

MAP ID: 01-0437/ia_site.aml

April 05, 2001

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### *2.4.2 Interceptor Ditches*

Two man-made diversion channels, the West and South Interceptor Ditches, are used to reroute runoff at the Site. The West Interceptor Ditch diverts runoff from the headwaters of North Walnut Creek via the McKay Bypass Ditch and the McKay Bypass Extension Pipeline to Walnut Creek east of Indiana Street. This allows the lower reaches of North Walnut Creek to carry runoff from the Site that has not mixed with upstream flows.

Runoff and, potentially, spills from the southern part of the Site are diverted away from Woman Creek by the South Interceptor Ditch and routed to Pond C-2 where the water is detained and sampled prior to discharge.

### *2.4.3 Detention Ponds*

***Description and Management.*** Three series of constructed detention ponds exist to collect surface runoff and allow for management and controlled off-Site discharge of the water. Ponds located along North Walnut Creek are designated as Ponds A-1 through A-4; ponds located along South Walnut Creek are designated as Ponds B-1 through B-5; and ponds located along Woman Creek are designated Ponds C-1 and C-2. The ponds serve three main purposes for surface water management: (1) storm water detention and settling of sediments, (2) holding water for sampling and, as necessary, treatment prior to being discharged, and (3) emergency spill control in those instances where a spill cannot be adequately managed without use of the ponds.

The ponds farthest downstream within the Site boundaries (Pond A-4 on North Walnut Creek, Pond B-5 on Walnut Creek, and Pond C-2 on Woman Creek) are referred to as "terminal" ponds. The terminal ponds are designed to provide additional volume for flood control and are monitored for specified water-quality characteristics before and during discharge.

Ponds A-1, A-2, B-1, and B-2 are reserved for emergency spill control when no other spill containment alternative is available. Water that accumulates in these ponds as a result of runoff from the immediate watersheds is generally transferred to Pond A-2 after being analyzed.

Pond B-3 receives treated effluent from the WWTP, while the remaining A- and B-series ponds receive runoff from the storm water management system, as well as runoff from their drainage basins. Pond C-1 receives flow from Woman Creek and Pond C-2 collects diverted flow from the South Interceptor Ditch as previously noted. A detention pond is also located at the Present Landfill. Water from this pond, which has no water source except for the watershed immediately surrounding the pond, is typically not transferred unless dam overtopping is an immediate threat.

***History.*** Between the mid-1950s and 1962, the pond network at the Site consisted of Pond A (now known as Pond A-1), Ponds B-2, B-3, B-4, and Pond C (now known as Pond C-1) (Dow Chemical, 1972; Dow Chemical, 1973). Pond B-1 was added in 1962.

These ponds were operated in series with the flow from one pond entering the next pond downstream until the final pond was reached and the water was discharged off plant site. In June 1973, construction was completed on the three drainages to provide (1) additional detention capacity, and (2) the capability of bypassing flows around particular ponds (Shirk and Dresser, 1973; Dow Chemical, 1971.) A portion of the additional detention capacity created at that time was related to the construction of new ponds, while the remainder of the increased capacity was provided by raising the level of the existing dams (Dow Chemical, 1971.) By mid-1974, Ponds A-1, A-2, A-3, B-1, B-2, B-3, B-4, and C-1 all existed, with Ponds A-1, A-2, B-1, B-2, and C-1 all equipped to handle spills (Dow Chemical, 1974.) The ponds were operated in series fashion until December 21, 1973, at which time Ponds A-2 and B-2 were connected by pipeline, allowing for water transfer between the two ponds, and isolated from the rest of the flow system to allow for management of untreated decontamination laundry wastewater (Colston, 1974.) Construction of the current terminal ponds, A-4, B-5, and C-2, began in 1979 and was completed in 1980 along with surface water interceptor canals to allow for improved surface water management (Rockwell, 1980; Rockwell, 1981.) After the construction of Pond C-2 and the South Interceptor Ditch, Pond C-2 became the pond on the C-series drainage available for emergency spill control.

## 2.5 Industrial Area Storm Water Control Structures and Outfalls

### *2.5.1 Control Structures*

***Inventory***. An inventory and inspection of the Site IA storm water structural controls was completed in September 1993 (EG&G, 1993a) and updated in March 2001, using field investigations to confirm and update information gained from utility drawings and historical inspection reports. The *Rockwell Site Utility Mapping (Drawing Series 15501)* (EG&G, 1993a) contained the best information regarding existing structural controls, especially with respect to storm sewers, culverts, and underdrains. Data from this inventory were used for generating the base map of storm water structural controls in Appendix A, *Structural Stormsewer Controls Inventory*. Past video inspections of the storm sewer system, summarized in the *Study for Storm Sewer Inspection Review* (Rockwell, 1989), provided background information regarding storm sewer inspections.

***Inventory Rating System.*** Field inspections involved assigning separate rating numbers to each control structure for both physical condition and the need for maintenance. Ratings were based on a scale of 1 to 5. A rating of 1, with respect to condition, represents a structure that is deteriorating or corroding. In terms of maintenance, a rating of 1 represents a structure that is severely blocked with sediment or debris. In contrast, a rating of 5 represents structures that are in new condition or are newly installed and in need of no maintenance. A rating of 3 indicates that the structure, while not new or newly repaired, is in good condition and needs no immediate maintenance. This dual rating-number system takes into consideration situations where, for example, a control structure such as a corrugated metal pipe is in good condition but is full of sediment and therefore requires maintenance.

In general, structures within the Protected Area are in greater need of maintenance than structures elsewhere within the IA. Factors considered in prioritizing future drainage structure maintenance include a consideration of the effects of flooding that may occur as a result of a blocked drainage to include personal safety, equipment and facilities, critical access roads, and the environment. In addition, consideration will be given to the disturbance of soils, hazardous substances, and wetlands when drainage improvements are made. As Site Closure proceeds with building and infrastructure removal, current storm water structural controls may be modified or removed. These issues all potentially impact maintenance of storm water control structures. Results of the inventory are shown on the map in Appendix A, *Structural Stormsewer Controls Inventory* and contained in tabular form in Appendix B, *RFETS Structural Stormwater Control Inventory*.

### *2.5.2 Outfalls*

The Site IA has been divided into drainage basins for monitoring storm water to comply with the monitoring requirements of the NPDES Permit. Section I.C.15.c.2)a)(i) of the NPDES Permit specifies that a Site map indicating the drainage area of each storm water outfall shall be included in the SWPPP. Figure 2-3 presents the Site drainage areas associated with each outfall. Table 2-1 identifies the outfall locations and corresponding drainage basin acreage.

**Table 2-1**
***Storm Water Outfall Locations and Drainage Basin Sizes***

| Outfall Number | Outfall Location Description | Approximate Drainage Area (Ac.)[1] |
|---|---|---|
| 008 | Basin SW022, located at the point where Central Avenue Ditch crosses the outer Industrial Area security fence. | 31.0 |
| GS10 | Basin SW023, located on South Walnut Creek upstream of Pond B-1. | 67.6 |
| 010 | Basin SW027, located at the downstream end of the South Interceptor Ditch. | 86.7 |
| 011 | Basin SW093, located on North Walnut Creek at a point upstream of Pond A-1. This area receives any storm water discharge from the SW118 subbasin. | 97.9 |

[1] *Rocky Flats Plant Drainage and Flood Control Master Plan* (EG&G, 1992a).

Monitoring requirements for storm water discharges are in accordance with the Site *Integrated Monitoring Plan* (RFETS, 2000g) developed pursuant to RFCA. The event-related and flow proportioned sampling currently required under the IMP is included in

the NPDES Permit by reference, with provisions for more specific sub-basin sampling under certain circumstances. This approach was designed to serve a variety of needs, and should adequately support the SWPPP under most circumstances. In the event that additional monitoring needs are identified as necessary to support the SWPPP, these shall be incorporated into the Site *Integrated Monitoring Plan*, during the periodic update process, as appropriate.

## 2.6 Regulatory Background

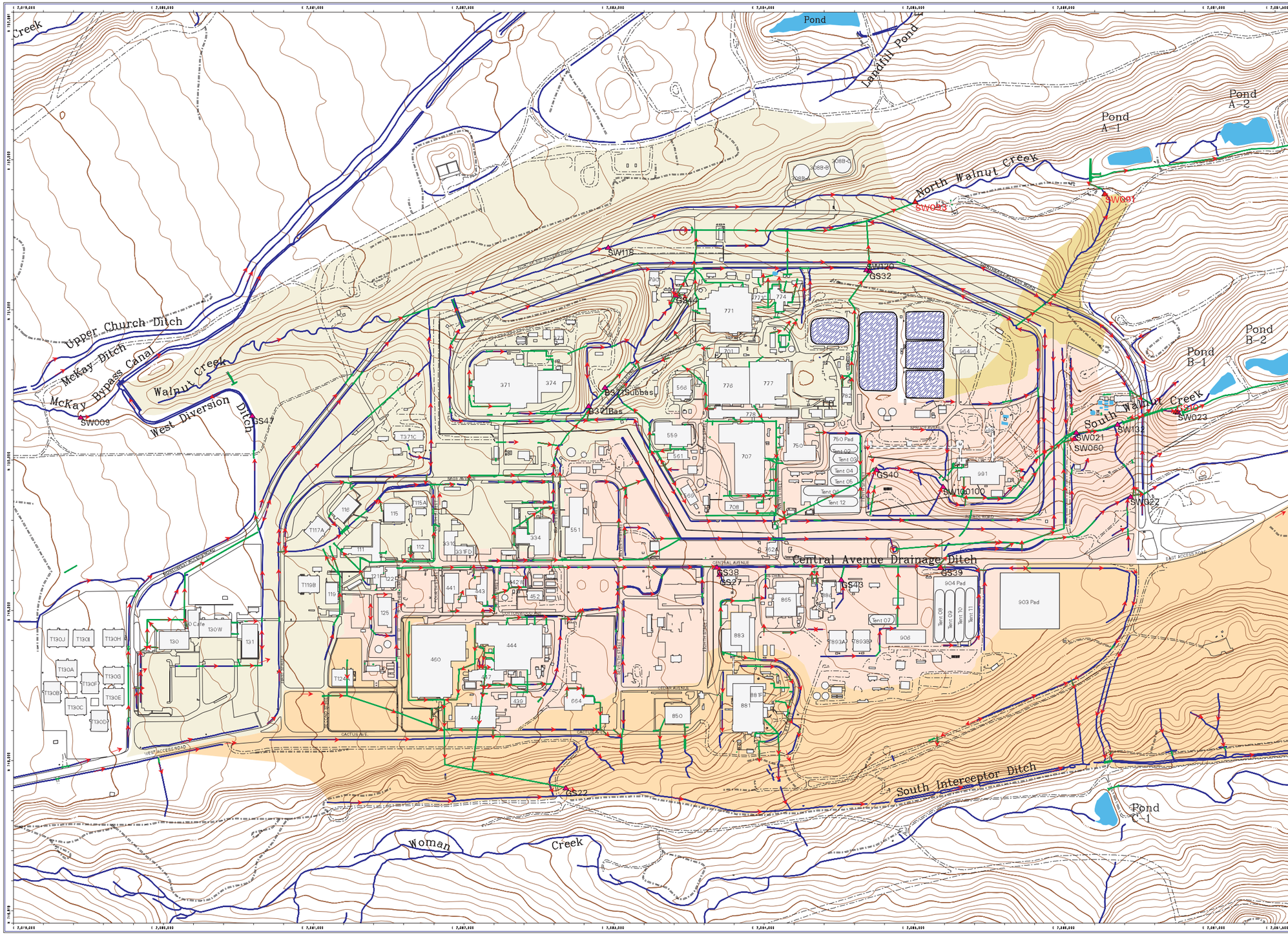
The Site complies with many requirements and regulations governed by both federal and state government agencies. The following review summarizes regulations and agreements that concern Site surface water discharges and impact SWPPP issues.

### *2.6.1 National Pollutant Discharge Elimination System (NPDES) Permit*

The original Clean Water Act, formally referred to as the Federal Water Pollution Control Act of 1972, prohibits the discharge of any pollutant into waters of the United States from a point source unless the discharge is authorized by a NPDES Permit. Initial efforts to improve water quality under the NPDES program focused on reducing pollutants in point discharges of industrial and municipal wastewater. At the beginning of the NPDES program, many sources of municipal and industrial wastewater were not adequately controlled, resulting in poor, often drastically degraded, water quality conditions. However, as pollution control measures for point sources became more widely installed, regulatory attention turned to more diffuse sources (occurring over a wide area or non-point sources). Currently, the NPDES program is undergoing expansion to address non-point sources of pollution better (see Section 2.6.4). The Site originally obtained a NPDES permit for its activities in 1974, with permit renewals granted in 1981 and 1984. NPDES permits have in the past been extended while new permits were negotiated. The Site is currently operating under the terms of the 2000 NPDES Permit.

### *2.6.2 Storm Water Regulations*

The first round of federal regulations regarding storm water management and permitting required that storm water discharge permit applications be submitted for storm water discharges from sites with industrial activity (applicable to the RFETS) or for discharges from municipal separate storm sewer systems serving more than 100,000 people. DOE submitted a Storm Water Permit Application for the Site in October 1992 that included: (1) outfall location and receiving water, (2) a description of improvements to the Site that may affect storm water, (3) a Site drainage map; a narrative description of pollutant sources for each outfall, (4) a certification that non-storm water discharges do not take place at any storm water outfall to the extent possible, (5) a history of significant leaks and spills for the last three years, and (6) chemical and physical discharge information. In addition, a SWPPP must be prepared and submitted to the permitting authority within six months of the effective date of the NPDES Permit.




# Figure 2-3
# IA Surface Water Routing Map

## EXPLANATION

- Subordinate Automated Surface Water Monitoring Location
- Final Automated Surface Water Monitoring Location
- Surface Water Flow Routing
- Surface Water Streams
- Culverts / Storm Drains

**Major IA Drainages**

- GS10
- SW027
- SW091
- SW093

**Standard Map Features**

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Contour (5-Foot)
- Paved roads
- Dirt roads

*DATA SOURCE BASE FEATURES:*

*Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by E G&G RSL, Las Vegas.*
*Digitized from the orthophotographs, 1/95*
*Topology (contours) were derived from digital elevation model (DEM) data by Morrison Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution.*
*DEM post-processing performed by MK, Winter 1997.*

*DISCLAIMER:*
*Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.*

Scale = 1 : 7820
1 inch represents approximately 652 feet

100 0 200 400ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy

Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by: DynCorp — THE ART OF TECHNOLOGY

Prepared for: KAISER•HILL COMPANY

MAP ID: 01-0437/ia_routing_map-final.aml

April 05, 2001

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### *2.6.3 National Pollutant Discharge Elimination System/Federal Facilities Compliance Agreement (NPDES/FFCA)*

The NPDES/FFCA (EPA, 1991) was an agreement between DOE and EPA under Executive Order 12088. Its purpose was to achieve and maintain compliance with water pollution control standards of the CWA at RFETS. The NPDES/FFCA included revisions to NPDES monitoring requirements and required the preparation of three compliance plans, the *Groundwater Monitoring Plan for the Sewage Treatment Plant Sludge Drying Beds*, the *Sewage Treatment Plant Compliance Plan*, and the *Chromic Acid Incident Plan and Implementation Schedule*. These plans addressed spill and water management improvements through operational changes and capital equipment projects. These projects constituted BMPs for protection of surface water. In addition, the *Final Vadose Zone Monitoring Report, Sanitary Treatment Plant Sludge Drying Beds, Rocky Flats Plant* was prepared as a follow-up of the groundwater monitoring plan and was implemented to determine whether operation of the WWTP sludge drying beds caused an impact to groundwater or the unsaturated zone. It was determined the sludge drying beds caused negligible impacts. The NPDES/FFCA was superseded by the renewal of the NPDES Permit in October 2000.

### *2.6.4 Agreement in Principle (AIP)*

DOE and the Governor of the State of Colorado signed the AIP (DOE, 1989) on June 28, 1989. The intent of the AIP was to assure citizens of Colorado that any discharges from RFETS do not adversely affect public health and safety or the environment. The agreement is an extension of a Memorandum of Understanding (MOU) that DOE and Colorado signed in 1979, which initiated monitoring and assessment of terminal ponds prior to discharge. The AIP adopted existing programs and created substantial, new commitments for DOE at the Site. It also authorized a vigorous program of independent monitoring and guidance by CDPHE.

Under the AIP, the EPA, CDPHE and the five municipalities with drinking water supplies immediately downstream of RFETS (Cities of Broomfield, Federal Heights, Westminster, Thornton, and Northglenn) have the opportunity to sample the RFETS ponds prior to and during surface water discharges for inorganic and organic chemicals and for radionuclides. The CDPHE is provided with a split set of surface water samples for analysis and is consulted regarding the water quality prior to discharge.

The AIP also requires frequent meetings of RFETS operators with CDPHE, EPA, and cities downstream of RFETS to share water quality data. These AIP-related activities constitute BMPs for protection of surface water and the general environment near the RFETS.

### *2.6.5 Rocky Flats Cleanup Agreement (RFCA)*

The *Rocky Flats Cleanup Agreement* (DOE, 1996) is the legal document that replaces certain earlier intergovernmental agreements and describes roles, responsibilities and

relationship between the agencies, DOE, EPA, and CDPHE during cleanup. Its goal was to create a "single regulator" approach, using one set of consistent environmental requirements and a process for reaching specific decisions within targeted timeframes. The document provides a legal framework for guiding individual cleanup and waste management decisions for environmental restoration without predetermining those decisions. The *Rocky Flats Cleanup Agreement* does not govern the management of Special Nuclear Materials or residues, nor does it govern the management of building deactivation and decontamination as long as DOE has a mission for those facilities.

The *Rocky Flats Cleanup Agreement* divides the Site into "The Buffer Zone" and "The Industrial Area" operable units. EPA is designated as lead regulatory agency on remedial activities in the Buffer Zone or off-Site areas and CDPHE is the lead regulatory agency for the Industrial Area.

### *2.6.6 Colorado Water Quality Control Commission Regulations (CWQCC)*

The CWQCC has authority to create or change water quality standards for all waters of the state under the Colorado Water Quality Control Act. The CWQCC establishes basic standards for water quality, and then assigns these standards on a site-specific basis to all stream segments, lakes and reservoirs, based on their respective use classifications. Most of the water leaving RFETS is tested before discharge to compare with applicable stream standards. The Site uses these standards as the primary guidance for general pond water management and discharge operations.

# 3. STORM WATER POLLUTION PREVENTION TEAM

## 3.1 Purpose

The Site formed a Storm Water Pollution Prevention team, a multi-company team that participated in the preparation of this Plan. This meets the requirements of Section I.C.15.c.1) of the NPDES Permit, which requires the SWPPP to include the specific individuals who are responsible for developing, implementing, and revising the SWPPP.

The Storm Water Pollution Prevention Team responsible for developing and implementing this SWPPP consists of the following Site personnel:

- Bill Burdelik, Water Monitoring
- David Daboll, Surface Water Operations
- Leslie Dunstan, Water Monitoring
- Craig Hoffman, Surface Water Operations
- Michael Jones, Surface Water Operations
- Keith Motyl, Surface Water Operations
- Frank Rukavina, Environmental Compliance
- Robert Fiehweg, Environmental Compliance
- Scott Thompson, Surface Water Operations

Development of the SWPPP included investigative work regarding storm water pollutant sources and identification of existing pollution control measures, as well as proposing new BMPs for storm water pollution prevention. Names and specific responsibilities of team members are contained in Appendix C, *RFETS Storm Water Pollution Prevention Team.*

## 3.2 SWPPP Implementation

Site facilities have previously implemented most BMPs identified in the SWPPP as part of the requirements for other regulatory programs, including: hazardous materials management inventory; underground and aboveground storage tank regulations; hazardous waste generation, treatment and storage regulations; and waste minimization/pollution prevention requirements.

The responsibility for SWPPP implementation rests with each K-H Vice-President and Project Manager who owns facilities that handle significant materials which have the potential to release these materials to the storm drain system or to the environment. It is the responsibility of each K-H Vice-President and Project Manager's line management to ensure implementation of the SWPPP for their facility. The Facility Manager will assure that the appropriate people within the facility have the information necessary to manage

storm water properly according to this SWPPP. The SWPPP will be provided to the Site Document Control organization for subsequent availability to Site Facility Managers via the Site Intranet system.

In the future, the Site Water Monitoring organization will report the results of monthly and annual water monitoring, and the Site Surface Water Operations organization will report inspection results (annual *Comprehensive Site Compliance Evaluation* report). In addition to developing the SWPPP, the above SWPPP Team members perform periodic Site inspections, conduct record keeping and recording activities, forward inspection findings to the Plant Action Tracking System and/or the Environmental Compliance Action Tracking System as necessary, follow up on corrective actions being implemented by Facility Managers, and perform storm water monitoring.

### 3.3 SWPPP Revision

Proposed amendments, revisions, and scheduled updates to the SWPPP will be prepared by the Site Surface Water Operations organization and certified by the Kaiser-Hill Vice-President and Project Manager for the Remediation, Industrial D&D, and Site Services organization. In addition to annual reviews, modifications to the SWPPP are made when changes to the Site make updating the Plan necessary.

# 4. POTENTIAL STORM WATER POLLUTANT SOURCES

## 4.1 Inventory of Exposed Materials

### *4.1.1 Pollution Prevention Plan Inventory*

In March 2001, the Site conducted an inventory of potential sources of storm water within the outdoor areas of the IA. The survey, separate from the ongoing Source Control Review (SCR) program (see Section 5.6.1), included a written description of each potential pollutant source and, where applicable, information regarding the number of containers, volume, potential for leakage or spillage, threat to surface waters, and potential for reaching the storm sewer system. Storage practices and activities involving potential sources were evaluated, and dust particulate pollution sources were considered in addition to liquid pollutants. The Site inventory noted potential sources listed as water priority chemicals for Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA).

The potential storm water pollution sources were evaluated on three criteria: (1) the potential for a leak or spill to occur; (2) the threat of the source to surface waters based on the nature and volume of the source; and, (3) the potential for a leak or spill to reach the storm water system.

Table 4-1 identifies significant potential pollution sources exposed to precipitation, their location and estimated total volume. A map showing locations of all the identified potentially significant pollution sources is presented in Appendix D, *Significant Potential Pollutant Sources and Spills*.

**Table 4-1**

***Locations and Descriptions of Potential Significant Pollution Sources***

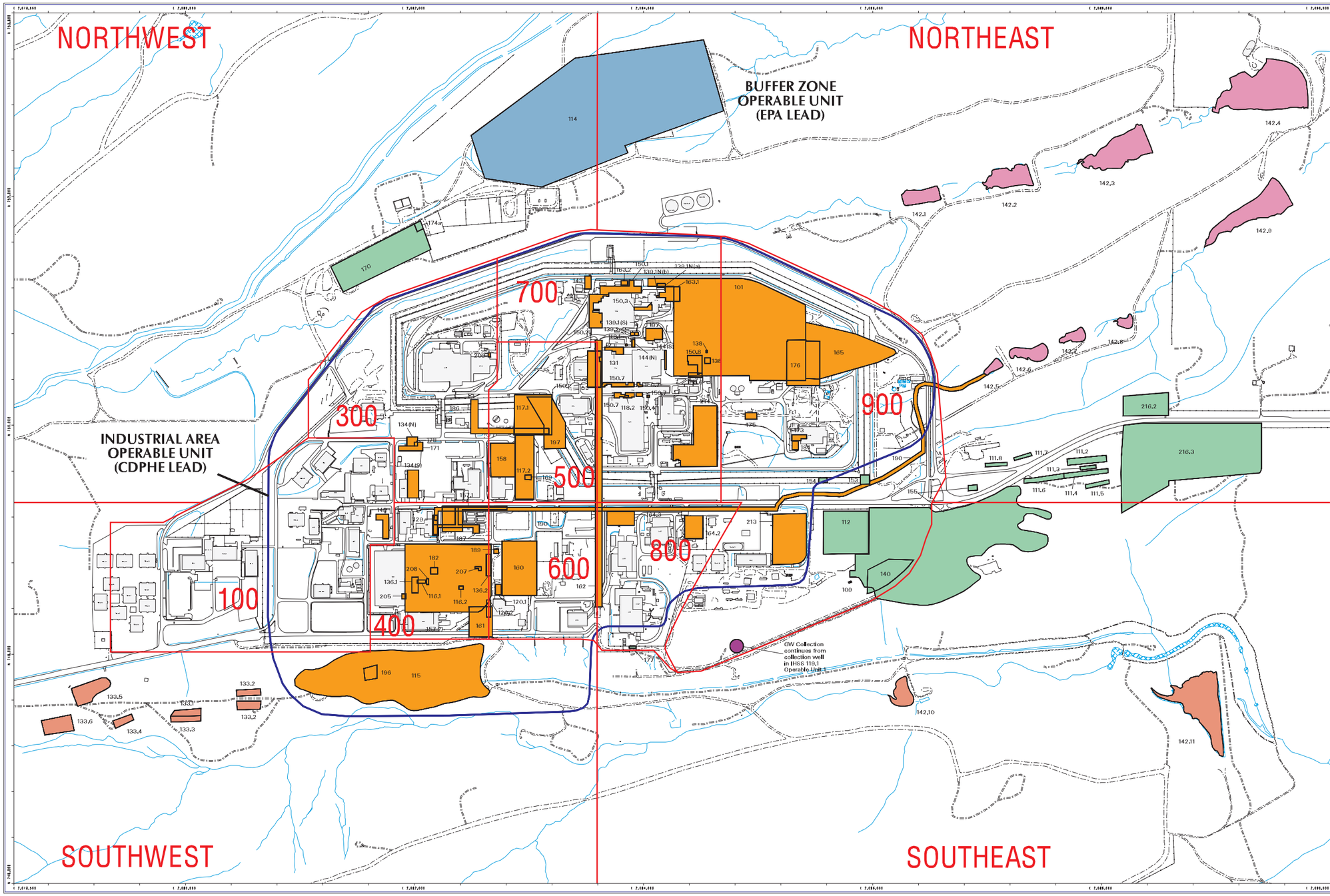
| Map ID. | Bldg. | Location | Description | Number of Containers | Total Volume |
|---|---|---|---|---|---|
| 1 | 331 | North side | Fuel pumping area | 2 pumps | 30,800 gals |
| 2 | 334 | Parking area on N.E. | Heavy equipment/truck parking area - Lubricating and hydraulic oils, etc. | variable | 16 to 320 qts. |
| 3 | 374 | S. side of building. | Carpentry Shop stores large volumes of coolants, oils, solvents, paints, epoxies and cements in various size containers and drums. Stored in cargo containers. | approx. 300 | approx. 750 gal. |
| 4 | 444 | Transformer at Bldg. 429 | Transformer, non-PCB oil, with no secondary containment. | 6 | >600 gal. |

| Map ID. | Bldg. | Location | Description | Number of Containers | Total Volume |
|---|---|---|---|---|---|
| 5 | 663 | Outside fenced area | 6 liquid cooled transformers being stored without secondary containment | 6 | > 300 gal. |
| 6 | 707 | East side/Door 1 | Transformer 369-009 | 1 | > 50 gal. |
| 7 | 707 | Bldg. roof Door 1 | Substation transformers | 10 | > 500 gal. |
| 8 | 865 | West side | Transformers 370-043, 370-044 | 2 | > 100 gal. |
| 9 | 865 | East side | Transformers 370-045. Storm drain within 30 feet. | 1 | > 50 gal. |
| 10 | 928 | South of building. | Transformer T928 without secondary containment. | 1 | > 50 gal. |
| 11 | 928 | West of building. | 1000 gal. #2 fuel oil tank with secondary containment in poor condition. | 1 | < 1000 gal. |

### *4.1.2 Individual Hazardous Substance Sites (IHSS) Inventory*

The Site maintains a comprehensive list of all known and suspected sites where environmental media have been contaminated with hazardous, radioactive, and mixed waste materials. These sites, now referred to as IHSSs, were previously called Solid Waste Management Units. Descriptions and all known release information for the IHSSs are included in the *Historical Release Report* (DOE, 1992). The *Rocky Flats Cleanup Agreement* divides the Site into the “Buffer Zone” and the “Industrial Area” operable units. EPA is designated as lead regulatory agency on remedial activities in the Buffer Zone or off-Site areas and CDPHE is the lead regulatory agency for the Industrial Area and issues arising from siting of any new waste storage or disposal facility.

The *Historical Release Report* provides a comprehensive compilation of historical information updated to reflect present Site conditions and response actions with regard to environmental releases or significant releases. The Industrial Area operable units include Potential Areas of Concern (PAC) and Under Building Contamination sites (UBCs) located within the IA. During the reporting period from August 1, 1999 through August 2000, no new spills, releases, or findings of contaminants were identified at RFETS requiring new CERCLA sites (i.e., IHSSs, PACs, or UBCs). The IHSS survey, conducted for remediation purposes, complements the information compiled in the inventory of exposed materials. IHSS locations are shown in Figure 4-1.




# Figure 4-1

## Individual Hazardous Substance Sites by Consolidated Operable Unit

(As of Sept. 2000)

**Industrial Area Operable Units**

- Industrial Area OU

**Buffer Zone Operable Units**

- Buffer Zone OU
- Operable Unit 1
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7

NOTE:
Former Operable Unit 9 (OU9), that is now part of the Industrial Area Operable Unit, is shown on a separate map for clarity.
(See Map-ID 98-0254/97-017/SOP1/LL)

IHSS NE-142.12 (Indiana Plume Pond) not shown due to map scale.

**Other Map Features**

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads
- Industrial Area Operable Unit Boundary
- HRR Designation Area Boundary

*DATA SOURCE BASE FEATURES:*
*Buildings, fences, hydrography, roads and other structures from 1994 aerial flyover data captured by EG&G RSL, Las Vegas.*
*Digitized from the orthophotographs, 1/95 Individual Hazardous Substance Sites (IHSS) DOE 1992, HRR Report and Subsequent Updates.*

Scale = 1 : 10580
1 inch represents approximately 882 feet

25.0 0 500 1000ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by: DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL COMPANY

MAP ID: 2k-0373

April 05, 2001

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## 4.2 Unplanned Releases

### *4.2.1 October 1997 Through October 2000*

The Site has maintained a database of all unplanned releases (in the past greater than one pint or one pound) reported since January 1, 1990. The Site publishes a monthly *Environmental Management and Compliance Report* (KH, various) that summarizes information reflecting the types of substances spilled on-Site, spill locations, the number of spills per month, and causes of the spills.

Hazardous substances, for the purposes of that report, are defined as "any element, compound, mixture, solution, or substance that may endanger human health or the environment including hazardous substances (which include radionuclides) as defined by 40 CFR Part 302, extremely hazardous substances as defined by 40 CFR Part 173, hazardous materials as defined by 40 CFR 261, hazardous chemicals as defined by 40 CFR §370.2, oil and petroleum products (including antifreeze), and non-hazardous substances (e.g., water) contaminated by hazardous constituents".

Releases of solid or liquid hazardous substances are reportable if the release directly impacts human health, the environment, or regulatory requirements. Initially, the Site detailed all unplanned releases in the monthly *Environmental Management and Compliance Report*, which is reported to both EPA and the CDPHE. However, beginning in September 1998, small leaks of vehicle fluids or non-hazardous materials were not included in the Report. Any release involving radioactive material is still included, however. All of these releases are reported to the Shift Superintendent and the Emergency Operation Center (EOC) Notification Officer.

Part I.C.15.c.2)c) of the NPDES Permit requires, "A list of significant spills and significant leaks of toxic, hazardous or radioactive pollutants that have occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility after the date of 3 years prior to the effective date of this permit." There were 306 unplanned releases at the Site from October 1997 through October 2000. Appendix E, *RFETS Spill Inventory* lists the reported spills (both radioactive and non-radioactive) occurring from October 1997 through October 2000. See Section 4.2.3, *Radioactive Releases* below for information concerning radioactive releases prior to October 1997.

***Outside Spill Locations.*** The most frequent locations where spills occurred on-Site were parking lots and roadways. Predominantly, these releases were antifreeze released from radiators of personally owned vehicles.

***Substances Spilled.*** Ethylene glycol (antifreeze) (30.7%) was the most commonly spilled substance at the Site. Hydraulic oil (6.9%) was the second most frequent spill to the environment, predominantly from vehicles.

***Spill Causes.*** For all releases where a cause could be determined, including incidents both inside and outside buildings, equipment failure was the most common cause.

Deficient maintenance was the leading cause of releases attributed to equipment. Lack of attention was the most frequently cited cause of releases attributed to personnel.

Table 4-2 presents significant liquid spills that have occurred at the Site from October 1997 through October 2000. None of the spills were Reportable Quantities and all were cleaned up within 24 hours with no negative environmental impacts. Part I.C.15.c.2)a) of the NPDES Permit requires that locations where major Site spills or leaks occurred be delineated upon a map. Appendix D, *Significant Potential Pollutant Sources and Spills* presents these locations identified in Table 4-2.

***Table 4-2 Significant Liquid Spills from October 1997 through October 2000***

| Map ID. | Location | Description | Amount Released |
|---|---|---|---|
| A | South of Building 707 | Non-radioactive water from a cooling tower was released to the soil. | Approximately 500 gallons |
| B | North of Building 774 | Untreated Groundwater stored in a Modular Storage Tank released due to a broken pipe. | Approximately 200 gallons. |
| C | Building 120 | Untreated sanitary waste (sewage) released to the soil due to infiltration of groundwater. | Approximately 1,500 – 2,000 gallons. |

### *4.2.2 Prior Unplanned Releases*

The Site's *Historical Release Report* provides a complete listing of all spills, releases and/or incidents involving hazardous substances that have occurred since the Site was established in 1951. The report also includes a listing of all spills, releases and/or incidents requiring implementation of the contingency plan, the notification requirements of 40 CFR §265.56, 6 CCR §1007-3, or as required under EPCRA (DOE, 1992). The *Historical Release Report* provides a comprehensive compilation of historical information and is regularly updated to reflect present Site conditions and response actions with regard to environmental releases or significant releases.

The *Historical Release Report* organizes information on past releases is by location at the Site. Historical reviews of past and current activities for buildings in each area are followed by descriptions of spills and releases that occurred. Spills and releases are grouped by location into geographic units called Potential Areas of Concern (PAC). For each spill or release event, documentation provides a physical and chemical description of the constituents released, response(s) to the events, and fate of the constituents released to the environment.

The *Historical Release Report*, currently a two-volume compilation, was completed in 1992 and was originally developed from information gathered through interviews, file review, Site visits and photographs. The *Historical Release Report* is updated annually

with the last update having occurred in September 2000. The *Historical Release Report* and its updates are provided to the regulatory agencies.

#### *4.2.3 Radioactive Releases*

Part I.C.15.c.2)c) notes, "The limitation of three (3) years prior to the effective date of the issuance of this Permit does not apply to radioactive materials." Appendix E, *RFETS Spill Inventory* lists the reported radioactive spills occurring from October 1997 through October 2000. Radioactive water spills accounted for 14.7% of the total spills during this 3-year period. The majority of these spills were inside facilities and/or secondary containment. Prior radioactive releases are discussed below.

Releases involving radioactive substances over the entire Site history are described within the general records of the *Historical Release Report*. The history of some individual sites involves multiple releases, while other sites involve just a single incident.

For the purposes of this SWPPP, all sites involving releases to the environment of radioactive substances were included in the radioactive substance release listing in the *Historical Release Report*. This includes radioactive sites that were documented to have measured radioactive contamination, sites where a radioactive release was suspected but undocumented, and sites that involved legacy disposal of low-level radioactive waste.

The 700 Area, in the central portion of the Site PA, had the most locations with records of outside radioactive releases. Twenty-eight (28) radioactive release sites in this area were documented since the beginning of Site operations. The 900 Area located in the eastern portion of the PA adjacent to the 700 Area, had 15 recorded radioactive release sites. No other area within the Industrial Area had more than eight (8) sites with a record of a radioactive release.

The Buffer Zone is also included in the *Historical Release Report* documentation. The northeast quadrant, which contains the A- and B-series detention ponds, had five sites with records of past radioactive releases including trenches where low-level radioactive sludge from the sanitary wastewater treatment plant was disposed. Two (2) sites in the northwest quadrant, one (1) site in the southeast quadrant, and three (3) historical sites in the southwest quadrant were documented as having past releases or disposal of radioactive materials.

### 4.3 Non-Storm Water Discharges

#### *4.3.1 Description*

A non-storm water discharge is a discharge to the surface that is not composed entirely of storm water and could reasonably be expected to reach the storm sewer or surface waters. A listing and description of non-storm water discharges at the Site is provided in Appendix F, *Management of Non-Storm Water Discharges* report.

The primary source of non-storm water discharges at the Site is the discharge of groundwater from foundation drains, building sumps, and utility pits. Process waste valve vaults do not generate non-storm water discharges because groundwater collected in these is transferred to the Building 374 process waste system. Discharges of steam condensate and fire suppression system water are not considered to be non-storm water discharges because both systems are supplied with potable water.

Ninety-one (91) non-storm water discharge locations have been identified at the Site. These locations were reported as part of the NPDES storm water permit application. Nineteen (19) of the discharges are from foundation drains or building sumps, most of which are described in *A Description of Rocky Flats Foundation Drains* report (EG&G, 1992c). Although groundwater is the source for foundation and building drains, sampling is performed on a routine basis to help ensure that any unreported or undetected spills have not entered the foundation drain system. The remaining 72 locations are pits for utilities such as alarms, electric, telecommunications, water meters, steam/condensate and cooling tower lines. Eleven (11) of the utility pit discharge locations are steam pits with the potential for cooling tower water accumulation. Foundation drains, building sumps, and utility pits have the potential for infiltration by contaminated ground water.

Detailed information concerning non-storm water discharges is provided in Section 5.9, *Non-Storm Water Discharges*.

## 4.4 Storm Water Sampling Data

### *4.4.1 Storm Water Monitoring*

Storm water monitoring specified in the NPDES Permit was incorporated into the Site's automated surface-water monitoring program. This program meets the requirements of the *Integrated Monitoring Plan* (RFETS, 2000g), which groups all Site surface-water monitoring objectives into five primary categories: Site-Wide, Industrial Area, Industrial Area Discharges to Ponds, Water Leaving the Site, and Off-Site. IMP automated surface-water monitoring objectives are organized in an upstream-to-downstream direction, beginning with Performance monitoring in the IA and ending downstream at the Points of Compliance at Indiana Street.

Storm water is included under New Source Detection (NSD) and Point of Evaluation (POE) monitoring objectives. Both the IMP and the *Final Interim Measure/Interim Remedial Action Decision Document for the Rocky Flats Industrial Area* (IA IM/IRA) (DOE, 1994) require the Site to identify and address accidental or undetected releases of contaminants from the IA to the Site detention ponds. Storm water outfalls listed in the NPDES Permit and the corresponding IMP automated surface water monitoring locations are listed in Table 4-3.

***Table 4-3 Cross-reference of Stormwater Outfalls to IMP Automated Monitoring Locations***

| Outfall # | Description | Monitoring Station ID | Description |
|---|---|---|---|
| 008 | Storm water discharge from Basin SW022 located at the point where Central Avenue Ditch crosses the outer IA security fence. | SW022 | A RFCA New Source Detection monitoring location. The NSD objective monitors the performance of all remedial activities within the IA with respect to their impact on surface water. |
| GS10 | Storm water discharge from Basin SW023 located on South Walnut Creek upstream of Pond B-1. | GS10 | RFCA NSD and Point of Evaluation monitoring location for South Walnut Creek. |
| 010 | Storm water discharge from Basin SW027 located at the downstream end of the South Interceptor Ditch (SID). | SW027 | RFCA NSD and POE monitoring location for the SID. |
| 011 | Storm water discharge from Basin SW093 located on North Walnut Creek upstream of Pond A-1 receives storm water from sub-basin 118. | SW093 | RFCA NSD and POE monitoring location for North Walnut Creek. |

### *4.4.2 Sampling Methods - New Source Detection Monitoring*

The objective of NSD monitoring is to provide comprehensive coverage of the entire IA but not specifically individual activities within the IA (which are addressed under the Performance monitoring objective). NSD monitoring evaluates the performance of all remedial activities within the IA with respect to their impact on surface waters.

Under the NSD decision rule [IF/THEN action statements], water quality baselines are first developed for the monitored subdrainage and these baseline levels are then compared to future monitoring results. If contaminant concentrations are observed that significantly deviate above the baseline water quality, then activity project managers are notified. The NSD decision rule does not include identification and location of specific sources within the IA, which is under the Source Location monitoring objective described in the IMP.

In addition to fulfilling the NSD monitoring objective, monitoring locations SW023, GS10, and SW093 serve as Point of Evaluation monitoring locations for Stream Segment 5 of Big Dry Creek. POE monitoring is conducted to ensure adherence with the RFCA Action Level Framework. If elevated monitoring results are observed (those results above the Action Levels), formal agency notification and a source evaluation are required under RFCA.

### *4.4.3 Data Types, Frequency, and Collection Protocols*

The NSD objective requires contaminant concentration data from water samples taken at permanent monitoring locations on five main surface-water pathways to Site detention

ponds. Analyses are performed for the contaminants and parameters (listed below) to establish a baseline. The basis for selecting these contaminants and indicator parameters is described below.

- Plutonium (Pu), uranium (U), and americium (Am) are primary contaminants of concern to regulators and the public.
- Turbidity, pH, nitrate ( $NO_3^-$ ), and conductivity are analyses performed continuously because they are inexpensive per measurement and can be used as real-time indicators to focus additional analyzes for other specific contaminants.
- Turbidity may indicate increased contaminant loads in general and increased Pu specifically. (Pu in surface water is generally bound to particulates).
- pH can be used to detect an acid or caustic spill.
- Nitrate can be used in real-time to detect chemical spills that include plutonium nitrate or other nitrate waste streams.
- Conductivity can be used to corroborate a pH reading and to detect salt solution spills or significant concentrations of ionic contaminants.
- Precipitation data are used to determine whether a flow event results from rain/snow runoff, an operational discharge (i.e., footing drain, incidental water, dust suppression spray water, fire hydrant testing, utility line break) or a spill. Precipitation data are collected at 10 locations across the Site. From these, effective precipitation for a given monitoring location drainage can be calculated.
- Water flow rate is needed to identify an event, trigger an automated sampler, control the flow-paced sampling, and evaluate the magnitude of a potential spill or contaminant source (mass loading).
- Small changes to apparent base flow not attributable to rain and snow melt, or unusual runoff hydrograph shapes, may indicate an operational discharge or spill.

The NSD monitoring objective is limited to information collected at the IA boundary, as represented by surface-water monitoring stations SW022, SW091, SW093, SW027, and GS10. This monitoring focuses on runoff into the three main drainage areas leaving the IA: North Walnut Creek, South Walnut Creek, and the South Interceptor Ditch/Pond C-2 drainage. SW022 waters are also monitored downstream at GS10, so there is some redundancy in this pair of monitoring stations. SW022 has been included at the request of the EPA to provide increased sensitivity for the Central Avenue Ditch sub-drainage. Data from SW022 are used to delineate further any new source detected at GS10.

For SW022, sampling is continuous flow-paced during all flow periods. For SW093, GS10, and SW027, the analytical data used for the NSD objective are the same data as those collected from the continuous flow-paced sampling used to evaluate water quality performance against Stream Segment 5 Action Levels.

Only surface-water runoff from the IA is included (i.e., baseflow, storm water runoff flow, operational discharges, and spills to surface water) in the NSD monitoring objective. Monitoring for spills is included under NSD monitoring as a secondary monitoring objective should increased flow rate be detected that cannot be attributed to precipitation runoff or other identified discharge. However, other management controls (e.g., SPCC) address monitoring of spills as a primary objective. These NSD locations also provide confirmation that containment and cleanup measures for spills or accidental discharges have been effective through monitoring of the real-time indicator parameters.

Indicator monitoring is performed for the parameters specified in Table 4-4. The first three columns are Analytes of Interest (AoIs) monitored directly in laboratory analytical measurements. The remaining columns lists indicator parameters that are monitored with real-time probes in lieu of laboratory analyses.

### *4.4.4 Data Summary*

Part I.C.15.c.2)d) of the renewed Site NPDES Permit requires the SWPPP to identify existing discharge sampling data describing pollutants in storm water discharges from the Site. This includes a summary of sampling data collected during the term of the Site NPDES Permit.

Currently, the Site distributes collected storm water quality data quarterly to the regulatory agencies via the *RFETS Quarterly Environmental Monitoring Report*. The report is available from the RFETS web site (http://www.rfets.gov/) under the Environmental Data web page EDDIE (Environmental Data Dynamic Information Exchange). The quarterly report includes both water quantity (mean daily discharge rates) and water quality data including radionuclides (Pu-239,-240, Am-241, total uranium), metals (total Be and Cr, dissolved Cd and Ag), and water quality parameters (e.g., pH, hardness).

## 4.5 Summary of Potential Pollutant Sources

Potential sources of storm water pollutants were identified through several programs: physical inventories, monitoring, and historical records. The main sources of potential storm water pollutants, as identified by the various information resources, are briefly summarized below:

- An inventory of exposed materials noted 12 significant potential pollutant sources, determined to be a high risk based on the potential for a leak or spill to occur, the threat of the source to surface waters (based on the nature and volume of the source),

**Table 4-4 Screening for New Source Detection: AoIs vs. Indicator Parameters**

| | Routinely Monitored Parameters | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monitored AoIs | | | Indicator Parameters for AoIs | | | | |
| AoIs | Pu | U | Am | Turbidity | pH | Conductivity | Nitrate | Flow Rate; Precipitation[a] |
| Plutonium | X | | | X | | | X | X |
| Uranium | | X | | | | | | X |
| Americium | | | X | X | | | | X |
| Turbidity | | | | X | | | | X |
| pH | | | | | X | | X | X |
| Conductivity | | | | | | X | | X |
| Nitrate | | | | | | X | X | X |
| Chromium | | | | | X | X | X | X |
| Beryllium | | | | | | X | | X |
| Silver | | | | | | X | | X |
| Cadmium | | | | | | X | X | X |

[a] Precipitation data are collected at Sitewide locations. Precipitation data collection is not required at each NSD location, but Sitewide data are used for NSD evaluation.

The parameter list and frequency for collection of field parameters are summarized in Table 4-5. The automated sample collection protocols are summarized in Table 4-6 and the target analyte suite and collection frequencies are summarized in Table 4-7.

***Table 4-5 New Source Detection Field Data Collection: Parameters and Frequency***

| | Parameter | | |
|---|---|---|---|
| ID Code | Discharge | Real-Time pH, Conductivity, Turbidity, Nitrate | Precipitation |
| SW093 | 15-min continuous | 15-min continuous | |
| GS10 | 15-min continuous | 15-min continuous | |
| SW022 | 15-min continuous | Impractical for ephemeral flow | 5-min continuous |
| SW027 | 15-min continuous | 15-min continuous | |

***Table 4-6 New Source Detection Sample Collection Protocols***

| ID Code | Frequency[a] | Type[b] |
|---|---|---|
| SW093 | 12 per year | Continuous flow-paced composites |
| GS10 | 12 per year | Continuous flow-paced composites |
| SW022 | 12 per year | Continuous flow-paced composites |
| SW027 | 12 per year | Continuous flow-paced composites |

[a] Stations SW093, SW027, and GS10 are the Stream Segment 5 Action Level (POE) monitoring stations. At these stations, NSD is performed by statistically testing the continuous flow-paced sample results required for the POE objective. The same testing criterion is used, except that continuous flow-paced samples are tested against flow-paced variability. These locations collect more than the target 12 samples for the NSD objective. All results collected at these locations under the POE objective are used in the NSD objective.

[b] Continuous flow-paced composite samples are collected during all flow conditions.

***Table 4-7 New Source Detection Analytical Targets (Analyses per Year)***

| ID Code | TSS[a] | Pu, U, Am |
|---|---|---|
| SW093[b] | 12 | 12 |
| SW091 | 12 | 12 |
| GS10[b] | 12 | 12 |
| SW022 | 12 | 12 |
| SW027[b] | 12 | 12 |

[a] Ideally, TSS would be analyzed for all samples collected at the above locations. However, continuous flow-paced sampling protocols often result in composite samples which are collected over periods exceeding the 7-day hold time for TSS analyses. Therefore, TSS cannot be determined for all continuous flow-paced composite samples, but is analyzed when possible.

[b] Stations SW093, SW027, and GS10 are the Stream Segment 5 Action Level (POE) monitoring stations. At these stations, NSD is performed by statistically testing the continuous flow-paced sample results required for the POE objective. The same testing criterion is used, except that continuous flow-paced samples are tested against flow-paced variability. These locations collect more than the target 12 samples for the NSD objective. All results collected at these locations under the POE objective are used in the NSD objective.

and the potential for a leak or spill to reach the storm water system. Spill consequences from the various potential sources varies, ranging from the release of five gallons of linseed oil to the rupture of a 1,000 gallon tank containing #2 fuel oil.

- Historical records indicate that ethylene glycol (antifreeze) spills from vehicles in parking lots constitute the single largest spill source (30.7%) on the Site. Deficient equipment maintenance and lack of personal attention were the two reasons cited most frequently as causes of spills. A listing of reported spills occurring from October 1997 through October 2000 is contained in Appendix E, *RFETS Spill Inventory*.

- A total of 91 non-storm water discharge locations have been identified at the Site. Nineteen of the discharges are from foundation drains or building sumps, and the remaining 72 locations are utility pits. Non-storm water discharged inventory results are discussed in detail in Section 5.9, *Non-Storm Water Discharges*.

- The 700 Area of the plantsite, in the central portion of the PA, had the most locations with records of outside radioactive releases. Twenty-eight radioactive release sites in this area have been documented since the beginning of Site operations. The 900 Area, located in the eastern portion of the PA and adjacent to the 700 Area, had fifteen recorded radioactive release sites. The most radioactive release sites for any other single area of the plant site was eight. Historical radioactive releases and disposal activities are summarized in the *Historical Release Report* (DOE, 1992).

- Surface water monitoring results of radiological contaminants suggest fundamental differences in mobilization and transport mechanisms between IA drainage basins. Storm water monitoring for the central Industrial Area at RFCA POE GS10 shows the highest average surface water Pu concentration and the largest Pu load of any sub-basin with only modest Pu concentrations in surface soils. In contrast, storm water runoff monitoring of the South Interceptor Ditch (which includes the 903 Pad) at RFCA POE SW027 shows lower average surface-water Pu concentrations and Pu

loads than expected for storm water flowing from the 903 Pad area (which has the highest surface soil Pu concentrations on Site. The SW091 sub-basin includes a Pu surface soil source (IHSS 141) and shows average Pu surface water concentrations that are higher than other sub-basins without Pu sources. However, because the basin has a low percentage of impervious area, there is little runoff and the resulting average annual Pu load delivered from the sub-basin is relatively small.

- The risk of any contaminant flowing uncontrolled off of the Site is minimized because, if normal storm water BMPs and protection measures fail, gates and valves could be configured in an emergency to divert spill-contaminated water to Site Ponds A-1, A-2, B-1, or B-2 for temporary storage. Tainted water could then be transferred or necessary treatment arranged. Surface water at the RFETS is detained and sampled in the terminal ponds prior to being discharged off-Site.

# 5. EXISTING MEASURES AND CONTROLS

## 5.1 Good Housekeeping

Good housekeeping is the maintenance of a clean, orderly work environment and is encouraged and sustained through a number of programs at the Site. Good housekeeping is an important factor in both spill prevention and spill control.

Responsibility for good housekeeping is delegated to facility management through the line organizations. Each has a responsibility to maintain a clean, tidy environment within the facility. Each level of management attempts to deal with housekeeping problems as they are identified. If they are unable to initiate corrective action, they report the situation to their manager. Good housekeeping awareness is part of the early training received by all employees. This initial general indoctrination in policies and procedures is reinforced by documented group safety meetings, which occur at least quarterly. These safety meetings are a requirement of all facilities and areas. Area housekeeping is often an item of review in the safety meetings.

Daily maintenance of floors, hallways, storerooms, and work areas is a responsibility shared by employees of the area and trained custodial staff. Cleanup of minor incidental spills of material inside facilities is typically accomplished quickly and efficiently by the generator of the spill, with appropriate input and guidance from Site groups. Chemical spills require immediate contact of the supervisor and the Shift Superintendent, and each initiates appropriate action. Additionally, end-of-shift clean-up duties are detailed in most functional work areas, or in shutdown procedures. Good housekeeping practices decrease the potential for spills and other discharges to the environment.

Trained professionals routinely review housekeeping (such as storage of bags, drums, and containers of chemicals), chemical labeling, compatibility and fire potential, and maintenance egress routes to ensure that good practices are observed. Reviewing the above operations includes both operating procedures and periodic inspections. The Site Fire Department and Environmental Compliance personnel conduct inspections of these operations inside buildings.

Site Building Coordinators are assigned to each building or facility. They are responsible for identifying housekeeping problems, both indoors and outdoors, and notifying the appropriate Facility Manager or Site Services. If there is a recurring problem or a housekeeping problem significant enough to require special attention, the Building Coordinator notifies the Site Maintenance Services Manager.

Facility Managers are responsible to ensure the outside of their facility and the surrounding areas are maintained neat and orderly. If trash, debris, or other outdoor housekeeping problems are identified, the Facility Manager will contact Site Maintenance Services and/or Trucking to have the situation rectified.

Site personnel conduct periodic, detailed inspections of each building or facility. These inspections are required by and conducted in accordance with procedures. The purpose of these inspections is to provide adequate protection of workers from toxic and noxious materials, physical stresses, biological and ergonomic factors. Good housekeeping is stressed during these inspections. The inspections also give workers an opportunity to raise concerns regarding health issues in the work environment. Reports, detailing deficiencies and recommending corrective action, are sent to the Facility Manager responsible for the area in which deficiencies are found. Follow-up inspections are conducted to verify that appropriate corrective action(s) was taken. Records of inspection and follow-up are retained, as appropriate.

The RFETS Fire Department also conducts a number of routine inspections. Monthly inspections are conducted in nuclear facilities or other high risk buildings. High-risk buildings, for the purpose of these inspections, are those containing large quantities of flammable materials or with a potential large monetary loss in a fire. All other Site buildings are inspected quarterly. The above monthly and quarterly inspections are conducted to check for compliance with all Site H&S, DOE, and NFPA requirements. The Fire Department also conducts a detailed annual survey of all buildings. The annual survey assesses the loss potential of the building and evaluates building components, material storage, process and occupancy changes, as well as housekeeping. The Facility Managers are required to provide timely notification to the Fire Department of any such changes in building operations and structures; however, the annual Fire Department Survey Program provides for proper evaluation of any new fire protection needs. A written report and corrective actions follow all of the Fire Department inspections and surveys. Records of inspections, surveys and follow-up are retained by the Fire Department. Housekeeping is an important aspect of these inspections.

The practice of good housekeeping, maintained through formal training programs, operating procedures, and inspection programs, is an important measure for preventing storm water pollution.

## 5.2 Material Inventory and Management

### *5.2.1 Chemical Control System Inventory*

The Site *Chemical Management Manual* (RFETS, 1999a) provides the methodology and requirements for the Chemical Lifecycle Program. This program provides stewardship and regulatory compliance direction for the safe management of chemicals used at the Site. This includes chemical procurement control, inventory tracking, regulatory reporting, waste minimization and management, and spill notification and reporting. To obtain the goal of reducing hazards and costs while maintaining regulatory compliance, the *Chemical Management Manual* provides a comprehensive process for procurement, inventory tracking, storage and disposal of chemicals, regulatory compliance, emergency and spill response, and health and safety.

The Chemical Lifecycle Program provides a systematic means for tracking chemicals stored, used, and disposed at the Site. This program allows for tracking of chemical containers throughout the Site through use of a barcode labeling system. The chemical inventory program consists of product, waste, MSDS, and chemical exchange modules. Information is available on the name, manufacturer, building location and room number, chemical quantity, and container storage information. Maintaining an accurate inventory of chemicals is important for reducing the amount of chemicals purchased for and stored on the Site, as well as assessing which areas of the Site house chemicals that potentially pose the greatest risk to storm water. Appropriate pollution prevention measures are implemented based on this information.

### *5.2.2 Labeling*

Chemical containers at the Site are labeled with the name of the material it contains. If the material is a hazardous chemical, the label also displays appropriate warnings of the hazards of the chemical. The name of the chemical is placed either above or below the NPFA diamond label. It may not, however, be placed in the white diamond, which is reserved for special hazards. The trade name shown on the diamond label is the same as the name on the manufacturer's label. If the manufacturer's label and the Chemical Dispensary bar code are on a hazardous chemical container, then no other labeling is required. However, if the Site judges the manufacturer's label to be inadequate, then additional labeling may be required.

The Site makes decisions on requests for exemption from this labeling standard. An example of an exemption might be a series of beakers of chemicals undergoing laboratory analysis. The only labels on the beakers are sample numbers, which refer to a nearby logbook or other document that shows the names of the chemicals in the beakers and appropriate warnings of their hazards.

All hazardous waste containers, including tanks, are appropriately labeled. In general, only the yellow/red hazardous waste label applies to hazardous waste containers. Similarly, every pipe at the Site is labeled with the name of the material contained in the pipe, as provided by Site Engineering Standard SX-164, *Plant System and Component Identification and Labeling* (RFETS, 1998b).

### *5.2.3 Material Safety Data Sheets (MSDS)*

The Site Chemical Dispensary maintains a master file of MSDS obtained from the suppliers of the chemicals and MSDSs are maintained and distributed to each work area where hazardous chemicals are present. Each work area file consists of a list of the hazardous chemicals present in the area, and an MSDS for each chemical on the list. Holders keep their manuals current by inserting updates as they are received. The MSDS work area files correspond with the current chemical list as supplied by the Chemical Dispensary.

The information on the MSDSs is also entered into the Chemical Dispensary database. The master file and the database are kept as current by replacing obsolete MSDSs with updated versions. When a hazardous chemical is brought to the Site for the first time, the Site assures that an MSDS for the chemical is ordered from the manufacturer and kept in the central MSDS files. A copy is also sent to the owner of the chemical on Site.

### *5.2.4 Acquisition of Hazardous Chemicals*

The acquisition of hazardous chemicals is strictly controlled to minimize quantities of hazardous materials purchased by or stored at the Site. All chemicals requisitions are subject to the approval of the Chemical Dispensary.

### *5.2.5 Transportation of Hazardous Chemicals*

The packaging and labeling for transfer or shipment, and transporting of hazardous chemicals to, from, and within the Site is controlled by three manuals issued by the Traffic Department: (1) the *Site Transportation Safety Manual*, (RFETS, 2001a); (2) the *Off-Site Transportation Procedure* (RFETS, 2000j); and (3) the *Labeling and Marking Procedures for Radioactive Waste Material Packages* (RFETS, 2000f). These manuals implement applicable DOE Orders and other governmental regulations, notably those of the DOT, as found in 49 CFR. DOE Transportation Orders define on-Site movements of materials as “transfers” and off-Site movements of materials as “shipments”.

The Traffic Manager is responsible for compliance with the DOT requirements and the requirements of the waste receivers. Traffic is responsible for DOT Hazardous Materials Transportation training of personnel, data review and preparation of the shipping papers, notification of disposal sites prior to shipment, certification that applicable requirements are met prior to off-Site shipment, maintenance of an auditable records system pertaining to shipments, and pre-loading and post-loading vehicle trailer and load inspections.

The specific responsibilities of the Traffic Manager include certifying that the Uniform Hazardous Waste Manifests are in compliance with RCRA and hazardous waste transportation requirements, the waste container contents are adequately described, and the waste shipments are in proper condition for transportation

The On-Site Traffic Control Committee is responsible for performing functions and resolving issues as they pertain to packaging and transportation of radioactive material, hazardous material, hazardous substances, and hazardous waste on Site.

All employees involved in the transportation of hazardous chemicals receive specific training and certification for that activity, as required by the above-named manuals. This includes the Hazardous Material Transportation training, as required in 49 CFR.

### *5.2.6 Treatment and Disposal of Hazardous Chemicals*

There are numerous Site procedures that control the treatment, storage and disposal of Site hazardous wastes. They implement regulations and orders of EPA, CDPHE, DOE,

and other agencies having jurisdiction at the Site. Releases to the environment of hazardous chemicals must be kept within the limits established by CDPHE, EPA, and other governmental agencies having jurisdiction, as prescribed in DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards* (DOE, 1993) and other DOE Orders. The Site monitors compliance with these standards and recommends corrective actions when needed.

The *Chemical Management Manual* (RFETS, 1999a) delineates Site requirements for waste chemical disposition. This includes chemical characterization, chemical database updates, chemical packaging preparation, and treatment and disposal pathway determination. All employees involved with hazardous waste and chemical management receive specific training for their particular activities.

### *5.2.7 Waste Minimization*

The Site has a formally organized Waste Minimization Program with the overall goal of reducing the volume and toxicity of Site waste streams. The program is conducted to fulfill EPA and CDPHE requirements for waste minimization (40 CFR 262.41 and 6 CCR 1007-3, Part 262.41) as well as DOE Orders 5400.1, *General Environmental Protection Program* (DOE, 1990) and DOE Order 435.1, *Radioactive Waste Management* (DOE, 1999). The goals of the Waste Minimization Program include:

- Establish and demonstrate senior management commitment to pollution prevention and waste minimization practices;
- Conduct process waste assessments to identify opportunities for waste minimization and needed research and development;
- Heighten employee awareness in pollution prevention and waste minimization through specific training, special campaigns, and incentive programs;
- Establish quality assurance measures for waste minimization activities;
- Establish a system to measure and report performance in waste minimization to management, DOE, and regulatory agencies;
- Maintain consistency with Site policies for release of materials to the public, and expand current recycling programs to include other items determined to be economically feasible;
- Adapt and implement new and existing technologies as rapidly as possible to reduce the generation of waste and plutonium residues at the source;
- Promote a work ethic among Site employees that encourages pollution prevention ideals and the preservation of natural resources; and

- Establish numerical reduction goals for Site waste generators (separate goals may be established for each waste category and apportioned among Facility Managers who will be responsible for reporting progress toward these goals to senior management).

Many waste minimization goals are described in greater detail in the Site *Pollution Prevention Program Plan* (RFETS, 2000i) which should be referenced for additional details on waste minimization.

## 5.3 Preventive Maintenance

Thousands of pieces of equipment, operational systems and storm water management structures exist at the Site that in the event of malfunction or failure could impact storm water runoff quality. Strict monitoring and documentation of maintenance programs is essential to plan and track maintenance activities properly. This document distinguishes between the maintenance of storm water management structures, such as culverts, and maintenance of general equipment and systems that are not directly related to storm water management, but may impact storm water quality.

### *5.3.1 Equipment and Systems Maintenance*

Preventive maintenance (PM) is one element of the RFETS comprehensive maintenance program and includes testing and monitoring of plant systems and equipment to maintain operations, extend operational life, or prevent safety or environmental problems. The Integrated Work Control Program outlines detailed procedures for the maintenance process. For the purposes of the SWPPP, discussion is limited to PM programs.

The development of PM Work Packages, which differ in type depending on the complexity of PM work to be performed, begins with the Facility Managers, who maintain lists of equipment that require PM. Site Engineering provides the technical requirements and frequency for the PM action based on manufacturer information and other available sources. Processing the PM Work Package involves the completion of a Work Control Document and follows Chapter 7, *Preventive Maintenance Work Package Process* of the *Integrated Work Control Program Manual* (RFETS, 2000e). Following approval from several Site organizations, a Work Package is ultimately approved and information is forwarded to the PM Coordinator for entry into the Maintenance Management System Database. This allows for a continual assessment of the PM status of equipment and systems throughout the Site.

### *5.3.2 Storm Water Management Devices Maintenance*

Drainage maintenance related to storm water pollution prevention is balanced with considerations associated with wetland habitat, listed threatened and endangered species identified per the Endangered Species Act, and IHSS issues. For example, if maintenance activities involve removing sediment from a drainage channel and the potential exists to impact wetlands, documentation must be provided for observation of Clean Water Act and where applicable, National Environmental Policy Act requirements. Similarly, excavation of soils for typical drainage maintenance purposes may be preempted by

concerns over disturbing IHSS soils. Therefore, maintenance of storm water drainage structures is currently limited to specific problem areas.

## 5.4 Spill Prevention and Response

### *5.4.1 Spill Prevention*

This section summarizes spill prevention measures and references many of the measures outlined in the Site *Spill Prevention, Control, and Countermeasures Plan* (SPCC) (RMRS, 1999b). For this discussion, a spill is defined as a release of materials from a primary containment structure that is not specifically intended or controlled.

In general, Site spill prevention is achieved through appropriate engineering design, management practices, and administrative controls such as procedures or work instructions. Appropriate engineering design is ensured by the *Site Engineering Requirements Manual* (RFETS, 2000b) and other specifications that identify minimum design requirements. Applicable management practices include periodic integrity testing and inspections of hazardous material tanks and equipment. These practices should identify problems with equipment prior to the compromise of the primary containment. Applicable procedures include written documentation that describes, in detail, how certain activities (for example, the unloading of transportation vessels to bulk storage tanks) are to be conducted. Spill prevention is achieved through secondary containment and other flow control structures designed to control and/or mitigate adverse environmental effects if a spill occurs. Specific containment measures exist in all buildings containing hazardous materials, and in areas where hazardous materials are stored exterior to buildings. These containment measures were either built with the facility or were later engineered and retrofitted.

Spill prevention measures qualify as Best Management Practices (BMPs) per 40 CFR §125.104(b)(4). Therefore, this section of the SWPPP also addresses requirements that each facility component or system be considered in BMP programs (40 CFR §125.104(b)(2)(i)).

***Prediction of Rate, Quantity, and Direction of Spills.*** Part I.C.15.c.2)a)(ii) of the NPDES Permit specifies that for each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing pollutants, a prediction of the direction of flow, and an identification of the types of pollutants which are likely to be present in storm water discharges will be prepared. Factors to be considered include the toxicity of the chemicals, quantity of chemicals used, produced, or discharged, the likelihood of contact with storm water, and history of significant leaks or spills of toxic or hazardous pollutants.

Recently, the Site developed the *Spill Prevention, Control, and Countermeasures Plan* (SPCC) (RMRS, 1999b) which addressed the above requirements (specified by the NPDES Permit). Part I.C.15.c.5) of the NPDES Permit identifies that the SWPPP may reflect requirements for spill prevention control and countermeasure plans developed for

RFETS under Section 311 of the Clean Water Act. This approach is allowed provided such requirements(s) are incorporated into the SWPPP, or referenced by specific document title, volume, heading, and page number(s). All referenced documents must be available for review and inspection upon request.

To meet the requirement for the prediction of rate, quantity, and direction of spills, the SWPPP incorporates by reference the analyses and calculations contained in Section 8.1, *Prediction of Rate, Quantity and Direction of Spills* of the SPCC (RMRS, 1999b, page 35). In summary, these analyses predicted that in the unlikely event a release does occur, it is expected that the release would be captured within Site facilities. If a spill occurs during a major storm event, it is conceivable that pollutants might flow to the A-, B- or C-Series drainages. The Site ponds located in these drainages could be used to capture the spill in an emergency only basis.

Predictions of the direction of flow, rate of flow and total quantity of a potential spill are discussed below. Locations where spills are likely to occur were determined based on the locations of the tanks containing regulated substances that might potentially fail or, for an area where no such tanks exist, the likely location of a spill was defined as a loading/unloading area where regulated substances are handled.

Four main basins and four sub-basins drain the 384-acre Industrial Area of the Site. Each of these main basins, some of which also drain land immediately adjacent to the Industrial Area, empties to a specific monitoring point. These drainage basins were evaluated for proximal outdoor storage tanks or loading and unloading areas that handle regulated materials. For the purposes of calculation, the maximum quantity that could be released from these various containers is the entire tank capacity. The flow times for these spills were calculated for each of these containers based on the surface flow rate of water. Materials that are more viscous than water would travel more slowly than water over the same distance, and thereby allow additional time for response.

Table 5-1 lists the estimated times for spilled constituents to reach the monitoring point in the respective drainage basins. Please refer to Section 8.1, *Prediction of Rate, Quantity and Direction of Spills* of the SPCC (page 35) for details concerning these calculations.

**Table 5-1 Estimated Spill Volume and Flow Time**

| Drainage Area | Tank # Or Point Of Concern | Tank Contents | Tank Construction And Capacity | Flow Length (feet) | Minimum Flow Time (minutes) |
|---|---|---|---|---|---|
| SW022 | #2998<br>NE corner of Building 443 | Diesel | Steel, 1550 gallons | 4,400 | 50 |
| GS10 | #1911<br>South of Building 564 | #2 Diesel | Steel, 1000 gallons | 3,400 | 39 |

| Drainage Area | Tank # Or Point Of Concern | Tank Contents | Tank Construction And Capacity | Flow Length (feet) | Minimum Flow Time (minutes) |
|---|---|---|---|---|---|
| SW027 | Loading dock; NE corner of Building 460 | Varies | Not Applicable | 5,100 | 58 |
| SW093 | #1912 South of Building 771 | #2 Diesel | Steel, 4000 gallons | 1,520 | 18 |
| SW091 | See note 1 below | | | | |

[1] No known tanks or loading areas handling regulated substances in this drainage area.

Emergency containment of a major spill is possible downstream of the monitoring points. Any major spill occurring outside a Site building would normally be impounded or controlled upstream in secondary containment, a building, a sump, or other control structure, so it does not enter the surface drainage ditches or downstream ponds. In the unlikely event that the stormwater ditches, culverts, and immediate downstream ponds could not be configured for temporary emergency spill containment, the Site terminal ponds (Ponds A-4, B-5, and C-2) would be employed to detain the spill. Once contained, treatment for the impounded waters would be identified and treatment/transfer provided as necessary.

Additionally, Part I.C.15.c.2)a)(ii) of the NPDES Permit requires the SWPPP to identify flows with a significant potential for causing erosion. These flows are addressed in SWPPP Section 5.10, *Sediment and Erosion Control*.

***Containment and Diversionary Structures.*** At the Site, containment and diversionary structures are in place that will help prevent any spills from reaching navigable waters. Most tanks and units handling regulated materials at the Site are provided with full or partial secondary containment. This secondary containment varies, but generally consists of stainless steel, secondary tanks, coated concrete, catch basins, or earthen/asphalt berms. All permanent tanks at the Site are in a managed drainage system that allows for diversion of releases to various tanks, structures, and, if necessary, to detention ponds for proper management.

Liquid hazardous or mixed wastes are stored in areas providing secondary containment. Containments are designed and maintained to prevent run-on and run-off of liquids into the containment system. Liquids accumulated within secondary containment areas are removed in a timely manner to prevent overflow of the collection system. The collected liquids are transferred to a container of adequate integrity and managed appropriately based on the waste characterization.

The Site maintains the *Containment of Spills Within the Rocky Flats Drainages* (RFETS, 1998c) procedure for spills or releases that have reached or likely will reach the Site drainages. The Site goal is to contain spills as closely as possible to the source and thereby minimize contamination of the environment. Depending on the exact location of

a spill, curbing, sumps, and collection systems may be available for management of the spill. Primarily a Site Hazardous Materials Response Team as delineated in the RFETS *Emergency Plan* (RFETS, 1999d) will provide response to a spill. This Team is trained and equipped to respond to emergency situations involving hazardous materials and spills. Absorbent materials (booms), personal protective equipment, and neutralizing chemicals are available to the Hazardous Materials Response Team personnel in their mobile van. This team will contain the spill and stabilize the situation. Once a spill is contained, adequate treatment is assessed and provided by Site personnel.

***Process Waste System.*** Many buildings at the Site have process waste drains in floor areas where spills of oils and hazardous materials are possible. Floors are slightly sloped so that spilled liquid will flow towards the floor drain and liquids entering the drains will flow to a process waste collection system. Some areas of buildings have pits in the floors. If a spilled liquid enters a pit, it is evacuated by a sump pump and transferred to the process waste system.

The internal drains in the Site nuclear facilities were evaluated and areas that needed corrective action were identified during Site drain verification activities (EG&G, 1990). A comprehensive *Drain Identification Study* (DIS) (RMRS, 1996a) was prepared in accordance with the *Chromic Acid Incident Plan* (EG&G, 1992b) of the FFCA. These activities ensure that radioactive or chemically contaminated liquids cannot inadvertently be released to the environment or enter the sanitary waste system and thereby cause exceedance of applicable water quality standards. Facility Managers are responsible and accountable for drains in their facilities.

Process waste lines located within buildings-the most common configuration-are secondarily contained with respect to storm water runoff by the building itself. These lines are usually above the floor and easily inspected. Process waste lines located in common areas of buildings, such as offices, are additionally double-contained by chase pipes. Process waste lines external to Site facilities have secondary containment, or can be inspected where not double-contained. Secondary containment is provided by chase pipes surrounding the process waste lines.

***Valves.*** Manually activated valves control drainage from secondary containment areas. Some secondary containment systems at the Site are not provided with a drainage system and must have contained liquids (such as stormwater) manually pumped. The *Control and Disposition of Incidental Waters* (RMRS, 1998) procedure determines the proper disposition of water (usually groundwater or storm water) drained from these areas. Valves for secondary containment systems are closed following discharge of contents that had been held by the secondary containment system.

***Valve Vaults.*** Valve vaults were originally constructed of concrete and are not watertight. Groundwater can enter the vaults under certain hydraulic conditions. To reduce groundwater inflow, Hypalon® liners were initially installed in the valve vaults with space between the liners and the vault floors. Groundwater that collected in this

space was pumped via a sump pump to the process waste system. The Hypalon® liners also provided secondary containment for the process pipes.

The original Hypalon® liners did not fully prevent the migration of liquids between the groundwater and the containment area. A program was initiated to upgrade all liners in the valve vaults. The Hypalon® liners were replaced with high-density polyethylene liners that extend four feet up the sides of the walls. A liner pump is used to pump ground water that accumulates under the liner. Leaks or spills that are collected in the floor sump are pumped back into a transfer line. All transfer lines are double-contained to prevent release in case the primary transfer line fails. Each containment pipe has a leak detection line leading to a leak collection bottle. The bottle has a liquid level probe, which causes an alarm to activate when liquid is detected.

***Transformers.*** All non-pole-mounted, liquid-filled outdoor transformers at the Site have been provided with secondary containment, or removed. This secondary containment is designed to hold the liquid contents of the transformer plus some precipitation (detention capacity is one-third of the original contents). Some transformers that are the property of Public Service Company have also been provided with secondary containment. Pole-mounted transformers are not secondarily contained. The Site's goal is to have no transformers with greater than 50 ppm polychlorinated biphenyls (PCBs) in use outdoors. Currently, this goal is being met. Some indoor transformers that are ancillary to equipment (e.g., welders) do contain PCBs.

To provide adequate capacity for transformer secondary containment, the Site has directed the pumping of accumulated precipitation to the stormwater drainage system, if no oil sheen is visible on the water surface. If there is a visible oil sheen, the water is sampled and handled in accordance with the *Control and Disposition of Incidental Waters* (RMRS, 1998).

The historical use of PCB transformers has resulted in areas on Site that have been contaminated. As these areas are identified, they are evaluated and remediated as appropriate.

***Foundation Drains***. Foundation drains originate in the foundation footings of many Site buildings. The purpose of a foundation drain is to intercept and transport groundwater away from the foundation and subsurface structure of a facility. Generally, the groundwater is transported via gravel-filled trenches to surface drainage ditches. Although regular inspections and maintenance make it unlikely, a large spill within a building could potentially enter the footing drains and be transported to the surface water control system. This liquid would then be retained and sampled in the surface water control ponds and only released in compliance with the NPDES Permit and the RFCA Action Level Framework.

The *Drain Identification Study* (RMRS, 1996a) identified drains that could adversely impact operations of the WWTP or the environment. Site personnel investigated foundation drains as part of this study, and corrected foundation drains connected to the

sanitary waste system to the satisfaction of Site personnel. Facility Managers are responsible and accountable for the drains in their facilities.

***Storage Tanks.*** Bulk storage tanks at the Site are designed to be compatible with the intended contents under the intended conditions of service. All new storage tanks containing regulated materials are constructed with a means for full secondary containment. Secondary containments are constructed of an impermeable material compatible with the contents of the tank. An allowance for precipitation (25-year, 24-hour storm event) is made in the secondary containment for those tanks located outside. Required secondary containment for a series of tanks is designed to hold the total capacity of the largest tank and enough freeboard for precipitation. Leak detection, which may include visual observation, may be provided in secondary containment for new tanks. Disposal of materials removed from secondary containment is based upon characterization (through process knowledge or analytical testing) of the material in accordance with the *Control and Disposition of Incidental Waters* (RMRS, 1998). Release to the environment is allowed only when the material is confirmed to pose no threat to the environment.

Inspection of storage tanks was initially conducted under the *Tank Management Plan* (RFETS, 1997), as required by the FFCA. Responsibility and accountability for tank management was distributed to Facility Managers. The *Tank Management Plan* provided for visual inspection of all tanks and non-destructive testing of all metal tanks on a regular basis. Results of all inspections implemented for the *Tank Management Plan* are maintained on a Site tank database.

The *Tank Management Plan* governs the management and closure of certain interim status tanks located at the Site. These tanks are to be closed pursuant to the requirements of RCRA and the Colorado Hazardous Waste Act and implementing regulations. The *Tank Management Plan* is intended only for the interim status RCRA-regulated tank systems at the Site that are operating for the use of RCRA-regulated hazardous waste and will continue to be used (specifically, Tanks 231A and 231B). This Plan no longer covers inactive interim status RCRA tanks that have been rendered RCRA stable or that have been closed. This Plan requires tank integrity assessments every two years for Tanks 231A and 231B.

Secondary containment for most existing indoor tanks is provided by the building. Radiological process areas have berms around the perimeter of the radiological process areas and door thresholds are raised to contain contamination in the area. The depth of the containment is determined by Criticality Engineering. In addition, some indoor tanks have secondary containment berms to minimize the spread of liquid. Liquid spilled from a tank or ancillary equipment inside a building is transferred to the process waste system, usually through the process waste drains, and treated.

More detailed information on tank management is presented below by tank category.

Non-Regulated Chemical and Petroleum Storage Tanks. Each operable aboveground chemical and petroleum storage tank will eventually be provided with secondary containment. The majority of these tanks already have secondary containment. Aboveground tanks that are operated without secondary containment are considered high-risk areas.

The *Tank Management and Inspection Procedure* (RFETS, 2000a) provides for visual inspection of tanks under the supervision of a certified weld inspector and nondestructive thickness testing of metal tanks. Petroleum tanks are visually inspected every 30 days, and non-regulated chemical tanks are inspected quarterly. All metal non-hazardous and non-radioactive tanks are ultrasonically thickness tested when requested by Engineering or required by regulatory requirements or consent orders.

Underground Storage Tanks (USTs). These tanks contained an accumulation of materials, the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground. In recent years, all Site USTs regulated by RCRA Subtitle I and CDPHE underground storage tank regulations have undergone annual tightness testing (for pipes and fittings). Previous procedures required existing USTs without interstitial leak monitoring to be tightness tested annually. This requirement is no longer applicable because all Site USTs now meet leak detection requirements.

Eighteen of the regulated tanks are diesel fuel tanks for emergency generators and are thus deferred from required leak detection equipment, but are required to meet corrosion protection and overfill protection. The remaining tanks were scheduled for upgrades including release detection, spill prevention, and corrosion protection. In the long term, all USTs will be upgraded or replaced as necessary to meet the RCRA performance standards. Facility Manager are responsible for these tank upgrades in their facilities.

Unprotected metal UST components can deteriorate and leak when underground electrical currents act upon them. Cathodic protection for steel USTs is achieved by attaching anodes (pieces of metal that are more electropositive than steel) to a tank, and thus the “sacrificial” anode suffers the destructive effects of corrosion rather than the steel tank. All steel USTs have been provided with cathodic protection devices unless site conditions preclude failure by corrosion during the lifetime of the tank. Additionally, to eliminate corrosion, USTs may be constructed of fiberglass-reinforced plastic or steel-fiberglass-reinforced plastics if the proper design standards are followed. USTs may not be constructed of concrete. Spill and overflow equipment is provided for all appropriate USTs.

Hazardous Waste Storage Tanks All hazardous waste storage tanks comply with RCRA interim status regulations including requirements for secondary containment. All such tanks were assessed and integrity was certified in 1989, except for the mixed residue tanks, which were only recently declared waste tanks. After the United States District Court for the District of Colorado ruled that certain mixed residues were regulated by RCRA, CDPHE issued a Compliance Order requiring that mixed residues comply

Colorado Hazardous Waste Regulations. The Site developed a *Mixed Residue Tank Plan* (RFETS, 1999e) which manages the closure of certain tanks and associated equipment used to process mixed residues at the Site.

Inspection frequency of the tank systems (tank and associated equipment) depends upon the current status of the tank system. Tanks that are RCRA-active tanks are inspected daily. RCRA-stable tanks are inspected on a frequency approved by CDPHE. Mixed residue tanks that are physically empty are inspected quarterly, while those that are operationally empty are inspected daily. Piping that has been drained is inspected quarterly and piping that has not been drained is inspected daily. Hazardous waste tank assessments that include ultrasonic thickness testing are now performed annually. The annual assessments are also performed for 90-day tanks. All newly identified RCRA tanks have been assessed and certified.

Mobile and Portable Tanks. Mobile and portable tanks and other equipment containing or managing regulated substances are occasionally used at the Site for various purposes. The use of such tanks or equipment is evaluated for the potential to cause a release to the environment. The following are acceptance criteria/operational standards for these tanks:

- use of portable tanks except for surface water collection is not permitted by the On-Site Transportation Committee at the Site;
- no hazardous materials are allowed in portable tanks;
- tank wagons, as defined by DOT and meeting the specifications shown in 49 CFR Part 178, are permitted to be used with the permission of the On-Site Transportation Committee;
- new tanks designed to be transported but which are not permanently attached to vehicles or mobile equipment (e.g., portable tanks which are stationary while in use) are subject to the requirements of the *RCRA-Hazardous Waste Tank Systems Management Plan* (Part VII of DOE, 1997)) if they meet the criteria of containing an RQ of regulated substance or are permitted under RCRA;
- the tank and related equipment will be provided with full secondary containment to the extent practical if the tank has the potential to cause an immediate release to surface water (for instance, fuel supply tanks adjacent to ponds);
- the tank and related equipment will be provided with full secondary containment if the tank is to contain hazardous waste or radioactively contaminated materials; and
- containment (such as drip pans) will be provided to the extent practical for all other instances.

The above criteria do not apply to vehicles and other mobile equipment (such as drill rigs), although spill prevention and spill control measures should be considered prior to the use of such equipment in order to prevent or minimize releases to the environment.

***Facility Loading and Unloading Areas.*** All tank car or tank truck loading and unloading is governed by the provisions established by CDPHE, EPA, OSHA, and DOT.

Wastes being shipped or received is kept on loading docks for less than 24 hours and monitored during that time to ensure no spills or releases occur. Within 24 hours, following the use of any dock for the shipment or receipt of hazardous or mixed waste, the dock will be checked for signs of leakage from the waste containers. All loading docks at the Site are raised and/or covered to prevent run-on.

The Site requires that bulk storage tanks (new tanks or those that undergo a major repair) loaded by transport vehicles have loading stations. Underground petroleum storage tanks are exempted from this requirement. The loading stations provide secondary containment for the entire contents of the delivery vehicle as well as dry disconnect couplings or similar means to prevent spillage during uncoupling. All valves at loading stations will be equipped with locks to preclude operation by unauthorized personnel.

Loading and unloading areas are not used for storage of hazardous or mixed wastes. When wastes are transferred from containers to tanks or container-to-container, the containers are open for only a minimal period of time to prevent spills or leakage.

***Container Storage and Handling Areas.*** There are various container storage and handling areas at the Site. These include buildings, rooms, cargo containers, tents, fenced areas, vaults, and gloveboxes. Handling and storage areas for non-waste hazardous materials, such as petroleum compounds, are generally isolated from working areas. RCRA-regulated storage areas are maintained and inspected as required by the Site's RCRA Permit. This includes proper aisle spacing, storage limits, secondary containment capacity, material compatibility, and regular inspections. Loading docks that handle hazardous wastes are not regulated RCRA units, but are subject to daily inspections.

The Site garage (B331) is used to store containers (typically 55-gallon drums) of new engine oil and other lubricants for the Site's fleet of motor vehicles. A secondary containment is used for potential spill control. These facts, coupled with Site policy that all personnel on Site have an obligation to immediately report any release or threat of release of hazardous materials, mitigate the potential for significant release of raw materials to the environment.

***Security.*** The entire Site is fenced and patrolled by a 24-hour armed security force. Entrance gates are guarded at all times to prevent unauthorized personnel entry. Closed-circuit television provides monitoring of gate operations. The Protected Area of the Site is provided with adequate lighting such that identification of unplanned releases can occur at night. Valves at loading stations are provided with locks to preclude operation by unauthorized personnel. This comprehensive security program is considered sufficient for preventing material spills caused by acts of vandalism from outside parties.

### *5.4.2 Spill Response and Reporting*

Occurrences at the Site are of importance due to the nature of the operations and materials handled. A number of response plans and procedures have been developed which document, to the extent possible, actions that will likely be taken in response to an occurrence, as well as arrangement for cooperative aid. The most pertinent of these documents are the RFETS *Emergency Plan* (RFETS, 1999d), the *Occurrence Reporting Process* (RFETS, 1998a), the *RCRA Contingency Plan* (Part VIII of DOE, 1997), *Hazardous Waste Operations* (RFETS, 2001d), and the RFETS *Fire Department Standard Operating Procedures* (RFETS, 2000h). The discussion presented in this SWPPP is a general description of the spill reporting and response activities at the Site. In the case of a spill, the documents referenced should be used rather than this SWPPP.

An occurrence reporting system has been established at the Site that identifies the processes and responsibilities for reporting all occurrences at the Site. It also serves to document occurrences for the purpose of minimizing recurrence and complying with legal requirements. This system includes, but is not limited to environmental incidents. The *Occurrence Reporting Process* (RFETS, 1998a) details occurrence identification, categorization, notification, and reporting and is the parent document to several procedures and process descriptions, which are updated, as necessary.

<u>Incident Response</u>

The *Emergency Plan* details Site emergency response organizations, structure, and functions. The EOC Control Room is staffed 24-hours a day. Under normal operating conditions, the EOC is in a stand-by status. When an occurrence is categorized as an emergency or the occurrence actually or potentially poses a significant and immediate threat, the Shift Superintendent has the responsibility to activate the EOC. The EOC then becomes the focal point for emergency response communications and notifications. Several other groups and organizations not mentioned in this discussion are part of, or related to, the EOC. They provide emergency response support and consultation to the EOC and are listed in the *Emergency Plan*.

The Hazardous Materials Response Team (HazMat Team) was established to respond to hazardous material occurrences at the Site. This team is the immediate respondent to any environmental incident causing the release of radioactive, toxic, or hazardous materials. This team is composed of Fire Department personnel thoroughly trained in emergency response. Support staff and groups to the HazMat Team typically include:

- Environmental Compliance;
- Radiological Control Technicians;
- Radiological Engineering;
- Safety and Industrial Hygiene;
- Surface Water Operations;

- Utilities on-duty;
- Garage Heavy Equipment and Trucking;
- Security;
- Traffic;
- Waste Management; and
- Medical.

Upon notification of an incident, the Shift Superintendent notifies the HazMat Team, which responds to the scene and initiates appropriate mitigation efforts. Support members of the HazMat Team are activated as necessary for the particular emergency being addressed. These mitigation efforts and other actions of the HazMat Team are detailed in *Hazardous Waste Operations* (RFETS, 2001d).

The Emergency Control Station is a location that can be used as a command post during HazMat incidents. The Emergency Control Station is positioned in a safe and strategic location, and the HazMat Team Leader and Shift Superintendent operate from this command post. The Emergency Control Station is equipped with resources such as radios with multiple channels, reference books, maps, and reports. In addition, the HazMat Team operates the HazMat Van, a vehicle equipped with special supplies that may be needed to respond to a hazardous materials event. A complete inventory of HazMat Van is available from the Site Fire Department.

The HazMat Team Leader is solely responsible for the entire operation of the HazMat Team. The Team Leader is typically a Senior Fire Officer and is subordinate only to the Fireground Commander or Shift Superintendent. The HazMat Team Leader will operate in cooperation with the Shift Superintendent or Fireground Commander as follows:

1) The first-arriving Fire Department Officer will be designated as initial HazMat Team Leader. Depending on the type and level of the incident, the HazMat Team Leader function will be delegated to the Team Member with the most relevant training and experience. The Fireground Commander has the authority to select the most qualified Team Leader.

2) The HazMat Team Leader will assure that all aspects of the operation are addressed and that actions are taken to mitigate the incident safely. The Team Leader's responsibilities include, but are not limited to:

   - establishing and directing the HazMat Team command post;
   - determining safe and restricted areas, including the "Yellow Zone" into which only emergency personnel will be admitted and the "Red Zone" into which only HazMat Team members will be admitted;
   - calling upon the Security Department to maintain the zone areas as needed;

- using accepted tactical methods to contain and control the incident;
- assuring efforts are made to assist in the remediation of the site;
- assuring continual monitoring of the situation to detect any change in spill runoff or vapor cloud movement, travel, and amount;
- ordering of additional evacuation or other measures as needed;
- advising Fire Communications to notify appropriate secondary response personnel for assistance if the quantity of materials involved in the occurrence is significant enough;
- requesting that the Security Department make Public Address announcements and assist in evacuation if the HazMat Team Leader and Shift Superintendent determine it is necessary;
- communicating directly with Safety and Industrial Hygiene when specific material properties and methods of material handling are not absolutely certain;
- ensuring that the scene of the incident is safe prior to releasing the area to anyone other than Fire Department personnel;
- providing formal documentation of the incident encompassing all reports and notifications required to meet statutory requirements; and
- ensuring minimum staffing levels are maintained for safe and effective operations.

3) If further assistance is needed to mitigate a HazMat incident, mutual aid from the Jefferson County Hazardous Substance Response Authority or the Boulder County HazMat Team is available. The Shift Superintendent or Crisis Management Team shall authorize activation of any off-Site mutual aid assistance if the Emergency Operations Center is activated.

If the HazMat Team effort to contain a spill is unsuccessful and the spill may migrate to the Site drainages, or the spill is of such magnitude it cannot be contained, then appropriate spill diversion procedures will be implemented to contain the pollutants in the Site detention ponds. As mentioned previously, the A-, B-, and C-series ponds may serve as emergency spill control or spill isolation ponds if no other alternative is available.

A Site spill diversion procedure, *Containment of Spills Within the Rocky Flats Drainages* (RFETS, 1998c), describes operation of the gates and valves necessary to control runoff, floods, and spills originating both west of the Site and on-Site. In general, uncontrolled releases occurring in the 700 complex area will be diverted to Pond A-1 or A-2. Releases in part of the 400 complex, part of the 800 complex, the 900 complex, and the central area of the Site will be diverted to Pond B-1 or B-2. Releases occurring in the remainder of the 400 and 800 complexes will be diverted to Pond C-2 via the South Interceptor Ditch. In the event a major spill overwhelms influent storage (over 800,000 gallons) and treatment at the WWTP, effluent form the sanitary waste treatment system will be directed to Ponds B-1 and B-2, if there is sufficient capacity, or to Pond B-3 if there is not

capacity. Spills, which cannot be contained in these Site detention ponds, will be pumped into containment vessels such as drums or portable tanks when possible and practical.

If a large spill were to occur west of the West Interceptor Ditch and the HazMat Team could not contain it, then the spilled material could enter the West Interceptor Ditch. If this happened, the flow could travel through the West Interceptor Ditch to McKay Bypass, Walnut Creek, and off-Site. There is little risk of such an occurrence happening because all production buildings, process waste system components, and major tanks are east of the West Interceptor Trench. The only scenario for such a major spill involves a tanker truck leaking or spilling a large quantity of hazardous material close to the West Interceptor Trench. Such a spill is very unlikely to occur.

Once the incident has been controlled, cleanup and decontamination activities will begin. Cleanup involves the collection and containment of released material including liquids, contaminated sorbent material, and contaminated soil. Liquid releases will be pumped into drums or portable tanks and analyzed to determine appropriate action. Contaminated sorbent material will be contained in DOT-approved containers. Soil that is contaminated will be removed and contained. The remaining soil in the area will be identified as a potential area of concern (possible IHSS pending further evaluation). If EPA or CDPHE decides the area qualifies as an IHSS, it will be added to the IHSS list, and sampled and investigated as a part of the environmental restoration activities at the Site. In general, Site policies call for removal of contaminated soils until the contaminant concentrations in remaining soils do not pose an unacceptable risk to human health and the environment. In the unlikely event that a spill impacts groundwater, remediation will be implemented as necessary as part of the remedial activities at the Site.

Responsibility for spill cleanup rests with the generator of the spill, unless the site is declared an IHSS. If the site is declared an IHSS, the responsibility for cleanup will then fall to the Environmental Remediation group. Should a spill occur in an already identified IHSS, all released materials that could spread in an uncontrolled manner will be removed or remediated (as per discussions with CDPHE or EPA). The remainder of any released materials will be remediated following schedules for the IHSSs presented in the *Rocky Flats Cleanup Agreement*.

Occurrence Categorization and Reporting

Site personnel are trained and instructed to report all releases. Upon discovery of a release of materials or other non-life-threatening emergency situations, Site personnel immediately notify their supervisor. The supervisor evaluates the situation and notifies the Facility Manager and Shift Superintendent. If the supervisor is not available, the employee notifies the Facility Manager or the Shift Superintendent, in that order. If the situation is immediately life threatening, the employee evacuates the area and calls

extension 2911 for emergency assistance. All calls to 2911 ring through to the Shift Superintendent's office.

After the Facility Manager and Shift Superintendent have been notified, the occurrence is categorized, as described below. The Facility Manager or Shift Superintendent gives approval for notification appropriate to the categorization or classification. If the occurrence could impact the environment (e.g., a spill or release of radioactive or hazardous material or an abnormal operating condition (a regulatory noncompliance), an Occurrence Notification Worksheet will be completed and verbal and written notifications will begin as detailed in the *Occurrence Reporting Process* (RFETS, 1998a). The categories are Emergency, Unusual Occurrence, Off-Normal Occurrence, or an Internally Reportable Event and the notification requirements differ for each (see Section 5.5). Verbal notification of employees in areas potentially affected by a release of materials would be made by a Life Safety and Disaster Warning system that is operative throughout the Industrial Area of the Site. In addition to this warning system, there is also a fire alarm system operative throughout the Site. A number of other alarms are present in facilities that handle radionuclides. These alarms are typically specific to certain types of events involving radionuclides. A list of notification contacts with names and phone numbers is maintained. A list of off-Site (non-RFETS) notification contacts is presented below.

<u>ONC Notification Contacts</u>

DOE Headquarters
DOE Toxic Material Hotline
Jefferson County Communications Center
Boulder County Communications Center
State Oil and Gas Inspector
CDPHE Emergency Response Center
CDPHE RFETS Program Unit
Arvada Communications Center
EPA National Response Center
EPA Operations Center
EPA Region 8, 24-Hour Emergency Spill
FEMA (Denver Region)
FBI (Security Related)
Colorado State Patrol
Denver Emergency Preparedness
City of Arvada
CHEMTREC
Civil Air Patrol (Lowry AFB)

Depending on the occurrence category some or all of the listed contacts may be notified. Procedures provide guidance and worksheets for determining when to contact which off-Site agencies. These procedures are in addition to the notifications made to DOE.

The Facility Manager is responsible for ensuring that all reports are transmitted to the DOE within the time requirements. A preliminary 10-day report is required. Update reports are not required, but should be submitted when significant new information becomes available. The Final Report is mandatory and must be completed per the requirements of the *Occurrence Reporting Process* (RFETS, 1998a).

The Facility Manager will conduct a critique meeting as soon as practical following stabilization of the situation, usually within two hours of discovery of the occurrence and prior to transmittal of the 24-hour DOE Notification Report. The results of the meeting are documented and maintained in the history file and should be factored into notifications and 10-day reports.

Occurrences are tracked per the *Site Corrective Actions Requirements Manual* (RFETS, 2001b). Tracking is initiated by the 24-hour DOE Notification Report and is terminated by the DOE Program Manager's approval of the Final Report once corrective actions are completed.

## 5.5 Occurrence Categorization

The Facility Manager determines the nature of the occurrence and the initial categorization in accordance with *Occurrence Reporting Process* (RFETS, 1998a), and notification to the ONC. The Facility Manager also authorizes initiation of notifications. The Facility Manager will continuously review the event conditions and upgrade or downgrade categorization as necessary until the Shift Superintendent has taken responsibility, or the Emergency Operations Center (EOC) has been activated (for emergency categorization only), or the occurrence has ended. In the absence of the Facility Manager, the Shift Superintendent will assume these responsibilities.

Notification procedures require that the State of Colorado and DOE be verbally notified of unusual occurrences within 2 hours and emergencies within 15 minutes. If the Site notifies the state, but does not categorize an emergency within the required time frame, then the State of Colorado may default to an automatic General Emergency category. Descriptions of occurrence categories are summarized below.

**Emergency -** Any significant deviation from planned or expected behavior or course of events, which could result in significant off-Site consequences to people, property, the environment, or national security. Some of the different categories of emergencies are described below.

General Emergency – A General Emergency is declared when events or conditions are predicted, are in progress, or have occurred that result in one or more of the following; (1) actual or imminent catastrophic reduction of facility safety or security systems with potential for the release of large quantities of hazardous materials (radiological or nonradiological) to the environment; (2) the radiation dose from any release of radioactive material or a concentration in the air from any release of other hazardous material is expected to exceed the protective action criteria at or beyond the

Site boundary; and (3) actual or likely catastrophic failures in safety or security systems threatening the integrity of a nuclear weapon, component, or test device that may impact the health and safety of workers and the public.

Site Area Emergency – A Site Area Emergency is declared when events or conditions are predicted, are in progress, or have occurred that result in one or more of the following: (1) an actual or potential major failure of functions necessary for the protection of workers or the public. The radiation dose from any release is expected to exceed the protective action criteria beyond the facility boundary or exclusion zone boundary. The protective action criteria is not expected to be exceeded at or beyond the Site boundary; (2) an actual or potential threat to the integrity of a nuclear weapon, component, or test device that may adversely impact the health and safety of workers in the immediate area, but not the public; and (3) actual or potential major degradation in the level of safety of security of a facility or process that could, with further degradation, produce a General Emergency.

Alert – An Alert is declared when events or conditions are predicted, are in progress, or have occurred, resulting in one or more of the following: (1) an actual or potential substantial degradation in the level of control over hazardous materials (radiological and non-radiological); (2) the radiation dose from any release to the environment of radioactive material or a concentration in the air of other hazardous material is expected to exceed the protective action criteria of one rem TEDE or ERPG-2 at or beyond 30 meters from the point of release to the environment; (3) it is not expected that the protective action criteria will be exceeded at or beyond the facility boundary (100 meters) or exclusion zone boundary; (4) an actual or potential substantial degradation in the level of safety or security of a nuclear weapon, component, or test device that would not pose an immediate threat to employees or the public; and (5) an actual or potential substantial degradation in the level of safety or security of a facility or process that could, with further degradation, produce a Site Area Emergency or General Emergency.

**Unusual Occurrences -** A non-emergency occurrence that exceeds the Off-Normal threshold, is related to safety, safeguards and security, environmental or health protection, and performance or operation of a facility.

**Off-normal Occurrence -** A non-emergency abnormal or unplanned occurrence that adversely affects, potentially affects, or is indicative of degradation in the safety, security, or environmental and health protection performance or operation of a facility.

**Internally Reportable Occurrence** – An event that is not reportable to DOE because it does not fit any of the categorizations, but is appropriate for management notification, written evaluation, analysis, and tracking. Internal reports are assigned numbers and may be documented on the Shift Superintendent's Daily Summary Report.

The RFETS *Emergency Plan* (RFETS, 1999d) may be implemented in response to a variety of occurrences. In addition to the requirements stated in the *Emergency Plan*, the

Shift Superintendent is charged with the responsibility of determining if an occurrence meets the criteria for implementation of the *RCRA Contingency Plan* (Part VIII of DOE, 1997) based on consultation with specialists on Site in making this determination. The *RCRA Contingency Plan* is implemented when an occurrence:

1) involving hazardous waste results in an injury requiring more than first-aid;
2) involving a spill, leak, or other release of hazardous waste to the air, soil, or surface water (outside a building);
3) involving a spill, leak, or other release of hazardous waste inside a building results in:
   - a release which exceeds a reportable quantity equivalent volume as defined in 40 CFR Part 302; or
   - a spilled material from a hazardous waste tank system not removed from secondary containment within 24 hours; or
4) a fire and/or explosion in which a hazardous waste release or an active hazardous waste management unit is involved.

The *RCRA Contingency Plan* can also be implemented as the result of a hazardous waste incident resulting in an injury requiring more than first aid. If the *RCRA Contingency Plan* is implemented, additional reporting and notification are required. These notifications and reports are outlined in the *RCRA Contingency Plan*.

***Disposition of Spill Waters.*** In the event of a spill inadvertently entering the sanitary collection system and in case spills are not immediately compatible with or would overwhelm the WWTP treatment system, the WWTP incorporates an influent holding tank where water can be diverted before it enters. These influent tanks are managed in accordance with *Waste Water Treatment Plant Influent Tank Operation* (RMRS, 1997) procedure. Spills are addressed on a case by case basis in accordance with *Response to Unwanted Releases Into the Sanitary Wastewater System* (RMRS, 1999a). Spills are either introduced (if compatible) and treated slowly in the WWTP treatment system from the influent tank or precipitated and dried as sludge, or otherwise pretreated before admission to the WWTP treatment system.

The surface water ponds can serve as emergency temporary containment of large spills or spills that migrate through the WWTP if other alternatives are not available. Should any of these ponds be used to contain a spill, treatment of water in the ponds may be necessary. The possible treatment options for that water on-Site include: (1) transfer of the water to the Building 891 Consolidated Water Treatment Facility for precipitation of contaminants; (2) treatment of the water through the WWTP; and (3) upon closure of Building 374 an alternate treatment system is planned, but not finalized yet. Should one of these alternatives be appropriate, approval from the regulatory agencies will be sought prior to transfer and treatment of the water. As control systems at the Site are modified and upgraded, additional treatment capability and flexibility may be available. In the event that none of the available on-Site treatment systems are suitable for the material to

be treated, purchase or lease of a more suitable treatment system or a contract with an outside firm to treat the waters will be pursued.

***Disposition of Incidental Waters.*** Many activities at the Site result in the generation of incidental waters requiring evaluation, treatment or other management. This water may originate as surface water, storm water, groundwater, utility water, process water, or wastewater from:

- construction activities that require excavation below the groundwater table and subsequent groundwater pumping;
- natural collection and subsequent pumping of storm water and/or groundwater in excavations, pits, trenches, ditches, or depressions that do not intercept the groundwater table;
- collection of water in secondary containments, process waste valve vaults, electrical vaults, sumps or manholes that require pumping; and
- discharge of water from the fire water suppression system.

Water originating from these sources is controlled, contained, sampled, analyzed and treated or discharged according to the *Control and Disposition of Incidental Waters* (RMRS, 1998) procedure. This document establishes the process for planning, sampling, and management of incidental water generated at any Site location. The procedure identifies acceptable criteria for water-quality parameters, such as gross alpha, gross beta, pH, conductivity, and nitrates. If the incidental water meets applicable criteria, the water is discharged to the storm water drainage system. However, if the established criteria are exceeded, the incidental water is collected and treated either in the Consolidated Water Treatment Facility (Building 891) or the Waste Water Treatment Plant (Building 995). Additionally, if the source of water is an area of known or suspected contamination, additional analyses are performed for the specific known or likely water quality parameters. Results of the analyses are used to determine the appropriate disposition of the water.

## 5.6 Inspections

### *5.6.1 Source Control Review (SCR) Inspections*

The Site conducts SCRs to proactively identify problems or concerns involving the protection of surface water quality. Site Industrial Area facilities exteriors and associated cargo containers, external storage areas, drainage structures, and secondary spill containment facilities are subject to annual SCR inspections to identify potential surface water contamination sources and pathways. Items addressed during the inspections include:

- Proper storage of potential surface water contaminants

- Integrity of liquid storage tanks
- Adequacy and effectiveness of secondary containment
- Housekeeping practices in vehicle and equipment maintenance/cleaning areas
- Presence of incidental waters in secondary containment

Concerns are identified to Facility Managers for corrective action. Follow-up inspections are made to confirm that past observations and deficiencies are resolved. All observations, deficiencies, and updates are kept on file. Hard copies of all field notes, maps, and summary letters to Facility Managers are maintained on file.

### *5.6.2 Drain Identification Study Inspections*

The *Drain Identification Study* (RMRS, 1996a) was conducted from 1992 to 1996 per the *Chromic Acid Incident Plan* (EG&G, 1992b), and later incorporated into the NPDES/FFCA. The DIS identified all pathways (mainly building drains) to the Site WWTP from inside 194 major Site buildings. In March 1996, the DIS activity was modified by DOE to reflect scope changes in FFCA activities. Under the DIS rescope, which was formally accepted by EPA, Facility Managers were assigned to address DIS-identified deficiencies. In December 1998, the Site completed a Sanitary Drain Vulnerability Assessment that evaluated the potential drain vulnerabilities in the 10 major plutonium buildings for the release of radioactively contaminated materials to the WWTP. This assessment confirmed there were no viable pathways to the WWTP from the 10 buildings. In March 1999, the CDPHE initiated a limited review of the DIS-identified pathways in 9 plutonium-contaminated buildings. The focus of the CDPHE review was to evaluate the potential for an inadvertent release of plutonium to the WWTP that could cause downstream exceedances of RFCA water quality standards. No pathways or vulnerabilities were identified by the CDPHE review that included potential releases of radionuclides associated with activation of the fire suppression systems. Recommendations from the CDPHE report to a RFCA Water Working Group were appropriately addressed.

Based upon these assessments and absence of a credible release scenarios, a RFCA Water Working Group, which consisted of Stakeholders from the Site, regulators, and public, concurred on direct discharge of water from Pond B-5, rather than batch the water to Pond A-4 for subsequent discharge. The Site periodically inspects Site sanitary drains to ensure protection of the WWTP from inadvertent releases.

A Site drawing database preserves the DIS information for Emergency Response Organization actions and D&D project usage. The DIS drawings are updated periodically to reflect changes in building configuration (especially as facilities undergo decommissioning and demolition). Hard copies of all findings, fieldnotes, and general drawings are kept on file.

### *5.6.3 Tank Inspections*

The CDPHE has been authorized by EPA to enforce the RCRA regulations at the Site and to ensure that hazardous and mixed waste is managed properly. The Colorado Hazardous Waste Regulations, 6 CCR 1007-03, Parts 262, 264 and 265 provide standards that define the acceptable management of hazardous waste in tanks. The RFETS *RCRA Part B Permit* (DOE, 1997) the *Mixed Residue Tank Plan* (RFETS, 1999e), and the *RCRA Hazardous Waste Tank Systems Management Plan* (Part VII of DOE, 1997) outline the requirements for hazardous and mixed waste tanks.

If a tank at the Site contains, or once contained hazardous or mixed waste, then it is a RCRA-regulated tank. These tanks currently in operation at the Site are used for waste accumulation and storage, waste treatment, or residue processing. RCRA-regulated tanks that are no longer in operation are tanks previously used in production processes, and tanks previously used for waste storage or treatment. Even empty tanks are subject to certain RCRA requirements until completely closed.

Visual inspections are the first line of defense in preventing uncontrolled or detecting inadvertent releases of hazardous or mixed wastes. Efforts to ensure that the tank system and its ancillary equipment are operating properly, or are in its expected configuration, are necessary to protect human health and the environment. The tank owner has primary responsibility for ensuring that the visual inspections of tanks and piping systems are conducted in accordance with applicable requirements. The tank owner is also responsible for timely implementation of any and all corrective actions that might arise from the visual inspections. For RCRA-regulated tanks, only personnel trained as RCRA Inspectors may conduct the visual inspections. The *Tank Management and Inspection Procedure* (RFETS, 2000a) contains specific information for RCRA tanks, however, the procedure is a visual inspection procedure for ALL tanks on Site, not just RCRA tanks. This procedure also identifies the inspection frequency for different tank categories.

All tanks and tank systems shall have an identification number, plate, or tag clearly displayed in an easily accessible area. Also, a National Fire Protection Association (NFPA) label shall be affixed to the exterior of the tank (this only applies to tanks or tank systems that consistently contain a particular type of material in which the physical and chemical characteristics remain constant). Tanks containing ignitable or reactive hazardous wastes must be posted with “No Smoking” signs and be protected from sources of ignition.

Some tank systems may contain materials that have the potential to generate gases that are flammable. Any tanks that contain materials having the potential for flammable gas or vapor generation may be marked as such on the exterior of the tank. Management of these tanks may require additional actions beyond those required by the RCRA Permit. The additional requirements for managing tanks containing materials that pose flammable gas generation hazards are identified in RFETS procedures involving the control of flammable gas. The inspector must observe the tank system for signs of spills or leaks.

Leakage is defined as any form of solid, liquid, or gaseous discharge that is unplanned and uncontrolled or is not a part of the normal functioning tank system.

The *RCRA Part B Permit Contingency Plan* (Part VIII of DOE, 1997) provides a description of the responsible groups and the requirements for response to, and reporting an imminent or actual unplanned releases of a hazardous chemical, hazardous material (i.e., oil), hazardous substance (i.e., radionuclides), or a hazardous or mixed waste. Releases from RCRA-regulated tank systems, at a minimum, require notification to Supervision/Shift Superintendent. The *RCRA Part B Permit Contingency Plan* provides the necessary steps to ensure timely notification of an unplanned release that is reportable to DOE and off-Site regulatory agencies.

### *5.6.4 Other Inspections*

Site Health and Safety organizations conduct periodic, detailed inspections of each building complex in accordance with written procedures. Although worker safety and health issues are of primary interest, issues of concern relating to storm water, such as good housekeeping, are also inspected. Formal reports, detailing deficiencies and recommending corrective action, are sent to the Facility Manager responsible for the area in which deficiencies are found. Follow-up inspections are conducted to verify appropriate corrective action was taken.

The Site Fire Department conducts monthly inspections of production (or other high risk) buildings. A building is considered high risk if it contains large quantities of flammable materials or would represent a large monetary loss in a fire. All other Site buildings are inspected quarterly. Inspections are conducted to check for compliance with all Site H&S, DOE, and NFPA requirements, including storm water related subjects such as housekeeping and chemical storage. Detailed annual surveys of buildings are conducted in which evaluations of process and occupancy changes are included. These surveys are conducted even though Facility Managers are required to provide timely notification to the Fire Department of any changes in building operations and structures. All of the Fire Department inspections and surveys are followed by a written report.

In addition to the formal inspection programs, visual inspections are incorporated in the day-to-day operations of Site personnel. It is the responsibility of all personnel to note any activities or conditions not conducive to environmental protection and to notify management so that appropriate response actions can be initiated.

## 5.7 Employee Training

All employees at RFETS receive training, commensurate with job responsibilities, regarding the relationship between work practices and environmental concerns. These training and education programs have two main objectives. First, employees are educated to help prevent environmental incidents. Second, training is given to provide for a rapid response to environmental incidents, including spill identification and reporting. Swift

identification and reporting of spills aids in the abatement process. These training programs ensure that employees with all levels of responsibility understand the processes and materials of their jobs, potential safety hazards, and procedures for preventing unplanned discharges. In addition, employees are trained to understand their roles and responsibilities during emergency situations.

Existing Site programs meet the awareness and training requirements in the renewed NPDES Permit. The Site maintains a collection of the training materials used in the various courses that cover spill awareness. Some training is applicable to all Site employees, including routine training such as the annual Resource Conservation and Recovery Act (RCRA) refresher training, and individual training which is tailored to each worker's duties. Other training is specific to personnel responsible for responding to and cleaning up spilled material of all types, primarily the Site's Hazardous Materials Team. Finally, there is periodic training on the proper disposal of wastes and the programs that control the use of the Site's sanitary collection system.

Employee communication is a key element of promoting employee awareness. Various avenues of communication include the Site employee newspaper, periodic communications to management (e.g., Manager's Preview), posting on Site bulletin boards and other suitable locations, and through the Rocky Flats Intranet, which hosts a Website specific to the Internal Waste Streams and Incidental Waters programs.

The Site maintains a spill response contact schedule, which identifies Site personnel on-call for spill events, and a description of how the responders cascade information to Site organizations to ensure that all necessary parties are notified in a timely manner. This is a direct communication link that formalizes the duties and responsibilities of all Site personnel involved in spill response.

### *5.7.1 General Employee Training*

Employee training and education programs are used by the Site to help prevent environmental incidents and to provide for the rapid identification and reporting of spills. Rapid identification and reporting of spills aids rapid response and abatement. These training programs ensure that employees, at all levels of responsibility, understand the processes and materials of their jobs, potential safety hazards, and procedures for preventing environmental discharges. In addition, employees are trained to understand their roles and responsibilities during emergency situations.

Training begins on the first day of employment at the Site. The new hire orientation program, known as the General Employee Training (GET) program includes an environmental presentation, as well as discussions of environmentally related areas such as Safety and Industrial Hygiene, Fire Protection, Safety, Radiation Safety, Security, and Emergency Preparedness. The environmental presentation details Site policies and programs regarding protection of the environment. Specific indoctrinations are also provided to new hires expected to work with toxic substances such as plutonium. All Site

employees are required to complete this training and receive periodic updates with specific on-the-job instructions from their supervisor.

Specific items covered during General Employee Training that relate to spill prevention, spill control, and storm water management include:

- the Hazards Communication Program, specifically:
  - the NFPA "Diamond" method of Chemical Hazard Rating;
  - Material Safety Data Sheets and the meaning of Threshold Limit Value, Permissible Exposure Limit, and similar environmental concepts and the identification of spill leak and disposal procedures;
  - the necessity for Site-specific training courses;
  - the prevention of accidental chemical spills by not using chemicals unless the employee has been specifically trained to do so;
  - Site procedures regarding spills, uncontrolled chemicals, and proper disposal of hazardous materials;
- housekeeping and its relationship to safety and minimization of the spread of waste and contamination;
- the Fire Protection Program, with specific emphasis on:
  - recognition of special fire protection needs at the Site;
  - identification of types of fires, fire alarms, protection systems, barriers and extinguishing methods, and reporting procedures;
  - recognition of the requirements for storage and work permits relative to potential fire hazards;
- the Emergency Preparedness program, including:
  - recognition of employee responsibilities for emergency preparedness and plant emergency response;
  - credible emergencies that could occur;
  - alarm types, notification methods, and proper responses;
- security at the Site, including employee responsibility for compliance with the security program; and
- a section of the course that specifically addresses spill prevention.

Initial GET is supplemented by GET refreshers that are provided every other year.

Another aspect of the Site training program is building indoctrinations. These indoctrinations cover subjects such as response to nuclear alarms, fire alarms, emergency

notifications and actions pertinent to specific work areas, hazardous materials handling, health hazards, storage and waste disposal practices, area hazards, plant rules, and building rules. A permanent record is kept for each topic and the employee signs the record, thus indicating an understanding of the material covered. Periodic re-indoctrination covering the same material is required for each employee.

Integrated Safety Management and the Integrated Work Control Program (IWCP) govern all work on Site. The IWCP Responsible Manger is directly responsible and accountable for the development, implementation, and performance of Site work. The Responsible Managers (RM) are trained in the use of the IWCP, Work Control Document development, and are familiar with the general principles and practices of project management. The RM must pass both a written examination and an oral board certification. The RM is responsible for determining if additional on-the-job training is necessary to prevent, or mitigate, potential hazards associated with doing work with unfamiliar equipment, and to ensure workers understand the safety controls.

Central to the Site Closure is the completion of the Closure Project safely and in compliance with environmental regulatory requirements. The Site has developed environmental management systems described in the *Environmental Management Program Guidance* (RFETS, 2000k) to ensure Site Closure is accomplished in accordance with principles of regulatory compliance and environmental stewardship. The Site environmental management systems include the elements: (1) Management Leadership and Commitment, (2) Strategic Planning, (3) Implementation, (4) Measurement and Evaluation, and (5) Management Review and Continuous Improvement. All Site employees should report any known or suspected environmental issue and non-compliance to supervision. Non-compliance with environmental requirements by and Site employee, either by committing a wrongful act or failure to act where required to do so by law, regulation, Site policy, or Site procedure, is unacceptable and subject to disciplinary action in accordance with each Site company's policy.

The Site *Training Program Manual* (RFETS, 2000d), the *TRU Waste Characterization Program Training Implementation Plan* (RFETS, 2001c), the *Low-Level/Low-Level Mixed Waste Management Plan* (RFETS, 1999b) and the RFETS *RCRA Permit Personnel Training Requirement Plan* (Part IX of DOE, 1997) all specify training and qualification requirements for personnel assigned to these programs. Persons directly involved with the transportation of hazardous materials are required to complete the DOT Hazardous Material Transportation Course. The Traffic Department teaches this course.

Employees at the Site that have responsibilities in the environmental field are trained in Occupation Safety and Health Administration (OSHA) requirements for worker protection at hazardous waste sites if they work in RCRA-regulated areas. The requirements for this course are outlined in 29 CFR 1910.120. This course is offered by the Site training department, and helps to raise awareness of potential problem areas, potential health and safety threats that may be encountered, and sources of contamination (or releases to the environment) during environmental work.

The Site HazMat Team has special training requirements to adequately prepare for emergency response. This training is detailed in the HazMat Standard Operation Procedures. At the current time, this training initially consists of an 80-hour Colorado Safety Institute Level I Course and a 24-hour awareness course. The initial training is supplemented at least annually by 24 hours of additional training.

DOE Order 5400.1, *General Environmental Protection Program* (DOE, 1990) requires a program to increase employee awareness of pollution prevention and demonstrate how employees can contribute to this effort. A *Pollution Prevention Program Plan* (RFETS, 2000i) emphasizes the goal is to prevent pollution, rather than to clean up or treat pollution. Spills are a potential source of pollution that is preventable. The *Pollution Prevention Program Plan* lists the pollution prevention regulatory drivers, describes the pollution prevention systems in place at the Site, lists Site documents with pollution prevention relevance, and provides roles and responsibilities of pollution prevention program partners. One key pollution prevention system at the Site is the Chemical Management System, which controls the procurement and usage of hazardous materials. This system prevents the introduction of unnecessary toxic chemicals to the Site, while minimizing the quantities of toxic chemicals that are used.

Personnel that are responsible for the implementation and maintenance of the SWPPP are familiar with the policies and procedures implementing this plan. Among these are occurrence response and reporting procedures, equipment management policies, engineering design standards, and material handling policies. Familiarity with these programs and procedures enables proper and thorough implementation of this SWPPP. By identifying deficiencies and problem areas, spill prevention and spill control can be implemented where applicable.

Personnel with SWPPP responsibilities are familiar with the contents of, and relationships between, the documents in the reference list for this Plan. The most important of these are:

- RFETS *Emergency Plan* (RFETS, 1999d);
- RFETS *Occurrence Reporting Process* (RFETS, 1998a);
- *RCRA Part B Permit Contingency Plan* (DOE, 1997); and
- *Control and Disposition of Incidental Waters*, (RMRS, 1998).

Employees at RFETS maintain their training and qualification by refreshing their training as required by their current work assignments. Site training coordinators track training requirements and notify RFETS personnel when training is due to expire. If training has expired, then the affected employee is no longer qualified to perform the specific functions addressed by that training. Refresher requirements and deadlines are dependent on various procedures and/or regulations that drive specific courses. Non-regulatory

training, which is typically developed by line organizations to meet operational needs, may expire at the discretion of the owning line management.

## 5.8 Recordkeeping and Internal Reporting Procedures

Spill Records

An internally reportable release includes all unplanned solid, liquid, and gaseous hazardous substances. These criteria apply whether the release is inside or outside a building. Releases are reported to the Shift Superintendent and the EOC.

The Site publishes a monthly *Environmental Management and Compliance Report* (KH, various) that summarizes information reflecting the types of substances spilled, spill locations on Site, the number of spills per month, and causes of the spills. In addition to descriptions of spill incidents that were reportable to offsite agencies, information is presented in charts reflecting the types of substances spilled, spill locations on plant site, months of occurrences, and causes of the spills. The breakdown of information enables quick recognition of problems, whether it is a particular building with a high incidence of spills or a substance being spilled frequently.

Monitoring Records

Records of the storm water monitoring data are maintained by K-H Analytical Services. Analytical results are received in paper and electronic format from the analytical laboratories. The paper copies (quality records) are maintained on-Site for a period of time (several years) and then transferred to the Federal Record Center where the records are maintained in perpetuity. Supporting electronic data deliverables received by analytical laboratories are uploaded to the Site's Soil and Water Database (SWD), an ORACLE based system, for electronic archive and retrieval. Field flow measurements (electronic records recorded at 15-minute intervals) are evaluated and corrected as needed to account for instrument datum corrections and other problems. The conditioned 15-minute records are transferred electronically and uploaded to the Site's FLOW database. FLOW is an ORACLE based Environmental Field Results System that stores continuous field results for water monitoring systems. Periodically, new SWD and FLOW data are extracted and uploaded to the Site's Environmental Data Dynamic Information Exchange (EDDIE)/Integrated Sitewide Environmental Data System, which is accessible (via the Internet) by authorized Site Stakeholders who require access to Site environmental monitoring data.

Source Control Review Inspection Records

All SCR observations and deficiencies are identified to the Facility Managers. Follow-up inspections are made to confirm that past findings are resolved. All observations, deficiencies, concerns, and updates are archived in a central location. Hard copies of all field notes, maps, and summary letters to Facility Managers are kept on file. Records are

maintained for a minimum of three years in accordance with *Records Management Guidance for Records Sources* (RFETS, 1999c).

Tank Inspections

The NDT is responsible for performing tank inventories, inspections and testing under the comprehensive TMP. NDT maintains a database of inspections and testing, as well as maps showing the locations of all tanks inspected. In addition, all assessment related information is accessible through the Engineering Maintenance master tank database. Tanks not conforming to RFETS Tank Standards are recorded and reported in a multi-tiered reporting process that ranges from Level 1, the most critical situation, to Level 3. Any leak or anomaly detected during the inventory, visual inspection, or tank testing that may present an immediate danger to workers, public, or environment, is considered a Level 1 reporting situation and appropriate supervision is notified immediately. Corrective actions, including notification of the Shift Superintendent, are promptly initiated. Less critical nonconformance situations are reported at lower levels of urgency and are dealt with accordingly (RFETS, 1997).

Other Inspection Records

Safety and Industrial Hygiene building inspections cover storm water related topics such as chemical storage and general housekeeping. Inspections are required by, and conducted in accordance with approved work controls. Inspection records and follow-up are retained per *Records Management Guidance for Records Sources* (RFETS, 1999c).

The Site Fire Department also conducts routine inspections of all plant site buildings. Monthly inspections are conducted on nuclear facilities or other high risk buildings. Records of inspections, surveys, and follow-up are retained by the Fire Department.

Maintenance Records

The IWCP outlines detailed procedures for the maintenance process. Following approval of a maintenance Work Package by the initiating Facility Manager, information is forwarded to the Preventive Maintentance Coordinator for entry into the Maintenance Management System Database. This allows for a continual assessment of the maintenance status of equipment and systems throughout the Site.

## 5.9 Non-Storm Water Discharges

Appendix F presents the *Management of Non-Storm Water Discharges* study required by Part I.C.15.c.3)g) of the NPDES Permit. This study is required by the NPDES Permit to be attached to the SWPPP. Appendix F lists the 91 known non-storm water discharge locations and descriptions for each. Groundwater is the principal water source for discharges, while surface water runoff is a minor contributor to utility, electrical and steam pit accumulations. As additional non-storm water discharge locations are identified, they will be added to the list and sampled. Provided below is a summary of

the *Management of Non-Storm Waster Discharges* study. Additional details concerning non-storm water discharges are included in Appendix F.

### *5.9.1 Incidental Waters*

Under Part I.C.13 of the NPDES Permit, incidental waters are also called non-storm waters. Incidental waters include accumulations of precipitation, surface water, ground water, utility water, process water, or wastewater collecting in one or more of the following areas:

- Utility pits/vaults (Electric, Alarm, Steam, Cooling tower, Security, Telephone)
- Foundation drains
- Fire suppression lines
- Potable water lines
- Excavation sites, pits or trenches.

The Site is currently undergoing closure, resulting in a continuing flux of storm water locations. Periodic Site walk-downs assist in maintaining a current list of storm water and non-storm water locations. The work planning process, Integrated Work Control Program (IWCP) requires a review of new programs, projects, and activities, to include environmental considerations, such as non-storm water discharges. In addition, temporary discharge locations that might be associated with decontamination and decommissioning activities are identified via the IWCP process, as well as the NEPA Environmental Checklist review process.

The *Final Industrial Area Interim Measures/Interim Remedial Action Decision Document for the Rocky Flats Plant* (IA IM/IRA) (DOE, 1994) provides a decision flowchart for managing non-storm water discharges. The IA IM/IRA provides the basis for the Site procedure for managing non-storm water discharges, *Control and Disposition of Incidental Waters* (RFETS, 1998) which is used for dispositioning collected water.

Discharge of incidental waters is determined after evaluating water quality using a combination of screening parameters, laboratory analyses, and reviews of historical data. The evaluation includes interviews with operations personnel, reviews of associated processes and material safety data sheets (MSDS), and a review of the historical database for the location in question. Based on the results of these screening tools, a decision is made on whether to perform sampling and analysis, and which parameters to target.

If the concentration for any parameter exceeds the applicable levels, the collected water is not acceptable for discharge to the storm water drainage system. Instead, the water must be managed and treated on-Site or shipped off-Site for treatment or disposal. Incidental water that passes the evaluation described above may be discharged to the storm sewer system. If water exceeds these standards, it must be treated prior to discharge.

### *5.9.2 Contaminated Non-Storm Waters*

The NPDES Permit defines "contaminated non-storm water discharges" as those incidental waters that do not meet the stream standards for Big Dry Creek Segment 5. (Stream Standards are adopted by the Colorado Water Quality Control Commission and are published at 5 CCR 1002-38.)

Contaminated non-storm water (CNSW) that is routed to the Waste Water Treatment Plant, Building 995, via the sanitary sewer system, is monitored at the minimum rate of one sample for each 25,000 gallons. Monitoring is performed for constituents known or suspected to be present in concentrations greater than the applicable water quality standards for Segment 5 of Big Dry Creek Basin. The determination for monitoring is based on field screening, historical data, source identification and process knowledge.

Discharge to Building 995 is limited to a maximum of 10,000 gallons per day. In addition, if certain organic constituents are present (as listed in the NPDES Permit), there are further restrictions on the total mass allowed per day to be discharged.

Building 891, the Consolidated Water Treatment Facility, is capable of treating water that is contaminated with radionuclides and volatile organic compounds. The facility has an operating procedure that establishes Waste Acceptance Criteria which is intended to ensure that pollutants are not accepted that could not be adequately handled/treated or could damage the treatment system.

Building 374, the Liquid Waste Treatment Facility, is capable of treating water contaminated with radionuclides, but cannot handle volatile organic compounds. The primary purpose of the Liquid Waste Treatment Facility was to treat process water for Site buildings during the Site's nuclear production mission. Now that the Site is undergoing closure, the role of Building 374 is diminished, and it is scheduled for decommissioning.

Contaminated non-storm water that otherwise might have been routed to B374 will have to be managed elsewhere after closure of that facility. Options include an expanded role for Building 891 or a temporary treatment facility. The primary need for temporary replacement of Building 374 is more for treatment of process water than contaminated non-storm water.

For each month there is a discharge of CNSW to the Sewage Treatment Plant, the following information are required to be submitted to the Agency, along with the *Discharge Monitoring Report* (DMR) due for that month:

- Total volume of CNSW discharged per day
- Source of discharges
- Average and maximum values of all analytical monitoring data available as of the DMR date
- Explanatory comments (if applicable), including identification of delayed data to be included in the subsequent month's DMR.

## 5.10 Sediment and Erosion Control

The quality of storm water runoff is directly related to the character of the watershed and, proper watershed management is essential for storm water pollution prevention. However, to best maintain and protect watershed resources and water quality, sediment and erosion control must be integrated with the management of storm water runoff, which is discussed in Section 5.11 *Management of Runoff*.

This section identifies areas that due to topography, activities, or other factors, have a high potential for significant soil erosion, and identifies structural, vegetative, and/or stabilization measures that may be used to limit erosion. Technical support for this analysis is provided in Appendix G, *RFETS Soil Erosion Areas*.

Identification of Soil Erosion Areas (SEAs)

Land areas subject to loss of surface soils to storm-water runoff (i.e., soil erosion areas or SEAs) vary widely according to anthropomorphic and environmental factors. Higher SEAs are characterized by one or more features or characteristics including: landscape grade, perviousness, soil type, soil disturbance, vegetative cover, structural controls, and stabilization measures. Rainfall frequency and intensity affect soil erosion. Construction activities, which are of limited duration but have a high potential for erosion, merit special attention due to the presence of disturbed soils.

Site topography, aerial photographs, drainage maps, and key technical references were reviewed and provide the basis for identifying SEAs. The location and contributions of SEAs will change over time and the objectives of this erosion evaluation are to (1) provide a current snapshot of SEAs for the IA and BZ, and (2) identify perennial areas and features expected to produce high erosion areas.

Geography and land-use considerations divide the Site landscape into two areas or zones: (1) the IA, a central improved area comprised of buildings, paved roads and parking lots, and sparsely vegetated areas, supporting the vast majority of Site activities; and, (2) the BZ area, which is largely unimproved land surrounding the IA with largely unimproved roads, minimal Site activity and substantial vegetation over the majority of the land area. Key objectives in selecting storm water and erosion controls were minimizing (1) mobilization of contaminants and their potential water-quality impacts (water-quality protection) and (2) impacts to sensitive habitats and protected species (ecological values).

The two Site areas (IA and BZ) require different levels of management and erosion control. Erosion control in natural or unimproved areas of the BZ is generally limited to seasonal or occasional re-grading of unimproved roads, except when remedial actions or other construction projects produce significant soil disturbance. When occasional projects create soil disturbance (e.g., during remediation activities), the size and proximity of the project area to waterways are major determining factors in the type and extent of storm water and erosion controls selected. EPA and Urban Drainage and Flood

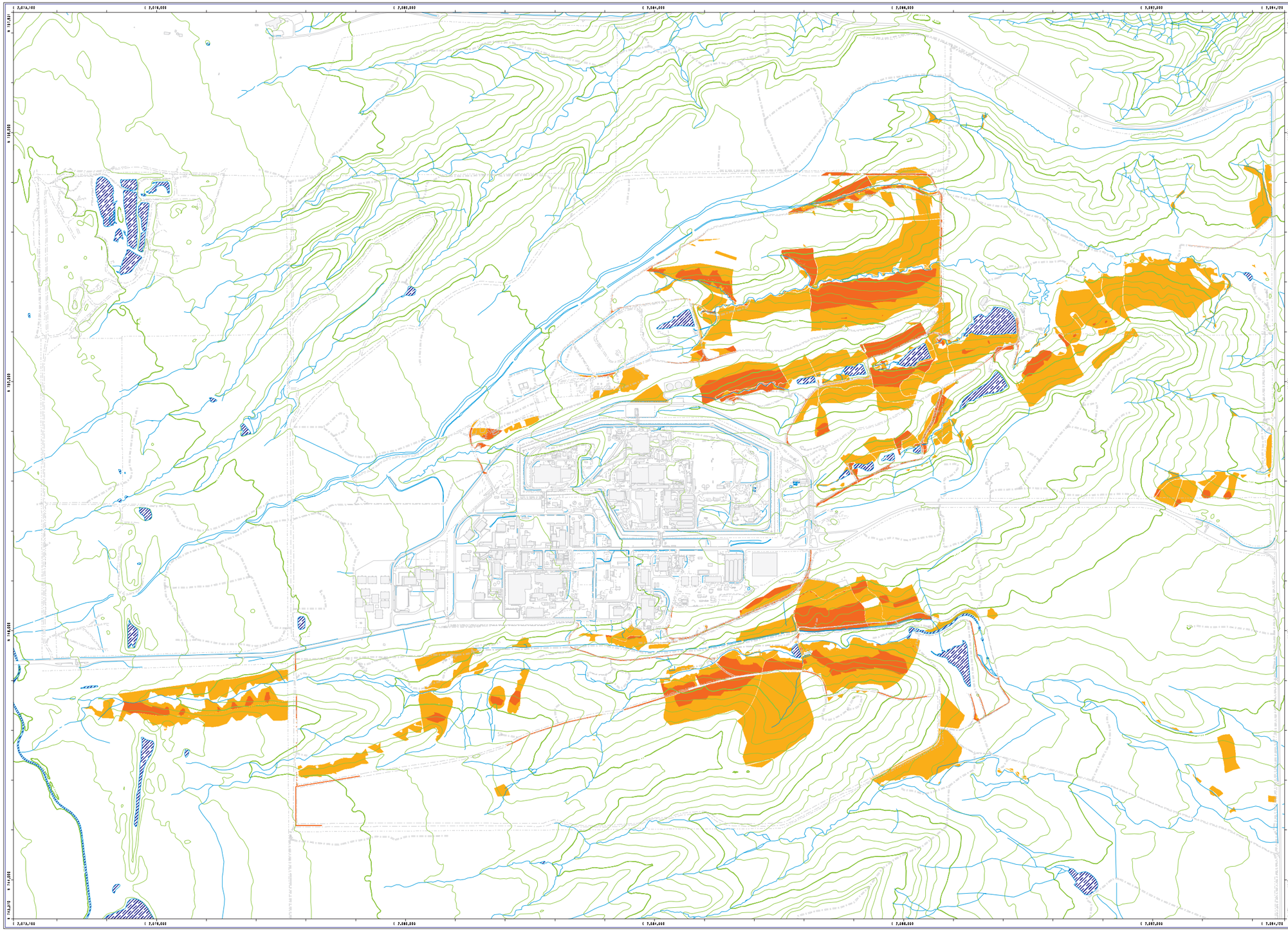
Control District[2]-standard storm-water management and erosion control practices are employed in the design and implementation of construction projects. These practices are implemented where applicable and appropriate.

IA storm water management and erosion controls minimize the mobilization of soils potentially containing higher levels of legacy contamination (especially radionuclides) that are typical of this central, industrialized area. Therefore, the IA receives the majority of attention when construction and closure-related activities are planned. Typically, the focus of IA erosion control measures is on activities involving excavation and soil disturbance (especially on hillslopes) such as below-grade utility maintenance and repair, D&D, and general construction in support of Site closure.

Soil erosion areas at the Site typically fall into two general types: (1) characteristic, often persistent or long-term associated with topography (hill slope), vegetative cover, or land use, and (2) temporary or project-related in which construction activities produce significant soil disturbance.

The Site's Actinide Migration Evaluation group (AME) used specialized techniques in erosion, sediment transport and surface-water concentration modeling to investigate soil erosion, sediment transport, and associated Pu-239/240 and Am-241 transport in the BZ. The AME also developed and tested erosion and surface soil contaminant mobility mapping techniques. More recently, the extensive, detailed soil-erosion predictions of AME were simplified to only two (moderate and high) levels of soil-erosion rate, and these were re-plotted to produce a semi-quantitative map of SEAs in the BZ (Figure 5-1).

[2] *Urban Storm Drainage Criteria Manual*, Volume 3, Best Management Practices.



# Figure 5-1
# Erosion Control Areas in RFETS Buffer Zone

**EXPLANATION**

**Actinide Migration Evaluation (August 2000) Predicted Average Annual Erosion**

- Moderate Erosion Areas (Predicted average annual soil erosion between 0.05 Kg/m2 and 0.10 Kg/m2)
- High Erosion Areas (Predicted average annual soil erosion greater than 0.10 Kg/m2)

Note: Unimproved Buffer Zone roads are everywhere high erosion areas.

**Standard Map Features**

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Topographic Contour (20-Foot)
- Paved roads
- Dirt roads

**NOTE:**
Adapted from "Report on Soil Erosion and Surface Water Sediment Transport Modeling for the Actinide Migration Evaluation at the Rocky Flats Environmental Technology Site", 00-RF-01823, August 2000.

***DATA SOURCE BASE FEATURES:***
*Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by: EG&G RSL, Las Vegas.*
*Digitized from the orthophotographs. 1/95*
*Topology (contours) were derived from digital elevation model (DEM) data by Morrison Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by: the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~ 10 meter resolution. DEM post-processing performed by: MK, Winter 1997.*

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Scale = 1 : 18790
1 inch represents approximately 1566 feet

250 0 500 1000ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by: DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER•HILL COMPANY

MAP ID: 01-0353

April 06, 2001

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Note that erosion-prone areas surround much of the immediate drainage upgradient and tributary to the terminal ponds and on north-facing slopes east of Pond B-5. A more detailed examination also shows that unimproved BZ roads are high SEAs. This map and the conclusions from the AME work suggest that the following characteristic BZ areas generally afford opportunities for soil movement or loss to erosion during storm events:

- hillslopes, especially adjacent to stream and creek channels,
- stream and creek channels and adjacent side slopes, and
- unpaved roads, especially along hillslopes.

No AME study results are available for erosion in the IA. Thus, the Site adopted a conceptual framework that simply assigns high soil erosion potential to hillslopes and unvegetated or poorly vegetated areas. The Site identified, graduated, and plotted geographically two surface characteristics that strongly influence availability (and often erodibility) of soils, namely, *perviousness* of the surface and *grade or slope* of the landscape.[3] The Site evaluated the relative importance of perviousness and hillslope influences and produced a qualitative map of their respective significance by geographic location. (Figure 5-2). This soil erosion area map qualitatively shows a large portion of the IA as pervious areas that drain stormwater in a generally easterly direction. The Northern and southern parts of the IA as well as selected eastern areas in upper reaches of South Walnut Creek show hillslopes with grades of 8 percent or greater that would be expected to show medium to high soil erodibility.

Construction activities and similar soil disturbing activities provide the greatest temporary opportunity for soil loss to erosion. To protect against soil loss during storm events, activities involving construction, soil disturbance, or excavation are planned, designed, and implemented using storm water management BMPs. Silt fencing, straw bales, detention berms, and re-vegetative measures are used to minimize erosion during and following project activities. In cases where soil disturbance is planned "soil disturbance permits" are required to identify soil contaminants as well as to control the work practices. Special care is exercised when elevated radiological levels or other contaminants are found or expected. Local construction and excavation water is collected and managed under incidental water procedures to assure quality standards before being treated or discharged.

Typically, a combination of stormwater management and erosion controls are employed to minimize soil erosion and potential transport of contaminants. Planning, design, and employment of soil-erosion controls during routine planned construction and occasional maintenance activities are discussed below.

---

[3] *Pervious* areas lack soil coverage in the form of concrete, asphalt, buildings, or other structures. Clearly, pervious and poorly vegetated are not synonymous, but IA vegetation is often of variable quality for erosion control.

Applicable Erosion Controls

Erosion controls are planned and implemented at the Site with the dual purpose of minimizing (1) mobilization and transportation of soils into waterways and (2) migration of radiological and potentially regulated contaminants downstream to waterways as a preventive measure for controlling downstream water quality. Opportunities to apply erosion controls are provided at planning, permitting, design, construction, and post-construction or reclamation phases of Site projects that are expected to produce extensive soil disturbance although smaller projects receive scrutiny when local soil contamination is expected. Erosion controls are provided and inspected according to established EPA guidance (EPA, 1992a) during the engineering and design phase of the project.

Erosion controls are employed in a graded approach. Those areas – which as a result of grade, soil type, proximity to waterways, or recognized presence of radiological or hazardous substances, offer the greatest potential soil loss and downgradient water quality impacts, are afforded special consideration.

Erosion controls may be subdivided by their expected longevity (1) long-term, recurring, or routine controls, and (2) short-term controls to accommodate closure (D&D, WM, and ER) projects. Erosion controls are maintained as needed to preclude high-turbidity runoff or applied to reduce mobility of radiological contaminants in vulnerable areas. Erosion control practices in the form of structural, vegetative, and stabilization measures for both short-term projects and long-term or persistent erosion prone areas are presented in Table 5-2.

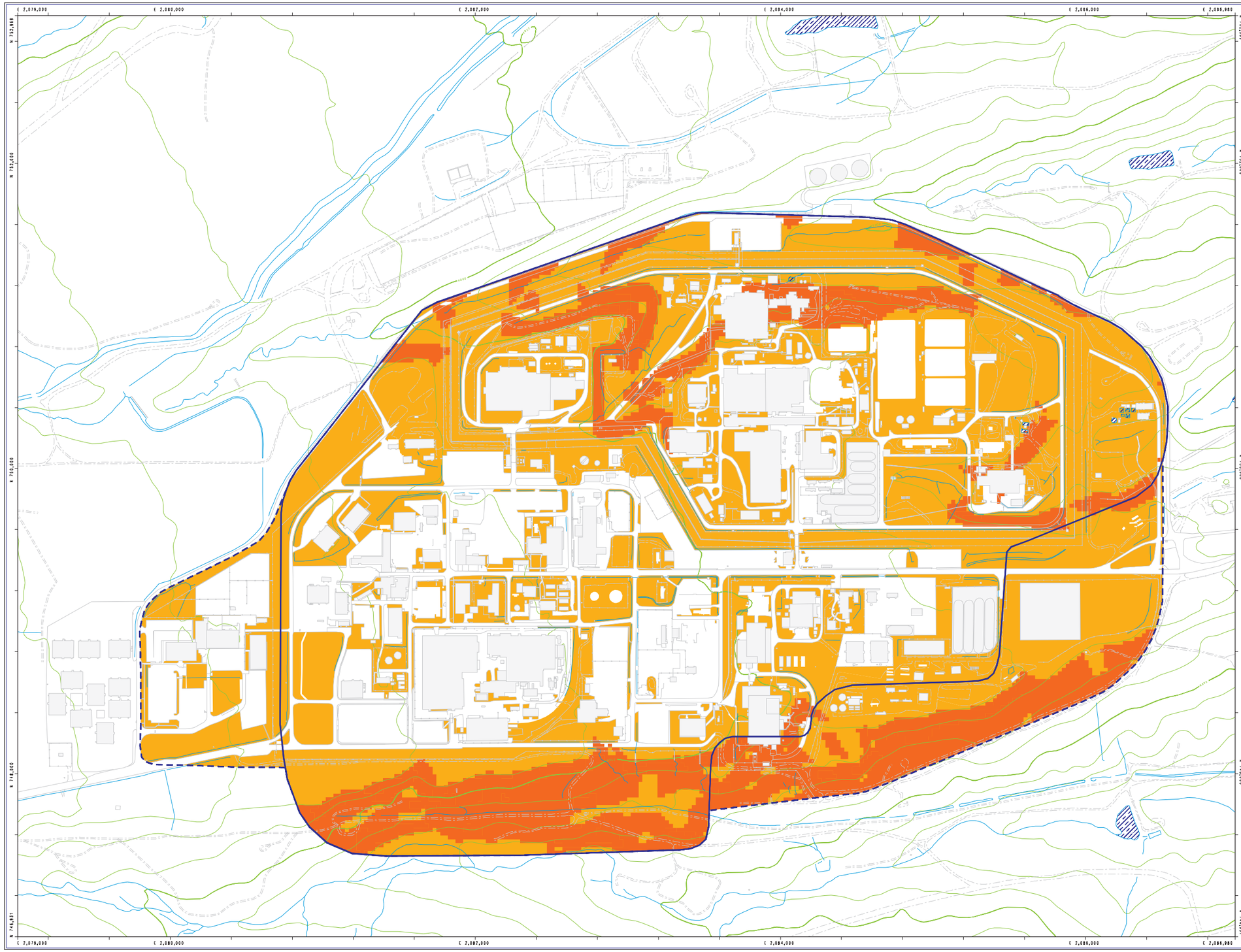
Erosion control for persistent or long-term SEAs includes road grading and shoulder maintenance to remove channelization and rills and occasional application of soil amendments or stabilizers/binders (e.g., TopSeal®). Evaluating activities and recommending erosion controls for short-term closure projects (where soil disturbance and opportunity for erosion is anticipated) begins in the activity planning and permitting stages and continues through the design, construction and remediation phases via design reviews and construction site walk-downs which are described below.

The following structural, vegetative, and stabilization measures, in use at the Site are described below and in Table 5-2.

Structural Measures

Erosion-prone areas can be stabilized with vegetative cover, riprap, asphalt or concrete linings, as appropriate where significant localized erosion potential is expected. Hillslopes on which landscape grade and inadequate vegetation may increase erosion potential are stabilized initially with silt fence, straw bales and temporary ground cover (e.g., straw or mulch) or soil amendments that sponsor re-vegetation, and eventually with vegetation.

In the BZ, high-usage unimproved roads and shoulders are routinely re-graded to reduce




# Figure 5-2

# Erosion Control Areas in RFETS Industrial Area

## EXPLANATION

- Pervious areas in RFETS Industrial Area (Pervious areas are land surfaces not covered by buildings, pavement or concrete.)
- Grade or slope equals or exceeds 8%
- Industrial Area Boundary
- Expanded Industrial Area

### Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Topographic Contour (20-Foot)
- Paved roads
- Dirt roads

*DATA SOURCE BASE FEATURES:*
*Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.*
*Digitized from the orthophotographs, 1/95*
*Topology (contours) were derived from digital elevation model (DEM) data by Morrison Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~ 10 meter resolution. DEM post processing performed by MK, Winter 1997.*

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MAP ID: 01-0354

April 06, 2001

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rills and re-establish side drainage. The Site installs and/or maintains storm water control measures (berms, swales, ditches, etc.) and, when possible, closes non-essential roads. Geotextile fabric or the use of riprap, cribbing, gabions, and galvanized wire mesh are methods of installing permanent structural measures to erosion-prone areas. Construction projects and other temporary erosion-inducing activities employ silt fences and staked straw-bale barriers on hillslopes, and stabilized construction area entrances with crushed stone over geotextile fabric (optional) over culverts or french drains, as required.

In the IA, re-grading of paved road shoulders to reduce rills and re-establish side drainage along with cleaning ditches and culverts is routinely performed to enhance existing permanent structural erosion control measures. When necessary, such measures may need to be replaced and reconfigured to minimize erosion from areas undergoing D&D. Temporary structural measures include the use of temporary earthen berms to detain local runoff, stream bed stabilization including riprap splash beds below culvert outfalls, gabions, and cribbing. Hay bales and silt fences are used extensively in project areas subject to sheet and rill erosion (not to include streams or swales).

Vegetative Measures

Generally vegetative measures are the preferred method of erosion control where growing conditions and anticipated flow rates are appropriate. The Site recently had success with chemical stabilizers and soil binders that are combined with seed mix to provide re-vegetation of disturbed areas. The seed mixes are selected to include only native species and are inspected to ensure that undesirable species (e.g., blue grama, Russian Thistle) are not introduced. Seeding and planting has been done by hand also with the goal of establishing permanent cover with vegetation on steep slopes, stream banks, and closed roads. On temporary construction projects, the goal of minimizing the amount of disturbed soil that needs to be vegetated is also accomplished by minimizing the project "footprint" by minimizing that laydown and staging, and equipment parking areas.

Stabilization Measures

The Site applies chemical stabilizers on high-use unimproved roads in the BZ and a variety of vegetative measures (as above). Temporary stabilization measures include mulching with strewn straw or other ground cover (i.e., grass, hay, woodchips, wood fibers, or gravel) to improve re-vegetation and reduce the speed of storm water runoff over the area of disturbed soil. The Site IA stabilization measures for areas where persistent attention is required receive periodic and repeated applications of chemical stabilizers, as appropriate (e.g., commercial products such as TopSeal®, Soil Guard®, ProGuard® or ConCover®). Storm channel inlet protection may be provided to include the structural measures introduced earlier (riprap, cribbing, gabions). Projects and other short-term erosion problems may receive mulching to improve re-vegetation of seeded areas and reduce the erosive effects of sheet flow.

**Table 5-2 RFETS Erosion Control Practices**

| Location | Long-Term Soil Erosion Areas (Persistent) | | Short-Term Soil Erosion Areas (Projects) | |
|---|---|---|---|---|
| **Buffer Zone** | *Structural* | • Re-grading of unimproved roads and shoulders to reduce rills and re-establish side drainage<br>• Installing and/or maintaining storm water control measures (berms, swales, ditches, etc.)<br>• Closure of non-essential roads<br>• Geotextile fabric or the use of riprap, cribbing, gabions, and galvanized wire mesh | *Structural* | • Silt fences and staked straw bale barriers on hillslopes<br>• Stabilized construction entrance with crushed stone over geotextile fabric (optional)<br>• Culverts or French Drains as required to direct stormwater flows |
| | *Vegetative* | • Application of chemical stabilizers and soil binders, etc,. combined with seed mix<br>• Seeding and planting - establishing permanent cover with vegetation on steep slopes, stream banks, closed roads, etc. | *Vegetative* | • Application of chemical stabilizers and soil binders, etc,. combined with seed mix<br>• Re-vegetation of disturbed areas: native grasses, wheat<br>• Preservation of existing vegetation by minimizing the project "footprint" |
| | *Stabilization* | • Application of chemical stabilizers on high-use unimproved roads<br>• Vegetative measures (as above) | *Stabilization* | • Mulching with strewn straw or other ground cover to improve re-vegetation |
| **Industrial Area** | *Structural* | • Re-grading of paved road shoulders to reduce rills and re-establish side drainage<br>• Cleaning ditches and culverts and improving stormwater control<br>• Reconfiguring Site drainage systems to minimize erosion from areas undergoing D&D | *Structural* | • Temporary earthen berms to detain local runoff<br>• Stream bed stabilization including riprap splash beds below culvert outfalls, gabions, cribbing, etc.<br>• Hay bales and silt fences in areas subject to sheet and rill erosion (not to include streams or swales) |
| | *Vegetative* | • Re-vegetation of disturbed areas: native grasses | *Vegetative* | • Re-vegetation of disturbed areas: native grasses |
| | *Stabilization* | • Application of soil stabilizers: TopSeal®<br>• Storm channel inlet protection | *Stabilization* | • Mulching with strewn straw or other ground cover to improve re-vegetation of seeded areas |

## 5.11 Management of Runoff

Runoff pollution occurs every time rain or snowmelt flows across the ground and picks up contaminants. Management of runoff reduces or eliminates the negative impacts of storm water runoff. This includes controlling flooding, reducing erosion, and improving water quality.

The Site employs detention ponds, soil fixative and vegetative practices, routing of storm water runoff to minimize contact with potential contaminants, and automated storm water monitoring to ensure compliance with water quality standards. These are discussed below.

### *5.11.1 Detention Ponds*

The Site Ponds serve three main surface water management purposes: (1) storm water detention and settling of sediments suspended in runoff; (2) detaining water for sampling and treatment prior to discharge as necessary; and (3) emergency spill control for a spill that cannot be managed without the use of the ponds. The ponds detain storm water runoff, allowing pollutants to settle out, then discharge the water in a controlled fashion. The Site maintains the ponds at low volumes for increased capacity for managing storm water, and capturing contaminants that are transported via runoff. The ponds remove a significant amount of particulates and reduce flooding, but are not effective at removing soluble pollutants.

Should any unplanned release bypass upstream control measures, the detention pond network provides an effective storm water management BMP. Pollutant removal is achieved through natural physical, biological, and chemical processes. Sediment, organic matter and metals are removed by sedimentation and dissolved metals and nutrients are removed through biological uptake (Maryland, 1986).

Research indicates that a wet detention pond, or one that maintains a continuous pool of water, can remove up to 90 percent of total suspended solids and phosphorous. Soluble nutrients are removed by up to 80 percent and Biochemical Oxygen Demand (BOD) is reduced by 20 to 40 percent by natural wet detention (Schuler, 1992 and Hartigan, 1988). Certain radionuclide (Pu-239/240 and Am-241) concentration levels in suspended particulates are reduced between 87% and 95%, respectively (RFETS, 2000c).

In addition to the role played in pollutant removal, the Site detention ponds serve as emergency spill containment structures. If normal storm water BMPs and protection measures fail, gates and valves can be configured to divert water to ponds A-1, A-2, B-1, or B-2, depending on the location and nature of the upset or spill, for temporary storage of spill-contaminated waters. Ongoing water discharges can be paused or suspended due to unplanned/non-routine events according to Appendix E of the *Pond Operations Plan* (RMRS, 1996b). Spill-contaminated water can be transferred to alternative Site ponds, but no on-line treatment facilities are currently available in the drainages. The Site has a

facility (B891 CWTF) that could be used to remove a variety of contaminants, but the water would have to be transported via tanker to the facility. Surface water at the RFETS is detained and sampled in the terminal ponds prior to being discharged offsite.

### *5.11.2 Soil Fixative and Vegetative Practices*

Runoff controls are essential to prevent runoff from Site roads, parking lots, and industrial areas from reaching surface waters. Appropriate water pollution controls include effective combinations of both soil stabilization and sediment controls. Heavy metals, oils, and other hazardous substances, as well as debris from construction traffic and spillage can be absorbed by soil and carried with runoff water to surface waters. Vegetative practices (filter strips, grassed swales) reduce storm water velocity, and allows water to percolate into soils, where particulates can settle out.

To minimize sediments and radionuclides transport from the Site in runoff, control measures have been used to stabilize sediment materials. The Site uses SoilGuard®, which is a hydraulically-applied soil stabilizer. This material is a combination of wood fibers mixed with a guar gum tackifier and fertilizers, which is applied by a certified contractor using a special hydroseeding vehicle. The product can be used strictly as a soil stabilizer (without seed), sprayed on top of a seed layer, or sprayed with seed mixed into the product itself. The seed mix used at RFETS contains drought-tolerant native grasses. SoilGuard® dries within several hours to form a bonded fiber matrix that can withstand heavy rainfall while protecting the top layer of soil. New vegetative growth can protrude through the matrix without disrupting the surrounding sealed area. The Site has used this product successfully in preventing erosion while supporting revegetation.

Additionally, the Site has used TopSeal®, which is an acrylic copolymer emulsion product that is mixed with water and applied with a water truck to areas where revegetation is not practical, such as dirt roads or storage lots. It dries within several hours to seal and bind the soil together. Past experience with this product has been most encouraging for areas with low vehicular traffic.

In the recent past, Site areas targeted for control were areas identified as probable sources of material and where a transport mechanism existed for sediments and radionuclides in Site runoff. These efforts included:

- The BZ road leading down the hill from the 903 Pad to Pond C-1 was closed and revegetated using imported topsoil, native grass seed mix, and a soil fixative protective cover (approximately 1,900 $yd^2$).
- Silt fences were installed in the major drainage swales leading from the 903 Pad Lip Area into the SID (approximately 300 linear feet of fence in selected locations).
- Removed trees (approximately 185) from the SID to improve capacity for handling runoff from the south side of the IA, including the 903 Pad Lip Area.

- The road that runs north and south between the 903 and 904 Pads was sealed with soil fixative sealant (approximately 2,500 $yd^2$).
- Revegetated small areas in ditches along road between the 903 and 904 Pads to minimize sediment transport.
- Removed sediments (7 drums) deposited along south side of Building 884.
- Applied native seed mix and soil fixative cover to dirt exposed by PCB removal activities (approximately 200 $yd^2$).
- Applied native seed mix and soil fixative cover to exposed dirt area on west side of Building 707 (approximately 3,200 $yd^2$).
- Road sealant was applied to the dirt road running downhill from Solar Pond 207C (East of Building 774) (approximately 2,500 $yd^2$).
- Applied native seed mix and soil fixative cover to exposed dirt area on northeast side of Building 779 (approximately 800 $yd^2$).
- Applied soil fixative on the northeast side of Building 779 (approximately 1,100 $yd^2$).
- Applied soil fixative on the west of Building 707 (approximately 3,700 $yd^2$).
- Applied soil fixative to Site drainage ditches (1,700 $yd^2$).
- Applied soil fixative to roadways east and south of the 903 Pad (7,600 $yd^2$).
- Applied soil fixative to approximately 3.5 miles of BZ unpaved roads to provide dust and erosion control.

### *5.11.3 Routing of Storm Water Runoff*

The Site compiled an inventory of storm water control structures with focus on storm drains and culverts. Information regarding condition of these facilities for future maintenance was also obtained. Detailed information was presented in Section 2.5.1, *Control Structures*.

The Site has undertaken to clean out water conveyance systems and to enlarge ditches with limited water carrying capacity. Approximately 2,400 linear feet of storm water drainage systems have been refurbished, which included removal of sediment from the drainage channels, and unblocking culverts. In addition, the drainage channels were lined with riprap and gravel for additional erosion protection. Drainage system improvements will be made as necessary during the Site Closure period. Currently, storm water runoff BMPs are specified during project planning stages, and especially in the NEPA Environmental Checklist review of proposed Site projects. The conveyance of storm water runoff to the Site detention ponds is a primary focus during the project review. When necessary, new culverts or storm water conveyances, or protection mechanisms (e.g., silt fences) are specified. As Site Closure proceeds with building and infrastructure removal, current storm water control structures may be modified or removed.

Good housekeeping, preventive maintenance and visual inspections of structures are best management practices recommended by EPA to eliminate or minimize storm water contamination. The Site performs periodic field inspections to ensure the delineated BMPs are actually implemented and are maintained. These inspections are performed as part of the Pollutant Source Control activity.

### *5.11.4 Automated Storm Water Monitoring*

Storm water monitoring is conducted at the Site for a variety of objectives, including: (1) Characterize waters and identify changes/trends in water quality over time; (2) Identify specific existing or emerging water quality problems; (3) Gather information to design pollution prevention or remediation programs; (4) Determine whether best management practices are effective or ensure compliance with water quality standards; (5) respond to emergencies, such as spills and floods; and, (6) to ensure regulatory compliance.

Storm water monitoring specified in the NPDES Permit was incorporated into the Site's automated surface-water monitoring program. This program meets the requirements documented in the *Integrated Monitoring Plan* (RFETS, 2000g), which groups all surface-water monitoring objectives into five primary categories: Site-Wide, Industrial Area, Industrial Area Discharges to Ponds, Water Leaving the Site, and Off-Site. IMP automated surface-water monitoring objectives are organized in a roughly upstream-to-downstream direction, beginning with Performance monitoring within the IA and ending downstream at the Points of Compliance at Indiana Street. Storm water is included under the New Source Detection and Point of Evaluation (POE) monitoring objectives.

Both the IMP and the IM/IRA document require the Site to identify and address accidental or undetected releases of contaminants from the IA to the Site detention ponds. Section 4.4, *Storm Water Sampling Data* of the SWPPP discusses in detail the Site's water quality monitoring program to ensure that specified BMPs are effective and that water quality regulatory compliance is maintained.

After Site Closure, surface water monitoring activities will be required during the long-term stewardship period to manage sediment and contaminant transport. Erosion of former roads and disturbed areas from severe storm events can be expected and will require water monitoring. The Site may undergo periodic re-contouring and re-vegetating. After Site Closure, one potential long-term strategy being evaluated, is to convert the detention ponds to wetlands for sediment stabilization and wildlife habitat, and to breach the dams to allow for a natural flow-through of water.

## 6. PROPOSED BEST MANAGEMENT PRACTICES

A storm water BMP is a technique, measure, or structural control that is used for a given set of conditions to manage the quantity and improve the quality of storm water runoff in the most cost-effective manner. BMPs can be either engineered and constructed systems ("structural BMPs") that improve the quality and/or control the quantity of runoff (such as detention ponds and constructed wetlands), or institutional, education or pollution prevention practices designed to limit the generation of storm water runoff or reduce the amounts of pollutants contained in the runoff ("non-structural BMPs"). No single BMP can address all storm water problems. Each type has certain limitations based on drainage area served, available land space, cost, pollutant removal efficiency, as well as a variety of site-specific factors such as soil types, slopes, and depth of groundwater table. Careful consideration of these factors is necessary in order to select the appropriate BMP or group of BMPs for a particular location.

The Site erosion control strategy has four main objectives; (1) Preserve existing vegetation to the maximum extent possible; (2) Minimize areas disturbed by Site projects; (3) Restabilize disturbed areas; and (4) Control or minimize erosion potential of cuts, fills, and drainage patterns. The following BMPs will be employed to minimize storm water pollution and adequately manage storm water flows at the Site.

### 6.1 Spill Prevention and Response BMPs

1) Curbing will be used as a spill containment measure, especially to the north of Building 331 (the garage). Spills in this area, where vehicles are fueled and a large of number of drums are stored, currently have a direct path to the drainage. Stored drums (next to the fuel pumps) currently have secondary containment. In addition, a protective post or guardrail will be installed to prevent accidental contact with vehicles in the area.

2) Drip pans will be used under equipment utilized in the field that has a potential for surface water quality impacts, such as portable generators, pipe threaders, etc.

3) Covers (lids or tarps) will be in-use or installed on waste containers (such as construction roll-off containers). Currently all Site dumpsters have been upgraded to models with hinged lids.

### 6.2 Drainage Improvement BMPs

1) The Site will continue to maintain the Site water conveyance flow control and energy dissipation structures, in a manner consistent with Site Closure. Flow control involves managing both the volume and intensity of storm water discharges to receiving waters. Routine maintenance of Site ditches including removal of accumulated sediment and debris will help reduce pollutant loading in these ditches, reducing the length and slope of ditch runs and reducing the velocity of runoff with

other energy dissipation structures, can help prevent excessive channelization and localized erosion.

2) Snow plowing and disposal at the Site will avoid depositing or accumulating plowed snow into the Site storm water drainage ditches. Snow combined with sand and debris can block a storm drainage system and cause localized flooding. As snow melts, road salt, sand, litter, and other pollutants transport directly via surface water or percolate through the soil and pose negative water quality impacts.

3) Site topography has been altered by buildings and infrastructure such as roads, parking lots, storm water drainage control and ponds. As Site structures are removed, the present topography may promote erosion and storm water runoff that could impact earlier remedial actions and natural drainage system. To address these changes, the Site will develop and implement an engineered final land surface configuration (*Land Configuration Design Basis* Project) to aid compliance with surface water protection standards consistent with the future Site land use. Until the *Land Configuration Design Basis* Project is completed, altered Site topography will be re-graded and contoured to promote water drainage via the existing storm water control system or to the Site's natural drainages.

### 6.3 Pollutant Reduction BMPs

1) Parking lots will be assessed to determine where the installation of curbing as a secondary containment measure for spills and runoff would be most effective. Curbing installation will be prioritized based on factors including the proximity of the lot to water drainages and the number of vehicles using the lot.

2) A routine Site sweeping program (street and parking lot) will be employed to significantly reduce the pollutant load to storm water runoff. Site streets and parking lots can accumulate large amounts of pollutants (e.g., road salt and sand) that wash off during storm events. Streets and parking areas comprise a significant portion of the total impervious area at the Site. A large percentage, if not the entire area, of streets and parking lots are directly connected to the storm drain system.

### 6.4 Disturbed Area BMPs

1) The Site will continue, where possible, to minimize areas disturbed by Site projects and will employ soil fixatives to minimize dust and erosion.

2) The Site will continue to regrade high-usage unimproved roads and shoulders in the BZ to reduce rills and re-establish side drainage. The Site will install essential and maintain existing storm water control measures (berms, swales, ditches, etc.) and, when possible, close non-essential roads.

3) Site construction projects and other temporary soil disturbing activities shall employ run-on and run-off controls including silt fences and staked straw-bale barriers on

hillslopes, and stabilized construction area entrances with crushed stone over geotextile fabric (optional) over culverts or french drains, as required.

4) The Site will continue re-grading paved road shoulders to reduce rills and re-establish side drainage. Cleaning ditches and culverts in the IA to maintain functionality of storm water management structures and minimize opportunity for flooding that might cause property damage, pollutant transport, or excessive erosion. When necessary, such structures may need to be replaced and reconfigured to minimize erosion from areas undergoing D&D or land reconfiguration during Site Closure.

## 6.5 Salt Pile BMPs

Part I.C.15.c.7) of the NPDES Permits requires that storage piles of salt used for deicing or other commercial or industrial purposes and which generate a storm water discharge associated with industrial activity, which is discharged to the waters of the United States, shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile.

1) The Site has several sand/salt piles which are used for melting ice and snow on the Site roads. Currently, the sand/salt piles at the Site are uncovered; however, the Site is investigating several options for covering these piles. Some of these options include construction of a permanent structure, procurement of a ready-made structure, or custom tarps to cover the piles. Part I.C.15.c.7) of the NPDES Permit requires compliance with this provision as expeditiously as practicable, but in no event later than two years after the effective date of the Permit (by October 27, 2002).

2) Part C.15.a.1)b) of the NPDES Permit requires an implementation plan for those portions of the SWPPP that may require construction. A Site engineering evaluation is underway and final option selection is scheduled by July 2001. An implementation plan will be developed before October 27, 2001. All of the options currently being evaluated could be constructed in less than six months.

## 6.6 Best Management Practices Summary

The Site's storm water management begins with ensuring the proper storage and management of wastes, product materials, and other potential pollutants – controlling the potential sources. The second element of the Site storm water management is runoff control, and incorporates Site planning principles that prevent or minimize the generation of runoff, prevents development in floodplains, preserves natural drainage systems, and avoids disturbing sensitive areas such as wetlands and riparian areas. Where runoff generation cannot be avoided, then the above BMPs along with the Site erosion control practices identified in Table 5-2 of Section 5.10, *Sediment and Erosion Control* can be implemented to reduce the impacts associated with Site storm water runoff.

## 7. RFETS IMPACTS TO THE BIG DRY CREEK BASIN WATER QUALITY

Part I.C.15.c.4)b) of the NPDES Permit requires that Site storm water monitoring be evaluated to determine if the Site storm water discharges are causing or contributing to water quality problems in Segment 5 of the of the Big Dry Creek Basin.

Storm water leaving the Site does not significantly contribute to downstream water quality problems. Water quality in the Big Dry Creek Basin is evaluated annually and results are compiled by the Big Dry Creek Watershed Association. The preliminary report for the calendar year 2000 was released in March 2001; parameters of concern include iron, selenium, cyanide and fecal coliforms. None of these parameters are known to occur in Site storm water at concentrations that would contribute to the levels observed in the main stem of the creek.

Iron levels in 2000 were lower than those observed in 1999, and are highly correlated with total suspended solids levels. Dissolved selenium was observed in the upper portions of Big Dry Creek, near Standley Lake and the confluence with Walnut Creek (which extends westward into the watershed to Rocky Flats). Selenium is known to occur naturally in the soils of Colorado. All of the cyanide results reported above the stream standard were from a single sampling event, leading to the suspicion that a laboratory error had occurred. Cyanide has not been measured elsewhere in the watershed, including at RFETS.

Fecal coliforms normally range up to 1,000 colonies/100 ml in the main stem of Big Dry Creek, below the current stream standard for the Recreation 2 Use Classification. While the State of Colorado recently retained this use classification, based on the *Big Dry Creek Recreational Use Attainability Analysis* (COB, 2000) commissioned by the municipalities in the watershed, the EPA has drafted a rejection of the state's action and restated its opinion that the applicable use classification is Recreation 1, which carries with it a fecal coliform standard of 200 colonies/100 ml. The main stem of Big Dry Creek does not meet EPA's preferred standard. However, water leaving Rocky Flats currently meets the Recreation 1 standards for fecal coliform since Walnut and Woman Creeks were both classified Recreation 1 when use classifications were first assigned in 1989.

In addition to the comparison of Site runoff to water quality in Big Dry Creek, the Site recently submitted an evaluation of nutrients in Walnut Creek to meet an NPDES permit requirement. Results for ammonia and nitrate analyses show that the Site contribution to nutrient levels in Walnut Creek and Big Dry Creek are low. The 85th percentile for nitrate, for example, was 3.3 mg/L in calendar year 2000 for water leaving RFETS. In comparison, the 85th percentile of nitrate levels in lower Big Dry Creek was over 12 mg/L. Un-ionized ammonia levels in RFETS waters were well below 0.1 mg/L, the water quality standard protective of aquatic life. RFETS will report annually to EPA the results of nutrient monitoring in Walnut Creek, and will compare the results to similar data collected by the Big Dry Creek Watershed Association.

# 8) COMPREHENSIVE SITE COMPLIANCE EVALUATION

## 8.1 Inspection Method

A *Comprehensive Site Compliance Evaluation* will be conducted annually as part of the SWPPP as described in the November 19, 1993 Federal Register (FR, 1993). SWPPT members will perform the inspections as part of the Source Control Review program.

The comprehensive site inspections confirm the accuracy of the potential pollutant sources described in the SWPPP, determine the effectiveness of the SWPPP, and assess compliance with the terms and conditions of the NPDES storm water permit. Specifically, the annual inspections will include:

- Visual inspection of areas contributing to a storm water discharge associated with industrial activity for evidence of, or the potential for pollutants entering the drainage system.
- Evaluation of implemented measures to reduce pollutant loadings to determine if they are adequate and properly implemented in accordance with the terms of the Permit or whether additional control measures are needed.
- Observation of structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the SWPPP to ensure they are operating correctly.
- Visual inspection of equipment needed to implement the SWPPP, such as spill response equipment. Visual inspections and equipment checks will be performed by the responsible Site organization (primarily the Fire Department and Radiological Protection organizations). This activity is discussed below in detail.

Annual inspections will involve building exteriors, cargo containers, external storage areas, and exterior secondary spill containment structures. Field notes from the inspections will be retained in logbooks and all findings, concerns, and updates archived in a central file. Findings will also be entered into the Environmental Compliance Action Tracking System (ECATS) for tracking of corrective actions to be implemented by the appropriate Facility and Project Managers.

Adequate equipment and supplies are available, properly stored and maintained in operational status for emergency response personnel to carry out their duties. Additional equipment and capabilities are available to support emergency response at the Site through the implementation of agreements with off-Site organizations and vendors. The type, quantity and location of emergency equipment and supplies at the Site are identified in Fire Department Standard Operating Procedures, Radiological Protection procedures, and Health and Safety Plans. Requirements for equipment checks (e.g., inspections, calibrations, etc.) are also contained in those documents. Typically, these inspections are specified on a monthly or quarterly frequency.

Maintaining the SWPPP will be an ongoing process. Per guidelines outlined by the EPA (FR, 1993), the description in the SWPPP of potential pollutant sources and measures and controls will be revised as appropriate within 4 weeks after each inspection. Necessary changes to any measures and controls will be implemented, and never more than 12 weeks after completion of the inspection. The permitting authority may allow additional time for changes that require construction.

## 8.2 Inspection Report

Results of the comprehensive site inspection will be documented in an annual *Comprehensive Site Compliance Evaluation* report. The report will describe the scope of the inspection, the personnel conducting the inspection, the dates of the inspection, major observations relating to implementation of the SWPPP, any incidents of non-compliance (i.e., deficiencies) and actions taken to rectify noted problems. The inspections will be completed by September 30th of each calendar year, and the resulting *Comprehensive Site Compliance Evaluation* report approved by October 27th. Inspection reports will be retained as part of the SWPPP in Appendix I, *Annual Comprehensive Site Compliance Evaluation Reports* for at least one year after coverage under the NPDES storm water permit expires. Where a report does not identify any incidents of non-compliance, the report will contain a certification that the Site is in compliance with the SWPPP.

## 9) EPCRA SECTION 313 REQUIREMENTS

Facilities subject to EPCRA Section 313 water priority chemical reporting requirements must provide, in the SWPPP, a description of special practices that conform to specific storm water pollution prevention measures. These guidelines, specified in the EPA guidance manual *Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices* (EPA 1992b), refer to measures and controls applicable to operations at the Site.

### 9.1 Measures and Controls

Existing measures and controls employed at the Site to prevent storm water pollution, outlined in Section 5.0 are the same practices required for facilities subject to EPCRA Section 313 water priority chemical reporting requirements. The minimum requirement is that appropriate containment or drainage control structures must be provided wherever Section 313 chemicals are stored, processed or otherwise handled.

The Site *Chemical Management Manual* (RFETS, 1999a) provides the methodology and requirements for the Chemical Lifecycle Program. This program provides stewardship and regulatory compliance direction for the safe management of chemicals used at the Site. The *Chemical Management Manual* delineates a comprehensive process for procurement, inventory tracking, storage and disposal of chemicals, regulatory compliance and reporting, emergency and spill response, and waste management to attain the goal of reducing hazards and costs while maintaining regulatory compliance,

The treatment and storage of hazardous chemicals at Rocky Flats is controlled by several Site guidance documents (SWPPP Section 5.2.6). The identified Site water priority chemicals are stored inside hardened facilities and structures. These hardened structures include roofs, curbing, culverting, gutters, sewers or other forms of drainage control to prevent or minimize the potential for storm water runoff to contact significant sources of pollution. All new tanks are subject to stringent Site Standards that specify requirements for secondary containment and leak detection (SWPPP Section 5.5.3). The Chemical Lifecycle Program ensures storage tanks or containers are compatible with the material stored and conditions of storage such as pressure and temperature.

In addition to the RFETS requirements for chemical storage and loading areas (SWPPP Section 5.4.1), the process waste systems also have secondary containment (SWPPP Section 5.4.1). The *Chemical Management Manual* delineates Site requirements for chemical handling precautions, receipt and storage of chemical containers, chemical transfer operations, and chemical storage. Only approved facilities at the Site may store chemicals.

In the event of a spill, storm water flow within the RFETS can be rerouted and contained (SWPPP Section 5.4.2). Response plans and procedures are reviewed and rehearsed and a fully equipped HazMat Response Team exists on Site (SWPPP Section 5.4.2).

Other measures employed to prevent the release of Section 313 water priority chemicals include a preventive maintenance program tracked through a central database (SWPPP Section 5.3.1). Housekeeping throughout the Site is reviewed routinely through several different inspection programs (SWPPP Section 5.1) and potential sources of storm water pollutants outside of buildings are evaluated during the annual Source Control Review inspections (SWPPP Section 5.6.1).

Security at the Site includes a 24-hour armed security force, a fenced perimeter around the Site, and strict entry requirements that allow admittance only to authorized personnel (SWPPP Section 5.7). Employees receive training commensurate with job responsibilities regarding the relationship between work practices and environmental concerns (SWPPP Section 5.7). Training programs address prevention of environmental incidents, including the discharge of potential storm water pollutants, and the appropriate response to such incidents.

The SWPPP for facilities subject to EPCRA Section 313 requirements must be reviewed and certified by a registered Professional Engineer. Such certification is contained in Section 1.2 of this Plan. The Plan must be re-certified every three years or as soon as practicable after significant modifications are made to the facility (EPA 1992b).

# 10) STORM WATER POLLUTION PREVENTION FOR CONSTRUCTION ACTIVITIES

This section supplements the preceding sections of the SWPPP applicable to industrial activities at the RFETS with information regarding storm water pollution prevention during construction activities. The EPA guidance manual *Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA, 1992a) is the basis for storm water pollution prevention measures related to construction activities at the Site.

## 10.1 Purpose of a SWPPP for Construction Activities

The purpose of a SWPPP for construction activities, separate from the SWPPP for industrial activities, is to develop a concise plan for minimizing storm water pollution caused by a specific construction activity. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those from agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction activity can contribute more sediment to streams than can be deposited over several decades, causing physical and biological impacts to waters.

Concerns regarding storm water pollution related to construction activities at the RFETS are:

- Disturbed soil is prone to erosion and can result in increased suspended sediments in storm water runoff.
- Construction activities frequently involve materials that, if exposed to the elements, can impair the quality of storm water running off the construction site.
- Soil contaminated from past industrial activities at the RFETS could, if excavated, contaminate storm water runoff.
- Excavations involving contaminated soils that fill with water present an incidental water problem.

Although measures and controls designed to address these concerns function in different ways, the basic principle is the same: Prevent or control the pollution of storm water before it reaches the receiving stream.

## 10.2 Development of a SWPPP for Construction Activities

In 1990, EPA promulgated rules establishing Phase I of the NPDES storm water program. Phase I addresses, among other discharges, discharges from large construction activities disturbing 5 acres or more of land. Phase II of the NPDES storm water program covers small construction activities disturbing between 1 and 5 acres. Phase II became final on December 8, 1999 with small construction permit applications due by March 10, 2003 (specific compliance dates will be set by the NPDES permitting authority in each State).

The SWPPP is the key component of the NPDES storm water permit and is key to controlling pollutants in storm water discharges. The process of developing and implementing a SWPPP for construction activities has been divided into six elements, which are:

1. Site Evaluation and Design Development
2. Assessment
3. Control Selection/Plan Design
4. Certification/Notification
5. Construction/Implementation
6. Final Stabilization/Termination

Each of the six elements is discussed below (Section 10.3) in summary to describe the components of an effective SWPPP for construction activities. The process for developing and implementing a SWPPP is described in detail in the EPA guidance *Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA, 1992a).

### *10.2.1 Projects Larger Than Five Acres*

The process for developing a SWPPP for RFETS construction activities varies with the size of the construction project. Projects involving the disturbance of five or more acres of soil require the submittal of a *Notice of Intent* (NOI) to the EPA prior to commencing construction activities. The EPA will issue a NPDES storm water permit for construction activities following receipt of the NOI. Requirements will be outlined in the NPDES storm water permit for developing a SWPPP specifically for the proposed construction. A SWPPP with appropriate BMPs to minimize the discharge of pollutants from the site is required. Submission of a *Notice of Termination* is required when final stabilization of the site has been achieved, or storm water runoff is no longer being discharged, or when another operator has assumed control of the site.

### *10.2.2 Projects Between One and Five Acres*

Phase II of the EPA storm water program became final on December 8, 1999 with small construction permit applications due by March 10, 2003 (specific compliance dates will be set by the NPDES permitting authority in each State). Construction projects resulting in a land disturbance of equal to or greater than 1 and less than five acres in size require the development of a RFETS Construction Activity SWPPP. “Disturbance” refers to exposed soil resulting from activities such as clearing, grading, and excavating. Construction activities can include road building, construction of office buildings, industrial sites, or demolition.

Beginning in March 2003, Site projects involving the disturbance of equal to or greater than 1 and less than five acres of soil require the submittal of a NOI to the EPA prior to

commencing construction activities. The EPA will issue a NPDES storm water permit for construction activities following receipt of the NOI. Requirements will be outlined in the NPDES storm water permit for developing a SWPPP specifically for the proposed construction. A SWPPP with appropriate BMPs to minimize the discharge of pollutants from the site is required. Submission of a *Notice of Termination* is required when final stabilization of the site has been achieved, or storm water runoff is no longer being discharged, or when another operator has assumed control of the site.

### *10.2.3 Projects Less Than One Acre*

Phase II of the EPA storm water program became final on December 8, 1999 with small construction permit applications due by March 10, 2003 (specific compliance dates will be set by the NPDES permitting authority in each State). Construction projects resulting in a land disturbance less than one acre in size are also regulated as a small construction activity if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than 1 acre and less than 5 acres, or if they are designated by the NPDES permitting authority. The NPDES permitting authority or EPA Region may designate construction activities disturbing less than 1 acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

Beginning in March 2003, Site projects involving the disturbance of less than one acre of soil, that have been designated by the NPDES permitting authority, will need to submit a NOI to the EPA prior to commencing construction activities. The EPA will issue a NPDES storm water permit for construction activities following receipt of the NOI. Requirements will be outlined in the NPDES storm water permit for developing a SWPPP specifically for the proposed construction. A SWPPP with appropriate BMPs to minimize the discharge of pollutants from the site is required. Submission of a *Notice of Termination* is required when final stabilization of the site has been achieved, or storm water runoff is no longer being discharged, or when another operator has assumed control of the site.

### *10.2.4 Phase II Construction Activity Waiver*

Under the Phase II rule (which is effective March 2003), NPDES permitting authorities can provide a waiver from the requirements to operators of small construction activities (less than 5 acres) who certify:

1. Low predicted rainfall potential (i.e., activity occurs during a negligible rainfall period), where the rainfall erosivity factor ("R" in the Revised Universal Soil Loss Equation) is less than 5 during the period of construction activity; **or**

2. A determination that storm water controls are not necessary based on either:

   (A) A "total maximum daily load" that addresses the pollutant(s) of concern for construction activities; **or**

(B) An equivalent analysis that determines allocations are not needed to protect water quality based on consideration of instream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

Pollutants of concern, as identified above, include sediment or a parameter that addresses sediment (such as total suspended solids, turbidity, or siltation) and any other pollutant that has been identified as a cause of impairment to water quality.

The intent of the waiver provision is to waive only those sites that are highly unlikely to have a negative effect on water quality. Therefore, before applying for a waiver, operators of small construction activity are encouraged to consider the potential water quality impacts that may result from their project and to carefully examine such factors as proximity to water resources and sensitivity of receiving waters.

## 10.3 RFETS Construction Activity SWPPP

Summarized below are the contents of a typical RFETS Construction Activity SWPPP and define roles of Site organizations involved in producing the plan. The RFETS Construction Activity SWPPP will be submitted to the Storm Water Pollution Prevention Team for review prior to construction activities being initiated. Information required for a RFETS Construction Activity SWPPP, with Site organizations responsible for such information, is provided in Appendix H, *RFETS Construction Activity SWPPP*.

### *10.3.1 Site Evaluation and Design Development*

The first element in preparing a SWPPP for a construction activity is to define the characteristics of the site and of the type of construction that will be occurring. This subsection consists of three primary tasks: collect site information, develop a site plan, and prepare a site map.

### *10.3.2 Assessment*

After the characteristics of the site and the construction have been defined, the next element in developing a SWPPP is to measure the size of the land disturbance and estimate the impact the project will have on storm water runoff from the site. The three primary tasks for assessment are: measure the site area, measure the drainage areas, and calculate a runoff coefficient.

### *10.3.3 Control Selection/Plan Design*

This element of a SWPPP is to design a plan to prevent and control pollution of storm water runoff from the construction site. This subsection should address: erosion and sediment controls and other controls. Erosion and sediment controls can include temporary or permanent measures. Other controls should address other potential pollutant sources that may exist on a construction site. They include: proper waste disposal, control of offsite vehicle tracking, compliance with applicable State or local waste

disposal, sanitary sewer or septic system regulations, and control of allowable non-storm water discharges. The final controls that should be addressed in a SWPPP are storm water management controls, which are constructed to prevent or control pollution after the construction is completed. These controls include retention ponds, detention ponds, infiltration measures, vegetated swales, and natural depressions. Considering all of the above controls, the selection of the most appropriate storm water management measures is dependent upon a number of factors, but is most dependent on site conditions. The information collected in the site evaluation, design and assessment phases is used to select controls.

Additional tasks include: locating the pollution prevention controls on a site map, preparing an Inspection and Maintenance Plan, preparing a description of controls, preparing a sequence of major activities that lists all of the tasks required, coordinating controls with construction management, and the incorporation of State or local sediment and erosion or storm water management requirements.

### *10.3.4 Certification and Notification*

This element of a SWPPP is to provide certification of the RFETS Construction Activity SWPPP. This subsection should address: certification of the SWPPP, submittal of a *Notice of Intent*, and delineation of the Construction Activity SWPPP location and public access.

To ensure that the Construction Activity SWPPP is completely developed and adequately implemented, authorized representative(s) of the project as specified in Part IV.G of the renewed Site NPDES Permit, shall sign the Construction Activity SWPPP and certify that the information is true, accurate, and complete. The permittee should be aware that Section 309 of the Clean Water Act provides for significant penalties where information is false or the permittee violates, either knowingly or negligently, the NPDES Permit requirements.

Submission of a *Notice of Intent* constitutes notice that the Site intends to be authorized by a NPDES Permit issued for storm water discharges associated with construction activity. Submission of a *Notice of Intent* also constitutes notice that the Site meets the eligibility requirements of Part I.B of the general permit (including those related to protection of endangered species determined through the procedures in Addendum A of the general permit), understands that continued authorization to discharge is contingent on maintaining permit eligibility, and that implementation of the SWPPP will begin at the time the permittee commences work on the construction activity.

Permittees must make the SWPPP available, upon request, to EPA, State, Tribal or local agencies approving sediment and erosion plans, grading plans, or storm water management plans. The SWPPP may also have to be sent to local government officials. A notice about the permit and the SWPPP must be conspicuously posted near the main entrance of the construction activity site. The permit notice must include the following information: (1) the project NPDES Permit number; (2) the name and phone number of a

local contact; (3) a brief project description; and (4) the location of the SWPPP if not kept on the construction activity site. The permit does not require the general public have access to the site nor does it require that copies of the SWPPP be available or mailed to members of the public. However, the EPA strongly encourages permittees to provide public access to SWPPPs at reasonable hours.

### *10.3.5 Construction/Implementation*

Construction can begin upon approval of the SWPPP and the *Notice of Intent*. This element should address: implementing controls, inspecting and maintaining controls, updating the SWPPP as necessary, and reporting releases of Reportable Quantities.

Specified controls in the SWPPP should be implemented in accordance with State or local standard specifications. If there are no State or local specifications for control measures then the controls should be constructed/implemented in accordance with good engineering practices. Inspection and maintenance of the controls should be performed at the frequency specified in the SWPPP and/or the permit. The inspector should note any damage or deficiencies as soon as practicable after the inspection.

In addition to the inspection and maintenance reports, the operator should keep records of the construction activity on the site. These records include:

- The dates when major grading activities occur in a particular area,
- The dates when construction activities cease in an area, temporarily or permanently,
- The dates when an area is stabilized.

In order for a construction activity to be in full compliance with its NPDES storm water permit, and for the SWPPP to be effective, the SWPPP should be consistent with the permit conditions, and the SWPPP should accurately reflect site features and operations. Should either of these conditions not be met by the SWPPP, then it shall be changed. Any changes required by the permitting authority shall be made within 7 days of the notification. The permittee will submit a certification to the permitting authority that the requested changes have been made.

SWPPPs are developed based on site-specific features and functions. Where there are changes in design, construction, operation or maintenance, and that change will have a

significant effect on the potential for discharging pollutants in storm water at a site, the SWPPP should be modified to reflect the changes and new conditions. Another situation in which the SWPPP should be modified is where the SWPPP proves to be ineffective in controlling pollutants.

Because construction activities may handle certain hazardous substances over the course of the project, spills of these substances in amounts that equal or exceed Reportable Quantity (RQ) levels are a possibility. EPA has issued regulations that define what reportable quantity levels are for oil and hazardous substances. These regulations are found at 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302. For oil, if you detect an oily sheen in the storm water runoff, then you have exceeded the reportable quantity level. For hazardous substances, the RQ levels depend on the chemical. The Construction Activity SWPPP shall identify requirements for reporting spills to meet Part III.B of the permit.

### *10.3.6 Final Stabilization/Termination*

Typically, the storm water discharge associated with a construction activity is eliminated when the site is finally stabilized. When storm water discharge associated with a construction activity ceases, the NPDES permit may allow the owner/operator of the facility to cease coverage by submitting a *Notice of Termination.*

As soon as practicable after construction activities have been completed in a disturbed area, permanent stabilization should be started to prevent further erosion of soil from that area. A site can be considered finally stabilized when all soil disturbing activities at the site have been completed and a uniform perennial vegetative cover with a density of 70 percent for the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been employed.

The *Notice of Termination* is typically the final task to comply with the requirements of an NPDES storm water permit for a construction activity. The *Notice of Termination* communicates to the permit enforcement agency that the construction activity has ceased and the area is stabilized. The NPDES permit will list the requirements for *Notice of Termination*.

## 11) CERTIFICATION AND SIGNATURES

### Rocky Flats Environmental Technology Site
### Storm Water Pollution Prevention Plan
### Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. I further certify that all potential significant sources of non-storm water have been evaluated and none of these sources have been determined to adversely affect Site water quality. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

04/23/01

John L. Motes II
General Manager,
Rocky Flats Closure Site Services, L.L.C.

Date

DW Fenn for NRT

04/24/01

Nancy R. Tuor
Vice-President and Project Manager,
Remediation, Industrial D&D, and Site Services
Kaiser-Hill Company, L.L.C.

Date

01/04/26

Joseph A. Legare
For Assistant Manager for Environment and Infrastructure,
U.S. Department of Energy

Date

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## 12.2 Acronyms

| | |
|---|---|
| AIP | Agreement In Principle |
| ALARA | As Low As Reasonably Achievable |
| AME | Actinide Migration Evaluation |
| AOI | Analyte of Interest |
| BMP | Best Management Practice |
| BOD | Biochemical Oxygen Demand |
| BZ | Buffer Zone |
| CAA | Clean Air Act |
| CCR | Colorado Code of Regulations |
| CDPHE | Colorado Department of Public Health and Environment |
| CERCLA | Comprehensive Environmental Response Compensation and Liability Act |
| CFR | Code of Federal Regulations |
| CNSW | Contaminated Non-Storm Water |
| CWA | Clean Water Act |
| CWQCC | Colorado Water Quality Control Commission |
| D&D | Decontamination & Decommissioning |
| DIS | Drain Identification Study |
| DMR | Discharge Monitoring Report |
| DOE | Department of Energy |
| DOE,RFFO | Department of Energy, Rocky Flats Field Office |
| DOT | Department of Transportation |
| ECATS | Environmental Compliance Action Tracking System |
| EOC | Emergency Operations Center |
| EPA | United States Environmental Protection Agency |
| EPCRA | Emergency Planning and Community Right-to-Know Act |

| | |
|---|---|
| ER | Environmental Restoration |
| ERPG | Emergency Response Planning Guidelines |
| FBI | Federal Bureau of Investigation |
| FEMA | Federal Emergency Management Administration |
| FFCA | Federal Facility Compliance Agreement |
| FM | Facility Manager |
| GET | General Employee Training |
| GIS | Geographic Information System |
| H&S | Health & Safety |
| HazMat | Hazardous Materials |
| HRR | Historical Release Report |
| HSP | Health & Safety Practices |
| IA | Industrial Area |
| IAG | Inter-Agency Agreement |
| IHSS | Individual Hazardous Substance Site |
| IM/IRA | Interim Measures/Interim Remedial Action |
| IMP | Integrated Monitoring Plan |
| IWCP | Integrated Work Control Program |
| K-H | Kaiser-Hill |
| LCO | Limiting Condition of Operation |
| MOU | Memorandum of Understanding |
| MSDS | Material Safety Data Sheet |
| NA | Not Applicable |
| NDT | Non-Destructive Testing |
| NEPA | National Environmental Policy Act |
| NFPA | National Fire Protection Association |
| NOI | Notice of Intent |

| | |
|---|---|
| NPDES | National Pollutant Discharge Elimination System |
| NSD | New Source Detection |
| ONC | Occurrence Notification Center |
| OSHA | Occupational Safety and Health Administration or Act |
| OU | Operable Unit |
| PA | Protected Area |
| PAC | Potential Areas of Concern |
| PATS | Plant Action Tracking System |
| PCB | Polychlorinated Biphenyl |
| PM | Preventive Maintenance |
| POE | Point of Evaluation |
| PPM | Part Per Million |
| RCRA | Resource Conservation and Recovery Act |
| RFCA | Rocky Flats Cleanup Agreement |
| RFCSS | Rocky Flats Closure Site Services |
| RFETS | Rocky Flats Environmental Technology Site |
| RM | Responsible Manager |
| RQ | Reportable Quantity |
| SARA | Superfund Amendments and Reauthorization Act |
| SCR | Source Control Review |
| SEA | Soil Erosion Areas |
| SID | South Interceptor Ditch |
| SOP | Standard Operating Procedure |
| SPCC | Spill Prevention, Control, and Countermeasures Plan |
| STP | Sewage Treatment Plant |
| SWD | Soil and Water Database |
| SWPPP | Storm Water Pollution Prevention Plan |

| | |
|---|---|
| TEDE | Total Effective Dose Equivalent |
| TMP | Tank Management Plan |
| TSS | Total Suspended Solids |
| UBC | Under Building Contamination |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compounds |
| WM | Waste Management |
| WWTP | Waste Water Treatment Plant |