



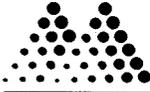








# **ATTACHMENT C**



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

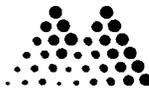
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB  
Matrix: Waste Water

MSAI Sample: 23534  
MSAI Group: 5810  
Date Reported: 09/09/94  
Discard Date: 10/09/94  
Date Submitted: 08/29/94  
Date Sampled: 08/25/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.91	mg/l	0.10
7243 Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250 Calcium by ICP Method: SW-846 6010A	464	mg/l	1.0
7253 Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7257 Magnesium by ICP Method: SW-846 6010A	313	mg/l	1.0
7258 Manganese by ICP Method: SW-846 6010A	ND	mg/l	0.02
7261 Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262 Potassium by ICP Method: SW-846 6010A	28.9	mg/l	1.0
7267 Sodium by ICP Method: SW-846 6010A	448	mg/l	1.0
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	314	mg/l	1





## Mountain States Analytical

Eckhoff, Watson & Preator Engineering *The Quality Solution*

Sample ID: CRB

MSAI Sample: 23534  
MSAI Group: 5810

Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,120	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,730	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	20.0	mg/l	1.0
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,560	mg/l	2

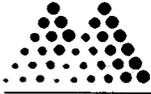
ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



# Analytical Report



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB  
Matrix: Waste Water

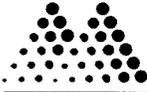
MSAI Sample: 23534  
MSAI Group: 5810  
Date Reported: 09/09/94

Discard Date: 10/09/94  
Date Submitted: 08/29/94  
Date Sampled: 08/25/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.91	mg/l	0.10
7243 Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250 Calcium by ICP Method: SW-846 6010A	464	mg/l	1.0
7253 Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7257 Magnesium by ICP Method: SW-846 6010A	313	mg/l	1.0
7258 Manganese by ICP Method: SW-846 6010A	ND	mg/l	0.02
7261 Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262 Potassium by ICP Method: SW-846 6010A	28.9	mg/l	1.0
7267 Sodium by ICP Method: SW-846 6010A	448	mg/l	1.0
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	314	mg/l	

INCORPORATED  
EFFECTIVE:  
AUG 16 1994





## Mountain States Analytical

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Eckhoff, Watson & Preator Engineering *The Quality Solution*

MSAI Sample: 23534  
MSAI Group: 5810

Sample ID: CRB

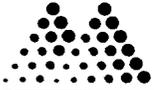
Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,120	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,730	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	20.0	mg/l	1.0
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,560	mg/l	2

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

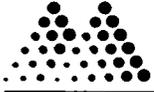
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Matrix: Waste Water

MSAI Sample: 23535  
MSAI Group: 5810  
Date Reported: 09/09/94

Discard Date: 10/09/94  
Date Submitted: 08/29/94  
Date Sampled: 08/25/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved, w/ww Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.06	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	474	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	0.55	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	304	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.33	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	34.5	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	435	mg/l	1





**Mountain States Analytical**

Eckhoff, Watson & Preator Engineering The Quality Solution

Sample ID: CRS Dissolved

Page 2

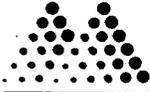
MSAI Sample: 23535  
MSAI Group: 5810

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

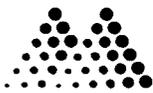
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Matrix: Waste Water

MSAI Sample: 23536  
MSAI Group: 5810  
Date Reported: 09/09/94

Discard Date: 10/09/94  
Date Submitted: 08/29/94  
Date Sampled: 08/25/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved, w/ww Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.13	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	487	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	0.29	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	344	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.56	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	37.6	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	487	mg/l	1





## Mountain States Analytical

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Sample ID: CRC Dissolved

MSAI Sample: 23536  
MSAI Group: 5810

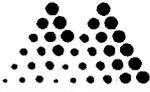
ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

---

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

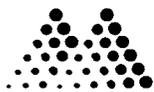
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Matrix: Waste Water

MSAI Sample: 23537  
MSAI Group: 5810  
Date Reported: 09/09/94

Discard Date: 10/09/94  
Date Submitted: 08/29/94  
Date Sampled: 08/25/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
0243D	Aluminum by ICP, Dissolved, w/ww Method: SW-846 6010A	ND	mg/l	0.2
0248D	Boron by ICP, Dissolved Method: SW-846 6010A	0.95	mg/l	0.10
0250D	Calcium by ICP, Dissolved Method: SW-846 6010A	483	mg/L	1.0
0253F	Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F	Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D	Magnesium by ICP, Dissolved Method: SW-846 6010A	327	mg/L	1.0
0258F	Manganese by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0261F	Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D	Potassium by ICP, Dissolved Method: SW-846 6010A	30.2	mg/L	1.0
0267F	Sodium by ICP, Dissolved Method: SW-846 6010A	465	mg/l	1





**Mountain States Analytical**

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Sample ID: CRB Dissolved

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MSAI Sample: 23537  
MSAI Group: 5810

ND - Not detected at the limit of quantitation

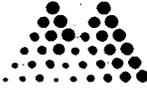
Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





# Analytical Report



## Mountain States Analytical

The Quality Solution

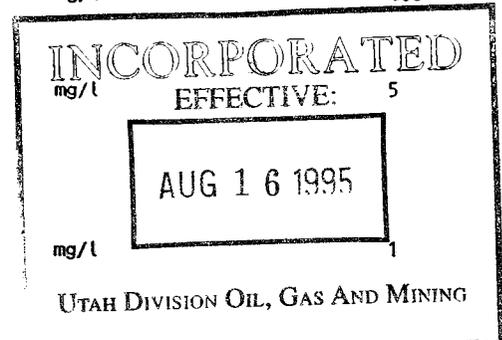
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

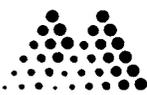
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS - Source  
Matrix: Waste Water

MSAI Sample: 24548  
MSAI Group: 6059  
Date Reported: 10/05/94  
  
Discard Date: 11/04/94  
Date Submitted: 09/22/94  
Date Sampled: 09/20/94  
Collected by: JAM  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.01	mg/l	0.10
7243 Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250 Calcium by ICP Method: SW-846 6010A	471	mg/l	1.0
7253 Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254 Iron by ICP Method: SW-846 6010A	8.78	mg/l	0.10
7257 Magnesium by ICP Method: SW-846 6010A	297	mg/l	1.0
7258 Manganese by ICP Method: SW-846 6010A	1.43	mg/l	0.02
7261 Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262 Potassium by ICP Method: SW-846 6010A	35.7	mg/l	1.0
7267 Sodium by ICP Method: SW-846 6010A	437	mg/l	
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	470	mg/l	





## Mountain States Analytical

Page 2

Eckhoff, Watson & Preator Engineering  
*The Quality Solution*

MSAI Sample: 24548  
MSAI Group: 6059

Sample ID: CRS - Source

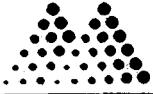
Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Carbonate Hydroxide	ND ND	mg/l mg/l	1 1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	67	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,490	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,650	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	1.7	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	72	mg/l	
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,260	mg/l	2

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

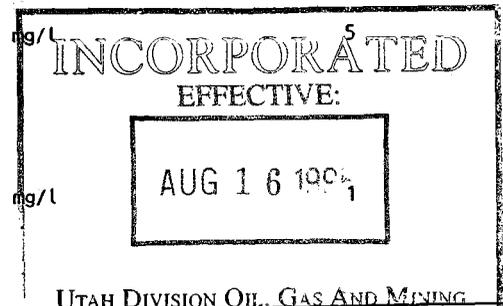
Attn: Mr. Scott Carlson  
Project: Sunnyside

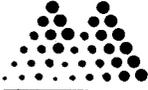
Sample ID: CRC - Culvert  
Matrix: Waste Water

MSAI Sample: 24549  
MSAI Group: 6059  
Date Reported: 10/05/94

Discard Date: 11/04/94  
Date Submitted: 09/22/94  
Date Sampled: 09/20/94  
Collected by: JAM  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.04	mg/l	0.10
7243 Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250 Calcium by ICP Method: SW-846 6010A	445	mg/l	1.0
7253 Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254 Iron by ICP Method: SW-846 6010A	15.6	mg/l	0.10
7257 Magnesium by ICP Method: SW-846 6010A	309	mg/l	1.0
7258 Manganese by ICP Method: SW-846 6010A	1.41	mg/l	0.02
7261 Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262 Potassium by ICP Method: SW-846 6010A	36.5	mg/l	1.0
7267 Sodium by ICP Method: SW-846 6010A	441	mg/l	
0201 Alkalinity as CaCO3 (pH 4.5) Method: EPA 310.1 Bicarbonate	386	mg/l	





## Mountain States Analytical

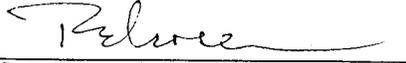
Eckhoff, Watson & Preator Engineering *The Quality Solution*

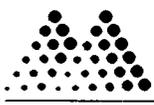
Sample ID: CRC - Culvert

MSAI Sample: 24549  
MSAI Group: 6059

Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Carbonate Hydroxide	ND ND	mg/l mg/l	1 1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	14	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,680	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,950	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	22	mg/l	
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,820	mg/l	2

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: Sunnyside

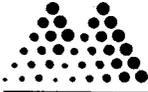
Sample ID: CRB - Boundary  
 Matrix: Waste Water

MSAI Sample: 24550  
 MSAI Group: 6059  
 Date Reported: 10/05/94  
 Discard Date: 11/04/94  
 Date Submitted: 09/22/94  
 Date Sampled: 09/20/94  
 Collected by: JAM  
 Purchase Order:  
 Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.82	mg/l	0.10
7243 Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250 Calcium by ICP Method: SW-846 6010A	441	mg/l	1.0
7253 Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7257 Magnesium by ICP Method: SW-846 6010A	295	mg/l	1.0
7258 Manganese by ICP Method: SW-846 6010A	0.07	mg/l	0.02
7261 Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262 Potassium by ICP Method: SW-846 6010A	28.2	mg/l	1.0
7267 Sodium by ICP Method: SW-846 6010A	426	mg/l	5
0201 Alkalinity as CaCO3 (pH 4.5) Method: EPA 310.1 Bicarbonate	322	mg/l	

**INCORPORATED**  
 EFFECTIVE:  
AUG 16 1995





## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Page 2

Sample ID: CRB - Boundary

MSAI Sample: 24550  
MSAI Group: 6059

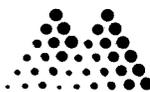
Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Carbonate Hydroxide	ND ND	mg/l mg/l	1 1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,240	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,550	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	12	mg/l	
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,070	mg/l	2

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

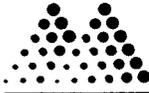
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS - Source ~~Dissolved~~ *TOTAL*  
Matrix: Waste Water

MSAI Sample: 24551  
MSAI Group: 6059  
Date Reported: 10/05/94  
  
Discard Date: 11/04/94  
Date Submitted: 09/22/94  
Date Sampled: 09/20/94  
Collected by:  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved, w/ww Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.03	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	476	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	8.84	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	303	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.45	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	36.3	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	440	mg/l	1





## Mountain States Analytical

Eckhoff, Watson & Preator <sup>The Quality Solution</sup> Engineering

Sample ID: CRS - Source ~~Dissolved~~

Page 2

MSAI Sample: 24551

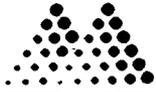
MSAI Group: 6059

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC - Culvert Dissolved **TOTAL**  
Matrix: Waste Water

MSAI Sample: 24552  
MSAI Group: 6059  
Date Reported: 10/05/94

Discard Date: 11/04/94  
Date Submitted: 09/22/94  
Date Sampled: 09/20/94  
Collected by:  
Purchase Order:  
Project No.: EC450593

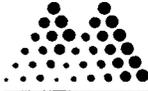
Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved, w/ww Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.08	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	453	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	3.90	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	320	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.13	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	38.2	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	461	mg/L	

INCORPORATED  
EFFECTIVE:

AUG 16 1995

UTAH DIVISION OIL, GAS AND MINING





## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRC - Culvert Dissolved

Page 2

MSAI Sample: 24552  
MSAI Group: 6059

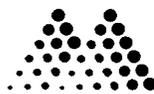
ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

---

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

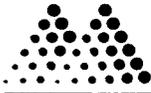
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB - Boundary Dissolved **TOTAL**  
Matrix: Waste Water

MSAI Sample: 24553  
MSAI Group: 6059  
Date Reported: 10/05/94  
  
Discard Date: 11/04/94  
Date Submitted: 09/22/94  
Date Sampled: 09/20/94  
Collected by:  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved, w/ww Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.79	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	432	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	287	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.07	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	27.0	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	406	mg/l	1





## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRB - Boundary ~~Dissolved~~ TOTAL

Page 2

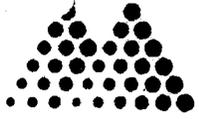
MSAI Sample: 24553  
MSAI Group: 6059

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





# Mountain States Analytical

No 3787

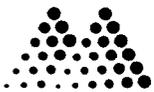
## Sample Chain of Custody

Client Name: <u>EWP Engineering</u> P.O. # _____		Analysis Required					Total of Containers	Temp. of Samples Upon Receipt
Phone #: <u>801-261-0090</u> Fax #: <u>801-266-1671</u>								
Project Name/ #: <u>Sunnyside - EC 450593</u>								
Sampler: <u>John A. Martin</u>								
Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Remarks
CRS - Source	9/20/94	1435				X		
CRC - Culvert	9/20/94	1530				X		
CRB - Boundary	9/20/94	1630				X		

Analysis Required  
 As per previous sampling events

Name of Shipper	Airbill No.	Date	Time	Sample relinquished by:	Date	Time	Sample received by:	Date	Time
UPS	317345585	9/21/94	1400	John A. Martin	9/21/94	1030			
Received By (Lab)	Date	Time	Seals Intact?						
John K. [Signature]	9/20/94	1415	Yes						
Turnaround Time Requested (please circle): <u>Normal</u> Rush									
Report Results By: (Date)									
Rush results requested by (please circle): _____ Phone Fax									
Report Results to: <u>Scott Carlson</u>				Type of Disposal:			Authorized for Disposal by:		
<u>EWP Engineering 1121 E. 3900 South C-100</u>				Date/Time of Disposal:			Disposed of by:		
<u>Salt Lake City UT 84124</u>									

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278



## Mountain States Analytical

The Quality Solution

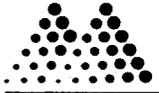
Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: Sunnyside

Sample ID: CRS-Dissolved  
 Matrix: Waste Water

MSAI Sample: 25448  
 MSAI Group: 6260  
 Date Reported: 10/25/94  
 Discard Date: 11/24/94  
 Date Submitted: 10/13/94  
 Date Sampled: 10/12/94  
 Collected by: JC  
 Purchase Order:  
 Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved 6010A Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.13	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	503	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	318	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.47	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	37.5	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	466	mg/l	1



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRS-Dissolved

Page 2

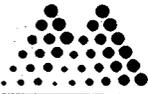
MSAI Sample: 25448

MSAI Group: 6260

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: Sunnyside

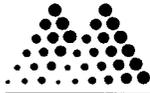
Sample ID: CRC-Dissolved  
 Matrix: Waste Water

MSAI Sample: 25449  
 MSAI Group: 6260  
 Date Reported: 10/25/94

Discard Date: 11/24/94  
 Date Submitted: 10/13/94  
 Date Sampled: 10/12/94  
 Collected by: JC  
 Purchase Order:  
 Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved 6010A Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.14	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	483	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	338	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.30	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	39.2	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	491	mg/l	1

INCORPORATED  
 EFFECTIVE:  
 AUG 16 1904



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRC-Dissolved

Page 2

MSAI Sample: 25449

MSAI Group: 6260

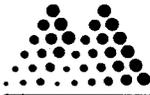
ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

*Pamela K. Larsen*

Rolf E. Larsen

Project Manager *for*



## Mountain States Analytical

The Quality Solution

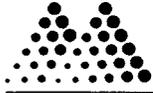
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB-Dissolved  
Matrix: Waste Water

MSAI Sample: 25450  
MSAI Group: 6260  
Date Reported: 10/25/94  
Discard Date: 11/24/94  
Date Submitted: 10/13/94  
Date Sampled: 10/12/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved 6010A Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.86	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	470	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	313	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.19	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	29.2	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	453	mg/l	1



## Mountain States Analytical

Eckhoff, Watson & Preator *The Quality Solution*  
Engineering

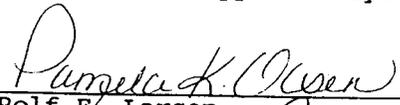
Sample ID: CRB-Dissolved

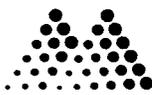
Page 2

MSAI Sample: 25450  
MSAI Group: 6260

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

  
\_\_\_\_\_  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

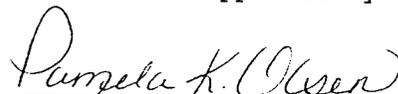
Sample ID: CRS  
Matrix: Waste Water

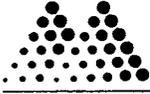
MSAI Sample: 25451  
MSAI Group: 6260  
Date Reported: 10/25/94

Discard Date: 11/24/94  
Date Submitted: 10/13/94  
Date Sampled: 10/12/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test	Analysis	Results as Received	Units	Limit of Quantitation
7254	Iron by ICP Method: SW-846 6010A	8.99	mg/l	0.10
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	21	mg/l	4

Respectfully Submitted,  
Reviewed and Approved by:

  
\_\_\_\_\_  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC  
Matrix: Waste Water

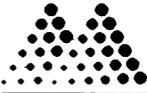
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MSAI Group: 6260  
Date Reported: 10/25/94

Discard Date: 11/24/94  
Date Submitted: 10/13/94  
Date Sampled: 10/12/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test	Analysis	Results as Received	Units	Limit of Quantitation
----	-----	-----	-----	-----
7254	Iron by ICP Method: SW-846 6010A	3.50	mg/l	0.10
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	9	mg/l	4

Respectfully Submitted,  
Reviewed and Approved by:

  
\_\_\_\_\_  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

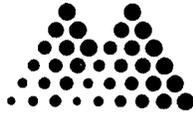
Sample ID: CRB  
Matrix: Waste Water

MSAI Sample: 25453  
MSAI Group: 6260  
Date Reported: 10/25/94  
Discard Date: 11/24/94  
Date Submitted: 10/13/94  
Date Sampled: 10/12/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
7254 Iron by ICP Method: SW-846 6010A	0.14	mg/l	0.10
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:  
EFFECTIVE:  
*Rolf E. Larsen*  
Rolf E. Larsen  
Project Manager



# Mountain States Analytical

No 4007

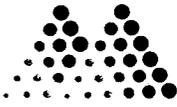
## Sample Chain of Custody

REL

Client Name: <u>E.W.P. ENGINEERING</u> P.O. # _____							Analysis Required										Temp. of Samples Upon Receipt							
Phone #: <u>801-261-0090</u> Fax #: <u>1-801-266-1671</u>																								
Project Name/#: <u>SUNNYSIDE EC450593</u>							COARSE REFUSE SEEP										Temp. of Samples Upon Receipt							
Sampler: <u>J. Comas</u> <u>*CONTACT SCOTT CARLSON@E.W.P. OFFICE</u>																								
Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	Rush?										Remarks					
CRS	10-12-94	1600	✓			✓		3																
CRC	10-12-94	1630	✓			✓		3																
CRB	10-12-94	1650	✓			✓		3																
Name of Shipper											Airbill No.		Date	Time	Sample relinquished by:			Date	Time	Sample received by:			Date	Time
															J. Comas			10-13-94	1508					
Received By (Lab)		Date	Time	Seals Intact?																				
Mail Bestn		10/13/94	15:08	OK!																				
Turnaround Time Requested (please circle): Normal Rush																								
(Rush TAT is subject to MSAI approval and surcharge)																								
Report Results By: (Date) _____																								
Rush results requested by (please circle): Phone Fax																								
Report Results to: _____																								
											Type of Disposal:					Authorized for Disposal by:								
											Date/Time of Disposal:					Disposed of by:								

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Cop turn to Customer Pink Copy - Retain by Sampler



# Mountain States Analytical

---

November 9, 1994

Mr. Scott Carlson  
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

RECEIVED

NOV 14 1994

ECKHOFF, WATSON & PREATOR  
ENGINEERING

Reference:

Project: Sunnyside  
Project No.: EC450593  
MSAI Group: 6408

Dear Mr. Carlson:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

CRS	CRC	CRB
CRS Dissolved	CRC Dissolved	CRB Dissolved

All holding times were met for the tests performed on these samples.

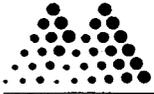
If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

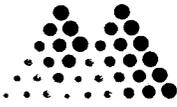
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS  
Matrix: Waste Water

MSAI Sample: 26143  
MSAI Group: 6408  
Date Reported: 11/09/94

Discard Date: 12/09/94  
Date Submitted: 10/28/94  
Date Sampled: 10/27/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	1.10	mg/l	0.10
7243	Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250	Calcium by ICP Method: SW-846 6010A	500	mg/l	1.0
7253	Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254	Iron by ICP Method: SW-846 6010A	8.73	mg/l	0.10
7257	Magnesium by ICP Method: SW-846 6010A	316	mg/l	1.0
7258	Manganese by ICP Method: SW-846 6010A	1.45	mg/l	0.02
7261	Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262	Potassium by ICP Method: SW-846 6010A	37.0	mg/l	1.0
7267	Sodium by ICP Method: SW-846 6010A	455	mg/l	10
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	486	mg/l	1



# Mountain States Analytical

---

November 9, 1994

Mr. Scott Carlson  
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

RECEIVED

NOV 14 1994

ECKHOFF, WATSON & PREATOR  
ENGINEERING

Reference:

Project: Sunnyside  
Project No.: EC450593  
MSAI Group: 6408

Dear Mr. Carlson:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

CRS	CRC	CRB
CRS Dissolved	CRC Dissolved	CRB Dissolved

All holding times were met for the tests performed on these samples.

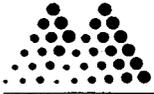
If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

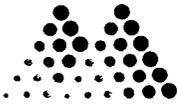
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS  
Matrix: Waste Water

MSAI Sample: 26143  
MSAI Group: 6408  
Date Reported: 11/09/94

Discard Date: 12/09/94  
Date Submitted: 10/28/94  
Date Sampled: 10/27/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	1.10	mg/l	0.10
7243	Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250	Calcium by ICP Method: SW-846 6010A	500	mg/l	1.0
7253	Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254	Iron by ICP Method: SW-846 6010A	8.73	mg/l	0.10
7257	Magnesium by ICP Method: SW-846 6010A	316	mg/l	1.0
7258	Manganese by ICP Method: SW-846 6010A	1.45	mg/l	0.02
7261	Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262	Potassium by ICP Method: SW-846 6010A	37.0	mg/l	1.0
7267	Sodium by ICP Method: SW-846 6010A	455	mg/l	10
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	486	mg/l	1



# Mountain States Analytical

---

November 9, 1994

Mr. Scott Carlson  
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

RECEIVED

NOV 14 1994

ECKHOFF, WATSON & PREATOR  
ENGINEERING

Reference:

Project: Sunnyside  
Project No.: EC450593  
MSAI Group: 6408

Dear Mr. Carlson:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

CRS	CRC	CRB
CRS Dissolved	CRC Dissolved	CRB Dissolved

All holding times were met for the tests performed on these samples.

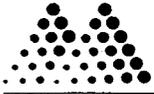
If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

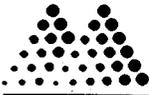
Sample ID: CRS  
Matrix: Waste Water

MSAI Sample: 26143  
MSAI Group: 6408  
Date Reported: 11/09/94

Discard Date: 12/09/94  
Date Submitted: 10/28/94  
Date Sampled: 10/27/94

Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	1.10	mg/l	0.10
7243	Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250	Calcium by ICP Method: SW-846 6010A	500	mg/l	1.0
7253	Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254	Iron by ICP Method: SW-846 6010A	8.73	mg/l	0.10
7257	Magnesium by ICP Method: SW-846 6010A	316	mg/l	1.0
7258	Manganese by ICP Method: SW-846 6010A	1.45	mg/l	0.02
7261	Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262	Potassium by ICP Method: SW-846 6010A	37.0	mg/l	1.0
7267	Sodium by ICP Method: SW-846 6010A	455	mg/l	10
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	486	mg/l	1



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering

Page 2

Sample ID: CRS

MSAI Sample: 26143  
MSAI Group: 6408

Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	20	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,450	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,850	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	1.7	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	59	mg/l	
1125	Sulfate, Turbidimetric Method: EPA 375.4	4,220	mg/l	2

ND - Not detected at the limit of quantitation

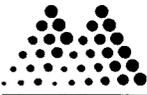
INCORPORATED

Respectfully Submitted,  
(Reviewed and Approved by:

AUG 16 1995

*Rolf E. Larsen*

Rolf E. Larsen  
Project Manager  
UTAH DIVISION OIL, GAS AND MINING



## Mountain States Analytical

The Quality Solution

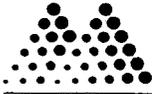
Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: Sunnyside

Sample ID: CRC  
 Matrix: Waste Water

MSAI Sample: 26144  
 MSAI Group: 6408  
 Date Reported: 11/09/94  
 Discard Date: 12/09/94  
 Date Submitted: 10/28/94  
 Date Sampled: 10/27/94  
 Collected by: JC  
 Purchase Order:  
 Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.08	mg/l	0.10
7243 Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250 Calcium by ICP Method: SW-846 6010A	493	mg/l	1.0
7253 Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254 Iron by ICP Method: SW-846 6010A	4.48	mg/l	0.10
7257 Magnesium by ICP Method: SW-846 6010A	344	mg/l	1.0
7258 Manganese by ICP Method: SW-846 6010A	1.14	mg/l	0.02
7261 Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262 Potassium by ICP Method: SW-846 6010A	36.6	mg/l	1.0
7267 Sodium by ICP Method: SW-846 6010A	486	mg/l	10
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	424	mg/l	1



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering

Sample ID: CRC

Page 2

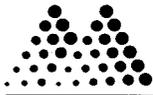
MSAI Sample: 26144  
MSAI Group: 6408

Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Carbonate Hydroxide	ND ND	mg/l mg/l	1 1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	29	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,520	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,860	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	31	mg/l	
1125	Sulfate, Turbidimetric Method: EPA 375.4	2,650	mg/l	2

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

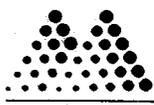
Attn: Mr. Scott Carlson  
 Project: Sunnyside

Sample ID: CRB  
 Matrix: Waste Water

MSAI Sample: 26145  
 MSAI Group: 6408  
 Date Reported: 11/09/94

Discard Date: 12/09/94  
 Date Submitted: 10/28/94  
 Date Sampled: 10/27/94  
 Collected by: JC  
 Purchase Order:  
 Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.85	mg/l	0.10
7243 Aluminum by ICP Method: SW-846 6010A	ND	mg/l	0.20
7250 Calcium by ICP Method: SW-846 6010A	454	mg/l	1.0
7253 Copper by ICP Method: SW-846 6010A	ND	mg/l	0.02
7254 Iron by ICP Method: SW-846 6010A	0.12	mg/l	0.10
7257 Magnesium by ICP Method: SW-846 6010A	303	mg/l	1.0
7258 Manganese by ICP Method: SW-846 6010A	0.21	mg/l	0.02
7261 Nickel by ICP Method: SW-846 6010A	ND	mg/l	0.040
7262 Potassium by ICP Method: SW-846 6010A	27.8	mg/l	1.0
7267 Sodium by ICP Method: SW-846 6010A	428	mg/l	10
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	348	mg/l	1



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Eckhoff, Watson & Preator Engineering

Sample ID: CRB

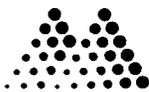
MSAI Sample: 26145  
MSAI Group: 6408

Test	Analysis	Results as Received	Units	Limit of Quantitation
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Carbonate Hydroxide	ND ND	mg/l mg/l	1 1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,190	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,740	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	2	mg/l	
1125	Sulfate, Turbidimetric Method: EPA 375.4	2,590	mg/l	2

ND - Not detected at the limit of quantitation

INCORPORATED  
Respectfully Submitted,  
Reviewed and Approved by:  
*Rolf E. Larsen*  
AUG 16 1995  
Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

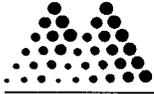
Sample ID: CRS Dissolved  
Matrix: Waste Water

MSAI Sample: 26146  
MSAI Group: 6408  
Date Reported: 11/09/94

Discard Date: 12/09/94  
Date Submitted: 10/28/94  
Date Sampled: 10/27/94  
Collected by: JC

Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.96	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	432	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	0.18	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	274	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.26	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	32.0	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	395	mg/l	1



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRS Dissolved

Page 2

MSAI Sample: 26146

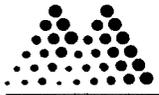
MSAI Group: 6408

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

---

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

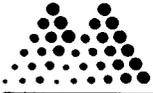
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC Dissolved  
Matrix: Waste Water

MSAI Sample: 26148  
MSAI Group: 6408  
Date Reported: 11/09/94

Discard Date: 12/09/94  
Date Submitted: 10/28/94  
Date Sampled: 10/27/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.13	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	473	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	340	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.32	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	38.1	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	485	mg/l	1



## Mountain States Analytical

Eckhoff, Watson & Preator *The Quality Solution*  
Engineering

Sample ID: CRC Dissolved

Page 2

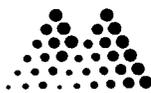
MSAI Sample: 26148  
MSAI Group: 6408

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

---

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

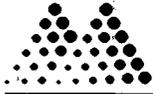
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB Dissolved  
Matrix: Waste Water

MSAI Sample: 26149  
MSAI Group: 6408  
Date Reported: 11/09/94

Discard Date: 12/09/94  
Date Submitted: 10/28/94  
Date Sampled: 10/27/94  
Collected by: JC  
Purchase Order:  
Project No.: EC450593

Test Analysis	Results as Received	Units	Limit of Quantitation
0243D Aluminum by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.2
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.88	mg/l	0.10
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	469	mg/L	1.0
0253F Copper by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.02
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	316	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.22	mg/l	0.02
0261F Nickel by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.04
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	29.0	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	448	mg/l	1



**Mountain States Analytical**

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRB Dissolved

Page 2

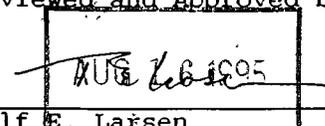
MSAI Sample: 26149

MSAI Group: 6408

ND - Not detected at the limit of quantitation

**INCORPORATED**

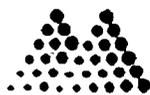
Respectfully Submitted,  
Reviewed and Approved by:



Rolf E. Larsen  
Project Manager



# Analytical Report



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

Sample ID: CRS  
 Matrix: Waste Water

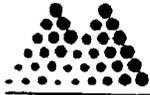
MSAI Sample: 27424  
 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.1	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	7.19	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	1.46	mg/l	0.02
0201 Alkalinity as CaCO3 (pH 4.5) Method: EPA 310.1			
Bicarbonate	460	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	16	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,430	mg/l	10
0216 Hardness as CaCO3 - Titrimetric Method: EPA 130.2	2,730	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	1.5	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	101	mg/l	
1125 Sulfate, Turbidimetric Method: EPA 375.4	629	mg/l	

INCORPORATED  
 EFFECTIVE:  
 AUG 16 1994

# Analytical Report



**Mountain States Analytical**

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRS

Page 2

MSAI Sample: 27424  
MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager

**Analytical Report****Mountain States Analytical***The Quality Solution*

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

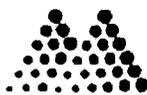
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 Matrix: Waste Water

MSAI Sample: 27425  
 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.1	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	7.49	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	1.24	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	420	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	18	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,660	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,710	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	0.6	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	49.4	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	652	mg/l	2

# Analytical Report



**Mountain States Analytical**

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRC

Page 2

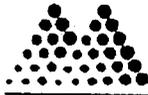
MSAI Sample: 27425

MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager

**Analytical Report****Mountain States Analytical***The Quality Solution*

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

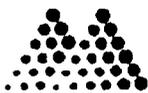
Sample ID: CRB  
 Matrix: Waste Water

MSAI Sample: 27426  
 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.8	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.24	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	342	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,200	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,560	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	12.2	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	643	mg/l	2

# Analytical Report



## Mountain States Analytical

*The Quality Solution*  
Eckhoff, Watson & Preator Engineering

Page 2

Sample ID: CRB

MSAI Sample: 27426  
MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



**Analytical Report****Mountain States Analytical***The Quality Solution*

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: EC 45 05 93

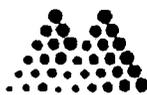
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Matrix: Waste Water

MSAI Sample: 27425  
MSAI Group: 6692  
Date Reported: 12/09/94

Discard Date: 01/08/95  
Date Submitted: 11/23/94  
Date Sampled: 11/22/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.1	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	7.49	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	1.24	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	420	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	18	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,660	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,710	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	0.6	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	49.4	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	652	mg/l	2

# Analytical Report



**Mountain States Analytical**

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRC

Page 2

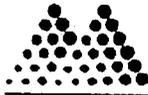
MSAI Sample: 27425

MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager

**Analytical Report****Mountain States Analytical***The Quality Solution*

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: EC 45 05 93

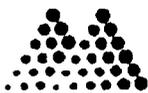
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Matrix: Waste Water

MSAI Sample: 27426  
MSAI Group: 6692  
Date Reported: 12/09/94

Discard Date: 01/08/95  
Date Submitted: 11/23/94  
Date Sampled: 11/22/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.8	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.24	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1 Bicarbonate	342	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,200	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,560	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	12.2	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	643	mg/l	2

# Analytical Report



## Mountain States Analytical

*The Quality Solution*  
Eckhoff, Watson & Preator Engineering

Page 2

Sample ID: CRB

MSAI Sample: 27426  
MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager

# Analytical Report



Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

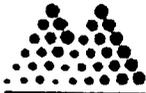
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 MSAI Group: 6692  
 Date Reported: 12/09/94  
 Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.2	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	542	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	1.36	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	345	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.60	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	40.3	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	526	mg/l	5

**INCORPORATED**  
 EFFECTIVE:  
 Respectfully Submitted,  
 Reviewed and Approved by:  
 AUG 16 1995  
*Rolf E. Larsen*  
 Rolf E. Larsen  
 Project Manager  
 UTAH DIVISION OIL, GAS AND MINING



**Analytical Report****Mountain States Analytical***The Quality Solution*

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

Sample ID: CRC Dissolved  
 Matrix: Waste Water

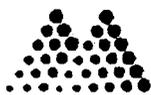
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 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.1	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	486	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	0.59	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	349	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.34	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	36.5	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	527	mg/l	5

Respectfully Submitted,  
 Reviewed and Approved by:

  
 Rolf E. Larsen  
 Project Manager

**Analytical Report****Mountain States Analytical***The Quality Solution*

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: EC 45 05 93

Sample ID: CRB Dissolved  
Matrix: Waste Water

MSAI Sample: 27429  
MSAI Group: 6692  
Date Reported: 12/09/94

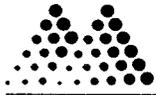
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Date Submitted: 11/23/94  
Date Sampled: 11/22/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.8	ng/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	476	ng/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	ng/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	311	ng/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.25	ng/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	27.2	ng/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	475	ng/l	5

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

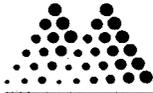
Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

Sample ID: CRS  
 Matrix: Waste Water

MSAI Sample: 27424  
 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.1	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	7.19	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	1.46	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	460	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	16	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,430	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,730	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	1.5	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	101	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	629	mg/l	2



## Mountain States Analytical

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Eckhoff, Watson & Preator Engineering

Sample ID: CRS

Page 2

MSAI Sample: 27424

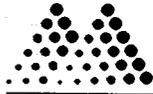
MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

---

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

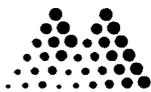
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 Matrix: Waste Water

MSAI Sample: 27425  
 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.1	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	7.49	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	1.24	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	420	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	18	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,660	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,710	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	0.6	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	49.4	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	652	mg/l	2

INCORPORATED  
 EFFECTIVE:  
 AUG 16 1995



**Mountain States Analytical**

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRC

Page 2

MSAI Sample: 27425

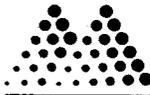
MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

---

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

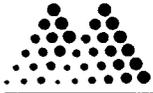
Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

Sample ID: CRB  
 Matrix: Waste Water

MSAI Sample: 27426  
 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.8	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.24	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	342	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,200	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,560	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	12.2	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	643	mg/l	2



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRB

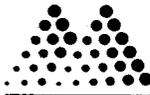
Page 2

MSAI Sample: 27426  
MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

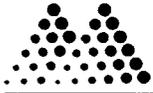
Attn: Mr. Scott Carlson  
 Project: EC 45 05 93

Sample ID: CRB  
 Matrix: Waste Water

MSAI Sample: 27426  
 MSAI Group: 6692  
 Date Reported: 12/09/94

Discard Date: 01/08/95  
 Date Submitted: 11/23/94  
 Date Sampled: 11/22/94  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.8	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.24	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	342	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,200	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,560	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	12.2	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	643	mg/l	2



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRB

Page 2

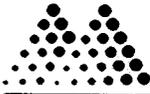
MSAI Sample: 27426  
MSAI Group: 6692

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

---

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: EC 45 05 93

Sample ID: CRS Dissolved  
Matrix: Waste Water

MSAI Sample: 27427  
MSAI Group: 6692  
Date Reported: 12/09/94

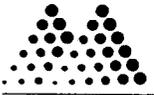
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Date Submitted: 11/23/94  
Date Sampled: 11/22/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.2	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	542	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	1.36	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	345	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.60	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	40.3	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	526	mg/l	5

INCORPORATED  
Respectfully Submitted,  
Reviewed and Approved by:

*Rolf E. Larsen*  
Rolf E. Larsen  
Project Manager

UTAH DIVISION OF OIL, GAS AND MINING  
FAX (801)973-6278



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: EC 45 05 93

Sample ID: CRC Dissolved  
Matrix: Waste Water

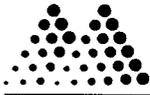
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Date Reported: 12/09/94

Discard Date: 01/08/95  
Date Submitted: 11/23/94  
Date Sampled: 11/22/94  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.1	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	486	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	0.59	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	349	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.34	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	36.5	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	527	mg/l	5

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: EC 45 05 93

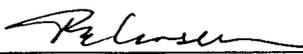
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Matrix: Waste Water

MSAI Sample: 27429  
MSAI Group: 6692  
Date Reported: 12/09/94  
Discard Date: 01/08/95  
Date Submitted: 11/23/94  
Date Sampled: 11/22/94  
Collected by: JC  
Purchase Order:  
Project No.:

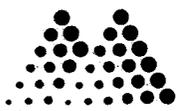
Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.8	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	476	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	311	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.25	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	27.2	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	475	mg/l	5

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

  
Rolf E. Larsen  
Project Manager





# Mountain States Analytical

*The Quality Solution*

February 1, 1995

Mr. Scott Carlson  
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Reference:

Project: Sunnyside  
MSAI Group: 7077

Dear Mr. Carlson:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

CRS

CRB

CRC Dissolved

CRC

CRS Dissolved

CRB Dissolved

All holding times were met for the tests performed on these samples.

If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

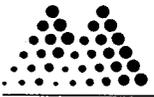
With Regards,

Rolf E. Larsen  
Project Manager

INCORPORATED  
EFFECTIVE:

AUG 16 1905

UTAH DIVISION OIL GAS AND MINING



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

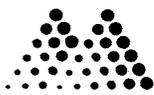
Attn: Mr. Scott Carlson  
 Project: Sunnyside

Sample ID: CRS  
 Matrix: Waste Water

MSAI Sample: 29021  
 MSAI Group: 7077  
 Date Reported: 02/01/95

Discard Date: 03/03/95  
 Date Submitted: 01/23/95  
 Date Sampled: 01/21/95  
 Collected by: JG  
 Purchase Order:  
 Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	1.0	mg/l	0.3
7254	Iron by ICP Method: SW-846 6010A	6.15	mg/l	0.10
7258	Manganese by ICP Method: SW-846 6010A	1.37	mg/l	0.02
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Bicarbonate	478	mg/l	1
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	6	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	5,480	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,820	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	1.7	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	107	mg/l	
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,340	mg/l	2



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRS

Page 2

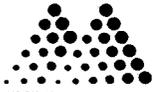
MSAI Sample: 29021  
MSAI Group: 7077

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

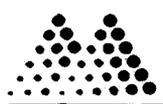
Attn: Mr. Scott Carlson  
 Project: Sunnyside

Sample ID: CRC  
 Matrix: Waste Water

MSAI Sample: 29022  
 MSAI Group: 7077  
 Date Reported: 02/01/95

Discard Date: 03/03/95  
 Date Submitted: 01/23/95  
 Date Sampled: 01/21/95  
 Collected by: JG  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.9	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	3.60	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.82	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	392	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	8	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,340	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,800	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	49	mg/l	
1125 Sulfate, Turbidimetric Method: EPA 375.4	3,480	mg/l	2



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering

Sample ID: CRC

Page 2

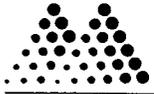
MSAI Sample: 29022  
MSAI Group: 7077

ND - Not detected at the limit of quantitation

INCORPORATED  
EFFECTIVE:  
Respectfully Submitted,  
Reviewed and Approved by:  
AUG 16 1991  
*Rolf E. Larsen*  
Rolf E. Larsen  
Utah Division Oil, Gas and Mining  
Project Manager



FEB - 7 1995



## Mountain States Analytical

*The Quality Solution*

**ECKHOFF, WATSON & PREATOR  
ENGINEERING**

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB  
Matrix: Waste Water

MSAI Sample: 29023  
MSAI Group: 7077  
Date Reported: 02/01/95  
  
Discard Date: 03/03/95  
Date Submitted: 01/23/95  
Date Sampled: 01/21/95  
Collected by: JG  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.7	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	0.12	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.17	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	346	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,030	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,650	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	6	mg/l	
1125 Sulfate, Turbidimetric Method: EPA 375.4	3,070	mg/l	2



Page 2

Eckhoff, Watson & Preator Engineering

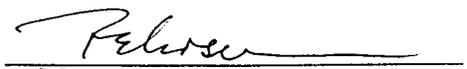
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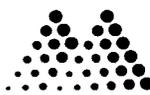
MSAI Group: 7077

Sample ID: CRB

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS Dissolved  
Matrix: Waste Water

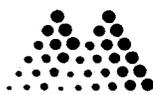
MSAI Sample: 29024  
MSAI Group: 7077  
Date Reported: 02/01/95

Discard Date: 03/03/95  
Date Submitted: 01/23/95  
Date Sampled: 01/21/95  
Collected by: JG  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.0	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	468	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	2.04	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	293	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.37	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	32.6	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	423	mg/l	2

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC Dissolved  
Matrix: Waste Water

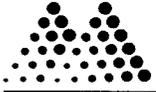
MSAI Sample: 29025  
MSAI Group: 7077  
Date Reported: 02/01/95

Discard Date: 03/03/95  
Date Submitted: 01/23/95  
Date Sampled: 01/21/95  
Collected by: JG  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.8	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	428	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	0.45	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	297	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.81	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	27.2	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	396	mg/l	2

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

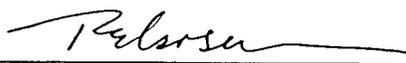
Sample ID: CRB Dissolved  
Matrix: Waste Water

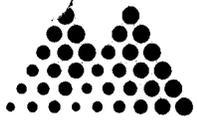
MSAI Sample: 29026  
MSAI Group: 7077  
Date Reported: 02/01/95  
Discard Date: 03/03/95  
Date Submitted: 01/23/95  
Date Sampled: 01/21/95  
Collected by: JG  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.7	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	428	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	280	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.17	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	23.3	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	377	mg/l	2

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

  
Rolf E. Larsen  
Project Manager



# Mountain States Analytical

The Quality Solution

5254

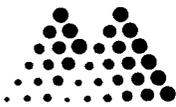
## Sample Chain of Custody

Client Name: <u>E.W.P. ENGINEERING</u>		P.O. # _____		Analysis Required  <b>COARSE REFUSE "SEEP"</b>																										
Phone #: <u>801-261-0090</u>		Fax #: <u>801-266-1671</u>																												
Project Name/ #: <u>SUNNYSIDE</u>																														
Sampler: <u>J. GOMAS</u>																														
Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	Rush?										Remarks	Temp. of Samples Upon Receipt										
<u>CRS</u>	<u>1-21-95</u>	<u>1430</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>												<u>3.6</u>										
<u>CRC</u>	<u>1-21-95</u>	<u>1445</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>																						
<u>CRB</u>	<u>1-21-95</u>	<u>1500</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>																						
Name of Shipper											Airbill No.		Date		Time		Sample relinquished by:			Date		Time		Sample received by:			Date		Time	
Received By (Lab)											Date		Time		Seals Intact?		<u>David Frieg</u>			<u>1-22-95</u>		<u>1145</u>		<u>David Frieg</u>			<u>1-22-95</u>		<u>11:45</u>	
<u>10/1/95</u>											<u>9:20</u>		<u>none</u>		<u>Scott Carlson</u>			<u>1-23-95</u>		<u>9:00 am</u>		<u>Scott Carlson</u>			<u>1-23-95</u>		<u>9:00 am</u>			
Turnaround Time Requested (please circle):											Normal		Rush																	
Report Results By: (Date)																														
Rush results requested by (please circle):											Phone		Fax																	
Report Results to:											Type of Disposal:						Authorized for Disposal by:													
											Date/Time of Disposal:						Disposed of by:													

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Copy - Return to Customer Pink Copy - Retain by Sampler

1021



# Mountain States Analytical

*The Quality Solution*

March 9, 1995

Mr. Scott Carlson  
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

RECEIVED

MAR 13 1995

ECKHOFF, WATSON & PREATOR  
ENGINEERS

Reference:  
Project: Sunnyside  
MSAI Group: 7492

Dear Mr. Carlson:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

CRS	CRC	CRB
CRS Dissolved	CRC Dissolved	CRB Dissolved

All holding times were met for the tests performed on these samples.

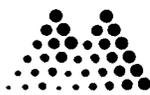
If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

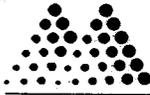
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS  
Matrix: Waste Water

MSAI Sample: 30444  
MSAI Group: 7492  
Date Reported: 03/09/95

Discard Date: 04/08/95  
Date Submitted: 03/02/95  
Date Sampled: 02/28/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	1.3	mg/l	0.3
7254	Iron by ICP Method: SW-846 6010A	8.26	mg/l	0.10
7258	Manganese by ICP Method: SW-846 6010A	1.64	mg/l	0.02
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Bicarbonate	484	mg/l	1
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	12	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	4,950	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,960	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	1.7	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	63.0	mg/l	1.0
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,270	mg/l	2



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

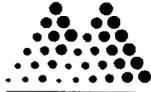
Sample ID: CRS

Page 2

MSAI Sample: 30444  
MSAI Group: 7492

ND - Not detected at the limit of quantitation

<p><b>INCORPORATED</b> Respectfully Submitted, Reviewed and Approved by:</p> <p>AUG 16 1995 <i>R. B. Larsen</i></p> <p>Rolf B. Larsen Project Manager UTAH DIVISION OIL, GAS AND MINING</p>
---



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

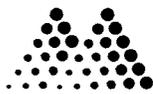
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC  
Matrix: Waste Water

MSAI Sample: 30445  
MSAI Group: 7492  
Date Reported: 03/09/95

Discard Date: 04/08/95  
Date Submitted: 03/02/95  
Date Sampled: 02/28/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.0	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	4.19	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.78	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	404	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	16	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,070	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,760	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	35.8	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	3,220	mg/l	2



**Mountain States Analytical**

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRC

Page 2

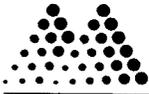
MSAI Sample: 30445

MSAI Group: 7492

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

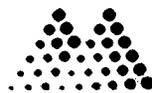
Attn: Mr. Scott Carlson  
 Project: Sunnyside

Sample ID: CRB  
 Matrix: Waste Water

MSAI Sample: 30446  
 MSAI Group: 7492  
 Date Reported: 03/09/95

Discard Date: 04/08/95  
 Date Submitted: 03/02/95  
 Date Sampled: 02/28/95  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.9	mg/l	0.3
7254 Iron by ICP Method: SW-846 6010A	ND	mg/l	0.10
7258 Manganese by ICP Method: SW-846 6010A	0.11	mg/l	0.02
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	330	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	4,780	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,580	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	5.0	mg/l	1.0
1125 Sulfate, Turbidimetric Method: EPA 375.4	2,940	mg/l	2



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering

Sample ID: CRB

Page 2

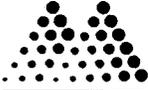
MSAI Sample: 30446

MSAI Group: 7492

ND - Not detected at the limit of quantitation

INCORPORATED
EFFECTIVE:
Respectfully Submitted, Reviewed and Approved by:
AUG 16 1995 <i>Rolf E. Larsen</i>
Rolf E. Larsen Project Manager UTAH DIVISION OIL, GAS AND MINING

# Analytical Report



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS Dissolved  
Matrix: Waste Water

MSAI Sample: 30447  
MSAI Group: 7492  
Date Reported: 03/09/95

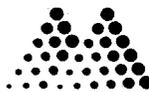
Discard Date: 04/08/95  
Date Submitted: 03/02/95  
Date Sampled: 02/28/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.4	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	545	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	2.43	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	350	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.62	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	41.2	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	482	mg/l	4

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager

# Analytical Report



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

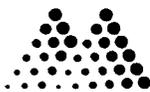
Sample ID: CRC Dissolved  
Matrix: Waste Water

MSAI Sample: 30448  
MSAI Group: 7492  
Date Reported: 03/09/95

Discard Date: 04/08/95  
Date Submitted: 03/02/95  
Date Sampled: 02/28/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.1	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	487	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	0.27	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	341	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.97	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	33.0	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	447	mg/l	4

INCORPORATED  
Respectfully Submitted,  
Reviewed and Approved by:  
AUG 16 1995  
Rolf E. Larsen  
Project Manager  
UTAH DIVISION OF OIL, GAS AND MINING



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB Dissolved  
Matrix: Waste Water

MSAI Sample: 30449  
MSAI Group: 7492  
Date Reported: 03/09/95

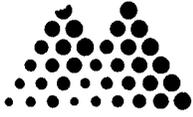
Discard Date: 04/08/95  
Date Submitted: 03/02/95  
Date Sampled: 02/28/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.9	mg/l	0.3
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	511	mg/L	1.0
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.10
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	342	mg/L	1.0
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.11	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	29.5	mg/L	1.0
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	427	mg/l	4

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



# Mountain States Analytical

The Quality Solution

4998

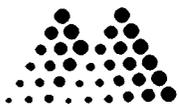
## Sample Chain of Custody

Client Name: <u>E.W.P. ENGINEERING LLC</u>		P.O. # _____		Analysis Required <b>COARSE REFUSE SEEP</b>		Rush?		Remarks		Temp. of Samples Upon Receipt									
Phone #: <u>261-0090</u>		Fax #: <u>266-1671</u>																	
Project Name/#: <u>SUNNYSIDE</u>		Sampler: <u>J.C.</u>																	
Date Collected		Time Collected																	
Sample Identification				Grab		Composite		Soil		Water		Other		Total of Containers					
<u>CRS</u>		<u>2/28/95 1100</u>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>				<u>4</u>					
<u>CRC</u>		<u>2/28/95 1130</u>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>				<u>4</u>					
<u>CRB</u>		<u>2/28/95 1155</u>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>				<u>4</u>					
Name of Shipper		Airbill No.		Date		Time		Sample relinquished by:		Date		Time		Sample received by:		Date		Time	
<u>Fed ex</u>		<u>4268757964</u>		<u>3/2/95</u>		<u>0835</u>		<u>[Signature]</u>		<u>2/29/95</u>									
Received By (Lab)		Date		Time		Seals Intact?													
<u>[Signature]</u>		<u>3/2/95</u>		<u>0835</u>		<u>NA</u>													
Turnaround Time Requested (please circle):		<input checked="" type="radio"/> Normal		<input type="radio"/> Rush															
Report Results By: (Date)																			
Rush results requested by (please circle):		Phone		Fax															
Report Results to: <u>SCOTT CARLSON</u>																			
Type of Disposal:																			
Date/Time of Disposal:																			
Authorized for Disposal by:																			
Disposed of by:																			

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Copy - Return to Customer Pink Copy - Retain by Sampler

1107



# Mountain States Analytical

*The Quality Solution*

April 5, 1995

Mr. Scott Carlson  
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

RECEIVED

APR - 6 1995

ECKHOFF, WATSON & PREATOR  
ENGINEERING

Reference:

Project: Sunnyside  
MSAI Group: 7762

Dear Mr. Carlson:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

CRS	CRC	CRB
CRS Dissolved	CRC Dissolved	CRB Dissolved

All holding times were met for the tests performed on these samples.

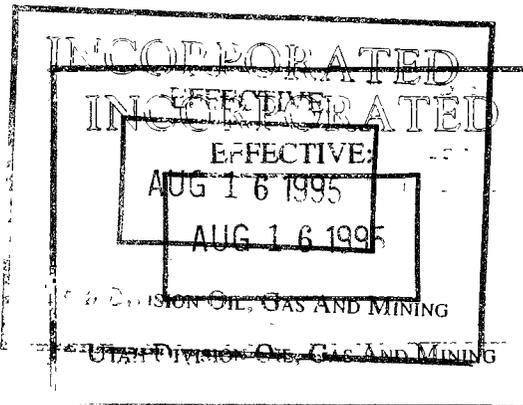
If the report is acceptable, please approve the enclosed invoice and forward it for payment.

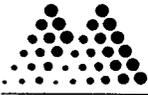
Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Rolf E. Larsen  
Project Manager





## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

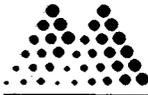
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS  
Matrix: Waste Water

MSAI Sample: 31634  
MSAI Group: 7762  
Date Reported: 04/05/95

Discard Date: 05/05/95  
Date Submitted: 03/23/95  
Date Sampled: 03/22/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	1.1	mg/l	0.1
7254 Iron by ICP Method: SW-846 6010A	6.78	mg/l	0.25
7258 Manganese by ICP Method: SW-846 6010A	1.38	mg/l	0.015
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	470	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	16	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,250	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,760	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	1.7	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	78	mg/l	1
1125 Sulfate, Turbidimetric Method: EPA 375.4	3,200	mg/l	2



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

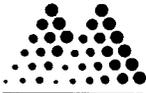
Sample ID: CRS

Page 2

MSAI Sample: 31634  
MSAI Group: 7762

ND - Not detected at the limit of quantitation

<p>INCORPORATED EFFECTIVE: Respectfully Submitted, Reviewed and Approved by: AUG 16 1995 <i>Rolf E. Larsen</i> Rolf E. Larsen Utah Division OIL, GAS AND MINING Project Manager</p>
---



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
 1121 East 3900 South  
 Suite C100  
 Salt Lake City, UT 84124

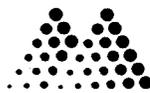
Attn: Mr. Scott Carlson  
 Project: Sunnyside

Sample ID: CRC  
 Matrix: Waste Water

MSAI Sample: 31635  
 MSAI Group: 7762  
 Date Reported: 04/05/95

Discard Date: 05/05/95  
 Date Submitted: 03/23/95  
 Date Sampled: 03/22/95  
 Collected by: JC  
 Purchase Order:  
 Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248A Boron by ICP Method: SW-846 6010A	0.9	mg/l	0.1
7254 Iron by ICP Method: SW-846 6010A	5.85	mg/l	0.25
7258 Manganese by ICP Method: SW-846 6010A	0.955	mg/l	0.015
0201 Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
Bicarbonate	408	mg/l	1
Carbonate	ND	mg/l	1
Hydroxide	ND	mg/l	1
0206 Solids, Total Suspended (TSS) Method: EPA 160.2	9	mg/l	4
0212 Solids, Total Dissolved Method: EPA 160.1	5,090	mg/l	10
0216 Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,710	mg/l	5
0221 Nitrogen, Ammonia by distillation Method: EPA 350.2	0.6	mg/l	0.5
0475 Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	52	mg/l	1
1125 Sulfate, Turbidimetric Method: EPA 375.4	3,220	mg/l	2



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering

Sample ID: CRC

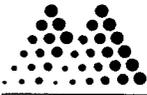
Page 2

MSAI Sample: 31635  
MSAI Group: 7762

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

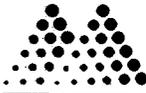
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB  
Matrix: Waste Water

MSAI Sample: 31636  
MSAI Group: 7762  
Date Reported: 04/05/95

Discard Date: 05/05/95  
Date Submitted: 03/23/95  
Date Sampled: 03/22/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	0.7	mg/l	0.1
7254	Iron by ICP Method: SW-846 6010A	ND	mg/l	0.25
7258	Manganese by ICP Method: SW-846 6010A	0.071	mg/l	0.015
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Bicarbonate	314	mg/l	1
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212	Solids, Total Dissolved Method: EPA 160.1	4,770	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,620	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity (to pH 3.7 and 8.3) Method: EPA 305.1	12	mg/l	1
1125	Sulfate, Turbidimetric Method: EPA 375.4	2,910	mg/l	2



## Mountain States Analytical

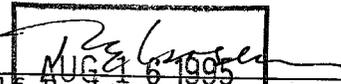
Eckhoff, Watson & Preator *The Quality Solution*  
Engineering

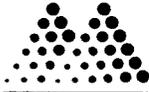
Sample ID: CRB

Page 2

MSAI Sample: 31636  
MSAI Group: 7762

ND - Not detected at the limit of quantitation

INCORPORATED  
Respectfully Submitted  
Reviewed and Approved by:  
EFFECTIVE:  
  
MUG 6 1995  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS Dissolved  
Matrix: Waste Water

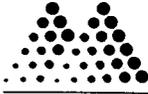
MSAI Sample: 31637  
MSAI Group: 7762  
Date Reported: 04/05/95

Discard Date: 05/05/95  
Date Submitted: 03/23/95  
Date Sampled: 03/22/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.2	mg/l	0.1
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	490	mg/L	0.8
0254F Iron by ICP, Dissolved Method: SW-846 6010A	1.10	mg/l	0.25
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	310	mg/L	0.2
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.48	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	36.1	mg/L	0.8
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	437	mg/l	1

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC Dissolved  
Matrix: Waste Water

MSAI Sample: 31638  
MSAI Group: 7762  
Date Reported: 04/05/95

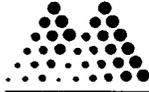
Discard Date: 05/05/95  
Date Submitted: 03/23/95  
Date Sampled: 03/22/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.0	mg/l	0.1
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	457	mg/L	0.8
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.25
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	317	mg/L	0.2
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.93	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	31.8	mg/L	0.8
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	439	mg/l	1

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB Dissolved  
Matrix: Waste Water

MSAI Sample: 31639  
MSAI Group: 7762  
Date Reported: 04/05/95  
Discard Date: 05/05/95  
Date Submitted: 03/23/95  
Date Sampled: 03/22/95  
Collected by: JC  
Purchase Order:  
Project No.:

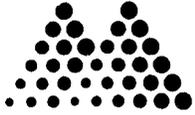
Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.7	mg/l	0.1
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	408	mg/L	0.8
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.25
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	265	mg/L	0.2
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.07	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	23.1	mg/L	0.8
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	366	mg/l	1

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager

5-EB



# Mountain States Analytical

The Quality Solution

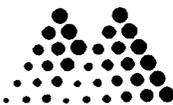
5360

## Sample Chain of Custody

Client Name: <u>E.W.P. ENGINEERING Co</u> P.O. # _____				Analysis Required  "COARSE REFUSE SEEP"												Temp. of Samples Upon Receipt					
Phone #: <u>261-0090</u> Fax #: <u>266-1671</u>																					
Project Name/ #: <u>SUNNYSIDE</u>																					
Sampler: <u>J.C.</u>																					
Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	Rush?												Remarks
<u>CRS</u>	<u>3-22-95</u>	<u>1130</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>													<u>IPC</u>
<u>CRC</u>	<u>3-22-95</u>	<u>1145</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>													<u>JF</u>
<u>CRB</u>	<u>3-22-95</u>	<u>1210</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>													<u>03-23-95</u>
Name of Shipper		Airbill No.		Date	Time	Sample relinquished by:			Date	Time	Sample received by:			Date	Time						
<u>Federal Express</u>				<u>3/23/95</u>	<u>0830</u>	<u>[Signature]</u>			<u>3-22-95</u>	<u>1:30 PM</u>											
Received By (Lab)		Date	Time	Seals Intact?																	
<u>[Signature]</u>		<u>03/23/95</u>	<u>0830</u>	<u>Yes</u>																	
Turnaround Time Requested (please circle):																					
<input checked="" type="radio"/> Normal <input type="radio"/> Rush <small>(Rush TAT is subject to MSAI approval and surcharge)</small>																					
Report Results By: (Date) _____																					
Rush results requested by (please circle): Phone Fax																					
Report Results to: <u>SCOTT CARLSON</u>				Type of Disposal:						Authorized for Disposal by:											
				Date/Time of Disposal:						Disposed of by:											

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab    Yellow Copy - Return to Customer    Pink Copy - Retain by Sampler



# Mountain States Analytical

May 11, 1995

Mr. Scott Carlson  
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

RECEIVED

MAY 13 1995

ECKHOFF, WATSON & PREATOR  
ENGINEERING

Reference:  
Project: Sunnyside  
MSAI Group: 8110

Dear Mr. Carlson:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

CRS	CRC	CRB
CRS Dissolved	CRC Dissolved	CRB Dissolved

All holding times were met for the tests performed on these samples.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

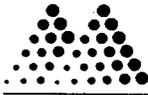
With Regards,

Rolf E. Larsen  
Project Manager

INCORPORATED  
EFFECTIVE:

AUG 16 1995

UTAH DIVISION OIL, GAS AND MINING



## Mountain States Analytical

The Quality Solution

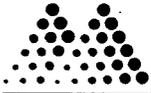
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS  
Matrix: Waste Water

MSAI Sample: 32868  
MSAI Group: 8110  
Date Reported: 05/11/95  
  
Discard Date: 06/10/95  
Date Submitted: 04/28/95  
Date Sampled: 04/27/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	1.2	mg/l	0.1
7254	Iron by ICP Method: SW-846 6010A	7.67	mg/l	0.25
7258	Manganese by ICP Method: SW-846 6010A	1.52	mg/l	0.015
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Bicarbonate	468	mg/l	1
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	20	mg/l	4
0212	Solids, Total Dissolved (TDS) Method: EPA 160.1	5,440	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,760	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	1.6	mg/l	0.5
0475	Acidity, (to pH 3.7 and 8.3) Method: EPA 305.1	93.1	mg/l	1.0
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,420	mg/l	2



## Mountain States Analytical

Eckhoff, Watson & Preator Engineering *The Quality Solution*

Sample ID: CRS

Page 2

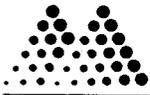
MSAI Sample: 32868

MSAI Group: 8110

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

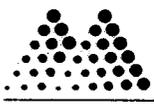
Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC  
Matrix: Waste Water

MSAI Sample: 32869  
MSAI Group: 8110  
Date Reported: 05/11/95  
  
Discard Date: 06/10/95  
Date Submitted: 04/28/95  
Date Sampled: 04/27/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	1.1	mg/l	0.1
7254	Iron by ICP Method: SW-846 6010A	6.44	mg/l	0.25
7258	Manganese by ICP Method: SW-846 6010A	1.18	mg/l	0.015
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Bicarbonate	422	mg/l	1
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	19	mg/l	4
0212	Solids, Total Dissolved (TDS) Method: EPA 160.1	5,520	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,780	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity, (to pH 3.7 and 8.3) Method: EPA 305.1	48.2	mg/l	1.0
1125	Sulfate, Turbidimetric Method: EPA 375.4	3,250	mg/l	2



## Mountain States Analytical

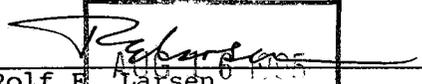
Eckhoff, Watson & Preator Engineering *The Quality Solution*

Sample ID: CRC

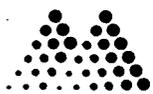
Page 2

MSAI Sample: 32869  
MSAI Group: 8110

ND - Not detected at the limit of quantitation

Respectfully Submitted  
Reviewed and Approved by:  
EFFECTIVE:  
  
Rolf E. Larsen  
Project Manager





## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

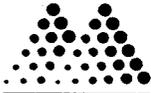
Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB  
Matrix: Waste Water

MSAI Sample: 32870  
MSAI Group: 8110  
Date Reported: 05/11/95

Discard Date: 06/10/95  
Date Submitted: 04/28/95  
Date Sampled: 04/27/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
0248A	Boron by ICP Method: SW-846 6010A	0.8	mg/l	0.1
7254	Iron by ICP Method: SW-846 6010A	ND	mg/l	0.25
7258	Manganese by ICP Method: SW-846 6010A	0.042	mg/l	0.015
0201	Alkalinity as CaCO <sub>3</sub> (pH 4.5) Method: EPA 310.1			
	Bicarbonate	312	mg/l	1
	Carbonate	ND	mg/l	1
	Hydroxide	ND	mg/l	1
0206	Solids, Total Suspended (TSS) Method: EPA 160.2	ND	mg/l	4
0212	Solids, Total Dissolved (TDS) Method: EPA 160.1	5,120	mg/l	10
0216	Hardness as CaCO <sub>3</sub> - Titrimetric Method: EPA 130.2	2,540	mg/l	5
0221	Nitrogen, Ammonia by distillation Method: EPA 350.2	ND	mg/l	0.5
0475	Acidity, (to pH 3.7 and 8.3) Method: EPA 305.1	10.2	mg/l	1.0
1125	Sulfate, Turbidimetric Method: EPA 375.4	2,820	mg/l	2



## Mountain States Analytical

Eckhoff, Watson & Preator Engineering The Quality Solution

Sample ID: CRB

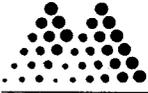
Page 2

MSAI Sample: 32870  
MSAI Group: 8110

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRS Dissolved  
Matrix: Waste Water

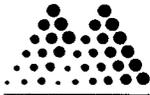
MSAI Sample: 32871  
MSAI Group: 8110  
Date Reported: 05/11/95

Discard Date: 06/10/95  
Date Submitted: 04/28/95  
Date Sampled: 04/27/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.1	mg/l	0.1
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	488	mg/L	0.8
0254F Iron by ICP, Dissolved Method: SW-846 6010A	1.16	mg/l	0.25
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	330	mg/L	0.2
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.47	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	33.9	mg/L	0.8
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	449	mg/l	4

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



## Mountain States Analytical

The Quality Solution

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRC Dissolved  
Matrix: Waste Water

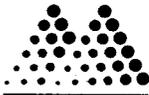
MSAI Sample: 32872  
MSAI Group: 8110  
Date Reported: 05/11/95  
Discard Date: 06/10/95  
Date Submitted: 04/28/95  
Date Sampled: 04/27/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	1.1	mg/l	0.1
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	460	mg/L	0.8
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.25
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	337	mg/L	0.2
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	1.12	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	33.1	mg/L	0.8
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	440	mg/l	4

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

  
Rolf E. Larsen  
Project Manager



## Mountain States Analytical

*The Quality Solution*

Eckhoff, Watson & Preator Engineering  
1121 East 3900 South  
Suite C100  
Salt Lake City, UT 84124

Attn: Mr. Scott Carlson  
Project: Sunnyside

Sample ID: CRB Dissolved  
Matrix: Waste Water

MSAI Sample: 32873  
MSAI Group: 8110  
Date Reported: 05/11/95

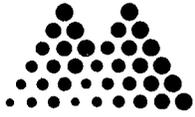
Discard Date: 06/10/95  
Date Submitted: 04/28/95  
Date Sampled: 04/27/95  
Collected by: JC  
Purchase Order:  
Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
0248D Boron by ICP, Dissolved Method: SW-846 6010A	0.8	mg/l	0.1
0250D Calcium by ICP, Dissolved Method: SW-846 6010A	455	mg/L	0.8
0254F Iron by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.25
0257D Magnesium by ICP, Dissolved Method: SW-846 6010A	305	mg/L	0.2
0258F Manganese by ICP, Dissolved Method: SW-846 6010A	0.04	mg/l	0.02
0262D Potassium by ICP, Dissolved Method: SW-846 6010A	23.1	mg/L	0.8
0267F Sodium by ICP, Dissolved Method: SW-846 6010A	403	mg/l	4

ND - Not detected at the limit of quantitation

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager



# Mountain States Analytical

The Quality Solution

5482

## Sample Chain of Custody

Client Name: <u>E.W.P. ENGINEERING</u> P.O. # _____				Analysis Required <div style="border: 1px solid black; padding: 10px; transform: rotate(-15deg); display: inline-block;">           "COARSE REFUSE SEEP"         </div>													
Phone #: <u>801-261-0090</u> Fax #: <u>801-266-1671</u>																	
Project Name/ #: <u>SUNNYSIDE</u>																	
Sampler: <u>J.C.</u>																	
Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	Analysis Required							Remarks	Temp. of Samples Upon Receipt
<u>CRS</u>	<u>4-27-95</u>	<u>1100</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>	Rush? ↓ PH C2								<u>70C</u>
<u>CRC</u>	<u>4-27-95</u>	<u>1120</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>									
<u>CRB</u>	<u>4-27-95</u>	<u>1145</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<u>4</u>									
Name of Shipper		Airbill No.		Date	Time	Sample relinquished by:		Date	Time	Sample received by:		Date	Time				
						<u>Scott Carlson</u>		<u>4-27-95</u>	<u>1300</u>								
Received By (Lab)		Date	Time	Seals Intact?													
<u>Anna Ford</u>		<u>04/28/95</u>	<u>0915</u>	<u>YCS</u>													
Turnaround Time Requested (please circle) <u>Normal</u> Rush																	
<small>(Rush TAT is subject to MSAI approval and surcharge)</small>																	
Report Results By: (Date) _____																	
Rush results requested by (please circle): Phone Fax																	
Report Results to: <u>SCOTT CARLSON</u>				Type of Disposal:					Authorized for Disposal by:								
				Date/Time of Disposal:					Disposed of by:								

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Copy - Return to Customer Pink Copy - Retain by Sampler

## **ATTACHMENT D**

# SUNNYSIDE COGENERATION ASSOCIATES

Carbon County, UT

EWP ENGINEERING

Salt Lake City, UT

## COARSE REFUSE SEEP MONITORING

## V-NOTCH WEIR AT SOURCE (CRS)

Date	Time	Personel	Weather	Flow		Temp C	pH	SC ( $\mu$ S/cmhos)	DO (mg/l)
				(feet)	(gpm)				
5/19/94	1600	J.C.	PTLY CLDY 65°	0.14	8.5	25.5	6.8	5.5	4.2
5/27/94	1315	J.C.	PTLY CLDY 70°	0.16	12.0	25.8	6.6	5.6	3.6
6/8/94	1050	J.C.	CLEAR 60°	0.14	8.5	24.4	6.6	5.5	4.0
6/16/94	1338	J.C.	CLEAR 75°	0.13	7.1	26.97	6.6	5.48	3.8
6/23/94	1615	J.C.	CLEAR 80°	0.13	7.1	27.92	6.6	5.5	2.6
6/30/94	0855	J.C.	CLEAR 70°	0.13	7.1	24.32	6.7	5.5	1.1
7/8/94	1115	J.C.	CLEAR 78°	0.13	7.1	25.61	6.8	5.5	1.2
7/14/94	1250	J.C.	CLEAR 85°	0.13	7.1	26.01	6.6	5.5	1.9
7/21/94	1415	J.C.	CLEAR 90°	0.13	7.1	26.6	6.8	5.5	1.5
7/29/94	0945	J.C.	CLEAR 80°	0.13	7.1	25.27	6.9	5.36	1.0
8/4/94	1005	J.C.	CLEAR 80°	0.14	8.5	25.52	6.9	5.5	1.1
8/11/94	1035	J.C.	CLEAR 80°	0.13	7.1	25.18	6.9	5.5	1.4
8/19/94	1005	J.C.	CLOUDY 70°	0.13	7.1	24.6	6.9	5.5	2.0
8/26/94	0915	J.C.	CLEAR 75°	0.13	7.1	23.9	6.9	5.5	1.5
8/31/94	1630	J.C.	CLEAR 80°	0.12	5.8	25.6	6.9	5.5	1.2
9/9/94	1035	J.C.	CLEAR 70°	0.12	5.8	24.9	7.0	5.5	1.5
9/16/94	1030	J.C.	CLEAR 70°	0.12	5.8	23.3	7.2	5.5	1.6
9/29/94	1435	J.Martin	Cloudy/rain 65°	0.14	8.5	23.94	7.12	5.48	1.57
9/29/94	1010	J.C.	CLOUDY/RAIN 65°	0.13	7.1	24.3	7.2	5.5	1.4
10/6/94	1240	J.C.	PTLY CLDY 55°	0.14	8.5	22.8	7.2	5.5	1.4
10/13/94	1030	J.C.	CLEAR 50°	0.13	7.1	22.7	7.3	5.5	1.6
10/21/94	1300	J.C.	CLEAR 50°	0.13	7.1	23.1	7.3	5.5	1.5
10/28/94	1020	J.C.	CLEAR 50°	0.11	4.7	22.1	7.4	5.0	1.6
11/4/94	1000	J.C.	CLDY 45°	0.11	4.7	22.3	7.3	5.4	1.5
11/9/94	1445	J.C.	CLEAR 50°	0.11	4.7	22.4	7.4	5.5	1.6
11/17/94	1430	J.C.	CLDY 40°	0.11	4.7	22.4	7.4	5.4	1.8



# SUNNYSIDE COGENERATION ASSOCIATES

Carbon County, UT

EWP ENGINEERING

Salt Lake City, UT

COARSE REFUSE SEEP MONITORING

V-NOTCH WEIR @ CULVERT (CRC)

Date	Time	Personel	Weather	Flow		Temp C	pH	SC <sub>mg/l</sub> (umhos)	DO (mg/l)
				(feet)	(gpm)				
5/19/94	1630	J.C.	PTLY CLDY 65°	.23	29	15.92	7.60	5.62	6.15
5/27/94	1330	J.C.	PTLY CLDY 70°	.25	36	17.79	7.2	5.6	6.04
6/8/94	1100	J.C.	CLEAR 60°	.26	40	16.97	7.3	5.6	7.00
6/16/94	1323	J.C.	CLEAR 75°	.23	29	19.06	7.3	5.62	6.33
6/23/94	1630	J.C.	CLEAR 80°	.23	29	20.37	7.3	5.6	5.5
6/30/94	0910	J.C.	CLEAR 70°	.24	32	18.10	7.3	5.66	5.6
7/8/94	1125	J.C.	CLEAR 78°	.24	32	18.8	7.4	5.67	5.7
7/14/94	1300	J.C.	CLEAR 85°	.24	32	20.3	7.4	5.68	5.7
7/21/94	1445	J.C.	CLEAR 90°	.23	29	21.2	7.5	5.7	5.0
7/29/94	1000	J.C.	CLEAR 80°	.24	32	19.8	7.5	5.7	5.3
8/4/94	1020	J.C.	CLEAR 90°	.24	32	20.6	7.5	5.8	5.2
8/11/94	1050	J.C.	CLEAR 80°	.24	32	19.7	7.6	5.7	5.1
8/19/94	1020	J.C.	CLOUDY 70°	.24	32	19.4	7.6	5.7	5.8
8/26/94	0930	J.C.	CLEAR 75°	.24	32	19.5	7.6	5.7	5.3
8/31/94	1145	J.C.	CLEAR 80°	.24	32	20.7	7.6	5.8	5.2
* 9/9/94	1050	J.C.	CLEAR 70°	.28	48	20.1	7.5	5.2	4.9
* 9/16/94	1045	J.C.	CLEAR 70°	.28	48	18.0	7.8	5.6	6.0
* 9/29/94	1530	J. Martin	Cloudy/Rain 65°	.27	52	18.80	7.96	5.51	6.10
9/29/94	1030	J.C.	CLOUDY/RAIN 65°	.24	32	18.7	7.8	5.7	5.3
10/6/94	1300	J.C.	PTLY CLDY 55°	.24	32	16.7	7.9	5.7	5.5
10/13/94	1045	J.C.	CLEAR 50°	.24	32	17.8	7.9	5.7	5.4
10/21/94	1320	J.C.	CLEAR 50°	.24	32	14.9	8.3	5.7	7.0
10/28/94	1035	J.C.	CLEAR 50°	.23	29	15.2	7.9	5.7	5.8
11/4/94	1015	J.C.	CLDY 45°	.23	29	14.7	7.9	5.7	5.9
11/9/94	1500	J.C.	CLEAR 50°	.23	29	14.4	7.9	5.7	5.8
11/17/94	1445	J.C.	CLDY 40°	.22	26	14.0	7.9	5.6	5.9

\* NOTE: AREA IN FRONT OF WEIR HAS BEEN FILLED IN WITH SEDIMENT RESULTING FROM STORM THAT TOOK PLACE ON 9-2-94 1" OF RAIN IN ONE HOUR WAS RECORDED AT SUNNYSIDE WEATHER STA. FLOW IS NOT ACCURATE AT TIME OF MONITORING. POOL NEEDS TO BE CLEANED OUT IN FRONT OF WEIR. J.C. 9.9.94



# SUNNYSIDE COGENERATION ASSOCIATES

Carbon County, UT

EWP ENGINEERING

Salt Lake City, UT

COARSE REFUSE SEEP MONITORING

V-NOTCH WEIR @ BOUNDARY (CRB)

Date	Time	Personel	Weather	Flow		Temp C	pH	SC <small>ms</small> (umho/cm)	DO (mg/l)
				(feet)	(gpm)				
5/19/94	1650	J.C.	PTLY CLOUDY 65°	.28	48	15.55	8.1	5.18	7.64
5/27/94	1400	J.C.	PTLY CLOUDY 70°	.29	52	16.77	7.8	5.07	6.87
6/5/94	1120	J.C.	CLEAR 60°	.28	48	15.50	7.8	5.30	8.0
6/16/94	1307	J.C.	CLEAR 75°	.26	40	19.62	7.8	5.28	7.61
6/23/94	1645	J.C.	CLEAR 80°	.25	36	22.75	7.8	5.29	6.4
6/30/94	0930	J.C.	CLEAR 70°	.26	40	15.90	7.9	5.4	7.3
7/8/94	1140	J.C.	CLEAR 78°	.26	40	17.6	8.06	5.4	7.4
7/14/94	1320	J.C.	CLEAR 85°	.24	32	19.75	7.98	5.4	7.02
7/21/94	1520	J.C.	CLEAR 90°	.22	26	22.6	7.9	5.4	<del>7.4</del>
7/29/94	1020	J.C.	CLEAR 80°	.28	48	17.5	8.1	5.5	7.3
8/4/94	1040	J.C.	CLEAR 80°	.25	36	18.3	8.2	5.5	6.6
8/11/94	1110	J.C.	CLEAR 80°	.28	48	18.5	8.2	5.6	6.8
8/19/94	1035	J.C.	CLOUDY 70°	.25	36	17.2	8.2	5.6	6.9
8/26/94	0945	J.C.	CLEAR 75°	.23	29	16.1	8.2	5.6	6.9
8/31/94	1700	J.C.	CLEAR 80°	.22	26	20.3	8.2	5.6	7.4
9/9/94	1115	J.C.	CLEAR 75°	.28	48	17.6	8.3	5.5	7.2
9/16/94	1100	J.C.	CLEAR 70°	.26	40	14.2	8.4	5.5	7.8
9/20/94	1630	J. Martin	PTLY CLOUDY 65°	.26	40	15.95	8.34	5.47	7.60
9/29/94	1045	J.C.	CLOUDY/RAIN 65°	.26	40	15.00	8.4	5.5	7.5
10/6/94	1315	J.C.	PTLY CLOUDY 55°	.26	40	12.7	8.5	5.5	8.5
10/13/94	1110	J.C.	CLEAR 50°	.25	36	13.0	8.5	5.5	7.7
10/21/94	1340	J.C.	CLEAR 50°	.26	40	12.6	8.6	5.4	8.3
10/28/94	1050	J.C.	CLEAR 50°	.26	40	9.9	8.6	5.5	8.4
11/4/94	1030	J.C.	CLOUDY 45°	.26	40	9.1	8.5	5.4	8.1
11/9/94	1515	J.C.	CLEAR 50°	.26	40	9.0	8.7	5.5	8.6
11/17/94	1500	J.C.	CLOUDY 40°	.24	32	9.1	8.6	5.6	8.1



# SUNNYSIDE COGENERATION ASSOCIATES

Carbon County, UT

EWP ENGINEERING

Salt Lake City, UT

COARSE REFUSE SEEP MONITORING

V-NOTCH WEIR AT SOURCE (CRS)

Date	Time	Personel	Weather	Flow		Temp C	pH	SC (umhos)	DO (mg/l)
				(feet)	(gpm)				
11/22/94	1445	J.C.	CLEAR 37°F	0.11	4.7	18.10	7.5	5.5	2.3
12/9/94	1400	J.C.	CLEAR 25°F	2.08	2.1	17.9	7.7	5.5	2.7
12/15/94	1315	J.C.	PTLY CLOUDY 25°F	0.09	2.8	17.3	7.7	3.0	2.8
12/22/94	1400	J.C.	PTLY CLOUDY 35°F	0.09	2.8	18.1	7.6	5.5	2.8
1/6/95	1020	J.C.	CLEAR 25°F	0.08	2.1	17.3	7.8	5.4	2.7
1/24/95	1245	J.C.	PTLY CLOUDY 30°F	0.08	2.1	17.5	7.8	5.5	2.6
1-21-95	1420	J.C.	CLOUDY 35°F	.08	2.1	17.6	7.8	5.4	2.0
1-27-95	1400	J.C.	CLOUDY 32°F	.08	2.1	17.3	7.8	5.5	2.4
2-1-95	1300	J.C.	CLEAR 40°F	.08	2.1	18.1	7.8	2.6	2.0
2-9-95	1100	J.C.	CLEAR 55°F	.08	2.1	17.1	7.5	4.9	2.7
2-23-95	1310	J.C.	PTLY CLOUDY 40°F	.08	2.1	18.0	7.9	5.1	2.5
2-28-95	1100	J.C.	PTLY CLOUDY 45°F	.08	2.1	19.8	8.06	5.6	2.1
3-1-95	1400	J.C.	PTLY CLOUDY 45°F	.08	2.1	19.2	8.1	5.4	2.6
3-8-95	1330	J.C.	PTLY CLOUDY 40°F	.09	2.8	18.5	7.8	5.0	2.7
3-22-95	1130	J.C.	PTLY CLOUDY 50°F	.08	2.1	18.8	8.1	5.4	2.2
3-27-95	1310	J.C.	PTLY CLOUDY 50°F	.08	2.1	18.2	8.6	5.0	2.7
4-5-95	1030	J.C.	CLEAR 45°F	.07	1.5	18.1	8.4	5.1	2.1
4-13-95	1400	J.C.	CLEAR 50°F	.07	1.5	18.0	7.8	4.8	2.5
4-20-95	1120	J.C.	RAIN 40°F	.06	1.0	18.6	8.0	5.1	2.1
4-27-95	1100	J.C.	WINDY 50°F	.06	1.0	19.1	8.2	5.4	2.2
5-4-95	1030	J.C.	CLOUDY 60°F	.06	1.0	18.5	7.7	5.6	2.7
5-11-95	1300	J.C.	CLEAR 65°F	.06	1.0	18.2	7.5	5.7	2.5
5-19-95	1410	J.C.	WINDY 65°F	.06	1.0	18.1	7.8	5.4	2.2
5-25-95	1020	J.C.	CLOUDY 60°F	.06	1.0	17.9	7.9	5.0	2.3
6-2-95	1500	J.C.	PTLY CLOUDY 70°F	.06	1.0	18.2	7.5	5.6	2.4



# SUNNYSIDE COGENERATION ASSOCIATES

Carbon County, UT

EWP ENGINEERING

Salt Lake City, UT

COARSE REFUSE SEEP MONITORING

V-NOTCH WEIR @ CULVERT (CRC)

Date	Time	Personel	Weather	Flow		Temp C	pH	SC (umhos)	DO (mg/l)
				(feet)	(gpm)				
11/22/94	1500	J.C.	CLEAR 32°±	.21	23	11.0	8.04	5.1	6.5
12/9/94	1420	J.C.	CLEAR 25°±	.20	21	11.3	8.1	5.6	5.4
12/15/94	1330	J.C.	PTLY CLOUDY 25°±	.22	26	12.2	8.1	5.5	4.9
12/22/94	1430	J.C.	PTLY CLOUDY 35°±	.20	21	13.4	8.0	4.5	5.6
1/6/95	1040	J.C.	CLEAR 25°±	.20	21	11.2	8.0	5.6	5.6
1/12/95	1230	J.C.	PTLY CLOUDY 30°±	.20	21	11.1	8.1	5.4	5.0
1-28-95	1445	J.C.	CLOUDY 35°±	.20	21	11.3	8.2	5.5	4.5
1-27-95	1405	J.C.	CLOUDY 32°±	.22	26	11.2	8.1	5.5	4.4
2-1-95	1315	J.C.	CLEAR 40°±	.24	32	11.7	8.3	4.8	4.4
2-9-95	1320	J.C.	CLEAR 40°±	.25	36	11.8	8.1	5.1	4.5
2-23-95	1345	J.C.	PTLY CLOUDY 40°±	.25	36	11.2	8.0	5.5	4.8
2-28-95	1120	J.C.	PTLY CLOUDY 45°±	.24	32	11.9	8.3	5.2	5.1
3-1-95	1430	J.C.	PTLY CLOUDY 45°±	.24	32	11.3	8.0	5.6	4.9
3-9-95	1345	J.C.	PTLY CLOUDY 40°±	.24	32	11.8	8.1	5.5	5.6
3-22-95	1145	J.C.	PTLY CLOUDY 50°±	.20	21	12.1	8.5	4.8	5.0
3-30-95	1330	J.C.	PTLY CLOUDY 50°±	.22	26	11.8	8.1	4.9	4.5
4-5-95	1045	J.C.	CLEAR 45°±	.22	26	11.7	8.0	5.4	4.9
4-13-95	1420	J.C.	CLEAR 50°±	.22	26	11.9	8.1	5.2	4.7
4-20-95	1140	J.C.	RAIN 40°±	.23	29	12.1	8.5	4.8	5.0
4-27-95	1120	J.C.	OVERCAST 30°±	.24	32	13.0	8.6	5.0	4.7
5-4-95	1100	J.C.	CLOUDY 60°±	.24	32	12.8	8.4	5.1	4.9
5-11-95	1330	J.C.	CLEAR 60°±	.23	29	13.0	8.1	4.9	4.7
5-19-95	1430	J.C.	WINDY 65°±	.22	26	12.7	8.0	5.4	4.9
5-25-95	1045	J.C.	CLOUDY 60°±	.22	26	13.1	8.2	5.2	4.5
6-2-95	1520	J.C.	PTLY CLOUDY 70°±	.23	29	12.9	8.3	4.8	5.2

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**APPENDIX 7-8**

**SURFACE AND GROUNDWATER MONITORING SCHEDULES**

**UPDES AND BASELINE, OPERATIONAL, & POST MINING**

INCORPORATED  
EFFECTIVE:

AUG 16 1995

UTAH DIVISION OIL, GAS AND MINING

## SURFACE AND GROUNDWATER MONITORING SCHEDULES

This Appendix section outlines the surface and groundwater monitoring schedules for the SCA Permit Site. The schedules outline both UPDES Requirements and Baseline, Operational and Post Mining Monitoring locations and parameters along with the corresponding measuring frequency for each parameter.

### UPDES REQUIREMENTS

Discharge locations subject to the UPDES Permit regulations under Permit Number UT0024759 are listed in Table 7-1A below. Plate 7-3 shows the approximate locations of the UPDES monitoring sites and the sediment pond record drawings show the specific monitoring locations. Discharge from outfalls 004, 007, 008, 009, 012, 014, and 016 will be monitored as specified in the current UPDES Permit which is included in Appendix 7-1 and summarized in TABLE 7-1B:

**TABLE 7-1A. UPDES DISCHARGE MONITORING LOCATIONS**

SITE	LOCATION	OUTFALL
Clear Water Pond	Lat 39° 32' 52" Long: 110° 23' 11"	4
Rail Cut Pond	Lat 39° 32' 14" Long: 110° 23' 48"	7
Old Coarse Refuse Road Pond	Lat: 39° 32' 20" Long: 110° 23' 03"	8
Pasture Sediment Pond	Lat: 39° 32' 36" Long: 110° 23' 29"	9
Coarse Refuse Toe Pond	Lat: 39° 32' 28" Long: 110° 23' 58"	12
Coal Pile Sediment Pond	Lat: 39° 32' 45" Long: 110° 23' 26"	14
Borrow Area Pond	Lat 39° 32' 25" Long: 110° 23' 45"	16

**TABLE 7-1B. UPDES WATER QUALITY MONITORING PARAMETERS**

Parameter	Units	Measurement Frequency	Sample Type
Flow	gpm	Twice/Month	Field Measurement
pH	standard	Monthly	Field Measurement
Dissolved Oxygen	ppm	Monthly	Field Measurement
Iron (total)	mg/L	Monthly	Grab Sample
Oil and Grease	mg/L	Monthly	Grab Sample
Total Suspended Solids	mg/L	Twice/Monthly	Grab Sample
Total Dissolved Solids	mg/L	Monthly	Grab Sample
Total Settleable Solids	mg/L	Weekly during storms	Grab Sample
Floating Solids, Foam	n/a	Monthly	Visual Check
Sanitary Wastes	n/a	Monthly	Visual Check

Notes: No sampling or analysis is required if discharge from the sediment ponds does not occur during the month  
 Total Settleable Solids is analyzed when discharge has occurred due to runoff from storm events or snow melt  
 The Hexane method is recommended by DWQ for Oil and Grease analysis instead of the Freon method.

Surface water monitoring for the UPDES sites will be continued through the end of the operations relating to the Coarse Refuse Pile and each year through the reclamation process until the UPDES permit is no longer required by the Utah Department of Environmental Quality, Division of Water Quality (DWQ). This monitoring will always be performed in accordance with the requirements of the DWQ via the UPDES permits.

There are four operational discharge locations that are not regulated by DOGM, but are included in the UPDES permit #UT0024759. They are: discharge point 001, Deep water well; discharge point 002, Water supply pipeline; discharge point 013, Facility Sediment Pond; and discharge point 015, Landfill Sediment Pond. These discharge locations are regulated by the Department of Environmental Quality (DEQ) and are included in the power plant facility. All water monitoring information for these discharge points is kept in a separate file from those regulated by the DOGM.

It should be noted that discharge points 001, 002, 013, and 015 are not subject to the water monitoring plan regulated by DOGM. These discharge points will be monitored separately under regulations set forth by the DWQ.

## **SURFACE AND GROUNDWATER MONITORING**

In addition to the UPDES requirements for the sediment ponds listed above, SCA will monitor the surface and groundwater quality at the locations listed in Table 7-2A according to the parameters listed in Table 7-2B or Table 7-2C. These surface and groundwater monitoring sites are shown on Plate 7-2. The surface or groundwater monitoring data will be submitted to the DOGM quarterly for each monitoring location.

## **BASELINE REQUIREMENTS**

At a meeting on December 18, 1992 at DOGM, SCA proposed two water quality monitoring sites for which there was no available background data. These two sites were the Iclander Columbia Dugway Spring 1350 and the East Carbon City Well. Both sites occur downstream from the SCA Permit Area. The Iclander Columbia Dugway Spring 1350 (Whitmore Springs) should provide indication as to whether the activities within the Permit Site are impacting the water resources in the area and although the city well may not show impacts from the SCA facility, it will provide a good source of groundwater data.

SCA contacted Sunnyside Coal Company, the State Division of Water Quality, the State Division of Drinking Water, and East Carbon City to obtain the background data which was available for the other sites. Due to the limited amount of data available, baseline data was gathered from all of the sites listed on Table 7-2A for two years (June 1993-1995). Table 7-2B was developed in 1993 based on DOGM's *Baseline Water Quality Parameter List*.

Once every five years (prior to each application for permit renewal) one sample from each of the monitoring sites listed in Table 7-2A will be sampled and analyzed for the parameters listed in Table 7-2B.

Additional data was gathered weekly and monthly from the Coarse Refuse Seep at the source, culvert, and boundary sites for one year (May 1994-1995) under the direction of DWQ.

The baseline data was analyzed and incorporated into the permit in Appendix 7-4.

## OPERATIONAL REQUIREMENTS

After the two year period of baseline data collection, operational data will be collected quarterly at the sites listed on Table 7-2A and in accordance with the parameters listed on Table 7-2C throughout the life of the mine until two years after surface reclamation activities have ceased.

The sampling schedule listed in Table 7-2C for Operational Water Quality Monitoring was developed based on DOGM's Technical Directive 004 signed May 23, 1995, and titled *Water Monitoring Programs for Coal Mines*.

The directive 004 was under additional discussion and review at the time that SCA prepared Table 7-2C. Some revisions may be needed based on the outcome of the discussions.

## POST MINING MONITORING REQUIREMENTS

The post mining monitoring will continue every year following completion of Operational Monitoring until termination of bonding to provide information relevant to potential impacts due to the mining and reclamation activity. Water monitoring information will also be used to determine that the reclaimed areas are not contributing additional contributions of Suspended Solids to stream flow outside the permit area and that the water quality is meeting all State and Federal water quality requirements. Technical Directive 004 does not specifically list parameters required for post mining monitoring. SCA proposes that the sites listed in Table 7-2A will be monitored as listed in Table 7-2D.

The DWQ administers the Nonpoint Source Program. Regulations under this program focus on storm water runoff and management. When the sediment ponds are removed during reclamation, the DWQ will determine if specific monitoring is required beyond the items listed in Table 7-2D in order to replace the point source monitoring associated with the sediment pond outfalls listed in the UPDES permit.

**TABLE 7-2A SURFACE AND GROUNDWATER MONITORING LOCATIONS**

LOCATION	TYPE	LOCATION ID
Coarse Refuse Seep at Source	Spring	CRS
Coarse Refuse Seep at Boundary	Springs	CRB
Icelanders Columbia Dugway Spring 1350	Spring	F-2
Icelanders Creek	Surface Water	ICE-1
East Carbon City Well (Dragerton Well)	Ground Water	Well

**TABLE 7-2B BASELINE WATER QUALITY MONITORING PARAMETERS**

Parameter	Units	Measurement	Sample Type
Flow	gpm	Monthly	Field Measurement
pH	standard	Monthly	Field Measurement
Temp	degrees C	Monthly	Field Measurement
Specific Conductivity	umhos/cm	Monthly	Field Measurement
Dissolved Oxygen	mg/L	Monthly	Field Measurement
Aluminum (dissolved)	mg/L	Quarterly	Laboratory Measurement
Arsenic (dissolved)	mg/L	Quarterly	Laboratory Measurement
Boron (dissolved)	mg/L	Quarterly	Laboratory Measurement
Bicarbonate	mg/L	Quarterly	Laboratory Measurement
Carbonate	mg/L	Quarterly	Laboratory Measurement
Cadmium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Calcium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Chloride	mg/L	Quarterly	Laboratory Measurement
Copper (dissolved)	mg/L	Quarterly	Laboratory Measurement
Lead (dissolved)	mg/L	Quarterly	Laboratory Measurement
Total Hardness	mg/L	Quarterly	Laboratory Measurement
Iron (total & dissolved)	mg/L	Quarterly	Laboratory Measurement
Magnesium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Manganese (total & dissolved)	mg/L	Quarterly	Laboratory Measurement
Molybdenum (dissolved)	mg/L	Quarterly	Laboratory Measurement
Nitrogen: Ammonia (NH <sub>3</sub> )	mg/L	Quarterly	Laboratory Measurement
Nitrite	mg/L	Quarterly	Laboratory Measurement
Nitrate	mg/L	Quarterly	Laboratory Measurement
Potassium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Phosphate (ortho)	mg/L	Quarterly	Laboratory Measurement
Selenium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Sodium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Sulfate	mg/L	Quarterly	Laboratory Measurement
Zinc (dissolved)	mg/L	Quarterly	Laboratory Measurement
C-A Balance	meq/L	Quarterly	Laboratory Measurement
Oil and Grease	mg/L	Quarterly	Laboratory Measurement
Total Suspended Solids	mg/L	Quarterly	Laboratory Measurement
Total Dissolved Solids	mg/L	Quarterly	Laboratory Measurement
Total Settleable Solids	mg/L	Quarterly	Laboratory Measurement

Note: 1) Because the East Carbon City Well is a groundwater source, it will not be analyzed for Total Suspended Solids or Total Settleable Solids.

2) Once every five years (prior to each application for permit renewal) one sample from each of the monitoring sites listed in Table 7-2A will be sampled and analyzed for the parameters listed in Table 7-2B.

**TABLE 7-2C OPERATIONAL WATER QUALITY MONITORING PARAMETERS**

<b>Parameter</b>	<b>Units</b>	<b>Measurement</b>	<b>Sample Type</b>
Flow	gpm	Quarterly	Field Measurement
pH	standard	Quarterly	Field Measurement
Temp	degrees C	Quarterly	Field Measurement
Specific Conductivity	umhos/cm	Quarterly	Field Measurement
Dissolved Oxygen	mg/L	Quarterly	Field Measurement
Total Alkalinity	mg/L	Quarterly	Laboratory Measurement
Total Hardness (CaCO <sub>3</sub> )	mg/L	Quarterly	Laboratory Measurement
Bicarbonate	mg/L	Quarterly	Laboratory Measurement
Carbonate	mg/L	Quarterly	Laboratory Measurement
Calcium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Chloride	mg/L	Quarterly	Laboratory Measurement
Iron (total)	mg/L	Quarterly	Laboratory Measurement
Iron (dissolved)	mg/L	Quarterly	Laboratory Measurement
Magnesium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Manganese (total)	mg/L	Quarterly	Laboratory Measurement
Manganese (dissolved)	mg/L	Quarterly	Laboratory Measurement
Potassium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Sodium (dissolved)	mg/L	Quarterly	Laboratory Measurement
Sulfate	mg/L	Quarterly	Laboratory Measurement
C-A Balance	meq/L	Quarterly	Laboratory Measurement
Oil and Grease	mg/L	Quarterly	Laboratory Measurement
Total Suspended Solids	mg/L	Quarterly	Laboratory Measurement
Total Dissolved Solids	mg/L	Quarterly	Laboratory Measurement
Total Settleable Solids	mg/L	Quarterly	Laboratory Measurement

Note: 1) Because the East Carbon City Well is a groundwater source, it will not be analyzed for Total Suspended Solids or Total Settleable Solids. However, if no flow is occurring at the time of sampling, the water level will still be measured.

**TABLE 7-2D POST MINING WATER QUALITY MONITORING PARAMETERS**

<b>Parameter</b>	<b>Units</b>	<b>Measurement</b>	<b>Sample Type</b>
Flow	gpm	Twice / Annum	Field Measurement
pH	standard	Twice / Annum	Field Measurement
Specific Conductivity	umhos/cm	Twice / Annum	Field Measurement
Dissolved Oxygen	mg/L	Twice / Annum	Field Measurement
Total Suspended Solids	mg/L	Twice / Annum	Laboratory Measurement
Total Dissolved Solids	mg/L	Twice / Annum	Laboratory Measurement
Total Settleable Solids	mg/L	Twice / Annum	Laboratory Measurement
Total Iron	mg/L	Twice / Annum	Laboratory Measurement
Total Manganese	mg/L	Twice / Annum	Laboratory Measurement

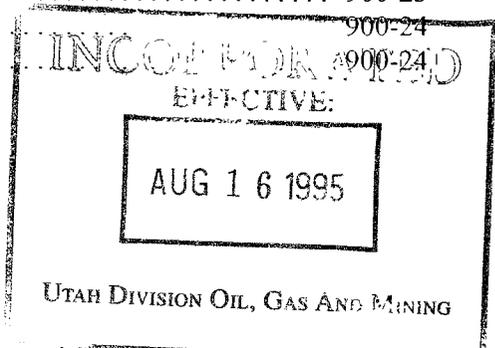
- Note: 1) Because the East Carbon City Well is a groundwater source, it will not be analyzed for Total Suspended Solids or Total Settleable Solids. However, if no flow is occurring at the time of sampling, the water level will be measured.
- 2) Monitoring will be conducted during snowmelt and rainfall events for intermittent streams.

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Plate 9-1D, Excess Spoil Disposal Area Design - Drainage Areas and Diversions  
Plate 9-2, Storage Area Design  
Plate 9-3, ~~Reclamation Sequencing (Removed and Replaced by Plate 10-3 in January 1995)~~  
Plate 9-4, Mine Sequencing - Years 1 thru 5  
Plate 9-4A, Mine Sequencing Sections - Year 1  
Plate 9-4B, Mine Sequencing Sections - Year 2  
Plate 9-4C, Mine Sequencing Sections - Year 3  
Plate 9-4D, Mine Sequencing Sections - Year 4  
Plate 9-4E, Mine Sequencing Sections - Year 5  
Plate 9-5, Mine Sequencing - Years 6 thru 10  
Plate 9-6, Mine Sequencing - Years 11 thru 20  
Plate 9-7, Areas of Permanent Mining Activity



## CHAPTER NINE

### 9.1 MINING PLANS

Sunnyside Coal Company's (SCC) refuse disposal area has been acquired by Sunnyside Cogeneration Associates (SCA) to serve as a long-term supply of waste fuel for its coal mine waste-to-energy facility, located adjacent to the SCA Permit Area. SCA has contracted with SCC to provide alternative disposal for coal mine waste generated by SCC, both past and future. SCA's alternative energy project has been approved by the Federal Energy Regulatory Commission as a Qualifying Facility, based on the usage of coal mine waste as fuel in its fluidized-bed combustion boiler. SCA will use both "active waste", from the processing plant, and "accumulated waste", from the refuse pile, as sources of waste fuel for the facility.

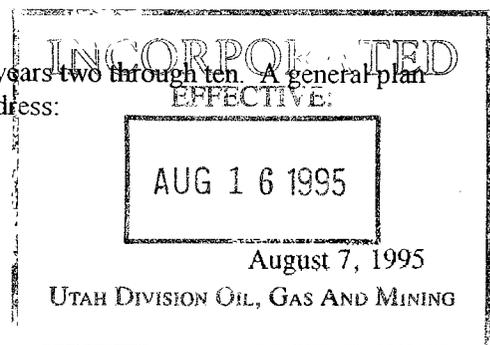
Based on SCA's contract for the sale of electricity to Utah Power and Light, handling coal mine waste to serve as an alternative energy fuel will be a consistent and continuous process. Coal mine waste that continues to be generated by SCC's preparation plant will also be factored into SCA's fueling strategy, which can allow direct acceptance of coal mine waste at the facility, or temporary placement within the refuse disposal area prior to utilization.

SCA will excavate coal mine waste from the refuse disposal area based on detailed sampling and analyses and a materials handling plan which will be continuously updated by SCA. Excavation of the coal mine waste will be considerate of material quality, pile and embankment stability, and mine operation. Over the life of SCA's facility, nearly all of the coal mine waste will be burned to generate electricity, resulting in significantly less material that will need final reclamation. Final reclamation of the refuse pile will be accomplished after all of the coal mine waste is either burned as a fuel, or repositioned within the refuse disposal area for final disposal, if determined to be non-combustible (i.e., ashes, rock).

SCC will continue to dispose of the coal mine waste and slurry within the SCA Permit Area. The East Slurry Cell, and Slurry Ponds One and Two will continue to accept slurry from the SCC's coal processing facility. Figure 9-2 outlines SCA's mining process in relation to SCC's and Savage's operations.

Plates 9-4 (A-E), 9-5, 9-6, and 9-7 present an overall projection for the sequence of mining events. The projection for the first five years of mining is detailed by year in Plates 9-4 (A-E). Calculations to verify the quantity of materials to be excavated during the first five years is included in Appendix 9-6. The majority of mining activity is expected to be concentrated within the areas identified in the mine sequencing maps. However, in order to obtain the proper blending of material which will be suitable for use in the adjacent cogeneration plant, excavation of coal mine waste may occur in any of the existing disturbed areas of the SCA Permit site. Mining activities will regularly occur in the storage areas and in the slurry handling areas throughout the life of the mine. Information used to compile these mine sequencing maps was gathered mostly from the John T. Boyd Reports found in Appendix 9-1 and 9-3. Appendix 9-1 presents the John T. Boyd mine plan for SCA. Data, including boring logs, to substantiate the conclusions of the Mine Plan are included in Appendix 9-3. The John T. Boyd mine plan includes:

- Cross sections of the refuse pile.
- A detailed mine plan for year one. A moderately detailed plan for years two through ten. A general plan for years 11 through 20. The critical issues of the mine plan address:



1. Optimization of blending to provide consistent quality fuel over the life of the project.
2. Utilization of fines
3. Minimization of material handling
4. Characterization and handling of non-fuel zones in the refuse pile
5. Compliance with reclamation and regulatory requirements

- Recommended equipment types, methods of mining and locations of mining.

## 9.2 DESCRIPTION OF PRESENT DISTURBANCE

Presently approximately 57% of the SCA Permit Area is disturbed. The disturbances have been caused from 1) coal mine waste disposal, 2) roads, and 3) sedimentation ponds and ditches. The majority of the impacted land was disturbed prior to the present resource protection laws. The future activities of the SCA Cogeneration facilities are expected to cause little or no new disturbances to vegetated areas as the permit activities will be located mainly in areas that have been disturbed in the past.

All facilities are shown on Plate 5-1. Plate 3-1 outlines the areas of pre- and post-law disturbances.

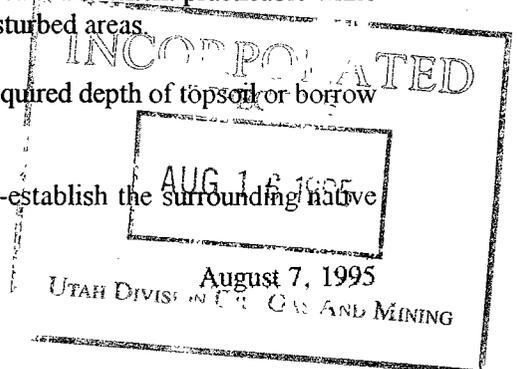
## 9.3 RECLAMATION ACCOMPLISHED TO DATE

Interim reclamation was conducted in the fall of 1992 on the faces of lifts one through four of the coarse refuse pile. Approximately two feet of borrow material was placed on these areas to control fires that had been burning within the coarse refuse pile. This project was conducted by SCC in cooperation with DOGM. Interim seeding on lifts three and four was accomplished by SCA in the spring of 1994.

## 9.4 GENERAL RECLAMATION OBJECTIVES

The reclamation activities proposed in this chapter are intended to meet the following specific objectives:

- Regrading of the areas within the coarse refuse pile, slurry cells and other disturbances to achieve a stable, post-mining contour which will be compatible with the surrounding area, similar to the original pre-mining contour, free-draining, and conducive to revegetation.
- Restoration of the natural drainage pattern through the disturbed area to the extent practicable while maintaining appropriate sediment controls at the periphery of the disturbed areas.
- Covering areas that have been cleaned of refuse or slurry with the required depth of topsoil or borrow material to allow revegetation of these surfaces.
- Reseeding the regraded surfaces with a species mix designed to re-establish the surrounding native



vegetation on the reclaimed areas and provide for wildlife habitat.

- Monitor and maintain the reclaimed property until the reclamation success standards are achieved and the bond is released.

## 9.5 AREAS TO BE RECLAIMED AND PLANNED RECLAMATION

There are approximately 209 acres of post-law disturbance within the SCA Permit Area of which all areas will eventually be reclaimed. The area of reclamation and reclamation sequencing is shown in Plate 10-3.

During the mining plan phase of the project the coarse refuse pile and East and West Slurry Cells will be excavated and the site will be covered with borrow material, recontoured and revegetated. The existing sediment ponds will be kept in-place until the final reclamation phase to control runoff from the area.

## 9.6 EXCAVATION AND DISPOSAL OF COAL MINE MATERIAL

SCA's activities will include excavation and handling of non-coal mine waste, coal mine waste, and redisposal of non-combustible materials within the SCA Permit Area. Temporary storage of non-coal mine waste (including, but is not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities). will be in the area just west of the Pasture Pond, between the Pasture Pond and Industrial Borrow Area 1 (See Plate 5-1). The site is approximately 1.1 acres and will be used as a temporary storage facility for material not suitable (non-coal mine waste) for the Excess Spoil Pile site produced from within the SCA Permit Area. Temporary storage of non-coal mine wastes will be conducted to ensure that leachate and surface runoff do not degrade surface or groundwater, that fires are prevented, and that the area remains stable and suitable for reclamation and revegetation compatible with the natural surroundings. It should be noted that accommodations have NOT been made for the disposal of non-coal mine waste that is produced from the Sunnyside mines. It is Sunnyside Coal Company's (SCC) responsibility to dispose of all non-coal mine waste produced from their facility outside of the SCA Permit Boundary. SCC has NOT been authorized to store or dispose of non-coal mine waste within the SCA Permit Boundary.

Final disposal of non-coal mine waste will be in an appropriate local, State-approved solid waste landfill. All non-coal mine waste will be disposed of in a timely manner as it is accumulated. It is not foreseen that there will be a significant amount of non-coal mine waste that will require disposal. At no time shall any non-coal mine waste be deposited in a refuse pile or impounding structure.

The mine sequencing maps 9-4 (A-E), 9-5, 9-6, and 9-7 project the excavation of coal mine waste within the SCA Permit Area. These are projections and may need to be revised with each permit renewal if existing conditions within the refuse pile are discovered to be significantly different than expected. The annual reports submitted to DOGM should be adequate to keep the Division advised concerning the mining progress.

The majority of mining excavation is expected to be concentrated within the areas identified on the mine sequencing maps. However, mining activities may occur within any of the existing disturbed areas of the SCA

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Permit site and should be expected to occur regularly in the storage areas and the slurry handling areas.

The mine sequencing maps are based on a detailed conceptual mining plan that was completed by John T. Boyd Company in November of 1992 and is included in Appendix 9-1. Exhibits 3 through 29 in Appendix 9-1 demonstrate the conceptual mine sequence. Some of the findings of this report are summarized below.

The existing refuse pile consists of recoverable coarse and fine coal refuse and noncombustible material in the following proportions:

Type of Material	<u>Tons</u>	<u>Percent</u>
Coarse Refuse	6,816,000*	73.5
Fine Refuse	1,998,000	21.5
Noncombustible	<u>460,000</u>	<u>5.0</u>
Total	9,274,000	100.0

\* Includes 70,000 tons expected to be added between July 31, 1992 and January 1, 1993.

Based on 1993 SCC mine production, approximately 264,000 tons per year of waste material (198,000 tons of coarse material and 66,000 tons of fines) will be added to the pile during the remaining life of the mine.

Mine plan delivery parameters are as outlined in Table 9-1.

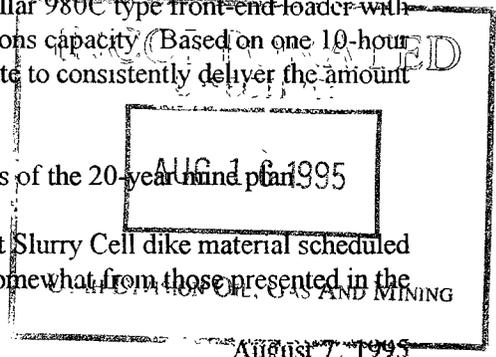
**TABLE 9-1  
MINE PLAN DELIVERY PARAMETERS**

Mine Plan Deliveries	TONS		
	<u>Coarse</u>	<u>Fines</u>	<u>Total</u>
Average annual fuel requirement	310,102	99,898	410,000
Average daily basis (240 days)	1,292	416	1,708
Average hourly basis (1,920 hours)	161.5	52	213.5
Number of trips per day (56.5 tons)	23	7	30
Trips per operating hour	3	1	4

The equipment typically used for loading and hauling services are one Caterpillar 980C type front-end loader with a modified 7.0 cubic yard bucket and one hauler with dual trailer rated at 60 tons capacity. (Based on one 10-hour shift and a 5-day work week, this equipment allocation is more than adequate to consistently deliver the amount of waste coal fuel required by the cogeneration facility.)

Tables 3.2 and 3.3 of Appendix 9-1 show summary and detailed schedules of the 20-year mine plan.

Appendix 9-6 includes calculations identifying the quantity of refuse on West Slurry Cell dike material scheduled to be excavated during each of the first five years. These quantities vary somewhat from those presented in the



John T. Boyd Report. The numbers in Appendix 9-6 are based on the data presented in the mine sequencing maps as well as the John T. Boyd Report. These calculations are not intended to be a limiting or restricting factor in the mining plan nor a representation of actual fuel requirements for the cogeneration plant. They are only intended to estimate the quantities which are identified within the highlighted areas of the mine sequencing maps. Variations in actual mining rates are expected. The quantities calculated are as follows (rounded to nearest hundred cubic yards):

	<u>Refuse Material C.Y.</u>	<u>Dike Material C.Y.</u>
Year 1	355,800	50,900
Year 2	404,500	12,700
Year 3	383,000	16,800
Year 4	411,700	11,500
Year 5	<u>392,800</u>	<u>300</u>
	1,947,800	92,200

The quantity of dike material calculated in Appendix 9-6 exceeds that projected in the John T. Boyd Report. The Excess Spoil Disposal Area is adequate to handle the larger quantity if it exists.

### 9.6.1 COARSE REFUSE

The initial excavation area was determined by the readily available coarse refuse material. The area within the SCA Permit Area where this occurs is in the zone west of the West Slurry Cell. The coarse refuse in other areas is covered either by 15 to 30 feet of fine refuse or by two to three feet of noncombustible clay, sand and rock used by SCC for reclamation. Exhibits 6, 7 and 8 of Appendix 9-1 show the initial development area in the coarse refuse.

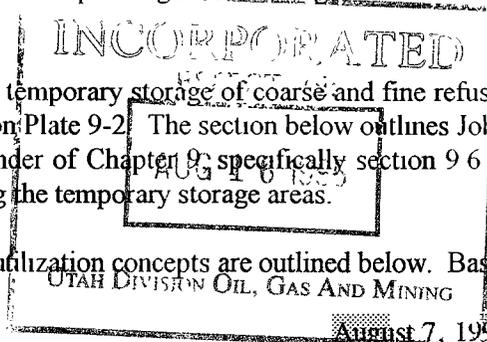
The coarse refuse west of the West Slurry Cell will be mined by cuts oriented in a north-south direction. The base elevation selected for the initial lift is 6500 feet. This lift will vary from 10 to 30 feet in height in order to excavate the top or road portion of the noncombustible material of the West Slurry Cell dike in the first year. Noncombustible material excavated and disposed of during the first year is estimated at 50,000 cubic yards; of which 94% is dike material.

Each successive coarse refuse lift below 6,500 feet is ten feet. The 6,500 feet level is mined in a southerly direction. In all levels below 6,500 feet, mining commences in the middle of the level and progresses both north and south in order to present as many operating faces as possible. This mining sequence gives flexibility to the operator in selecting areas of varying quality for blending in order to deliver as consistent a fuel as possible.

The area of coarse refuse covered by fine material in the West Slurry Cell is mined in an easterly direction. As proposed by the conceptual mine plan, mining commences in this area in the third quarter of the fourth year of operation. At this time period the elevation difference between the two operating levels mining coarse refuse is 40 feet (elevation 6,430 vs 6,470 feet).

There are four locations that will be utilized specifically for the temporary storage of coarse and fine refuse. These areas are shown on Plate 5-1 and a detailed design is shown on Plate 9-2. The section below outlines John T. Boyd's analyses of the temporary storage areas. The remainder of Chapter 9, specifically section 9.6.3, includes further discussion concerning the practicality of utilizing the temporary storage areas.

John T. Boyd has provided analyses of these areas and the disposal/utilization concepts are outlined below. Basic



parameters used for the analyses are:

1. During 1993, SCC was producing approximately 198,000 tons of coarse refuse annually (average - 16,500 tons per month).
2. Bulk density of the drained refuse is 80 lbs per cubic foot.
3. Each levelled lift (formed from truck dump windows) measures four feet high.
4. The loading/transportation equipment is the same (i.e. one Caterpillar 980C type front-end loader with a modified 7.0 cubic yard bucket and one hauler with dual trailers rated at 60-ton capacity).

### 9.6.2 FINE REFUSE

The initial development area for fine refuse excavation was determined primarily by moisture content (13.0%) during the first two operating months and by the critical requirement to uncover coarse refuse material thereafter. This uncovering process may begin about two months after start-up in order to avoid mining and temporary storage of fines for subsequent rehandle. One of the prime objectives of the mine plan is to minimize material handling.

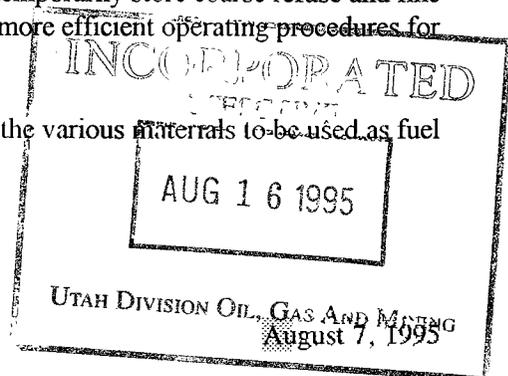
Typical constraints that may be encountered during the mining of coarse and fine refuse can be illustrated by the following example: Exhibit 5 of Appendix 9-1 (mine bench elevation 6,540 to 6,530 feet) illustrates a proposed decanted fines excavation area for the initial two-month period north of the West Slurry Cell. Fines excavation may then be shifted to the western portion of the cell in order to remove the decanted fines dumped there from Slurry Ponds One and Two. These fines have a moisture content estimated at 13% and may be mined out by Month 7 as shown in Exhibit 6 and 7 of Appendix 9-1. Fines excavation then begins in the higher moisture (17.5%) material of the West Slurry Cell from Month 8 of Year 1 to Year 10 of the mining sequence. During this period all of the coarse material covered by these fines will be exposed (see Exhibits 8, 9, 10, 11 and 12 of Appendix 9-1) These fines may be mined in an easterly direction in a sequence of advancing benches, each upper bench remaining about 40 feet ahead of each succeeding lower bench. SCA will adjust mining activities as needed to meet the operational requirements of providing the proper mixture of fine and coarse refuse to the cogeneration plant.

The sequencing as described exposes coarse refuse ahead of requirement and does not create excessive high wall height between one operating area and another.

### 9.6.3 TEMPORARY STORAGE AREAS

Four temporary storage areas exist within the Permit Area for blending, mixing, handling, and storage of coarse refuse and fine refuse. The reasons for these storage areas are: a place to temporarily store coarse refuse and fine refuse being brought to the SCA Permit Area, and to create a smoother, more efficient operating procedures for material prior to entering the crushing units.

These areas will be used for blending, mixing, handling and storage of the various materials to be used as fuel in the power plant.



## Storage Area 1

Storage Area One measures 2.9 acres or 126,324 square feet. The storage capacity of each 4-foot lift is about 20,200 tons as follows:

$$\frac{126,324\text{ft}^2 \times 4\text{ft} \times 80\text{lbs/ft}^3}{2000\text{lbs/ton}} = 20,212 \text{ tons}$$

The surface of Storage Area One slopes towards the southwest at about 3% grade. The drainage direction is southwest. There is a ditch that runs parallel to the southern boundary of Storage Area One that drains to the existing 24" culvert at the south end of the New Access Road then to the Pasture Sediment Pond. The location of the drainages are shown on Plate 9-2.

Approximately 1.95 acres of Storage Area One was undisturbed and has been reclassified as "post-law disturbed" (see Plate 3-1) due to the storage of coarse refuse material in this area.

Topsoil removal will be consistent with approved methods outlined in Section 9.8. Topsoil from Storage Area One will be placed adjacent to the northeastern boundary of the SCA Permit Boundary as shown on Plate 5-1.

Minor alterations to both the Lower and Upper Haul Roads provided access into and out of Storage Areas One and Two. Both of these roads have been designated "Primary Roads". The east end of the Lower and Upper Haul Roads was slightly altered to allow easy access into and out of Storage Areas One and Two. The west intersection of Storage Area Two and the Upper Haul Road will also be changed to allow access into Storage Area Two from the west side. The proposed changes to the two roads are minor.

Topsoil was handled according to DOGM guidelines and was consistent with the plans outlined in the approved SCA Permit Document. Vegetation was removed and topsoil was stripped and stockpiled. Topsoil piles are labeled with visible signs and measures will be taken to protect the topsoil from further disturbance. Topsoil will be used during final reclamation and therefore, will not be respread over the roadway embankment.

Trees and large shrubs were removed prior to topsoil removal. Small shrubs, grasses and forbs were collected with the topsoil material. Coal mine waste was separated from this material and a Soil Tabulation Chart was completed for the topsoil which was removed. Topsoil was stockpiled near the northeast boundary of Storage Area One as shown on Plates 5-1 and 5-5. The topsoil storage pile was contoured to minimize soil loss and seeded with the interim seed mixture. Fertilizer was not required on the stockpiles. A small berm will be constructed at the base of the new topsoil pile to prevent erosion until vegetation becomes established.

Three grab samples have been taken in Storage Area One (sample locations are shown on Plate 5-1) and testing has been completed. The samples were tested according to Table 1 of the DOGM's *Guidelines for Management of Topsoil and Overburden*. Based on DOGM's overburden evaluation for vegetative root zone, the material in Storage Area One is rated 'Good'. These results are included in Appendix 9-4.

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**Storage Area 2**

Storage Area Two measures approximately 3.1 acres or 135,036 square feet. An active industrial waste dump occurs in this area as a depression measuring 25,000 square feet and averaging 8 feet deep. To prepare Storage Area Two, the floor of the Industrial Waste Dump will be leveled. Utah Department of Environmental Quality (UDEQ) regulations will be followed to ensure proper closure of the dump site. The following section outlines procedures that will be followed to ensure compliance.

According to R315-303-2(3) of the UDEQ's regulations, "Any landfill that received waste after October 9, 1991 but stopped receiving waste before October 9, 1993 is exempt from all requirements of this section except for final cover." The Industrial Waste Dump located on SCA's property falls under this requirement. The closure of the site entailed complying with the requirements listed below:

- 1) At least 18" of compacted soil with a permeability of  $1 \times 10^{-5}$  cm/sec or less or equivalent will be placed upon the final lifts. Artificial liners may replace compacted soil covers provided that a minimum of either 20 mils reinforced or 40 mils non-reinforced thickness is used and is covered with eighteen inches of natural subsoils present in the unit.
- 2) The grade of the surface slopes will not be less than 2%, nor the grade of side slopes more than 33%.

In addition to the above requirements, SCA exterminated all rats or other vermin from the site, extinguished all fires, covered all solid wastes with consolidated, compacted material at least 18 inches deep, graded to provide proper drainage (see discussion below), and will reclaim the site upon final reclamation of the entire SCA Permit Area. These requirements are outlined under R315-304-8 of the UDEQ Division of Solid and Hazardous Waste regulations.

The natural drainage of the site is toward the east at approximately 2%. Storage Area Two was graded to allow drainage toward the northeast at approximately 2% grade (see Plate 9-2). An 18-inch culvert was installed at the northeast corner of the site which allows drainage into the Pasture Sediment Pond. Hydrologic calculations are included in Appendix 7-3. In addition, a 12" high berm was constructed around the southern perimeter of Storage Area Two to prevent runoff from the West Slurry Cell from entering the storage area.

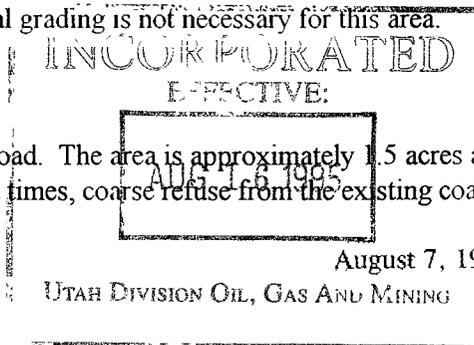
**Storage Area 3**

Storage Area Three (approximately 7.5 acres) will be used primarily when additional storage is required if Areas One and Two cannot handle the amount of coarse refuse and fine refuse being generated. Fine refuse removed from the active Slurry Ponds numbers One and Two is currently stored within this area. The fine refuse (approximately 15,000 tons) occupies 25,000 square feet of surface (of the total 275,000 square feet available for coarse refuse storage) in two separate areas. The coarse refuse storage capacity of each lift is approximately 44,000 tons.

The surface slopes toward the west at about 6% grade. Drainage direction is west-southwest to the ditch which transports slurry to the East Slurry Cell (when in use). Additional grading is not necessary for this area.

**Storage Area 4**

Storage Area Four is located inside the loop of the New Access Road. The area is approximately 1.5 acres and runoff from this area is diverted to the Pasture Sediment Pond. At times, coarse refuse from the existing coarse



refuse pile is stored in the center of the loop of the New Access Road prior to being placed on the conveyor. This area is also utilized for temporary storage of High Ash Fuel Reject and/or ROM coal acquired from outside sources.

### Disposal/Utilization Concepts

In 1993, SCC was producing 198,000 tons of coal refuse annually or an average of 16,500 tons of coarse refuse produced monthly. The capacity of the storage areas is adequate to meet the demands of production and have been designed to allow sufficient time for proper drainage of the refuse.

The concept of utilizing currently generated coarse refuse as feed fuel to the cogeneration plant boiler will not interfere with the conceptual mine plan presented by John T. Boyd. The mining plan is enhanced since the use of coarse refuse currently produced by the preparation plant makes the requirement to uncover coarse refuse material covered by the West Slurry Cell fine refuse less critical.

### Maintenance

Maintenance of the storage areas will consist of providing general maintenance and inspections of the surrounding structures, drainages, culverts, and roads.

Water or other dust control measures will be applied as necessary to reduce dust. General road maintenance procedures will be practiced and inspections will be done as necessary. Inspections will consist of: erosion control, repair of structures and drainage systems, removal of debris in culverts and replacement of road surfacing material as needed.

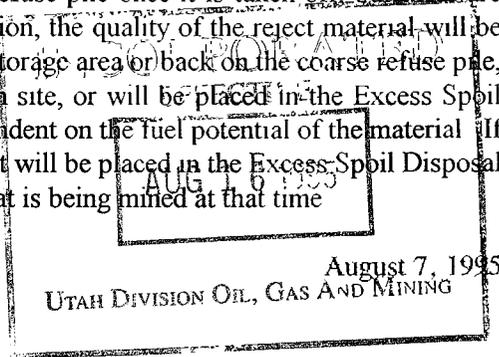
### Reclamation Plans

Reclamation plans will not deviate from those outlined in chapters 9 and 10. Approximately two acres of Storage Area One, which have had minimal disturbance in the past, were disturbed as a result of the initiation of the temporary storage areas. Reclamation activities for this area will follow procedures outlined in section 9.9.1 GENERAL REVEGETATION PROCEDURES.

### **9.6.4 GENERAL REFUSE HANDLING PROCEDURES**

Currently, SCA is utilizing coarse refuse from the coarse refuse pile for use as fuel in the cogeneration facility. Prior to the material being used as fuel, whether it be run of mine ("ROM") coal or waste coal, it must be run through the receiving hopper and sized accordingly to meet operational specifications of the cogeneration facility. Nonetheless, there are instances when the material from the coarse refuse pile does not meet sizing requirements and is rejected by the crushing unit, i.e. cannot be sized correctly.

The crushing/screening process has been modified to reduce the potential for reject material. Therefore, it is unlikely that material will have to be taken back to the coarse refuse pile once it is taken off, but there are instances when the situation cannot be avoided. In such a situation, the quality of the reject material will be determined. When the reject material is placed in the temporary storage area or back on the coarse refuse pile, the material will either be backblended with existing material on site, or will be placed in the Excess Spoil Disposal Area. The placement of the reject material will be dependent on the fuel potential of the material. If the material has low fuel potential, i.e. cannot be utilized as fuel, it will be placed in the Excess Spoil Disposal Area. All other material will be backblended with the material that is being mined at that time.



The stockpiling of the reject material will be in accordance with applicable DOGM regulations. When placed in the temporary storage area or back on the coarse refuse pile, the high fuel potential material will be placed in 4 foot lifts, but will not be compacted. Compaction will not be accomplished for the area being mined due to the fact that the pile is continually altered due to excavation activities.

The low fuel potential material will be placed in the Excess Spoil Disposal Area in accordance with the approved plan and applicable regulations under R645-301-535. Slopes in both areas will be at a maximum of 2.5:1 unless otherwise approved by DOGM. Drainage of the areas will follow the existing drainage of the area and will be contained in an existing sediment pond.

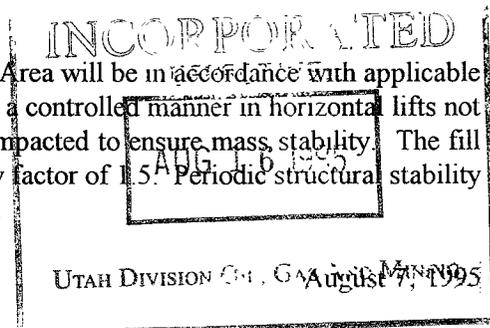
The New Access Road, located adjacent to the cogeneration facility, plays a vital role in the transporting of material from the SCA Permit Site to the Cogeneration Facility. The New Access Road, the hopper, and the crushing/screening facilities are within the boundaries of the SCA Permit Area. However, the conveyor to the Cogeneration facility's storage silos is not within the SCA Permit Area. A detailed description of the waste coal handling system can be found in Chapter Four, section 411.210. The New Access Road is rarely, if ever, utilized by Sunnyside Coal Company. SCA transports coarse refuse from the coarse refuse pile and/or Storage Areas to the cogeneration facility via the New Access Road. The coarse refuse is then placed on the conveyor system and screened before entering the storage silos. The material that is rejected during the screening process is dumped into the Waste Coal Storage Area (see Plate 4-5). After it has been stored it is taken back to the New Access Road and is either temporarily stored in one of the storage areas, or immediately placed back on the conveyor to be screened and used in the cogeneration facility. At times, the coarse refuse from the existing coarse refuse pile is stored in one of the temporary storage areas prior to being placed on the conveyor.

The New Access Road was constructed by SCA specifically for these operations. The design of the road was approved by DOGM prior to construction and DOGM approved the road once it was built. Drainage from this road is diverted to the Pasture Sediment Pond (see Plate 7-1A). Hydrologic calculations for the Pasture Pond are included in Chapter Seven (Appendix 7-3).

There are instances when SCA will purchase and transport material that originates off-site (i.e. from other coal mines) to the SCA Permit Area. For example, SCA will purchase approximately six to seven thousand tons of ROM coal from outside sources each year. Prior to being utilized at the cogeneration facility, this material must be blended with the existing coarse refuse in order to achieve the most effective blend of material for the cogeneration facility. Blending of the material will be accomplished by placing it in one of the Storage Areas (One, Two, Three or Four) or on the existing coarse refuse pile.

Recently, SCA acquired the right to use approximately 24 railroad cars of ROM coal (approximately 2,400 tons) that was recovered from a train wreck. SCA plans to utilize this coal in the cogeneration facility. SCA will follow the plan outlined above by first storing the material in one of the storage areas or on the coarse refuse pile. The material will then be fed through the waste coal receiving hopper and utilized in the SCA facility. In the event that this material contains spoil material, the spoil material will be separated from the higher quality material and placed in the Excess Spoil Disposal Area. In a worst case scenario, spoil will comprise approximately 10% or 240 tons of the total quantity.

Stockpiling of the excess spoil material in the Excess Spoil Disposal Area will be in accordance with applicable DOGM regulations. All material will be transported and placed in a controlled manner in horizontal lifts not exceeding four feet in thickness. If necessary, the pile will be compacted to ensure mass stability. The fill material will be placed to maintain a minimum long-term static safety factor of 1.5. Periodic structural stability inspections will be accomplished to monitor the stability of the pile.



### 9.6.5 FINAL DISPOSAL OF WASTE MATERIAL (Excess Spoil and Coal Mine Waste)

The plan presented in Appendix 9-5 describes the design, construction, operation, and maintenance of the Excess Spoil Disposal Area. A geotechnical investigation of the foundation was conducted by SHB AGRA INC and is included as Appendix 9-2. Associated maps and cross-section drawings of the area as designed are Plates 9-1 A, B, C & D.

Excess spoil and coal mine waste will be placed in the designated Excess Spoil Disposal Area in a controlled manner to:

- (1) Minimize adverse effects of leachate and surface-water runoff from the fill on surface- and ground-water quality and quantity;
- (2) Ensure mass stability and prevent mass movement during and after construction;
- (3) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use;
- (4) Not create a public hazard; and
- (5) Prevent combustion.

At no time will any non-coal mine waste (including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities) be deposited in the excess spoil fill. No burning waste will be placed in the fill.

This disposal area is designed in accordance with the requirements for excess spoil fills as well as for refuse piles. Coal mines waste which is disposed of in the excess spoil fill will be placed in accordance with the requirements specified in Appendices 9-2 and 9-5 and will be of the proper characteristics to be consistent with the design stability of the fill. Coal mine waste materials from activities located outside the SCA permit area may be disposed of in the permit area only if of the proper characteristics to be consistent with the design stability of the fill.

Information used to design the Excess Spoil Fill was obtained from the John T. Boyd Report presented in Appendix 9-1, the Foundation Investigation Report by SHB AGRA Inc. presented in Appendix 9-2, information available from Sunnyside Coal Company, and field surveys conducted by SCA.

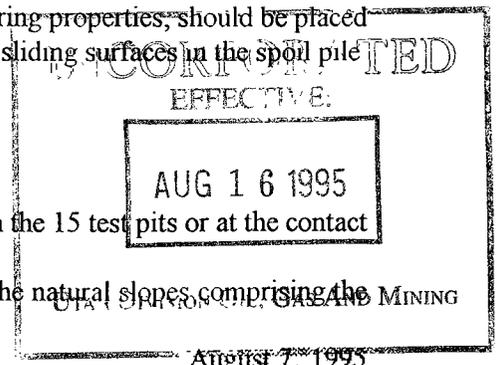
The SHB AGRA foundation investigation report, found in Appendix 9-2, is summarized below.

#### Stability

- The fill should be set back 25 feet from the crest of the natural foundation slope.
- The outer slopes of the fill should be no steeper than 2.5H:1V.
- Measures should be taken to prevent surface water discharge on the side slopes of the fill and foundation
- Waste material from outside sources with uncertain geotechnical engineering properties, should be placed 10 feet from the outer slopes so that they will not influence potential sliding surfaces in the spoil pile
- A mass stability factor of safety greater than 1.5 will exist.

#### Groundwater Conditions

- No signs of groundwater were observed within the foundation soils in the 15 test pits or at the contact with the Mancos Shale.
- No evidence of ground water flow, seeps, springs, or damp soil on the natural slopes comprising the



- foundation of the spoil pile.
- Surface water from areas above the fill should be diverted around the fill.
- Percolation tests indicate permeability of approximately  $2.5 \times 10^{-3}$  cm/sec for in-place conditions and about  $8.4 \times 10^{-2}$  cm/sec for loose conditions.
- The material should be free draining and thus pore water pressures should not develop.
- Any low permeability or wet waste material should be scattered throughout the fill.

## PROTECTION OF SURFACE AND GROUND WATER

Runoff from areas above the Excess Spoil Disposal Area will be diverted around the disposal area in stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff from the surface of the Excess Spoil Disposal Area will be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event.

The potential for acidic leachate is minimal because of the site selected for this permanent disposal area. The disposal area does not contain springs, natural or manmade water courses, or wet weather seeps (see Appendix 9-2, Section 6.3). Under-drains will not be necessary to insure the stability of the fill. Wet waste, such as slurry, will not be disposed in the excess spoil area. If, for any reason, water seeps out from the base of the fill, it will be contained in the perimeter ditches and diverted with the surface runoff to the existing sediment ponds.

Excess spoil that is acid- or toxic-forming or combustible and all coal mine waste placed in the disposal area will be adequately covered with four-feet of non-acid, non-toxic and non-combustible material, or otherwise treated, to control the impact on surface and groundwater, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved post-mining land use. Excess spoil that is not acid-forming nor toxic-forming nor combustible may be used to provide some, or all, of this adequate cover.

Analysis to determine the acid- and/or toxic-forming and alkalinity producing potential of the waste material disposed in the Excess Spoil Disposal Area will be performed for the constituents outlined in the Division's "Guidelines for Management of Topsoil and Overburden." The objective of this sampling program is to identify areas within the fill that may adversely impact the surface water, groundwater, plant growth, or the

post-mining land use. One grab sample per acre will be taken from each four-foot lift immediately following the completion of the lift and throughout construction of the pile. Results of the sampling shall be submitted to the Division with the Quarterly Engineering Inspection Reports.

## QUANTITIES

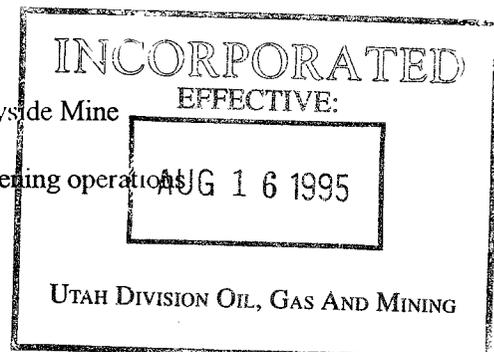
Over the life of the SCA facility, the spoil material and coal mine waste which may potentially be disposed in the Excess Spoil Disposal Area will come from various sources. Each of these sources is discussed in detail in Appendix 9-5.

### Coal Mine Waste

- Breaker reject from the Bradford breaker located at the Sunnyside Mine
- Material from outside sources
- Low fuel potential high ash fuel reject from the crushing/screening operations

### Spoil Material

- West Slurry Cell dike material



- Reclamation material uncovered from the existing coarse refuse pile
- Fire control materials, Burned waste within the existing refuse pile, Inert materials
- Sediment cleaned out of the sediment ponds

Table One of Appendix 9-5 projects the approximate quantities per year and for the life of the mine, and the approximate time each source of material will require disposal. Table Two of Appendix 9-5 summarizes the estimated quantities of material to be disposed during different periods through out the life of the mine. Modifications to this plan may still be required throughout the life of the mine as more information is gathered from the mining process.

Some spoil material (less than 15,000 yards) was placed in this area prior to September 1994 in accordance with the previously submitted plan. This material has been inspected and was adequately placed in a stable condition to meet the design criteria of this plan and the permanent program performance standards.

### CAPACITY of the EXCESS SPOIL DISPOSAL AREA

The design of the Excess-Spoil Disposal Area has a capacity of approximately 467,800 cubic yards. The eastern part of the designed site is presently covered with refuse which is scheduled to be mined during years 5-10 (See the mine sequencing maps Plates 9-4 and 9-5). Adequate capacity exists in the western portion to place the material expected, as listed in Appendix 9-5, to require disposal during the first five years. SCA will ensure that the refuse material on the eastern part is excavated prior to the time when the area is needed for the disposal area.

It should be noted that the area may be compatible to allow for further expansion of the excess spoil disposal area to the east at a later date to handle additional material if necessary.

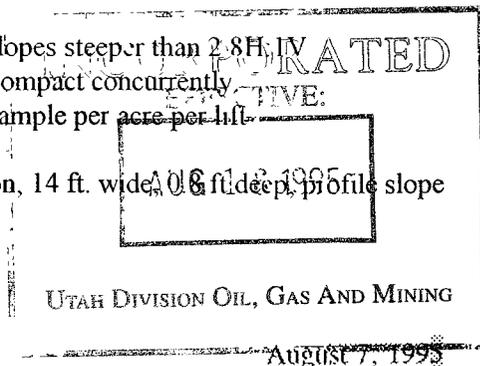
The sites described below in Additional Locations Considered for Excess Spoil Disposal Areas are available to provide additional capacity for disposal of excess spoil materials in the event that excavation of the existing refuse pile encounters quantities of material beyond what is initially expected. These other areas may also provide SCA with the opportunity to selectively place different types of spoil material into different locations to the extent possible within the capacities available at the time the materials are disposed.

### RECLAMATION of EXCESS SPOIL DISPOSAL AREA

Reclamation of the Excess Spoil Disposal Area will be in accordance with applicable DOGM regulations. The excess spoil and coal mine waste obtained over the life of SCA operations will be placed in a controlled manner to ensure that the final disposal facility will be suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use. The area will be reclaimed as outlined in Chapters Nine and Ten.

### SUMMARY

- Foundation slope no steeper than 2.8H:1V (36%)
- Minimum 25 ft. setback from the crest of natural foundation slopes steeper than 2.8H:1V
- Place material in horizontal lifts no deeper than four feet and compact concurrently
- Sample and analyze for acid- or toxic-forming potential, one sample per acre per lift
- Outer slopes of fill no steeper than 2.5H:1V
- Construct terraces on the outer slope every 25-35 feet elevation, 14 ft. wide, 0.6 ft deep, profile slope 1%-4%
- Maximum height of 70 feet
- Minimum surface slope of 2%



- Protect against surface run-on with diversions designed for 100 yr, 6 hr precipitation event
- Coal mine waste, acid-forming, toxic-forming, or combustible material will be covered with a minimum of four feet of non-acid-forming, non-toxic-forming, and non-combustible material
- Regular inspections as required in R645-301-514.

### ADDITIONAL LOCATIONS CONSIDERED FOR EXCESS SPOIL DISPOSAL AREAS

SCA anticipates designation of three additional sites for the disposal of excess spoil. The sites under consideration include the following: Slurry Ponds #1 and #2; Industrial Borrow Area #1; and the Industrial Borrow Area #3 and Reclamation Borrow Area. SCA will submit a permit amendment for approval by DOGM in the event that it appears necessary to utilize additional sites because of the need for additional disposal capacity. SCA does not intend to be actively constructing various excess spoil areas concurrently without specific justification (such as separation of different types of excess spoil materials, etc.).

Construction design of the additional disposal areas will be submitted following the regulations as required. Construction is expected to be similar to the methods described above and in appendices 9-2 and 9-5. However, the locations of these additional areas are such that specific design issues to meet the requirements for structural stability, drainage concerns, approximate original contours, etc will need to be addressed in the permit amendment.

The additional sites are being considered because of the potential to use excess spoil materials to fill areas from which soil materials were or will be removed for other purposes. Filling with excess spoil could attempt to return the areas to the approximate original contours. These areas are not anticipated to be constructed with steep out-slopes or in major drainage-ways where erosion would be a serious concern. These areas may be used for excess spoil disposal following completion of their current or anticipated use.

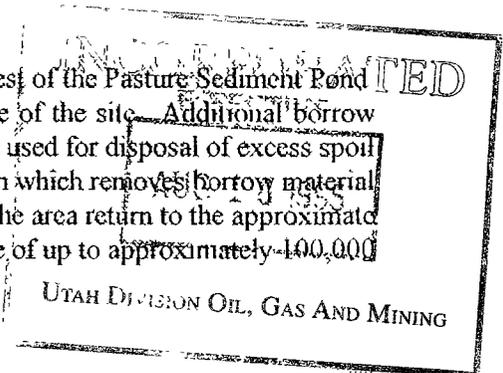
### SLURRY PONDS #1 AND #2

These slurry ponds, located in the northeast portion of the permit area, have a capacity of approximately 45,000 cubic yards and have been used for the disposal of slurry fines from the SCC wash plant since their construction. The ponds are and will continue to be classified and inspected as impoundments until such time as SCA determines the need for additional disposal capacity for excess spoil materials. Although SCA has not received slurry from SCC since their cessation of operations in 1994, the contractual obligation to accept slurry continues to be in affect. The slurry ponds will need to remain available as long as SCA has an obligation

Slurry fines are essential to the operations of SCA because of the higher BTU factor. It is essential that the slurry fines be conserved to the extent possible. The slurry ponds will be cleaned out as the fines are needed for operations. Cleaning the ponds prior to the needed use of the fines would only mean unnecessary additional handling of the material.

### INDUSTRIAL BORROW AREA #1

The Industrial Borrow Area #1 is located on the north edge of the permit just west of the Pasture Sediment Pond. Some borrow material was removed from this area prior to SCA's purchase of the site. Additional borrow material is available for use in contemporaneous reclamation. If this area is to be used for disposal of excess spoil materials, it could be constructed concurrently with contemporaneous reclamation which removes borrow material from the area. This spoil material could be placed in a manner which helps the area return to the approximate original contours. This area could be expanded to have the capacity to dispose of up to approximately 100,000 to 200,000 cubic yards of spoil material if needed.



## INDUSTRIAL BORROW AREA #3 AND RECLAMATION BORROW AREA

These borrow areas are located on the east edge of the permit area. Some borrow material has been removed from the Industrial Borrow Area #3. Phased reclamation work throughout the life of the mine, as identified in the reclamation plan, will periodically require additional borrow material to be used until the Industrial Borrow Area #3 has consumed the entire Reclamation Borrow Area at the completion of final reclamation of the permitted area.

If this area is to be used for disposal of excess spoil materials, it could be constructed concurrently with contemporaneous reclamation which removes borrow material from the area. This spoil material could be placed in a manner which helps the area return to the approximate original contours. This area could be expanded to have the capacity to dispose of up to approximately 400,000 to 500,000 cubic yards of spoil material if needed.

## 9.7 BACKFILLING AND GRADING

This section discusses the backfilling and regrading that will be done during the operations plan period. Backfilling and regrading will involve redistribution of spoil material and regrading exposed surface areas that will be reclaimed. The objective of these activities is to restore the site to topographic configurations and geomorphic conditions similar to premining conditions. Final grading of all areas will include blending materials into the surrounding areas and reclaiming as detailed in Plate 10-1.

As discussed under section 9.6.3, the Industrial Waste Dump was closed prior to grading the site for temporary storage of coarse and fine refuse. Additional grading was necessary to establish the storage areas. Grading was required for Storage Areas One, Two, and Four whereas Storage Area Three did not require additional grading. Grading requirements for each storage area are specified under section 9.6.3.

## 9.8 TOPSOIL AND BORROW MATERIAL HANDLING

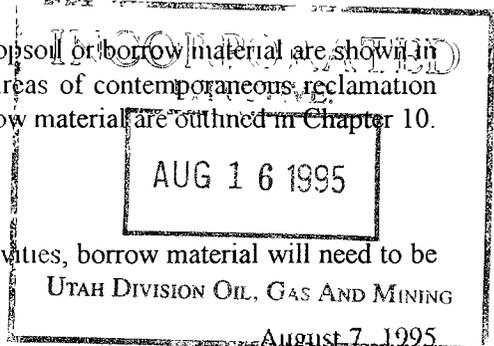
Mining operations began at the Sunnyside Mines prior to implementation of topsoil salvage requirements. Therefore, borrowed soil materials will be required in most locations in order to achieve successful reclamation on areas affected by the re-mining operations. A complete discussion of the materials used for topsoil and borrow material is included in Chapter Two, R645-301-200, Soils.

### 9.8.1 AREAS TO RECEIVE TOPSOIL OR BORROW MATERIAL

Areas within the SCA Permit Area that will receive an application of topsoil or borrow material are shown in Plate 10-1 or in Plate 8-4 for Worst Case Scenario Reclamation. Areas of contemporaneous reclamation sequencing are outlined in Plate 10-3. Application of the topsoil or borrow material are outlined in Chapter 10.

### 9.8.2 BORROW MATERIAL REMOVAL

Because very little topsoil has been saved during the SCC mining activities, borrow material will need to be



substituted for topsoil in order to establish vegetative growth on reclaimed areas. Detailed descriptions of topsoil handling on any newly disturbed sites is discussed in R645-301-232, Topsoil and Subsoil Removal. The following discussion pertains to the borrow area removal that will be necessary for reclamation.

Approximately 640,000 cubic yards of borrow material will be needed for all reclamation activities to cover the area delineated in Plate 10-3. This borrow material will be obtained from the borrow areas outlined in Chapter Two, R645-301-224, Substitute Topsoil. The borrow material that will be utilized is the best available within the SCA Permit Area which lies close to the existing disturbed areas. Borrow material will be removed from these sites and contoured such that each acts as a catchment basin or drained to flow into the existing sediment ponds. This will be done to control run-off from each borrow area and provide water for wildlife species.

A sufficient amount of material will be left in the bottom of each borrow area for reclamation, and each borrow area will be permanently revegetated according to the procedures discussed in section 9.9. For contemporaneous revegetation efforts, the borrow area will be seeded with the approved interim seed mix if additional borrow excavation is not expected during the next year.

The borrow material stripping depths will be confirmed by qualified personnel in the field prior to actual disturbance. Salvageable topsoil will be removed from the borrow areas as described in Chapter Two, R645-301-232, Topsoil and Subsoil Removal.

### 9.8.3 TOPSOIL STORAGE

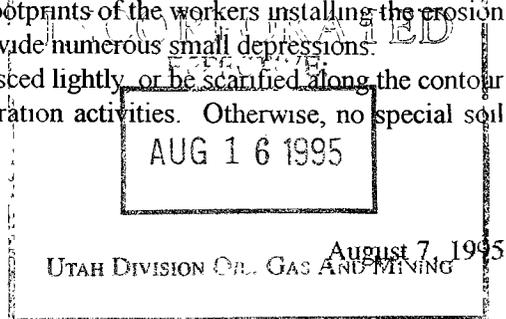
Detailed descriptions of topsoil handling on any newly disturbed sites is discussed in R645-301-232, Topsoil and Subsoil Removal

### 9.8.4 TOPSOIL AND BORROW MATERIAL REDISTRIBUTION

The recontoured surfaces of disturbed areas that will receive borrow material or topsoil will be cleaned of waste material including the hardpan material that has formed between the refuse and soil layers. The subgrade will be prepared by ripping to a prudent depth. Ripping will alleviate compaction caused by equipment and will also provide a roughened surface for bonding with the borrow material. All roadbeds will be ripped twice, once each in opposite directions.

After appropriate surface regrading and ripping is completed, borrow material will be applied. The borrow material will be distributed by end-dumping, and minimal grading will be utilized to redistribute the dumped materials sufficient to cover the reclaimed sites. The borrow materials will not be evenly distributed as to depth, thus the materials will be unevenly distributed and result in a rough uneven surface. The small ruts and ridges will serve as catchment for water during the revegetation process. The average borrow material depths are outlined in Section 9.8.1.

On slopes greater than 2:1 the end-dumped topsoil materials will be pushed onto the slopes with a dozer and a backhoe will be used to systematically gouge depressions from four (4) to eight (8) inches deep on 30% of the slope surface or as needed to roughen smoothed surfaces. The footprints of the workers installing the erosion netting or other additional erosion control measures may also provide numerous small depressions. Prior to seeding, the topsoil and other regraded surfaces will be disced lightly or be scarified along the contour if a crust has developed since final grading or other soil preparation activities. Otherwise, no special soil preparation will be necessary.



### 9.8.5 AMENDMENTS

It is expected that the applied borrow material may require fertilizer amendments at the time of reclamation. Soil testing at the time of reclamation will be conducted according to DOGM Topsoil Guidelines to determine appropriate fertilizer rates. SCA will work with DOGM to ensure that the redistributed soils are analyzed according to DOGM Guidelines and that the tests are performed by an approved laboratory. In general, soil amendments will be applied during the fall concurrent with reseeding operations to maximize plant response.

## 9.9 REVEGETATION

The objective of the post-mining revegetation program is to restore the surface-disturbed area to a land use capability similar to that which existed prior to mining. The initial reclamation objectives will be to stabilize the soils and to restore the disturbed area to approximate original topographic conditions. Ultimately, the disturbed areas will be returned to their pre-mining use with watersheds in their approximate premining character. In general, the long-term appearance and usefulness of the reclaimed permit area will be similar to that encountered prior to mining and also to that found in the adjacent areas that remain undisturbed by mining and related activities.

### 9.9.1 GENERAL REVEGETATION PROCEDURES

All areas that are currently disturbed are shown on Plate 3-1, as well as those areas that will be disturbed as a result of the Mining Plan or the Reclamation Plan activities will be reclaimed according to the procedures discussed in this section. Areas of contemporaneous reclamation which will occur during the operations phase are outlined in Plate 10-3. A Final Reclamation Plan is presented in Plate 10-1 through 10-7. The general procedures outlined below will be used for all reclaimed sites. Additional details on these procedures can be found throughout this chapter and in chapter 10

- Subgrade shall be cleaned of waste material, scarified and pulverized before covering with topsoil or borrow material.
- Topsoil or borrow material will be spread unevenly over all areas to approximate depths as described in the final reclamation plan.
- The final grade will be blended into the existing grade with a natural finish.
- The finished grades will be left in a roughened state. On slopes less steep than 2:1, all efforts will be made during grading to conduct the last pass in the direction of the contour rather than perpendicular to the contour. The purpose of this effort will be to leave small berms to break up the slope.
- Fertilizer will be spread just prior to seeding. The fertilizer may be spread by any method that will give an even distribution.
- Areas with slopes greater than 2:1 shall be scarified to a depth of 6-inches prior to seeding.
- Final reclamation seeding must be accomplished between October 1st and November 30th. All efforts will be made to plan and schedule reclamation work such that it can be completed in a time frame that allows seeding to be accomplished during this approved seeding window. If seeding is not finished during this

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time frame then all remaining seeding and any related reclamation work will be suspended until the following year. Areas which cannot be seeded during the seeding window will be stabilized to reduce erosion. Some acceptable methods of stabilization include seeding with an annual grain, mulching, or netting until the seeding window has opened. However, seeding with an annual grain will not take place later in the year than September 15 for areas which are to be seeded with a permanent seed mixture that fall due to the potential competition the annual grain may have. Interim seeding may be conducted at SCA's discretion during other times during the year (such as early spring) that currently appear to show promise of success.

- For areas to be hydro-seeded the water and 15% of the wood fiber mulch and 50% of the tackifier will be mixed in the hydroseeder. The slurry will then be mixed with water at a rate of 13,000 gallons per acre and the seed will be added to the slurry. The seed/slurry mixture will be applied to form an even cover within 30 minutes of the seed being added to the slurry. Application will begin at the top of the slope and work downward. The remaining mulch and tackifier will be applied immediately following initial seeding.
- For slopes greater than 2:1, seed may be broadcast evenly over the prepared slopes by means of a hand-held seeder. Broadcasting will not be done during windy conditions or when the soil is saturated.
- All areas which are seeded will be raked to provide adequate seed to soil contact.
- On slopes 2:1 or greater, additional erosion control measures (consisting of excelsior type mats and/or fiber roving) will be implemented to cover the seed bed surface and protect the barren soil surface from wind and water erosion, as determined necessary on a case-by-case basis to increase revegetation success to meet the post-mining land use.
- Shrub plantings will be used on a few sites to augment the shrub portion of the existing plant community and to blend in man-made features with the natural terrain. The shrub stock will be pinyon pine and juniper tublings. The tublings will be grouped and not evenly placed at a density of 200 shrubs per acre. The planting site will be saturated with water as the initial irrigation. The planting site and rooting area will be hand-cleared of all vegetative growth to reduce competition from established vegetation. SCA commits to creating six (6) areas consisting of approximately 1000 shrub plantings each as shown on Plate 10-7. These shrub plantings will occur at the time that final reclamation work is performed in each designated area. The shrub plantings are being created for the purpose of establishing areas of cover for habitat.
- Rock piles will be placed at random across the regraded site. The rock piles will be constructed from boulders obtained during borrow material excavation and will generally consist of boulders larger than one foot in diameter (ie. those easily removed during excavation). Approximately four piles will be constructed per acre until available rock materials obtained from the borrow areas are exhausted. The piles will vary in size but could average approximately 6'-10' in diameter and 3'-8' high. The rock piles are being created for the purpose of providing habitat for snakes, small mammals (marmots, ground squirrels, chipmunks and other ground dwelling rodents), etc.

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## 9.9.2 INTERIM REVEGETATION

During the operations phase several areas will receive interim revegetation stabilization including the following:

- New berms or other new disturbances associated with the construction of sedimentation ponds or related structures including embankment tops, slopes, ditches, etc. At this time there are no new sedimentation ponds proposed.
- New topsoil piles associated with new disturbances.
- Any other areas associated within the SCA Permit Area which are judged to require interim stabilization.

These areas will be disturbed again during final reclamation activities and therefore will not receive topsoil. Because backfilling and construction of hydrologic controls will occur just prior to seeding, many of the seed beds will require no additional preparation. Furthermore, subsequent surface manipulation of these areas would demolish constructed structures.

Compacted areas will be prepared for seeding by ripping, scarifying, or discing the materials in place. All areas will then be seeded, fertilized, and mulched utilizing standard broadcast or hydroseeder methods.

For most areas requiring interim stabilization during the Mining Period, 16-16-8 fertilizer will be applied at a rate of 150 pounds per acre. Topsoil stockpiles will not be fertilized. The interim seed mix proposed for use in all areas is shown in Figure 9-1, Interim Reclamation Seed Mixture. This mix contains a combination of native and introduced species and is proposed because the species establish rapidly and effectively control erosion. Mulch will consist of a wood fiber or weed-free straw applied at a rate of one ton (1) per acre.

In addition to the benefits received from interim revegetation in terms of soil stabilization and erosion control, SCA also expects to reduce annual weedy species on topsoil piles and borrow areas through establishment of an interim perennial vegetative cover. This reduction in weedy species, and therefore a reduction in available weed seed in the area, could greatly increase the chance of permanent vegetation success. SCA will pay close attention to weed population and determine if additional weed controls are needed in accordance with section 9.11.2.

### 9.9.2.1 INTERIM RECLAMATION OF THE THIRD and FOURTH LIFTS OF THE COARSE REFUSE PILE

Revegetation on all land that is disturbed by coal mining and reclamation operations will occur as contemporaneously as practicable with mining operations, except when such mining operations are conducted in accordance with a variance for combined SURFACE and UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES issued under R645-302-280. During the life of SCA operations, interim reclamation will be accomplished as necessary or as required by the Division. Cover material will be obtained from an approved borrow material site and the depth of cover will be approved by DOGM prior to conducting contemporaneous reclamation.

Interim reclamation was performed on the third lift and the fourth lift of the coarse refuse pile in 1993 and the spring of 1994. The Division approved SCA's plan to cover the remaining portion of the third lift with two (2) feet of borrow material. The material in the designated Excess Spoil Pile site was previously approved by DOGM to use as borrow material, therefore, SCA utilized this material to cover the remainder of the third lift. There were approximately two (2) acres on the third lift which were covered with approximately 6,500 cubic

yards of material. The fourth lift was covered and reseeded at the same time and in the same manner as the third lift.

Revegetation was accomplished in accordance with R645-301-353. The Interim Seed Mixture (Figure 9-1) was utilized for interim reclamation of the third and fourth lifts. Erosion and sediment control consisted of slope stabilization using 16-16-8 fertilizer at a rate of 150 pounds per acre and wood fiber mulch at a rate of one (1) ton per acre.

### 9.9.3 SEEDING AND PLANTING

All seeding will be done during the fall of the year of reclamation in order to maximize revegetation success. It should be noted, however, that seeding using the interim seed mixture may occur during other seasons if needed to control erosion or soil degradation.

The seed mix, application rate, and seeding techniques are based on reclamation experience in the area, as well as on consideration of local environmental conditions of soil, slopes, elevation, and precipitation. Use of this seed mix will result in a rapidly established and effective vegetation cover capable of minimizing erosion and meeting the goals of the reclamation program. The seed mix proposed for use in final reclamation, shown in figures 10-2, 10-3, and 10-4, is designed to reestablish a wildlife vegetative type and will be planted throughout the disturbed area. This proposed seed mix contains species well adapted to the area, and will produce a diverse, effective vegetation cover capable of self-regeneration.

Seed availability will determine the ultimate seed mixture and variety of seed used. If a variety of seed is not available, DOGM will be notified and additional seed of one of the seeds listed or another species or variety will be substituted upon approval by DOGM so that the final PLS per acre is equivalent to the proposed mix.

During final reclamation, the seed mixture will be placed by either drill seeding, hydro-seeding or by hand broadcast seeding, depending upon the slope. On steep slopes where equipment cannot be safely operated, the seed will be broadcast.

The final reclamation plan is designed to provide successful reclamation when compared with the current condition of the two reference areas. It is anticipated the required live shrub stem density can be achieved from the shrub seed currently in the seed mix. SCA commits to meeting an acceptable success standard following review of a recommended standard which has received concurrence from appropriate state and or federal agencies. DOGM has suggested that the standard for trees/shrubs be set at 1000 per acre and composed of three shrub species of which no one species can make up more than fifty percent of the number. DOGM recommends this standard based on existing shrub densities within the region and similar standards required by other coal mines within the area. When DOGM obtains concurrence from other agencies, SCA will review recommendations and commit to a specific standard to be met.

#### Seed Specifications

1. Seed stock must be from the previous year's or current year's seed crops.
2. 90% Pure Live Seed (PLS).
3. All seed furnished shall be those specified in the plan and shall be measured by PLS weight. All seed shall be tested by a certified seed analyst in a duly accredited seed testing laboratory. Each seed species

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(variety) shall be furnished with a tag which clearly lists: (1) botanical name, (2) common name, (3) collection location and elevation, (4) pure seed (%), (5) inert matter (%), (6) other crop seed (%), (7) weed seed (%), (8) noxious weed seed, (9) germination (%), (10) hard seed (%), (11) date tested, (12) lot number, (13) net weight, (14) name of seed testing laboratory, and (15) name and address of seed company. A report of certification shall be submitted to DOGM prior to shipment. Seed shall not contain prohibited noxious weed seed as listed by state seed law. Wet, moldy, or otherwise damaged seed shall not be accepted.

4. The seeds will be delivered to the site in the fall of the year. A 30-day notice of shipment will be issued when the site is ready for seeding.
5. The seed shipment is subject to inspection by the Utah State Department of Agriculture.
6. The seeding will take place in the fall on the prepared sites after October 1st and prior to November 30th. No reclamation will take place on sites that cannot be seeded prior to November 30th. The fall seeding will allow for a period of exposure to freezing conditions and to spring moisture for the optimum germination conditions for all seed types in the mix.

#### **9.9.4 MULCHING AND SOIL STABILIZATION**

Mulch decreases moisture loss, increases site stabilization, moderates soil surface temperature, and reduces wind velocity at the soil surface. All revegetated areas will be mulched with a wood fiber mulch at a rate of two (2) tons per acre. Tackified wood fiber at a rate of 120 pounds per acre will be applied for every 2000 pounds of wood fiber mulch used. Fifteen percent (15%) of the wood fiber mulch and 50% of the tackifier will be mixed in the hydroseeder with the slurry. The remaining mulch and tackifier will be applied immediately following initial seeding.

#### **9.9.5 VEGETATION SUCCESS DETERMINATION**

The post-mining land use is wildlife habitat. The objective is to achieve a plant cover sufficient to control erosion and provide a plant community useful as wildlife habitat. The perennial grasses and forbs growing under the moderating influence of the shrubs will stabilize the soil surface. The shrubs will provide cover for small animals. Additional wildlife enhancement features include planted pinyon pine and juniper trees.

The standard for the revegetation will be the two reference sites. In the summer of 1993 the reference sites were sampled by methods found in the DOGM Vegetation Guidelines. The results of this survey are found in Appendix 3-3.

Permanent revegetation efforts will be monitored in areas not identified as "Previously-Mined Areas" on Plate 5-7 according to the following schedule:

- First year following seeding: reconnaissance survey and qualitative evaluation of revegetation.
- Second year: qualitative and quantitative sampling of cover, frequency, and woody plant density.
- Third year: qualitative and quantitative sampling of cover, frequency, and woody plant density.
- Fourth year: qualitative evaluation only.

- Fifth year: all parameters listed during the second year.
- Sixth year: qualitative evaluation only.
- Seventh year: qualitative evaluation only.
- Eighth year: qualitative evaluation only.
- Ninth year: all parameters listed during the third year.
- Tenth year: all parameters listed during the ninth year.

During the ninth and tenth years, revegetated areas as well as the reference areas will be sampled for all parameters listed in order to test reclamation success. In the tenth year following revegetation, application for final bond release will be made.

See R645-301-350, Reclamation Performance Standards for additional information.

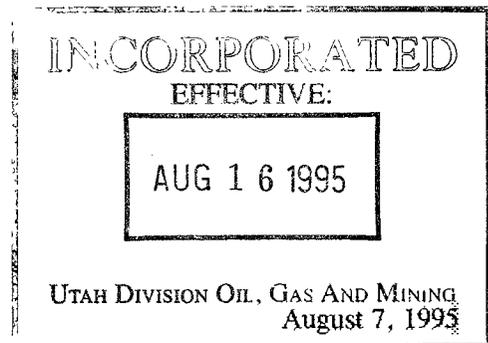
#### 9.9.6 SAMPLING PROCEDURES

The qualitative sampling will take place annually in the summer months. The first year will require monthly visits from April to September to closely follow the progress of the seedlings and plantings. The second year will require visits in the spring and late summer to continue tracking the progress of the seedlings and plantings. The visits in years three (3) through ten (10) will occur annually in the summer or be coordinated with the quantitative sampling schedule.

The qualitative sampling will consist of visiting each reclamation area and recording growth, species success, soil conditions, erosion, livestock or wildlife use, insect damage, and other special conditions. The qualitative sampling will incorporate needs identified under the DOGM inspection program.

The quantitative sampling will take place in years two (2), three (3), five (5), nine (9) and ten (10) in the reference areas and revegetated sites. All of the measurements for cover, diversity, and woody stem densities will be taken in each year scheduled for quantitative sampling. Eighty percent of the measurements for woody stem density at bond release will be taken only from shrubs and trees that have existed for sixty (60) percent of the applicable minimum period of responsibility. The qualitative and quantitative data will be included in the annual reports.

See R645-301-350, Reclamation Performance Standards for additional information.



**TABLE 9-4  
RECLAMATION MONITORING SCHEDULE**

SAMPLING	YEARS									
	1	2	3	4	5	6	7	8	9	10
Qualitative	x	x	x	x	x	x	x	x	x	x
Quantitative										
Cover		x	x		x				x	x
Frequency		x	x		x				x	x
Woody Plant Density		x	x		<sup>1</sup> x		<sup>2</sup> x		x	x
Transplant Survival	x	x	x		x					

<sup>1</sup> At this time, if 80% of the standard has not been met, planting methods will be used to increase the woody plant density to the required 80%.

<sup>2</sup> Subsequent monitoring will occur in year seven if supplemental plantings were required in year 5. Monitoring at this time is for the purpose of determining the success rate of supplemental plantings.

### 9.9.7 IRRIGATION

Irrigation should not be required to establish successful vegetative growth for final reclamation. All areas will be mulched to increase germination and to improve soil moisture.

## 9.10 WATER TREATMENT

During the mining period the existing sediment control structures and diversion ditches will be used. This would allow the site to meet the regulatory effluent requirements and to ensure that no significant environmental damage would be caused by the operations.

### 9.10.1 DIVERSIONS

Plans for diversion ditches within the SCA Permit Area are discussed in Chapter Seven, Hydrology. Included in this chapter are the criteria and the designs of the ditches, culverts and sedimentation ponds required to maintain water quality in accordance with the prevailing regulations.

### 9.10.2 SEDIMENT CONTROL

The impoundments within the SCA Permit Area have been, and will continue to be used to control sediment during the operations and reclamation activities. The impoundments are discussed in Chapter Seven, sections 732, 733, 742 and 743.

Berms will also be used to control sedimentation from temporarily or permanently reclaimed areas. These berms will be used to ensure that drainage from the area in question will be treated.

## 9.11 MONITORING AND MAINTENANCE

This section addresses the concerns of the monitoring efforts that will take place during the mining period. This will consist of water, vegetation, and erosion monitoring activities.

### 9.11.1 WATER

Impoundments which are subject to MSHA requirements are shown in Plate 5-7. These impoundments will be inspected weekly.

Quarterly inspections of runoff and sediment control structures not subject to MSHA, 30 CFR 77.216, will be conducted. Evidence of berm or ditch overtopping, bypass, or erosion will be noted and any needed repairs or upgrading will take place at the time of inspection or shortly after, depending on the scope of work required. The sedimentation ponds will be certified annually and the certification included in the annual report.

In addition, a water quality monitoring program will continue through the bonding period. A description of the monitoring program is included in Chapter Seven, sections 722 through 724. Quarterly monitoring reports will be submitted to DOGM.

### 9.11.2 VEGETATION

The establishment of weeds will be minimized by ensuring that all seed purchased is labeled in accordance with the Federal Seed Act, Section 201 (see specification in Section 9.9.3). This law limits or restricts the presence of certain noxious plant species. All seed will be tested and certified according to federal and state seed laws. Certificates of testing will be submitted to DOGM.

Mulching will be used during seeding to partially control weed emergence. Revegetation experience has shown that after a couple of years, most weeds are naturally eliminated from the reclamation stands. If weeds should become a problem, mowing may be utilized where terrain permits, SCA may choose to scarify and reseed some areas, or in extreme cases herbicides may be used.

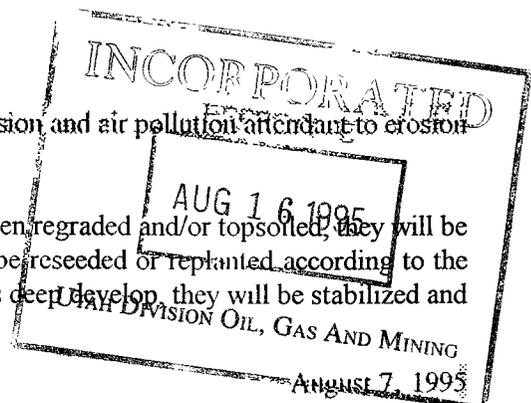
Any necessary insect or rodent control will be guided by the U.S. Fish and Wildlife Services; The Utah State Cooperative Extensive Service; and the Animal, Plant, Health Inspection Service.

To insure the vigor of the revegetation, strict grazing management may be required to properly utilize the forage in line with wildlife requirements. If wildlife feeding becomes a problem in the first few years of plant growth, steps may be taken to restrict their use of the revegetation. Wildlife management will be coordinated with the Division of Wildlife Resources.

### 9.11.3 EROSION

All exposed surface areas shall be protected and stabilized to control erosion and air pollution attendant to erosion to the extent possible.

When rills or gullies deeper than 9 inches develop in areas that have been regraded and/or topped, they will be filled, graded, or otherwise stabilized. The affected area will then be reseeded or replanted according to the methods described in Section 9.2. If rills or gullies less than 9 inches deep develop, they will be stabilized and



reseeded if they are disruptive to post-mining land use or the reestablishment of the vegetative cover, or may result in additional erosion and sedimentation which would cause or contribute to a violation of water quality standards for receiving streams. A mixture of 3 PLS/acre of barley and 3 PLS/acre of oats will be used in order to minimize surface erosion at times of the year when the interim seed mixture is not planted.

The diversions within the Permit Area will be inspected periodically and after large storm events for signs of erosion and other irregularities which may impede flow. If necessary, maintenance will be provided which may include excavating or shaping the diversion to line, grade and cross section as required to meet the design criteria specified in Chapter 7, Hydrology.

#### **9.11.4 TEMPORARY STORAGE AREAS**

Maintenance of the four temporary storage areas will consist of providing general maintenance and inspections of the surrounding structures, drainages, culverts, and roads.

Water or other dust control measures will be applied as necessary to reduce dust. General road maintenance procedures will be practiced and inspections will be done as necessary. Inspections will consist of: erosion control, repair of structures and drainage systems, removal of debris in culverts and replacement of road surfacing material as needed.

#### **9.11.5 REPORTING AND EMERGENCY PROCEDURES**

If a slide occurs, Sunnyside Cogeneration Associates will telephone DOGM to notify them of the situation and recommend remedial measures to be taken to alleviate the problem. Additional remedial measures required by DOGM will be implemented.

During impoundment inspections any potential hazards noted will be reported to DOGM along with measures to be implemented to eliminate the hazard.

### **9.12 SCHEDULE**

The different work items described in this chapter will be accomplished continually over the 30 year life of the cogeneration project.

The approximate final reclamation sequencing schedule is shown in Plate 10-3. Each year as sites of two acres or larger are permanently excavated of waste, and no longer needed for the continued operations, they will be reclaimed. SCA will notify DOGM of the areas that will be reclaimed and will commence implementation of the various portions of the reclamation plans as projected in Figure 10-1.

As with all areas receiving final reclamation treatment, after completing the appropriate backfilling and regrading, and drainage control in accordance with Phase I of the approved reclamation plan, the operator will request release of sixty percent of the Bond or collateral for the applicable area. After Phase II, revegetation has been established on the reclaimed land, the operator will request release of an additional amount of the Bond. At the completion of Phase III, after the operator has completed successfully all surface coal mining and reclamation operations, the operator will request release of the remaining portion of the Bond.

**FIGURE 10-3**  
**PINYON/JUNIPER/SAGEBRUSH SEEDING SCHEDULE**

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FIGURE 10-3  
SEEDING SCHEDULE  
PINYON/JUNIPER/SAGEBRUSH AREAS

SPECIES	DRILL RATE		BROADCAST RATE	
	SEEDS/FT <sup>2</sup>	#PLS/ACRE	SEEDS/FT <sup>2</sup>	#PLS/ACRE
<u>GRASSES</u>				
<u>Elymus cinereus</u> Gt. Basin Wildrye	6.5	3.0	13.0	6.0
<u>Elymus lanceolatus</u> Thickspike Wheatgrass	5.8	2.0	11.6	4.0
<u>Elymus spicatus</u> Bluebunch Wheatgrass	3.5	3.0	7.0	6.0
<u>Stipa Comata</u> Needle-and-Threadgrass	6.8	2.0	13.6	4.0
<u>Stipa hymenoides</u> Indian Ricegrass	6.8	2.0	13.6	4.0
<u>FORBS</u>				
<u>Achillea millifolium</u> Yarrow	6.4	0.1	12.8	0.2
<u>Aster chilensis</u> Pacific Aster	6.0	0.1	12.0	0.2
<u>Hedysarum boreale</u> Northern Sweetvetch	1.5	2.0	3.0	4.0
<u>Linum lewsii</u> Lewis Flax	6.7	1.0	13.4	2.0
<u>Melilotus officinalis</u> Yellow Sweetclover	6.0	1.0	12.0	2.0
<del>Penstemon palmeri</del> Palmer's Penstemon	7.0	0.5	14.0	1.0
<u>SHRUBS</u>				
<u>Amelanchier utahensis</u> Serviceberry	1.3	2.0	2.6	4.0
<u>Artemisia tridentata</u> Big Sagebrush (Wyoming)	6.7	0.1	13.4	0.2
<u>Cercocarpus leifellius</u> Mountain Mahogany	2.3	2.0	4.6	4.0
<u>Atriplex canescens</u> Fourwing Saltbrush	1.2	1.0	2.4	2.0
<u>Rhus trilobata</u> Squawbush	1.0	2.0	2.0	4.0
	75.5	23.8	151.0	47.6

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**FIGURE 10-4**  
**HYDROPHYTIC VEGETATION SEEDING SCHEDULE**

FIGURE 10-4  
SEEDING SCHEDULE  
HYDROPHYTIC VEGETATION AREAS

SPECIES	DRILL RATE		BROADCAST RATE	
	SEEDS/FT <sup>2</sup>	#PLS/ACRE	SEEDS/FT <sup>2</sup>	#PLS/ACRE
<u>GRASSES</u>				
<u>Agropyron smithii</u> Western Wheatgrass	8.0	3.0	16.0	6.0
<u>Elymus cinereus*</u> Gt. Basin Wildrye	9.0	3.0	18.0	6.0
<u>Phalaris arundinacea</u> Reed canarygrass	12.0	1.0	24.0	2.0
<u>Typha latifolia*</u> Broad-leaved Cattail	23.0	0.1	46.0	0.2
<u>Sporobolus Airoides</u> Alkali Sacaton	20.2	0.5	40.4	1.0
<u>FORBS</u>				
<u>Iris missouriensis</u> Rocky Mountain Iris	2.0	5.0	4.0	10.0
<u>Castilleja Exilis</u> Marsh Indian Paintbrush	10.5	0.1	21.0	0.2
<u>Geranium Viscosissimum</u> Wild Geranium	0.1	0.1	0.2	0.2
<u>SHRUBS</u>				
<u>Amelanchier alnifolia</u> Saskatoon Serviceberry	1.0	1.0	2.0	2.0
<u>Cornus stolonifera</u> Redosier dogwood	2.0	0.5	4.0	1.0
	87.0	14.3	175.6	28.6

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 DIRECTIVE  
 Native to the Seep Area  
 AUG 10 1995  
 UTAH DIVISION OIL, GAS AND MINING

August 9, 1995

FIGURE 10-4  
SEEDING SCHEDULE  
HYDROPHYTIC VEGETATION AREAS

SPECIES	DRILL RATE		BROADCAST RATE	
	SEEDS/FT <sup>2</sup>	#PLS/ACRE	SEEDS/FT <sup>2</sup>	#PLS/ACRE
<u>GRASSES</u>				
<u>Elymus cinereus*</u> Gt. Basin Wildrye	12.0	4.0	24.0	8.0
<u>Agropyron smithii</u> Western Wheatgrass	8.0	3.0	16.0	6.0
<u>Phalaris arundinacea</u> Reed canarygrass	12.0	1.0	24.0	2.0
<u>Phleum pratense</u> - <i>Introduced</i> Timothy	9.0	0.3	18.0	0.6
<u>Typha latifolia*</u> Broad-leaved Cattail	23.0	0.1	46.0	0.2
<u>Agrostis alba</u> - <i>Introduced</i> Redtop	11.0	0.1	22.0	0.2
<u>FORBS</u>				
<u>Iris missouriensis</u> Rocky Mountain Iris	2.0	5.0	4.0	10.0
<u>SHRUBS</u>				
<u>Amelanchier alnifolia</u> Saskatoon Serviceberry	1.0			2.0
<u>Cornus stolonifera</u> Redosier dogwood	2.0			1.0
	80.0			30.0

\*Native to the Seep Area.

*Betula occidentalis*  
~~*Cornus sericea*~~  
*Salix lasiolepis*  
*Clematis ligusticifolia*  
*Equisetum*  
*Sporobolus airoides* *altali Saskatoon*  
*Distichlis spicata*