

CALCULATIONS OF NEW MEXICO WATER QUALITY-BASED EFFLUENT LIMITATIONS

NMAC 20.6.4. **NMWQS as of January 14, 2011**

(EPA approved site-specific criteria for aluminum, cadmium, and zinc on April 30, 2012)

Calculations Specifications:

Excel **Revised as of May 1, 2012**

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STEP 1: REFERENCE IMPLEMENTATION PROCEDURES
INPUT FACILITY AND RECEIVING STREAM DATA
LIST SOURCE OF DATA INPUT

APPENDIX A
of FACT SHEET

IMPLEMENTATION PROCEDURES

The State of New Mexico Standards for Interstate and Intrastate Surface Waters are implemented in this spread sheet by using procedures established in the "Procedures for Implementing NPDES Permits in New Mexico" amended May 2011

| FACILITY | DATA INPUT | |
|---------------------------|------------|---|
| Permittee | LANL | |
| NPDES Permit No. | NM0028355 | |
| Outfall No.(s) | 001 | |
| Plant Effluent Flow (MGD) | 0.357 | For industrial and federal facility, use the highest monthly average flow for the past 24 months. For POTWs, use the design flow. |
| Plant Effluent Flow (cfs) | 0.55335 | |

| RECEIVING STREAM | DATA INPUT | |
|--|---------------|--|
| Receiving Stream Name | Sandia Canton | |
| Basin Name | Rio Grande | |
| Waterbody Segment Code No. | 20.6.4.126 | |
| Is a publicly owned lake or reservoir (enter "1" if it's a lake, "0" if not) | 0 | |
| Are acute aquatic life criteria considered (1= yes, 0= no) (MUST enter "1" for 2005 Standards) | 1 | |
| Are chronic aquatic life criteria considered (1= yes, 0=no) | 1 | |
| Are domestic water supply criteria considered (1= yes, 0=no) | 0 | |
| Are irrigation water supply criteria considered (1= yes, 0=no) | 0 | |
| Livestock watering and wildlife habitat criteria applied to all streams | | |
| USGS Flow Station | USGS | |
| WQ Monitoring Station No. | SJR | |
| Receiving Stream TSS (mg/l) | 1.0833 | For intermittent stream, enter effluent TSS |
| Receiving Stream Hardness (mg/l as CaCO ₃) | 78.8 | For intermittent stream, enter effluent Hardness (If no data, 20 mg/l is used) |
| Receiving Stream Critical Low Flow (4Q3) (cfs) | 0 | Enter "0" for intermittent stream and lake. |
| Receiving Stream Harmonic Mean Flow (cfs) | 0.00155 | Enter harmonic mean or modified harmonic mean flow data |
| Avg. Water Temperature (C) | 16.8 | |
| pH (Avg) | 7.7 | |
| Fraction of stream allowed for mixing (F) | 1 | Enter 1, if stream morphology data is not available or for intermittent streams. |
| Fraction of Critical Low Flow | 0 | |

STEP 2: INPUT AMBIENT AND EFFLUENT DATA

CALCULATE IN-STREAM WASTE CONCENTRATIONS

DATA INPUT

Input pollutant geometric mean concentration as micro-gram per liter (ug/l or ppb)
 unless other unit is specified for the parameter.
 Effluent value reported as "< detection level" (DL) but the DL is greater than MQL, input "1/2 DL" for calculation.
 Effluent value reported as "< detection level" (DL) and the DL is smaller than MQL, no data is inputted.
 If a less than MQL value is reported, input either the reported value or "0" for calculation.

The following formula is used to calculate the Instream Waste Concentration (Cd)
 See "Procedures for Implementing NPDES Permits in New Mexico" amended July 2009

$$Cd = [(F \cdot Qa \cdot Ca) + (Qe \cdot 2.13 \cdot Ce)] / (F \cdot Qa + Qe)$$

 Where:
 Cd = Instream Waste Concentration
 F = Fraction of stream allowed for mixing (see "Procedures for Implementing NPDES Permits in New Mexico")
 Ce = Reported concentration in effluent
 Ca = Ambient stream concentration upstream of discharge
 Qe = Plant effluent flow
 Qa = Critical low flow of stream at discharge point expressed as the 4Q3 or harmonic mean flow for human health criteria

The following formula convert metals reported in total form to dissolved form if criteria are in dissolved form

See "Procedures for Implementing NPDES Permits in New Mexico" amended July 2009

$$Kp = Kpo \cdot (TSS)^a$$

$$C/Ct = 1 / (1 + Kp \cdot TSS \cdot 10^{-6})$$

 Total Metal Criteria (Ct) = Cr / (C/Ct)
 Kp = Linear partition coefficient; Kpo and a can be found in table below
 TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)
 C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value

| Total Metals | Total Value | Stream Linear Partition Coefficient | | | | | Lake Linear Partition Coefficient | | | | |
|--------------|-------------|-------------------------------------|-----------|-------------|-------------|---------------------------|-----------------------------------|-----------|-------------|-------------|-------------------------|
| | | Kpo | alpha (a) | Kp | C/Ct | Dissolved Value in Stream | Kpo | alpha (a) | Kp | C/Ct | Dissolved Value in Lake |
| Arsenic | 1.9 | 480000 | -0.73 | 452766.8845 | 0.670923738 | 1.2747551 | 480000 | -0.73 | 452766.8845 | 0.670923738 | 1.2747551 |
| Chromium III | | 3360000 | -0.93 | 3119054.377 | 0.228369336 | 0 | 2170000 | -0.27 | 2123623.747 | 0.302982413 | 0 |
| Copper | 2.6 | 1040000 | -0.74 | 980210.3172 | 0.484998549 | 1.26099623 | 2850000 | -0.9 | 2651984.56 | 0.258204788 | 0.67133245 |
| Lead | 0 | 2800000 | -0.8 | 2626388.916 | 0.26006672 | 0 | 2040000 | -0.53 | 1955299.7 | 0.32070029 | 0 |
| Nickel | 0.8 | 490000 | -0.57 | 468154.6015 | 0.663503137 | 0.53080251 | 2210000 | -0.76 | 2079616.377 | 0.307422871 | 0.2459383 |
| Silver | 0 | 2390000 | -1.03 | 2200932.358 | 0.295484696 | 0 | 2390000 | -1.03 | 2200932.358 | 0.295484696 | 0 |
| Zinc | 30 | 1250000 | -0.7 | 1181914.043 | 0.438525811 | 13.1557743 | 3340000 | -0.68 | 3163132.042 | 0.225905948 | 6.77717844 |

The following formula is used to calculate hardness dependent criteria
 (Please refer to State Water Quality Standards for details)

| | | | Dissolved WQC (ug/l) | |
|--------------|---------|--|-------------------------|--|
| Aluminum (T) | Acute | $e(1.3695[\ln(\text{hardness})]+1.8308)$ | 2468.305963 | If Stream pH < 6.5, enter 750 in cell O113 |
| | Chronic | $e(1.3695[\ln(\text{hardness})]+0.9161)$ | 988.8942 | If Stream pH < 6.5, enter 87 in cell P113 |
| Cadmium (D) | Acute | $e(0.8968[\ln(\text{hardness})]-3.5699) \cdot CF1$ | 1.348811145 | $CF1 = 1.136672 - 0.041838 \cdot \ln(\text{hardness})$ |
| | Chronic | $e(0.7647[\ln(\text{hardness})]-4.2180) \cdot CF2$ | 0.381698435 | $CF2 = 1.101672 - 0.041838 \cdot \ln(\text{hardness})$ |

| | | | Dissolved WQC (ug/l) | | |
|------------------|---------|--|--|-------------|---------------------------------------|
| Chromium III (D) | Acute | | $0.316 e^{(0.819[\ln(\text{hardness})]+3.7256)}$ | 468.758954 | |
| | Chronic | | $0.860 e^{(0.819[\ln(\text{hardness})]+0.6848)}$ | 60.97590918 | |
| Copper (D) | Acute | | $0.960 e^{(0.9422[\ln(\text{hardness})]-1.700)}$ | 10.73686805 | |
| | Chronic | | $0.960 e^{(0.8545[\ln(\text{hardness})]-1.702)}$ | 7.306067456 | |
| Lead (D) | Acute | | $e^{(1.273[\ln(\text{hardness})]-1.46)*CF3}$ | 49.77827924 | CF3 = 1.46203 - 0.145712*ln(hardness) |
| | Chronic | | $e^{(1.273[\ln(\text{hardness})]-4.705)*CF4}$ | 1.939788078 | CF4 = 1.46203 - 0.145712*ln(hardness) |
| Manganese (D) | Acute | | $e^{(0.3331[\ln(\text{hardness})]+6.4676)}$ | 2757.883231 | |
| | Chronic | | $e^{(0.3331[\ln(\text{hardness})]+5.8743)}$ | 1523.733297 | |
| Nickel (D) | Acute | | $0.998 e^{(0.846[\ln(\text{hardness})]+2.255)}$ | 382.7593232 | |
| | Chronic | | $0.997 e^{(0.846[\ln(\text{hardness})]+0.0584)}$ | 42.51274385 | |
| Silver (D) | Acute | | $0.85 e^{(1.72[\ln(\text{hardness})]-6.59)}$ | 2.135223714 | |
| Zinc (D) | Acute | | $0.978 e^{(0.9094[\ln(\text{hardness})]+0.9095)}$ | 128.8340408 | |
| | Chronic | | $0.986 e^{(0.90947[\ln(\text{hardness})]+0.6235)}$ | 97.60975516 | |

| POLLUTANTS | CAS No. | MQL | Instream Waste Concentration | | | | | | | Irrigation Criteria ug/l | Livestock& Wildlife Criteria ug/l | Acute Aquatic Criteria ug/l | Chronic Aquatic Criteria ug/l | Human Health Criteria ug/l | Need TMDL |
|---|------------|-----|-------------------------------|--------------------------------|-----------------------------|-------------------------------------|---------------------------------|---------------------------------|------------------------------|--------------------------------|--|--------------------------------------|--|-------------------------------------|--------------|
| | | | Ambient Conc. Ca (ug/l) | Effluent Conc. Ce (ug/l) | Acute Aquatic 2.13*Ce | Domestic Supply Cd,dom (ug/l) | Chronic Aquatic Cd (ug/l) | Human Health Cd,hh (ug/l) | Domestic Criteria ug/l | | | | | | |
| | | | | | | | | | | | | | | | |
| Radioactivity, Nutrients, and Chlorine | | | | | | | | | | | | | | | |
| Aluminum, total | 7429-90-5 | 2.5 | | 35 | 74.55 | 74.55 | 74.55 | 74.3417598 | 1E+100 | 5000 | 1E+100 | 2468.305963 | 988.8942 | 1E+100 | N/A |
| Barium, dissolved | 7440-39-3 | 100 | | 51 | 108.63 | 108.63 | 108.63 | 108.326564 | 2000 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Boron, dissolved | 7440-42-8 | 100 | | 54.6 | 116.298 | 116.298 | 116.298 | 115.973145 | 1E+100 | 750 | 5000 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Cobalt, dissolved | 7440-48-4 | 50 | | 0.11 | 0.2343 | 0.2343 | 0.2343 | 0.23364553 | 1E+100 | 50 | 1000 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Uranium, dissolved | 7440-61-1 | 0.1 | | | 0 | 0 | 0 | 0 | 30 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Vanadium, dissolved | 7440-62-2 | 50 | | | 0 | 0 | 0 | 0 | 1E+100 | 100 | 100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Ra-226 and Ra-228 (pCi/l) | | | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 30 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Strontium (pCi/l) | | | | | 0 | 0 | 0 | 0 | 8 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Tritium (pCi/l) | | | | | 0 | 0 | 0 | 0 | 20000 | 1E+100 | 20000 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Gross Alpha (pCi/l) | | | | | 0 | 0 | 0 | 0 | 15 | 1E+100 | 15 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Asbestos (fibers/l) | | | | | 0 | 0 | 0 | 0 | 7000000 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Total Residual Chlorine | 7782-50-5 | 33 | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 11 | 19 | 11 | 1E+100 | N/A |
| Nitrate as N (mg/l) | | | | | 0 | 0 | 0 | 0 | 10 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Nitrite + Nitrate (mg/l) | | | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 132 | 1E+100 | 1E+100 | 1E+100 | N/A |
| METALS AND CYANIDE | | | | | | | | | | | | | | | |
| Antimony, dissolved (P) | 7440-36-0 | 60 | | | 0 | 0 | 0 | 0 | 6 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 640 | N/A |
| Arsenic, dissolved (P) | 7440-38-2 | 0.5 | | 1.274755102 | 2.715228367 | 2.71522837 | 2.71522837 | 2.70764393 | 10 | 100 | 200 | 340 | 150 | 9 | N/A |
| Beryllium, dissolved | 7440-41-7 | 0.5 | | | 0 | 0 | 0 | 0 | 4 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Cadmium, dissolved | 7440-43-9 | 1 | | | 0 | 0 | 0 | 0 | 5 | 10 | 50 | 1.348811145 | 0.38169844 | 1E+100 | N/A |
| Chromium (III), dissolved | 16065-83-1 | 10 | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 1E+100 | 468.758954 | 60.9759092 | 1E+100 | N/A |
| Chromium (VI), dissolved | 18540-29-9 | 10 | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 1E+100 | 16 | 11 | 1E+100 | N/A |
| Chromium, dissolved | 7440-47-3 | | | 2.7 | 5.751 | 5.751 | 5.751 | 5.73493575 | 100 | 100 | 1000 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Copper, dissolved | 7440-50-8 | 0.5 | | 1.260996229 | 2.685921967 | 2.68592197 | 2.68592197 | 2.67841939 | 1300 | 200 | 500 | 10.73686805 | 7.30606746 | 1E+100 | N/A |
| Lead, dissolved | 7439-92-1 | 0.5 | | 0 | 0 | 0 | 0 | 0 | 15 | 5000 | 100 | 49.77827924 | 1.93978808 | 1E+100 | N/A |
| Manganese, dissolved | 7439-96-5 | | | 0 | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 1E+100 | 2757.883231 | 1523.7333 | 1E+100 | N/A |

| POLLUTANTS | CAS No. | MQL | Instream Waste Concentration | | | | | | Livestock& | Acute | Chronic | Human | Need | Health | TMDL |
|-------------------------------|-----------|-----------|------------------------------|-------------|---------------|------------|--------------|------------|------------|------------|----------|-------------|------------|---------|------|
| | | | Ambient | Effluent | Acute | Domestic | Chronic | Human | Domestic | Irrigation | Wildlife | Aquatic | Aquatic | | |
| | | | Conc | Conc. | Aquatic | Supply | Aquatic | Health | Criteria | Criteria | Criteria | Criteria | Criteria | | |
| | | Ca (ug/l) | Ce (ug/l) | 2.13*Ce | Cd,dom (ug/l) | Cd (ug/l) | Cd,hh (ug/l) | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | | |
| Mercury, dissolved | 7439-97-6 | 0.005 | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 1E+100 | 1.4 | 0.77 | 1E+100 | N/A |
| Mercury, total | 7439-97-6 | 0.005 | | | 0 | 0 | 0 | 0 | 2 | 1E+100 | 0.77 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Molybdenum, dissolved | 7439-98-7 | | | | 0 | 0 | 0 | 0 | 1E+100 | 1000 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| Molybdenum, total recoverable | 7439-98-7 | | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 1E+100 | 7920 | 1895 | 1E+100 | N/A |
| Nickel, dissolved (P) | 7440-02-0 | 0.5 | | 0.530802509 | 1.130609345 | 1.13060935 | 1.13060935 | 1.12745122 | 700 | 1E+100 | 1E+100 | 382.7593232 | 42.5127439 | 4600 | N/A |
| Selenium, dissolved (P) | 7782-49-2 | 5 | | | 0 | 0 | 0 | 0 | 50 | 130 | 50 | 1E+100 | 1E+100 | 4200 | N/A |
| Selenium, dis (SO4 >500 mg/l) | | 5 | | | 0 | 0 | 0 | 0 | 50 | 250 | 50 | 1E+100 | 1E+100 | 4200 | N/A |
| Selenium, total recoverable | 7782-49-2 | 5 | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 5 | 20 | 5 | 1E+100 | N/A |
| Silver, dissolved | 7440-22-4 | 0.5 | | 0 | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 1E+100 | 2.135223714 | 1E+100 | 1E+100 | N/A |
| Thallium, dissolved (P) | 7440-28-0 | 0.5 | | | 0 | 0 | 0 | 0 | 2 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.47 | N/A |
| Zinc, dissolved | 7440-66-6 | 20 | | 13.15577433 | 28.02179933 | 28.0217993 | 28.0217993 | 27.9435261 | 10500 | 2000 | 25000 | 128.8340408 | 97.6097552 | 26000 | N/A |
| Cyanide, total recoverable | 57-12-5 | 10 | | | 0 | 0 | 0 | 0 | 200 | 1E+100 | 5.2 | 22 | 5.2 | 140 | N/A |
| Dioxin | 1764-01-6 | 0.00001 | | | 0 | 0 | 0 | 0 | 3.00E-05 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 5.1E-08 | N/A |
| VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| Acrolein | 107-02-8 | 50 | | | 0 | 0 | 0 | 0 | 18 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 9 | N/A |
| Acrylonitrile | 107-13-0 | 20 | | | 0 | 0 | 0 | 0 | 0.65 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 2.5 | N/A |
| Benzene | 71-43-2 | 10 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 510 | N/A |
| Bromoform | 75-25-2 | 10 | | 15.5 | 33.015 | 33.015 | 33.015 | 32.9227793 | 44 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1400 | N/A |
| Carbon Tetrachloride | 56-23-5 | 2 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 16 | N/A |
| Chlorobenzene | 108-90-7 | 10 | | | 0 | 0 | 0 | 0 | 100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1600 | N/A |
| Clorodibromomethane | 124-48-1 | 10 | | 40 | 85.2 | 85.2 | 85.2 | 84.9620112 | 4.2 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 130 | N/A |
| Chloroform | 67-66-3 | 50 | | 15.7 | 33.441 | 33.441 | 33.441 | 33.3475894 | 57 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 4700 | N/A |
| Dichlorobromomethane | 75-27-4 | 10 | | 28.9 | 61.557 | 61.557 | 61.557 | 61.3850531 | 5.6 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 170 | N/A |
| 1,2-Dichloroethane | 107-06-2 | 10 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 370 | N/A |
| 1,1-Dichloroethylene | 75-35-4 | 10 | | | 0 | 0 | 0 | 0 | 7 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 7100 | N/A |
| 1,2-Dichloropropane | 78-87-5 | 10 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 150 | N/A |
| 1,3-Dichloropropylene | 542-75-6 | 10 | | | 0 | 0 | 0 | 0 | 3.5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 210 | N/A |
| Ethylbenzene | 100-41-4 | 10 | | | 0 | 0 | 0 | 0 | 700 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 2100 | N/A |
| Methyl Bromide | 74-83-9 | 50 | | | 0 | 0 | 0 | 0 | 49 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1500 | N/A |
| Methylene Chloride | 75-09-2 | 20 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 5900 | N/A |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 10 | | | 0 | 0 | 0 | 0 | 1.8 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 40 | N/A |
| Tetrachloroethylene | 127-18-4 | 10 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 33 | N/A |
| Toluene | 108-88-3 | 10 | | | 0 | 0 | 0 | 0 | 1000 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 15000 | N/A |
| 1,2-trans-Dichloroethylene | 156-60-5 | 10 | | | 0 | 0 | 0 | 0 | 100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 10000 | N/A |
| 1,1,1-Trichloroethane | 71-55-6 | | | | 0 | 0 | 0 | 0 | 200 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | N/A |
| 1,1,2-Trichloroethane | 79-00-5 | 10 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 160 | N/A |
| Trichloroethylene | 79-01-6 | 10 | | | 0 | 0 | 0 | 0 | 5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 300 | N/A |
| Vinyl Chloride | 75-01-4 | 10 | | | 0 | 0 | 0 | 0 | 2 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 24 | N/A |
| ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 2-Chlorophenol | 95-57-8 | 10 | | | 0 | 0 | 0 | 0 | 175 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 150 | N/A |
| 2,4-Dichlorophenol | 120-83-2 | 10 | | | 0 | 0 | 0 | 0 | 105 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 290 | N/A |
| 2,4-Dimethylphenol | 105-67-9 | 10 | | | 0 | 0 | 0 | 0 | 700 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 850 | N/A |
| 4,6-Dinitro-o-Cresol | 534-52-1 | 50 | | | 0 | 0 | 0 | 0 | 14 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 280 | N/A |

| POLLUTANTS | CAS No. | MQL | Instream Waste Concentration | | | | | | | Livestock& Wildlife | Acute Aquatic | Chronic Aquatic | Human Health | Need TMDL | |
|-----------------------------|----------|-----|------------------------------|-------------------|------------------|--------------------|--------------------|-----------------|----------------------|------------------------|------------------|--------------------|-----------------|--------------|------------------------|
| | | | Ambient Conc | Effluent Conc. | Acute Aquatic | Domestic Supply | Chronic Aquatic | Human Health | Domestic Criteria | | | | | | Irrigation Criteria |
| | | | Ca (ug/l) | Ce (ug/l) | 2.13*Ce | Cd,dom (ug/l) | Cd (ug/l) | Cd,hh (ug/l) | ug/l | | | | | | ug/l |
| 2,4-Dinitrophenol | 51-28-5 | 50 | | | 0 | 0 | 0 | 0 | 70 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 5300 | N/A |
| Pentachlorophenol | 87-86-5 | 50 | | | 0 | 0 | 0 | 0 | 1 | 1E+100 | 1E+100 | 19 | 15 | 30 | N/A |
| Phenol | 108-95-2 | 10 | | | 0 | 0 | 0 | 0 | 10500 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 860000 | N/A |
| 2,4,6-Trichlorophenol | 88-06-2 | 10 | | | 0 | 0 | 0 | 0 | 32 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 24 | N/A |
| BASE/NEUTRAL | | | | | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 10 | | | 0 | 0 | 0 | 0 | 2100 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 990 | N/A |
| Anthracene | 120-12-7 | 10 | | | 0 | 0 | 0 | 0 | 10500 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 40000 | N/A |
| Benzidine | 92-87-5 | 50 | | | 0 | 0 | 0 | 0 | 0.0015 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.002 | N/A |
| Benzo(a)anthracene | 56-55-3 | 5 | | | 0 | 0 | 0 | 0 | 0.048 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.18 | N/A |
| Benzo(a)pyrene | 50-32-8 | 5 | | | 0 | 0 | 0 | 0 | 0.2 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.18 | N/A |
| 3,4-Benzofluoranthene | 205-99-2 | 10 | | | 0 | 0 | 0 | 0 | 0.048 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.18 | N/A |
| Benzo(k)fluoranthene | 207-08-9 | 5 | | | 0 | 0 | 0 | 0 | 0.048 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.18 | N/A |
| Bis(2-chloroethyl)Ether | 111-44-4 | 10 | | | 0 | 0 | 0 | 0 | 0.3 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 5.3 | N/A |
| Bis(2-chloroisopropyl)Ether | 108-60-1 | 10 | | | 0 | 0 | 0 | 0 | 1400 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 65000 | N/A |
| Bis(2-ethylhexyl)Phthalate | 117-81-7 | 10 | | | 0 | 0 | 0 | 0 | 6 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 22 | N/A |
| Butyl Benzyl Phthalate | 85-68-7 | 10 | | | 0 | 0 | 0 | 0 | 7000 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1900 | N/A |
| 2-Chloronaphthalene | 91-58-7 | 10 | | | 0 | 0 | 0 | 0 | 2800 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1600 | N/A |
| Chrysene | 218-01-9 | 5 | | | 0 | 0 | 0 | 0 | 0.048 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.18 | N/A |
| Dibenzo(a,h)anthracene | 53-70-3 | 5 | | | 0 | 0 | 0 | 0 | 0.048 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.18 | N/A |
| 1,2-Dichlorobenzene | 95-50-1 | 10 | | | 0 | 0 | 0 | 0 | 600 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1300 | N/A |
| 1,3-Dichlorobenzene | 541-73-1 | 10 | | | 0 | 0 | 0 | 0 | 469 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 960 | N/A |
| 1,4-Dichlorobenzene | 106-46-7 | 10 | | | 0 | 0 | 0 | 0 | 75 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 190 | N/A |
| 3,3'-Dichlorobenzidine | 91-94-1 | 5 | | | 0 | 0 | 0 | 0 | 0.78 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.28 | N/A |
| Diethyl Phthalate | 84-66-2 | 10 | | | 0 | 0 | 0 | 0 | 28000 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 44000 | N/A |
| Dimethyl Phthalate | 131-11-3 | 10 | | | 0 | 0 | 0 | 0 | 350000 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1100000 | N/A |
| Di-n-Butyl Phthalate | 84-74-2 | 10 | | | 0 | 0 | 0 | 0 | 3500 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 4500 | N/A |
| 2,4-Dinitrotoluene | 121-14-2 | 10 | | | 0 | 0 | 0 | 0 | 1.1 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 34 | N/A |
| 1,2-Diphenylhydrazine | 122-66-7 | 20 | | | 0 | 0 | 0 | 0 | 0.44 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 2 | N/A |
| Fluoranthene | 206-44-0 | 10 | | | 0 | 0 | 0 | 0 | 1400 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 140 | N/A |
| Fluorene | 86-73-7 | 10 | | | 0 | 0 | 0 | 0 | 1400 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 5300 | N/A |
| Hexachlorobenzene | 118-74-1 | 5 | | | 0 | 0 | 0 | 0 | 1 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.0029 | N/A |
| Hexachlorobutadiene | 87-68-3 | 10 | | | 0 | 0 | 0 | 0 | 4.5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 180 | N/A |
| Hexachlorocyclopentadiene | 77-47-4 | 10 | | | 0 | 0 | 0 | 0 | 50 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 1100 | N/A |
| Hexachloroethane | 67-72-1 | 20 | | | 0 | 0 | 0 | 0 | 25 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 33 | N/A |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | 5 | | | 0 | 0 | 0 | 0 | 0.048 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.18 | N/A |
| Isophorone | 78-59-1 | 10 | | | 0 | 0 | 0 | 0 | 368 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 9600 | N/A |
| Nitrobenzene | 98-95-3 | 10 | | | 0 | 0 | 0 | 0 | 18 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 690 | N/A |
| n-Nitrosodimethylamine | 62-75-9 | 50 | | | 0 | 0 | 0 | 0 | 0.0069 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 30 | N/A |
| n-Nitrosodi-n-Propylamine | 621-64-7 | 20 | | | 0 | 0 | 0 | 0 | 0.05 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 5.1 | N/A |
| n-Nitrosodiphenylamine | 86-30-6 | 20 | | | 0 | 0 | 0 | 0 | 71 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 60 | N/A |
| Pyrene | 129-00-0 | 10 | | | 0 | 0 | 0 | 0 | 1050 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 4000 | N/A |
| 1,2,4-Trichlorobenzene | 120-82-1 | 10 | | | 0 | 0 | 0 | 0 | 70 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 70 | N/A |

| POLLUTANTS | CAS No. | MQL | Instream Waste Concentration | | | | | | | | Livestock& Wildlife Criteria ug/l | Acute Aquatic Criteria ug/l | Chronic Aquatic Criteria ug/l | Human Health Criteria ug/l | Need TMDL |
|----------------------------|------------|------|------------------------------|-------------------|------------------|--------------------|--------------------|-----------------|----------------------|------------------------|--|--------------------------------------|--|-------------------------------------|--------------|
| | | | Ambient Conc | Effluent Conc. | Acute Aquatic | Domestic Supply | Chronic Aquatic | Human Health | Domestic Criteria | Irrigation Criteria | | | | | |
| | | | Ca (ug/l) | Ce (ug/l) | 2.13*Ce | Cd,dom (ug/l) | Cd (ug/l) | Cd,hh (ug/l) | ug/l | ug/l | | | | | |
| PESTICIDES AND PCBs | | | | | | | | | | | | | | | |
| Aldrin | 309-00-2 | 0.01 | | | 0 | 0 | 0 | 0 | 0.021 | 1E+100 | 1E+100 | 3 | 1E+100 | 0.0005 | N/A |
| Alpha-BHC | 319-84-6 | 0.05 | | | 0 | 0 | 0 | 0 | 0.056 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.049 | N/A |
| Beta-BHC | 319-85-7 | 0.05 | | | 0 | 0 | 0 | 0 | 0.091 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.17 | N/A |
| Gamma-BHC | 58-89-9 | 0.05 | | | 0 | 0 | 0 | 0 | 0.2 | 1E+100 | 1E+100 | 0.95 | 1E+100 | 1.8 | N/A |
| Chlordane | 57-74-9 | 0.2 | | | 0 | 0 | 0 | 0 | 2 | 1E+100 | 1E+100 | 2.4 | 0.0043 | 0.0081 | N/A |
| 4,4'-DDT and derivatives | 50-29-3 | 0.02 | | | 0 | 0 | 0 | 0 | 1 | 1E+100 | 0.001 | 1.1 | 0.001 | 0.0022 | N/A |
| Dieldrin | 60-57-1 | 0.02 | | | 0 | 0 | 0 | 0 | 0.022 | 1E+100 | 1E+100 | 0.24 | 0.056 | 0.00054 | N/A |
| Diazinon | 333-41-5 | | | | 0 | 0 | 0 | 0 | 1E+100 | 1E+100 | 1E+100 | 0.17 | 0.17 | 1E+100 | N/A |
| Alpha-Endosulfan | 959-98-8 | 0.01 | | | 0 | 0 | 0 | 0 | 62 | 1E+100 | 1E+100 | 0.22 | 0.056 | 89 | N/A |
| Beta-Endosulfan | 33213-65-9 | 0.02 | | | 0 | 0 | 0 | 0 | 62 | 1E+100 | 1E+100 | 0.22 | 0.056 | 89 | N/A |
| Endosulfan sulfate | 1031-7-8 | 0.1 | | | 0 | 0 | 0 | 0 | 62 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 89 | N/A |
| Endrin | 72-20-8 | 0.02 | | | 0 | 0 | 0 | 0 | 2 | 1E+100 | 1E+100 | 0.086 | 0.036 | 0.06 | N/A |
| Endrin Aldehyde | 7421-93-4 | 0.1 | | | 0 | 0 | 0 | 0 | 10.5 | 1E+100 | 1E+100 | 1E+100 | 1E+100 | 0.3 | N/A |
| Heptachlor | 76-44-8 | 0.01 | | | 0 | 0 | 0 | 0 | 0.4 | 1E+100 | 1E+100 | 0.52 | 0.0038 | 0.00079 | N/A |
| Heptachlor Epoxide | 1024-57-3 | 0.01 | | | 0 | 0 | 0 | 0 | 0.2 | 1E+100 | 1E+100 | 0.52 | 0.0038 | 0.00039 | N/A |
| PCBs | 1336-36-3 | 0.2 | | 0.000565 | 0.00120345 | 0.00120345 | 0.00120345 | 0.00120009 | 0.5 | 1E+100 | 0.014 | 2 | 0.014 | 0.00064 | N/A |
| Toxaphene | 8001-35-2 | 0.3 | | | 0 | 0 | 0 | 0 | 3 | 1E+100 | 1E+100 | 0.73 | 0.0002 | 0.0028 | N/A |

Note: SCORET CODE for reference only. Codes for total form are used except for parameters which have criteria in both total and dissolved forms.

STEP 3: SCAN POTENTIAL INSTREAM WASTE CONCENTRATIONS AGAINST WATER QUALITY CRITERIA
AND ESTABLISH EFFLUENT LIMITATIONS FOR ALL APPLICABLE PARAMETERS

No limits are established if the receiving stream is not designated for the particular uses.

No limits are established if the potential instream waste concentrations are less than the chronic water quality criteria.

The most applicable stringent criteria are used to establish effluent limitations for a given parameter.

Water quality criteria apply at the end-of-pipe for acute aquatic life criteria and discharges to public lakes.

If background concentration exceeds the water quality criteria, water quality criteria apply. And "Need TMDL" shown to the next column of Avg. Mass

Monthly avg concentration = daily max. / 1.5.

APPLICABLE WATER QUALITY-BASED LIMITS

The following formula is used to calculate the allowable daily maximum effluent concentration

See "Procedures for Implementing NPDES Permits in New Mexico" amended July 2009

Daily Max. Conc. = $C_s + (C_s - C_a)(F \cdot Q_a / Q_e)$

Monthly Avg. Conc. = Daily Max. Conc. / 1.5

Where:

C_s = Applicable water quality standard

C_a = Ambient stream concentration

F = Fraction of stream allowed for mixing (1.0 is assigned to domestic water supply and human health uses)

Q_e = Plant effluent flow

Q_a = Criteria Low flow (4Q3) or Harmonic Mean flow for Human Health Criteria

