

## 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)	03A160	
Plant Effluent Flow (MGD)	0.0026	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)	0.00403	

#### RECEIVING STREAM

#### DATA INPUT

Receiving Stream Name	Ten Site Canyon	
Basin Name	Rio Grande	
Waterbody Segment Code No.	20.6.4.128	
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)	1	(MUST enter "1" for 2005 Standards)
Are chronic aquatic life criteria considered (1= yes, 0=no)	0	Designated uses: livestock watering, wildlife habitat, limited aquatic life and secondary contact.
Are domestic water supply criteria considered (1= yes, 0=no)	0	Limited aquatic life: The acute aquatic life criteria of Subsections I and J of this section apply to this subcategory. Chronic
Are irrigation water supply criteria considered (1= yes, 0=no)	0	
Livestock watering and wildlife habitat criteria applied to all streams	0	

#### USGS Flow Station

#### USGS

WQ Monitoring Station No.	SJR	
Receiving Stream TSS (mg/l)	1.1	For intermittent stream, enter effluent TSS
Receiving Stream Hardness (mg/l as CaCO <sub>3</sub> )	102	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 Max)	23.4	
pH (Max)	8.7	
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

$$Kp = Kpo \cdot (TSS^{**a})$$

Kp = Linear partition coefficient; Kpo and a can be found in table below

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

TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)

$$\text{Total Metal Criteria (Ct)} = Cr / (C/Ct)$$

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	4.3	480000	-0.73	447738.6415	0.670011136	2.881047887	480000	-0.73	447738.6415	0.670011136	2.88104789
Chromium III	5.15	3360000	-0.93	3074992.637	0.228180684	1.175130523	2170000	-0.27	2114870.157	0.300629171	1.54824023
Copper	11.9	1040000	-0.74	969176.2259	0.484005119	5.759660922	2850000	-0.9	2615721.146	0.257911881	3.06915139
Lead	2.41	2800000	-0.8	2594441.504	0.259478378	0.625342892	2040000	-0.53	1939510.094	0.319135922	0.76911757
Nickel	1.6	490000	-0.57	464090.0416	0.662032858	1.059252572	2210000	-0.76	2055577.394	0.306641693	0.49062671
Silver	0	2390000	-1.03	2166523.655	0.295580246	0	2390000	-1.03	2166523.655	0.295580246	0
Zinc	11.2	1250000	-0.7	1169324.727	0.437396108	4.898836405	3340000	-0.68	3130397.16	0.22505102	2.52057142

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	$e(1.3695[\ln(\text{hardness})]+1.8308)$	3514.66772	If Stream pH < 6.5, enter 750 in cell O113
	Chronic	$e(1.3695[\ln(\text{hardness})]+0.9161)$	1408.105225	If Stream pH < 6.5, enter 87 in cell P113
Cadmium (D)	Acute	$e(0.8968[\ln(\text{hardness})]-3.5699) \cdot CF1$	1.680799232	CF1 = 1.136672 - 0.041838*ln(hardness)
	Chronic	$e(0.7647[\ln(\text{hardness})]-4.2180) \cdot CF2$	0.459505506	CF2 = 1.101672 - 0.041838*ln(hardness)

			Dissolved WQC (ug/l)	
Chromium III (D)	Acute	$0.316 e(0.819[\ln(\text{hardness})]+3.7256)$	579.0794391	
	Chronic	$0.860 e(0.819[\ln(\text{hardness})]+0.6848)$	75.32633773	
Copper (D)	Acute	$0.960 e(0.9422[\ln(\text{hardness})]-1.700)$	13.69221455	
	Chronic	$0.960 e(0.8545[\ln(\text{hardness})]-1.702)$	9.10858408	
Lead (D)	Acute	$e(1.273[\ln(\text{hardness})]-1.46)*CF3$	65.98849117	CF3 = 1.46203 - 0.145712*ln(hardness)
	Chronic	$e(1.273[\ln(\text{hardness})]-4.705)*CF4$	2.571476765	CF4 = 1.46203 - 0.145712*ln(hardness)
Manganese (D)	Acute	$e(0.3331[\ln(\text{hardness})]+6.4676)$	3005.437551	
	Chronic	$e(0.3331[\ln(\text{hardness})]+5.8743)$	1660.507312	
Nickel (D)	Acute	$0.998 e(0.846[\ln(\text{hardness})]+2.255)$	476.1462226	
	Chronic	$0.997 e(0.846[\ln(\text{hardness})]+0.0584)$	52.88514524	
Silver (D)	Acute	$0.85 e(1.72[\ln(\text{hardness})]-6.59)$	3.32820896	
Zinc (D)	Acute	$0.978 e(0.9094[\ln(\text{hardness})]+0.9095)$	162.9111023	
	Chronic	$0.986 e(0.90947[\ln(\text{hardness})]+0.6235)$	123.4301119	

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						
<b>Radioactivity, Nutrients, and Chlorine</b>															
Aluminum, total	7429-90-5	2.5	68	144.84	144.84	144.84	104.606667	1E+100	5000	1E+100	3514.66772	1408.10523	1E+100	N/A	
Barium, dissolved	7440-39-3	100	65.3	139.089	139.089	139.089	100.453167	2000	1E+100	1E+100	1E+100	1E+100	1E+100	N/A	
Boron, dissolved	7440-42-8	100	69.1	147.183	147.183	147.183	106.298833	1E+100	750	5000	1E+100	1E+100	1E+100	N/A	
Cobalt, dissolved	7440-48-4	50	0	0	0	0	0	1E+100	50	1000	1E+100	1E+100	1E+100	N/A	
Uranium, dissolved	7440-61-1	0.1	0	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	0	1E+100	100	100	1E+100	1E+100	1E+100	N/A	
Ra-226 and Ra-228 (pCi/l)			0.379	0.80727	0.80727	0.80727	0.58302833	5	1E+100	30	1E+100	1E+100	1E+100	N/A	
Strontium (pCi/l)			0	0	0	0	0	8	1E+100	1E+100	1E+100	1E+100	1E+100	N/A	
Tritium (pCi/l)			0	0	0	0	0	20000	1E+100	20000	1E+100	1E+100	1E+100	N/A	
Gross Alpha (pCi/l)			0.0712	0.151656	0.151656	0.151656	0.10952933	15	1E+100	15	1E+100	1E+100	1E+100	N/A	
Asbestos (fibers/l)			0	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	0	1E+100	1E+100	11	19	11	1E+100	N/A	
Nitrate as N (mg/l)			0	0	0	0	0	10	1E+100	1E+100	1E+100	1E+100	1E+100	N/A	
Nitrite + Nitrate (mg/l)			0.752	1.60176	1.60176	1.60176	1.15682667	1E+100	1E+100	132	1E+100	1E+100	1E+100	N/A	
<b>METALS AND CYANIDE</b>															
Antimony, dissolved (P)	7440-36-0	60	0	0	0	0	0	6	1E+100	1E+100	1E+100	1E+100	640	N/A	
Arsenic, dissolved (P)	7440-38-2	0.5	2.881047887	6.136631998	6.136631998	6.136632	4.432012	10	100	200	340	150	9	N/A	
Beryllium, dissolved	7440-41-7	0.5	0	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	0	5	10	50	1.680799232	0.45950551	1E+100	N/A	
Chromium (III), dissolved	16065-83-1	10	1.175130523	2.503028014	2.503028014	2.50302801	1.80774245	1E+100	1E+100	1E+100	579.0794391	75.3263377	1E+100	N/A	
Chromium (VI), dissolved	18540-29-9	10	5.15	10.9695	10.9695	10.9695	7.92241667	1E+100	1E+100	1E+100	16	11	1E+100	N/A	
Chromium, dissolved	7440-47-3		5.15	10.9695	10.9695	10.9695	7.92241667	100	100	1000	1E+100	1E+100	1E+100	N/A	
Copper, dissolved	7440-50-8	0.5	5.759660922	12.26807776	12.26807776	12.2680778	8.86027838	1300	200	500	13.69221455	9.10858408	1E+100	N/A	
Lead, dissolved	7439-92-1	0.5	0.625342892	1.33198036	1.33198036	1.33198036	0.96198582	15	5000	100	65.98849117	2.57147676	1E+100	N/A	
Manganese, dissolved	7439-96-5		2	4.26	4.26	4.26	3.07666667	1E+100	1E+100	1E+100	3005.437551	1660.50731	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		
Mercury, dissolved	7439-97-6	0.005		0.067	0.14271	0.14271	0.14271	0.10306833	1E+100	1E+100	1E+100	1.4	0.77	1E+100	N/A
Mercury, total	7439-97-6	0.005		0.067	0.14271	0.14271	0.14271	0.10306833	2	1E+100	0.77	1E+100	1E+100	1E+100	N/A
Molybdenum, dissolved	7439-98-7			2.72	5.7936	5.7936	5.7936	4.18426667	1E+100	1000	1E+100	1E+100	1E+100	1E+100	N/A
Molybdenum, total recoverable	7439-98-7			2.72	5.7936	5.7936	5.7936	4.18426667	1E+100	1E+100	1E+100	7920	1895	1E+100	N/A
Nickel, dissolved (P)	7440-02-0	0.5		1.059252572	2.256207979	2.256207979	2.25620798	1.62948354	700	1E+100	1E+100	476.1462226	52.8851452	4600	N/A
Selenium, dissolved (P)	7782-49-2	5		2	4.26	4.26	4.26	3.07666667	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		2	4.26	4.26	4.26	3.07666667	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	3.32820896	1E+100	1E+100	N/A
Thallium, dissolved (P)	7440-28-0	0.5		0.6	1.278	1.278	1.278	0.923	2	1E+100	1E+100	1E+100	1E+100	0.47	N/A
Zinc, dissolved	7440-66-6	20		4.898836405	10.43452154	10.43452154	10.4345215	7.53604334	10500	2000	25000	162.9111023	123.430112	26000	N/A
Cyanide, total recoverable	57-12-5	10		0	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	0	3.00E-05	1E+100	1E+100	1E+100	1E+100	5.1E-08	N/A
<b>VOLATILE COMPOUNDS</b>															
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			0	0	0	0	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			0	0	0	0	4.2	1E+100	1E+100	1E+100	1E+100	130	N/A
Chloroform	67-66-3	50			0	0	0	0	57	1E+100	1E+100	1E+100	1E+100	4700	N/A
Dichlorobromomethane	75-27-4	10			0	0	0	0	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
<b>ACID COMPOUNDS</b>															
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						
			Ca (ug/l)	Ce (ug/l)	2.13*Ce	Cd,dom (ug/l)	Cd (ug/l)	Cd,hh (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		8.41	17.9133	17.9133	17.9133	12.9373833	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
<b>BASE/NEUTRAL</b>															
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	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		67.4	143.562	143.562	143.562	103.683667	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&	Acute	Chronic	Human	Need
			Ambient	Effluent	Acute	Domestic	Chronic	Human	Domestic	Irrigation	Wildlife	Aquatic	Aquatic	Health	TMDL
			Conc	Conc.	Aquatic	Supply	Aquatic	Health	Criteria	Criteria	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	
<b>PESTICIDES AND PCBs</b>															
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	0	0	0	0	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

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

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

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

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







