

# 2005 Annual Inspection and Site Status Report for the Grand Junction, Colorado, UMTRCA Title I Processing Site

## Summary

The Grand Junction, Colorado, Processing Site was inspected on February 24, 2005. The site is in excellent condition. There was no evidence of unapproved ground water extraction or construction activities that would encounter contaminated ground water. Institutional controls were checked and found to be effective. No cause for a follow-up or contingency inspection was identified.

Surface and ground water samples were collected in January 2005 and analyzed to monitor ground water quality and determine if site-related contaminants affect water quality of the Colorado River. Ground water quality has not deviated from previous trends and concentrations of site-related constituents are not significantly higher downstream of the site.

## 1.0 Introduction

This report presents the findings of the annual U.S. Department of Energy (DOE) inspection of the Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Processing Site at Grand Junction, Colorado.

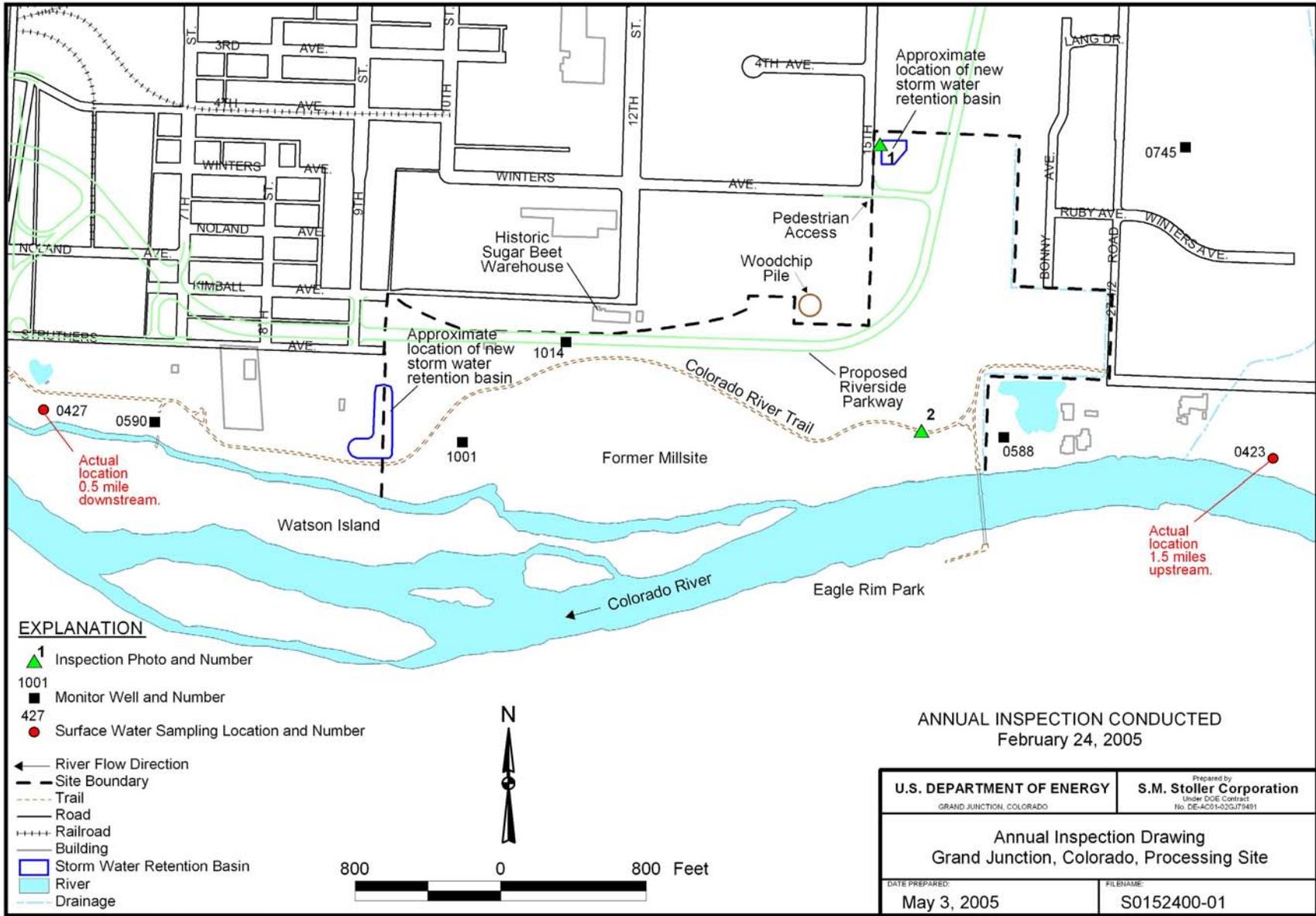
M.R. Widdop and G.K. Baur of S.M. Stoller Corporation, the DOE Legacy Management (LM) Contractor at Grand Junction, conducted the inspection. J. F. Sink of DOE-LM, P. Oliver of the Colorado Department of Public Health and Environment (CDPHE), and T. Prall of the city of Grand Junction Public Works and Utilities Department also were present. Mr. Prall is the Riverside Parkway Project Manager.

The purposes of the annual inspection were to confirm compliance with the *Ground Water Compliance Action Plan [GCAP] for the Grand Junction, Colorado, UMTRA Project Site* (GJO-99-90-TAR, April 1999), to verify that ground water had not been extracted or exposed without DOE approval, and to determine the need, if any, for additional inspections and monitoring.

Mr. Prall mentioned that the City may remodel the historic sugar beet warehouse to provide office, shop, and storage space. Mr. Oliver and Mr. Widdop informed Mr. Prall that the warehouse walls contain yellowcake (uranium oxide) that was left in place by the Uranium Mill Tailings Remedial Action Project to avoid destroying the building, after determining that the contamination does not pose a health risk. This information was conveyed to the City of Grand Junction by letter in March 2005.

## 2.0 Inspection Results

Features discussed in this report are shown on Figure 1. Photographs supporting specific observations are identified in the text and on Figure 1 by photograph location (PL) numbers, and are presented at the end of this text.



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Figure 1. Grand Junction, Colorado, Processing Site

## **2.1 Specific Site Surveillance Features**

### **2.1.1 Facility Access**

The former processing site, historically known as the Climax millsite, is owned by the City of Grand Junction and is administered by the Parks and Recreation Department. Property development currently is limited to a concrete-paved riverfront trail constructed on a flood-control dike along the Colorado River and two storm water retention basins—one located along the west property boundary and the other located adjacent to 15<sup>th</sup> Street and the north property boundary. Access to the site is easily gained by using the public riverfront trail. Pedestrian and bicycle access also is possible through openings in the fence for that purpose at the gate at 15<sup>th</sup> Street and Winters Avenue. The ground water sampling crews use a locked gate on the west side of the property at Struthers Avenue for access.

### **2.1.2 Signs, Site Markers, Survey Monuments, and Fences**

No DOE signs, site markers, or survey monuments exist at the Grand Junction Processing Site, and DOE is not responsible for maintaining the fences at the site.

A fence separating the city-owned property from adjacent private properties exists along the northern boundary of the site. A large pile of wood chips on an adjacent sawmill property is piled against the fence and is causing it to lean outward. The fence is in poor repair at another location. However, there are no security issues, and these conditions do not pertain to the institutional control requirements at the site.

### **2.1.3 Monitor Wells**

Two ground water monitor wells remain at the site and two off-site wells are located upstream (background) and downstream of the site on private property. The wells are completed in the unconfined Colorado River alluvial aquifer. The on-site wells were secure and in good condition. Annual sampling of the wells occurred in January 2005, at which time the two off-site wells also were secure and in good condition.

The City of Grand Junction has proposed the Riverside Parkway be located along the north edge of the former processing site. DOE previously responded to a request for comment and indicated that CDPHE has procedures in place to control exposure to contaminated ground water. Mr. Prall said monitor well MW-1014 is located in the proposed bike lane adjacent to the driving lanes. DOE responded to a request for comment on this issue in the same letter mentioned above about the sugar beet warehouse. DOE told the City that the well could be flush mounted if necessary.

### **2.1.4 Storm Water Retention Basins**

Two storm water basins are located on the former mill site. These are associated with a City project to decouple the storm water and sanitary sewer systems and route storm water into the river.

When DOE conducted the 2004 inspection, the City had completed a storm water retention basin at the west end of the property. At that time, the City had contacted DOE about a proposed storm

water retention basin at the north end of the site and conducted site exploratory trenching to confirm the depth of fill. In coordination with CDPHE, the new retention basin has been constructed (PL-1). A swale was created to allow water from the basin to flow toward the river through box culverts and one-way gates beneath the flood control dike (PL-2).

DOE will acquire as-built information from the City's Engineering Department to update the site map.

## **2.2 Institutional Controls**

CDPHE transferred the former processing site to the City of Grand Junction. In the transfer agreement the City agrees "not to use the ground water from the site for any purpose, and not to construct wells or any means of exposing ground water on the property unless prior written approval is given by the Grantor [CDPHE] and the U.S. Department of Energy." In addition, City of Grand Junction Ordinance 2432 stipulates that all locations within city limits shall be served by the city water treatment and distribution system (i.e., ground water shall not be used for residential purposes).

To verify the effectiveness of institutional controls, Stoller contacted the Grand Junction Parks and Recreation Department and the State Engineer's Office on February 24, 2005 (see attachment). No construction has occurred without DOE approval and no wells have been permitted or installed for the Colorado River alluvial aquifer in the vicinity of the site.

## **3.0 Ground Water and Surface Water Monitoring**

### **3.1 Ground Water Monitoring**

#### **3.1.1 Ground Water Monitoring Program**

The shallow unconfined alluvial aquifer is contaminated with ammonia, iron, manganese, molybdenum, vanadium, and uranium as a result of historic processing operations. Elevated concentrations of uranium and selenium in the aquifer upgradient of the site are thought to be naturally occurring and derived from the dark marine shales of the Mancos Shale formation that underlie most of the Grand Valley. The ground water is not used as a water supply for any purpose, and no actual risks exist at the site because no pathways for human use of ground water are complete (see Section 2.2, "Institutional Controls").

The compliance strategy to meet EPA ground water protection standards, which was described in the GCAP, is no remediation and application of supplemental standards on the basis of limited use ground water (40 CFR 192.21[g]). In this situation, limited use ground water is defined as ground water in the uppermost aquifer that is not a current or potential source of drinking water because widespread, ambient contamination not due to activities involving residual radioactive materials from a designated processing site exists that cannot be cleaned up using treatment methods reasonably employed in public water systems (40 CFR 192.11[e][2]). Ground water in the alluvial aquifer is of limited use because of widespread, elevated concentrations of naturally occurring uranium and selenium.

Limited ground water monitoring is conducted to determine when concentrations of site-related constituents are at a level that allows certain uses of ground water to no longer be restricted. These uses, however, may be limited by the poor ambient quality of the ground water. Monitoring locations will include on-site monitor wells MW-1014 (the well with the highest contaminant levels) and MW-1001 (located directly downgradient of MW-1014), off-site and upgradient (background) well MW-0745, and off-site and downgradient monitor well MW-0590 (see Figure 1). Analytes will include ammonia (as N), molybdenum, and uranium. Samples will be collected and analyzed annually for the first 5 years and every fifth year thereafter for 30 years. If, after the first 5-year period, concentrations of target analytes are consistently below maximum concentration limits or baseline values, the analyte list or frequency of sampling may be modified. Sampling at 5-year intervals will continue until all analytes are below their respective maximum concentration limits or background values, or until the monitoring program is modified. Because monitoring is specified in the GCAP, DOE will obtain U.S. Nuclear Regulatory Commission concurrence for changes to the monitoring program.

DOE commenced annual sampling in 2000; therefore, after this 2005 sampling event, the next sampling will occur in 2010.

### **3.1.2 Ground Water Monitoring Results**

Ammonia concentrations are generally less than several times the detection limit at upgradient well MW-0745. Ammonia concentrations are highest at on-site well MW-1001 and slightly lower at well MW-1014; ammonia concentrations are trending lower at both locations. At location MW-0590, ammonia concentrations are elevated but less than the onsite concentrations.

Molybdenum concentrations are consistent with previous results and remain below the Maximum Concentration Limit established at 40 CFR 192 of 0.1 milligrams per liter (mg/L) at well MW-0590 and MW-0745. At wells MW-1001 and MW-1014, molybdenum has ranged from about 0.2 to 0.4 mg/L.

Uranium concentrations remain generally consistent for sampling in 2005. They are slightly elevated above the EPA standard of 0.030 mg/L at background well MW-0745. At downgradient well MW-0590, uranium concentrations remain elevated at around 0.12 mg/L. Uranium concentrations remain elevated at wells MW-1001 (0.430 mg/L) and MW-1014 (2.900 mg/L). Figure 2 presents the time-concentration plot for uranium in ground water.

## **3.2 Surface Water Monitoring**

### **3.2.1 Surface Water Monitoring Program**

There are no surface water expressions of ground water on the property. Surface water samples are collected annually at two locations along the Colorado River. The upstream location, SW-0423, is approximately 1.5 miles (2.4 kilometers) east of the site, and the downstream location, SW-0427, is approximately 0.5 mile (0.8 kilometer) west of the site. Location SW-0427 was sampled in January 2005; however, surface water location SW-0423 was not sampled. This location is in an area now closed due to construction activities in preparation for a new bridge; therefore, the upstream sample location has been temporarily moved 3 miles upstream (location SW-0316).

## Grand Junction Processing Site (GRJ01)

### Uranium Concentration

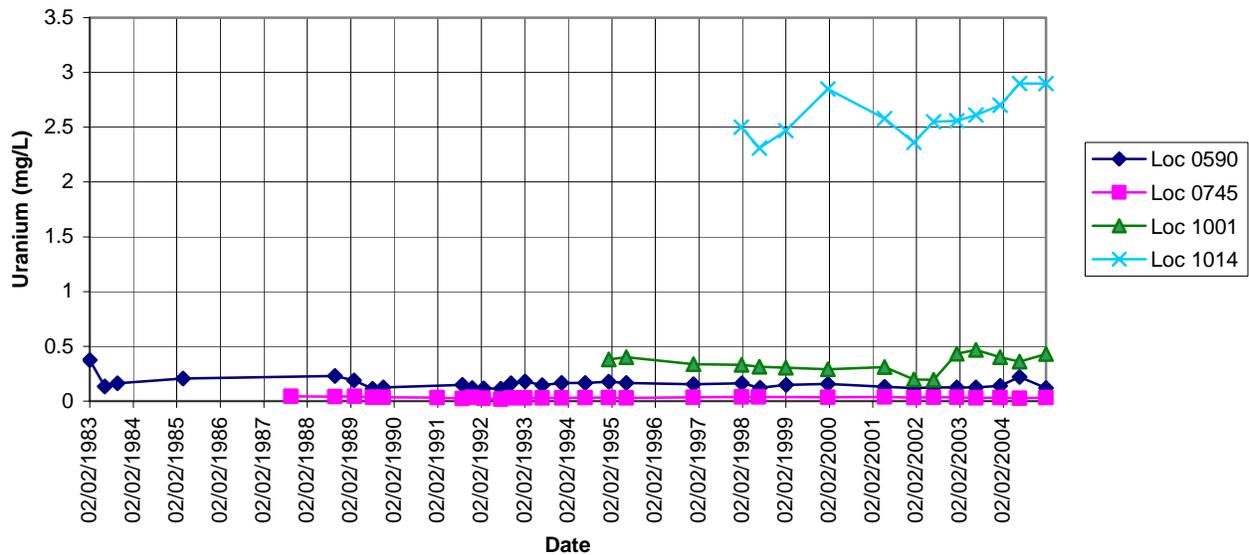


Figure 2. Uranium Concentrations in Ground Water

Analytes, sampling frequency, and evaluation are the same as for ground water sampling. Sample results from location SW-0423 and SW-0316 (the temporary upstream location) will provide background values, and results from location SW-0427 will provide continuing verification that mill-related constituents in ground water are not affecting the water quality of the river.

### 3.2.2 Surface Water Monitoring Results

Ammonia concentrations had been less than the detection limit at both monitoring locations until the January 2004 sampling event. In 2004, the ammonia concentration increased at SW-0427 but remained near the detection limit. The concentration in January 2005 was still above the detection limit but had decreased from 2004.

Molybdenum concentrations are consistent with previous results and remain near detection limits.

Uranium concentrations at the upgradient and downgradient locations are similar (0.004 and 0.0047 mg/L, respectively). As a point of comparison, a representative standard might be the State of Colorado standard for the Gunnison River at the Grand Junction Site of 0.04 mg/L. Uranium results show a strong seasonal variation and concentrations at the two locations co-vary. Figure 3 presents the time-concentration plot for uranium in surface water. The slight difference between uranium concentrations indicates site-related contamination is not causing uranium levels to increase to near a typical standard.

Grand Junction Processing Site (GRJ01)

Uranium Concentration

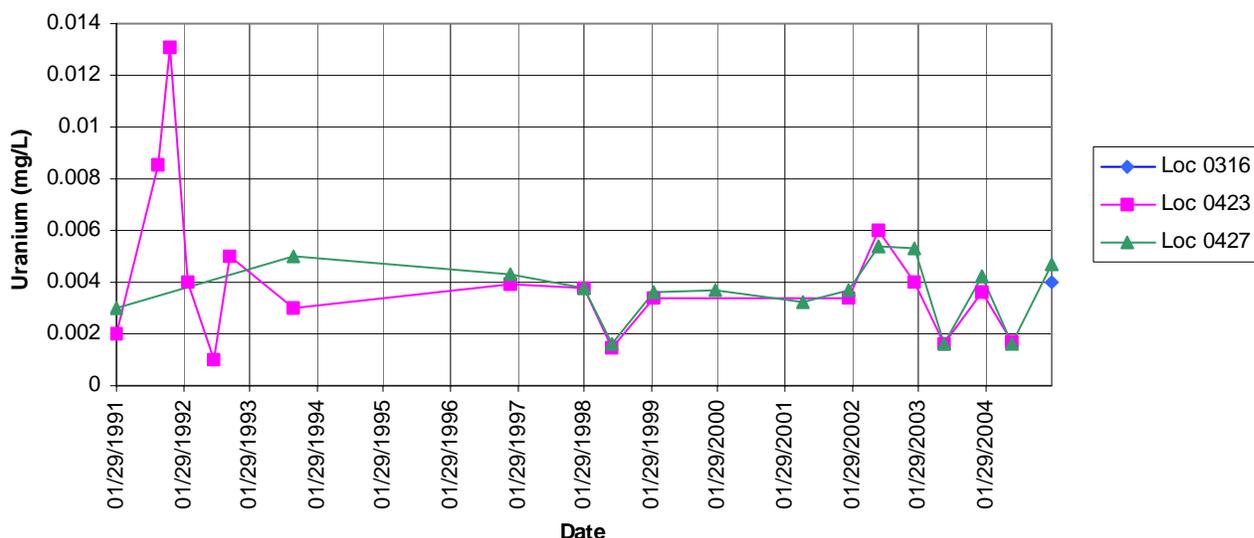


Figure 3. Uranium Concentrations in Surface Water

#### 4.0 Recommendations

1. The storm water retention basins on the west and north edges of the former processing site are not accurately shown on the site map (page 4).

**Recommendation:** DOE will acquire as-built information from the City’s Engineering Department to update the site map.

2. Exposure to contaminated ground water under the site needs to be prevented (page 4).

**Recommendation:** Continue to verify, on an annual basis, the effectiveness of institutional controls by contacting the Grand Junction Parks and Recreation Department and the State Engineer’s Office to ensure that no construction has occurred without DOE approval and that no wells have been permitted or installed.

#### 5.0 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	120	Storm water retention/settling basin at north end of site
PL-2	0	Swale constructed for north storm water retention basin



GJT 2/2005. PL-1. Storm water retention/settling basin at north end of site.



GJT 2/2005. PL-2. Swale constructed for north storm water retention basin.

**ATTACHMENT 1**

# Land Management Project

# Meeting/Teleconference Record

Date: February 24, 2005

To: Gary Baur

From: Cheri Bahrke, Environmental Services

Subject: Annual verification of ICs for the Grand Junction Site

Persons Present/Contacted:

Name	Company/Agency	Telephone Number/Extension
Peggy Holquin	City of Grand Junction, Parks Department	
	State Engineers Office	

**Issue/Concern:**

**At the request of Gary Baur, I contacted Peggy Holquin of the Grand Junction Parks Department to determine if any work had been conducted at the site that could create a potential pathway for residual contamination at the site. Ms. Holquin's response is as follows:**

As part of the Combined Sewer Elimination Project a water quality basin was excavated in the northeast corner of the old millsite property, near the intersection of 15th Street and Winters Avenue. The area from the water quality pond to the south side of the property was regraded to provide a swale for major storm events when the water quality pond fills to overflowing. At the downstream end of the swale box culverts were installed through the levee. The box culverts have flap gates to prevent the backflow of water from the Colorado River when it is in flood stage. The Colorado Department of Health and Environment was aware of the project and provided direction and oversight.

I also reviewed the State Engineers website for well permitting to determine if any well permits have been granted for the area of interest. The website was current as of 2/1/05. There have been no new wells drilled in the past year.

**Followup Action Required: None**

**Affect Scope/Schedule or Budget: YES \_\_\_ NO X**

**Explain:**

CC: Project File GJT 605.25.35 (A) (Dianna Roberts)