STATE OF COLORADO

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
TDD Line (303) 691-7700
Located in Glendale, Colorado

http://www.cdphe.state.co.us

Laboratory Services Division
8100 Lowry Blvd.
Denver, Colorado 80230-6928
(303) 692-3090

Colorado Department of Public Health and Environment

For Agency Use Only

Permit Number Assigned

_____

Date Received ___/___/___
Month Day Year

COLORADO DISCHARGE PERMIT SYSTEM (CDPS)

INDUSTRIAL INDIVIDUAL WASTEWATER DISCHARGE PERMIT

Please print or type. Original signatures are required. All items must be completed accurately and in their entirety for the application to be deemed complete. Incomplete applications will not be processed until all information is received which will ultimately delay the issuance of a permit. If more space is required to answer any question, please attach additional sheets to the application form. Applications must be submitted by certified mail or hand delivered to:

Colorado Department of Public Health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South WQCD-P-B2
Denver, Colorado 80246-1530

PHOTO COPIES, FAXED COPIES, PDF COPIES OR EMAILED COPIES WILL NOT BE ACCEPTED.

This application is for use by all **individual industrial process water dischargers to surface water, ground water or stormwater dischargers.** Discharges to ground water may occur from impoundments that are either non-discharging to surface water or discharging to surface water, land application and septic systems, whose design capacity is greater than 2000 gallons per day. The Division has industry specific permits for construction dewatering, sand and gravel, gasoline clean up sites or other groundwater remediation, hydrostatic testing, subterranean dewatering, water treatment plants, hardrock mining, coal mining, non-contact cooling water, aquatic animal production, produced water from oil and gas facilities, commercial washing of outdoor structures, along with several for stormwater only discharges. If the facility falls under one of these activities, please check the website for the appropriate application (www.coloradowaterpermits.com – click on the industrial link).

PERMIT INFORMATION

Reason for Application: ☒ NEW PERMIT
☐ RENEW PERMIT EXISTING PERMIT #_____

Discharge is to ☒ Surface Water ☐ Ground Water ☐ Both

Applicant is: ☐ Property Owner ☒ Contractor/Operator

1. **Permit Applicant Legal Contact Address and Contact Information**

Company Name GreenBack Produced Water Recovery, LLC
First Name Daniel Last Name Packard
Title CEO
Mailing Address 1900 Grant Street, Suite 630
City, State and Zip Code Denver, Colorado
Phone 303-887-8387 Fax 303-318-9659 Cell _____
E-mail Address DanPackard@aol.com

2. Other Contact Information

Owner ☒ Same as Applicant

Company Name _____

First Name _____ Last Name _____

Title _____

Mailing Address _____

City, State and Zip Code _____

Phone _____ Fax _____ Cell _____

E-mail Address _____

Operator ☒ Yes We have a Certified Operator ☐ Same as Applicant

Company Name CGRS, Inc.

First Name Gregg Last Name Neurohr

Title Project Manager

Mailing Address P. O. Box 1489

City, State and Zip Code Fort Collins, CO 80522

Phone 970-493-7780 Fax 970-493-7986 Cell 970-420-6836

E-mail Address gregg@cgrs.com

Certification Number 13836 Certification Level C

Facility Contact ☒ Same as Applicant

Company Name CGRS, INC

First Name Joby Last Name Adams

Title Chief Operating Officer

Mailing Address P. O. Box 1489

City, State and Zip Code Fort Collins, Colorado 80522

Phone 970-493-7780 Fax 970-493-7986 Cell 970-420-6821

E-mail Address Joby@cgrs.com

Is the Facility/Site Address and Contact the DMR Mailing Address and Contact? ☒ YES ☐ NO

DMR Mailing Address and Contact ☐ Same as Applicant

Company Name CGRS, Inc

First Name Joby Last Name Adams

Title Vice President

Mailing Address P. O. Box 1489

City, State and Zip Code Fort Collins, CO 80522

Phone 970-493-7780 Fax 970-493-7986 Cell 970-420-6821

E-mail Address Joby@cgrs.com

If more spaces are needed, please add additional pages

Billing Address and Contact ☒ Same as Applicant

Company Name _____

First Name _____ Last Name _____

Title _____

Mailing Address _____

City, State and Zip Code _____

Phone _____ Fax _____ Cell _____

E-mail Address _____

Authorized Agent if not listed above

(Authorized agent may sign reports such as DMR's as required by the permit.)

Authorized Agent Joby Adams Email Address Joby@cgrs.com

Title Chief Operating Officer Telephone No. 970-493-7780

Authorized Position _____ Telephone No. _____

Currently held by _____ Email Address _____

3. **Permitted Facility Information**

- Facility Name GreenBack Shaeffer Ranch Facility

Type of Facility Ownership

☐ City Government ☒ Corporation ☐ Private ☐ Municipal or Water District

☐ State Government ☐ Mixed Ownership _____

- **Facility/Site Location**

Street Address N/A

City, State and Zip Code _____

County Garfield

Legal Description

NE, NE, S12, T7S, R93W

Directions

I70 take exit 96 (Mamm Creek exit) south on CR 315 5 miles to CR 322. Go west 2.3 miles to unmarked private road go north 0.89 miles to facility on west side of road. Map attached.

Latitude (Dec.Deg) 39.466811 Longitude (Dec.Deg.) -107.715334

☐ Horizontal Collection Method: ☐ GPS Unspecified ☐ Interpolation – Map Map Scale Number _____

☐ Reference Point : ☐ Facility Entrance ☒ Facility Center/Centroid

- **Facility Industry Classification Codes (Use SIC)**

Primary _____ Secondary _____ Secondary _____ Secondary _____

3. **Permitted Facility Information continued**

- **Facility Industrial/Business Activity**

Describe the primary industrial and/or business activities which take place on site. If this is a seasonal operation, list the months of operation:

The facility will treat, store and recycle produced water generated from oil and natural gas gathering operations. The water will be treated by oil/water separation, mechanical solids removal, clarification by dissolved air flotation, air stripping and reverse osmosis.

- **Production:** List the principal product(s) produced and maximum production rate.

The facility will accept and treat up to 5000 barrels (bbls) of produced water daily. It is anticipated that the majority of water will be returned to oil and gas operators. We anticipate that up to 4% of the total waste stream will consist of condensate, which will be recycled as a fuel.

- **Intermittent Discharges**

A discharge is intermittent unless it occurs without interruption during the operating hours of the facility, except for maintenance, process change or similar shutdown. A discharge is seasonal if it occurs only during certain parts of the year.

Except for storm runoff, are any discharges intermittent or seasonal? ☒ YES ☐ NO

Describe the frequency, duration, and flow rate of each discharge occurrence, except for storm runoff, spillage, or leaks:

Discharges from the RO system will be intermittent at an flow rate of 45 gpm. Discharges will be periodic and may not occur for several days or weeks. The duration of discharges can vary from several hours to several days.

- **Location Map :** A location map designating the facility property, intake points, discharge points, each of its hazardous waste treatment storage or disposal facilities, each well where fluids from the facility are injected underground, those wells, springs, other surface water bodies and drinking water wells listed in public records or otherwise known to the applicant and the receiving waters shall be submitted. The map shall extend one mile beyond the property boundaries. The map shall be from a 7□ or 15 minute USGS quad sheet, or a map of comparable scale. A north arrow shall be shown. **The map must be on paper 8.5 x 11 inches.**

- **Site sketch:** A legible sketch of the facility site shall be submitted and will include buildings, roads, ditches, ponds, streams, drains, sumps, impoundment(s), land application areas, any septic systems and monitoring well locations (indicate if in place or proposed). This sketch may be the same as the one in the surface water discharge permit, if no additional information is needed. **The sketch will be on 8.5 X 11 inch paper.**

- **Water Balance:** Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in item 18. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined, provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

3. **Permitted Facility Information continued**

- **Site-specific conditions:**

a) Does this facility have bulk storage of diesel fuel, gasoline, solvents, fertilizers, or other hazardous materials on site? ☐ NO ☐ YES

b) Is this operation located within one mile of a landfill, or any mine or mill tailings? ☐ NO ☐ YES

If **YES for either** of these, please show location of landfill, tailings, or possible groundwater contamination on the **Location Map or in the Site Sketch** (See above requirements). Please explain the location, extent of contamination, possible effect on the discharges from this facility.

- **Chemical treatment:** Will any flocculants (settling agents or chemical additives) be used to treat water prior to discharge? ☐ NO ☐ YES

If YES, list here and include the Material Safety Data Sheet (MSDS) with the application.

Chemical Name *	Manufacturer	Purpose	In Which Waste Stream?
Polyacrylamide	Fischer Scientific	Flocculant	DAF to Pond Storage
Alum	J.T. Baker	Flocculant	DAF to Pond Storage
Ferric Sulfate	J.T. Baker	Flocculant	DAF to Pond Storage
Ferrous Sulfate	J.T. Baker	Flocculant	DAF to Pond Storage
Tramfloc 343, 344, 345	J.T. Baker	Flocculant	DAF to Pond Storage

* If the chemical formula is unknown or confidential, provide the manufacturer's name, contact person, address and phone number or a copy of the manufacturer's brochure, product label information or materials handling data sheet for each product used. Please list the major constituents or active ingredient(s), if known.

- **Used of Manufactured toxics:** The applicant must provide a list of any constituents listed in Appendices A and B which the applicant currently uses or manufactures as an intermediate or final product or by-product. If any constituents are known to be used or manufactured and are not identified in Appendices A and B, list those as well:

Analyses of untreated produced water are provided as an attachment.

- **Flow measurement:** What method of flow measurement will be used for each discharge point (e.g., v notch weir, pump capacity, parshall flume, etc.)? Designate whether currently installed or proposed. Identify the minimum and maximum flow measurement capability.

Discharge will be measured by a 0-200 gpm magnetic driven turbine flow meter.

- **Improvements:** Please provide a description of any abatement requirement, abatement project and projected final compliance dates if subject to any present requirements or compliance schedules for construction, upgrading or operation of waste treatment equipment. Also include here a description of any changes to the facility since the previous permit renewal.

3. **Permitted Facility Information continued**

- **Ground Water Discharge:** Indicate whether this facility has any of the following:
  - Land Application (disposal/treatment) ☒ NO ☐ YES
  - Impoundment (pond/lagoon) ☐ NO ☒ YES The facility has pond storage with a double liner and will not discharge to groundwater.
  - Septic System for
    - Industrial Waste ☐ NO ☐ YES
    - Domestic Waste ☐ NO ☒ YES

- **Average flows and treatment:** Please provide a narrative identification of each type of process, operation, or production area which contributes wastewater to the effluent for each outfall including process wastewater, cooling waters, domestic wastewater and stormwater runoff; the average, maximum and design flow which each process contributes; and a description of the treatment the wastewater receives including the ultimate disposal of any solid or fluid wastes other than by discharge. Processes, operations or production areas may be described in general terms. The average flow of point sources composed of stormwater may be estimated. The basis for the rainfall event and the method of estimation must be indicated.

Use additional pages as needed

OUTFALL NUMBER	WASTEWATER SOURCE	TREATMENT USED	AVG FLOW MGD*	DESIGN ** FLOW MGD*	DAILY MAX FLOW MGD*
001	Produced Water	DAF, Air Stripping, RO	0.021	0.105	0.105

*MGD - Million gallons/day
**If sediment pond, indicate approximate volume of water.

For each outfall to surface water or discharge to ground water, provide latitude/longitude and receiving water

OUTFALL	LATITUDE			LONGITUDE			RECEIVING WATERS*
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds	* Give Formation Name for Discharges to Ground Water
001	39	27	59.11	107	42	52.84	

Are the receiving waters, indicated above, a ditch or storm sewer? ☐ NO ☒ YES
If YES, submit documentation that the owner of the ditch or storm sewer allows this discharge. No permit will be processed unless documentation of approval is received.

Discharge Quality: Analytical data for the following parameters, unless waived by the Division, shall be submitted from at least one composite sampling of each surface process water discharge point as well as state waters upstream of each discharge. Instream sampling is not required if upstream flow is intermittent or representative instream data exists. See instructions. For **GROUND WATER** analyses see Appendices D and E1-3.

PARAMETER	DETECTION LEVEL	PARAMETER	DETECTION LEVEL
Total Dissolved Solids, mg/P	10	Total Recoverable Manganese, mg/l	0.05
Flow, MGD	NA	Dissolved Manganese, mg/l	0.05
pH, s.u.	NA	Total Mercury, mg/l	0.00025
Oil and Grease, mg/l	5	Total Recoverable Nickel, mg/l	0.05
Dissolved Oxygen, mg/ l	NA	Potentially Dissolved Nickel, mg/l	0.05
Alkalinity, mg/ l	10	Total Recoverable Silver, mg/l	0.0002
Total Suspended Solids, mg/ l	10	Potentially Dissolved Silver, mg/l	0.0002
Hardness, mg/ l as $CaCO_3$	10	Total Recoverable Uranium, mg/l	0.03
Total Ammonia, mg/ l as N	0.05	Total Recoverable Zinc mg/l	0.05
Temperature, °C Winter	NA	Potentially Dissolved Zinc, mg/l	0.05
Temperature, °C Summer	NA	Total Residual Chlorine, mg/l	0.05
Biochemical Oxygen Demand, mg/ l	1	Fecal Coliform, #/100 ml	NA
Chemical Oxygen Demand, mg/ l	30	Nitrate, mg/l as N	0.1
Dissolved Aluminum, mg/ l	0.1	Nitrite, mg/l as N	0.002
Total Arsenic, mg/l	0.05	Sulfide mg/l as H_2S	0.1
Total Recoverable Cadmium, mg/l	0.0004	Boron, mg/l	0.05
Hexavalent Chromium, mg/l	0.025	Chloride, mg/l	5
Trivalent Chromium, mg/l	0.05	Sulfate, mg/l	5
Total Chromium, mg/ l	0.005	Total Cyanide, mg/l	0.01
Total Recoverable Copper, mg/ l	0.005	Total Recoverable Selenium, mg/l	0.002
Potentially Dissolved Copper, mg/l	0.005	Total Cobalt, mg/l	0.006
Total Recoverable Iron, mg/l	0.3	Gross Alpha, piC/l	0.3
Dissolved Iron, mg/l	0.3	Total Radium 226 + 228, pCi/l	8
Total Recoverable Lead, mg/l	0.005	Total Fluoride, mg/l	0.1
Potentially Dissolved Lead, mg/l	0.005	Weak Acid Dissociable Cyanide, mg/l	0.01
Total Phenols, mg/l	0.100	Total Phosphorus, mg/l	0.05
Total Organic Nitrogen, mg/l	1.0		

Dioxin Testing: Each applicant must report qualitative data, generated using a screening procedure not calibrated with analytical standards, for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) if it:

(a) Uses or manufactures 2,4,5-trichlorophenoxy acetic acid (2,4,5,-T); 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5,-TP); 2-(2,4,5-trichlorophenoxy) ethyl, 2,2-dichloropropionate (Erbon); O,O-dimethyl O-(2,4,5-trichlorphenyl) phosphorothioate (Ronnel); 2,4,5-trichlorophenol (TCP); or hexachlorophene (HCP);

or

(b) Knows or has reason to believe that TCDD is or may be present in an effluent.

We will not use or believe there is the presence of the above mentioned chemicals in our treatment process.

Whole Effluent Toxicity Testing and Priority Pollutant Scan for Surface Discharge Points

If you have processes in one of the following industries you must also submit the analyses specified below by a "X" in the corresponding box. The parameters for the appropriate GC/MS fraction(s) are shown in Appendix A to this application (see 40 CFR Part 122, Appendix D Table 1 for testing requirements and additional information for these specific industries). The WET testing shall be conducted on 100% effluent and be for both Ceriodaphnia dubia and fathead minnows. This requirement is waived where routine testing is currently required under an existing CDPS permit. The test shall be an acute test unless the ratio of stream low flow to effluent design flow is less than 10:1, respectively, and the receiving stream has a Class 1 or Class 2 Aquatic Life use with all the appropriate aquatic life numeric standards. In the latter case a chronic test is required. The Division reserves the right to request WET testing on industries not listed below or to request additional testing as part of the application review process. If so required, the permit application will not be considered complete until the additional information is submitted.

INDUSTRY CATEGORY	WET TESTING	GC/MS FRACTION			
		VOLATILE	ACID	NEUTRAL	PETICIDE
Adhesives and sealants	X	X	X	X	
Aluminum forming	X	X	X	X	
Auto and other laundries	X	X	X	X	X
Battery manufacturing	X	X		X	
Coil coating	X	X	X	X	
Copper forming	X	X	X	X	
Electric and electronic compounds	X	X	X	X	X
Electroplating	X	X	X	X	
Explosives manufacturing	X		X	X	
Foundries	X	X	X	X	
Gum and wood (all sub parts except D and F)	X	X	X		
Subpart D--tall oil rosin	X	X	X	X	
Subpart F--rosin-based derivatives	X	X	X	X	
Inorganic chemicals manufacturing	X	X	X	X	
Iron and steel manufacturing	X	X	X	X	
Leather tanning and finishing	X	X	X	X	
Mechanical Products manufacturing	X	X	X	X	
Nonferrous metals manufacturing	X	X	X	X	X
Organic chemicals manufacturing	X	X	X	X	X
Paint and ink Formation	X	X	X	X	
Pesticides	X	X	X	X	X
Petroleum refining	X	X			
Pharmaceutical preparations	X	X	X	X	
Photographic equipment and supplies	X	X	X	X	
Plastic and synthetic materials manufacturing	X	X	X	X	X
Plastic processing	X	X			
Porcelain enameling	X				
Printing and publishing	X	X	X	X	X
Pulp and paperboard mills	X				
Rubber processing	X	X	X	X	
Soap and detergent manufacturing	X	X	X	X	
Steam electric power plants	X	X	X	X	
Textile mills (subpart C--Greige Mills are exempt from this table)	X	X	X	X	
Timber products processing	X	X	X	X	X
Landfills	X	X	X	X	X
Oil and gas extraction– produced water	X	X	X	X	
Sugar processing	X	X	X	X	X
Oil Shale	X	X	X	X	

Additional monitoring:

The applicant must review Appendices A and B and must indicate whether it knows or has reason to believe that any of the pollutants listed are present in its discharge. The Division may waive the reporting requirements for individual point sources if the applicant has demonstrated that such a waiver is appropriate because information adequate to support issuance of a permit can be obtained with less stringent requirements. Each applicant must report quantitative data for each outfall containing process wastewater with the following exceptions:

a.) For every pollutant discharged which is not so limited in an effluent limitations guideline, the applicant must either report quantitative data or briefly describe the reasons the pollutant is expected to be discharged.

b.) For every pollutant expected to be discharged in concentrations of 10 µg/l or greater the applicant must report quantitative data. For acrolein, acrylonitrile, 2,4 dinitrophenol, and 2-methyl-4,6 dinitrophenol, where any of these four pollutants are expected to be discharged in concentrations of 100 µg/l or greater the applicant must report qualitative data. For every pollutant expected to be discharged in concentrations less than 10 µg/l, or in the case of acrolein, acrylonitrile, 2,4 dinitrophenol, and 2-methyl-4,6 dinitrophenol, in concentrations less than 100 µg/l, the applicant must either submit quantitative data or briefly describe the reasons the pollutant is expected to be discharged.

c.) The applicant need not provide quantitative data if the pollutant is present in the discharge solely as the result of its presence in intake water. However, the applicant must report such pollutant as present.

Additional WET Testing: All applicants must identify any biological toxicity tests which have been performed within the last 3 years on any of the discharges or the receiving water in relation to a surface discharge from this facility. If this information is contained in DMRs, this step may be omitted. If there are additional tests that were not included in DMRs, then these tests must be submitted.

Activity duration: When did the activity commence? Est. 10/2010 What is the estimated life of the activity from which the discharge(s) identified in item 13 originate? 716 years.

Stormwater Discharges: Please review Appendix C. Does the facility fall under any of the industries listed?

☒ NO ☐ YES

If the answer is "yes", please complete the appropriate application for coverage under the applicable stormwater general permit. Applications are available at coloradowaterpermits.com, or by contacting the Stormwater Program at 303-692-3517.

Pollution Prevention Plans: Please describe any pollution prevention or best management plans currently in place which could result in the improvement of water quality. These could include solvent recycling programs, material containment procedures, education, etc.

The following plans were submitted as part of the Certificate of Designation permit: Integrated Contingency Plan, Waste Characterization, Plan and Facilities Operations Plan.

Please include any other information which you feel the Division should be aware of in drafting this permit.

Other Environmental Permits: Does this facility currently have any environmental permits or is it subject to regulation, under any of the following programs? Mark which of the other permits/programs the facility has obtained or is in the process of obtaining or is subject to regulation under.

Under item other mark "yes" if the facility has any of the following permits:

a.) Prevention of Significant Deterioration (PSD) program under the Clean Air Act;
b.) Non-attainment Program under the Clean Air Act; or
c.) National Emission Standards for Hazardous Pollutants (NESHAPS) under the Clean Air Act.
d.) CERCLA

Permit name	Yes	No	Date applied for	Permit no.
Colorado Division of Minerals and Geology Permit	☐	☒		
Underground Injection Control	☐	☒		
Dredge or Fill permit, Section 404 – Army Corps of Engineers	☐	☒		
Resource Conservation and Recovery Act (RCRA)	☐	☒		
CDPS Stormater	☐	☐		
Colorado State Air Pollution Program	☒	☐	March 22, 2010	
Other Certificate of Designation	☒		March 15, 2010	

REQUIRED SIGNATURES:

Signature of Applicant: The applicant must be either the owner and/or operator of the construction site. Refer to Part B of the instructions for additional information. The application must be signed by the applicant to be considered complete. In all cases, it shall be signed as follows:

a) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the application originates.
b) In the case of a partnership, by a general partner.
c) In the case of a sole proprietorship, by the proprietor.
d) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

x _____ 3/25/10
Signature of **Owner** (submission must include original signature) Date Signed

Eric Hick President
Name (printed) Title

x _____ 3/25/10
Signature of **Applicant** (submission must include original signature) Date Signed

Eric Hick President
Name (printed) Title

x _____ 3/25/10
Signature of **Operator** (submission must include original signature) Date Signed

Gregg Neurohr Project Manager
Name (printed) Title

Appendix A - Priority Pollutants

Organic Toxic Pollutants in Each of Three Fractions in Analysis by Gas Chromatography/Mass Spectroscopy(GC/MS).

Volatiles

Acrolein
Acrylonitrile
Benzene
Bromoform
Carbon Tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane
2-Chloroethylvinyl Ether
Chloroform
Dichlorobromomethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl Bromide
Methyl Chloride
Methylene Chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
Toluene
1,2-Trans-dichloroethylene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Vinyl Chloride

Base/Neutral

Acenaphthene
Acenaphthylene
Anthracene
Benzidine
Benzo(a)anthracene
Benzo(a)pyrene
3,4-Benzofluoranthene
Benzo(ghi)perylene
Benzo(k)fluoranthene
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether
Bis(2-chloroisopropyl) ether
Bis(2-ethylhexyl)phthalate
4-Bromophenyl phenyl ether
Butylbenzyl phthalate
2-Chloronaphthalene
4-Chlorophenyl phenyl ether
Chrysene
Dibenzo (a,h) anthracene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3-Dichlorobenzidine
Diethyl phthalate
Dimethyl phthalate
Di-n-butyl phthalate
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
1,2-Diphenylhydrazine (as azobenzene)
Fluorene
Fluoranthene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorcyclopentadiene
Hexachloroethane
Indeno(1,2,3-cd) pyrene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodi-n-propylamine
N-Nitrosodiphenylamine
Phenanthrene
Pyrene
1,2,4-Trichlorobenzene)

Acid

2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
4,6-Dinitro-o-cresol
2,4-Dinitrophenol
2-Nitrophenol
4-Nitrophenol
P-chloro-m-cresol
Pentachlorophenol
Phenol
2,4,6-Trichlorophenol

Pesticides

Aldrin
Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC
Chlordane
4,4'-DDT
4,4'-DDE
4,4'-DDD
Dieldrin
Alpha-Endosulfan
Beta-Endosulfan
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Heptachlor
Heptachlor Epoxide
PCB-1242
PCB-1254
PCB-1221
PCB-1232
PCB-1248
PCB-1260
PCB-1016
Toxaphene

Metals, Cyanide, and Total Phenols

Total Recoverable Antimony
Total Recoverable Beryllium
Total Recoverable Thallium
Bromide
Color
Sulfite
Surfactants
Total Magnesium
Total Molybdenum
Total Tin
Total Titanium

Appendix B - Toxic Pollutants and Hazardous Substances

Toxic Pollutants

Asbestos

Hazardous Substances

Acetaldehyde
Allyl alcohol
Allyl chloride
Amyl acetate
Aniline
Benzonitrile
Benzyl chloride
Butyl acetate
Butylamine
Captan
Carbaryl
Carbofuran
Carbon disulfide
Chlorphyrifos
Coumaphos
Cresol
Crotonaldehyde
Cyclohexane
2,4-D (2,4-Dichlorophenoxy acetic acid)
Diazinon
Dicamba
Dichlobenil
Dichlone
2,2-Dichloropropionic acid
Dichlorvos
Diethyl amine
Dimethly amine
Dinitrobenzene
Diquat
Disulfoton
Diuron
Epichlorohydrin
Ethion
Ethylene diamine
Ethylene dibromide
Formaldehyde
Furfural
Guthion
Isoprene
Isopropanolamine dodecylbenzenesulfonate
Kelthane
Kepone
Malathion
Mercaptodimethur
Methoxychlor
Methyl mercaptan
Methyl methacrylate
Methyl parathion
Mevinphos
Mexacarbate
Monoethyl amine
Monomethyl amine
Naled
Naphthenic acid
Nitrotoluene
Parathion
Phenolsulfanate
Phosgene
Propargite
Propylene oxide
Pyrethrins
Quinoline
Resorcinol
Strontium
Strychnine
Styrene
2,4,5-T (2,4,5-Trichlorophenoxy acetic acid)

TDE (Tetrachlorodiphenyl ethane)
2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]

Trichlorofan
Triethanolamine dodecylbenzenesulfonate
Triethylamine
Trimethylamine
Uranium
Vanadium
Vinyl acetate
Xylene
Xylenol
Zirconium

APPENDIX C - INDUSTRIES REQUIRED TO OBTAIN STORMWATER DISCHARGE PERMITS

The **Standard Industrial Classification (SIC) Code** or codes for the facility usually determines permit coverage. SIC Codes are assigned according to the primary activities performed by a company. They are often assigned for insurance purposes or when a business registers as a corporation. Industries can also determine their SIC Code by checking with their trade association, Chamber of Commerce, legal counsel, or library for the SIC Manual, or online at www.osha.gov/pls/imis/sic_manual.html.

The industries are listed here by their SIC Code. The manufacturing industries are generally represented by SIC Codes 20-39. (A two digit code, such as 42, means that **all** industries under that heading, from 4200 to 4299, are covered.) Use this table to determine which of the Division's general permits is appropriate for your facility.

SIC Code	Industry Type	Notes	Permit Type
10	Metal mining and milling, metal mining services	(a)	M
12	Coal mining, coal mining services	(a)	C, M
13	Oil and gas extraction, oil and gas services	(b)	A
14	Mining and quarrying of nonmetallic minerals except fuels (e.g., sand and gravel)	(a)	S
NA	Construction	(f)	N
20	Food and kindred products (except)	(g)	A
2011	Meat packing plants	(g)	B
2015	Poultry slaughtering and processing	(g)	B
2077	Animal and marine fats and oils	(g)	B
21	Tobacco products	(g)	A
22	Textile mills	(f) (g)	A
23	Apparel and other finished products made from fabric and similar material	(g)	A
24	Lumber and wood products except furniture (except)	(g)	A
2491	Wood preserving	(f) (g)	B
25	Furniture and fixtures	(g)	A
26	Paper and allied products	(g)	A
27	Printing, publishing, and allied products	(g)	A
28	Chemicals and allied products (except)	(f) (g)	B
283	Drugs	(f)(g)	B
285	Paints and allied products	(g)	B
29	Petroleum refining and related industries (except)	(f)	B
2951	Asphalt batch plants	(c)	A,N,S
30	Rubber and miscellaneous plastics products	(f) (g)	B
31	Leather Products (except)	(g)	A
311	Leather tanning and finishing	(f)	A
32	Stone, clay, glass and concrete products (except)	(g)	A
3241	Cement manufacturing	(f)	B
3273	Ready-mix concrete facilities	(c)	A,N,S
33	Primary metals industries	(f) (g)	B
34	Fabrication of metal products, except machinery and transportation equipment (except)	(g)	A
3441	Fabricated structural metal	(g)	A
35	Industrial and commercial machinery and computer equipment	(g)	A
36	Electronic and other electrical equipment and components, except computer equipment	(g)	A
37	Transportation equipment	(g)	A

APPENDIX C

SIC Code	Industry Type	Permit Notes	Type
38	Measuring, analyzing, and controlling instruments: photographic, medical, and optical goods, watches and clocks	(g)	A
39	Miscellaneous manufacturing industries	(g)	A
40	Railroad transportation	(d) (g)	A
41	Local and suburban transit and interurban highway passenger transportation	(d) (g)	A
42	Motor freight transportation and warehousing (except)	(d) (g)	A
4221	Farm Product warehousing and storage	(g)	A
4222	Refrigerated warehousing and storage	(g)	A
4225	General warehousing and storage	(g)	A
44	Water Transportation	(d) (g)	A
45	Transportation by Air	(d) (e) (g)	A,B
4911	Steam electric power generation (all fuel types)	(f) (g)	B
4952	Wastewater treatment plants with a design flow of 1.0 MGD or more, or required to have an approved pretreatment program under 40 CFR 403	(f) (g)	A
4953	Hazardous waste treatment, storage or disposal facilities; incinerators (including boilers and industrial furnaces) that burn hazardous waste; and active or inactive landfills, land application sites, or open dumps w/industrial waste and w/o stabilized final cover	(f) (g)	B
5015	Motor vehicle parts, used		R
5093	Scrap and waste materials		R
5171	Petroleum bulk stations and terminals	(d) (g)	A

Notes:

(a) For this SIC Code, a stormwater permit is required only if runoff contacts overburden, raw material, intermediate or finished product, or waste products.

(b) For this SIC Code (oil and gas facilities), a stormwater permit is essentially required only the facility has had a discharge of a reportable quantity. See Colorado Discharge Permit System Regulations, Section 61.4(3)(b)(i)(C).

(c) Facilities at sand and gravel operations may be covered under permit S; facilities at construction sites may be covered under permit N; other facilities, including mobile plants, may be covered under permit A.

(d) For this SIC Code, only facilities with vehicle maintenance (including fueling), equipment cleaning, or airport deicing need a stormwater permit.

(e) Airports that use 1000 gallons of deicer(s) or more annually (undiluted), and that have annual fuel sales of one million gal/year or more, are covered under permit B. Airports that do not meet these criteria need permit A.

(f) For most facilities covered by the stormwater regulations, SIC codes are used to indicate the **primary** function of the facility. This footnote denotes industries which, in most cases, are covered under the stormwater regulations regardless of what other activities are conducted at the site (contact Division for details).

(g) For this SIC Code, if **all** industrial activity, materials handling and storage at the facility are protected from precipitation, the facility may qualify for coverage under the No Exposure Exclusion. If that case, stormwater permit coverage would not be required. See http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/NoExposure.PDF

Permit types:

A: **Light Industry** General Permit (Permit No. COR-010000)

B: **Heavy Industry** General Permit (Permit No. COR-020000)

N: **Construction** General Permit (Permit No. COR-030000) (see Instructions, Item C.4)

M: **Metal Mining** General Permit (Permit No. COR-040000)

C: **Coal Mining** General Permit (Permit No. COG-850000)

S: **Sand and Gravel** General Permit (Permit No. COG-500000)

R: **Recycling Industry** General Permit (Permit No. COR-600000)

Appendix D -- GENERAL REQUIREMENTS FOR DISCHARGES TO GROUND WATER FROM

IMPOUNDMENTS, LAND APPLICATION AND SEPTIC SYSTEMS >2000 GPD

(1) FACILITY MAPPING: See Site map information in this application.

(2) FACILITY SKETCH: See Sketch information in this application.

(3) SITE STUDIES/INFORMATION: Provide a copy of any studies, geological reports, consultant reports, water quality analyses pertinent to your facility/site which you feel may help the Division in the development your ground-water permit. Include such reports/studies that address such areas of interest as ground-water quality analyses that establish ambient (existing ground-water quality prior to your ownership of the property), all Material Safety Data Sheets (MSDS) for each chemical used at your facility (an example MSDS is available from the Ground Water Unit), well driller's logs and pumping information of the local aquifer, any computer modelling results that have been performed for the immediate area, U. S. Geological Survey (USGS) reports for the area, etc.

(4) GEOLOGY/HYDROGEOLOGY OF SITE: (a) Describe the local geology of the site. Identify and describe all lithologic units from the ground surface to the first impermeable stratigraphic unit. Provide the estimated thickness of each unit. Include a geologic map or cross sections, if necessary. Maps will be on 8.5 X 11 paper.

(b) Describe the hydrogeology of the site. Describe in detail the relationship of this site to any alluvial or bedrock water bearing formations (unconfined, confined, or perched) and surface water (lakes, ponds, ditches or streams). Identify aquifer name or formation name for each water bearing formation and provide the depth to water (include water elevation) for each. Describe any unusual geologic or hydrologic features that could affect ground water rate of movement or direction of movement (i.e. faults, fractures).

(c) Describe aquifer characteristics (transmissivity or permeability, porosity and storage capacity) of these water bearing formations. State the source(s) of this information.

(d) Provide potentiometric surface (ground water level) map(s) of the water bearing formations. Document information source(s), if obtained from published data. If water levels are contoured from site data, control points must be annotated with water table elevation and time period of measurements indicated in legend. Map must be legible and no larger than 11 X 17 inches paper.

(e) Discuss any hydrogeologic investigations or ground-water modeling conducted at this site.

(5) Water Quality Sampling Requirements The Discharge Regulations have specific requirements [61.4. (7)] for effluent characterization. These requirements are listed below. In addition, the Division is requiring a ground water quality characterization, which is found in paragraph (a), below.

(a) Each applicant must submit (i) a description of the ground water in the sample prior to filtration [i.e. clear, murky, cloudy, etc.] (ii) the below listed analytical data used to document (A) ambient ground water near the impoundment, land application and/or leach field, and (B) the upgradient ground-water quality; (iii) indicate the sample location (well # and depth) and, how sample was obtained; (iv) have the analytical laboratory indicate the method used and the detection limits of the method:

Total Coliforms
Biochemical Oxygen Demand (BOD)
Chemical Oxygen Demand (COD)
Total Organic Carbon (TOC)
Total Suspended Solids (TSS)
Total Ammonia as N
Temperature
pH
Nitrate as N

(CONTINUED ON NEXT PAGE)

CHARACTERIZATION OF GROUND WATER
(Measured as dissolved concentration)

Sodium (Na)	Chloride (Cl)
Calcium (Ca)	Bicarbonate (HCO_3)
Magnesium (Mg)	Sulfate (SO_4)
Potassium (K)	Carbonate (CO_3)
Iron (Fe)	Total Dissolved Solids

(b) Each applicant must sample, analyze and report to the Division any of the below listed pollutants he/she knows or has reason to believe may be present in the ground water below his/her property:

(i) TABLE III OF APPENDIX D, PART 122,TITLE 40 OF THE CODE OF FEDERAL REGULATIONS; OTHER TOXIC POLLUTANTS (METALS AND CYANIDE) AND TOTAL PHENOLS (UNLESS INDICATED OTHERWISE, ANLYZE THE FOLLOWING FOR THE DISSOLVED CONCENTRATION):

ANTIMONY	ARSENIC
BERYLLIUM	CADMIUM
CHROMIUM**	COPPER
LEAD	MERCURY
NICKEL	SELENIUM
SILVER	THALLIUM
ZINC	CYANIDE, WEAK ACID DISSOCIABLE
TOTAL PHENOLS	

** = If the dissolved concentration for chromium exceeds 0.1 mg/l, then an additional analysis for hexavalent chromium shall be performed

(ii) TABLE II OF APPENDIX D, PART 122, TITLE 40 OF THE CODE OF FEDERAL REGULATIONS; ORGANIC TOXIC POLLUTANTS IN EACH OF THE FOUR FRACTIONS IN ANALYSIS BY GAS CHROMATOGRAPHY/MASS SPECTROSCOPY (GC/MS)--CONSIDER ALL POLLUTANTS LISTED FOR EACH FRACTION INDICATED FOR YOUR INDUSTRY, AS INDICATED IN THE CHART ON PAGE 4 OF THIS APPLICATION:

The list of organic toxic pollutants in each of four fractions -"Volatiles, Base/Neutral, Acid and Pesticides" - is found in "Appendix A - Priority Pollutants". Measure the dissolved concentration for each of the parameters listed that you know or believe will be present at your facility.

(iii) TABLE V OF APPENDIX D, PART 122, TITLE 40 OF THE CODE OF FEDERAL REGULATIONS; TOXIC POLLUTANTS AND HAZARDOUS SUBSTANCES.

The list of toxic pollutants and hazardous substances is found in "Appendix B", above. Measure the dissolved concentration for each of the parameters listed that you know or believe will be present at your facility.

(c) Each applicant is required to report that 2,3,7,8 Tetrachlorobenzo-P-Dioxin (TCDD) may be in the ground water based upon whether he/she uses or manufactures one of the below listed compounds or whether he/she knows or has reason to believe that TCDD will or may be present in the soil or ground water.

(i) 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) (CAS #93-76-5);
(ii) 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) (CAS #93-72-1);
(iii) 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) (CAS #136-25-4);
(iv) 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) (CAS #299-84-3);
(v) 2,4,5-trichlorophenol (TCP) (CAS #95-95-4); or
(vi) Hexachlorophene (HCP) (CAS #70-30-4).

APPENDIX E-1- IMPOUNDMENTS

SPECIFIC REQUIREMENTS FOR IMPOUNDMENTS

COMPLETE THIS PORTION OF THE APPLICATION FOR EACH IMPOUNDMENT AT YOUR FACILITY

1) CHECK ANY OF THE FOLLOWING THAT PERTAIN TO THIS FACILITY:

☐ _____(a)The impoundment(s) at this facility is(are) subject to regulation under the Uranium Mill Tailings Radiation Control Act.

☐ _____(b) The impoundment(s) at this facility is(are) used in the treatment, storage or recharge of raw or potable water.

☐ _____(c)The impoundment(s) at this facility is(are) used only for storm water retention or detention. Provide a copy of the Stormwater permit with this application, if applicable.

☐ _____(d) The impoundment currently has a valid certificate of designation [C.D.] (pursuant to the Solid Waste Disposal and Facilities Act, CRS 1973 30-20-101 et seq. as amended). Provide a copy of the C.D. with this application.

☐ _____(e) This facility has an Underground Injection Control Permit or Authorization by Rule (Safe Drinking Water Act, 42 USC 300f, et seq.). Provide a copy of the permit or authorization by rule.

☐ __X__(f) This facility has an impoundment which is subject to the jurisdiction of one of the following State agencies:

_____(i) Minerals and Geology Division (formerly Mined Land Reclamation)

_(ii) State Engineer's Office

_____(iii) Oil and Gas Conservation Commission

__X__(iv) Hazardous Materials and Waste Management Division

If you checked any of the above State agencies, please provide, on a separate sheet of paper, the contact person's name and telephone number and all pertinent identification for your facility, as provided to you by the State agency.

☐ _____ (g) This facility is subject to regulation under the "Confined Animal Feeding Operation Control Regulation", 4.8.0.

IF THE ONLY IMPOUNDMENT(S) AT THIS SITE IS (ARE) ONE (OR MORE) OF THE ABOVE AND LAND APPLICATION AND/OR SEPTIC SYSTEM ARE/IS NOT APPLICABLE, REFER TO "31" IN THIS APPLICATION.

2) Provide detailed plan and side view sketches of impoundment, include liner thickness (if lined) and depth to ground water.

3) Provide technical information on liner type, materials used in construction, thickness and installation.

4) Provide results of "in situ" permeability testing of the clay liner or the expected permeability of a synthetic liner for the bottom and sides of the impoundment.

CGRS on behalf of GreenBack Produced Water Recovery, LLC, has petitioned for a Certificate of Designation approval from the CDPHE. Our contact at CDPHE is identified below.

Roger Doak
Permitting Group Unit Leader
Solid Waste and Material Management Unit
Hazardous Materials and Waste Management Division
Colorado Dept. of Public Health and Environment
303-692-3437
roger.doak@state.co.us

APPENDIX E-2 - LAND APPLICATION

SPECIFIC REQUIREMENTS FOR LAND APPLICATION

COMPLETE THIS PORTION OF THE APPLICATION ON SEPARATE SHEETS OF PAPER AND ATTACH THEM TO THE APPLICATION AS APPENDIX E-2

(1) Analytical data used to document ambient ground-water quality should be submitted for the following parameters (Unless otherwise indicated, determine the dissolved concentration of each of the following):

Aluminum	Beryllium	Arsenic	Silver
Boron	Cobalt	Barium	Cadmium
Copper	Lithium	Chromium	Cyanide (Weak Acid Dissociable)
Nickel	Vanadium	Fluoride	Lead
		Mercury	Zinc
		Nitrite	Selenium
		Manganese	Color
		Copper	Corrosivity
		Foaming Agents	Odor
		Gross Alpha (excl. Radon/Uranium)	
		Beta and Photon Emitters	

(2) Provide a description of the A and B soil horizons mapped at this site by the U. S. Soil Conservation Service.

(3) Describe the existing vegetative cover at the site. Include plans for any proposed disturbance or planting.

(4) Does this land application plan use the root zone for attenuation of effluent components? If so, explain in detail. Include a report of the vadose zone modelling, if performed.

(5) Provide all information pertaining to precipitation, evapotranspiration, and infiltration for this site (supplemental irrigation, solar and wind evaporation, plant uptake, infiltration tests).

(6) Describe the proposed rate and schedule of application and its expected effects on ground water levels.

(7) The following parameters should be determined from soil samples taken at one foot intervals to a depth of five feet. It is preferred that these soil samples be collected in the spring. These results are to be provided to the Division, when they are available (Parameters are to be measured as Total concentrations (using the AB-DPTA extraction--Contact Jim Self at the CSU Soil Laboratory), as appropriate).

aluminum	copper	nitrate residuals	zinc
iron	nickel	ammonia residuals	
arsenic	lead	phosphorous	
cadmium	mercury	potassium	
chromium	molybdenum	selenium	

(8) Describe the effluent storage capacity during inclement weather and/or frozen ground.

APPENDIX E-3 - SEPTIC SYSTEMS GREATER THAN 2000 GALLONS PER DAY (GPD)

SPECIFIC REQUIREMENTS FOR SEPTIC SYSTEM >2000 GPD

FACILITY WASTESTREAM

DOMESTIC WASTE ☐ Yes ☐ No

INDUSTRIAL WASTE ☐ Yes ☐ No

Indicate "Facility Type" and indicate, below, the Design Capacity of the septic system plus whether the facility also has Impoundment(s) or Land Application associated with it.

Suggested "Facility Type"
Industrial/Domestic Wastewater: (a) Business; (b) Ski Area; (c) Campground/R.V. Park; (d) Motel/Hotel/Dude Ranch; (e) Community System; (f) School; (g) Church; (h) Hardrock Mining/Milling / Placer Mining / Coal Mining; (i) Sand and Gravel Production; (j) Construction Dewatering; (k) Ground Water Cleanup of Gasoline/Diesel

FACILITY TYPE _____

SEPTIC SYSTEM DESIGN CAPACITY = _____gpd

Circle the appropriate components of the septic system:

TWO STAGE SYSTEM:

FIRST STAGE	*(a) SEPTIC TANK*	
	(b) AERATION SYSTEM	
SECOND STAGE	*(a) BED*	*(1) PIPE & GRAVEL*
		(2) GRAVELLESS CHAMBERS
	(b) TRENCH	*(3) GRAVELLESS PIPE*

THREE STAGE SYSTEM:

FIRST STAGE	*(a) SEPTIC TANK*	
	(b) AERATION SYSTEM	
SECOND STAGE	*SAND FILTER*	
THIRD STAGE	*(a) BED*	*(1) PIPE & GRAVEL*
		(2) GRAVELLESS CHAMBERS
	(b) TRENCH	*(3) GRAVELLESS PIPE*

IMPOUNDMENT *No* *Yes* *# of Impoundments*_____
LENGTH and WIDTH of each pond at water surface L_1_____*ft* W_1_____*ft*

DEPTH of each pond D_1 _____*ft; HORIZONTAL SLOPE of sides of pond* ____:____
(Attach extra sheets of paper as required.)

LAND APPLICATION *No* *Yes* *Type*_____

If the response is "Yes" to either the impoundment or land application question, please refer to E-1 OR E-2, RESPECTIVELY.

APPENDIX F

ENVIRONMENTAL PERMIT INFORMATION

TYPES OF PERMITS AVAILABLE FOR FACILITIES:

1. USEPA UNDERGROUND INJECTION CONTROL PERMIT;

2. COLORADO DEPARTMENT OF HEALTH STORMWATER PERMIT;

3. COLORADO DEPARTMENT OF HEALTH AIR POLLUTION EMISSION PERMIT;

4. COLORADO DIVISION OF MINERALS AND GEOLOGY PERMIT;
   (Please include the mined land reclamation board permit anniversary date.)

5. RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
   I. RCRA SUBTITLE C HAZARDOUS WASTE:
      i) PROVIDE YOUR RCRA EPA ID NUMBER;
      ii) PROVIDE YOUR STATE RCRA PERMIT NUMBER;
      iii) DO YOU NOW HAVE OR HAVE YOU IN THE PAST HAD INTERIM STATUS?

   II. RCRA SUBTITLE D SOLID WASTE:
      i) HAS A CERTIFICATE OF DESIGNATION (CD) FOR SOLID WASTE DISPOSAL BEEN ISSUED FOR THIS SITE?
      ii) ARE YOU DISPOSING OF YOUR OWN WASTE ON YOUR OWN PROPERTY?
      iii) DO YOU HAVE AN APPLICATION FOR A CD PENDING?
      iv) IF THIS FACILITY IS A MINING OPERATION, ARE YOU DISPOSING OF MINE WASTE ON YOUR OWN PROPERTY?
      v) HAVE YOU DONE ANY RECYCLING AT THIS SITE?
      vi) IS THERE BENEFICIAL USE OR DISPOSAL OF BIOSOLIDS OR SEPTAGE AT THIS PROPERTY?
      vii) IS YOUR PROPERTY USED AS A TRANSFER STATION?

   III. RCRA SUBTITLE I UNDERGROUND STORAGE TANKS
      i) ARE THERE EITHER ABOVE GROUND OR BELOW GROUND TANKS ON THIS PROPERTY?
      ii) HAS THERE BEEN A RELEASE FROM THE TANK SYSTEM?--IF YES, THEN RESPOND TO "iii)".
      iii) HAS ASSESSMENT WORK BEEN PERFORMED?--IF YES, THEN RESPOND TO "iv)".
      iv) HAS A CORRECTIVE ACTION PLAN BEEN APPROVED OR PERFORMED?

6. URANIUM MILLS TAILINGS REMEDIAL ACTION PROGRAM (UMTRAP):
   IS THERE A REMEDIAL ACTION PLAN PENDING OR IN PLACE AT THIS PROPERTY?
      i) IS THERE A SURFACE DISCHARGE PERMIT?
      ii) IS THERE AN AIR EMISSSIONS PERMIT?

7. COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA):

   IS THIS PROPERTY LISTED AS A SUPER FUND SITE?

APPENDIX G
LOCAL RESOURCES OF INFORMATION

U.S. Geological Survey Library — Telephone: 303/236-1000
Building 20
Denver Federal Center *

U.S. Geological Survey Map Sales — Telephone: 303/236-7476
Building 810
Denver Federal Center *

* Located in Lakewood between Sixth Avenue and Alameda Boulevard, Kipling Street and Union Boulevard

Office of the Colorado State Engineer — Telephone: 303/866-3581
1313 Sherman Street
Room 818
Denver, Colorado

Soil Survey Maps are located at:
Soil Conservation Service — Telephone: 303/236-2897
655 Parfet Street
Room E 200 C
Lakewood, Colorado 80215-5517

US EPA Region VIII — Telephone: 303/293-1430
Mr. Chet Pauls
Underground Injection Control Program
999 18th St.
Suite 500
Denver, Colorado 80202-2466

Air Pollution Control Division — Telephone: 303/692-3100
Hazardous Materials and Waste Management Division — Telephone: 303/692-3300
Radiation Control Division — Telephone: 303/692-3030
Colorado Department of Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

Laboratory Division at the — Telephone: 303/691-4700
Colorado Department of Health and Environment
4210 East 11th Avenue
Denver, Colorado 80220

APPLICATION GENERAL INFORMATION AND INSTRUCTIONS

This application is for use by all industrial **process water dischargers to surface water, ground water or stormwater dischargers**. Discharges to ground water may occur from impoundments that are either non-discharging to surface water or discharging to surface water, land application and septic systems, whose design capacity is greater than 2000 gallons per day. The Division has industry specific permits for construction dewatering, gasoline clean up sites, water treatment plants, hardrock mining, coal mining, non-metallic metals mining and placer mining along with several for stormwater only discharges. If the facility falls under one of these activities, please contact the Division for the appropriate application. This form may be reproduced. For information on electronic copies, please contact the Permits and Enforcement Section at 692-3590.

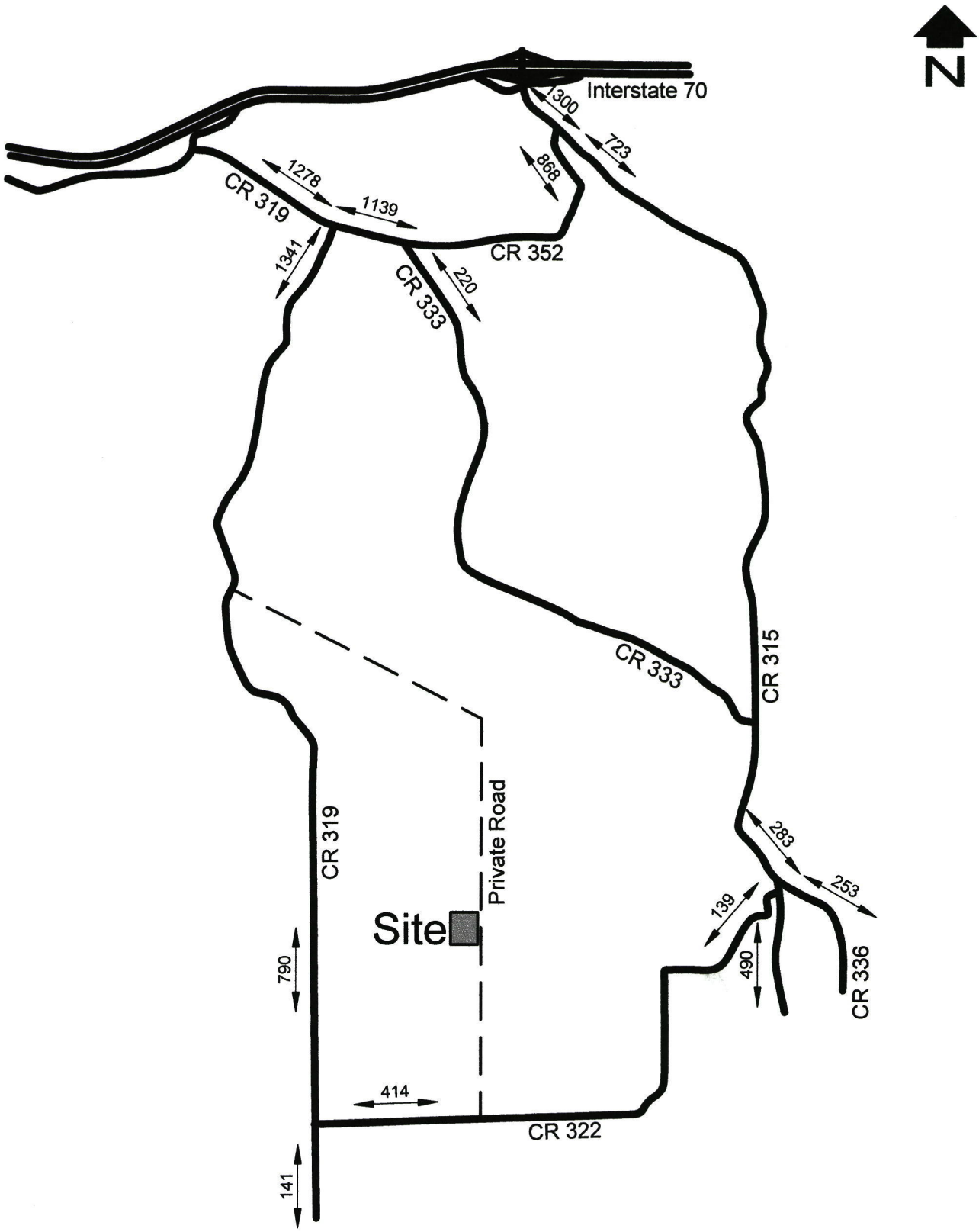
WATER RIGHTS

The State Engineers Office (SEO) has indicated that any discharge that does not return water directly to surface waters (i.e. land application, rapid infiltration basins, etc.) has the potential for material injury to a water right. As a result, the SEO needs to determine that material injury to a water right will not occur from such activities. To make this judgement, the SEO requests that a copy of all documentation demonstrating that the requirements of Colorado water law have been met, be submitted to their office for review. The submittal should be made as soon as possible to the following address:

Colorado Division of Water Resources
1313 Sherman St. Rm 818
Denver, Colorado 80203

Should there be any questions on the issue of water rights, the SEO can be contacted at (303) 866-3581. It is important to understand that any CDPS permit issued by the Division **does not constitute a water right. Issuance of a CDPS permit does not negate the need to also have the necessary water rights in place.** It is also important to understand that even if the activity has an existing CDPS permit, this is no guarantee that the proper water rights are in place.

LOCATION MAP



RECENT DAILY TRAFFIC

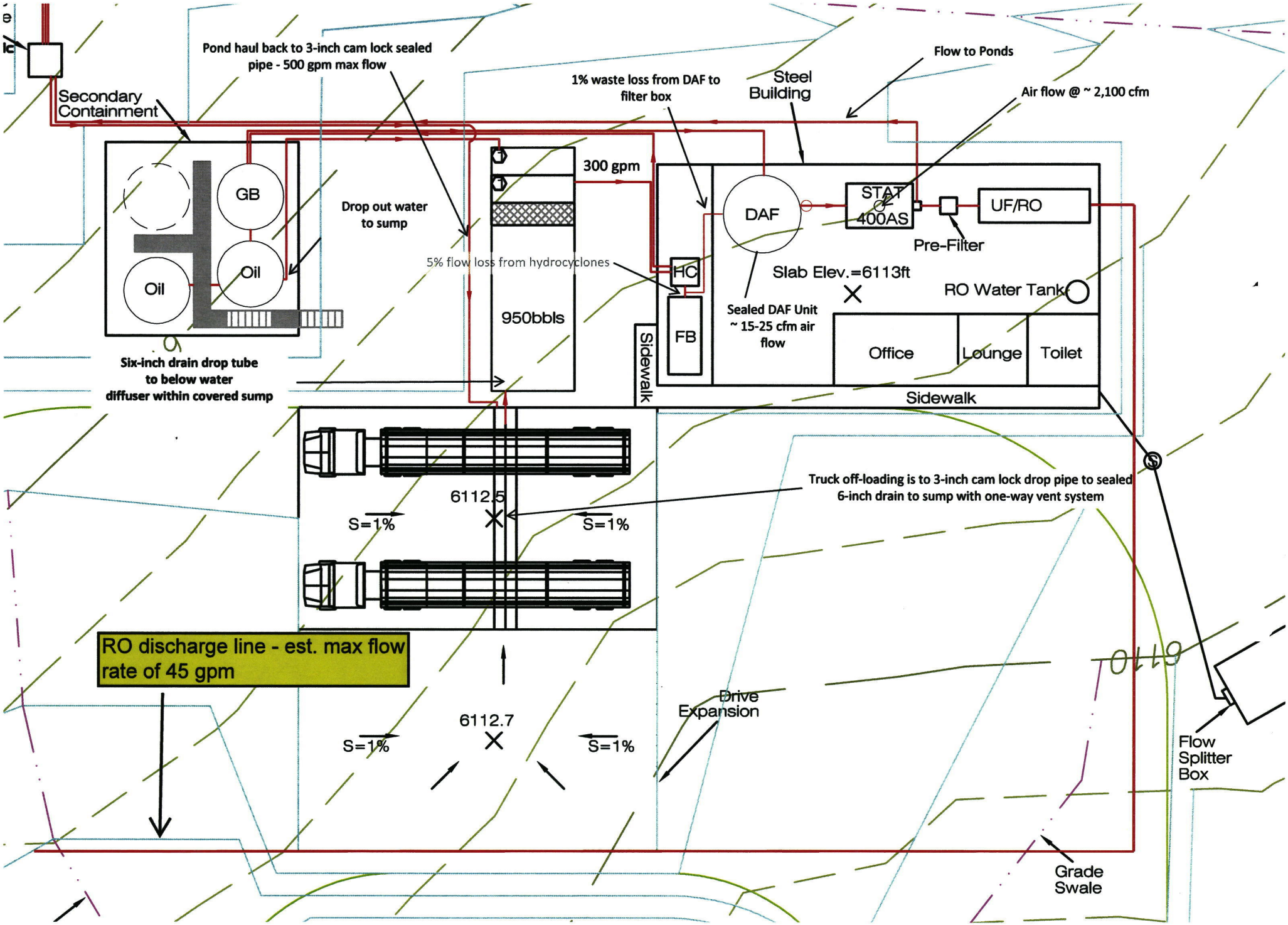
Figure 3

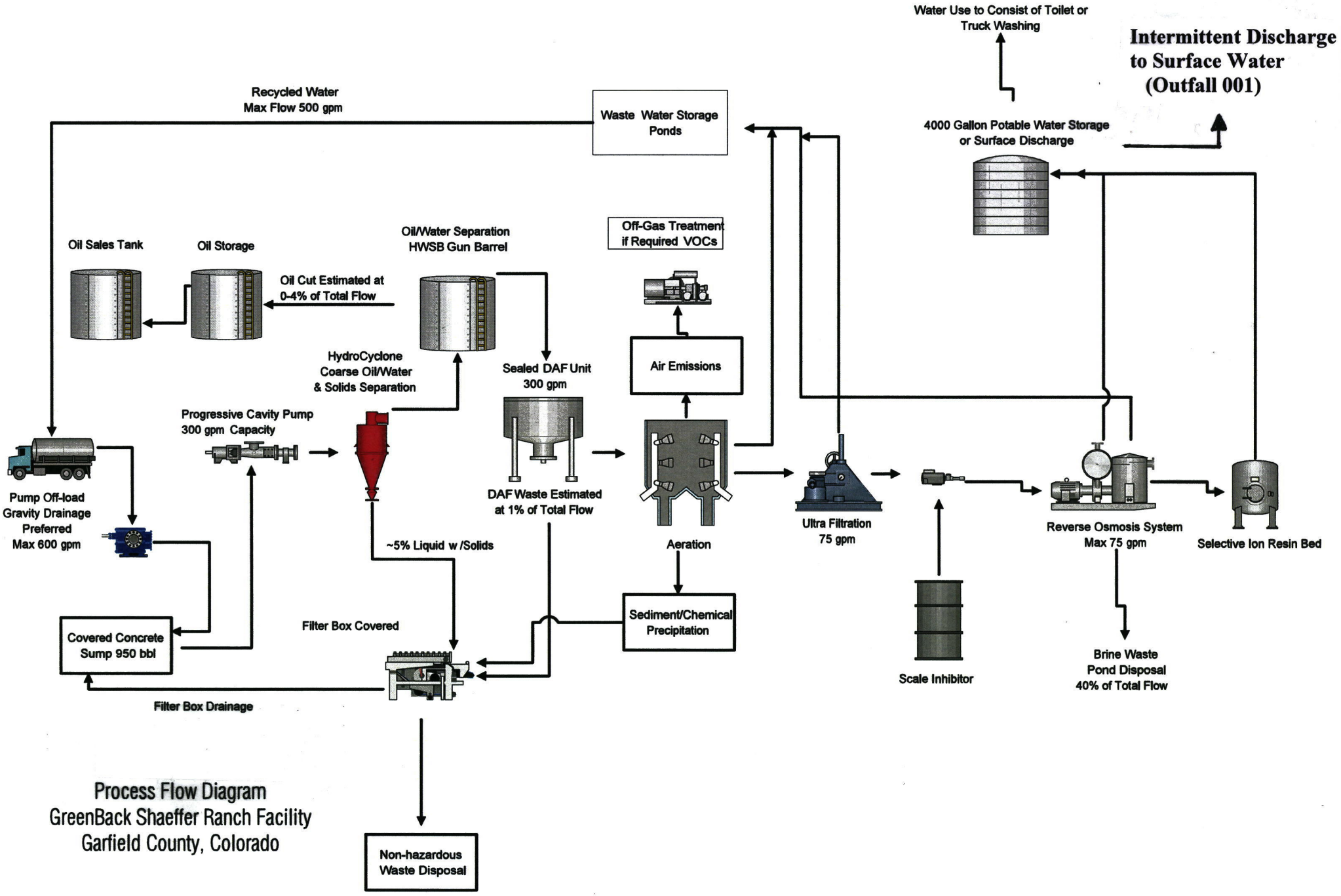
DELICH ASSOCIATES

SITE SKETCH

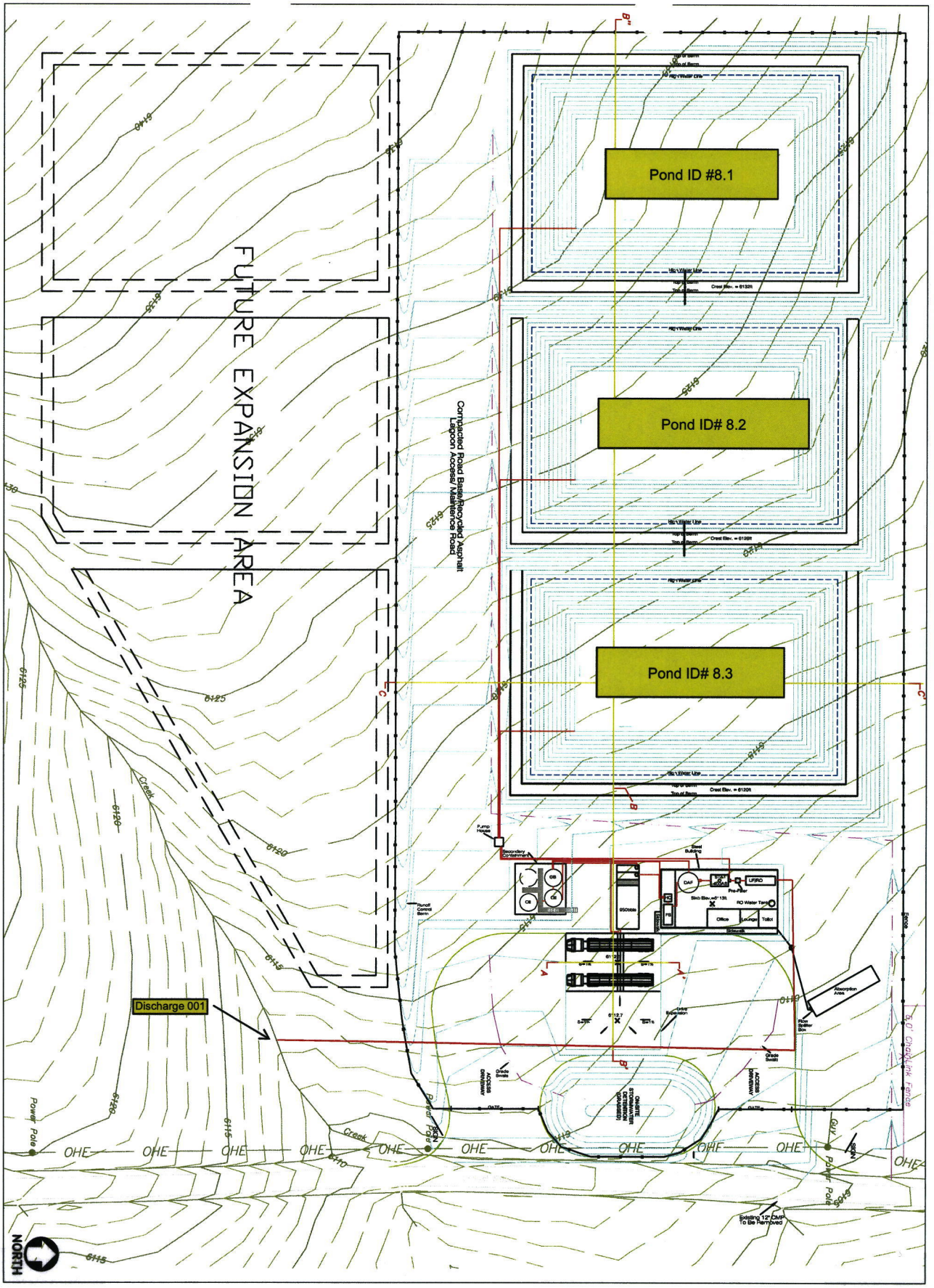
WATER BALANCE

Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)


Pond haul back to 3-inch cam lock sealed pipe - 500 gpm max flow
Secondary Containment
1% waste loss from DAF to filter box
Steel Building
Flow to Ponds
Air flow @ ~ 2,100 cfm
GB
Oil
Oil
Drop out water to sump
300 gpm
5% flow loss from hydrocyclones
950bbls
HC
FB
DAF
STAT 400AS
UF/RO
Pre-Filter
Slab Elev.=6113ft
RO Water Tank
Sealed DAF Unit ~ 15-25 cfm air flow
Office
Lounge
Toilet
Sidewalk
Sidewalk
Six-inch drain drop tube to below water diffuser within covered sump
Truck off-loading is to 3-inch cam lock drop pipe to sealed 6-inch drain to sump with one-way vent system
6112.5
S=1%
S=1%
RO discharge line - est. max flow rate of 45 gpm
6112.7
S=1%
S=1%
Drive Expansion
Flow Splitter Box
Grade Swale



Process Flow Diagram
GreenBack Shaeffer Ranch Facility
Garfield County, Colorado


Pond ID #8.1
Pond ID# 8.2
Pond ID# 8.3
FUTURE EXPANSION AREA
Compacted Road Base/Recycled Asphalt Lagoon Access/ Maintence Road
Discharge 001
Creek
Power Pole
OHE
NORTH

Sheet No.
S101

FIGURE 2
Site Development Map
GreenBack Shaeffer Ranch
Facility
Garfield County, Colorado

Designed By:
Drawn By: ARG
Checked By:
Date: MARCH 2010
Scale: 1" = 60'
SCALE IN FEET

GREENBACK
PRODUCED WATER
MANAGMENT

RIFLE, COLORADO

CGRS ENVIRONMENTAL CONSTRUCTION COMPLIANCE
P.O. BOX 1489
FORT COLLINS, CO 80522
Tel. (970) 493-7780
Fax. (970) 493-7986

MSDS SHEETS

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT and COMPANY IDENTIFICATION

PRODUCT NAMES: TRAMFLOC® 343, 344, 345

DATE ISSUED: 06/01/03
SUPERSEDES: 05/07/99

DESCRIPTION: Acrylamide/methacrylamidopropyltrimethylammonium chloride, 30% in water.

COMPANY IDENTIFICATION:
Tramfloc, Inc.
P. O. Box 350
Tempe, AZ 85280-0350
480-491-6895

EMERGENCY TELEPHONE: 24 hours a day, 7 days a week
CHEMTREC 1-800-424-9300

SECTION 2 - COMPOSITION/INFORMATION on INGREDIENTS

CHEMICAL NAME Acrylamide/maptac copolymer; CAS No. 58627-30-8

Cationic water soluble polymer in emulsion. This product is not considered hazardous in accordance with OSHA regulation 20 CFR 1910.1200.

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW - Straw colored viscous liquid with amine or musty odor. Spills are very slippery. Avoid contact with skin eyes and clothing.

POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE - EYE CONTACT: Prolonged or repeated eye contact may cause irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: Prolonged or repeated skin contact may cause irritation.

EFFECTS OF OVEREXPOSURE - INHALATION: Not available; EFFECTS OF OVEREXPOSURE - INGESTION: Not available.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: Not available; PRIMARY ROUTE OF ENTRY - Skin

SECTION 4 - FIRST AID MEASURES

INHALATION: Not expected to be harmful. Remove patient to fresh air.

SKIN: Flush immediately with soap and water for at least 15 minutes.

EYE CONTACT: Flush with water at least 15 minutes with eyelids open. Call a physician.

INGESTION: Material is not expected to be harmful by ingestion. If swallowed, do not induce vomiting. Give victim a glass of water. Consult a physician. Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASHPOINT: >212^0 F, Closed Cup.

FLAMMABILITY: None; AUTO FLAMMABILITY: None

EXPLOSIVE LIMITS: LOWER: Not applicable; UPPER: Not applicable. EXPLOSION HAZARD- None
EXTINGUISHING MEDIA: Use water, foam, carbon dioxide or dry chemical to extinguish.

EXTINGUISHING MEDIA WHICH MUST NOT BE USED: None.

SPECIAL EXPOSURE HAZARDS IN A FIRE: In a fire may liberate oxides of nitrogen, carbon or hydrogen chloride. Keep containers cool by spraying with water if exposed to fire.

SPECIAL PROTECTIVE EQUIPMENT: No special protective equipment required.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

ENVIRONMENTAL PRECAUTIONS: Avoid runoff into storm sewers and ditches. Do not flush with water.

METHODS FOR CLEANUP: Recycle if possible. If not, dike and absorb spill with inert materials such as clays, sand, earth, or other commercially available dry sweeping compound, and collect for disposal in accordance with federal, state, local or other applicable laws and regulations. Large spills should be contained and pumped into salvage tanks. Product may cause a slip hazard. If slippery conditions persist, apply dry sweeping compound.

SECTION 7 - HANDLING AND STORAGE

HANDLING: Avoid contact with eyes, skin and clothing. Make solutions within adequately ventilated areas.

STORAGE: Avoid storage temperatures <32^0 F as product may be either affected or damaged.

SECTION 8 - EXPOSURE CONTROLS/ PERSONAL PROTECTION

ENGINEERING CONTROLS: General ventilation is recommended. Eyewash and safety shower stations are recommended.

EXPOSURE GUIDELINES - No MAC values have been established.

PERSONAL PROTECTIVE EQUIPMENT: See below

RESPIRATORY PROTECTION: Is normally not needed since volatility and toxicity are low. If significant vapors, mists, or aerosols are present, use NIOSH approved respirator (ANSI Z 882.1980) or equivalent

HAND PROTECTION: Wear rubber gloves.

PRODUCT NAMES: TRAMFLOC® 343, 344, 345

EYE PROTECTION: Wear safety glasses with side shields. Do not wear contact lenses.

SKIN PROTECTION: Chemical resistant apron or suit. If clothing is contaminated, wash skin and launder clothing.

NOTE: Before eating, drinking or smoking, wash face and hands thoroughly with soap and water.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE, COLOR and ODOR: Milky, viscous liquid with aliphatic odor.

pH as is: 4.5-6.0; BOILING POINT/RANGE: >212^{0}F; WATER SOLUBILITY: Completely soluble

MELTING POINT/RANGE: NA; FLASH POINT: >212^0 F

VAPOR PRESSURE: 0.13 mm @ 20^0 C; SPECIFIC GRAVITY: 1.04

SECTION 10 - STABILITY and REACTIVITY

CHEMICAL STABILITY: Stable. No hazardous polymerization will occur.

CONDITIONS TO AVOID: None.

MATERIALS TO AVOID: Strong oxidizers, iron, mild steel, copper, copper alloys or aluminum.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of nitrogen, carbon dioxide and/or carbon monoxide, and hydrogen chloride may be formed in a fire.

SECTION 11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY: LD_{50} ORAL (rat)= > 5000 mg/kg; Product is not expected to bioaccumulate.

IRRITANCY AND CORROSIVENESS: May be slightly irritating to skin and eyes on prolonged exposure. No evidence of corrosiveness.

SENSITIZATION: This product is no expected to be sensitizing. Prolonged skin contact may produce dermatitis.

SUBACUTE, SUBCHRONIC AND PROLONGED TOXICITY: This product is not expected to be toxic by inhalation.

EMPIRICAL DATA ON EFFECTS ON HUMANS: Considered non-toxic in normal use.

SECTION 12 - ECOLOGICAL INFORMATION

PERSISTENCE IN THE ENVIRONMENT: Not available.

Aquatic toxicity is highly mitigated by the presence of dissolved organic carbon. Results obtained using the EPA's "Dirty Water " test show that irreversible adsorption onto suspended matter present reduces aquatic toxicity by factors of 10 to 100 times in the presence of 5 to 10 mg/l organic carbon as is found in most surface waters.

PRODUCT NAMES: TRAMFLOC® 343, 344, 345

OTHER INFORMATION: Discharge of this product must be in accordance with all federal, state, local or other applicable laws and regulations.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Recycle if possible. If not, absorb spilled material on inert absorbent and dispose of solidified material in accordance with federal, state, local or other applicable laws and regulations.

SECTION 14 - TRANSPORTATION INFORMATION

Non-Hazardous, Non-Regulated

SECTION 15 - REGULATORY INFORMATION

U. S. FEDERAL REGULATIONS:

CERCLA-SARA Hazard Category:

Reportable or Threshold Quantities: NA

No SARA Section 313 components exist in this product.

INVENTORY INFORMATION

EEC EINECS: All components of this product are included on the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC as amended.

US TSCA: This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C.

CANADA DSL: Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS: HEALTH: 1; FLAMMABILITY: 1; REACTIVITY: 0

The information contained herein is to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, Tramfloc, Inc. makes no guarantee for results obtained, and assume no responsibility for damages incurred by use of this product. It is the responsibility of the user to comply with all federal, state and local laws and regulations.

MSDS Number: **A2856** * * * * * *Effective Date: **02/03/09** * * * * * Supercedes: **02/15/08***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ALUMINUM POTASSIUM SULFATE

1. Product Identification

Synonyms: Sulfuric acid, aluminum potassium salt (2:1:1), dodecahydrate; potassium alum dodecahydrate; Alum Potassium USP Powder TAC; Potassium alum; Potash alum; Alum; Kalinite
CAS No.: 10043-67-1 (Anhydrous) 7784-24-9 (Dodecahydrate)
Molecular Weight: 474.38
Chemical Formula: AlK(SO4)2 12H2O
Product Codes:
J.T. Baker: 0546, 0547, 0548
Mallinckrodt: 3216

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid, Aluminum Potassium Salt (2:1:1)	10043-67-1	98 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Green (General Storage)

Potential Health Effects

This material hydrolyzes in water to form sulfuric acid, which is responsible for the irritating effects given below.

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
Ingestion:
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. There have been two cases of fatal human poisonings from ingestion of 30 grams of alum.
Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain.
Eye Contact:
Causes irritation, redness, and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Keep in mind that addition of water can cause the formation of sulfuric acid.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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6. Accidental Release Measures

Cover spill with sodium bicarbonate or soda ash and mix. Ventilate area of leak or spill. Keep unnecessary and

unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
15 mg/m3 (TWA) total dust and 5 mg/m3 (TWA)
respirable fraction for Aluminum metal as Al.
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 respirable fraction (TWA), Aluminum metal and Insoluble compounds, A4.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Colorless crystals.
Odor:
Odorless.
Solubility:
14% in water, 333% in boiling water
Density:
1.73
pH:
3.3 (0.2 M solution)

% Volatiles by volume @ 21C (70F):
0
Boiling Point:
ca. 200C (ca. 392F) Loses water
Melting Point:
92.5C (198F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Hydrolyzes to form dilute sulfuric acid. Toxic and corrosive oxides of sulfur may be formed when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Corrosive to metals in the presence of water.
Conditions to Avoid:
Moisture and incompatibles.

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11. Toxicological Information

Investigated as a reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sulfuric Acid, Aluminum Potassium Salt (2:1:1) (10043-67-1)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Not regulated.

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid, Aluminum Potassium Salt (2:1:1) (10043-67-1)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Sulfuric Acid, Aluminum Potassium Salt (2:1:1) (10043-67-1)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Sulfuric Acid, Aluminum Potassium Salt (2:1:1) (10043-67-1)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Sulfuric Acid, Aluminum Potassium Salt (2:1:1) (10043-67-1)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **1** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
Label Precautions:
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, wipe off excess material from skin then immediately flush eyes or skin

with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **F1368** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***01/19/06***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

FERRIC SULFATE

1. Product Identification

Synonyms: Iron (III) sulfate; iron persulfate; sulfuric acid, iron (3+) salt (3:2) hydrate
CAS No.: 10028-22-5 (Anhydrous); 15244-10-7 (Hydrated)
Molecular Weight: 399.87
Chemical Formula: Fe2(SO4)3. xH2O
Product Codes:
J.T. Baker: 2046
Mallinckrodt: 5036

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Ferric Sulfate	10028-22-5	70 - 80%	Yes
Water	7732-18-5	20 - 30%	No

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
Ingestion:
Low toxicity in small quantities but larger dosages may cause nausea, vomiting, diarrhea, and black stool. Pink urine discoloration is a strong indicator of iron poisoning. Liver damage, coma, and death from iron poisoning has been recorded.
Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain. May cause skin discoloration with irritation.
Eye Contact:
Causes irritation, redness, and pain.
Chronic Exposure:
Prolonged exposure of the eyes may cause discoloration. Repeated high exposure could cause too much iron to build up in the body. Symptoms of upset stomach, nausea, constipation and black bowel movements may occur. Chronic exposure may cause liver effects.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Dry chemical, foam, carbon dioxide, or water spray.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills:

Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. For ferric chloride anhydrous: US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed light-resistant container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 (TWA) soluble iron salt as Fe
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Maintain eye wash fountain and quick-drench facilities in work area. Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible.

9. Physical and Chemical Properties

Appearance:
Grayish-white powder or rhombic crystals.
Odor:
Odorless.
Solubility:
Soluble in water.
Density:
3.097 (Anhydrous)
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0

Boiling Point:
Not applicable.
Melting Point:
480C (896F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Very hygroscopic.
Hazardous Decomposition Products:
Oxides of sulfur and the contained metal.
Hazardous Polymerization:
This substance does not polymerize.
Incompatibilities:
No incompatibility data found.
Conditions to Avoid:
Heat, light, moisture.

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11. Toxicological Information

Oral rat LD50: 500 mg/kg. Investigated as a mutagen.

--------\Cancer Lists\--

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Ferric Sulfate (10028-22-5)	No	No	None
Water (7732-18-5)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Ferric Sulfate (10028-22-5)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Ferric Sulfate (10028-22-5)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Ferric Sulfate (10028-22-5)	No	No	No	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Ferric Sulfate (10028-22-5)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Solid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **1** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In all cases, get medical attention.
Product Use:
Laboratory Reagent.

Revision Information:
No Changes.
Disclaimer:
****
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****
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **F1802** * * * * * *Effective Date:* ***09/08/09*** * * * * * *Supercedes:* ***05/04/07***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

FERROUS SULFATE

1. Product Identification

Synonyms: Iron (II) sulfate (1:1)ç; sulfuric acid, iron (2+) salt (1:1), heptahydrate
CAS No.: 7720-78-7 (Anhydrous) 7782-63-0 (heptahydrate)
Molecular Weight: 278
Chemical Formula: FeSO4 7H2O
Product Codes:
J.T. Baker: 2063, 2070, 2074
Mallinckrodt: 5055, 5056, 5401, 5572

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Ferrous Sulfate	7720-78-7	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
Ingestion:
Low toxicity in small quantities but larger dosages may cause nausea, vomiting, diarrhea, and black stool. Pink urine discoloration is a strong indicator of iron poisoning. Liver damage, coma, and death from iron poisoning has been recorded. Smaller doses are much more toxic to children.
Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain.
Eye Contact:
Causes irritation, redness, and pain.
Chronic Exposure:
Severe or chronic ferrous sulfate poisonings may damage blood vessels. Large chronic doses cause rickets in infants. Chronic exposure may cause liver effects. Prolonged exposure of the eyes may cause discoloration.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
Use protective clothing and breathing equipment appropriate for the surrounding fire.

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6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Maintain a constant temperature not to exceed 24 degrees centigrade (75 degrees fahrenheit). Fluctuating temperatures causes product oxidation. Do not use this product if coated with brownish-yellow basic ferric sulfate. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 (TWA) soluble iron salt as Fe
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Blue green crystals.
Odor:
Odorless.
Solubility:
48.6 g/100 g water @ 50C (122F)
Density:
1.90
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
> 300C (> 572F) Decomposes.
Melting Point:

57C (135F) Loses water
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Looses water in dry air and oxidizes upon exposure to moisture, forming a brown coating of extremely corrosive basic ferric sulfate.
Hazardous Decomposition Products:
Burning may produce sulfur oxides.
Hazardous Polymerization:
This substance does not polymerize.
Incompatibilities:
Alkalis, soluble carbonates, and oxidizing materials. Reacts in moist air to form ferric sulfate.
Conditions to Avoid:
Moisture.

11. Toxicological Information

Oral rat LD50: 319 mg/kg. Investigated as a tumorigen and mutagen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Ferrous Sulfate (7720-78-7)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Ferrous Sulfate (7720-78-7)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Ferrous Sulfate (7720-78-7)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Ferrous Sulfate (7720-78-7)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Ferrous Sulfate (7720-78-7)	1000	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
Product Use:
Laboratory Reagent. Bulk pharmaceutical chemical.
Revision Information:
No Changes.
Disclaimer:
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Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no

representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Material Safety Data Sheet
Polyacrylamide

ACC# 89429

Section 1 - Chemical Product and Company Identification

MSDS Name: Polyacrylamide
Catalog Numbers: FB3405, FB3405S, FB3415, FB3415S, FB3425, FB3425S, FB3435, FB3435S
Synonyms:
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
79-06-1	Acrylamide	<.2	201-173-7
26628-22-8	Sodium Azide	.02	247-852-1
7732-18-5	Water	Balance	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Clear viscous liquid.
Caution! May cause eye, skin, and respiratory tract irritation. Potential cancer hazard.
Target Organs: None known.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: May cause irritation of the digestive tract.
Inhalation: May cause respiratory tract irritation.
Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and

lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.
Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store protected from light.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acrylamide	0.03 mg/m3 TWA (inhalable fraction and vapor); Skin - potential significant contribution to overall exposure by the cutaneous r oute	0.03 mg/m3 TWA 60 mg/m3 IDLH	0.3 mg/m3 TWA

Sodium Azide	0.29 mg/m3 Ceiling (as NaN3); 0.11 ppm Ceiling (vapor, as hydrazoic acid)	none listed	none listed
Water	none listed	none listed	none listed

OSHA Vacated PELs: Acrylamide: 0.03 mg/m3 TWA Sodium Azide: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Viscous liquid
Appearance: Clear
Odor: none reported
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 100 deg C
Freezing/Melting Point:0 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: Not available.
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Incompatible materials.
Incompatibilities with Other Materials: Sodium azide is incompatible with acids, ammonium chloride + trichloracetonitrile, barium carbonate, bromine, carbon disulfide, carbonyl dichloride (phosgene), cyanuric chloride, chromyl chloride, 2,5-dinitro-3-methylbenzoic acid + oleum, heavy metals, sulfuric acid, trifluoroacryloyl chloride. Polyacrylamide is incompatible with oxidizing and reducing agents, brass, aluminum
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide, ammonia.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 79-06-1: AS3325000
CAS# 26628-22-8: VY8050000
CAS# 7732-18-5: ZC0110000
LD50/LC50:
CAS# 79-06-1:
Draize test, rabbit, eye: 100 mg/24H Moderate;
Draize test, rabbit, skin: 50 mg/3D Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, mouse: LD50 = 107 mg/kg;
Oral, rabbit: LD50 = 150 mg/kg;
Oral, rat: LD50 = 124 mg/kg;
Skin, rabbit: LD50 = 1680 uL/kg;
Skin, rat: LD50 = 400 mg/kg;
.

CAS# 26628-22-8:
Inhalation, mouse: LC50 = 32400 ug/m3;
Inhalation, rat: LC50 = 37 mg/m3;
Oral, mouse: LD50 = 27 mg/kg;
Oral, rat: LD50 = 27 mg/kg;
Skin, rabbit: LD50 = 20 mg/kg;
Skin, rat: LD50 = 50 mg/kg;
.

CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;
.

Carcinogenicity:
CAS# 79-06-1:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Suspect carcinogen
- **IARC:** Group 2A carcinogen

CAS# 26628-22-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: ~~Methanol has been shown to prooduce fetoxicity in the embryo or fetus in laboratory animals. Specific developmental abnormalities include:musculoskeletal, urogenital and cardiovascular systems,
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: CAS# 26628-22-8: waste number P105.
RCRA U-Series:
CAS# 79-06-1: waste number U007.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 79-06-1 is listed on the TSCA inventory.
CAS# 26628-22-8 is listed on the TSCA inventory.
CAS# 7732-18-5 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 79-06-1: Effective 10/4/82, Sunset 10/4/92
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 79-06-1: 5000 lb final RQ; 2270 kg final RQ CAS# 26628-22-8: 1000 lb final RQ; 454 kg final RQ
SARA Section 302 Extremely Hazardous Substances
CAS# 79-06-1: 1000 lb lower threshold TPQ; 10000 lb upper threshold TP Q CAS# 26628-22-8: 500 lb TPQ (This material is a reactive solid. The TP Q does not default to 10000 pounds for non-powder, non-molten, non-so lvent form)
SARA Codes
CAS # 79-06-1: immediate, delayed, sudden release of pressure, reactive.
CAS # 26628-22-8: immediate, delayed, reactive.
Section 313
Acrylamide is not at a high enough concentration to be reportable under Section 313.
Sodium Azide is not at a high enough concentration to be reportable under Section 313. No chemicals are reportable under Section 313.
Clean Air Act:

CAS# 79-06-1 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 79-06-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 26628-22-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Acrylamide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 79-06-1: 0.2 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 79-06-1: 3
CAS# 26628-22-8: 2
CAS# 7732-18-5: No information available.

Canada - DSL/NDSL

CAS# 79-06-1 is listed on Canada's DSL List.
CAS# 26628-22-8 is listed on Canada's DSL List.
CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 79-06-1 is listed on the Canadian Ingredient Disclosure List.
CAS# 26628-22-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #5 Date: 11/20/2008

ANALYTICAL DATA

TECHNOLOGY LABORATORY, INC.

1012 Centre Avenue
Fort Collins, Colorado 80526
(970) 490-1414

CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Sample ID: Composite
Laboratory ID: 9952-07

Sampled: 01/28/10
Received: 01/29/10
Analyzed: 02/12/10
Project No.: 11727AA
Method: EPA-8260B
Matrix: Water

CAS Number	Parameter	Result µg/L	MDL µg/L	CAS Number	Parameter	Result µg/L	MDL µg/L
71-43-2	Benzene	4580	0.5	108-88-3	Toluene	8040	0.5
100-41-4	Ethylbenzene	711	0.5	1330-20-7	Total Xylenes	5570	0.5
91-20-3	Naphthalene	< 0.5	0.5	75-01-4	Vinyl Chloride	< 0.5	0.5
74-87-3	Chloromethane	< 0.5	0.5	74-83-9	Bromomethane	< 0.5	0.5
75-00-3	Chloroethane	< 0.5	0.5	75-69-4	Trichlorofluoromethane	< 0.5	0.5
75-35-4	1,1-Dichloroethene	< 0.5	0.5	156-60-5	trans-1,2-Dichloroethene	< 0.5	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5	0.5	75-09-2	Methylene Chloride	< 0.5	0.5
75-34-3	1,1-Dichloroethane	< 0.5	0.5	74-97-5	Bromochloromethane	< 0.5	0.5
67-66-3	Chloroform	< 0.5	0.5	71-55-6	1,1,1-Trichloroethane	< 0.5	0.5
56-23-5	Carbon Tetrachloride	< 0.5	0.5	107-06-2	1,2-Dichloroethane	< 0.5	0.5
79-01-6	Trichloroethene	< 0.5	0.5	78-87-5	1,2-Dichloropropane	< 0.5	0.5
75-27-4	Bromodichloromethane	< 0.5	0.5	74-95-3	Dibromomethane	< 0.5	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5	0.5	142-28-9	1,3-Dichloropropane	< 0.5	0.5
590-20-7	2,2-Dichloropropane	< 0.5	0.5	563-58-6	1,1-Dichloropropene	< 0.5	0.5
10061-01-5	cis-1,3-Dichloropropene	< 0.5	0.5	10061-02-6	trans-1,3-Dichloropropene	< 0.5	0.5
127-18-4	Tetrachloroethene	< 0.5	0.5	106-93-4	1,2-Dibromoethane (EDB)	< 0.5	0.5
124-48-1	Dibromochloromethane	< 0.5	0.5	108-90-7	Chlorobenzene	< 0.5	0.5
630-20-6	1,1,1,2-Tetrachloroethane	< 0.5	0.5	100-42-5	Styrene	< 0.5	0.5
75-25-2	Bromoform	< 0.5	0.5	79-34-5	1,1,2,2-Tetrachloroethane	< 0.5	0.5
98-82-8	Isopropylbenzene	83.7	0.5	108-86-1	Bromobenzene	< 0.5	0.5
103-65-1	n-Propylbenzene	81.6	0.5	95-49-8	2-Chlorotoluene	< 0.5	0.5
106-43-4	4-Chlorotoluene	< 0.5	0.5	108-67-8	1,3,5-Trimethylbenzene	1011	0.5
95-63-6	1,2,4-Trimethylbenzene	1219	0.5	98-06-6	tert-Butylbenzene	< 0.5	0.5
135-98-8	sec-Butylbenzene	1404	0.5	541-73-1	1,3-Dichlorobenzene	< 0.5	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5	0.5	99-87-6	4-Isopropyltoluene	70.1	0.5
104-51-8	n-Butylbenzene	< 0.5	0.5	120-82-1	1,2,4-Trichlorobenzene	< 0.5	0.5
87-61-6	1,2,3-Trichlorobenzene	< 0.5	0.5	87-68-3	Hexachlorobutadiene	< 0.5	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5	0.5				

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	113	68-120
Toluene-d8	97	81-128
Bromofluorobenzene	108	70-113

Bill Emery
TECHNOLOGY LABORATORY, INC.

State of Colorado

Be it known that **Gregg Z Neurohr** is hereby Certified as a Class C Industrial Wastewater Operator and Certified Water Professional (CWP)

having qualified by Article 9 of Title 25, C.R.S., effective May 23, 2000, and in accordance with Rules and Regulations adopted by the Colorado Water and Wastewater Facility Operators Certification Board.

Certificate Number: 13836

Expires: 04/01/2013

Secretary of Board

Jeannette M. Hillery
Board Chairperson

In witness where of I have subscribed my name and affixed the seal of the State of Colorado Certification Board. This 8th day of April, 2010 in the City of Denver, Colorado.

COLORADO WATER AND WASTEWATER FACILITY OPERATORS CERTIFICATION BOARD

Be it Known that Gregg Z Neurohr, CWP is hereby Certified as a Class C Industrial Wastewater Operator, Certificate No. 13836, until 4/1/2013, in accordance with Article 9 of Title 25, C.R.S., and the rules and regulations of the Board.

Operator ID. 9139
Certificate No. 13836
Expires 4/1/2013

Secretary
Colorado Facility Operators Certification Board

March 29, 2010

Colorado Department of Public Health & Environment
WQCD-P-B2 (Attn: Industrial Permits Unit)
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Subject: **Produced Water Treatment Discharge**
GreenBack Shaeffer Ranch Facility
Garfield County, Colorado

Dear Sir or Madam:

This letter serves as authorization for GreenBack Produced Water Recovery, LLC, to discharge treated water from its produced water treatment facility under a General NPDES Discharge Permit. It is my understanding that GreenBack will be required to conform to discharge parameters as required by your division.

If you have any questions regarding this letter, please contact me at 970-876-2819.

Sincerely,

H B Shaeffer

Harold Shaeffer