Overview of the Rocky Flats Site Annual Report of Site Surveillance and Maintenance Activities

Calendar Year 2007

Rocky Flats Stewardship Council
May 5, 2008
Five-Year Review

Second Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Five-Year Review

– Covered May 2002 to April 2007
– Final Report dated September 2007
– Report is available on the Rocky Flats website (www.lm.doe.gov/land/sites/co/rocky_flats/rocky.htm)

– Based on this review the remedy remains protective of human health and the environment.
Site Status

– Notice of Partial Deletion for the Peripheral Operable Unit (OU) (POU) and OU 3 (May 25, 2007).
– Most POU land transferred to the U.S. Fish and Wildlife Service (July 12, 2007).
– Five-Year Review addressed the Central OU (COU).
Surface-Water Monitoring and Operations

CY 2007 (January – December)
CY 2007 Environmental Monitoring Locations

Surface Water Locations: 23
Groundwater Wells: 100
Treatment System Locations: 10

Monitoring Locations
- SW Location
- Well
- Treatment System Location

Standard Map Features
- Stream, ditch, or other drainage feature
- Lake or Pond
- Swamp or Marsh
- Central OU Boundary
- Topographic contour (10-foot interval)
CY 2007 Highlights: Surface-Water Monitoring and Operations

- Collected 201 samples including 130 composites comprised of 7,074 grabs
- Discharged terminal ponds A-4 and B-5 twice each during CY 2007
CY 2007 Highlights: Surface-Water Monitoring and Operations (continued)

- Water quality at all Points of Compliance (POCs) below applicable standards
- Water quality at all Points of Evaluation, except GS10, below applicable standards
  - Reportable values for total uranium (U) at GS10, likely caused by groundwater contributions of naturally occurring uranium to South Walnut Creek
CY 2007 Highlights: Surface-Water Monitoring and Operations (continued)

- Surface-water quality results supporting Original Landfill (OLF) indicate remedy functioning properly
- Surface-water quality results supporting Present Landfill (PLF) indicate remedy functioning properly
Pond Operations – CY 2007

- Terminal Pond Discharges
  - Pond B-5 to Walnut Cr.
    - 3/1-3/13 (7.5MG)
    - 7/5-7/12 (3.1MG)
  - Pond A-4 to Walnut Cr.
    - 3/1-3/13 (10.3MG)
    - 7/5-7/26 (10.4MG)
- Transfers
  - Pond A-3 to A-4
    - 1/10-1/24 (5.7MG)
    - 2/7-2/12 (5.0MG)
    - 3/13-3/28 (7.7MG)
    - 4/25-5/4 (7.5MG)

Current Pond Levels (4/17/08)
- Landfill (24.5%)
- A-3 (8.7%)
- A-4 (15.4%)
- B-5 (27.3%)
- C-2 (18.9%)
Hydrologic Data – CY 2007

• Precipitation
  – 11.55” total precipitation
  – 92% of CY93-06 average

• Flow Rates (percent of CY97-06 average)
  – GS01 (244%)
  – GS03 (42%)
  – GS10 (45%)
  – SW027 (54%)
  – SW093 (69%)
POC GS01

• Plutonium and Americium

• Total Uranium
POC GS03

• Plutonium and Americium

• Total Uranium and Nitrate + Nitrite as N
POC GS08

- Plutonium and Americium

- Total Uranium and Nitrate + Nitrite as N
POC GS11

• Plutonium and Americium

• Total Uranium and Nitrate + Nitrite as N
POC GS31

- Plutonium and Americium

  No Pond C-2 discharge during CY 2007.

- Total Uranium
Questions?
Groundwater Monitoring

Four Years Ago: B991 and 700 Area on April 27, 2004

4th Calendar Quarter/Annual 2007
John Boylan
RFLMA Groundwater Monitoring, 4CQ07

- Rocky Flats Legacy Management Agreement (RFLMA) 4th-quarter monitoring includes
  - Area of Concern (AOC), Sentinel, and Resource Conservation and Recovery Act (RCRA) wells
  - Groundwater treatment systems
- All locations sampled as scheduled
- Analytical results consistent with previous data
- Sentinel well 45605 (slump) abandoned following sampling
Non-RFLMA Groundwater Monitoring, 4CQ07

• Collected additional performance-check samples at treatment systems
  – Sampled Mound Site Plume Treatment System (MSPTS) and East Trenches Plume Treatment System (ETPTS) (influent, effluent) to determine whether change to upflow configuration affected treatment efficiency
    • No significant effect observed
    • Returned to downflow
  – Samples at downgradient Solar Ponds Plume Treatment System (SPPTS) locations (Discharge Gallery [DG], GS13) collected to support Colorado Water Quality Control Commission (WQCC) discussions
Groundwater Conditions in CY 2007

- Contaminant plumes consistent with conditions in 2006
- Groundwater flow as predicted prior to closure
- Potentiometric surface and flow conditions very similar to pre-closure
- Post-closure hydrologic regime is equilibrating
Groundwater Conditions in CY 2007

• Recordable condition at AOC well B206989
  – Nitrate, consistent with previous data
• Not previously reportable because well was classified as a Sentinel well until RFLMA was signed
Groundwater Conditions in CY 2007

- Groundwater Treatment Systems
  - Continued to treat intercepted groundwater and remove contaminants
    - MSPTS shows strong influence from Oil Burn Pit #2
    - ETPTS media crust is thick, may replace in 2008
  - No major maintenance performed in 2007
  - Performed several studies/evaluations
    - Upflow vs. downflow at MSPTS and ETPTS
    - SPPTS treatability studies, Interceptor Trench Pump House (ITPH) potholing, DG flow monitoring, and telemetry improvements
  - Evaluating path forward for SPPTS (long-term maintenance costs, DG water quality)
Groundwater Conditions in CY 2007

• Other groundwater-related studies
  – Updates to several groundwater models
    • Confirmed groundwater flow is consistent with pre-closure predictions
  – Concluded “no-purge” sampling evaluation
    • Determined this sampling method will not be used at Rocky Flats
Groundwater Conditions in CY 2007

• RCRA well evaluations require comparison of upgradient-downgradient water quality and trending
  • PLF fundamentals: Downgradient concentrations higher than upgradient AND on an increasing trend trigger consultation
    – 2007: Two downgradient wells higher in boron (B) and selenium (Se), all three higher in U
    – B consistently below RFLMA Table 1 surface water standard (750 micrograms per liter [ug/L])
    – Se consistently above RFLMA Table 1 surface water standard (4.6 ug/L)
    – U typically below RFLMA threshold (120 ug/L)
    – No trends can be calculated due to insufficient data
    – SUMMARY: Conditions in 2007 similar to 2006, with fewer metals exhibiting statistically higher downgradient concentrations and no volatile organic compounds detected downgradient
Groundwater Conditions in CY 2007

• RCRA well evaluations, continued
  • OLF fundamentals: Downgradient concentrations higher than upgradient OR on an increasing trend trigger consultation
    – 2007: All three downgradient wells higher in B, one higher in U
    – B consistently below RFLMA Table 1 surface water standard (750 ug/L)
    – U consistently below RFLMA threshold (120 ug/L)
    – Per CERCLA 5-year review and 2006 Annual Report, analyzed sample for isotopic U signature; results were 100% natural U
    – No trends can be calculated due to insufficient data
  • SUMMARY: Conditions similar to 2006, with fewer metals exhibiting statistically higher downgradient concentrations
Questions?

Well 45605 (“Slump Well”) Replacement, March 26, 2008
Update on WQCC Rulemaking

– Petition to adopt statewide basic U standard (MCL 30 ug/L ~ 20 pCi/L): Hearing 1/09
  • Natural U in ground water now higher proportion of surface water (LANL samples completed)
  • Eliminate site-specific standards (10 pCi/L Walnut Creek; 11 pCi/L Woman Creek)

– Expiring Temporary Modifications (TMs) Review (New rule): Hearing 12/07
  • No changes to current Rocky Flats TMs
Update on WQCC Rulemaking (cont.)

– Triennial Review S. Platte River Basin
  • Issues Scoping Hearing 10/07
    – Rocky Flats TMs expire 12/31/09
    – New statewide basic standard for arsenic (10 ug/L) below site-specific standard (50 ug/L)
    – Will CDPHE adopt new EPA method for copper or other metals?
    – Uranium petition already scheduled for rulemaking
  • Issues Formulation Hearing 11/08; Rulemaking Hearing 6/09
Questions?
CY 2007 Ecology Activities

By Jody Nelson
Project Assistance

Project support for ecological issues was provided for the:

- Roads III Project
- Functional Channel (FC)-1/B371 Excavation/Fill Project
- 991 Slump Repair
- Annual Dam Mowing and Riprap Spraying Project
- Solar Ponds Potholing Project
- COU fence construction
Ecological Monitoring

- OLF and PLF monthly vegetation surveys
- Monthly weed surveys in the mitigation wetlands
- Revegetation monitoring
- Weed monitoring/mapping
- Preble’s mouse mitigation monitoring
- Wetland mitigation monitoring
Weed Control
Revegetation Activities
Questions?
Site Operations and Maintenance
CY 2007
Site Operations

• PLF
  – Eleven inspections performed in CY 2007
  – Changed inspection frequency from monthly to quarterly in November 2007 according to revisions in PLF Monitoring and Maintenance (M&M) Plan
  – No significant concerns
Site Operations

• PLF - Settlement Monuments
  – Installed in August 2006
  – 15 monuments on landfill cover
  – Quarterly surveys completed in March, June, August, and December
    • Movement within calculated settlement data per M&M Plan
Site Operations

• OLF
  – Twelve inspections performed in CY 2007
  – Followed prescribed checklist in M&M Plan
Site Operations

• OLF - Settlement Monuments
  – Seven settlement monuments installed
  – Quarterly survey completed in June, August, and December 2007
  • Movement within calculated settlement data per M&M Plan
Site Operations

- OLF – Seeps, Slumps, Berm Areas

- Repairs to Berm 1
- Trace of western slump
- Seep flow direction
- Seeps 1/2/3
- Slump under erosion matting
- Slump at end of Berm 7
- Woman Creek
- West Perimeter Channel
- South Interceptor Ditch
- East Perimeter Channel
- Approx 1800 ft.
- North (approx)
Site Operations

• OLF - Seeps
  – Seeps #4, #7, and #8 showed areas of active groundwater seepage throughout most of the year.
  – Smaller seeps only present temporarily after precipitation events
Site Operations

• OLF - Slumps
  - Berm #1 Slump
    • Documented February 7, 2007
    • Berm was repaired on April 12 and May 7, 2007
    • Final repairs completed on August 2, 2007
Site Operations

• OLF - Geotechnical Investigation
  – Project designed to evaluate mechanisms for movement and/or settlement of landfill cover
  – Phase 1 (geophysical survey) was completed on December 6, 2007
  – Investigate locations of waste beneath cover with seismic and resistivity equipment

• Phase II Test Pits and Boreholes in 2008
  – Stability Analysis Report and recommendations
Site Operations

• OLF - Consolidation Monitors
  – Twenty consolidation monitors installed on September 19, 2007
  – Evaluate movement in Berm #1 slump area
  – Surveyed monthly
Site Operations

- **Slump South of Former Building 991**
  - Slump Regrade Project completed on November 20, 2007
  - Excess material hauled to 903 Pad for revegetation efforts
  - Installed 13 consolidation monitors to assess future movement
Site Operations

• Building 371 Regrade
  – Project designed to improve drainage into FC-1 and FC-2
  – Grading and revegetation activities completed on September 22, 2007
Site Operations

• COU Fence
  - Construction completed on March 22, 2007
  - RFLMA-required “No Trespassing” signs attached on March 23 – inspected quarterly
  - Fence flags hung in May 2007 to help make fence more visible to deer
Site Operations

• Road Upgrades
  - Upgrade projects completed April 3, June 1, September 28, and November 26, 2007
  - Constructed water management structures and applied drain rock and road base
Site Operations

• Access/Security
  – Patrolled internally approved routes as well as outer perimeter routes
  – No significant concerns
Site Operations

Questions?