Department of Energy
Office of Legacy Management

August 31, 2010

Mr. Carl Spreng
RFLMA Project Coordinator
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246-1530

SUBJECT: Status Report of Steps Taken Regarding Monitoring Results at Surface Water Point of Evaluation (POE) SW027

Dear Mr. Spreng:

This correspondence is to transmit the enclosed Status Report in accordance with Rocky Flats Legacy Management Agreement (RFLMA) Contact Record (CR) 2010-06, Monitoring Results at Surface Water Point of Evaluation (POE) SW027. The Status Report will be posted on the Rocky Flats website linked to the CR.

In addition to submittal of this Status Report, the CR also provides that if the flow-paced sample currently being collected at SW027 is not large enough for plutonium analyses by the end of September 2010 (which is near the end of the six-month holding time for these analytes), the RFLMA parties will consider whether to perform the analyses from the then-existing partial volume or to extend the sample collection period beyond the formal hold time. As of the date of this Status Report, the volume of that flow-paced sample is not yet sufficient for analysis, and I will keep you apprised of the sample status so that we may consult in a timely manner.

I may be reached at (720) 377-9682 or Rick DiSalvo at (720) 377-9674 Assistant Project Manager if you have any questions regarding the enclosed document.

Sincerely,

Scott R. Surovchak
LM Site Manager

RLD/abm

7 B 3/4 Road, Grand Junction, CO 81503 | 99 Research Park Road, Morgantown, WV 26505
1000 Independence Ave., S.W., Washington, DC 20585 | 11025 Dover St., Suite 1000, Westminster, CO 80021
10995 Hamilton-Cleves Highway, Harrison, OH 45030 | 955 Mound Road, Miamisburg, OH 45342
232 Energy Way, N. Las Vegas, NV 89030
REPLY TO: Westminster Office

Enclosure

cc:
Tom Pauling, DOE
Vera Moritz, EPA Region 8
Rick DiSalvo, Stoller
Linda Kaiser, Stoller
George Squibb, Stoller
rc-rocky.flats

Report of Steps Taken Regarding Monitoring Results at Surface Water Point of Evaluation (POE) SW027 August 31, 2010

Introduction

Surface water location SW027 is the *Rocky Flats Legacy Management Agreement* (RFLMA) POE at the eastern (downstream) end of the South Interceptor Ditch (SID), upstream of Pond C-2.

The plutonium-239/240 (Pu) concentration measured at SW027 in samples collected through April 27, 2010, indicated that the 12-month rolling average of data from this monitoring point for the full month of April 2010 would likely exceed the RFLMA surface water standard when the next flow-paced sample (begun April 27, 2010) was completed and analyzed. As of August 31 (the date of this report), the volume of that flow-paced sample is not yet sufficient for analysis.

RFLMA Contact Record (CR) 2010-06, *Monitoring Results at Surface Water Point of Evaluation (POE) SW027*, provides a discussion of the monitoring results and recaps the outcome of the RFLMA parties' consultation regarding steps to be taken to evaluate the SW027 drainage area. CR 2010-06 is available at the Rocky Flats website: http://www.lm.doe.gov/Rocky_Flats/ContactRecords.aspx.

Purpose

This report provides a data evaluation and an update on the steps taken in accordance with CR 2010-06 and also provides recommendations beyond the actions already taken and discussed in CR 2010-06.

Status of Actions

The status of the actions for each topic outlined in CR 2010-06 is as follows.

Inspection of Drainage Area

Figures 1 and 2 show the drainage area for SW027 and the subdrainage within this area for GS51. This drainage area includes the former 903 Pad Lip Area, designated Individual Hazardous Substance Site (HSS) 900-155, which lies directly north of the SID. Large volumes of surface soil with residual Pu were removed from the surface of the 903 Lip Area in 2004, and the resulting surface was contoured and revegetated. Cleanup goals were met, but measurable concentrations of Pu in surface soil remained.

This drainage area also includes part of the southern end of the former 903 Pad, designated IHSS 900-112, where large volumes of surface and subsurface soil with residual Pu were also removed in 2003 and 2004. Soil cover for revegetation of the 903 Pad Area was placed over the soil removal area and graded, and the area was revegetated. The difference in the former 903 Pad and the former 903 Lip Area is that no soil was placed on the 903 Lip Area after soil removal. The "Discussion" section below describes conditions at the former 903 Lip Area in more detail.

A summary of the characterization and soil removal actions for former 903 Pad and 903 Lip Area is included in the *FY 2005 Historical Release Report*, Appendix B to the *RCRA Facility Investigation-Remedial Investigation/Corrective Measures Study-Feasibility Study Report for the Rocky Flats Environmental Technology Site*, June 2006 (RI/FS).

Rocky Flats Site personnel performed initial walk-downs of the area in early June 2010 to identify any physical indications that a source other than the expected slow, steady soil erosion process may be affecting water quality. No signs of an unexpected source were observed, although field staff identified several surface areas where additional revegetation could improve soil cover. The field staff also evaluated areas where additional interseeding and placement of localized erosion-control best-management practices, such as erosion matting and/or wattles, could help minimize erosion and promote vegetation cover.

Steps to improve vegetation cover will take time to be effective. Implementation of these steps began on June 23, 2010, when several areas were interseeded, as shown on Figure 3. Figure 4 shows potential locations for additional wattles.

Placement of erosion matting is difficult during the active growing season because stands of tall grass and other seasonal vegetation hinder proper lay-down of the matting. Although mowing might assist proper placement of matting, this could also disturb the soil surface. Thus, erosion matting placement will be evaluated when the vegetation is dormant in the winter and early spring. The evaluation will consider the possible impacts of disturbing soil and destroying existing stands of vegetation to properly install matting. Additional seeding will also be done at that time.

The placement of additional wattles will require shallow, narrow trenching. Soil disturbance will be minimal for wattle placement. This work will be done in the next few months as conditions allow.

The drainage area, including the SID, will also be inspected in late winter and early spring of 2011 to afford a better observation of the ground surface for any indications of erosion or conditions that precede significant erosion.

Evaluate Erosion Controls for the SID

The SID channel is covered with areas of riprap, vegetation, and vegetation debris, which limit movement of sediment within the SID. Site personnel inspected areas of the SID during the June visits and conducted an additional walk-down of the SID area on August 23, 2010. The conditions in the SID were documented during the August visit with photographs taken from locations identified by field global-positioning system coordinates. Figure 5 shows the photograph (Photopoint) locations. Figures 6, 7, and 8 are photographs that illustrate the types of cover in the SID channel. Inspectors also noted that the SID channel banks had good stands of vegetation, and there were no conditions that indicate significant erosion, such as gullying or washouts, or conditions that are precursors to significant erosion on the channel banks.

The generally reduced flow of water in the SID relative to pre-closure conditions was apparent in areas that previously supported wetland-type vegetation. The wetland plants are no longer thriving, and dead stands and litter now occupy these locations. These areas will be reseeded at the appropriate times with vegetation more suitable to the drier conditions.

Much of the litter and the riprap, which has litter in the spaces between the rocks, appear to form natural erosion matting. Site personnel are evaluating where additional erosion controls, such as reseeding or installation of permanent erosion matting, might be used for localized areas in the SID and are evaluating the approach to installing these items, where recommended.

GS51 Evaluation

Site personnel have reviewed the results from GS51 to evaluate whether this location indicates a source of residual Pu contamination that could significantly impact water quality at SW027. The results from GS51 and SW027 have also been reviewed for indications that Pu concentrations may be trending upward at these locations.

The review does not indicate any unexpected source of Pu at GS51, and no upward trends are evident. Figures 9 and 10 provide the graphs of data reviewed.

Sampling Pond C-2

Once water in the SID is monitored at SW027, it is retained in Pond C-2 for eventual batch discharge. Since flow volumes entering Pond C-2 are small relative to its storage capacity, the pond does not require frequent discharge; Pond C-2 has been batch discharged twice since completion of site closure in 2005. The SID stopped flowing at SW027 on June 17, 2010, and has not flowed since.

Pre-discharge samples for Pond C-2 were collected on July 7, 2010. All results indicated that RFLMA water quality standards would be met at downstream point-of-compliance (POC) locations GS31 and GS01during discharge. The pre-discharge sample result for Pu-239,240 was reported as 0.0022 picocurie per liter (pCi/L), which is below the laboratory detection limit. The predischarge sample report is available at the Rocky Flats website at http://www.lm.doe.gov/Rocky_Flats/Sites.aspx?view=5.

Discharge of Pond C-2 using the outlet works to Woman Creek through GS31began on July 31, 2010, and ended on August 12, 2010.

Water discharged from Pond C-2 is monitored immediately downstream of the outlet at POC GS31. During the recent discharge, six flow-paced composite samples consisting of 274 individual grabs were collected at GS31; analysis of these composites is in progress, and results are not yet available as of August 31, 2010. After passing GS31, water discharged from Pond C-2 joins Woman Creek just before leaving the site boundary. These Woman Creek flows continue downstream and commingle with water from other Woman Creek tributaries (most significantly South Woman Creek) before being subsequently sampled at POC GS01 (Woman Creek at Indiana Street).

During the recent C-2 discharge, four flow-paced composite samples consisting of 213 individual grabs were collected at GS01; analysis of these composites is in progress, and results are not available as of August 31. Site staff will inform the RFLMA parties of the results of the RFLMA-required data evaluation after analytical results are received.

Discussion

Although there is normally no water flowing at SW027, heavy runoff during late April 2010 generated the two highest analytical results. Plutonium concentration in a subsequent sample collected April 26, 2010, was 0.029 pCi/L, which indicates that Pu levels have decreased. Sampling at SW027 is accomplished using automated samplers that collect continuous flow-paced composites; the composites are filled based on the availability of water flow. The SW027 composite that was started on April 27, 2010, is still in progress as of August 31, because the composite bottle does not yet contain enough sample volume to conduct a valid analysis. Therefore, the 12-month rolling average for the end of April 2010 cannot be calculated at this time. However, based on the results available through April 26, 2010, DOE has made preliminary notification that the April 2010 12-month rolling average for Pu is expected to be just above the 0.15 pCi/L standard. Figure 6 shows the 12-month rolling average calculated for SW027 with sample results up to April 26, 2010.

The SW027 drainage area covers 177.6 acres within the southern portion of the Central Operable Unit. The most significant potential source area for residual Pu contamination within the SW027 drainage is the 903 Pad Lip Area. Unlike the former 903 Pad, no imported soil was used to fill, contour, and revegetate the 903 Lip Area after surface soil removal.

The mechanism by which Pu moves in surface water is well understood. Since Pu in the environment is almost exclusively associated with soils and sediments, if these solids were to become suspended in runoff (through mechanical processes like raindrop/hail impact, and hydraulic forces due to concentrated runoff), then the Pu could be transported within the resulting stream flow.

As noted in CR 2010-06,

> The fate and transport of residual contamination is evaluated in the June 2006 *RCRA Facility Investigation-Remedial Investigation/Corrective Measures Study – Feasibility Study Report for the Rocky Flats Environmental Technology Site* (RI/FS). The RI/FS concluded that while erosional transport of soil and sediment will continue to impact surface water in this area, the remedial actions, land configuration, and revegetation in the area will reduce runoff volumes, peak discharge rates, and soil transport, thereby resulting in an overall improvement in water quality. Furthermore, erosion of surface soils with residual contamination below the 50 pCi/g soil action level for Pu can result in exceedances of the 0.15 pCi/L RFLMA Table 1 surface water standard.
>
> Reduced volumes of runoff predicted for the SID after closure has been confirmed through continuous flow measurement. No flow paced samples were collected at SW027 for calendar years 2006 and 2008 since no flow occurred. Also, post-closure erosion controls and revegetation have reduced soil transport, and in calendar years 2007 and 2009, when there was flow at SW027, the 12-month rolling averages for Pu during both years were below the RFMLA standard.

Figure 7 shows discharge volumes at SW027, and Figure 8 shows 12-month rolling average results at SW027. While the recent SW027 results indicate that the RFLMA standard for Pu will be exceeded when the April 2010, 12-month rolling average can be calculated, these results are within historical variability and do not indicate a previously unknown source or transport mechanism.

The *Closeout Report for IHHS Group 900-11, IHSS 900-155, 903 Lip Area; IHSS 900-140, Hazardous Disposal Area*, January 2005, (Closeout Report) fully documents the accelerated action for the 903 Pad Lip Area to remove contaminated soil with concentrations greater than 50 picocuries per gram (pCi/g). Figure 8 in the Closeout Report, "IHSS 155 Confirmation Sampling Locations and Results," shows the remaining surface soil Pu concentrations.

While the average concentration in surface soil remaining in IHSS 155 was approximately 13 pCi/g, many of the individual sample locations had residual contamination approaching 50 pCi/g. As noted in the RI/FS, erosion of soils with levels below 50 pCi/g can result in exceedances in surface water, given that the RFLMA surface water standard for Pu is 0.15 pCi/g.

Revegetation, vegetation management, and erosion controls are recognized as important in mitigating erosional processes. Revegetation requirements for the site have been established and are described in the *Rocky Flats, Colorado, Site Revegetation Plan*, LMS/RFS/S04513 (RFSRP). During transition from the cleanup to closure phases at the Rocky Flats Site, the selection and application of erosion control materials varied depending on area-specific contaminant levels, physical conditions, proximity to surface water, and slope and soil characteristics. The primary goals of erosion control and revegetation will continue to be protection of surface water quality and enhancement of wildlife habitat.

The SW027 drainage area met RFSRP revegetation success criteria in 2009. However, the RFSRP recognizes that additional management actions may be required even after success criteria are met. RFSRP Section 3.2 IA, "Revegetation Success Criteria," states that "success criteria are provided as initial guidance; however, common sense combined with scientific data must be applied to final evaluations to determine whether further management actions are required."

The *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, DOE–LM/1497-2007 (ECP) provides the regulatory approach, applicability, and scope of erosion control activities for the site. It also lists various Best Management Practices (BMPs) and describes how erosion controls will be implemented and monitored at the site. Erosion controls protect the reclaimed areas from significant erosion and promote infiltration and evapotranspiration of surface water. BMPs require minimal maintenance, but they will be inspected routinely (according to the ECP) to ensure that they are functioning correctly. If a revegetated area is seriously affected by surface erosion or deposition, such as from a heavy storm event, the area will be repaired. Also, erosion controls might be needed after a wildfire or controlled burn if significant destruction of vegetation creates the potential for erosion. Repairs might include placing and grading fill material or topsoil. After the erosion feature is repaired, the area will be reseeded, and an appropriate erosion control material will be applied.

Recommendations

Continuing to monitor the condition of the vegetation, revegetating where needed, and maintaining erosion controls as necessary are recommended and will be implemented as discussed above.

Recommendations include the following:

- Install wattles as shown on Figure 3.

- Install erosion matting and interseeding in localized areas where vegetation cover is sparse.
- Reseed in localized areas in the SID where wetland vegetation no longer thrives.
- Evaluate placement of erosion matting in localized areas of the SID and install any recommended matting when conditions are appropriate (likely in late winter or early spring 2011).

In addition, the SW027 drainage area will be included in the 2011 annual site inspection to look for signs of significant erosion or precursors of significant erosion, such as cracks, rills, slumping, subsidence, and sediment deposition.

Although the SW027 drainage area met RFSRP revegetation success criteria in 2009, continued revegetation management of the SW027 drainage will be implemented in accordance with the RFSRP. In particular, localized areas where interseeding and erosion controls have been or may be implemented will be inspected in the growing season to determine if the measures are promoting the desired additional vegetation cover. Interseeding and erosion controls will continue to be implemented as needed.

Status Reporting

The status of the vegetation management effort in the SW027 drainage will be reported in the 2010 RFLMA Annual Report, and in subsequent Annual Reports, if revegetation management is performed during the reporting year.

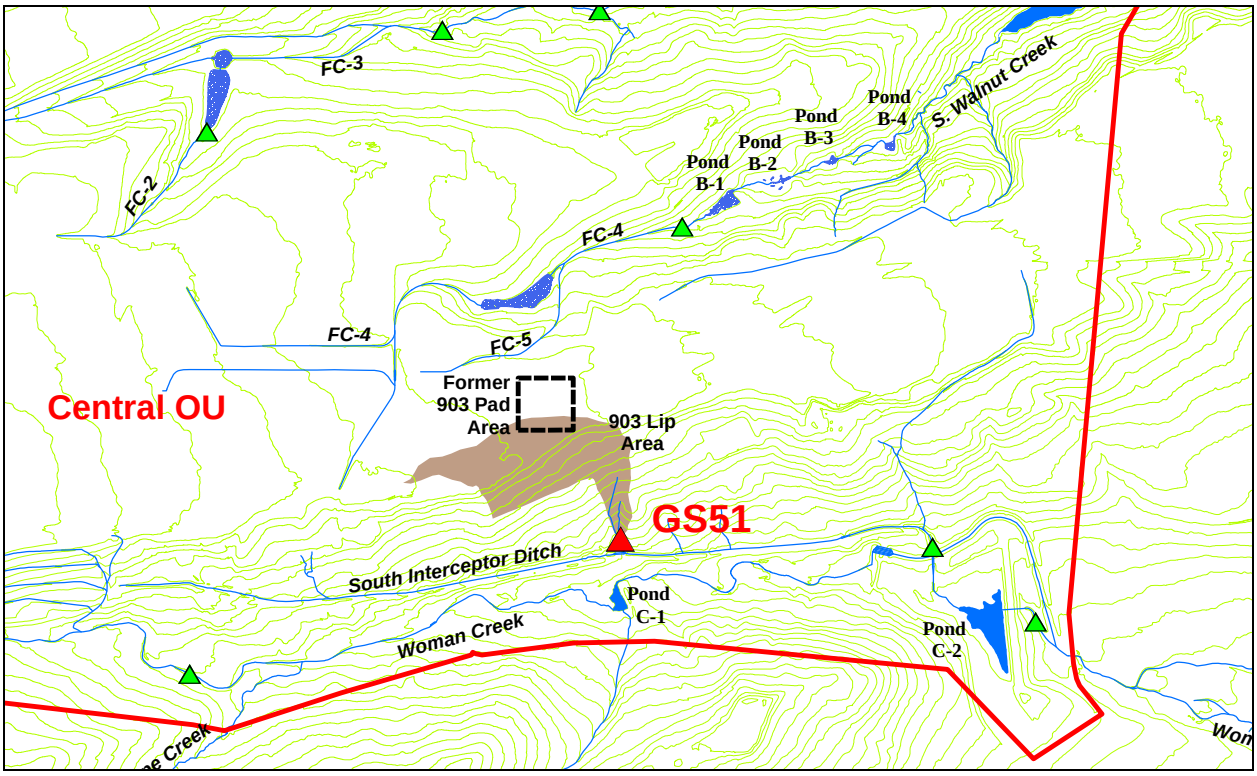


Figure 1. GS51 Drainage Area

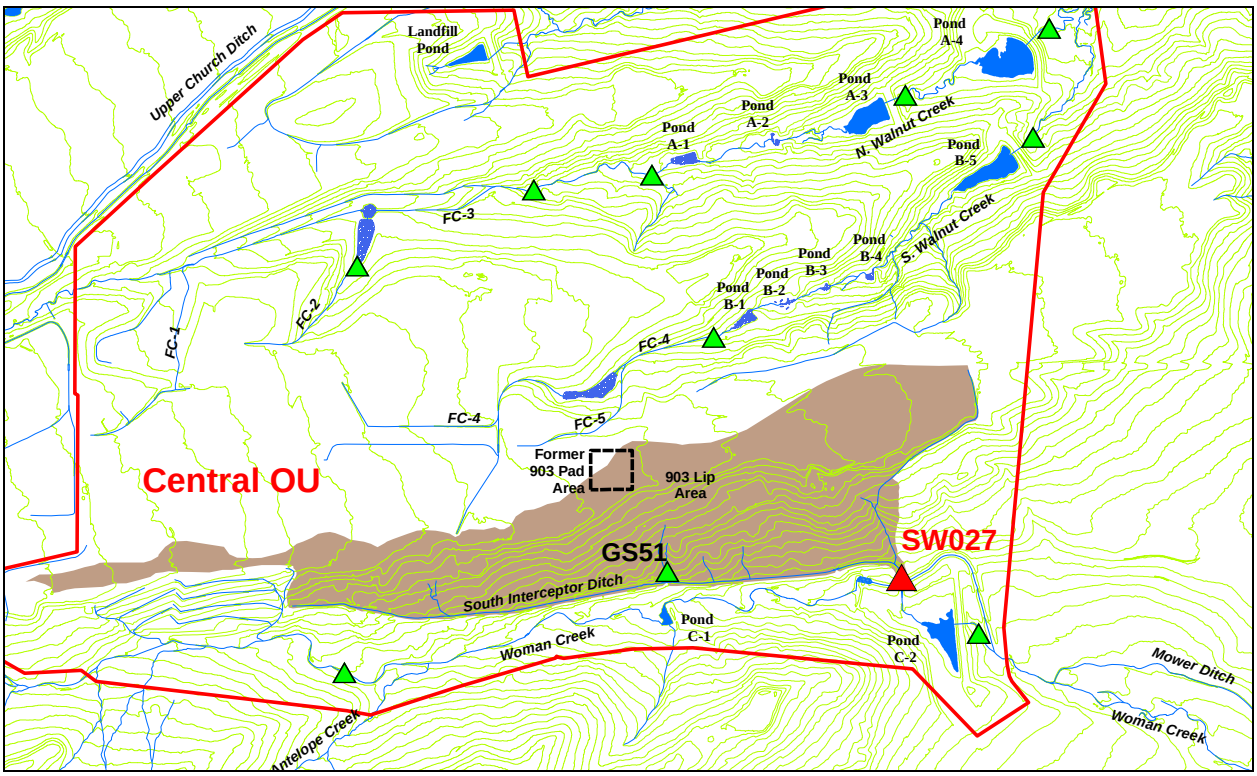
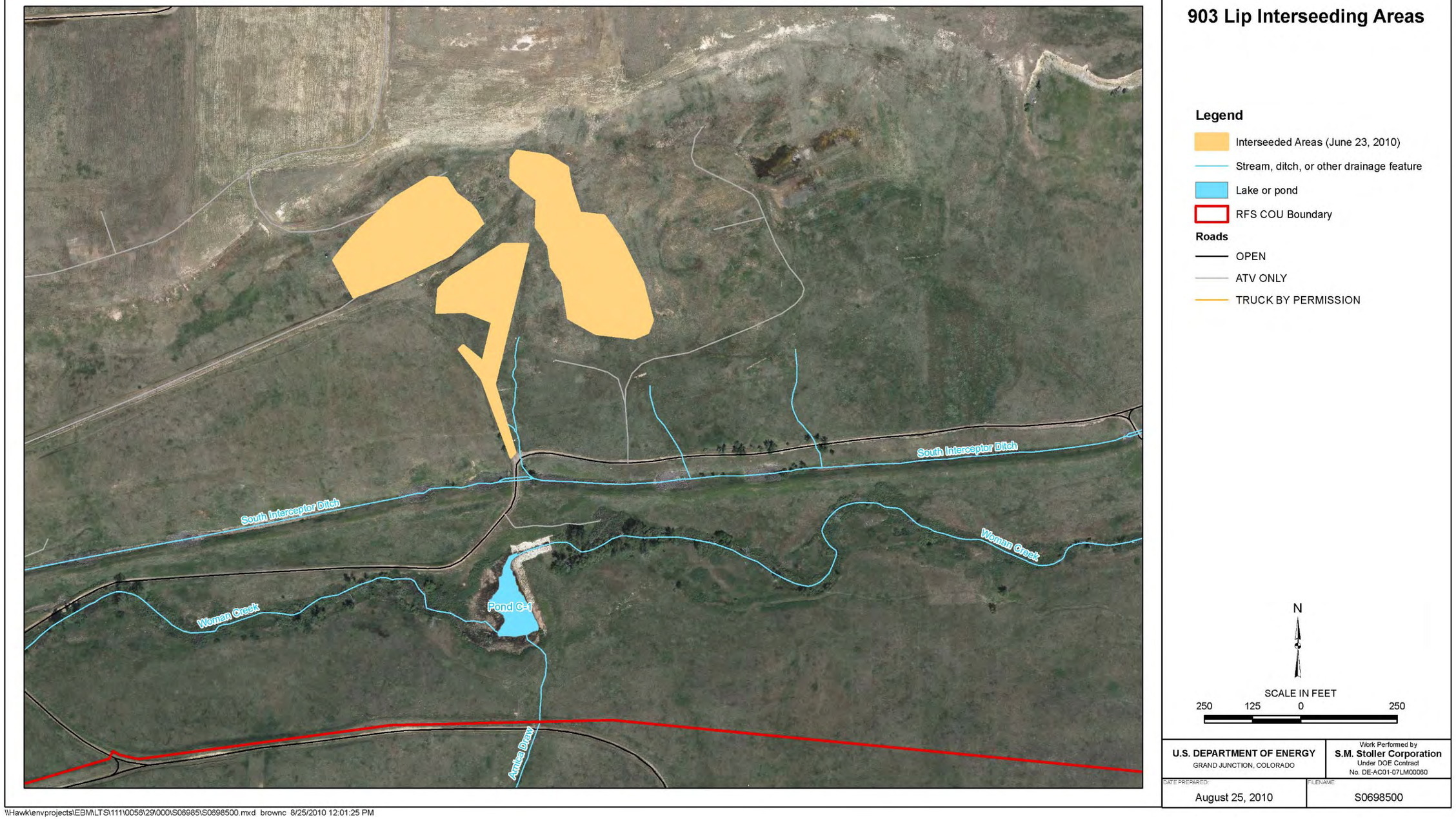


Figure 2. SW027 Drainage Area



903 Lip Interseeding Areas

Legend

- Interseeded Areas (June 23, 2010)
- Stream, ditch, or other drainage feature
- Lake or pond
- RFS COU Boundary

Roads

- OPEN
- ATV ONLY
- TRUCK BY PERMISSION

N

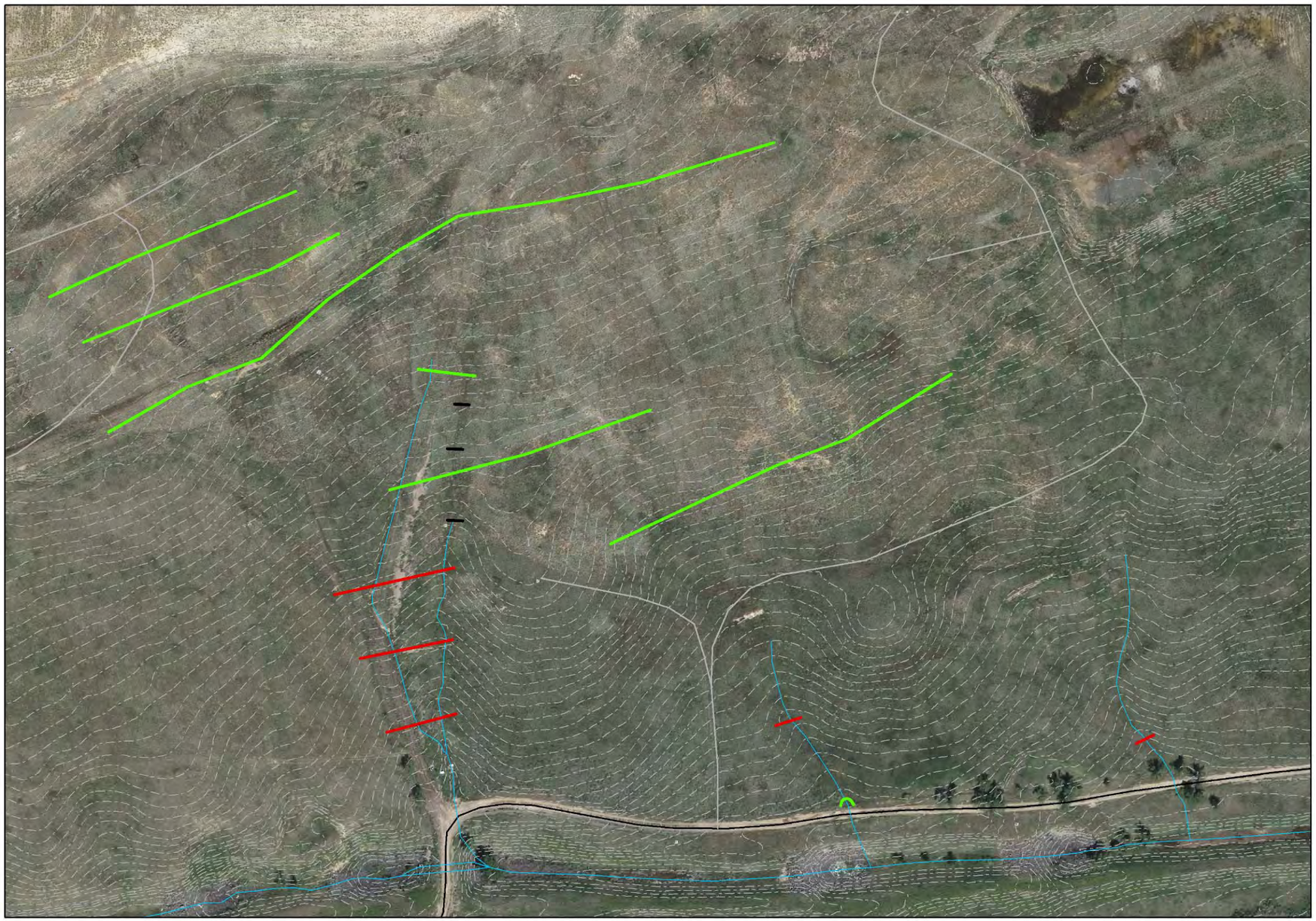
SCALE IN FEET

250 125 0 250

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AC01-07LM00060
DATE PREPARED: August 25, 2010	FILENAME: S0698500

\\Hawk\envprojects\EBM\LTS\111\0056\29\000\S06985\S0698500.mxd browne 8/25/2010 12:01:25 PM

Figure 3. Interseeding Areas



903 Lip
Erosion Control Plan

Legend

- Contours (2 foot)
- Stream, ditch, or other drainage feature
- Lake or pond

Roads

- Open
- ATV Only
- Truck By Permission

WattleType

- 20 inch wattles
- 9 inch wattles
- GeoRidge

Wattle Lengths (approx.)

9 inch = 2150 feet
20 inch = 355 feet

N

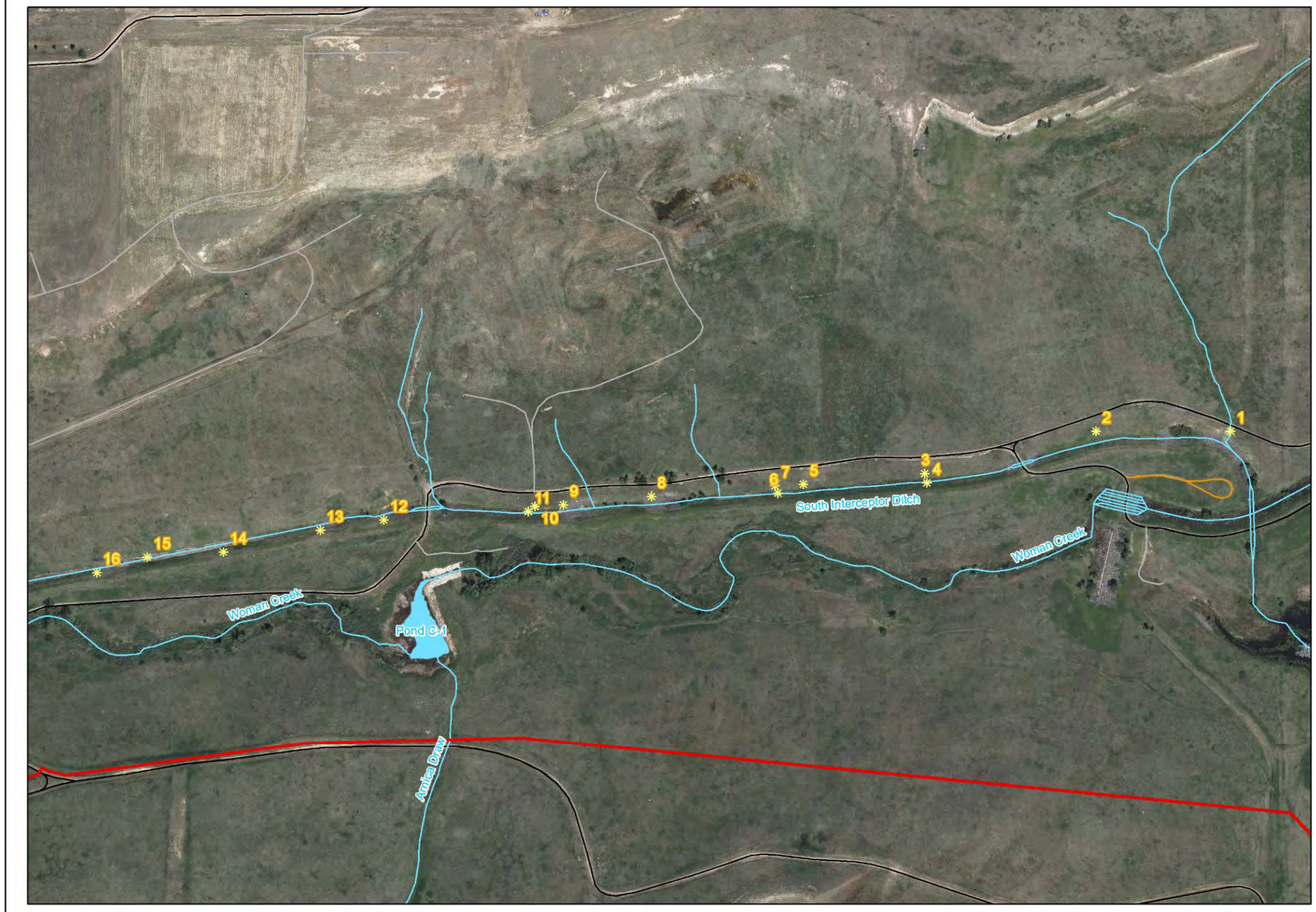
SCALE IN FEET

120 60 0 120

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AC01-07LM00060
DATE PREPARED: August 25, 2010	FILENAME: S0698300

\\Hawk\envprojects\EBM\LTS\111\0056\29\000\S06983\S0698300.mxd browne 8/25/2010 10:49:46 AM

Figure 4. Erosion Controls



South Interceptor Ditch Photopoint Locations

Legend

- South Inteceptor Ditch Photopoints
- Stream, ditch, or other drainage feature
- Lake or pond
- RFS COU Boundary

Roads

- Open
- ATV Only
- Truck By Permission

N

SCALE IN FEET

300 150 0 300

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by **S.M. Stoller Corporation** Under DOE Contract No. DE-AC01-07LM00060
DATE PREPARED: August 25, 2010	FILENAME: S0698400

M:\LTS\111\0056\29\000\S06984\S0698400.mxd browne 8/25/2010 11:28:16 AM

Figure 5. SID Photopoints

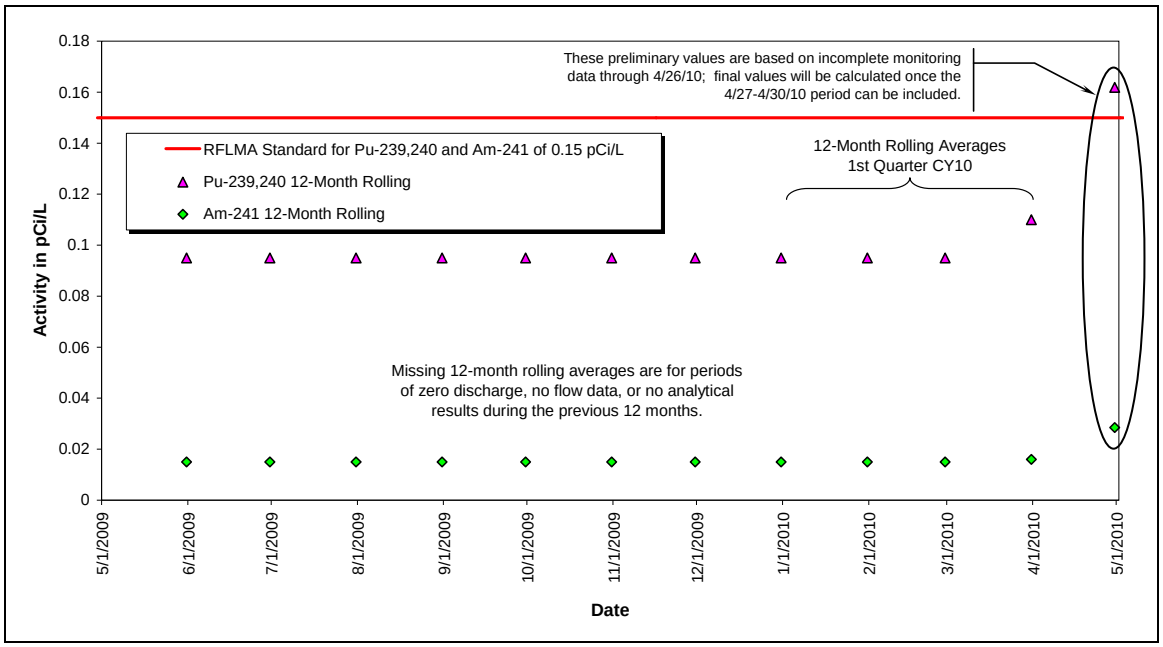


Figure 6. Data for SW027

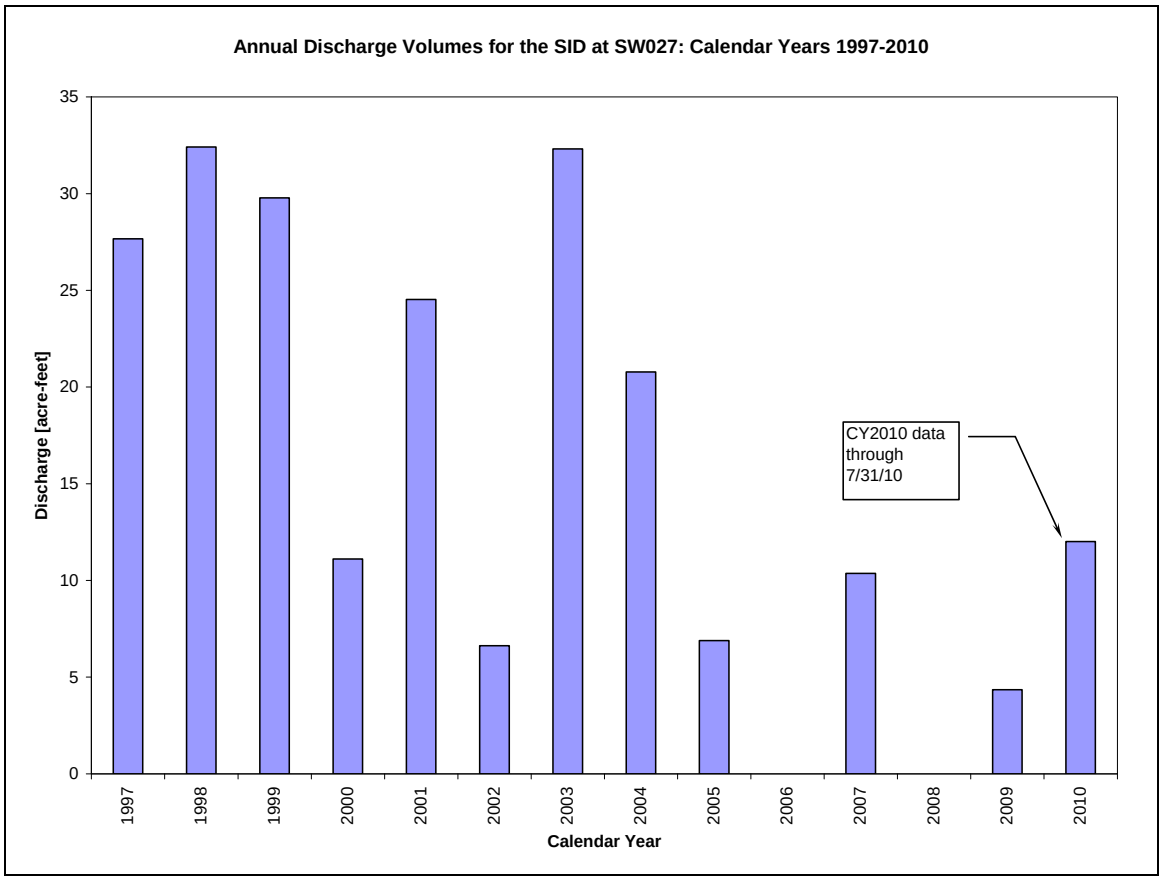


Figure 7. Flows at SW027

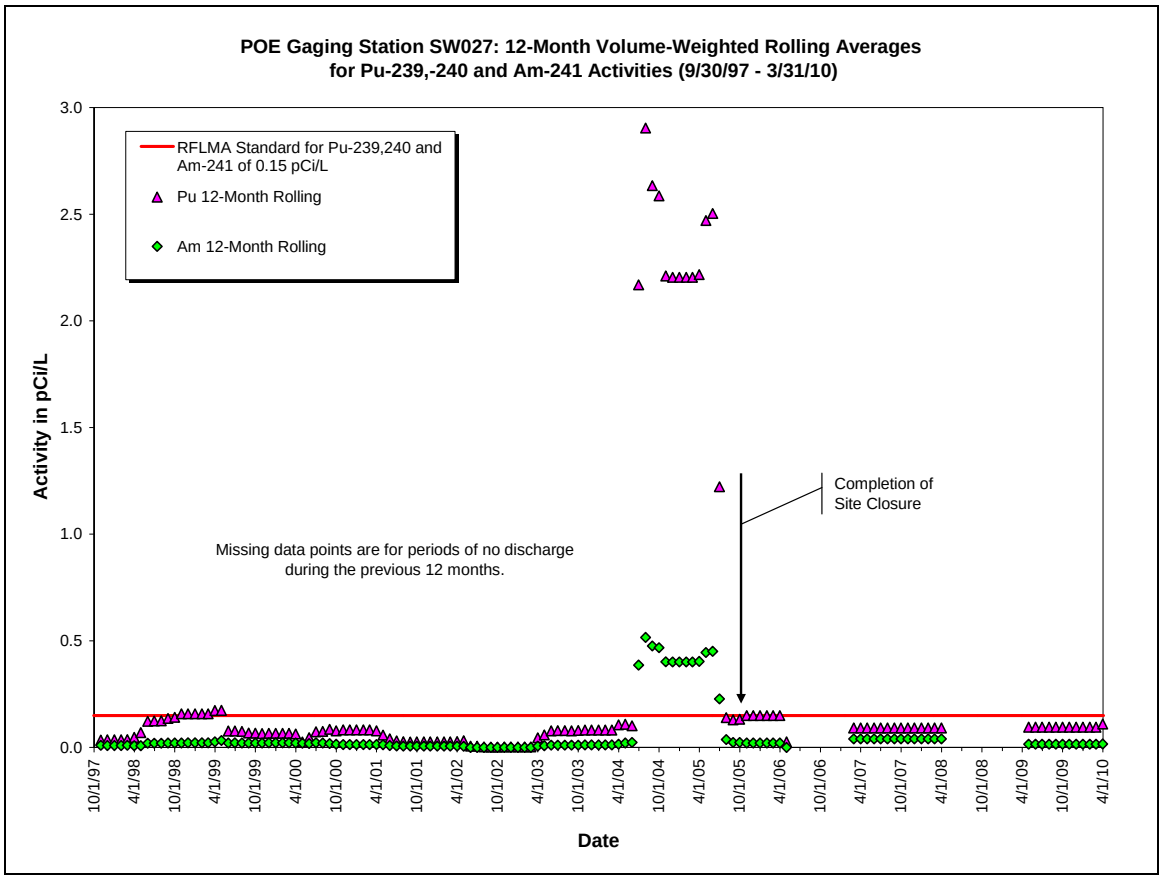


Figure 8. 12-Month Rolling Averages at SW027

Figure 9. SID Photopoint Location 1—Riprap and Vegetation Litter

Figure 10. SID Photopoint Location 6—Minimal Cover in Channel

Figure 11. SID Photopoint Location 15—Dead Wetland Vegetation Litter

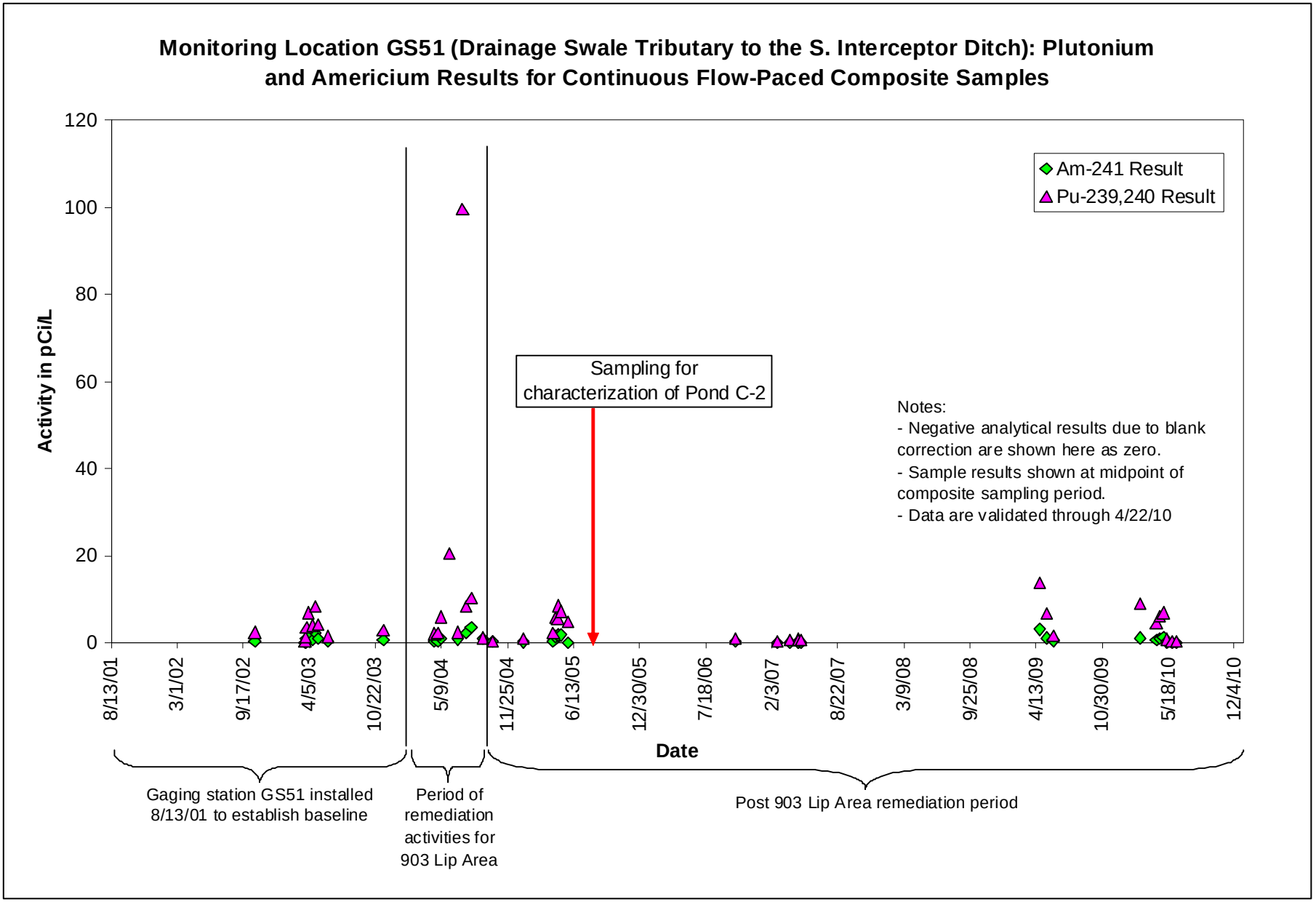


Figure 12. GS51 Data

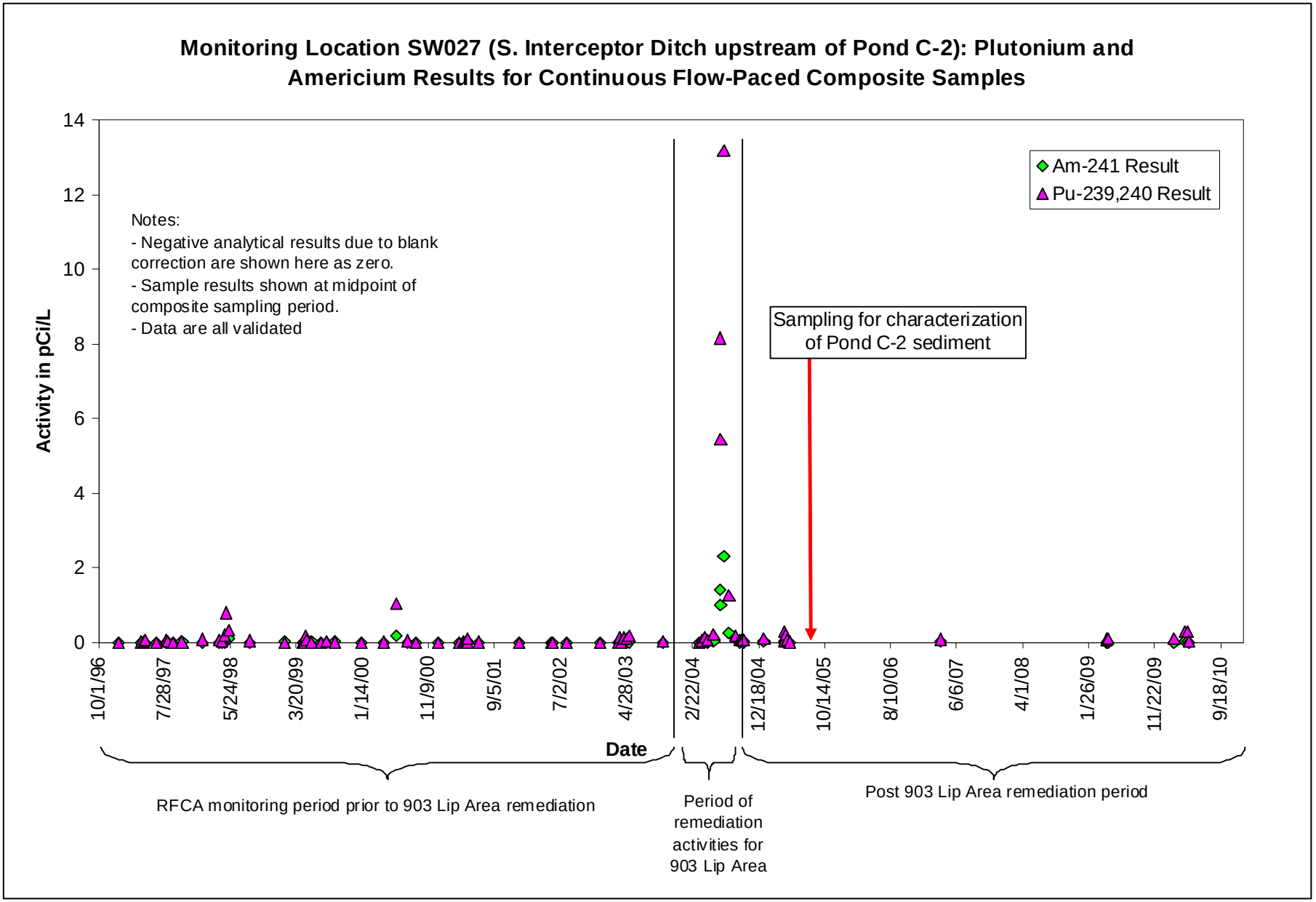


Figure 13. SW027 Data