



DEQ
MONTANA 

Montana Wadeable In-Stream Water Quality Standards

total-P: 0.025-0.15 mg/L

total-N: 0.275-1.30 mg/L



Montana Effluent Limits



Phased-In Nutrient Limits

	total-N (mg/L)				total-P (mg/L)			
	2016	2021	2026	2036	2016	2021	2026	2036
Lagoons	-	-	-	?	-	-	-	?
Less than 1.0 MGD	15	10	8	?	2.0	1.0	0.8	?
More than 1.0 MGD	10	8	8	?	1.0	0.8	0.5	?



Training Classes

Free Training for Design Engineers:

Bill Oldham (2009)

JB Neethling (2010)

Glen Daiger (2011)

James Barnard & David Stensel (2012)

Free Training for Wastewater Operators:

Paul Klopping (2010)

Ron Schuyler (2011)

Greg Kidd & Grant Weaver (2012)

Greg Kidd & Grant Weaver (2013)

Grant Weaver (2014)

Grant Weaver (2015)



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In-Plant Technical Support

Big Sky (2014)

Billings (2014)

Bozeman (2014)

Chinook (2015)

Columbia Falls (2013, 2014 & 2015)

Conrad (2014 & 2015)

Dillon (2014)

East Helena (2014 & 2015)

Hamilton (2015)

Hardin (2015)

Helena (2012, 2013, 2014 & 2015)

Kalispell (2014 & 2015)

Lewistown (2013 & 2014)

Libby (2015)

Lolo (2014)

Missoula (2013)



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Montana BNR wwtps	effluent total-Nitrogen			effluent total-Phosphorus		
	Before (mg/L)	After (mg/L)	Percent Reduction	Before (mg/L)	After (mg/L)	Percent Reduction
Columbia Falls	10	7	32%	2.5	0.3	87%
East Helena	20	10	48%	NR	NR	NA
Helena	7	5	31%	2.9	2.0	32%
Manhattan	10	8	21%	1.5	0.4	73%



Montana non-BNR wwtps	effluent total-Nitrogen			effluent total-Phosphorus		
	Before (mg/L)	After (mg/L)	Percent Reduction	Before (mg/L)	After (mg/L)	Percent Reduction
Big Sky	25	14	46%	1.3	1.4	-8%
Chinook	26	3	88%	2.8	0.3	89%
Conrad	35	5	85%	2.1	0.1	94%
Hamilton	7	3	54%	5.5	4.0	28%
Hardin	18	4	78%	2.1	2.4	-14%
Libby	32	21	34%	4.6	3.0	35%
Lolo	28	21	25%	4.6	4.4	5%



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Conrad, Montana
0.5 MGD
Population: 2,600



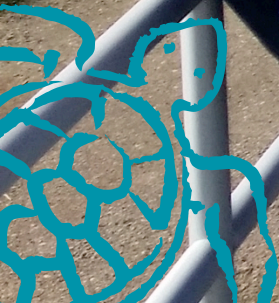


Chinook, Montana

0.5 MGD

Population: 1,300





Helena, Montana
5.4 MGD
Population: 30,000

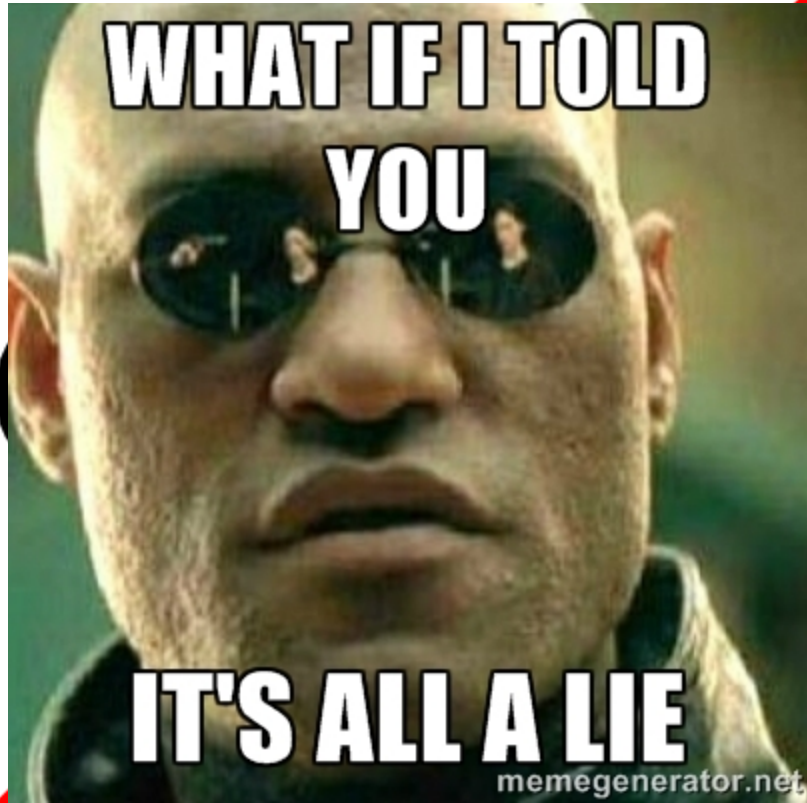
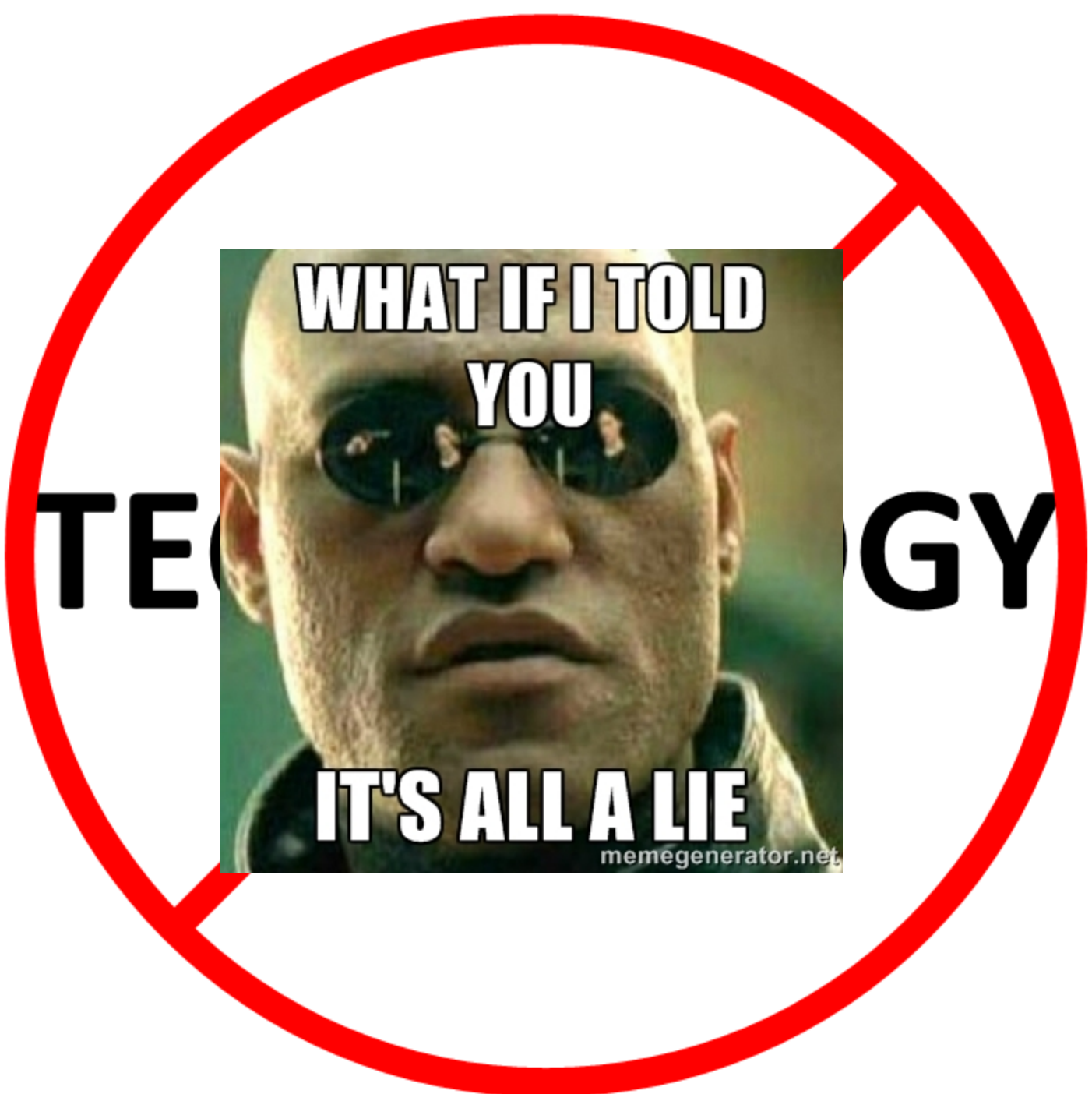


Lewis & Clark
Humane Society

Frontage Rd

Frontage Rd

Frontage Rd



TEC

GY

Regulatory Support is Critical

Biggest Barrier to Optimization is Regulatory:

“Follow Operations & Maintenance Manual”



DEQ
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The logo for the Department of Environmental Quality (DEQ) in Montana. It features the letters "DEQ" in a large, bold, blue serif font. Below "DEQ" is the word "MONTANA" in a smaller, blue, sans-serif font. To the right of "MONTANA" is a blue graphic element consisting of three wavy lines, resembling water or a stylized wave.

Regulatory Support is Critical

Biggest Barrier to Optimization is Regulatory:

“Follow Operations & Maintenance Manual”

Regulatory Support Encourages Optimization:

“Basically, we are training operators to hide their O&M Manuals in a dark corner somewhere and start operating their systems differently than they were originally designed for...”

Paul LaVigne
Program Manager
Water Pollution Control State Revolving Fund
Montana Department of Environmental Quality



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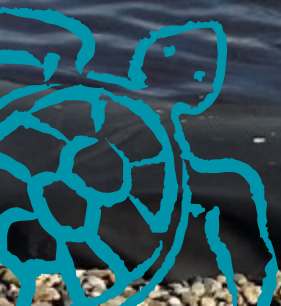




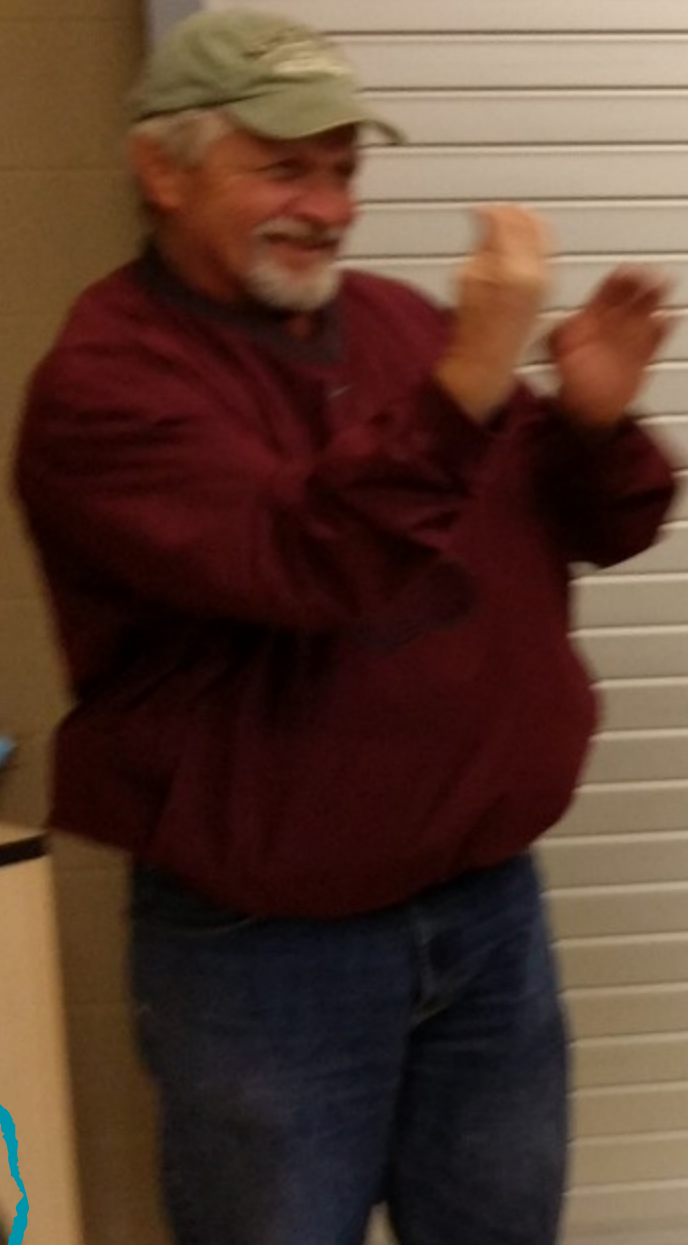


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WARNING
THIS EQUIPMENT
STARTS AND STOPS
AUTOMATICALLY

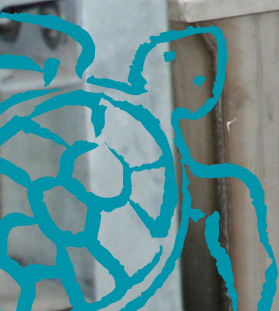
HEADWORKS INFLUENT SCREEN NO. 02
HW2-TR5-02

ron
.com



FIRST AID KIT

FIRE
EXTINGUISHER







Cost of Operator Training & Technical Support



Amherst, Massachusetts Athens North Mouse Creek, Tennessee Athens
Oostanaula, Tennessee Baileyton, Tennessee Barnstable, Massachusetts
Bartlett, Tennessee **Big Sky, Montana** Billings, Montana Bozeman, Montana
Chinook, Montana Colchester-East Hampton, Connecticut Columbia Falls,
Montana Conrad, Montana Cookeville, Tennessee Crossville, Tennessee
Dillon, Montana **East Haddam, Connecticut** East Helena, Montana
Easthampton, Massachusetts Farmington, Connecticut Greenfield,
Massachusetts Hamilton, Montana Hardin, Montana Helena, Montana
Kalispell, Montana **Keene, New Hampshire** LaFollette, Tennessee Lewistown,
Montana Libby, Montana Livingston, Tennessee Lolo, Montana
McKinleyville, California Missoula, Montana Montague, Massachusetts
Newburyport, Massachusetts New Hartford, Connecticut Norris, Tennessee
Northfield, Massachusetts **Nottingham MUD, Texas** Oak Ridge, Tennessee
Palmer, Massachusetts Plainfield North, Connecticut Plainfield Village,
Connecticut Portland, Connecticut South Deerfield, Massachusetts South
Hadley, Massachusetts Suffield, Connecticut Sunderland, Massachusetts
Upton, Massachusetts Westfield, Massachusetts Windham, Connecticut

Southwest 

Without a **Heart**,
it's just a machine.

2014 Southwest Airlines
One Report™



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