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PRELIMINARY ASSESSMENT

LANDFILL AT COTTONWOOD PARK

CERCLIS ID# CO0000309054

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION VIII

CONTRACT NO. 68-W9-0025
WORK ASSIGNMENT NUMBER 27-8JZZ

January 24, 1995



MORRISON KNUDSEN CORPORATION
Engineering, Construction & Environmental Group
7100 East Belleview Avenue, Suite 300
Englewood, Colorado 80111

APPROVAL PAGE


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MK TASK LEAD

1-24-95

DATE



MK ARCS PRE-REMEDIAL MANAGER

1/29/95

DATE



EPA SITE ASSESSMENT MANAGER

7/6/95

DATE

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1.0 INTRODUCTION

Morrison Knudsen Corporation (MK) completed this Preliminary Assessment of the Landfill at Cottonwood Park site in Jefferson County, Colorado (CERCLIS ID# CO0000309054) under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The purpose of this investigation was to collect information regarding the conditions at the site to assess the threat to human health and the environment and to determine the need for additional CERCLA/SARA or other action. This investigation included a review of available file information, an off-site reconnaissance, and a comprehensive target survey. This report was prepared in partial fulfillment of Work Assignment 27-8JZZ under ARCS contract number 68-W9-0025.

2.0 SITE DESCRIPTION

2.1 Site Location

The Landfill at Cottonwood Park site is located within the east one-half of Section 1, T. 3S., R. 70 W. of the 6th Prime Meridian, and is near West 68th Place and Joyce Street in Arvada, Colorado. The site consists of the southernmost parcel of land, Block 5, within the Cottonwood West Industrial Park (CWIP) Filing Number 1. Ralston Creek separates the industrial park from the landfill parcel (see Figures 1 and 2). A residential subdivision and a subdivision under construction are located west and south of the site respectively. The Cottonwood Industrial Park and City of Arvada Municipal Service Center are located northeast and southeast of the site, respectively (Ogden, 1991).

2.2 Site History

The site was used as a landfill by Jefferson County from 1954 to 1971 or 1972 and covers 13 acres. The site property was annexed by the City of Arvada in 1981 and 1982. The CWIP was divided into five parcels in November, 1985. Streets and easements have been dedicated to the City of Arvada, but since no development has occurred, the streets have not been constructed. This land was previously used for agricultural purposes (Ogden, 1991).

2.3 Site Characteristics

2.3.1 Site Geology

The fill lies at depths of 8 to 16 feet and is covered with approximately 3 feet of sandy clay. Subsoils at the site are highly variable, consisting of organic silt, clay, sand and gravel overlying claystone bedrock of the Arapahoe formation. The depth to bedrock ranges from 23 to 27 feet on slopes above Ralston Creek. Unconsolidated deposits at the site consist of Broadway Alluvium, which is a silty, cobbly gravel and coarse sand. The upper 1 to 3 feet are commonly clayey to pebbly silt (USGS, 1972; Chen, 1982; CTL/Thompson, Inc., 1985).

Bedrock formations present beneath the site include the Arapahoe, Laramie and Fox Hills formations. The Arapahoe Formation consists of quartzose sandstone, silty claystone, mudstone and conglomerate, and is approximately 400 to 500 feet thick. The Laramie Formation consists of claystone, siltstone, shale and quartzose sandstone; is approximately 560 to 985 feet thick, and contains sub-bituminous coal beds in the lower 200 feet. The Fox Hills Formations consists of micaceous, quartzose sandstone and shale, and is approximately 60 to 500 feet thick. The depth to this formation beneath the site ranges from 960 to 1,060 feet (USGS, 1972, 1976, 1979 and 1982).

2.3.2 Site Hydrology

There are two separate surface water flow paths at the site (see Figure 3). Ralston Creek flows along the north border of the site from west to east and continues for approximately 7 miles where it empties into Clear Creek. Clear Creek flows to the northeast for 6.2 miles and empties into the South Platte River (USGS, 1980).

The Croke Canal bounds the landfill on the west and south (see Photo #4 in Appendix D). Water in the canal flows northward and enters Standley Lake approximately 9.5 miles downstream from the site. The mouth of the canal is approximately 3/4 mile from the Standley Lake dam outlet to Big Dry Creek. This creek flows northeasterly to the South Platte River (Odgen, 1991; USGS, 1980).

Adjacent to the site a headgate and diversion on Ralston Creek control the flow of water into the Croke Canal. Between the diversion and the northwest corner of the site, an overchute structure conveys Ralston Creek over the canal (see Photo #3) (Contra, July, 1994).

The flow rate of Ralston Creek at gauging stations immediately upstream and downstream from the headgate and overchute are typically 10 to 20 cubic feet/second (cfs). The downstream gauging station is shown in Photo #2. The annual mean flow rate of Clear Creek at the west edge of Golden, Colorado, upstream of the site is 184 cfs. The annual mean flow rate of the South Platte River, upstream of the Clear Creek confluence at the 64th Avenue gauging station is 305 cfs. The Big Dry Creek gauging station, 5.2 miles below the outlet of Standley Lake, has an annual mean flow rate of 13.7 cfs. The site is not located in the 100-year floodplain, which is located along Ralston Creek (FEMA, 1986; USGS, 1993).

2.4 Other Landfills Near the Site

The Forest Springs Landfill is located southwest of the site across the Croke Canal in the northeast portion of the Forest Springs Subdivision, which is currently under development (see Figure 2, and Photos 4 and 6). The final subdivision development plan proposes the construction of 108 single-family homes on a 30.51-acre parcel. The landfill occupies the northeast portion of the subdivision. The drainage from this landfill and the new subdivision will be siphoned beneath the Croke Canal and discharged into Ralston Creek (Ochsner, 1994; Contra, 1994b; Mineral Systems, 1994).

Another landfill is located southeast of the site to the south of the Croke Canal. This landfill was used by the City of Arvada or by the Sundstrand Fluid Handling facility at 14845 West 64th Avenue. It was owned by Sundstrand, but may currently be owned by the city (see Figure 2) (City of Arvada, 1994).

3.0 PRELIMINARY PATHWAY ANALYSIS

3.1 Source Characteristics

General rubbish and trash were deposited at the 13-acre landfill. The surface of the landfill is elevated 5 to 10 feet above the surrounding landscape. In January, 1982 nine

boreholes were drilled at the landfill to determine the structural suitability of soil for the construction of a bridge across Ralston Creek. Six of the test holes drilled along the south side of the creek determined that fill was present to a depth of 25 feet below grade. The thickness of the trash fill varied from 8 to 16 feet. If an 8-foot trash thickness is assumed to be present over the entire site area, the trash volume would be approximately 167,786 cubic yards (Chen, 1982).

Fill materials were described as a mixture of wood, paper, glass, plastic and metal. Methane was encountered in four of the borings at concentrations of 85-100% of the Lower Explosive Limit. No liner, run-on control system or run-off management system is present at the site. There is no gas collection/treatment system and the site is not surrounded by an engineered windbreak. The site is covered with 3 feet of sandy clay (Chen, 1982; Ogden, 1991).

A soil sample collected from the site in December, 1991 was analyzed for volatile organic compounds (VOCs) and PCBs. The analytical results are shown below:

<u>Compound</u>	<u>Concentration</u> (In $\mu\text{g/kg}$)
Acetone	68 J (estimated value)
Tetrachloroethene	23 J
Toluene	24 J
Total Xylenes	43 J
1,1,1-Trichloroethane	12 J

A radiation survey performed at the site revealed onsite and background levels of gamma radiation ranging from 10 to 18 microrentgens/hour (Ogden, 1991).

3.2 Ground Water Migration Pathway

There are no municipal supply wells within 4 miles of the site. The following entities supply drinking water to areas within 4 miles of the site:

- City of Arvada
- City of Westminster
- Jefferson Center Metropolitan District #1
- Leyden Water District
- North Table Mountain Water and Sanitation District

- Ralston Valley Water and Sanitation District
- Valley Water District
- Wheat Ridge Water District

The City of Arvada obtains water from Arvada and Ralston Reservoirs, and does not use ground water as a source of supply. Jefferson Center Metropolitan District #1, the Leyden Water District and Ralston Valley Water and Sanitation District purchase water from the City of Arvada and do not use other supply sources. The City of Westminster obtains all of its potable water from Standley Lake. The North Table Mountain Water and Sanitation District, and the Valley and Wheat Ridge Water Districts purchase water from the Denver Water Department and do not use ground water as a supply source (Downey, 1994; Hays, 1994; Kadnuck, 1994; Lacy, 1994; Pettit, 1994; Streitmeier, 1994; Sullivan, 1994).

Two existing homes within the Forest Springs Subdivision have private wells (see Figure 2). These wells are located within ¼ mile southwest of the site, and are 222 and 275 feet deep. The owner of the subdivision, Ochsner Development Corporation of Arvada, plans to use these wells for irrigation in the future. Water rights data at the Colorado State Engineer's Office indicates there are 19 domestic wells located between ¼ and ½ mile from the site, and 13 domestic wells located between ½ and 1 mile of the site. The depths of the wells ranged from 14 to 285 feet. The drinking water status of these wells has not been confirmed (Jeffco, 1994; CDWR).

3.3 Surface Water Migration Pathway

In December, 1991 refuse was observed in Ralston Creek. An oily scum and sheen were observed on the surface of the creek. An orange discoloration of the creek sediment was also visible. Visible signs of contamination ¼ mile downstream of the site were noted. During the offsite reconnaissance conducted by MK on January 3, 1995 no sheens were observed on the creek adjacent to the site. A layer of decaying algae was present on the creek bottom (Ogden, 1991).

Water is withdrawn from the Croke Canal 5 feet south of the headgate/overchute structure on Ralston Creek, adjacent to the site, by the City of Arvada during peak water demand periods (typically mid-May to mid- or late July) (see Figure 2). This water is pumped westward to Arvada Reservoir, which is located upstream on Ralston Creek

approximately 2 miles from the site. Arvada Reservoir supplies up to 35% of the city's drinking water needs during the peak demand period. The balance of the city's water is obtained from Ralston Reservoir located approximately 3.5 miles west of the site (Sullivan, 1994).

The City of Thornton has water rights in two canals that originate from a diversion in Clear Creek approximately 9.5 miles downstream from the site. The Lower Clear Creek (LCC) Canal flows to the northeast roughly parallel to Clear Creek for 0.4 miles where the Colorado Agricultural Canal branches off of it. The flow rate of the canals varies from 0 to 50 cfs. The canals run parallel for approximately 3.4 miles to a point where a channel connects them. Approximately 0.6 miles downstream from this channel, a diversion on the LCC Canal directs water to three interconnected ponds known as the West Gravel Lakes (see Figure 3). Thornton uses an intake in the northern-most lake to supply raw water to the Columbine Treatment Plant. This intake is approximately 14.3 miles downstream from the site and typically pumps at a rate of 175-230 cfs. Water from the Columbine Treatment Plant is distributed only during the summer. Thornton obtains drinking water year round from Standley Lake. Approximately 80,000 people receive drinking water from the Thornton municipal system (USGS, 1971 and 1980; Krugmire, 1994; Mitchell, 1994).

Water from the South Platte River upstream of the Clear Creek confluence is also treated at the Columbine plant. This water is conveyed to the plant via the Burlington Ditch diversion in Section 14, T. 3S., R. 68W. Ditch water is diverted into the East Gravel Lakes, then into the West Gravel Lakes. The Columbine plant is operated in the summer, but not in the winter (Mitchell, 1994; Krugmire, 1994).

Water is withdrawn from Standley Lake by the Cities of Thornton, Westminster and Northglenn. The City of Thornton operates the Thornton Plant on a continuous basis. In the summer neither the Columbine nor Thornton plants provide less than 40% of Thornton's potable water (Mitchell, 1994).

Standley Lake is the sole water supply source for the Cities of Westminster and Northglenn. The City of Northglenn provides water to 27,000 residents. The City of Westminster supplies water to 80,000 residents and sells water to Federal Heights (Wyeno, 1994; Streitmeier, 1994).

A summary of wetlands within 15 downstream miles of the site meeting the wetlands definition in 40 CFR 230.3 is given in Table 1.

Ralston Creek is not a fishery. Warmwater gamefish, such as largemouth bass, sunfish and bluegills inhabit Clear Creek downstream from the site. Fishery survey data from 1990 indicate that the size of these fish generally are too small for human consumption. These same species, plus walleye, yellow perch and catfish inhabit the South Platte River downstream from the site. Fishery survey data indicate that these fish generally are too small for consumption, except for yellow perch captured near the 88th Street bridge in 1992, approximately 14.75 miles downstream from the site. Edible-size yellow perch were not captured at other locations in the river in 1992. A minimal quantity of fish are believed to be caught from Clear Creek and the South Platte River within 15 miles downstream of the site (CDOW, 1989, 1990b, 1990c, and 1992).

Gamefish present in Standley Lake include rainbow trout, yellow perch, smallmouth and largemouth bass, walleye, wiper, channel catfish, sunfish, bluegill and black crappie. In July, 1989 45 pounds of gamefish were captured at the lake. Sunfish are the only gamefish identified in stream surveys of Dry Creek. The sunfish captured in the creek were too small for consumption (CH2MHill, 1993; CDOW, 1985; CDH, 1990).

The mean annual total precipitation for the site area is 15.6 inches. The 2-year 24-hour rainfall for the site area is 1.5 inches (USWB, 1961; USDC, 1968).

3.4 Air Migration and Soil Exposure Pathways

The Ralston Creek Trail is located adjacent to the northwest corner of the site between Ralston Creek and the Croke Canal. This trail is used for public recreation. There are no fences or other barriers to prevent access to the site. The closest residence to the site is located within 200 feet of the southeast corner of the site across the Croke Canal. The closest business to the site is B-Ten Systems at 6803 Joyce Street, which is located within 200 feet of the northeast corner of the site. There are no schools within one mile of the site. (RMAS, Inc., 1992) (see Figure 2).

The area within 4 miles from the site includes parts of Arvada and unincorporated Jefferson County. The populations for each distance category below were determined by estimating the areas, in square miles, of the city and the county within each category,

multiplying by the community's population per square mile, and summing the population for each community within a distance category (USGS, 1980; USCB, 1991).

<u>Distance</u>	<u>Population</u>
0 to ¼ mile:	117
> ¼ to ½ mile:	2,535
> ½ to 1 mile:	5,427
> 1 to 2 miles:	11,911
> 2 to 3 miles:	31,589
> 3 to 4 miles:	46,097

Soils over most of the site are classified as Valmont clay loam. This soil consists of clay and clay loam underlain by very gravelly sandy loam below 30 inches. Soils along Ralston Creek near the site are classified as Standley-Nunn gravelly clay loams. Standley soils consist of gravelly clay loam and gravelly clay overlying gravelly loam. Nunn soils consist of gravelly clay loam, clay loam and clay (USDA).

4.0 SUMMARY

The Landfill at Cottonwood Park is located on a 13-acre parcel near West 68th Place and Joyce Street in the Cottonwood West Industrial Park, Arvada, Colorado. The site was used as a landfill by Jefferson County from 1954 to 1971 or 1972. The thickness of trash fill at the site ranges from 8 to 16 feet. A 3-foot thick sandy clay cover caps the site, but no other waste containment structures are present.

A soil sample collected at the site in 1991 contained less than 100 parts per billion of acetone, toluene, total xylenes, tetrachloroethene and 1,1,1-trichloroethane. No other waste characterization samples have been collected at the site. Fill materials include rubbish and trash containing a mixture of wood, paper, glass, plastic and metal.

The site is bordered by Ralston Creek on the north, and the Croke Canal on the west and south. Water is withdrawn from the portion of the canal adjacent to the site and pumped westward to Arvada Reservoir, which is used by the City of Arvada as a drinking water source during the summer months. The canal flows to Standley Lake, which is a drinking water source for Thornton, Westminster and Northglenn. Standley Lake is also a fishery.

Ralston Creek flows to Clear Creek, which is a tributary to the South Platte River. A headgate on Clear Creek diverts water, via two canals, to the West Gravel Lakes, which are used during the summer months as a drinking water source by the City of Thornton. Several wetland segments have been identified along the South Platte River and Ralston, Clear and Big Dry Creeks.

There are at least 34 private wells within one mile of the site. There are no municipal drinking water wells within 4 miles of the site. Threatened and endangered species habitats within 4 miles of the site or within 15 downstream miles of the site have not been identified. There are an estimated 177 and 8,079 people residing within $\frac{1}{4}$ and 1 mile of the site, respectively.

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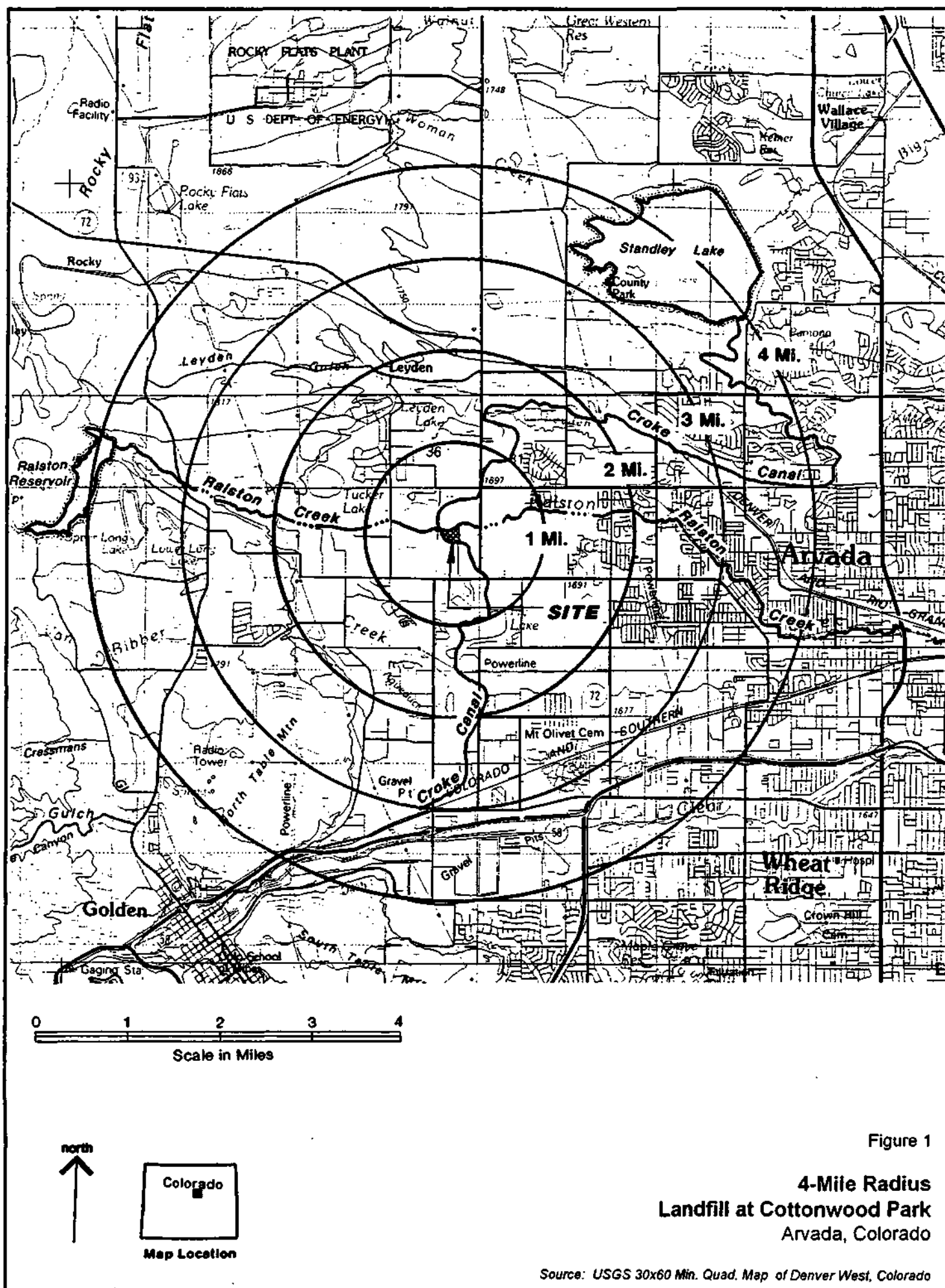
Arvada, Date of Photography: June, 1975,
Golden, Date of Photography: June, 1975,
Lafayette, Date of Photography: June, 1975.

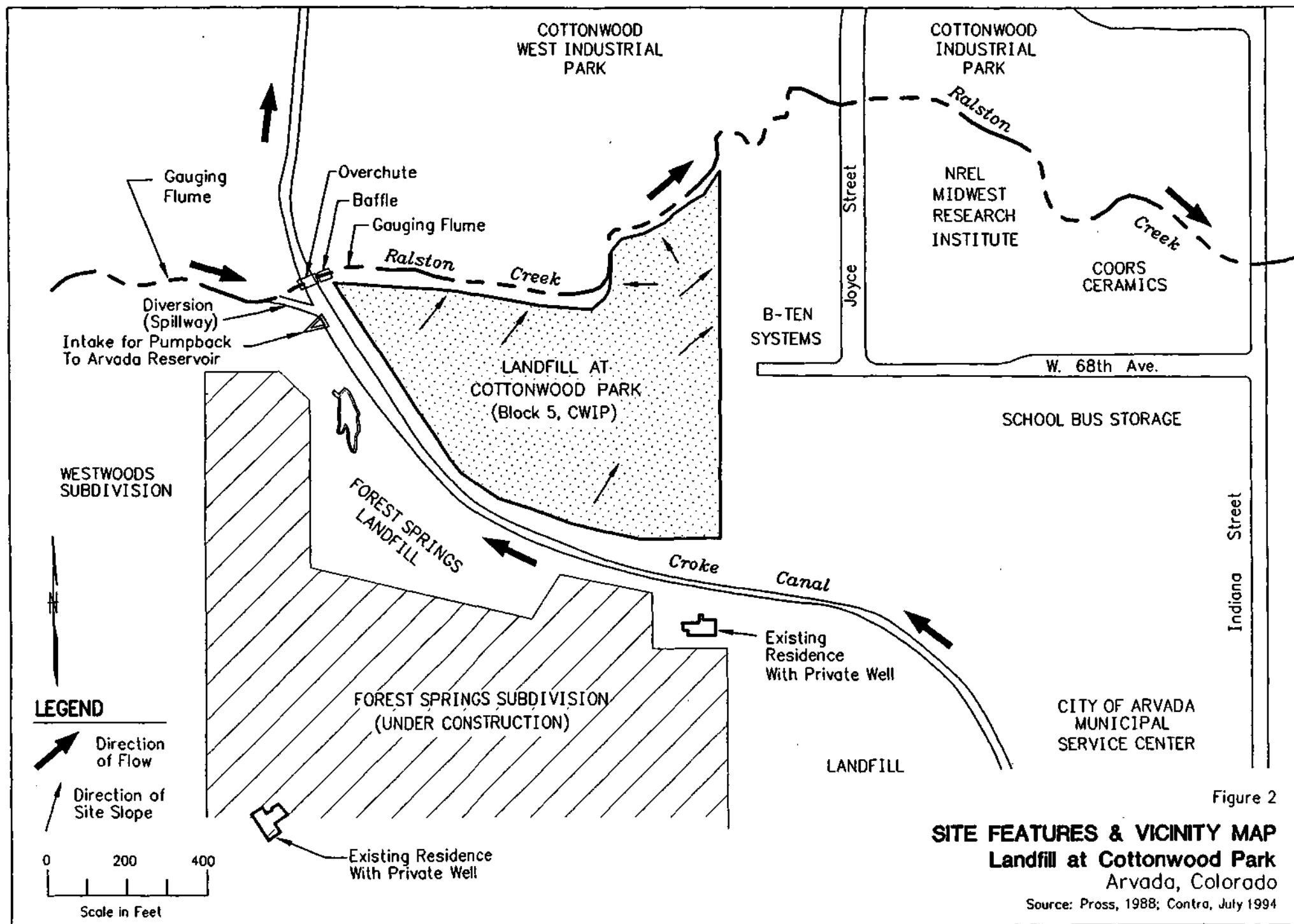
USGS (U.S. Geological Survey), 7.5' topographic maps for the following Colorado quadrangles:

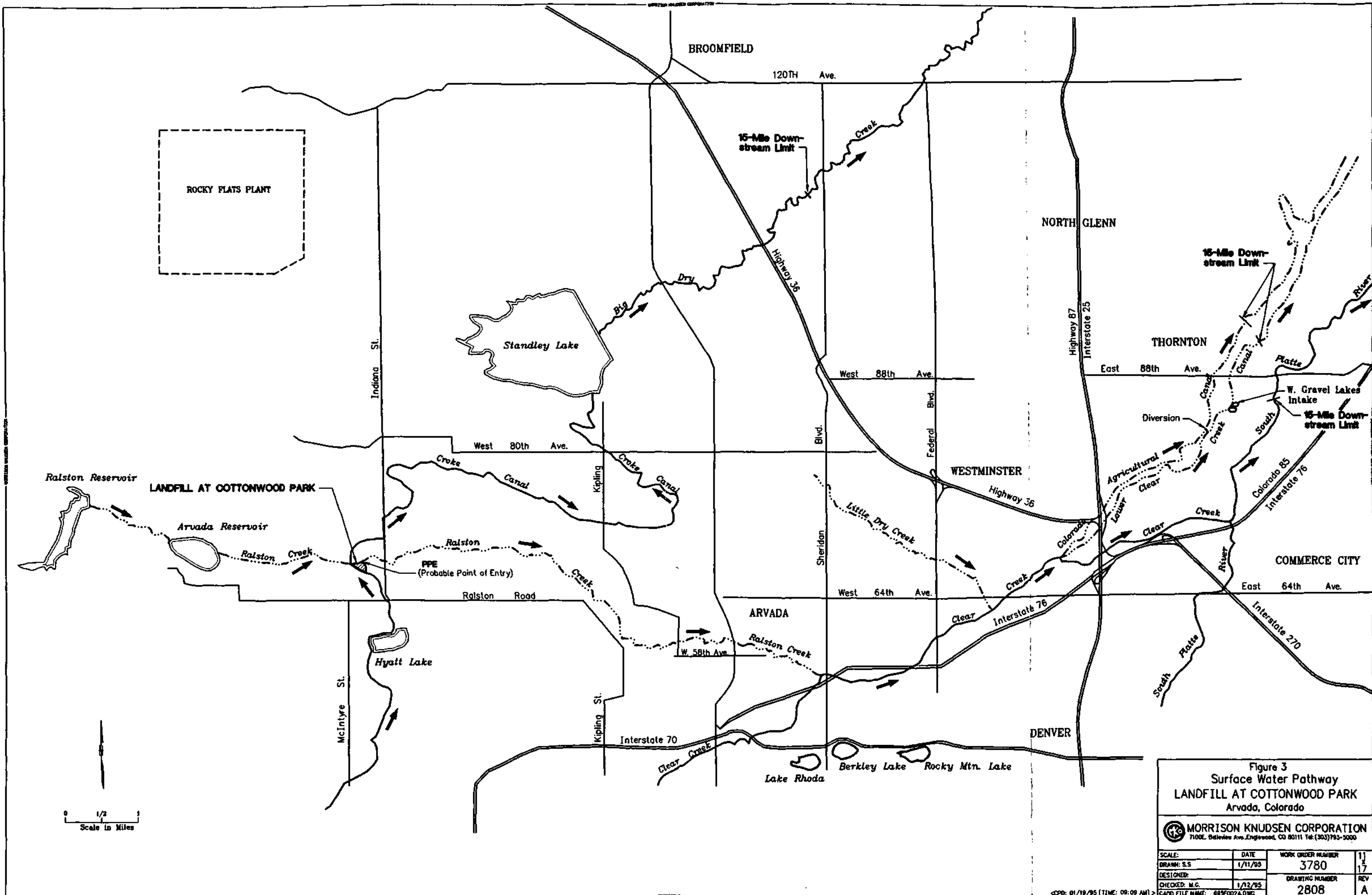
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0 1/2 1
Scale in Miles

Figure 3
Surface Water Pathway
LANDFILL AT COTTONWOOD PARK
Arvada, Colorado

MORRISON KNUDSEN CORPORATION
7100 E. Belview Ave., Englewood, CO 80111 Tel: (303) 793-5000

SCALE:	DATE	WORK ORDER NUMBER	11
DRAWN: S.S.	1/11/93	3780	17
DESIGNED:		DRAWING NUMBER	REV
CHECKED: M.G.	1/12/93	2808	A

CADD FILE NAME: 895002A.DWG

TABLE 1**Summary of Wetlands*
Within 15 Downstream Miles****Ralston Creek-Clear Creek-South Platte River Segment**

<u>Wetland Type</u>	<u>Frontage Distance</u>	<u>Distance from Site</u>	<u>SW Segment</u>
Palustrine Forested (PFOV)	1.62 miles	0	Ralston Creek
Palustrine Scrub/Shrub (PSS)/PFOV	0.48	1.91 miles	Ralston Creek
PFOV	0.19	4.29	Ralston Creek
PFOV	0.57	6.38	Ralston Creek
PFOV	0.86	8.02	Clear Creek
PFOV/Palustrine Emergent (PEM)	2.76	2.25(a)	Ralston Creek

Croke Canal-Standley Lake-Big Dry Creek Segment

PEM	0.1	8.38	Croke Canal
PEM	0.19	8.86	Croke Canal
PEM	0.1	9.62	Standley Lake
PEM/PSS	2.48	10.47	Big Dry Creek
PEM	0.38	14.19	Big Dry Creek
PEM	0.24	14.76	Big Dry Creek

* Meets Wetlands Definition in 40 CFR 230.3

(a) Located along Ralston Creek downstream from Arvada Reservoir (pumpback segment).

(Source: U.S. Fish & Wildlife Service)

Appendix A
EPA Preliminary Assessment Form

Potential Hazardous Waste Site Preliminary Assessment Form		Identification	
		State: <u>CO</u>	CERCLIS Number: <u>0000309054</u>
		CERCLIS Discovery Date: <u>MAY 20, 1994</u>	
1. General Site Information			
Name: <u>Landfill at Cottonwood Park</u>		Street Address: <u>near West 68th Place and Joyce Street</u>	
City: <u>ARVADA</u>	State: <u>CO</u>	Zip Code: _____	County: <u>Jefferson</u> Co. Code: <u>059</u> Cong. Dist: _____
Latitude: <u>39° 48' 18" 0"</u>	Longitude: <u>105° 06' 30" 0"</u>	Approximate Area of Site: <u>13</u> Acres Square Ft. _____	Status of Site: <input type="checkbox"/> Active <input type="checkbox"/> Not Specified <input checked="" type="checkbox"/> Inactive <input type="checkbox"/> NA (TWR phase, etc.)
2. Owner/Operator Information			
Owner: <u>Gibraltar Capital Corporation</u>		Operator: <u>SITE IS INACTIVE</u>	
Street Address: <u>4600 S. Wister Street Suite 700</u>		Street Address: _____	
City: <u>DENVER</u>		City: _____	
State: <u>CO</u>	Zip Code: <u>80231</u>	Telephone: <u>(303) 770-3353</u>	State: _____ Zip Code: _____ Telephone: _____
Type of Ownership: <input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> Federal Agency <input type="checkbox"/> Municipal Name: _____ <input type="checkbox"/> State <input type="checkbox"/> Not Specified <input type="checkbox"/> Indian <input type="checkbox"/> Other: _____		How Initially Identified: <input type="checkbox"/> Citizen Complaint <input type="checkbox"/> Federal Program <input type="checkbox"/> PA Petition <input type="checkbox"/> Incidental <input type="checkbox"/> State/Local Program <input checked="" type="checkbox"/> Not Specified <input type="checkbox"/> RCRA/CERCLA Notification <input type="checkbox"/> Other: _____	
3. Site Evaluator Information			
Name of Evaluator: <u>MARK LUNSFORD</u>		Agency/Organization: <u>MORRISON KNUDSEN CORP.</u>	
Date Prepared: <u>January 13, 1995</u>			
Street Address: <u>7100 E. BELLEVUE AVENUE Suite 500</u>		City: <u>ENGLEWOOD</u> State: <u>CO</u>	
Name of EPA or State Agency Contact: <u>PAT SMITH, SAM, USEPA, REGION 8</u>		Street Address: <u>999 18th Street, Suite 500</u>	
City: <u>DENVER</u>		State: <u>CO</u> Telephone: <u>(303) 293-1262</u>	
4. Site Disposition (for EPA use only)			
Emergency Response/Removal Assessment Recommendation: <input type="checkbox"/> Yes <input type="checkbox"/> No Date: _____		CERCLIS Recommendation: <input type="checkbox"/> Higher Priority SI <input type="checkbox"/> Lower Priority SI <input type="checkbox"/> NFRAP <input type="checkbox"/> RCRA <input type="checkbox"/> Other: _____ Date: _____	
Signature: _____		Name (typed): _____	
Position: _____			



Potential Hazardous Waste Site
Preliminary Assessment Form -

CERCLIS Number:

CO 0000309054

5. General Site Characteristics

Predominant Land Use Within 1 Mile of Site (check all that apply):

- ☒ Industrial ☐ Agriculture ☐ DOI
☐ Commercial ☐ Mining ☐ Other Federal Facility
☒ Residential ☐ DOD
☒ Forest/Fields ☐ DOE ☐ Other _____

Site Setting:

- ☐ Urban
☒ Suburban
☐ Rural

Years of Operation:

Beginning Year 1954

Ending Year 1971 or 72

☐ Unknown

Type of Site Operations (check all that apply):

☐ Manufacturing (must check subcategory)

- ☐ Lumber and Wood Products
☐ Inorganic Chemicals
☐ Plastic and/or Rubber Products
☐ Paints, Varishes
☐ Industrial Organic Chemicals
☐ Agricultural Chemicals
(e.g., pesticides, fertilizers)
☐ Miscellaneous Chemical Products
(e.g., adhesives, explosives, ink)
☐ Primary Metals
☐ Metal Coating, Plating, Engraving
☐ Metal Forging, Stamping
☐ Fabricated Structural Metal Products
☐ Electronic Equipment
☐ Other Manufacturing

☐ Mining

- ☐ Metals
☐ Coal
☐ Oil and Gas
☐ Non-metallic Minerals

☐ Retail

- ☐ Recycling
☐ Junk/Salvage Yard
☐ Municipal Landfill
☒ Other Landfill County

- ☐ DOD
☐ DOE
☐ DOI

☐ Other Federal Facility _____

☐ RCRA

☐ Treatment, Storage, or Disposal

☐ Large Quantity Generator

☐ Small Quantity Generator

☐ Subtitle D

☐ Municipal

☐ Industrial

☐ "Converter"

☐ "Prospective Filter"

☐ "Non- or Low Filter"

☐ Not Specified

☐ Other _____

Waste Generated:

- ☐ Onsite
☒ Offsite
☐ Onsite and Offsite

Waste Deposition Authorized By:

- ☐ Present Owner
☐ Former Owner
☐ Present & Former Owner
☐ Unauthorized
☒ Unknown

Waste Accessible to the Public:

- ☐ Yes
☒ No

Distance to Nearest Dwelling,
School, or Workplace:

~200 Feet

6. Waste Characteristics Information

Source Type:
(check all that apply)

☒ Landfill

☐ Surface Impoundment

☐ Drums

☐ Tanks and Non-Drum Containers

☐ Chemical Waste Pile

☐ Scrap Metal or Junk Pile

☐ Tailings Pile

☐ Trash Pile (open dump)

☐ Land Treatment

☐ Contaminated Ground Water Plume
(unidentified source)

☐ Contaminated Surface Water/Sediment
(unidentified source)

☐ Contaminated Soil

☐ Other _____

☐ No Sources

Source Waste Quantity:
(include units)

13 acres
167,786 yds³

Tier²:

A
V

General Types of Waste (check all that apply)

- ☐ Metals ☐ Pesticides/Herbicides
☐ Organics ☐ Acids/Bases
☐ Inorganics ☐ Oily Waste
☒ Solvents ☒ Municipal Waste
☐ Paints/Pigments ☐ Mining Waste
☐ Laboratory/Hospital Waste ☐ Explosives
☐ Radioactive Waste ☐ Other _____
☒ Construction/Demolition
Waste

Physical State of Waste as Deposited (check all that
apply):

- ☒ Solid ☐ Sludge ☐ Powder
☐ Liquid ☐ Gas

² C = Constituent, W = Wastestream, V = Volume, A = Area

Appendix B
PA Worksheet

PA WORKSHEET

Site Name Landfill at Cottonwood Park City, State Arvada, CO

CERCLIS ID # CO0000309054

Reported by Mark Lunsford Date January 24, 1995

HIGHLIGHTS:

- A) IS THERE QUALITATIVE OR QUANTITATIVE EVIDENCE OF A RELEASE TO AIR, SURFACE WATER, GROUND WATER, OR SURFACE SOIL? DESCRIBE BRIEFLY.

More detail in items GW-1 (for GW), SW-5 (for SW), A-1 (for air), and SE-1 (for soil exposure pathway).

Yes. An oily scum and sheen were observed on the surface of Ralston Creek. Orange discoloration of the creek sediment was also reported.

- B) IS THERE EVIDENCE OF AN **IMPACTED** TARGET POPULATION? DESCRIBE. **None.**

Pathway	Target none/target size	Brief description	More discussion in
Ground Water	public drinking water supply domestic drinking water supply		
Surface Water	drinking water fishery sens. env.		
Soil Exposure	people w/in 200' terrestrial sens. env.		
Air	population		

SITE INFORMATION

G-1. Directions to the site (from nearest easily recognized point).

From Indiana Street proceed west on West 68th Place to its end. Site is west of and behind B-Ten Systems, 6803 Joyce Street and south of Ralston Creek and the Ralston Creek Trail.

G-2. Are there other potential sources in the neighborhood to be aware of as the site is evaluated? eg. Is the site in an industrial area, near a railroad, along a highway? Are sources with similar contaminants to this site in the vicinity?

Yes. The Forest Springs Landfill is located southwest of the site across the Croke Canal. Another landfill is located southeast of the site to the south of the canal. This landfill was used by the City of Arvada or by Sundstrand Fluid Handling, Arvada.

Background/Operating History

G-3. Describe the operating history of the site:

The site was used as a landfill by Jefferson County from 1954 to 1971 or 1972.

Source of information: Ogden, 1991.

G-4. Describe site and nature of operations (property size, manufacturing, waste disposal, storage etc.):

The site covers 13 acres. Fill materials were described as a mixture of wood, paper, glass, plastic and metal.

Source of information: Chen, 1982; Ogden, 1991.

G-5. Describe any emergency or remedial actions that have occurred at the site:

None.

Source of information:

- G-6. Are there records or knowledge of accidents or spills involving site wastes? Are there Emergency Response Notification (ERNS) reports for this location?

No.

Source of information:

- G-7. Describe existing sampling data and briefly summarize data quality (e.g. sample objective, age/comparability, analytical methods, detection limits, QA/QC, validatability):

Acetone, tetrachloroethene, toluene, total xylenes and 1,1,1-trichloroethane were detected at estimated concentrations of less than 100 ppb in an onsite soil sample collected in December, 1991.

Source of information: Ogden, 1991

- G-8. Is there any other local, state or federal regulatory involvement? Describe. Include permits, and names of contact individuals within each government organization. None.

AGENCY	PROGRAM	CONTACT	PHONE	PERMIT

- G-9. Attach site sketch or schematic. Include all pertinent features including wells, storage areas, underground storage tanks, source areas, buildings, access roads, areas of ponded water. Refer to figure(s) submitted with text of report if appropriate.

See Figure 2 in PA report.

SOURCE CHARACTERIZATION

WC-1. Describe each source at the site, on Table 1, in terms of source type, containment, size/area/volume/quantity, and substances present. See HRS Tables 2-5 and 5-2 for source descriptions, Tables 3-2, 4-2, 4-8, 5-6, 6-3, and 6-9 for containment.

Landfill Area = 13 acres, volume unknown. No liner, run-on control system or runoff management system is present. The site is moderately accessible. The Ralston Creek Trail is adjacent to the site. This trail crosses over bridges at Ralston Creek and the Croke Canal. There is no gas collection/treatment system and the site is not surrounded by an engineered windbreak. The site is covered with 3 feet of sandy clay.

WC-2. Briefly describe how waste quantity was estimated (eg. historical records or manifests, permit applications, air photo measurements, etc.):

The thickness of the trash fill varied from 8 to 16 feet. If an 8 foot thickness is assumed to be present over the entire site area, the trash volume would be approximately 167,786 cubic yards.

$$43,560 \text{ ft}^2/\text{acre} \times 13 \text{ acres} = 4,530,240 \text{ ft}^2$$

$$4,530,240 \text{ ft}^2 \times 1 \text{ yd}^3/27 \text{ ft}^3 = 167,786.66 \text{ yds}^3$$

Source of information: Chen, 1982

WC-3. Describe any restrictions or barriers to accessibility of onsite sources.

The site is not fenced.

Source of information:

GROUND WATER CHARACTERISTICS

GW-1. Any positive or circumstantial evidence of a release to ground water? Describe.

No.

Source of information:

GW-2. Any positive or circumstantial evidence of a release to drinking water users? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

No.

Source of information:

GW-3. Briefly describe the geologic setting.

Unconsolidated deposits at the site are Broadway alluvium, which consists of silty, cobbly gravel and coarse sand. Bedrock formations beneath the site include the Arapahoe, Laramie and Fox Hills sandstone. Claystone and quartzose sandstone are present in the Arapahoe and Laramie Formations.

GW-4. Describe geologic/hydrogeologic units on Table 2. Give names, descriptions, and characteristics of consolidated and unconsolidated zones beneath the site.

GW-5. Is the site in an area of karst terrain or a karst aquifer?

No.

GW-6. Net Precipitation (per HRS section 3.1.2.2).

Net Factor Value = 1 (Figure 3-2)

SURFACE WATER CHARACTERISTICS

SW-1. Mean annual precipitation (per HRS section 4.0.2) = 15.6". If less than 20", then count intermittent channels as surface water.

SW-2. Discuss the probable surface water flow pattern from the site to surface waters:

There are 2 separate flow paths at the site. Ralston Creek flows along the northern border of the site and eventually empties into Clear Creek, which is a tributary to the South Platte River. The Croke Canal bounds the site on the west and south. The canal flows to Standley Lake. Big Dry Creek flows beyond the Standley Lake Dam.

Source of information: **Ogden, 1991; USGS, 1980**

SW-3. If surface water exists within 2 miles of the site, describe surface water segments within the 15-mile distance limit.

	Segment Name	River/Lake Type	Fresh/Salt Water	Start (mi.)	End (mi.)	Flow in cfs
(A)	Croke Canal	River	Fresh	0	9.5	0-50
	Standley Lake	Lake	Fresh	9.5	10.25	?
	Big Dry Creek	River	Fresh	10.25	15	13.7
*(B)	Croke Canal	River	Fresh	0	0.25	0-50
	Pumpback to Arvada Res.	River	Fresh	0.25	2.25	?
	Ralston Creek	River	Fresh	2.25	11.3	10-20
(C)	Clear Creek	River	Fresh	11.3	15	184
	Ralston Creek	River	Fresh	0	7.05	10-20
	Clear Creek	River	Fresh	7.05	13.25	184
*(D)	South Platte River	River	Fresh	13.25	15	489
	Ralston Creek	River	Fresh	0	7.05	10-20
	Clear Creek	River	Fresh	7.05	9.5	184
	Diversion for 2 Canals	River	Fresh	9.5	13.9	0-100
	West Gravel Lakes	Lake	Fresh	13.9	14.3	175-230

* B and D are drinking water pathways that vary from the natural surface water pathway (see PA Report for exploration).

Ground water to surface water distance 0 Angle Θ 300°

SW-4. Provide a schematic diagram or simple figure which describes surface water segments, locates targets, identifies flow direction, PPE(s), etc. Refer to figure(s) submitted with text of report if appropriate. See Figures 2 and 3 in PA Report.

SW-5. Any positive or circumstantial evidence of a release to surface water? **Yes.** Evidence of a release by direct observation? **No.** Is the source located in surface water? **No.** Describe.

An oily scum and sheen were observed on the surface of Ralston Creek. Orange discoloration of the creek sediment was also reported.

Source of information: **Ogden, 1991**

SW-6. Any positive or circumstantial evidence of a release to surface water target populations? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

No.

Source of information:

SW-8. Is the site or portions thereof located in surface water? **No.**

Is the site located in the 1 - <10 yr floodplain?	No
>10-100 yr?	No
>100-500 yr?	No
>500 yr?	Unknown

SW-9. Two-year 24-hour rainfall ?

TARGETS

T-1. Discuss ground water usage within four mile of the site:

Eight different entities supply drinking water to the area within 4 miles. There are at least two private wells within ¼ mile.

Source of information: Downey, Hays, Kadnuck, Lacy, Pettit, Streitelmeier, Sullivan

T-2. Summarize the drinking water population served via Ground Water within 4 miles of the site:

0 - 1/4 mi 6

1/4 - 1/2 mi _____

1/2 - 1 mi _____

Areas within 4 miles of the site are served by 8 water districts. There are no municipal wells, and limited use of private wells is likely.

1 - 2 mi _____

2 - 3 mi _____

3 - 4 mi _____

Attach calculations for population apportionment in blended systems.

T-3. Identify and locate any of the following surface water targets within 15 miles of the site: drinking water population(s) served by intakes, fisheries, sensitive environments described in Table 4-23 of the HRS, and wetlands as defined in the Federal Register.

Targets	Distance From Site	SW Body	Flow in cfs	Population Served/Size (units)	Contamination Known/Suspected
(1) Arvada Reservoir	2 miles	Lake	?	~ 30,409 Users	No
(2) Standley Lake	9.5 miles	Lake	?	~ 123,473 Users	No
(3) West Gravel Lakes	14.3 miles	Lake	175-230	~ 40,000 Users	No
(4) Clear Creek	7 miles	River	184	1 lb/yr	No
(5) South Platte River	13.2 miles	River	305	1 lb/yr	No

(1) Via Ralston Creek; pop. is 75% of Arvada.

(2) Via Croke Canal, pop. is 65% of Arvada, 100% of Northglenn and 50% of Thornton.

(3) Via Ralston and Clear Creeks, and Lower Clear Creek and Colorado Agriculture Canals; Pop. is 50% of Thornton.

See Table 1 in PA report for a summary of wetlands within 15 downstream miles.

T-4. Summarize the population within a four-mile radius of the site:

	<u>Total Pop.</u>	<u>Worker Pop.</u>
Onsite	<u>0</u>	<u>0</u>
0 - 1/4 mi	<u>117</u>	
1/4 - 1/2 mi	<u>2,535</u>	
1/2 - 1 mi	<u>5,427</u>	
1 - 2 mi	<u>11,911</u>	
2 - 3 mi	<u>31,589</u>	
3 - 4 mi	<u>46,097</u>	

T-5. Identify and locate any terrestrial sensitive environments described in Table 5-5 of the HRS.

None.

T-6. Describe any positive or circumstantial evidence of a release to air target populations? Of a release by direct observation where target population exists within 1/4 mile of the site? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

None.

T-7. Identify and locate any potential or known resident soil exposure populations, if present. Describe conditions which lead the researcher to suspect contaminated soil within 200' of residences, if this condition exists.

None.

TABLE 1

WASTE CONTAINMENT AND HAZARDOUS SUBSTANCE IDENTIFICATION^{*}

SOURCE TYPE	SIZE (Volume/Area)	ESTIMATED WASTE QUANTITY	SPECIFIC COMPOUNDS	CONTAINMENT [*]	SOURCES OF INFORMATION
Landfill	13 acres	167,786 yds ³	Acetone Tetrachloroethene Toluene Total Xylenes 1,1,1-Trichloroethane	There is no data indicating that a liner is present beneath the site.	Ogden, 1991 Chen, 1982

^{*}Evaluate containment of each source from the perspective of each migration pathway (e.g., ground water pathway - non-existent, natural or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.)

TABLE 2
HYDROGEOLOGIC INFORMATION¹

STRATA NAME/DESCRIPTION	THICKNESS (ft.)	HYDRAULIC CONDUCTIVITY (cm/sec)	TYPE OF DISCONTINUITY*	SOURCE OF INFORMATION
Broadway Alluvium (silty cobbly gravel and coarse sand)	23 feet	10.E-2	Not an aquifer	USGS, 1972 CTL/Thompson, Inc., 1985
Arapahoe Formation (quartzose sandstone, silty claystone, mudstone and conglomerate)	400 to 500 feet	variable	None	USGS, 1972 USGS, 1976 USGS, 1979 USGS, 1982
Laramie Formation (claystone, siltstone, shale and quartzose sandstone)	560 to 985 feet	variable	None	USGS, 1972 USGS, 1976 USGS, 1979 USGS, 1982
Fox Hills Formation (micaceous, quartzose sandstone and shale)	60 to 500 feet	variable	None	USGS, 1972 USGS, 1976 USGS, 1979 USGS, 1982

*Identify the type of aquifer discontinuity within four-miles from the site (e.g., river, strata "pinches out", etc.)

Appendix C
CERCLA Eligibility Form

CERCLA Eligibility Worksheet

Site Name LANDFILL AT COTTONWOOD PARK

City ARVADA State CO

EPA ID Number CO 0000309054

Note: The site is automatically CERCLA eligible if it is a Federally owned or operated RCRA site.

I. CERCLA Eligibility

Did the facility cease operations prior to November 19, 1980?

YES

If YES, then STOP. The facility is probably a CERCLA site.
If NO, continue to part II

II. RCRA Deferral Factors

Did the facility file a RCRA Part A application?

If YES:

1. Does the facility currently have interim status? _____
2. Did the facility withdraw its Part A application? _____
3. Is the facility a known or possible protective filer? (filed in error) _____
4. Does the facility have a RCRA operating or post closure permit? _____
5. Is the facility a late (after 11/19/80) or non-filer that has been identified by the EPA or the State? (facility did not know it needed to file under RCRA) _____

**PA Guidance
EPA Region VIII
August 1993**

Type of facility:

**Generator_____ Transporter_____ Recycler _____
TSD (Treatment/Storage/Disposal) _____**

If all answers to questions 1, 2, and 3 are NO, STOP. The facility is a CERCLA eligible site.

If answer to #2 or #3 is YES, STOP. The facility is a CERCLA eligible site.

If answer to #2 and #3 are NO and any other answer is YES, site is RCRA, continue to part III.

III. RCRA Sites Eligible for the NPL

Has the facility owner filed for bankruptcy under Federal or State laws? _____

Has the facility lost RCRA authorization to operate or shown probable unwillingness to carry out corrective action? _____

Is the facility a TSD that converted to a generator, transporter or recycler facility after November 19, 1980? _____

IV. Exempted substances:

Does the release involve hazardous substances other than petroleum? _____

PA Guidance
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V. Other programs: The site may never reach the NPL or be a candidate for removal. We need to be able to refer it to any other programs in EPA or state agencies which may have jurisdiction, and thus be able to effect a cleanup. Responses should summarize available information pertaining to the question. Include information in existing files in these programs as part of the PA. Answer all that apply.

Is there an owner or operator? YES

NPDES-CWA: Is there a discharge water containing pollutants with surface water through a point source (pipe, ditch, channel, conduit, etc.)?

storm water drainage from a subdivision and landfill adjacent to the site will be collected and siphoned underneath the Croke Canal and discharge into Ralston Creek adjacent to the site. MK has not verified if the siphon has been constructed yet.

CWA (404): Have fill or dredged material been deposited in a wetland or on the banks of a stream? Is there evidence of heavy equipment operating in ponds, streams or wetlands?

NO.

UIC-SDWA: Are fluids being disposed of to the subsurface through a well, cesspool, septic system, pit, etc.?

NO.

TSCA: Is it suspected that there are PCB's on the site which came from a source with greater than 50 ppm PCB's such as oil from electrical transformers or capacitors?

NO.

FIFRA: Is there a suspected release of pesticides from a pesticide storage site? Are there pesticide containers on site?

NO.

**PA Guidance
EPA Region VIII
August 1993**

RCRA (D): Is there an owner or operator who is obligated to manage solid waste storage or disposal units under State solid waste or ground water protection regulations?

NO.

UST: Is it suspected that there is a leaking underground storage tank containing a product which is a hazardous substance or petroleum?

NO.

Appendix D

Photo Log



Color Photo(s)

The following pages
contain color that does
not appear in the
scanned images.

To view the actual images, please
contact the Superfund Records
Center at (303) 312-6473.



Photo No.

1



Site Name:

Landfill at

Cottonwood Park

Location:

Arvada, CO

CERCLIS #:

CO0000309054

Photographer/Witness M. Lunsford

Date 1/03/95

Time 0855

Direction Northeast

Description The Ralston Creek Trail lies parallel to Ralston Creek north of the site.

In the background is the northwest portion of Cottonwood West Industrial Park.

Photo No.

2



Photographer/Witness M. Lunsford

Date 1/03/95

Time 0900

Direction West

Description Stream gauging flume (foreground) and baffle structure (background) along

Ralston Creek on downstream side of Croke Canal overchute structure.

Page 1

Of 4



Photo No.

3



Site Name:

Landfill at

Cottonwood Park

Location:

Arvada, CO

CERCLIS #:

CO0000309054

Photographer/Witness M. Lunsford

Date 1/03/95

Time 0905

Direction Northwest

Description View of Croke Canal adjacent to Northwest corner of site. The overchute structure above the canal conveys Ralston Creek over the canal. The small headgate along the canal is an intake for water pumped back to Arvada Reservoir, which is located upstream of the overchute on Ralston Creek.

Photo No.

4



Photographer/Witness M. Lunsford

Date 1/03/95

Time 0910

Direction Southeast

Description View of Croke Canal upstream of Ralston Creek overchute. The site is to the left of the canal. The mound behind the tree to the right of the Canal is Forest Springs Landfill.

Page 2

Of 4



Photo No.

5



Site Name:

Landfill at

Cottonwood Park

Location:

Arvada, CO

CERCLIS #:

CO0000309054

Photographer/Witness M. Lunsford

Date 1/03/95

Time 0915

Direction West

Description View from Croke Canal bridge along Ralston Creek Trail toward the Westwoods

Subdivision.

Photo No.

6



Photographer/Witness M. Lunsford

Date 1/03/95

Time 0920

Direction South

Description View from Croke Canal bridge of Forest Springs Subdivision. The mound at the
left is Forest Springs Landfill.

Page 3

Of 4



Photo No.

7



Site Name:

Landfill at

Cottonwood Park

Location:

Arvada, CO

CERCLIS #:

CO0000309054

Photographer/Witness M. Lunsford

Date 1/03/95

Time 0925

Direction Southwest

Description View from Ralston Creek Trail across Ralston Creek (which lies below the trees)
of site slope. North Table Mountain is in the left background.

Photo No.

8



Photographer/Witness M. Lunsford

Date 1/03/95

Time 0930

Direction ENE

Description Ralston Creek downstream from site with Joyce Street bridge in background.
Note the cattails at right.

Page 4

Of 4