

0009



State of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER QUALITY

Michael O. Leavitt
Governor
Dianne R. Nielson, Ph.D.
Executive Director
Don A. Ostler, P.E.
Director

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Salt Lake City, Utah 84114-4870
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Water Quality Board
K.C. Shaw, P.E.
Chairman

William R. Williams
Vice Chairman

Robert G. Adams
Nan Bunker

Ray M. Child, C.P.A.

John R. Cushing, Mayor

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Ronald C. Sims, Ph.D.

Douglas E. Thompson, Mayor

J. Ann Wechsler

Don A. Ostler, P.E.
Executive Secretary

July 18, 2000

CERTIFIED MAIL (Return Receipt Requested)

Mr. Gary Gray, Engineer
Genwal Resources, Inc.
P.O. Box 1420
Huntington, Utah 84528

Dear Mr. Gray:

Subject: Draft UPDES Permit UT0024368, Genwal Resources, Inc.

Enclosed is a copy of the Draft UPDES Permit No. UT0024368, the Statement of Basis, and the Public Notice for your facility.

If you have any questions with regards to this matter, please contact Mike Herkimer at (801) 538-6058.

Sincerely,

Gayle J. Smith, P.E., Manager
Permits & Compliance Section

GJS:MDH:st

Enclosure

- cc: Curt McCormick, EPA Region VIII (W/encl)
- Claron Bjork, Southeastern Utah District Health Dept. (W/encl)
- Dave Ariotti, DEQ District Engineer (W/encl)
- Bill Bradwisch, Aquatic Habitat Coordinator, DWR (W/encl)
- Ronette Reisenburg, US Fish & Wildlife Service (W/encl)
- Pam Grubaugh-Littig, Division of Oil Gas & Mining (W/encl)

:\WQ\PERMITS\MHERIMER\WPA\GENEWALPN.LTR.WPD
FILE:



(copy)

*FAX Cover
Letter to PFD
J. Nielson's Copy
of 7/15/032 Letter
to Dave*

RECEIVED
JUL 26 2000
DIVISION OF
OIL, GAS AND MINING



State of Utah

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Executive Secretary



July 18, 2000

CERTIFIED MAIL (Return Receipt Requested)

The Sun Advocate
845 East Main
Price, Utah 84501

ATTN: Legal Advertising Department

This letter will confirm authorization to publish the attached NOTICE in The Sun Advocate in the first available edition. Please mail the invoice and affidavit of publication to:

Department of Environmental Quality
Division of Water Quality
Attn: Stacy Carroll
P.O. 144870
Salt Lake City, Utah 84114-4870

If there are any questions, please contact me at (801) 538-6779. Thank you for your assistance.

Sincerely,

Gayle J. Smith, P.E., Manager
Permits & Compliance Section

GJS:MDH:st

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OIL, GAS AND MINING



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Don A. Ostler, P.E.
Executive Secretary

July 24, 2000

DIVISION OF WATER QUALITY UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

PUBLIC NOTICE OF ISSUANCE OF UPDES PERMIT

PURPOSE OF PUBLIC NOTICE

THE PURPOSE OF THIS PUBLIC NOTICE IS TO DECLARE THE STATE OF UTAH'S INTENTION TO ISSUE A UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES) PERMIT UNDER AUTHORITY OF THE UTAH WATER POLLUTION CONTROL ACT, SECTION 19-5-104(9) AND 107(2), UTAH CODE ANNOTATED 1953, AS AMENDED. SAID "PERMIT" REFERS TO THE UPDES PERMIT AND THE STATEMENT OF BASIS [INCLUDING THE TOTAL MAXIMUM DAILY LOADS (TMDL'S), IF APPLICABLE, AS PER SECTION 303(d) OF THE FEDERAL CLEAN WATER ACT (CWA)].

PERMIT INFORMATION

| | |
|--------------------|---|
| PERMITTEE NAME: | Genwal Resources, Inc. |
| MAILING ADDRESS: | P.O. Box 1420, 195 N. 100 W., Huntington, UT 84528 |
| TELEPHONE NUMBER: | (435) 687-9813 |
| FACILITY LOCATION: | Up Huntington Canyon in Emery County, Utah |
| UPDES PERMIT NO.: | UT0024368 |

BACKGROUND

Underground coal mining operation which discharges to Crandell Creek, which is a tributary to Huntington Creek.

PUBLIC COMMENTS

Public comments are invited any time prior to midnight on **August 24, 2000**. Comments may be directed to the Department of Environmental Quality, Division of Water Quality, 288 North 1460 West, P.O. Box 144870, Salt Lake City, Utah 84114-4870. All comments received prior to midnight on **August 24, 2000** will be considered in the formulation of final determinations to be imposed on the permit. A public hearing will be held if response to this Notice indicates significant public interest. A public hearing may be held if written requests are received within the first 15 days of this public comment period that demonstrate significant public interest and substantive issues exist to warrant holding a hearing.

FURTHER INFORMATION

Additional information may be obtained upon request by calling (801) 538-6146 or by writing the aforementioned address. All information appropriate to this permit renewal is available for review at the Division of Water Quality, 288 North 1460 West, Salt Lake City, Utah.

RECEIVED
JUL 26 2000
DIVISION OF
OIL, GAS AND MINING

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

AUTHORIZATION TO DISCHARGE UNDER THE
UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM
(UPDES)

In compliance with provisions of the *Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended (the "Act")*,

GENWAL RESOURCES, INC.

is hereby authorized to discharge from its facility located at Crandall Canyon up Huntington Canyon, Utah, with the outfalls located as indicated in the permit, to receiving waters named

Crandall Creek

in accordance with discharge points, effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on September 1, 2000.

This permit and the authorization to discharge shall expire at midnight, August 31, 2005.

Signed this day of

Authorized Permitting Official
Executive Secretary
Utah Water Quality Board

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I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Definitions.

1. The "30-day (and monthly) average" is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.
2. The "7-day (and weekly) average" is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains the Saturday.
3. "Daily Maximum" ("Daily Max.") is the maximum value allowable in any single sample or instantaneous measurement.
4. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.
5. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.
6. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
7. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
8. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
9. "Executive Secretary" means Executive Secretary of the Utah Water Quality Board.
10. "EPA" means the United States Environmental Protection Agency.
11. "Act" means the "*Utah Water Quality Act*".
12. "Chronic toxicity" occurs when the IC₂₅ is less than or equal to 65.5% effluent.
13. IC₂₅ (inhibitory concentration to 25 % of the population) is the concentration of toxicant (%effluent) that would cause a 25 % reduction in mean young per female or in growth for the test population.

14. "Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. *BMPs* also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
15. "Coal pile runoff" means the rainfall runoff from or through any coal storage pile.
16. "CWA" means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.
17. "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agriculture storm water runoff.
18. "10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in *Weather Bureau Technical Paper No. 40*, May 1961 and *NOAA Atlas 2*, 1973 for the 11 Western States, and may be obtained from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

B. Description of Discharge Points.

The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit is a violation of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

Outfall Number

Location of Discharge Points

001

An 18 inch discharge pipe on the east side of the sedimentation pond. Located at latitude 39° 27' 38" and longitude 111° 09' 59".

002

A twelve inch discharge pipe located in the riser pipe from the bypass culvert of Crandall Creek just west of the MCC building in the lower yard of the surface facilities. Located at latitude 39° 27' 38" and longitude 111° 09' 59".

C. Narrative Standard.

It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or

other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.

C. Specific Limitations and Self-monitoring Requirements.

1. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from outfalls 001 and 002. Such discharges shall be limited and monitored by the permittee as specified below:

| <u>Effluent Characteristics</u> | <u>Discharge Limitations a/</u> | | | <u>Monitoring Requirements</u> | |
|---------------------------------|---------------------------------|--------------|----------------------|--------------------------------|--------------------|
| | <u>Average 30-Day</u> | <u>7-Day</u> | <u>Daily Maximum</u> | <u>Measurement Frequency</u> | <u>Sample Type</u> |
| Flow, MGD | NA | NA | NA | Monthly | Record |
| TDS, mg/L | NA | NA | 723 | Monthly | Grab |
| Oil & Grease, mg/L | NA | NA | 10 | Monthly | Grab |
| Total Suspended Solids, mg/L | 25 | 35 | 70 | Monthly | Grab |
| Total Iron, mg/L | NA | NA | 1.3 | Monthly | Grab |

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units in any sample and shall be monitored monthly by a grab sample.

The thirty-day average dissolved oxygen (DO) shall not be less than 3 mg/L and shall be monitored monthly by a grab sample.

There shall be no visible sheen or floating solids or visible foam in other than trace amounts.

There shall be no discharge of sanitary wastes.

N.A. - Not Applicable.

a/ See Definitions, *Part I.A* for definition of terms.

2. Effective immediately and lasting through the life of this permit, there shall be no chronic toxicity in the discharge as defined in *Part I.A* and determined by test procedures described in *Part I.D.8*.
3. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): in the effluent before mixing with the receiving water.
4. An overflow, increase in volume of a discharge or discharge from a bypass system caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) at all surface runoff pond (outfalls) may comply with the following limitation instead of the total suspended solids limitations contained in Part I.D.1:

| <u>Effluent Characteristics</u> | <u>Daily Maximum</u> |
|---------------------------------|----------------------|
| Settleable Solids | 0.5 ml/L |

In addition to the monitoring requirements specified under Part I. D.1., all effluent samples collected during storm water discharge events shall also be analyzed for settleable solids. Such analyses shall be conducted on either grab or composite samples.

5. Any overflow increase in volume of a discharge or discharge from a bypass system caused by precipitation within any 24-hour period greater than the 10-year, 24, hour precipitation event (or snowmelt of equivalent volume) at all surface runoff pond outfalls may comply with the following limitations instead of the otherwise applicable limitations.

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units. However, as stated under Part I.D.4, all effluent samples collected at all surface runoff pond outfalls during storm water discharge events shall be analyzed for settleable solids and the parameters identified under Part I.D.1.

6. The operator shall have the burden of proof that the discharge or increase in discharge was caused by the applicable precipitation event described in Parts I.D.4. and D.5. The alternate limitation in Parts I.D.4. and D.5. shall not apply to treatment systems that treat underground mine water only.
7. The facility must minimize the discharge of salt by using the largest practicable amount of saline water for process and dust control. There shall be no use of gypsum for rock dusting unless the permittee provides sufficient information to the Executive Secretary such that approval is granted based upon the Colorado River Basin Salinity Control Forum Policies and the fact that it will not significantly increase total dissolved solids concentrations.
8. Whole Effluent Testing - Chronic Toxicity.

Starting on the effective date of the permit, the permittee shall quarterly, conduct chronic short-term toxicity tests on a composite sample of the final effluent using *Ceriodaphnia dubia* and twice per year using *Pimephales promelas* (fathead minnow). All whole effluent chronic test samples shall be collected at outfall 002.

The monitoring frequency shall be quarterly for *Ceriodaphnia dubia* and semi-annual for *Pimephales promelas*. Samples shall be collected on a two day progression; i.e., if the first sample is on a Monday, during the next sampling period, sampling shall be on a Wednesday. If chronic toxicity is detected, the test shall be repeated in less than four weeks from the date the initial sample was taken. The need for any additional samples, and/or a Toxicity Reduction Evaluation (TRE, see Part I.D.9) shall be determined by the Executive Secretary. If the second test shows no chronic toxicity, routine monitoring shall be resumed.

The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms. Third Edition. July 1994, EPA-600-4-91-002* as per *40 CFR 136.3(a) TABLE IA-LIST OF APPROVED BIOLOGICAL METHODS*, and the *Region VIII EPA NPDES Chronic Test Conditions - Static Renewal Whole Effluent Toxicity Test (August, 1997)*. In case of conflicts, the Region VIII procedure will prevail.

Chronic toxicity occurs when the IC_{25} is less than or equal to an effluent concentration of 65.5%. If any of the acceptable control performance criteria are not met, the test shall be considered invalid.

Quarterly and semi-annual test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar quarter or semi-annual period (e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). The format for the report shall be consistent with the latest revision of the

Region VIII Guidance for Chronic Whole Effluent Reporting (August, 1997) and shall include all the physical testing as specified.

If the results for one year of testing indicate no chronic toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Executive Secretary may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

The current Utah whole effluent toxicity (WET) policy is in the process of being updated and revised to assure its consistency with the Environmental Protection Agency's national and regional WET policy. When said revised WET policy has been finalized and officially adopted, this permit will be reopened and modified to incorporate satisfactory follow-up chronic toxicity language (chronic pattern of toxicity, PTI and/or TIE/TRE, etc.) without a public notice, as warranted and appropriate.

9. Toxicity Reduction Evaluation (TRE).

If toxicity is detected and it is determined by the Executive Secretary that a TRE is necessary, the permittee shall be so notified and shall initiate a TRE immediately thereafter. The purpose of the TRE will be to establish the cause of the toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity.

A TRE may include but is not limited to one, all, or a combination of the following:

1. Phase I - Toxicity Characterization
2. Phase II - Toxicity Identification Procedures
3. Phase III - Toxicity Control Procedures
4. Any other appropriate procedures for toxicity source elimination and control

If the TRE establishes that the toxicity cannot be immediately eliminated the permittee shall submit a proposed compliance plan to the Executive Secretary. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the Executive Secretary, this permit may be reopened and modified.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations, the permittee may:

1. Submit an alternative control program for compliance with the numerical requirements.
2. If necessary, provide a modified biomonitoring protocol which compensates for the pollutant(s) being controlled numerically.

If acceptable to the Executive Secretary, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the Executive Secretary, and/or a modified biomonitoring protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the Executive Secretary, shall be considered a violation of this permit.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

- A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to the use-disposal practice.
- B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10*, unless other test procedures have been specified in this permit.
- C. Penalties for Tampering. The *Act* provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- D. Reporting of Monitoring Results. Monitoring results obtained during the previous month shall be summarized for each month and reported monthly on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. The first report is due on October 28, 2000. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part IV.G)*, and submitted to the Director, Division of Water Quality at the following address:
- original to: Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870
- E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.
- F. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* or as otherwise specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.
- G. Records Contents. Records of monitoring information shall include:
1. The date, exact place, and time of sampling or measurements;
 2. The individual(s) who performed the sampling or measurements;
 3. The date(s) and time(s) analyses were performed;
 4. The individual(s) who performed the analyses;
 5. The analytical techniques or methods used; and,
 6. The results of such analyses.

- H. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location.
- I. Twenty-four Hour Notice of Noncompliance Reporting.
1. The permittee shall (orally) report any noncompliance which may seriously endanger health or environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 538-6146, or 24 hour answering service (801) 536-4123.
 2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:
 - a. Any noncompliance which may endanger health or the environment;
 - b. Any unanticipated bypass which exceeds any effluent limitation in the permit (See *Part III.G, Bypass of Treatment Facilities.*);
 - c. Any upset which exceeds any effluent limitation in the permit (See *Part III.H, Upset Conditions.*); or,
 - d. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit.
 3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
 - a. A description of the noncompliance and its cause;
 - a. The period of noncompliance, including exact dates and times;
 - c. The estimated time noncompliance is expected to continue if it has not been corrected; and,
 - d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 - e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.
 4. The Executive Secretary may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 538-6146.
 5. Reports shall be submitted to the addresses in *Part II.D, Reporting of Monitoring Results.*

- J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part II.D* are submitted. The reports shall contain the information listed in *Part II.1.3*.
- K. Inspection and Entry. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,
 4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

- A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- B. Penalties for Violations of Permit Conditions. The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions of the Act is subject to a fine not exceeding \$25,000 per day of violation; Any person convicted under UCA 19-5-115(2) a second time shall be punished by a fine not exceeding \$50,000 per day. Except as provided at Part III.G, Bypass of Treatment Facilities and Part III.H, Upset Conditions, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.
- C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- F. Removed Substances. Collected screening, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.
- G. Bypass of Treatment Facilities.
1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2 and 3 of this section. Return of removed substances, as described in Part III.F, to the discharge stream shall not be considered a bypass under the provisions of this paragraph.
 2. Notice:
 1. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.
 2. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required under Part II.I, Twenty-four Hour Reporting.

3. Prohibition of bypass.

1. Bypass is prohibited and the Executive Secretary may take enforcement action against a permittee for a bypass, unless:
 - (1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,
 - (3) The permittee submitted notices as required under paragraph 2 of this section.
2. The Executive Secretary may approve an anticipated bypass, after considering its adverse effects, if the Executive Secretary determines that it will meet the three conditions listed above in paragraph 3.a of this section.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2. of this section are met. Executive Secretary's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.
2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 1. An upset occurred and that the permittee can identify the cause(s) of the upset;
 2. The permitted facility was at the time being properly operated;
 3. The permittee submitted notice of the upset as required under *Part II.I, Twenty-four Hour Notice of Noncompliance Reporting*; and,
 4. The permittee complied with any remedial measures required under *Part III.D, Duty to Mitigate*.
3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

- I. Toxic Pollutants. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of *The Water Quality Act of 1987* for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

J. Changes in Discharge of Toxic Substances. Notification shall be provided to the Executive Secretary as soon as the permittee knows of, or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 1. One hundred micrograms per liter (100 ug/L);
 2. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 3. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(7)* or (10); or,
 4. The level established by the Executive Secretary in accordance with *UAC R317-8-4.2(6)*.
2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 1. Five hundred micrograms per liter (500 ug/L);
 2. One milligram per liter (1 mg/L) for antimony;
 3. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(9)*; or,
 4. The level established by the Executive Secretary in accordance with *UAC R317-8-4.2(6)*.

K. Industrial Pretreatment. Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of *The Water Quality Act of 1987*, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at *40 CFR 403*, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with *40 CFR 403.12(p)(1)*, the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under *40 CFR 261*. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

IV. GENERAL REQUIREMENTS

- A. Planned Changes. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Executive Secretary of any planned changes at least 30 days prior to their implementation.
- B. Anticipated Noncompliance. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.
- E. Duty to Provide Information. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.
- F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.
- G. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.
1. All permit applications shall be signed by either a principal executive officer or ranking elected official.
 2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 1. The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,
 2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under paragraph *IV.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph *IV.G.2* must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- H. Penalties for Falsification of Reports. The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.
- I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Executive Secretary. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.
- J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.
- K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
- L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- M. Transfers. This permit may be automatically transferred to a new permittee if:
 1. The current permittee notifies the Executive Secretary at least 20 days in advance of the proposed transfer date;
 2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.
- N. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117*.
- O. Water Quality-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:
1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.
 2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.
 3. A revision to the current Water Quality Management Plan is approved and adopted which calls for different effluent limitations than contained in this permit.
- P. Toxicity Limitation -Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;
1. Toxicity is detected, as per Part I.D.8 of this permit, during the duration of this permit.
 2. The TRE results indicate that compliance with the toxic limits will require an implementation schedule past the date for compliance and the Executive Secretary agrees with the conclusion.
 3. The TRE results indicate that the toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits, and the Executive Secretary agrees that numerical controls are the most appropriate course of action.
 4. Following the implementation of numerical control(s) of toxicant(s), the Executive Secretary agrees that a modified biomonitoring protocol is necessary to compensate for those toxicants that are controlled numerically.
 5. The TRE reveals other unique conditions or characteristics which, in the opinion of the Executive Secretary, justify the incorporation of unanticipated special conditions in the permit.

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1998 Annual Report Review

Permittee: Lodestar Energy, Inc.
 Mine Name: White Oak #1 G&M Mines, Leadout
 Permit Number: ACT/007/001
 Date Report Received: 3/21/2000 C. Price Field Office

Instructions: The assigned staff will review their respective portions of the Annual report and provide a written determination (findings) on how the Mine has or has not met the permit requirements for reporting. If the report is deficient or remedial action is required to obtain compliance, this should be noted and the inspector notified. Once all reviewers have completed the report, a copy will be filed in the Mine folder #6.

Assigned Reviewers: Peter Hess, Engineer
Inspector

| Section to review | Submitted | Yes | No | Findings |
|---|-----------|-----|----|--|
| * Cover sheet | X | | | Appears adequate; resident agent identified. |
| * AVS; Legal/Financial Update | X | | | Submitted in Appendix "C" on file at Utah Dept. of Commerce |
| * Mine Sequence Map | X | | | Maps for both Mines are P.E. certified. |
| Water Monitoring Data | | | | |
| Precipitation & Climatological Data | | | | |
| Non-Coal Waste | | | | |
| * Subsidence monitoring data | X | | | No differential Level survey. Pedestrian walkover by V.S. Miller |
| * Annual Impoundment Certification | X | | | 4th Qtr Impoundment Inspections P.E. certified by non-Utah P.E. 1/25/2000 |
| * Annual Overburden, Spoil, Refuse, Floor, etc. | | | X | 3rd & 4th quarter refuse pile inspection reports are missing page 2. All reports are P.E. certified but not dated. No new mat'l added to piles |
| Vegetation data | | | | |
| Revegetation Success monitoring | | | | |

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- Comments:
- 1) Spoil pile - no new material is being added.
 - 2) Many P.E. certifications are by a non-Utah registered P.E.
 - 3) Ponds inspected by V.S. Miller; Pond 005A not in use. Pond 001 only has 0.6 ACF sediment storage remaining
 - 4) No new subsidence noted during walk over survey.

| | | | | | |
|--------------|---------------|-------------|---------|------|----------------|
| Chromium III | 1,216.34 ug/l | 4.2 lbs/day | 7,488.2 | ug/l | 25.6 lbs/day |
| Chromium VI | 19.03 ug/l | 0.1 lbs/day | 22.9 | | |
| Copper | 71.74 ug/l | 0.2 lbs/day | 88.5 | ug/l | 0.3 lbs/day |
| Iron | | | 1,571.5 | ug/l | 5.4 lbs/day |
| Lead | 31.83 ug/l | 0.1 lbs/day | 615.7 | ug/l | 2.1 lbs/day |
| Mercury | 0.03 ug/l | 0.0 lbs/day | 3.8 | ug/l | 0.0 lbs/day |
| Nickel | 957.68 ug/l | 3.3 lbs/day | 6,322.6 | ug/l | 21.6 lbs/day |
| Selenium | 8.90 ug/l | 0.0 lbs/day | 30.5 | ug/l | 0.1 lbs/day |
| Silver | N/A ug/l | N/A lbs/day | 53.1 | ug/l | 0.2 lbs/day |
| Zinc | 645.36 ug/l | 2.2 lbs/day | 522.5 | ug/l | 1.8 lbs/day |
| Cyanide | 11.14 mg/l | 0.0 lbs/day | 6.3 | ug/l | 0.0 lbs/day |
| TDS, mg/l | | | 2,191.1 | mg/l | 3.7 tons/day |
| | | | 585.6 | mg/l | @ 1.0 tons/day |

**Effluent Limitations for Organics [Pesticides]
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Organics [Pesticides] will be met with an effluent limit as follows:

| | 4 Day Average | | 1 Hour Average | |
|-------------------|---------------|------------------|----------------|-----------------------|
| | Concentration | Load | Concentration | Load |
| Aldrin | | | 1.5E+00 | ug/l 7.92E-03 lbs/day |
| Chlordane | 4.30E-03 ug/l | 2.27E-02 lbs/day | 1.2E+00 | ug/l 6.34E-03 lbs/day |
| DDT, DDE | 1.00E-03 ug/l | 5.28E-03 lbs/day | 5.5E-01 | ug/l 2.91E-03 lbs/day |
| Dieldrin | 1.90E-03 ug/l | 1.00E-02 lbs/day | 1.3E+00 | ug/l 6.60E-03 lbs/day |
| Endosulfan | 5.60E-02 ug/l | 2.96E-01 lbs/day | 1.1E-01 | ug/l 5.81E-04 lbs/day |
| Endrin | 2.30E-03 ug/l | 1.22E-02 lbs/day | 9.0E-02 | ug/l 4.75E-04 lbs/day |
| Guthion | | | 1.0E-02 | ug/l 5.28E-05 lbs/day |
| Heptachlor | 3.80E-03 ug/l | 2.01E-02 lbs/day | 2.6E-01 | ug/l 1.37E-03 lbs/day |
| Lindane | 8.00E-02 ug/l | 4.23E-01 lbs/day | 1.0E+00 | ug/l 5.28E-03 lbs/day |
| Methoxychlor | | | 3.0E-02 | ug/l 1.58E-04 lbs/day |
| Mirex | | | 1.0E-02 | ug/l 5.28E-05 lbs/day |
| Parathion | | | 4.0E-02 | ug/l 2.11E-04 lbs/day |
| PCB's | 1.40E-02 ug/l | 7.40E-02 lbs/day | 2.0E+00 | ug/l 1.06E-02 lbs/day |
| Pentachlorophenol | 1.30E+01 ug/l | 6.87E+01 lbs/day | 2.0E+01 | ug/l 1.06E-01 lbs/day |
| Toxephene | 2.00E-04 ug/l | 1.06E-03 lbs/day | 7.3E-01 | ug/l 3.86E-03 lbs/day |

**Effluent Targets for Pollution Indicators
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

| | 1 Hour Average | |
|------------------------|----------------|--------------|
| | Concentration | Loading |
| Gross Beta (pCi/l) | 50.0 pCi/L | |
| BOD (mg/l) | 5.0 mg/l | 17.1 lbs/day |
| Nitrates as N | 4.0 mg/l | 13.7 lbs/day |
| Total Phosphorus as P | 0.05 mg/l | 0.17 lbs/day |
| Total Suspended Solids | 90.0 mg/l | 0.2 tons/day |

Note: Pollution indicator targets are for information purposes only.

Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)

In-stream criteria of downstream segments for Protection of Human Health [Toxics] will be met with an effluent limit as follows:

| | Maximum Concentration | |
|------------------------------|-----------------------|------------------|
| | Concentration | Load |
| Toxic Organics | | |
| Acenaphthene | 2.57E+03 ug/l | 1.36E+01 lbs/day |
| Acrolein | 6.86E+02 ug/l | 3.62E+00 lbs/day |
| Acrylonitrile | 1.26E-01 ug/l | 6.68E-04 lbs/day |
| Benzene | 2.57E+00 ug/l | 1.36E-02 lbs/day |
| Benzidine | ug/l | lbs/day |
| Carbon tetrachloride | 5.36E-01 ug/l | 2.83E-03 lbs/day |
| Chlorobenzene | 1.46E+03 ug/l | 7.70E+00 lbs/day |
| 1,2,4-Trichlorobenzene | | |
| Hexachlorobenzene | 1.61E-03 ug/l | 8.49E-06 lbs/day |
| 1,2-Dichloroethane | 8.14E-01 ug/l | 4.30E-03 lbs/day |
| 1,1,1-Trichloroethane | | |
| Hexachloroethane | 4.07E+00 ug/l | 2.15E-02 lbs/day |
| 1,1-Dichloroethane | | |
| 1,1,2-Trichloroethane | 1.31E+00 ug/l | 6.91E-03 lbs/day |
| 1,1,2,2-Tetrachloroethane | 3.64E-01 ug/l | 1.92E-03 lbs/day |
| Chloroethane | | |
| Bis(2-chloroethyl) ether | 6.64E-02 ug/l | 3.51E-04 lbs/day |
| 2-Chloroethyl vinyl ether | | |
| 2-Chloronaphthalene | 3.64E+03 ug/l | 1.92E+01 lbs/day |
| 2,4,6-Trichlorophenol | 4.50E+00 ug/l | 2.38E-02 lbs/day |
| p-Chloro-m-cresol | | |
| Chloroform (HM) | 1.22E+01 ug/l | 6.45E-02 lbs/day |
| 2-Chlorophenol | 2.57E+02 ug/l | 1.36E+00 lbs/day |
| 1,2-Dichlorobenzene | 5.79E+03 ug/l | 3.06E+01 lbs/day |
| 1,3-Dichlorobenzene | 8.57E+02 ug/l | 4.53E+00 lbs/day |
| 1,4-Dichlorobenzene | 8.57E+02 ug/l | 4.53E+00 lbs/day |
| 3,3'-Dichlorobenzidine | 8.57E-02 ug/l | 4.53E-04 lbs/day |
| 1,1-Dichloroethylene | 1.22E-01 ug/l | 6.45E-04 lbs/day |
| 1,2-trans-Dichloroethylene1 | | |
| 2,4-Dichlorophenol | 1.99E+02 ug/l | 1.05E+00 lbs/day |
| 1,2-Dichloropropane | 1.11E+00 ug/l | 5.89E-03 lbs/day |
| 1,3-Dichloropropylene | 2.14E+01 ug/l | 1.13E-01 lbs/day |
| 2,4-Dimethylphenol | 1.16E+03 ug/l | 6.11E+00 lbs/day |
| 2,4-Dinitrotoluene | 2.36E-01 ug/l | 1.25E-03 lbs/day |
| 2,6-Dinitrotoluene | | |
| 1,2-Diphenylhydrazine | 8.57E-02 ug/l | 4.53E-04 lbs/day |
| Ethylbenzene | 6.64E+03 ug/l | 3.51E+01 lbs/day |
| Fluoranthene | 6.43E+02 ug/l | 3.40E+00 lbs/day |
| 4-Chlorophenyl phenyl ether | | |
| 4-Bromophenyl phenyl ether | | |
| Bis(2-chloroisopropyl) ether | 3.00E+03 ug/l | 1.59E+01 lbs/day |
| Bis(2-chloroethoxy) methane | | |
| Methylene chloride (HM) | 1.01E+01 ug/l | 5.32E-02 lbs/day |
| Methyl chloride (HM) | | |
| Methyl bromide (HM) | | |
| Bromoform (HM) | 9.22E+00 ug/l | 4.87E-02 lbs/day |
| Dichlorobromomethane(HM) | 5.79E-01 ug/l | 3.06E-03 lbs/day |
| Chlorodibromomethane (HM) | 8.79E-01 ug/l | 4.64E-03 lbs/day |
| Hexachlorocyclopentadiene | 5.14E+02 ug/l | 2.72E+00 lbs/day |
| Isophorone | 1.80E+01 ug/l | 9.51E-02 lbs/day |
| Naphthalene | | |
| Nitrobenzene | 3.64E+01 ug/l | 1.92E-01 lbs/day |

| | | |
|------------------------------|---------------|------------------|
| 2-Nitrophenol | | |
| 4-Nitrophenol | | |
| 2,4-Dinitrophenol | 1.50E+02 ug/l | 7.93E-01 lbs/day |
| 4,6-Dinitro-o-cresol | 2.79E+01 ug/l | 1.47E-01 lbs/day |
| N-Nitrosodimethylamine | 1.48E-03 ug/l | 7.81E-06 lbs/day |
| N-Nitrosodiphenylamine | 1.07E+01 ug/l | 5.66E-02 lbs/day |
| N-Nitrosodi-n-propylamine | 1.07E-02 ug/l | 5.66E-05 lbs/day |
| Pentachlorophenol | 6.00E-01 ug/l | 3.17E-03 lbs/day |
| Phenol | 4.50E+04 ug/l | 2.38E+02 lbs/day |
| Bis(2-ethylhexyl)phthalate | 3.86E+00 ug/l | 2.04E-02 lbs/day |
| Butyl benzyl phthalate | 6.43E+03 ug/l | 3.40E+01 lbs/day |
| Di-n-butyl phthalate | 5.79E+03 ug/l | 3.06E+01 lbs/day |
| Di-n-octyl phthlate | | |
| Diethyl phthalate | 4.93E+04 ug/l | 2.60E+02 lbs/day |
| Dimethyl phthlate | 6.71E+05 ug/l | 3.54E+03 lbs/day |
| Benzo(a)anthracene (PAH) | 6.00E-03 ug/l | 3.17E-05 lbs/day |
| Benzo(a)pyrene (PAH) | 6.00E-03 ug/l | 3.17E-05 lbs/day |
| Benzo(b)fluoranthene (PAH) | 6.00E-03 ug/l | 3.17E-05 lbs/day |
| Benzo(k)fluoranthene (PAH) | 6.00E-03 ug/l | 3.17E-05 lbs/day |
| Chrysene (PAH) | 6.00E-03 ug/l | 3.17E-05 lbs/day |
| Acenaphthylene (PAH) | | |
| Anthracene (PAH) | | |
| Dibenzo(a,h)anthracene (PAH) | 6.00E-03 ug/l | 3.17E-05 lbs/day |
| Indeno(1,2,3-cd)pyrene (PAH) | 6.00E-03 ug/l | 3.17E-05 lbs/day |
| Pyrene (PAH) | 2.06E+03 ug/l | 1.09E+01 lbs/day |
| Tetrachloroethylene | 1.71E+00 ug/l | 9.06E-03 lbs/day |
| Toluene | 1.46E+04 ug/l | 7.70E+01 lbs/day |
| Trichloroethylene | 5.79E+00 ug/l | 3.06E-02 lbs/day |
| Vinyl chloride | 4.29E+00 ug/l | 2.26E-02 lbs/day |

Pesticides

| | | |
|--------------------|---------------|------------------|
| Aldrin | 2.79E-04 ug/l | 1.47E-06 lbs/day |
| Dieldrin | 3.00E-04 ug/l | 1.59E-06 lbs/day |
| Chlordane | 1.22E-03 ug/l | 6.45E-06 lbs/day |
| 4,4'-DDT | 1.26E-03 ug/l | 6.68E-06 lbs/day |
| 4,4'-DDE | 1.26E-03 ug/l | 6.68E-06 lbs/day |
| 4,4'-DDD | 1.78E-03 ug/l | 9.40E-06 lbs/day |
| alpha-Endosulfan | 1.99E+00 ug/l | 1.05E-02 lbs/day |
| beta-Endosulfan | 1.99E+00 ug/l | 1.05E-02 lbs/day |
| Endosulfan sulfate | 1.99E+00 ug/l | 1.05E-02 lbs/day |
| Endrin | 1.63E+00 ug/l | 8.61E-03 lbs/day |
| Endrin aldehyde | 1.63E+00 ug/l | 8.61E-03 lbs/day |
| Heptachlor | 4.50E-04 ug/l | 2.38E-06 lbs/day |
| Heptachlor epoxide | | |

PCB's

| | | |
|--------------------------|---------------|------------------|
| PCB 1242 (Arochlor 1242) | 9.43E-05 ug/l | 4.98E-07 lbs/day |
| PCB-1254 (Arochlor 1254) | 9.43E-05 ug/l | 4.98E-07 lbs/day |
| PCB-1221 (Arochlor 1221) | 9.43E-05 ug/l | 4.98E-07 lbs/day |
| PCB-1232 (Arochlor 1232) | 9.43E-05 ug/l | 4.98E-07 lbs/day |
| PCB-1248 (Arochlor 1248) | 9.43E-05 ug/l | 4.98E-07 lbs/day |
| PCB-1260 (Arochlor 1260) | 9.43E-05 ug/l | 4.98E-07 lbs/day |
| PCB-1016 (Arochlor 1016) | 9.43E-05 ug/l | 4.98E-07 lbs/day |

Pesticide

| | | |
|-----------|---------------|------------------|
| Toxaphene | 1.56E-03 ug/l | 8.27E-06 lbs/day |
|-----------|---------------|------------------|

Metals

| | | |
|----------|-------------|--------------|
| Antimony | 30.00 ug/l | 0.16 lbs/day |
| Arsenic | 106.25 ug/l | 0.56 lbs/day |

| | | |
|-----------------------|---------------|------------------|
| Asbestos | 1.50E+07 ug/l | 7.93E+04 lbs/day |
| Beryllium | | |
| Cadmium | | |
| Chromium (III) | | |
| Chromium (VI) | | |
| Copper | 2786.14 ug/l | 14.72 lbs/day |
| Cyanide | 1500.23 ug/l | 7.93 lbs/day |
| Lead | | |
| Mercury | 0.30 ug/l | 0.00 lbs/day |
| Nickel | 1307.34 ug/l | 6.91 lbs/day |
| Selenium | | |
| Silver | | |
| Thallium | 3.64 ug/l | 0.02 lbs/day |
| Zinc | | |
| Dioxin | | |
| Dioxin (2,3,7,8-TCDD) | 2.79E-08 ug/l | 1.47E-10 lbs/day |

Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rule

| | Class 4 Acute Agricultural ug/l | Class 3 Acute Aquatic Wildlife ug/l | Acute Toxics Drinking Water Source ug/l | Acute Toxics Wildlife ug/l | 1C Acute Health Criteria ug/l | Acute Most Stringent ug/l | Class 3 Chronic Aquatic Wildlife ug/l |
|----------------|--|---|--|-------------------------------------|--|---------------------------------|---|
| Aluminum | | 1177.3 | | | | 1177.3 | |
| Antimony | | | 30.0 | 9215.7 | | 30.0 | |
| Arsenic | 214.3 | 565.3 | 106.3 | | | 106.3 | 406.3 |
| Asbestos | | | 1.50E+07 | | | 1.50E+07 | |
| Barium | | | | | 2143.2 | 2143.2 | |
| Beryllium | | | | | | | |
| Cadmium | 21.3 | 24.7 | | | | 21.3 | 6.3 |
| Chromium (III) | | 7488.2 | | | | 7488.2 | 1216.3 |
| Chromium (VI) | 213.4 | 22.9 | | | | 22.87 | 19.03 |
| Copper | 427.7 | 88.5 | 2786.1 | | | 88.5 | 71.7 |
| Cyanide | | | 471500.0 | | | 1500.2 | |
| Iron | | 1571.5 | | | | 1571.5 | |
| Lead | 213.4 | 615.7 | | | | 213.4 | 31.8 |
| Mercury | | 3.8 | 0.3 | 0.3 | | 0.3 | 0.0 |
| Nickel | | 6322.6 | 1307.3 | 9858.6 | | 1307.3 | 957.7 |
| Selenium | 105.3 | 30.5 | | | | 30.5 | 8.9 |
| Silver | | 53.1 | | | | 53.1 | |
| Thallium | | | 3.6 | 13.5 | | 3.6 | |
| Zinc | | 522.5 | | | | 522.5 | 645.4 |
| Boron | 1607.4 | | | | | 1607.4 | |

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]

[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

| | WLA Acute ug/l | WLA Chronic ug/l | |
|----------------|-------------------|---------------------|----------------|
| Aluminum | 1177.3 | | |
| Antimony | 30.00 | | |
| Arsenic | 106.3 | 406.3 | Acute Controls |
| Asbestos | 1.50E+07 | | |
| Barium | | | |
| Beryllium | | | |
| Cadmium | 21.3 | 6.3 | |
| Chromium (III) | 7488.2 | 1216 | |
| Chromium (VI) | 22.9 | 19.0 | |
| Copper | 88.5 | 71.7 | |
| Cyanide | 1500.2 | | |
| Iron | 1571.5 | | |
| Lead | 213.4 | 31.8 | |
| Mercury | 0.300 | 0.026 | |
| Nickel | 1307.3 | 958 | |
| Selenium | 30.5 | 8.9 | |
| Silver | 53.1 | | |
| Thallium | 3.6 | | |
| Zinc | 522.5 | 645.4 | Acute Controls |
| Boron | 1607.39 | | |

Other Effluent Limitations are based upon R317-1.

The permit writers may utilize other information to tighten or make more stringent these limits based upon best available technology and other considerations.

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

Category III waters fall under special rules for the determination of effluent limits. These rules allow more stringent effluent limitations based upon additional factors, including: "Blue-ribbon" fisheries, special recreational areas, and drinking water sources.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless shown that this is not attainable. Refer to the Forum's Guidelines for additional information.

The permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important downstream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information.

Prepared by:
William O. Moellmer, Ph.D.
Utah Division of Water Quality
801-538-6329

genwal2000

Facilities: Genwal Resources, Inc.
 Discharging to: Crandall Creek -> Huntington Creek

UPDES No: UT- 0024368-002

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated in terms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

II. Receiving Water and Stream Classification

Crandall Creek -> Huntington Creek
 Antidegradation Segment Classification

1C, 2A, 2B, 4
 1

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)

Function of Temperature and pH

| | |
|---|--|
| Summer June, July, August | 0.83 mg/l as N (4 Day Average) 3.64 mg/l as N (1 Hour Average) 20.00 @ Temperature, Deg. C. 8.20 @ pH |
| Fall/Spring September, October, November March, April May | 1.05 mg/l as N (4 Day Average) 4.62 mg/l as N (1 Hour Average) 12.00 @ Temperature, Deg. C. 8.10 @ pH |
| Winter December, January, February | 1.35 mg/l as N (4 Day Average) 5.91 mg/l as N (1 Hour Average) 4.00 @ Temperature, Deg. C. 8.00 @ pH |

Chronic Total Residual Chlorine (TRC)

0.019 mg/l (4 Day Average)
 0.011 mg/l (1 Hour Average)

Chronic Dissolved Oxygen (DO)

6.50 mg/l (30 Day Average)
5.00 mg/l (7Day Average)
4.00 mg/l (1 Day Average)

Maximum Total Dissolved Solids
Maximum Boron

1200 mg/l
750 mg/l

Acute and Chronic Heavy Metals (Dissolved)

| Parameter | 4 Day Average (Chronic) Standard | | 1 Hour Average (Acute) Standard | | |
|--------------|----------------------------------|---------------|---------------------------------|------|----------------|
| | Concentration | Load* | Concentration | | Load* |
| Aluminum | 87.00 ug/l** | 0.942 lbs/day | 750.00 | ug/l | 8.117 lbs/day |
| Arsenic | 190.00 ug/l | 2.056 lbs/day | 360.00 | ug/l | 3.896 lbs/day |
| Cadmium | 2.86 ug/l | 0.031 lbs/day | 14.78 | ug/l | 0.160 lbs/day |
| Chromium III | 542.25 ug/l | 5.869 lbs/day | 4549.28 | ug/l | 49.238 lbs/day |
| Chromium VI | 11.00 ug/l | 0.119 lbs/day | 16.00 | ug/l | 0.173 lbs/day |
| Copper | 32.30 ug/l | 0.350 lbs/day | 53.68 | ug/l | 0.581 lbs/day |
| Iron | | | 1000.00 | ug/l | 10.823 lbs/day |
| Lead | 14.22 ug/l | 0.154 lbs/day | 364.80 | ug/l | 3.948 lbs/day |
| Mercury | 0.0120 ug/l | 0.000 lbs/day | 2.40 | ug/l | 0.026 lbs/day |
| Nickel | 426.37 ug/l | 4.615 lbs/day | 3835.34 | ug/l | 41.510 lbs/day |
| Selenium | 5.00 ug/l | 0.054 lbs/day | 20.00 | ug/l | 0.216 lbs/day |
| Silver | ug/l | lbs/day | 30.68 | ug/l | 0.332 lbs/day |
| Zinc | 287.07 ug/l | 3.107 lbs/day | 316.95 | ug/l | 3.430 lbs/day |

* Allowed below discharge

**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO3

Metals Standards Based upon a Hardness of 324.12 mg/l as CaCO3

Organics [Pesticides]

| Parameter | 4 Day Average (Chronic) Standard | | 1 Hour Average (Acute) Standard | | |
|-------------------|----------------------------------|-----------------|---------------------------------|------|---------------|
| | Concentration | Load* | Concentration | | Load* |
| Aldrin | | | 1.500 | ug/l | 0.016 lbs/day |
| Chlordane | 0.0043 ug/l | 0.071 lbs/day | 1.200 | ug/l | 0.013 lbs/day |
| DDT, DDE | 0.001 ug/l | 0.017 lbs/day | 0.550 | ug/l | 0.006 lbs/day |
| Dieldrin | 0.0019 ug/l | 0.031 lbs/day | 1.250 | ug/l | 0.014 lbs/day |
| Endosulfan | 0.056 ug/l | 0.925 lbs/day | 0.110 | ug/l | 0.001 lbs/day |
| Endrin | 0.0023 ug/l | 0.038 lbs/day | 0.090 | ug/l | 0.001 lbs/day |
| Guthion | | | 0.010 | ug/l | 0.000 lbs/day |
| Heptachlor | 0.0038 ug/l | 0.063 lbs/day | 0.260 | ug/l | 0.003 lbs/day |
| Lindane | 0.08 ug/l | 1.321 lbs/day | 1.000 | ug/l | 0.011 lbs/day |
| Methoxychlor | | | 0.030 | ug/l | 0.000 lbs/day |
| Mirex | | | 0.010 | ug/l | 0.000 lbs/day |
| Parathion | | | 0.040 | ug/l | 0.000 lbs/day |
| PCB's | 0.014 ug/l | 0.231 lbs/day | 2.000 | ug/l | 0.022 lbs/day |
| Pentachlorophenol | 13.00 ug/l | 214.689 lbs/day | 20.000 | ug/l | 0.216 lbs/day |
| Toxephene | 0.0002 ug/l | 0.003 lbs/day | 0.730 | ug/l | 0.008 lbs/day |

IV. Numeric Stream Standards for Protection of Agriculture

| | 4 Day Average (Chronic) Standard Concentration | Load* | 1 Hour Average (Acute) Standard Concentration | Load* |
|----------|---|-------|--|---------------|
| TDS | | | 1200.0 mg/l | 6.49 tons/day |
| Arsenic | | | 100.0 ug/l | lbs/day |
| Boron | | | 750.0 ug/l | 4.06 lbs/day |
| Cadmium | | | 10.0 ug/l | 0.05 lbs/day |
| Chromium | | | 100.0 ug/l | lbs/day |
| Copper | | | 200.0 ug/l | lbs/day |
| Lead | | | 100.0 ug/l | lbs/day |
| Selenium | | | 50.0 ug/l | lbs/day |

V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)

| | 4 Day Average (Chronic) Standard Concentration | Load* | 1 Hour Average (Acute) Standard Concentration | Load* |
|---------------|---|-------|--|----------------|
| Metals | | | | |
| Arsenic | | | 50 ug/l | 0.826 lbs/day |
| Barium | | | 1000 ug/l | 16.515 lbs/day |
| Cadmium | | | 10 ug/l | 0.165 lbs/day |
| Chromium | | | 50 ug/l | 0.826 lbs/day |
| Lead | | | 50 ug/l | 0.826 lbs/day |
| Mercury | | | 2 ug/l | 0.033 lbs/day |
| Selenium | | | 10 ug/l | 0.165 lbs/day |
| Silver | | | 50 ug/l | 0.826 lbs/day |
| Fluoride (3) | | | 1.4 ug/l | 0.023 lbs/day |
| to | | | 2.4 ug/l | 0.040 lbs/day |
| Nitrates as N | | | 10 ug/l | 0.165 lbs/day |

Chlorophenoxy Herbicides

| | | | | |
|------------------------|--|--|----------|---------------|
| 2,4-D | | | 100 ug/l | 1.651 lbs/day |
| 2,4,5-TP | | | 10 ug/l | 0.165 lbs/day |
| Endrin | | | 0.2 ug/l | 0.003 lbs/day |
| rocylohexane (Lindane) | | | 4 ug/l | 0.066 lbs/day |
| Methoxychlor | | | 100 ug/l | 1.651 lbs/day |
| Toxaphene | | | 5 ug/l | 0.083 lbs/day |

VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

| | Maximum Conc., ug/l - Acute Standards | | | |
|---------------------------|---|---------------|--|----------------|
| | Class 1C [2 Liters/Day for 70 Kg Person over 70 Yr.] | | Class 3A, 3B [6.5 g for 70 Kg Person over 70 Yr.] | |
| Toxic Organics | | | | |
| Acenaphthene | 1200.00 ug/l | 19.82 lbs/day | 2700 ug/l | 44.59 lbs/day |
| Acrolein | 320.00 ug/l | 5.28 lbs/day | 780 ug/l | 12.88 lbs/day |
| Acrylonitrile | 0.06 ug/l | 0.00 lbs/day | 0.66 ug/l | 0.01 lbs/day |
| Benzene | 1.20 ug/l | 0.02 lbs/day | 71 ug/l | 1.17 lbs/day |
| Benzidine | 0.00012 ug/l | 0.00 lbs/day | 0.00054 ug/l | 0.00 lbs/day |
| Carbon tetrachloride | 0.25 ug/l | 0.00 lbs/day | 4.4 ug/l | 0.07 lbs/day |
| Chlorobenzene | 680.00 ug/l | 11.23 lbs/day | 21000 ug/l | 346.81 lbs/day |
| 1,2,4-Trichlorobenzene | | | | |
| Hexachlorobenzene | 0.00075 ug/l | 0.00 lbs/day | 0.00077 ug/l | 0.00 lbs/day |
| 1,2-Dichloroethane | 0.38 ug/l | 0.01 lbs/day | 99 ug/l | 1.63 lbs/day |
| 1,1,1-Trichloroethane | | | | |
| Hexachloroethane | 1.90 ug/l | 0.03 lbs/day | 8.9 ug/l | 0.15 lbs/day |
| 1,1-Dichloroethane | | | | |
| 1,1,2-Trichloroethane | 0.61 ug/l | 0.01 lbs/day | 42 ug/l | 0.69 lbs/day |
| 1,1,2,2-Tetrachloroetha | 0.17 ug/l | 0.00 lbs/day | 11 ug/l | 0.18 lbs/day |
| Chloroethane | | | ug/l | lbs/day |
| Bis(2-chloroethyl) ether | 0.03 ug/l | 0.00 lbs/day | 1.4 ug/l | 0.02 lbs/day |
| 2-Chloroethyl vinyl ether | ug/l | lbs/day | ug/l | lbs/day |
| 2-Chloronaphthalene | 1700.00 ug/l | 28.07 lbs/day | 4300 ug/l | 71.01 lbs/day |
| 2,4,6-Trichlorophenol | 2.10 ug/l | 0.03 lbs/day | 6.5 ug/l | 0.11 lbs/day |

| | ug/l | lbs/day | ug/l | lbs/day |
|-----------------------------|---------------|------------------|--------------|------------------|
| p-Chloro-m-cresol | | | | |
| Chloroform (HM) | 5.70 ug/l | 0.09 lbs/day | 470 ug/l | 7.76 lbs/day |
| 2-Chlorophenol | 120.00 ug/l | 1.98 lbs/day | 400 ug/l | 6.61 lbs/day |
| 1,2-Dichlorobenzene | 2700.00 ug/l | 44.59 lbs/day | 17000 ug/l | 280.75 lbs/day |
| 1,3-Dichlorobenzene | 400.00 ug/l | 6.61 lbs/day | 2600 ug/l | 42.94 lbs/day |
| 1,4-Dichlorobenzene | 400.00 ug/l | 6.61 lbs/day | 2600 ug/l | 42.94 lbs/day |
| 3,3'-Dichlorobenzidine | 0.04 ug/l | 0.00 lbs/day | 0.077 ug/l | 0.00 lbs/day |
| 1,1-Dichloroethylene | 0.06 ug/l | 0.00 lbs/day | 3.2 ug/l | 0.05 lbs/day |
| 1,2-trans-Dichloroethylene | 700.00 ug/l | 11.56 lbs/day | ug/l | lbs/day |
| 2,4-Dichlorophenol | 93.00 ug/l | 1.54 lbs/day | 790 ug/l | 13.05 lbs/day |
| 1,2-Dichloropropane | 0.52 ug/l | 0.01 lbs/day | 39 ug/l | 0.64 lbs/day |
| 1,3-Dichloropropylene | 10.00 ug/l | 0.17 lbs/day | 1700 ug/l | 28.07 lbs/day |
| 2,4-Dimethylphenol | 540.00 ug/l | 8.92 lbs/day | 2300 ug/l | 37.98 lbs/day |
| 2,4-Dinitrotoluene | 0.11 ug/l | 0.00 lbs/day | 9.1 ug/l | 0.15 lbs/day |
| 2,6-Dinitrotoluene | ug/l | lbs/day | ug/l | lbs/day |
| 1,2-Diphenylhydrazine | 0.04 ug/l | 0.00 lbs/day | 0.54 ug/l | 0.01 lbs/day |
| Ethylbenzene | 3100.00 ug/l | 51.20 lbs/day | 29000 ug/l | 478.92 lbs/day |
| Fluoranthene | 300.00 ug/l | 4.95 lbs/day | 370 ug/l | 6.11 lbs/day |
| 4-Chlorophenyl phenyl ether | | | | |
| 4-Bromophenyl phenyl ether | | | | |
| Bis(2-chloroisopropyl) et | 1400.00 ug/l | 23.12 lbs/day | 170000 ug/l | 2807.48 lbs/day |
| Bis(2-chloroethoxy) met | ug/l | lbs/day | ug/l | lbs/day |
| Methylene chloride (HM) | 4.70 ug/l | 0.08 lbs/day | 1600 ug/l | 26.42 lbs/day |
| Methyl chloride (HM) | ug/l | lbs/day | ug/l | lbs/day |
| Methyl bromide (HM) | ug/l | lbs/day | ug/l | lbs/day |
| Bromoform (HM) | 4.30 ug/l | 0.07 lbs/day | 360 ug/l | 5.95 lbs/day |
| Dichlorobromomethane(| 0.27 ug/l | 0.00 lbs/day | 22 ug/l | 0.36 lbs/day |
| Chlorodibromomethane | 0.41 ug/l | 0.01 lbs/day | 34 ug/l | 0.56 lbs/day |
| Hexachlorobutadiene(c) | 0.44 ug/l | 0.01 lbs/day | 50 ug/l | 0.83 lbs/day |
| Hexachlorocyclopentadi | 240.00 ug/l | 3.96 lbs/day | 17000 ug/l | 280.75 lbs/day |
| Isophorone | 8.40 ug/l | 0.14 lbs/day | 600 ug/l | 9.91 lbs/day |
| Naphthalene | | | | |
| Nitrobenzene | 17.00 ug/l | 0.28 lbs/day | 1900 ug/l | 31.38 lbs/day |
| 2-Nitrophenol | ug/l | lbs/day | ug/l | lbs/day |
| 4-Nitrophenol | ug/l | lbs/day | ug/l | lbs/day |
| 2,4-Dinitrophenol | 70.00 ug/l | 1.16 lbs/day | 14000 ug/l | 231.20 lbs/day |
| 4,6-Dinitro-o-cresol | 13.00 ug/l | 0.21 lbs/day | 765 ug/l | 12.63 lbs/day |
| N-Nitrosodimethylamine | 0.00069 ug/l | 0.00 lbs/day | 8.1 ug/l | 0.13 lbs/day |
| N-Nitrosodiphenylamine | 5.00 ug/l | 0.08 lbs/day | 16 ug/l | 0.26 lbs/day |
| N-Nitrosodi-n-propylami | 0.01 ug/l | 0.00 lbs/day | 1.4 ug/l | 0.02 lbs/day |
| Pentachlorophenol | 0.28 ug/l | 0.00 lbs/day | 8.2 ug/l | 0.14 lbs/day |
| Phenol | 2.10E+04 ug/l | 3.47E+02 lbs/day | 4.6E+06 ug/l | 7.60E+04 lbs/day |
| Bis(2-ethylhexyl)phthalat | 1.80 ug/l | 0.03 lbs/day | 5.9 ug/l | 0.10 lbs/day |
| Butyl benzyl phthalate | 3000.00 ug/l | 49.54 lbs/day | 5200 ug/l | 85.88 lbs/day |
| Di-n-butyl phthalate | 2700.00 ug/l | 44.59 lbs/day | 12000 ug/l | 198.17 lbs/day |
| Di-n-octyl phthlate | | | | |
| Diethyl phthalate | 23000.00 ug/l | 379.83 lbs/day | 120000 ug/l | 1981.75 lbs/day |
| Dimethyl phthlate | 3.13E+05 ug/l | 5.17E+03 lbs/day | 2.9E+06 ug/l | 4.79E+04 lbs/day |
| Benzo(a)anthracene (P | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Benzo(a)pyrene (PAH) | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Benzo(b)fluoranthene (P | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Benzo(k)fluoranthene (P | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Chrysene (PAH) | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Acenaphthylene (PAH) | | | | |
| Anthracene (PAH) | 9600.00 ug/l | 158.54 lbs/day | ug/l | lbs/day |
| Dibenzo(a,h)anthracene | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Indeno(1,2,3-cd)pyrene | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Pyrene (PAH) | 960.00 ug/l | 15.85 lbs/day | 11000 ug/l | 181.66 lbs/day |
| Tetrachloroethylene | 0.80 ug/l | 0.01 lbs/day | 8.9 ug/l | 0.15 lbs/day |
| Toluene | 6800.00 ug/l | 112.30 lbs/day | 200000 ug/l | 3302.91 lbs/day |
| Trichloroethylene | 2.70 ug/l | 0.04 lbs/day | 81 ug/l | 1.34 lbs/day |
| Vinyl chloride | 2.00 ug/l | 0.03 lbs/day | 525 ug/l | 8.67 lbs/day |

| | | | | lbs/day |
|--------------------|-------------|--------------|--------------|--------------|
| | | | | lbs/day |
| Pesticides | | | | |
| Aldrin | 0.0001 ug/l | 0.00 lbs/day | 0.00014 ug/l | 0.00 lbs/day |
| Dieldrin | 0.0001 ug/l | 0.00 lbs/day | 0.00014 ug/l | 0.00 lbs/day |
| Chlordane | 0.0006 ug/l | 0.00 lbs/day | 0.00059 ug/l | 0.00 lbs/day |
| 4,4'-DDT | 0.0006 ug/l | 0.00 lbs/day | 0.00059 ug/l | 0.00 lbs/day |
| 4,4'-DDE | 0.0006 ug/l | 0.00 lbs/day | 0.00059 ug/l | 0.00 lbs/day |
| 4,4'-DDD | 0.0008 ug/l | 0.00 lbs/day | 0.00084 ug/l | 0.00 lbs/day |
| alpha-Endosulfan | 0.9300 ug/l | 0.02 lbs/day | 2 ug/l | 0.03 lbs/day |
| beta-Endosulfan | 0.9300 ug/l | 0.02 lbs/day | 2 ug/l | 0.03 lbs/day |
| Endosulfan sulfate | 0.9300 ug/l | 0.02 lbs/day | 2 ug/l | 0.03 lbs/day |
| Endrin | 0.7600 ug/l | 0.01 lbs/day | 0.81 ug/l | 0.01 lbs/day |
| Endrin aldehyde | 0.7600 ug/l | 0.01 lbs/day | 0.81 ug/l | 0.01 lbs/day |
| Heptachlor | 0.0002 ug/l | 0.00 lbs/day | 0.00021 ug/l | 0.00 lbs/day |
| Heptachlor epoxide | | | | |

| | | | | |
|------------------------|---------------|--------------|---------------|--------------|
| PCB's | | | | |
| PCB 1242 (Arochlor 12) | 0.000044 ug/l | 0.00 lbs/day | 0.000045 ug/l | 0.00 lbs/day |
| PCB-1254 (Arochlor 12) | 0.000044 ug/l | 0.00 lbs/day | 0.000045 ug/l | 0.00 lbs/day |
| PCB-1221 (Arochlor 12) | 0.000044 ug/l | 0.00 lbs/day | 0.000045 ug/l | 0.00 lbs/day |
| PCB-1232 (Arochlor 12) | 0.000044 ug/l | 0.00 lbs/day | 0.000045 ug/l | 0.00 lbs/day |
| PCB-1248 (Arochlor 12) | 0.000044 ug/l | 0.00 lbs/day | 0.000045 ug/l | 0.00 lbs/day |
| PCB-1260 (Arochlor 12) | 0.000044 ug/l | 0.00 lbs/day | 0.000045 ug/l | 0.00 lbs/day |
| PCB-1016 (Arochlor 10) | 0.000044 ug/l | 0.00 lbs/day | 0.000045 ug/l | 0.00 lbs/day |

| | | | | |
|------------------|---------------|------|------|---------|
| Pesticide | | | | |
| Toxaphene | 0.000750 ug/l | 0.00 | ug/l | lbs/day |

| | | | | |
|-----------------------|---------------|--------------|----------|------|
| Dioxin | | | | |
| Dioxin (2,3,7,8-TCDD) | 1.30E-08 ug/l | 0.00 lbs/day | 1.40E-08 | 0.00 |

| | | | | |
|----------------|---------------|------------------|--------------|-----------------|
| Metals | | | | |
| Antimony | 14.0 ug/l | 0.23 lbs/day | | |
| Arsenic | 50.0 ug/l | 0.83 lbs/day | 4300.00 ug/l | 71.01 lbs/day |
| Asbestos | 7.00E+06 ug/l | 1.16E+05 lbs/day | | |
| Beryllium | | | | |
| Cadmium | | | | |
| Chromium (III) | | | | |
| Chromium (VI) | | | | |
| Copper | | | | |
| Cyanide | 1.30E+03 ug/l | 21.47 lbs/day | 2.2E+05 ug/l | 3633.20 lbs/day |
| Lead | 700.0 ug/l | 11.56 lbs/day | | |
| Mercury | | | 0.15 ug/l | 0.00 lbs/day |
| Nickel | | | 4600.00 ug/l | 75.97 lbs/day |
| Selenium | 0.1 ug/l | 0.00 lbs/day | | |
| Silver | 610.0 ug/l | 10.07 lbs/day | | |
| Thallium | | | 6.30 ug/l | 0.10 lbs/day |
| Zinc | | | | |

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following

models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

| | |
|-----------------------|-------------------------------------|
| Flow, Q, (cfs or MGD) | D.O. mg/l |
| Temperature, Deg. C. | Total Residual Chlorine (TRC), mg/l |
| pH | Total NH3-N, mg/l |
| BOD5, mg/l | Total Dissolved Solids (TDS), mg/l |
| Metals, ug/l | Toxic Organics of Concern, ug/l |

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Upstream Information

| | Stream Flow | Temp. | pH | T-NH3 | BOD | DO | TRC | TDS |
|------------------|--------------|-------------|-------------|---------------|--------------|----------------|------------|------------|
| | cfs | Deg. C | | mg/l as N | mg/l | mg/l | mg/l | mg/l |
| Summer | 1.1 | 20.0 | 8.2 | 0.10 | 0.50 | 6.04 | | 287.0 |
| Fall/Spring | 1.1 | 12.0 | 8.1 | 0.10 | 0.50 | -- | | 287.0 |
| Winter | 1.1 | 4.0 | 8.0 | 0.10 | 0.50 | -- | | 287.0 |
| Dissolved Metals | Al ug/l | As ug/l | Cd ug/l | CrIII ug/l | CrVI ug/l | Copper ug/l | Fe ug/l | Pb ug/l |
| All Seasons | 1.59* | 0.53* | 0.053* | 0.53* | 2.65* | 0.53* | 0.1 | 0.53* |
| All Seasons | Hg 0.0001 | Ni 0.53* | Se 1.06* | Ag 0.1* | Zn 0.053* | Boron 10.0 | | * 1/4 MDL |

Discharge Information

(Non-contact Cooling Water NOT included in these calculations.)

| Season | Flow, MGD | Temp. |
|-------------|-----------|-------|
| Summer | 1.29800 | 11.5 |
| Fall/Spring | 1.29800 | 11.5 |
| Winter | 1.29800 | 11.5 |

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

All Seasons

| | | |
|----------------|----------|---------------|
| Not to Exceed: | 1.30 MGD | Daily Average |
| | 2.01 cfs | Daily Average |

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 1.298 MGD. If the discharger is allowed to have a flow greater than 1.298 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occurring, the permit writers must include the discharge flow limitation as indicated above; or, include loading effluent limits in the permit.

Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not occur downstream segments if the values below are met.

| | | | |
|------------------|--------|----------------|-----------|
| WET Requirements | LC50 > | EOP Effluent | [Acute] |
| | IC25 > | 65.5% Effluent | [Chronic] |

Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

| | | |
|----------------|--------------------------------|---------------|
| All Seasons | [Based upon Summer Conditions] | |
| | Concentration | |
| 30 Day Average | 25.0 mg/l as BOD5 | 270.6 lbs/day |
| 30 Day Average | 20.0 mg/l as COD | 216.5 lbs/day |

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

| | |
|----------------|--------------------------------|
| All Seasons | [Based upon Summer Conditions] |
| | Concentration |
| 30 Day Average | 3.0 mg/l |

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

| Season | 4 Day Average [Chronic] Concentration | Load |
|-------------|--|--------------|
| Summer | 1.22 mg/l as N | 13.2 lbs/day |
| Fall/Spring | 1.55 mg/l as N | 16.8 lbs/day |
| Winter | 2.00 mg/l as N | 21.7 lbs/day |

| Season | 1 Hour Average [Acute] Concentration | Load |
|-------------|---|--------------|
| Summer | 4.6 mg/l as N | 49.5 lbs/day |
| Fall/Spring | 5.8 mg/l as N | 62.9 lbs/day |
| Winter | 7.4 mg/l as N | 80.5 lbs/day |

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50.0%.

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

| Season | 4 Day Average [Chronic] [Totally Mixed] Concentration | Load |
|-------------|--|-------------|
| Summer | N/A mg/l | N/A lbs/day |
| Fall/Spring | N/A mg/l | N/A lbs/day |
| Winter | N/A mg/l | N/A lbs/day |

| | 1 Hour Average [Acute] [Totally Mixed] Concentration | Load |
|-------------|---|-------------|
| Summer | 0.014 mg/l | 0.2 lbs/day |
| Fall/Spring | 0.014 mg/l | 0.2 lbs/day |
| Winter | 0.014 mg/l | 0.2 lbs/day |

| | 4 Day Average (Chronic) [Plume Model] Concentration | Load |
|-------------|--|---------|
| All Seasons | N/A mg/l | lbs/day |

| | 1 Hour Average [Acute] (Plume Model) Concentration | Load |
|-------------|---|---------|
| All Seasons | N/A mg/l | lbs/day |

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) equal to 50.0%.

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 324.12 mg/l):

| | 4 Day Average Concentration | Load | 1 Hour Average Concentration | Load |
|----------|--------------------------------|-------------|---------------------------------|-------------|
| Aluminum | N/A ug/l | N/A lbs/day | 946.6 ug/l | 6.6 lbs/day |
| Arsenic | 289.49 ug/l | 2.0 lbs/day | 454.4 ug/l | 3.2 lbs/day |
| Cadmium | 4.32 ug/l | 0.0 lbs/day | 18.6 ug/l | 0.1 lbs/day |

| | | | | | |
|--------------|-------------|-------------|---------|------|----------------|
| Chromium III | 826.98 ug/l | 5.8 lbs/day | 5,745.2 | ug/l | 40.2 lbs/day |
| Chromium VI | 14.69 ug/l | 0.1 lbs/day | 19.2 | | |
| Copper | 48.86 ug/l | 0.3 lbs/day | 67.6 | ug/l | 0.5 lbs/day |
| Iron | | | 1,262.9 | ug/l | 8.8 lbs/day |
| Lead | 21.27 ug/l | 0.1 lbs/day | 460.5 | ug/l | 3.2 lbs/day |
| Mercury | 0.02 ug/l | 0.0 lbs/day | 3.0 | ug/l | 0.0 lbs/day |
| Nickel | 650.17 ug/l | 4.5 lbs/day | 4,843.5 | ug/l | 33.9 lbs/day |
| Selenium | 6.79 ug/l | 0.0 lbs/day | 24.8 | ug/l | 0.2 lbs/day |
| Silver | N/A ug/l | N/A lbs/day | 38.7 | ug/l | 0.3 lbs/day |
| Zinc | 437.99 ug/l | 3.1 lbs/day | 400.3 | ug/l | 2.8 lbs/day |
| Cyanide | 7.93 mg/l | 0.1 lbs/day | 5.1 | ug/l | 0.0 lbs/day |
| TDS, mg/l | | | 1,680.1 | mg/l | 5.9 tons/day |
| | | | 285.9 | mg/l | @ 1.0 tons/day |

**Effluent Limitations for Organics [Pesticides]
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Organics [Pesticides] will be met with an effluent limit as follows:

| | 4 Day Average | | 1 Hour Average | |
|-------------------|---------------|------------------|----------------|-----------------------|
| | Concentration | Load | Concentration | Load |
| Aldrin | | | 1.5E+00 | ug/l 1.62E-02 lbs/day |
| Chlordane | 4.30E-03 ug/l | 4.65E-02 lbs/day | 1.2E+00 | ug/l 1.30E-02 lbs/day |
| DDT, DDE | 1.00E-03 ug/l | 1.08E-02 lbs/day | 5.5E-01 | ug/l 5.95E-03 lbs/day |
| Dieldrin | 1.90E-03 ug/l | 2.06E-02 lbs/day | 1.3E+00 | ug/l 1.35E-02 lbs/day |
| Endosulfan | 5.60E-02 ug/l | 6.06E-01 lbs/day | 1.1E-01 | ug/l 1.19E-03 lbs/day |
| Endrin | 2.30E-03 ug/l | 2.49E-02 lbs/day | 9.0E-02 | ug/l 9.74E-04 lbs/day |
| Guthion | | | 1.0E-02 | ug/l 1.08E-04 lbs/day |
| Heptachlor | 3.80E-03 ug/l | 4.11E-02 lbs/day | 2.6E-01 | ug/l 2.81E-03 lbs/day |
| Lindane | 8.00E-02 ug/l | 8.66E-01 lbs/day | 1.0E+00 | ug/l 1.08E-02 lbs/day |
| Methoxychlor | | | 3.0E-02 | ug/l 3.25E-04 lbs/day |
| Mirex | | | 1.0E-02 | ug/l 1.08E-04 lbs/day |
| Parathion | | | 4.0E-02 | ug/l 4.33E-04 lbs/day |
| PCB's | 1.40E-02 ug/l | 1.52E-01 lbs/day | 2.0E+00 | ug/l 2.16E-02 lbs/day |
| Pentachlorophenol | 1.30E+01 ug/l | 1.41E+02 lbs/day | 2.0E+01 | ug/l 2.16E-01 lbs/day |
| Toxephene | 2.00E-04 ug/l | 2.16E-03 lbs/day | 7.3E-01 | ug/l 7.90E-03 lbs/day |

**Effluent Targets for Pollution Indicators
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

| | 1 Hour Average | |
|------------------------|----------------|--------------|
| | Concentration | Loading |
| Gross Beta (pCi/l) | 50.0 pCi/L | |
| BOD (mg/l) | 5.0 mg/l | 35.0 lbs/day |
| Nitrates as N | 4.0 mg/l | 28.0 lbs/day |
| Total Phosphorus as P | 0.05 mg/l | 0.35 lbs/day |
| Total Suspended Solids | 90.0 mg/l | 0.3 tons/day |

Note: Pollution indicator targets are for information purposes only.

**Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)**

In-stream criteria of downstream segments for Protection of Human Health [Toxics] will be met with an effluent limit as follows:

| | Maximum Concentration | |
|------------------------------|-----------------------|------------------|
| | Concentration | Load |
| Toxic Organics | | |
| Acenaphthene | 1.83E+03 ug/l | 1.98E+01 lbs/day |
| Acrolein | 4.88E+02 ug/l | 5.28E+00 lbs/day |
| Acrylonitrile | 9.00E-02 ug/l | 9.74E-04 lbs/day |
| Benzene | 1.83E+00 ug/l | 1.98E-02 lbs/day |
| Benzidine | ug/l | lbs/day |
| Carbon tetrachloride | 3.81E-01 ug/l | 4.13E-03 lbs/day |
| Chlorobenzene | 1.04E+03 ug/l | 1.12E+01 lbs/day |
| 1,2,4-Trichlorobenzene | | |
| Hexachlorobenzene | 1.14E-03 ug/l | 1.24E-05 lbs/day |
| 1,2-Dichloroethane | 5.80E-01 ug/l | 6.28E-03 lbs/day |
| 1,1,1-Trichloroethane | | |
| Hexachloroethane | 2.90E+00 ug/l | 3.14E-02 lbs/day |
| 1,1-Dichloroethane | | |
| 1,1,2-Trichloroethane | 9.31E-01 ug/l | 1.01E-02 lbs/day |
| 1,1,2,2-Tetrachloroethane | 2.59E-01 ug/l | 2.81E-03 lbs/day |
| Chloroethane | | |
| Bis(2-chloroethyl) ether | 4.73E-02 ug/l | 5.12E-04 lbs/day |
| 2-Chloroethyl vinyl ether | | |
| 2-Chloronaphthalene | 2.59E+03 ug/l | 2.81E+01 lbs/day |
| 2,4,6-Trichlorophenol | 3.20E+00 ug/l | 3.47E-02 lbs/day |
| p-Chloro-m-cresol | | |
| Chloroform (HM) | 8.70E+00 ug/l | 9.41E-02 lbs/day |
| 2-Chlorophenol | 1.83E+02 ug/l | 1.98E+00 lbs/day |
| 1,2-Dichlorobenzene | 4.12E+03 ug/l | 4.46E+01 lbs/day |
| 1,3-Dichlorobenzene | 6.10E+02 ug/l | 6.61E+00 lbs/day |
| 1,4-Dichlorobenzene | 6.10E+02 ug/l | 6.61E+00 lbs/day |
| 3,3'-Dichlorobenzidine | 6.10E-02 ug/l | 6.61E-04 lbs/day |
| 1,1-Dichloroethylene | 8.70E-02 ug/l | 9.41E-04 lbs/day |
| 1,2-trans-Dichloroethylene1 | | |
| 2,4-Dichlorophenol | 1.42E+02 ug/l | 1.54E+00 lbs/day |
| 1,2-Dichloropropane | 7.93E-01 ug/l | 8.59E-03 lbs/day |
| 1,3-Dichloropropylene | 1.53E+01 ug/l | 1.65E-01 lbs/day |
| 2,4-Dimethylphenol | 8.24E+02 ug/l | 8.92E+00 lbs/day |
| 2,4-Dinitrotoluene | 1.68E-01 ug/l | 1.82E-03 lbs/day |
| 2,6-Dinitrotoluene | | |
| 1,2-Diphenylhydrazine | 6.10E-02 ug/l | 6.61E-04 lbs/day |
| Ethylbenzene | 4.73E+03 ug/l | 5.12E+01 lbs/day |
| Fluoranthene | 4.58E+02 ug/l | 4.95E+00 lbs/day |
| 4-Chlorophenyl phenyl ether | | |
| 4-Bromophenyl phenyl ether | | |
| Bis(2-chloroisopropyl) ether | 2.14E+03 ug/l | 2.31E+01 lbs/day |
| Bis(2-chloroethoxy) methane | | |
| Methylene chloride (HM) | 7.17E+00 ug/l | 7.76E-02 lbs/day |
| Methyl chloride (HM) | | |
| Methyl bromide (HM) | | |
| Bromoform (HM) | 6.56E+00 ug/l | 7.10E-02 lbs/day |
| Dichlorobromomethane(HM) | 4.12E-01 ug/l | 4.46E-03 lbs/day |
| Chlorodibromomethane (HM) | 6.26E-01 ug/l | 6.77E-03 lbs/day |
| Hexachlorocyclopentadiene | 3.66E+02 ug/l | 3.96E+00 lbs/day |
| Isophorone | 1.28E+01 ug/l | 1.39E-01 lbs/day |
| Naphthalene | | |
| Nitrobenzene | 2.59E+01 ug/l | 2.81E-01 lbs/day |
| 2-Nitrophenol | | |
| 4-Nitrophenol | | |

| | | |
|------------------------------|---------------|------------------|
| 2,4-Dinitrophenol | 1.07E+02 ug/l | 1.16E+00 lbs/day |
| 4,6-Dinitro-o-cresol | 1.98E+01 ug/l | 2.15E-01 lbs/day |
| N-Nitrosodimethylamine | 1.05E-03 ug/l | 1.14E-05 lbs/day |
| N-Nitrosodiphenylamine | 7.63E+00 ug/l | 8.26E-02 lbs/day |
| N-Nitrosodi-n-propylamine | 7.63E-03 ug/l | 8.26E-05 lbs/day |
| Pentachlorophenol | 4.27E-01 ug/l | 4.62E-03 lbs/day |
| Phenol | 3.20E+04 ug/l | 3.47E+02 lbs/day |
| Bis(2-ethylhexyl)phthalate | 2.75E+00 ug/l | 2.97E-02 lbs/day |
| Butyl benzyl phthalate | 4.58E+03 ug/l | 4.95E+01 lbs/day |
| Di-n-butyl phthalate | 4.12E+03 ug/l | 4.46E+01 lbs/day |
| Di-n-octyl phthlate | | |
| Diethyl phthalate | 3.51E+04 ug/l | 3.80E+02 lbs/day |
| Dimethyl phthlate | 4.78E+05 ug/l | 5.17E+03 lbs/day |
| Benzo(a)anthracene (PAH) | 4.27E-03 ug/l | 4.62E-05 lbs/day |
| Benzo(a)pyrene (PAH) | 4.27E-03 ug/l | 4.62E-05 lbs/day |
| Benzo(b)fluoranthene (PAH) | 4.27E-03 ug/l | 4.62E-05 lbs/day |
| Benzo(k)fluoranthene (PAH) | 4.27E-03 ug/l | 4.62E-05 lbs/day |
| Chrysene (PAH) | 4.27E-03 ug/l | 4.62E-05 lbs/day |
| Acenaphthylene (PAH) | | |
| Anthracene (PAH) | | |
| Dibenzo(a,h)anthracene (PAH) | 4.27E-03 ug/l | 4.62E-05 lbs/day |
| Indeno(1,2,3-cd)pyrene (PAH) | 4.27E-03 ug/l | 4.62E-05 lbs/day |
| Pyrene (PAH) | 1.46E+03 ug/l | 1.59E+01 lbs/day |
| Tetrachloroethylene | 1.22E+00 ug/l | 1.32E-02 lbs/day |
| Toluene | 1.04E+04 ug/l | 1.12E+02 lbs/day |
| Trichloroethylene | 4.12E+00 ug/l | 4.46E-02 lbs/day |
| Vinyl chloride | 3.05E+00 ug/l | 3.30E-02 lbs/day |

Pesticides

| | | |
|--------------------|---------------|------------------|
| Aldrin | 1.98E-04 ug/l | 2.15E-06 lbs/day |
| Dieldrin | 2.14E-04 ug/l | 2.31E-06 lbs/day |
| Chlordane | 8.70E-04 ug/l | 9.41E-06 lbs/day |
| 4,4'-DDT | 9.00E-04 ug/l | 9.74E-06 lbs/day |
| 4,4'-DDE | 9.00E-04 ug/l | 9.74E-06 lbs/day |
| 4,4'-DDD | 1.27E-03 ug/l | 1.37E-05 lbs/day |
| alpha-Endosulfan | 1.42E+00 ug/l | 1.54E-02 lbs/day |
| beta-Endosulfan | 1.42E+00 ug/l | 1.54E-02 lbs/day |
| Endosulfan sulfate | 1.42E+00 ug/l | 1.54E-02 lbs/day |
| Endrin | 1.16E+00 ug/l | 1.26E-02 lbs/day |
| Endrin aldehyde | 1.16E+00 ug/l | 1.26E-02 lbs/day |
| Heptachlor | 3.20E-04 ug/l | 3.47E-06 lbs/day |
| Heptachlor epoxide | | |

PCB's

| | | |
|--------------------------|---------------|------------------|
| PCB 1242 (Arochlor 1242) | 6.71E-05 ug/l | 7.27E-07 lbs/day |
| PCB-1254 (Arochlor 1254) | 6.71E-05 ug/l | 7.27E-07 lbs/day |
| PCB-1221 (Arochlor 1221) | 6.71E-05 ug/l | 7.27E-07 lbs/day |
| PCB-1232 (Arochlor 1232) | 6.71E-05 ug/l | 7.27E-07 lbs/day |
| PCB-1248 (Arochlor 1248) | 6.71E-05 ug/l | 7.27E-07 lbs/day |
| PCB-1260 (Arochlor 1260) | 6.71E-05 ug/l | 7.27E-07 lbs/day |
| PCB-1016 (Arochlor 1016) | 6.71E-05 ug/l | 7.27E-07 lbs/day |

Pesticide

| | | |
|-----------|---------------|------------------|
| Toxaphene | 1.11E-03 ug/l | 1.21E-05 lbs/day |
|-----------|---------------|------------------|

Metals

| | | |
|----------------|---------------|------------------|
| Antimony | 21.36 ug/l | 0.23 lbs/day |
| Arsenic | 75.87 ug/l | 0.82 lbs/day |
| Asbestos | 1.07E+07 ug/l | 1.16E+05 lbs/day |
| Beryllium | | |
| Cadmium | | |
| Chromium (III) | | |

| | | |
|-----------------------|---------------|------------------|
| Chromium (VI) | | |
| Copper | 1983.61 ug/l | 21.47 lbs/day |
| Cyanide | 1068.10 ug/l | 11.56 lbs/day |
| Lead | | |
| Mercury | 0.21 ug/l | 0.00 lbs/day |
| Nickel | 930.77 ug/l | 10.07 lbs/day |
| Selenium | | |
| Silver | | |
| Thallium | 2.59 ug/l | 0.03 lbs/day |
| Zinc | | |
| Dioxin | | |
| Dioxin (2,3,7,8-TCDD) | 1.98E-08 ug/l | 2.15E-10 lbs/day |

**Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rule**

| | Class 4 Acute Agricultural ug/l | Class 3 Acute Aquatic Wildlife ug/l | Acute Toxics Drinking Water Source ug/l | Acute Toxics Wildlife ug/l | 1C Acute Health Criteria ug/l | Acute Most Stringent ug/l | Class 3 Chronic Aquatic Wildlife ug/l |
|----------------|--|---|--|-------------------------------------|--|---------------------------------|---|
| Aluminum | | 946.6 | | | | 946.6 | |
| Antimony | | | 21.4 | 6561.2 | | 21.4 | |
| Arsenic | 152.6 | 454.4 | 75.9 | | | 75.9 | 289.5 |
| Asbestos | | | 1.07E+07 | | | 1.07E+07 | |
| Barium | | | | | 1525.9 | 1525.9 | |
| Beryllium | | | | | | | |
| Cadmium | 15.2 | 18.6 | | | | 15.2 | 4.3 |
| Chromium (III) | | 5745.2 | | | | 5745.2 | 827.0 |
| Chromium (VI) | 152.2 | 19.2 | | | | 19.16 | 14.69 |
| Copper | 304.8 | 67.6 | 1983.6 | | | 67.6 | 48.9 |
| Cyanide | | | 335688.1 | | | 1068.1 | |
| Iron | | 1262.9 | | | | 1262.9 | |
| Lead | 152.2 | 460.5 | | | | 152.2 | 21.3 |
| Mercury | | 3.0 | 0.2 | 0.2 | | 0.2 | 0.0 |
| Nickel | | 4843.5 | 930.8 | 7018.9 | | 930.8 | 650.2 |
| Selenium | 75.5 | 24.8 | | | | 24.8 | 6.8 |
| Silver | | 38.7 | | | | 38.7 | |
| Thallium | | | 2.6 | 9.6 | | 2.6 | |
| Zinc | | 400.3 | | | | 400.3 | 438.0 |
| Boron | 1144.4 | | | | | 1144.4 | |

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]

[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

| | WLA Acute ug/l | WLA Chronic ug/l | |
|----------------|-------------------|---------------------|----------------|
| Aluminum | 946.6 | | |
| Antimony | 21.36 | | |
| Arsenic | 75.9 | 289.5 | Acute Controls |
| Asbestos | 1.07E+07 | | |
| Barium | | | |
| Beryllium | | | |
| Cadmium | 15.2 | 4.3 | |
| Chromium (III) | 5745.2 | 827 | |
| Chromium (VI) | 19.2 | 14.7 | |
| Copper | 67.6 | 48.9 | |
| Cyanide | 1068.1 | | |
| Iron | 1262.9 | | |
| Lead | 152.2 | 21.3 | |
| Mercury | 0.214 | 0.018 | |
| Nickel | 930.8 | 650 | |
| Selenium | 24.8 | 6.8 | |
| Silver | 38.7 | | |
| Thallium | 2.6 | | |
| Zinc | 400.3 | 438.0 | Acute Controls |
| Boron | 1144.39 | | |

Other Effluent Limitations are based upon R317-1.

The permit writers may utilize other information to tighten or make more stringent these limits based upon best available technology and other considerations.

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

Category III waters fall under special rules for the determination of effluent limits. These rules allow more stringent effluent limitations based upon additional factors, including: "Blue-ribbon" fisheries, special recreational areas, and drinking water sources.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless shown that this is not attainable. Refer to the Forum's Guidelines for additional information.

The permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important downstream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information.

Prepared by:
William O. Moellmer, Ph.D.
Utah Division of Water Quality
801-538-6329

genwal2000

STATEMENT OF BASIS

GENWAL RESOURCES, INC.

UPDES PERMIT NO. UT0024368

Renewal Permit for Minor Industrial Facility

FACILITY CONTACT: Mr. Gary Gray, Engineer
Genwal Resources, Inc.
P. O. Box 1420
195 North 100 West
Huntington, Utah 84528
Phone: (435) 687-9813

Responsible Official: Laine Adair, Mine Manager
Genwal Resources, Inc.
195 West 100 North
Huntington, Utah 84528

DESCRIPTION OF FACILITY: Genwal Resources, Inc. (GRI) is an under-ground coal mining operation located in Crandall Canyon. Crandall Canyon is located up Huntington Canyon. This mine is within national forest boundaries. GRI produces approximately 3.5 to 3.8 million tons of coal per year. In the last five years the mine site has changed significantly. Changes in the operating conditions include the following:

1. Discharge from 002 occurs substantially more than it previously did. The average thirty day flows is approximately 0.74 MGD.
2. Discharge sizes at 002 and 001 have been changed.
3. The location of the mine discharge point (002) has changed.

DESCRIPTION OF DISCHARGE: GRI has two discharge points known as 001 and 002. Outfall 001 is from a sedimentation pond located at a latitude of 59 27' 38" and a longitude of 111 09' 38". Outfall 002 is discharge from the mine. It is a 12 inch discharge pipe located in the riser pipe from the bypass culvert of Crandall Creek just west of the MCC Building in the lower yard of the surface facilities. This outfall is located at a latitude of 39 27' 38" and a longitude of 111 09' 59". Settling is provided underground before discharge.

Outfall 001 has not discharged for a number of years. Outfall 002 has discharged a number of times. The following table is discharge data at 002 since January 1, 1998 to the present and indicates the permittee has not violated it's permit since that time:

RECEIVING WATERS AND STREAM CLASSIFICATION: Crandall Creek originates in the mountains and drains to Huntington River. Based on R317-2-13 Huntington Creek is in the Green River drainage. Huntington Creek and its tributaries are classified as:

- 1C- Protected for domestic purposes with prior treatment by treatment process as required by the Utah Division of Drinking Water.
- 2B- Protected for secondary contact recreation such as boating, wading, or similar uses.
- 3A- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.
- 4- Protected for agriculture uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS: Technology based effluent limits are found in 40 CFR 434. The coal mines here in Utah are generally of the alkaline variety and therefore their technology based effluent limits are found in Subpart D of 40 CFR 434. If technology based effluent limits and water quality based limits are developed for the same parameter, those limits which are more stringent apply.

Based on 40 CFR 434.40 a daily maximum TSS value of 70 mg/L will be incorporated into the permit for both discharge points. Thirty day and seven day averages for TSS as well as pH limitations are taken from State secondary treatment standards contained in R317-1-3.2B. The 30-day average for TSS shall be 25 mg/L and the 7-day average shall be 35 mg/L and the pH shall be within the range of 6.5 to 9.0 at all times for both discharge points.

Total dissolved solids shall be limited to a 723 mg/L concentration at both discharge points. This is based on the Colorado Salinity Control Form and is a continuation of what was in the previous permit.

Total iron is limited based upon water quality considerations and is limited in the wasteload analysis appended to this statement of basis, to 1.3 mg/L at all discharge points.

Oil and grease is limited by best professional judgement (BPJ) to 10 mg/L. Dissolved oxygen is limited to 3.0 mg/L as a thirty day average, based on the wasteload allocation.

No limits are included in this permit for total chlorine residual nor total or fecal coliform, because no chlorine is used and no sanitary waste is discharged.

Also there are no ammonia nitrogen limitations included in the permit because the sample taken

showed a concentration (0.5 mg/L) substantially lower than required in the wasteload analysis (1.2 mg/L).

Alternate effluent limits are allowed in 40 CFR 434.63. These alternate effluent limits are only applicable to surface water runoff discharges and mine water discharges commingled with surface water discharges. The operator has the burden of proof that the applicable precipitation events occurred.

For runoff events (rainfall or snowmelt) less than or equal to the 10- year 24-hour precipitation event settleable solids (SS) shall be substituted for total suspended solids (TSS) and shall be limited to 0.5 ml/L. All of the other parameters shall be in full force and effect as contained in the permit.

For runoff events (rainfall or snowmelt) greater than the 10-year 24-hour precipitation event the only applicable effluent limit shall be pH which shall be limited to a value between 6.5 and 9.0.

SUMMARY OF EFFLUENT LIMITATIONS: The limitations shown below apply to both outfall 001 and 002.

| <u>Parameter</u> | <u>30-Day Ave.</u> | <u>7-Day Ave</u> | <u>Daily Min.</u> | <u>Daily Max.</u> |
|-------------------------|---------------------------|-------------------------|--------------------------|--------------------------|
| Flow, gpd | NA | NA | NA | NA |
| Total Iron, mg/L | NA | NA | NA | 1.3 |
| TDS, mg/L | NA | NA | NA | 723 |
| TSS, mg/L | 25 | 35 | NA | 70 |
| pH, S.U. | NA | NA | 6.5 | 9.0 |
| D.O., mg/L | 3.0 | NA | NA | NA |
| Oil & Grease, mg/L | NA | NA | NA | 10 |
| *SS, ml/L | NA | NA | NA | 0.5 |

* Not applicable at 002 because it is mine water discharge.

CHANGES FROM THE PREVIOUS PERMIT: The changes from the previous permit include a 10 mg/L daily maximum limit for oil and grease which on the previous permit was visual. This change was made because this permittee uses the long-wall mining method for coal removal. There is some potential for release of certain amounts of this fluid and some of these fluids are translucent. A dissolved oxygen thirty day average of 3.0 mg/L rather than 5.8 mg/L which was in the previous permit. This was added because it was taken from the wasteload analysis. The daily maximum dissolved oxygen limitation was eliminated from the permit because a daily maximum was not included in the wasteload analysis. Chronic whole effluent toxicity (WET) testing and limits were included in the renewal permit (see section on WET requirements).

SELF MONITORING AND REPORTING REQUIREMENTS: Monitoring shall be completed as outlined below at both outfall 001 and 002:

| <u>Parameter</u> | <u>Frequency</u> | <u>Sample Time</u> | <u>Units</u> |
|-------------------------|-------------------------|---------------------------|---------------------|
| Effluent Flow | Continuous | Measured | gpd |
| Total Iron | Monthly | Grab | mg/L |
| TDS | Monthly | Grab | mg/L |
| TSS | Monthly | Grab | mg/L |
| pH | Monthly | Grab | S.U. |
| D.O. | Monthly | Grab | mg/L |
| Oil & Grease | Monthly | Grab | mg/L |
| SS | * | Grab | ml/L |

- * Not applicable at 002. The frequency for SS samples is based upon runoff conditions. Report NA for either TSS or SS depending on runoff conditions and note at the bottom of the discharge monitoring report (DMR) runoff conditions which would invoke the alternate effluent limits.

Discharge monitoring reports shall be submitted on a monthly basis by the 28th day of the following month.

STORM WATER REQUIREMENTS: In the last several years a new storm water permit known as the Multi-Sector General Storm Water Permit (MSGSWP) Permit No. UTR000000 has been developed. The MSGSWP requires if necessary, best management practices (BMPs) for those areas outside of the disturbed area(s) which includes such things as sidings, internal haulage lines, conveyor belts, chutes and aerial tramway haulage areas, equipment storage and maintenance yards, coal handling building and structures, and inactive coal mines and other mining related areas. Please contact Harry Campbell at (801) 538-6923 to obtain a notice of intent form for the MSGSWP.

WHOLE EFFLUENT TOXICITY (WET) REQUIREMENTS: In application for the permit the permittee has tested their mine water discharge for acute and chronic toxicity. It passed the acute testing for both species and the chronic test for fathead minnow, but failed the chronic test using ceriodaphnia. WET results along with BPJ indicate that there does not appear to be potential for acute toxicity, but there is some potential for chronic toxicity. As a result no acute testing or limits will be included in the permit. However, effluent limits and testing for chronic toxicity will be included in the permit for outfall 002 only. Since it was ceriodaphnia that failed and not fathead minnow the permit will require quarterly chronic toxicity testing using

ceriodaphnia and semi-annual chronic toxicity testing using fathead minnow (twice per year chronic toxicity testing will occur using two species). The permittee has been required to determine the cause of the chronic toxicity. Based upon the cause of the chronic toxicity this permit can be reopened and modified as appropriate.

PRETREATMENT REQUIREMENTS: Any process water hauled to a public sanitary sewer is subject to federal, state and local pretreatment regulations. Pursuant to Section 307 of the Clean Water Act, the permittee shall comply with all applicable federal pretreatment regulations contained in 40 CFR 403, the state pretreatment requirements found in UAC R317-8-8, and any specific local discharge limitations developed by the wastewater treatment plant accepting any process wastewater from the permittee.

Statement of Basis and Permit drafted by Mike Herkimer, Environmental Scientist, Division of Water Quality, May 24, 2000.

Table 2 Solute compositions and discharge rates of streams, springs and wells in the GENWAL permit area.

summer's table revised for annual report 1999.xls 30 Mar 00

| Date | flow gpm | T °C | pH | Cond. µS/cm2 | TDS mg/l | Ca2+ mg/l | Mg2+ mg/l | Na+ mg/l | K+ mg/l | HCO3- mg/l | CO3- mg/l | SO42- mg/l | Cl- mg/l | Fe(T) mg/l | Fe(d) mg/l | Mn(T) mg/l | Mn(d) mg/l | |
|----------------------------------|-------------|---------|------|-----------------|-------------|--------------|--------------|-------------|------------|---------------|--------------|---------------|-------------|---------------|---------------|---------------|---------------|------|
| Streams | | | | | | | | | | | | | | | | | | |
| L. Flume (Crandall Creek) | | | | | | | | | | | | | | | | | | |
| 11-Mar-88 | 76.3 | 3.00 | 8.24 | 743 | 384 | 64.0 | 36.5 | 10.6 | 3.3 | 289 | 0 | 91.0 | 5.8 | <0.05 | <0.01 | | | |
| 31-May-88 | 350.1 | 3.60 | 8.14 | 528 | 252 | 64.0 | 21.9 | 4.7 | 2.8 | 269 | 0 | 18.0 | 4.1 | <0.05 | 0.02 | | | |
| 30-Sep-89 | 58.3 | 9.90 | 7.68 | 483 | 256 | 60.0 | 25.5 | 6.9 | 1.6 | 267 | 16 | 38.1 | 5.6 | <0.05 | <0.01 | | | |
| 02-Nov-88 | 62.8 | 6.80 | 8.40 | 670 | 330 | 60.0 | 42.6 | 8.6 | 2.5 | 298 | 0 | 73.3 | 4.2 | <0.05 | <0.01 | | | |
| 31-Mar-89 | | | | | 298 | 66.5 | 29.4 | 5.8 | 1.4 | 259 | 7 | 0.0 | 20.0 | | 0.03 | <0.01 | | |
| 22-Jun-89 | | | | | 198 | 56.3 | 23.1 | 3.9 | 0.7 | 248 | <1 | 28.0 | 25.0 | <0.02 | <0.02 | <0.01 | | |
| 28-Sep-89 | | | | | 32 | 57.6 | 32.2 | 5.3 | 0.4 | 314 | <1 | 25.0 | 10.0 | <0.02 | <0.02 | <0.01 | | |
| 18-Dec-89 | | | | | 326 | 68.7 | 29.2 | 5.4 | 0.1 | 294 | <1 | 40.0 | 10.0 | 0.06 | | <0.01 | | |
| 30-Jan-90 | | | | | 291 | 60.7 | 28.4 | 1.0 | 0.4 | 292 | <1 | 33.0 | 10.0 | <0.02 | <0.02 | <0.01 | | |
| 18-Jan-90 | 4.5 | 3.10 | 7.20 | 450 | | | | | | | | | | | | | | |
| 30-Jan-90 | | | | | 291 | 60.7 | 28.4 | 1.0 | 0.4 | 292 | <1 | 33.0 | 10.0 | <0.02 | <0.02 | <0.01 | | |
| 13-Apr-90 | | | | | 225 | 66.0 | 28.0 | 3.3 | 4.6 | 274 | <1 | 35.0 | 20.0 | | <0.02 | 0.02 | | |
| 14-Apr-90 | 430.9 | 3.20 | 7.20 | 448 | | | | | | | | | | | | | | |
| 23-Jul-90 | 502.7 | 3.30 | 7.20 | 448 | | | | | | | | | | | | | | |
| 24-Jul-90 | | | | | 254 | 61.8 | 21.6 | 3.4 | 0.0 | 270 | <1 | 28.0 | 10.0 | | <0.02 | 0.02 | | |
| 11-Oct-90 | 103.2 | 4.80 | 7.60 | 300 | | | | | | | | | | | | | | |
| 12-Oct-90 | | | | | 189 | 70.5 | 30.5 | 5.6 | 0.0 | 363 | <1 | 22.0 | 5.0 | <0.02 | <0.02 | <0.01 | | |
| 12-Jan-91 | 148.1 | 2.80 | 8.46 | 300 | | | | | | | | | | | | | | |
| 14-Jan-91 | | | | | 323 | 86.7 | 39.7 | 9.3 | 0.6 | 346 | <1 | 43.0 | 70.0 | 0.03 | 0.03 | 0.39 | | |
| 04-Apr-91 | 148.1 | 1.40 | 8.00 | 330 | 318 | 69.0 | 28.1 | 5.0 | 0.5 | 252 | <1 | 47.0 | 15.0 | <0.02 | <0.02 | <0.01 | | |
| 21-Jul-91 | 539.6 | 4.90 | 7.20 | 500 | | | | | | | | | | | | | | |
| 11-Oct-91 | 237.8 | 7.00 | 8.26 | 600 | 298 | 74.6 | 24.9 | 4.1 | 0.0 | 270 | <1 | 52.0 | 15.0 | | 0.09 | | | |
| 08-Mar-92 | 44.9 | 3.33 | 7.60 | 400 | 564 | 99.7 | 28.9 | 75.1 | 1.0 | 326 | 0 | 58.0 | 125.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 18-Jun-92 | 116.7 | 17.33 | 8.24 | 513 | 265 | 71.5 | 19.0 | 3.1 | 0.0 | 228 | 5 | 30.0 | 20.0 | 0.00 | | 0.00 | | |
| 30-Sep-92 | 134.6 | 16.1 | 8.2 | 550 | 357 | 91.2 | 24.1 | 3.1 | 0.0 | 406 | 0 | 50.0 | 10.0 | 0.44 | | 0.06 | | |
| 16-Dec-92 | 224.4 | 0.6 | 7.9 | 620 | 254 | 93.4 | 35.5 | 10.3 | 1.3 | 301 | 0 | 100.0 | 15.0 | 0.10 | 0.05 | 0.00 | | |
| 04-Mar-93 | 234.0 | 1.0 | 7.8 | 490 | 615 | 68.8 | 27.9 | 94.1 | 0.0 | 311 | 0 | 60.0 | 164.0 | 0.12 | 0.00 | 0.00 | | |
| 03-Jun-93 | 6500.0 | 12.0 | 8.1 | 300 | 244 | 57.8 | 20.2 | 4.8 | 0.6 | 248 | 0 | 19.0 | 4.9 | 0.28 | <0.5 | <0.03 | | |
| 01-Jul-93 | 290.0 | 10.0 | 8.1 | 540 | 249 | 57.7 | 21.3 | 5.7 | 0.1 | 253 | 0 | 24.0 | 5.3 | <0.05 | 0.05 | <0.03 | | |
| 25-Oct-93 | 380.0 | 7.0 | 7.2 | 440 | 368 | 59.0 | 32.0 | 9.0 | <2 | 281 | <1 | 50.0 | 28.0 | <0.2 | <0.2 | 0.10 | | |
| 09-Feb-94 | 220.0 | 29.4 | 7.3 | 506 | 265 | 46.0 | 35.0 | 4.5 | 1.7 | 296 | 0 | 29.0 | 4.1 | 0.00 | | 0.00 | | |
| 15-Jul-94 | 30.0 | 57.2 | 7.6 | 610 | 301 | 46.0 | 30.0 | 21.0 | 1.9 | 246 | 0 | 46.0 | 31.0 | 0.09 | 0.21 | <0.02 | | |
| 06-Sep-94 | 40.0 | 46.4 | 7.6 | 948 | 308 | 42.0 | 31.0 | 25.0 | 2.4 | 241 | 0 | 44.0 | 40.0 | 0.13 | <0.05 | <0.02 | | |
| 22-Nov-94 | 125.0 | 28.4 | 6.7 | 450 | 450 | 65.0 | 40.0 | 38.0 | <5 | 290 | 0 | 50.0 | 68.0 | <2 | <2 | <2 | | |
| 10-Mar-95 | 184.0 | 0.0 | 7.9 | 480 | 700 | 70.0 | 55.0 | 113.0 | 3.0 | 260 | 20 | 75.0 | 230.0 | 0.10 | <0.1 | <0.1 | | |
| 16-May-95 | 535.0 | 7.0 | 8.2 | 380 | 310 | 60.0 | 31.0 | 10.0 | 2.0 | 240 | 240 | 42.0 | 15.0 | 0.40 | <0.1 | <0.1 | | |
| 10-Aug-95 | 636.0 | 12.0 | 8.4 | 534 | 290 | 55.0 | 25.0 | 10.0 | 1.0 | 249 | 14 | 34.0 | 14.0 | 0.1< | <0.1 | <0.1 | | |
| 28-Nov-95 | 71.6 | 10.0 | 8.8 | 546 | 390 | 61.0 | 37.0 | 19.0 | 4.0 | 240 | 15 | 82.0 | 21.0 | 0.1< | <0.1 | <0.1 | | |
| 26-Mar-96 | 150.0 | 1.0 | 8.1 | 640 | 328 | 57.0 | 35.0 | 6.0 | 1.1 | 350 | <2 | 28.0 | 10.0 | 0.18 | <0.03 | | <0.04 | |
| 26-Jun-96 | | | | | 266 | 56.0 | 24.0 | 8.0 | 2.0 | 254 | 18 | 29.0 | 11.0 | <1 | <1 | | <0.1 | |
| 16-Aug-96 | 15.0 | 15.0 | 7.3 | 605 | 327 | 53.0 | 37.0 | 17.0 | 4.0 | 245 | 16 | 45.0 | 17.0 | <1 | <2 | | <0.1 | |
| 24-Oct-96 | 2.5 | 0.0 | 8.3 | 686 | 377 | 61.0 | 41.0 | 17.0 | 3.0 | 318 | <5 | 62.0 | 20.0 | <1 | <1 | | <0.1 | |
| 25-Mar-97 | 11.3 | 10.0 | 8.7 | 570 | 422 | 61.0 | 37.5 | 14.8 | 2.0 | 300 | <1 | 62.1 | 23.0 | <0.02 | 0.03 | | <0.005 | |
| 05-May-97 | 224.4 | 6.0 | 8.6 | 724 | 330 | 52.2 | 31.8 | 8.7 | 1.7 | 267 | <1 | 44.9 | 9.5 | 0.07 | <0.02 | | <0.005 | |
| 20-Aug-97 | 673.2 | 8.0 | 8.0 | 620 | 370 | 68.0 | 36.0 | 15.0 | 4.0 | 353 | <5 | 59.0 | 9.0 | 0.10 | <0.1 | <0.1 | | |
| 07-Oct-97 | 507.1 | 7.0 | 8.0 | 569 | 370 | 71.0 | 38.0 | 18.0 | 4.0 | 368 | <5 | 100.0 | 7.6 | 0.30 | <0.1 | <0.1 | | |
| 08-Sep-98 | | | | | 8.2 | 655 | 405 | 71.0 | 37.0 | 16.0 | 4.0 | 366 | <5 | 66.0 | 10.0 | 0.50 | <0.1 | <0.1 |
| 04-Mar-99 | 399.0 | 3.0 | 8.2 | 454 | 435 | 79.0 | 43.0 | 19.0 | 2.0 | 334 | <5 | 101.0 | 31.0 | <0.1 | <0.1 | <0.1 | | |
| 10-Jun-99 | 4405.0 | | | | 292 | 83.0 | 29.0 | 7.0 | 2.0 | 294 | <5 | 33.0 | 4.0 | 0.1 | <0.1 | <0.1 | | |
| 15-Sep-99 | 502.0 | 7.3 | 8.6 | 500 | 410 | 71.1 | 38.7 | 10.5 | 2.0 | 318 | <1 | 70.0 | 12.0 | 0.12 | <0.02 | 0.01 | | |
| 04-Nov-99 | 336.0 | 10.0 | 8.5 | 592 | 450 | 50.7 | 46.5 | 31.2 | 5.9 | 325 | <1 | 88.0 | 29.0 | 0.08 | <0.02 | <0.01 | | |
| mean | 583.9 | 16.0 | 7.9 | 533 | 333 | 64.8 | 31.9 | 16.8 | 1.8 | 291 | 8 | 48.6 | 27.3 | 0.084 | 0.012 | 0.016 | <0.01 | |
| max | 6500.0 | 57.2 | 8.8 | 848.0 | 700.0 | 99.7 | 55.0 | 113.0 | 5.0 | 406.0 | 240.0 | 101.0 | 238.0 | 0.5 | 0.2 | 0.4 | 0.0 | |
| min | 2.5 | 0.0 | 6.7 | 308.0 | 32.0 | 42.0 | 19.0 | 1.0 | 0.0 | 228.0 | 0.0 | 0.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Table 2 Solute compositions and discharge rates of streams, springs and wells in the GENVAL permit area.

summer's table revised for annual report 1999.xls 30 Mar 00

| Date | flow gpm | T °C | pH | Cond. µS/cm2 | TDS mg/l | Ca2+ mg/l | Mg2+ mg/l | Na+ mg/l | K+ mg/l | HCO3- mg/l | CO3- mg/l | SO42- mg/l | Cl- mg/l | Fe(T) mg/l | Fe(d) mg/l | Mn(T) mg/l | Mn(d) mg/l |
|---------------------------|-------------|---------|-----|-----------------|-------------|--------------|--------------|-------------|------------|---------------|--------------|---------------|-------------|---------------|---------------|---------------|---------------|
| U. Flume (Crandall Creek) | | | | | | | | | | | | | | | | | |
| 11-Mar-88 | 112.2 | 1.6 | 8.6 | 755 | 296 | 58.0 | 17.0 | 4.3 | 1.6 | 284 | 0 | 35.1 | 4.4 | <0.05 | 0.01 | | |
| 31-May-88 | 561.0 | 3.5 | 8.2 | 463 | 276 | 62.0 | 21.9 | 4.8 | 5.0 | 264 | 0 | 16.2 | 5.7 | <0.05 | 0.01 | | |
| 30-Sep-88 | 67.3 | 8.8 | 7.7 | 430 | 232 | 56.0 | 28.0 | 5.3 | 1.2 | 235 | 24 | 27.1 | 8.0 | <0.05 | | <0.01 | |
| 02-Nov-88 | 80.8 | 6.7 | 8.4 | 478 | 252 | 50.0 | 30.4 | 4.1 | 1.1 | 246 | 0 | 32.2 | 3.4 | <0.05 | | <0.01 | |
| 31-Mar-89 | | | | | 198 | 53.3 | 30.7 | 3.8 | 0.9 | 272 | 25 | 30.0 | 15.0 | | <0.02 | <0.01 | |
| 22-Jun-89 | | | | | 198 | 50.5 | 22.1 | 2.8 | 1.1 | 228 | <1 | 25.0 | 5.0 | <0.02 | <0.02 | <0.01 | |
| 28-Sep-89 | | | | | 265 | 62.9 | 27.6 | 3.7 | 0.1 | 273 | <1 | 20.0 | 10.0 | <0.02 | <0.02 | <0.01 | |
| 18-Dec-89 | | | | | 289 | 60.2 | 24.2 | 1.2 | 0.0 | 224 | <1 | 45.0 | 15.0 | <0.02 | | <0.01 | |
| 29-Jan-90 | | | | | 282 | 67.7 | 26.3 | 0.9 | 0.2 | 266 | <1 | 50.0 | 10.0 | | <0.02 | <0.01 | |
| 18-Jan-90 | 3.5 | 2.9 | 7.0 | 400 | | | | | | | | | | | | | |
| 30-Jan-90 | | | | | 282 | 67.7 | 26.3 | 0.9 | 0.2 | 266 | <1 | 50.0 | 10.0 | | <0.02 | <0.01 | |
| 13-Apr-90 | | | | | 185 | 89.9 | 24.6 | 4.9 | 4.5 | 325 | <1 | 40.0 | 20.0 | | <0.02 | | <0.01 |
| 14-Apr-90 | 430.9 | 3.0 | 7.0 | 400 | | | | | | | | | | | | | |
| 23-Jul-90 | 430.9 | 3.2 | 7.1 | 410 | | | | | | | | | | | | | |
| 24-Jul-90 | | | | | 247 | 82.2 | 21.3 | 2.8 | 0.0 | 251 | <1 | 32.0 | 15.0 | | <0.02 | 0.03 | |
| 11-Oct-90 | 170.5 | 5.2 | 7.5 | 300 | | | | | | | | | | | | | |
| 12-Oct-90 | | | | | 261 | 63.4 | 22.4 | 2.0 | 0.0 | 279 | <1 | 25.0 | 10.0 | <0.02 | <0.02 | 0.02 | |
| 12-Jan-91 | | 3.2 | 8.5 | 300 | | | | | | | | | | | | | |
| 14-Jan-91 | | | | | 300 | 76.6 | 33.1 | 4.9 | 0.1 | 323 | <1 | 27.0 | 45.0 | 0.09 | 0.11 | 0.24 | |
| 04-Apr-91 | 368.0 | 1.4 | 8.0 | 400 | 290 | 67.9 | 24.8 | 2.9 | 0.0 | 262 | <1 | 33.0 | 25.0 | <0.02 | <0.02 | <0.01 | |
| 21-Jul-91 | 852.7 | 5.1 | 7.0 | 500 | 234 | 56.5 | 22.9 | 2.8 | 1.8 | 261 | <1 | 23.0 | 5.0 | <0.02 | <0.02 | 0.05 | |
| 11-Oct-91 | 273.8 | 8.0 | 8.5 | 600 | 262 | 67.7 | 29.9 | 3.0 | 0.0 | 263 | <1 | 36.0 | 10.0 | | 0.05 | | |
| 08-Mar-92 | 67.3 | 1.1 | 7.5 | 300 | 320 | 72.2 | 22.2 | 3.2 | 0.0 | 274 | 0 | 32.0 | 20.0 | 0.00 | | 0.00 | |
| 18-Jun-92 | 161.6 | 16.8 | 8.2 | 517 | 250 | 53.5 | 26.8 | 1.4 | 0.0 | 217 | 5 | 27.0 | 10.0 | 0.00 | | 0.00 | |
| 30-Sep-92 | 94.3 | 13.3 | 8.2 | 600 | 288 | 63.9 | 23.7 | 1.3 | 0.0 | 224 | 0 | 28.0 | 20.0 | 0.13 | | 0.00 | |
| 04-Mar-93 | 68.7 | 0.8 | 7.9 | 440 | 611 | 56.7 | 25.7 | 3.2 | 1.4 | 306 | 0 | 60.0 | 3.3 | 1.20 | 0.14 | 0.00 | |
| 03-Jun-93 | 5386.0 | 3.0 | 8.2 | 300 | 245 | 60.3 | 18.0 | 3.0 | 0.2 | 244 | 0 | 18.0 | 3.9 | 0.34 | <0.05 | <0.03 | |
| 01-Jul-93 | 129.0 | 9.4 | 8.1 | 427 | 231 | 54.8 | 20.0 | 23.1 | <0.10 | 247 | 0 | 26.0 | 2.3 | <0.05 | <0.05 | <0.03 | |
| 25-Oct-93 | 147.0 | 6.0 | 7.8 | 440 | 297 | 56.0 | 28.0 | 4.0 | <2.0 | 194 | <1 | 28.0 | 6.0 | <0.20 | <0.20 | <0.10 | |
| 09-Feb-94 | 168.0 | 32.0 | 7.2 | | 409 | 55.0 | 44.0 | 39.0 | 1.7 | 312 | 3 | | | | | | |
| 15-Jul-94 | 70.0 | 55.4 | 7.6 | 430 | 228 | 44.0 | 26.0 | 4.1 | 1.1 | 227 | 0 | | | | | | |
| 06-Sep-94 | 50.0 | 41.0 | 7.6 | 613 | 225 | 41.0 | 25.0 | 5.0 | <10 | 241 | 0 | | | | | | |
| 22-Nov-94 | 125.0 | 28.4 | 6.8 | | 280 | 58.0 | 30.0 | <5 | <5 | 260 | <1 | | | | | | |
| 10-Mar-95 | 180.0 | 0.6 | 7.9 | 450 | 280 | 55.0 | 30.0 | 6.0 | 2.0 | 245 | 10 | 25.0 | 6.0 | <0.1 | <0.1 | <0.1 | |
| 16-May-95 | 522.0 | 8.0 | 8.0 | 490 | 260 | 60.0 | 31.0 | 5.0 | 1.0 | 250 | 20 | 38.0 | 10.0 | 0.30 | <0.1 | <0.1 | |
| 10-Aug-95 | 254.0 | 11.0 | 8.9 | 467 | 230 | 56.0 | 23.0 | 5.0 | <1 | 248 | 13 | 27.0 | 55.0 | <0.1 | <0.1 | <0.1 | |
| 28-Nov-95 | 47.7 | 6.0 | 9.2 | 432 | 290 | 62.0 | 27.0 | 5.0 | <1 | 250 | 15 | 31.0 | 20.0 | <0.1 | <0.1 | <0.1 | |
| 26-Mar-96 | 150.0 | 1.0 | 8.0 | 580 | 322 | 61.0 | 30.0 | 4.0 | <3 | 314 | <2 | 38.0 | 5.0 | 0.19 | <0.03 | | <0.04 |
| 26-Jun-96 | | | | | 266 | 52.0 | 21.0 | 4.0 | <1 | 240 | 13 | 24.0 | 4.0 | <0.1 | <0.1 | | <0.1 |
| 16-Aug-96 | 15.0 | 14.0 | 8.3 | 499 | 261 | 55.0 | 29.0 | 5.0 | <1 | 232 | 25 | 29.0 | 7.0 | <0.1 | <0.1 | | <0.1 |
| 24-Oct-96 | 2.0 | 3.0 | 8.2 | 564 | 312 | 60.0 | 34.0 | 6.0 | 1.0 | 326 | <5 | 38.0 | 7.0 | <0.1 | <0.1 | | <0.1 |
| 25-Mar-97 | 11.2 | 3.0 | 8.4 | 730 | 370 | 59.9 | 35.0 | 4.7 | 1.6 | 293 | <1 | 50.6 | 3.9 | <0.005 | | <0.005 | |
| 05-May-97 | 47.0 | 6.0 | 9.0 | 656 | 314 | 59.9 | 35.0 | 4.7 | 1.6 | 293 | <1 | 50.6 | 3.9 | <0.02 | <0.02 | <0.006 | |
| 20-Aug-97 | 673.2 | 8.0 | 7.7 | 502 | 310 | | 31.0 | 5.0 | 1.0 | 301 | <5 | 48.0 | 4.0 | 270.00 | <0.1 | | <0.1 |
| 01-Oct-97 | 507.1 | 6.0 | 7.9 | 641 | 320 | 69.0 | 32.0 | 5.0 | <1 | 352 | <5 | 48.0 | 4.0 | <0.1 | <0.1 | <0.1 | |
| 06-Sep-98 | | | 8.4 | 548 | 337 | 70.0 | 33.0 | 4.0 | 1.0 | 321 | <5 | 50.0 | 3.0 | 0.60 | <0.1 | <0.1 | |
| 04-Mar-99 | 367.0 | 3.0 | 8.1 | 380 | 344 | 71.0 | 37.0 | 5.0 | 2.0 | 356 | <5 | 79.0 | 4.0 | <0.1 | <0.1 | <0.1 | |
| 10-Jun-99 | 4173.0 | | | | 256 | 64.0 | 21.0 | 3.0 | <1 | 272 | <5 | 21.0 | 1.0 | 0.1 | <0.1 | <0.1 | |
| 15-Sep-99 | 467.0 | 7.2 | 8.0 | 480 | 370 | 62.1 | 36.2 | 4.4 | 1.4 | 283 | <1 | 67.0 | 7.0 | 0.09 | <0.02 | 0.01 | |
| 04-Nov-99 | 305.0 | 12.0 | 7.9 | 479 | 340 | 61.0 | 40.6 | 4.2 | 1.7 | 313 | <1 | 63.0 | 7.0 | 0.05 | <0.02 | <0.01 | |
| mean | 474.0 | 9.5 | 8.0 | 483 | 287 | 60.3 | 27.6 | 5.1 | 1.1 | 270 | 3 | 36.2 | 18.6 | 8.53 | <0.01 | <0.01 | <0.01 |

Facilities: Genwal Resources, Inc.
Discharging to: Crandall Creek -> Huntington Creek

UPDES No: UT- 0024368-001

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated in terms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

II. Receiving Water and Stream Classification

Crandall Creek -> Huntington Creek
Antidegradation Segment Classification

1C, 2A, 2B, 4
1

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)

Function of Temperature and pH

| | |
|---|--|
| Summer June, July, August | 1.32 mg/l as N (4 Day Average) 5.78 mg/l as N (1 Hour Average) 12.00 @ Temperature, Deg. C. 8.00 @ pH |
| Fall/Spring September, October, November March, April May | 1.32 mg/l as N (4 Day Average) 5.78 mg/l as N (1 Hour Average) 12.00 @ Temperature, Deg. C. 8.00 @ pH |
| Winter December, January, February | 1.36 mg/l as N (4 Day Average) 5.98 mg/l as N (1 Hour Average) 4.00 @ Temperature, Deg. C. 8.00 @ pH |

Chronic Total Residual Chlorine (TRC)

0.019 mg/l (4 Day Average)
0.011 mg/l (1 Hour Average)

Chronic Dissolved Oxygen (DO)

6.50 mg/l (30 Day Average)
5.00 mg/l (7Day Average)
4.00 mg/l (1 Day Average)

Maximum Total Dissolved Solids
Maximum Boron

1200 mg/l
750 mg/l

Acute and Chronic Heavy Metals (Dissolved)

| Parameter | 4 Day Average (Chronic) Standard | | 1 Hour Average (Acute) Standard | | |
|--------------|----------------------------------|---------------|---------------------------------|------|----------------|
| | Concentration | Load* | Concentration | | Load* |
| Aluminum | 87.00 ug/l** | 0.460 lbs/day | 750.00 | ug/l | 3.962 lbs/day |
| Arsenic | 190.00 ug/l | 1.004 lbs/day | 360.00 | ug/l | 1.902 lbs/day |
| Cadmium | 2.99 ug/l | 0.016 lbs/day | 15.75 | ug/l | 0.083 lbs/day |
| Chromium III | 567.96 ug/l | 3.001 lbs/day | 4765.01 | ug/l | 25.174 lbs/day |
| ChromiumVI | 11.00 ug/l | 0.058 lbs/day | 16.00 | ug/l | 0.085 lbs/day |
| Copper | 33.90 ug/l | 0.179 lbs/day | 56.61 | ug/l | 0.299 lbs/day |
| Iron | | | 1000.00 | ug/l | 5.283 lbs/day |
| Lead | 15.28 ug/l | 0.081 lbs/day | 392.04 | ug/l | 2.071 lbs/day |
| Mercury | 0.0120 ug/l | 0.000 lbs/day | 2.40 | ug/l | 0.013 lbs/day |
| Nickel | 447.28 ug/l | 2.363 lbs/day | 4023.36 | ug/l | 21.256 lbs/day |
| Selenium | 5.00 ug/l | 0.026 lbs/day | 20.00 | ug/l | 0.106 lbs/day |
| Silver | ug/l | lbs/day | 33.81 | ug/l | 0.179 lbs/day |
| Zinc | 301.17 ug/l | 1.591 lbs/day | 332.51 | ug/l | 1.757 lbs/day |

* Allowed below discharge

**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO3

Metals Standards Based upon a Hardness of 342.98 mg/l as CaCO3

Organics [Pesticides]

| Parameter | 4 Day Average (Chronic) Standard | | 1 Hour Average (Acute) Standard | | |
|-------------------|----------------------------------|-----------------|---------------------------------|------|---------------|
| | Concentration | Load* | Concentration | | Load* |
| Aldrin | | | 1.500 | ug/l | 0.008 lbs/day |
| Chlordane | 0.0043 ug/l | 0.049 lbs/day | 1.200 | ug/l | 0.006 lbs/day |
| DDT, DDE | 0.001 ug/l | 0.011 lbs/day | 0.550 | ug/l | 0.003 lbs/day |
| Dieldrin | 0.0019 ug/l | 0.022 lbs/day | 1.250 | ug/l | 0.007 lbs/day |
| Endosulfan | 0.056 ug/l | 0.634 lbs/day | 0.110 | ug/l | 0.001 lbs/day |
| Endrin | 0.0023 ug/l | 0.026 lbs/day | 0.090 | ug/l | 0.000 lbs/day |
| Guthion | | | 0.010 | ug/l | 0.000 lbs/day |
| Heptachlor | 0.0038 ug/l | 0.043 lbs/day | 0.260 | ug/l | 0.001 lbs/day |
| Lindane | 0.08 ug/l | 0.906 lbs/day | 1.000 | ug/l | 0.005 lbs/day |
| Methoxychlor | | | 0.030 | ug/l | 0.000 lbs/day |
| Mirex | | | 0.010 | ug/l | 0.000 lbs/day |
| Parathion | | | 0.040 | ug/l | 0.000 lbs/day |
| PCB's | 0.014 ug/l | 0.159 lbs/day | 2.000 | ug/l | 0.011 lbs/day |
| Pentachlorophenol | 13.00 ug/l | 147.196 lbs/day | 20.000 | ug/l | 0.106 lbs/day |
| Toxephene | 0.0002 ug/l | 0.002 lbs/day | 0.730 | ug/l | 0.004 lbs/day |

IV. Numeric Stream Standards for Protection of Agriculture

| | 4 Day Average (Chronic) Standard Concentration | Load* | 1 Hour Average (Acute) Standard Concentration | Load* |
|----------|---|--------------|--|---------------|
| TDS | | | 1200.0 mg/l | 3.17 tons/day |
| Arsenic | | | 100.0 ug/l | lbs/day |
| Boron | | | 750.0 ug/l | 1.98 lbs/day |
| Cadmium | | | 10.0 ug/l | 0.03 lbs/day |
| Chromium | | | 100.0 ug/l | lbs/day |
| Copper | | | 200.0 ug/l | lbs/day |
| Lead | | | 100.0 ug/l | lbs/day |
| Selenium | | | 50.0 ug/l | lbs/day |

V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)

| | 4 Day Average (Chronic) Standard Concentration | Load* | 1 Hour Average (Acute) Standard Concentration | Load* |
|---------------|---|--------------|--|----------------|
| Metals | | | | |
| Arsenic | | | 50 ug/l | 0.566 lbs/day |
| Barium | | | 1000 ug/l | 11.323 lbs/day |
| Cadmium | | | 10 ug/l | 0.113 lbs/day |
| Chromium | | | 50 ug/l | 0.566 lbs/day |
| Lead | | | 50 ug/l | 0.566 lbs/day |
| Mercury | | | 2 ug/l | 0.023 lbs/day |
| Selenium | | | 10 ug/l | 0.113 lbs/day |
| Silver | | | 50 ug/l | 0.566 lbs/day |
| Fluoride (3) | | | 1.4 ug/l | 0.016 lbs/day |
| to | | | 2.4 ug/l | 0.027 lbs/day |
| Nitrates as N | | | 10 ug/l | 0.113 lbs/day |

Chlorophenoxy Herbicides

| | | | | |
|-------------------------|--|--|----------|---------------|
| 2,4-D | | | 100 ug/l | 1.132 lbs/day |
| 2,4,5-TP | | | 10 ug/l | 0.113 lbs/day |
| Endrin | | | 0.2 ug/l | 0.002 lbs/day |
| γ-cyclohexane (Lindane) | | | 4 ug/l | 0.045 lbs/day |
| Methoxychlor | | | 100 ug/l | 1.132 lbs/day |
| Toxaphene | | | 5 ug/l | 0.057 lbs/day |

VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

Maximum Conc., ug/l - Acute Standards

| | Class 1C | | Class 3A, 3B | |
|---------------------------|---|---------------|--------------------------------------|----------------|
| | [2 Liters/Day for 70 Kg Person over 70 Yr.] | | [6.5 g for 70 Kg Person over 70 Yr.] | |
| Toxic Organics | | | | |
| Acenaphthene | 1200.00 ug/l | 13.59 lbs/day | 2700 ug/l | 30.57 lbs/day |
| Acrolein | 320.00 ug/l | 3.62 lbs/day | 780 ug/l | 8.83 lbs/day |
| Acrylonitrile | 0.06 ug/l | 0.00 lbs/day | 0.66 ug/l | 0.01 lbs/day |
| Benzene | 1.20 ug/l | 0.01 lbs/day | 71 ug/l | 0.80 lbs/day |
| Benzidine | 0.00012 ug/l | 0.00 lbs/day | 0.00054 ug/l | 0.00 lbs/day |
| Carbon tetrachloride | 0.25 ug/l | 0.00 lbs/day | 4.4 ug/l | 0.05 lbs/day |
| Chlorobenzene | 680.00 ug/l | 7.70 lbs/day | 21000 ug/l | 237.78 lbs/day |
| 1,2,4-Trichlorobenzene | | | | |
| Hexachlorobenzene | 0.00075 ug/l | 0.00 lbs/day | 0.00077 ug/l | 0.00 lbs/day |
| 1,2-Dichloroethane | 0.38 ug/l | 0.00 lbs/day | 99 ug/l | 1.12 lbs/day |
| 1,1,1-Trichloroethane | | | | |
| Hexachloroethane | 1.90 ug/l | 0.02 lbs/day | 8.9 ug/l | 0.10 lbs/day |
| 1,1-Dichloroethane | | | | |
| 1,1,2-Trichloroethane | 0.61 ug/l | 0.01 lbs/day | 42 ug/l | 0.48 lbs/day |
| 1,1,2,2-Tetrachloroethane | 0.17 ug/l | 0.00 lbs/day | 11 ug/l | 0.12 lbs/day |
| Chloroethane | | | ug/l | lbs/day |
| Bis(2-chloroethyl) ether | 0.03 ug/l | 0.00 lbs/day | 1.4 ug/l | 0.02 lbs/day |

| | ug/l | lbs/day | ug/l | lbs/day |
|-----------------------------|---------------|------------------|--------------|------------------|
| 2-Chloroethyl vinyl ether | | | | |
| 2-Chloronaphthalene | 1700.00 ug/l | 19.25 lbs/day | 4300 ug/l | 48.69 lbs/day |
| 2,4,6-Trichlorophenol | 2.10 ug/l | 0.02 lbs/day | 6.5 ug/l | 0.07 lbs/day |
| p-Chloro-m-cresol | | | ug/l | lbs/day |
| Chloroform (HM) | 5.70 ug/l | 0.06 lbs/day | 470 ug/l | 5.32 lbs/day |
| 2-Chlorophenol | 120.00 ug/l | 1.36 lbs/day | 400 ug/l | 4.53 lbs/day |
| 1,2-Dichlorobenzene | 2700.00 ug/l | 30.57 lbs/day | 17000 ug/l | 192.49 lbs/day |
| 1,3-Dichlorobenzene | 400.00 ug/l | 4.53 lbs/day | 2600 ug/l | 29.44 lbs/day |
| 1,4-Dichlorobenzene | 400.00 ug/l | 4.53 lbs/day | 2600 ug/l | 29.44 lbs/day |
| 3,3'-Dichlorobenzidine | 0.04 ug/l | 0.00 lbs/day | 0.077 ug/l | 0.00 lbs/day |
| 1,1-Dichloroethylene | 0.06 ug/l | 0.00 lbs/day | 3.2 ug/l | 0.04 lbs/day |
| 1,2-trans-Dichloroethylen | 700.00 ug/l | 7.93 lbs/day | ug/l | lbs/day |
| 2,4-Dichlorophenol | 93.00 ug/l | 1.05 lbs/day | 790 ug/l | 8.95 lbs/day |
| 1,2-Dichloropropane | 0.52 ug/l | 0.01 lbs/day | 39 ug/l | 0.44 lbs/day |
| 1,3-Dichloropropylene | 10.00 ug/l | 0.11 lbs/day | 1700 ug/l | 19.25 lbs/day |
| 2,4-Dimethylphenol | 540.00 ug/l | 6.11 lbs/day | 2300 ug/l | 26.04 lbs/day |
| 2,4-Dinitrotoluene | 0.11 ug/l | 0.00 lbs/day | 9.1 ug/l | 0.10 lbs/day |
| 2,6-Dinitrotoluene | ug/l | lbs/day | ug/l | lbs/day |
| 1,2-Diphenylhydrazine | 0.04 ug/l | 0.00 lbs/day | 0.54 ug/l | 0.01 lbs/day |
| Ethylbenzene | 3100.00 ug/l | 35.10 lbs/day | 29000 ug/l | 328.36 lbs/day |
| Fluoranthene | 300.00 ug/l | 3.40 lbs/day | 370 ug/l | 4.19 lbs/day |
| 4-Chlorophenyl phenyl ether | | | | |
| 4-Bromophenyl phenyl ether | | | | |
| Bis(2-chloroisopropyl) etf | 1400.00 ug/l | 15.85 lbs/day | 170000 ug/l | 1924.87 lbs/day |
| Bis(2-chloroethoxy) meth | ug/l | lbs/day | ug/l | lbs/day |
| Methylene chloride (HM) | 4.70 ug/l | 0.05 lbs/day | 1600 ug/l | 18.12 lbs/day |
| Methyl chloride (HM) | ug/l | lbs/day | ug/l | lbs/day |
| Methyl bromide (HM) | ug/l | lbs/day | ug/l | lbs/day |
| Bromoform (HM) | 4.30 ug/l | 0.05 lbs/day | 360 ug/l | 4.08 lbs/day |
| Dichlorobromomethane(f | 0.27 ug/l | 0.00 lbs/day | 22 ug/l | 0.25 lbs/day |
| Chlorodibromomethane (| 0.41 ug/l | 0.00 lbs/day | 34 ug/l | 0.38 lbs/day |
| Hexachlorobutadiene(c) | 0.44 ug/l | 0.00 lbs/day | 50 ug/l | 0.57 lbs/day |
| Hexachlorocyclopentadie | 240.00 ug/l | 2.72 lbs/day | 17000 ug/l | 192.49 lbs/day |
| isophorone | 8.40 ug/l | 0.10 lbs/day | 600 ug/l | 6.79 lbs/day |
| Naphthalene | | | | |
| Nitrobenzene | 17.00 ug/l | 0.19 lbs/day | 1900 ug/l | 21.51 lbs/day |
| 2-Nitrophenol | ug/l | lbs/day | ug/l | lbs/day |
| 4-Nitrophenol | ug/l | lbs/day | ug/l | lbs/day |
| 2,4-Dinitrophenol | 70.00 ug/l | 0.79 lbs/day | 14000 ug/l | 158.52 lbs/day |
| 4,6-Dinitro-o-cresol | 13.00 ug/l | 0.15 lbs/day | 765 ug/l | 8.66 lbs/day |
| N-Nitrosodimethylamine | 0.00069 ug/l | 0.00 lbs/day | 8.1 ug/l | 0.09 lbs/day |
| N-Nitrosodiphenylamine | 5.00 ug/l | 0.06 lbs/day | 16 ug/l | 0.18 lbs/day |
| N-Nitrosodi-n-propylamin | 0.01 ug/l | 0.00 lbs/day | 1.4 ug/l | 0.02 lbs/day |
| Pentachlorophenol | 0.28 ug/l | 0.00 lbs/day | 8.2 ug/l | 0.09 lbs/day |
| Phenol | 2.10E+04 ug/l | 2.38E+02 lbs/day | 4.6E+06 ug/l | 5.21E+04 lbs/day |
| Bis(2-ethylhexyl)phthalat | 1.80 ug/l | 0.02 lbs/day | 5.9 ug/l | 0.07 lbs/day |
| Butyl benzyl phthalate | 3000.00 ug/l | 33.97 lbs/day | 5200 ug/l | 58.88 lbs/day |
| Di-n-butyl phthalate | 2700.00 ug/l | 30.57 lbs/day | 12000 ug/l | 135.87 lbs/day |
| Di-n-octyl phthlate | | | | |
| Diethyl phthalate | 23000.00 ug/l | 260.42 lbs/day | 120000 ug/l | 1358.73 lbs/day |
| Dimethyl phthlate | 3.13E+05 ug/l | 3.54E+03 lbs/day | 2.9E+06 ug/l | 3.28E+04 lbs/day |
| Benzo(a)anthracene (PAI | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Benzo(a)pyrene (PAH) | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Benzo(b)fluoranthene (P/ | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Benzo(k)fluoranthene (P/ | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Chrysene (PAH) | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Acenaphthylene (PAH) | | | | |
| Anthracene (PAH) | 9600.00 ug/l | 108.70 lbs/day | ug/l | lbs/day |
| Dibenzo(a,h)anthracene | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |
| Indeno(1,2,3-cd)pyrene (I | 0.0028 ug/l | 0.00 lbs/day | 0.031 ug/l | 0.00 lbs/day |

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

| | |
|-----------------------|-------------------------------------|
| Flow, Q, (cfs or MGD) | D.O. mg/l |
| Temperature, Deg. C. | Total Residual Chlorine (TRC), mg/l |
| pH | Total NH3-N, mg/l |
| BOD5, mg/l | Total Dissolved Solids (TDS), mg/l |
| Metals, ug/l | Toxic Organics of Concern, ug/l |

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Upstream Information

| | Stream Flow | Temp. | pH | T-NH3 | BOD | DO | TRC | TDS |
|------------------|-------------|--------|--------|-----------|--------|--------|------|-----------|
| | cfs | Deg. C | | mg/l as N | mg/l | mg/l | mg/l | mg/l |
| Summer | 1.1 | 12.0 | 8.0 | 0.10 | 0.50 | 7.19 | | 333.0 |
| Fall/Spring | 1.1 | 12.0 | 8.0 | 0.10 | 0.50 | --- | | 333.0 |
| Winter | 1.1 | 4.0 | 8.0 | 0.10 | 0.50 | --- | | 333.0 |
| Dissolved Metals | Al | As | Cd | CrIII | CrVI | Copper | Fe | Pb |
| All Seasons | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l |
| | 1.59* | 0.53* | 0.053* | 0.53* | 2.65* | 0.53* | 0.1 | 0.53* |
| All Seasons | Hg | Ni | Se | Ag | Zn | Boron | | |
| | 0.0001 | 0.53* | 1.06* | 0.1* | 0.053* | 10.0 | | * 1/4 MDL |

Discharge Information

(Non-contact Cooling Water NOT included in these calculations.)

| Season | Flow, MGD | Temp. |
|-------------|-----------|-------|
| Summer | 0.63360 | 11.5 |
| Fall/Spring | 0.63360 | 11.5 |
| Winter | 0.63360 | 11.5 |

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

All Seasons

| | | |
|----------------|----------|---------------|
| Not to Exceed: | 0.63 MGD | Daily Average |
| | 0.98 cfs | Daily Average |

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.6336 MGD. If the discharger is allowed to have a flow greater than 0.6336 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occurring, the permit writers must include the discharge flow limitation as indicated above; or, include loading effluent limits in the permit.

Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not in occur downstream segements if the values below are met.

| | | | |
|------------------|--------|----------------|-----------|
| WET Requirements | LC50 > | EOP Effluent | [Acute] |
| | IC25 > | 46.7% Effluent | [Chronic] |

Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

| | | |
|----------------|--------------------------------|---------------|
| All Seasons | [Based upon Summer Conditions] | |
| | Concentration | |
| 30 Day Average | 25.0 mg/l as BOD5 | 132.1 lbs/day |
| 30 Day Average | 20.0 mg/l as COD | 105.7 lbs/day |

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

| | | |
|----------------|--------------------------------|--|
| All Seasons | [Based upon Summer Conditions] | |
| | Concentration | |
| 30 Day Average | 3.0 mg/l | |

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

| Season | 4 Day Average [Chronic] Concentration | Load |
|-------------|--|--------------|
| Summer | 2.71 mg/l as N | 14.3 lbs/day |
| Fall/Spring | 2.71 mg/l as N | 14.3 lbs/day |
| Winter | 2.81 mg/l as N | 14.8 lbs/day |

| Season | 1 Hour Average [Acute] Concentration | Load |
|-------------|---|--------------|
| Summer | 9.0 mg/l as N | 47.7 lbs/day |
| Fall/Spring | 9.0 mg/l as N | 47.7 lbs/day |
| Winter | 9.3 mg/l as N | 49.4 lbs/day |

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50.%.

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

| Season | 4 Day Average [Chronic] [Totally Mixed] Concentration | Load |
|-------------|--|-------------|
| Summer | N/A mg/l | N/A lbs/day |
| Fall/Spring | N/A mg/l | N/A lbs/day |
| Winter | N/A mg/l | N/A lbs/day |

| | 1 Hour Average [Acute] [Totally Mixed] Concentration | Load |
|-------------|---|-------------|
| Summer | 0.017 mg/l | 0.1 lbs/day |
| Fall/Spring | 0.017 mg/l | 0.1 lbs/day |
| Winter | 0.017 mg/l | 0.1 lbs/day |

| | 4 Day Average (Chronic) [Plume Model] Concentration | Load |
|-------------|--|---------|
| All Seasons | N/A mg/l | lbs/day |

| | 1 Hour Average [Acute] (Plume Model) Concentration | Load |
|-------------|---|---------|
| All Seasons | N/A mg/l | lbs/day |

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) equal to 50.%.

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 342.98 mg/l):

| | 4 Day Average Concentration | Load | 1 Hour Average Concentration | Load |
|----------|--------------------------------|-------------|---------------------------------|-------------|
| Aluminum | N/A ug/l | N/A lbs/day | 1,177.3 ug/l | 4.0 lbs/day |
| Arsenic | 406.30 ug/l | 1.4 lbs/day | 565.3 ug/l | 1.9 lbs/day |
| Cadmium | 6.31 ug/l | 0.0 lbs/day | 24.7 ug/l | 0.1 lbs/day |