LAS VEGAS WASH
Sampling and Analyses

DEPARTMENT OF UTILITY SERVICES
Water Quality Laboratory
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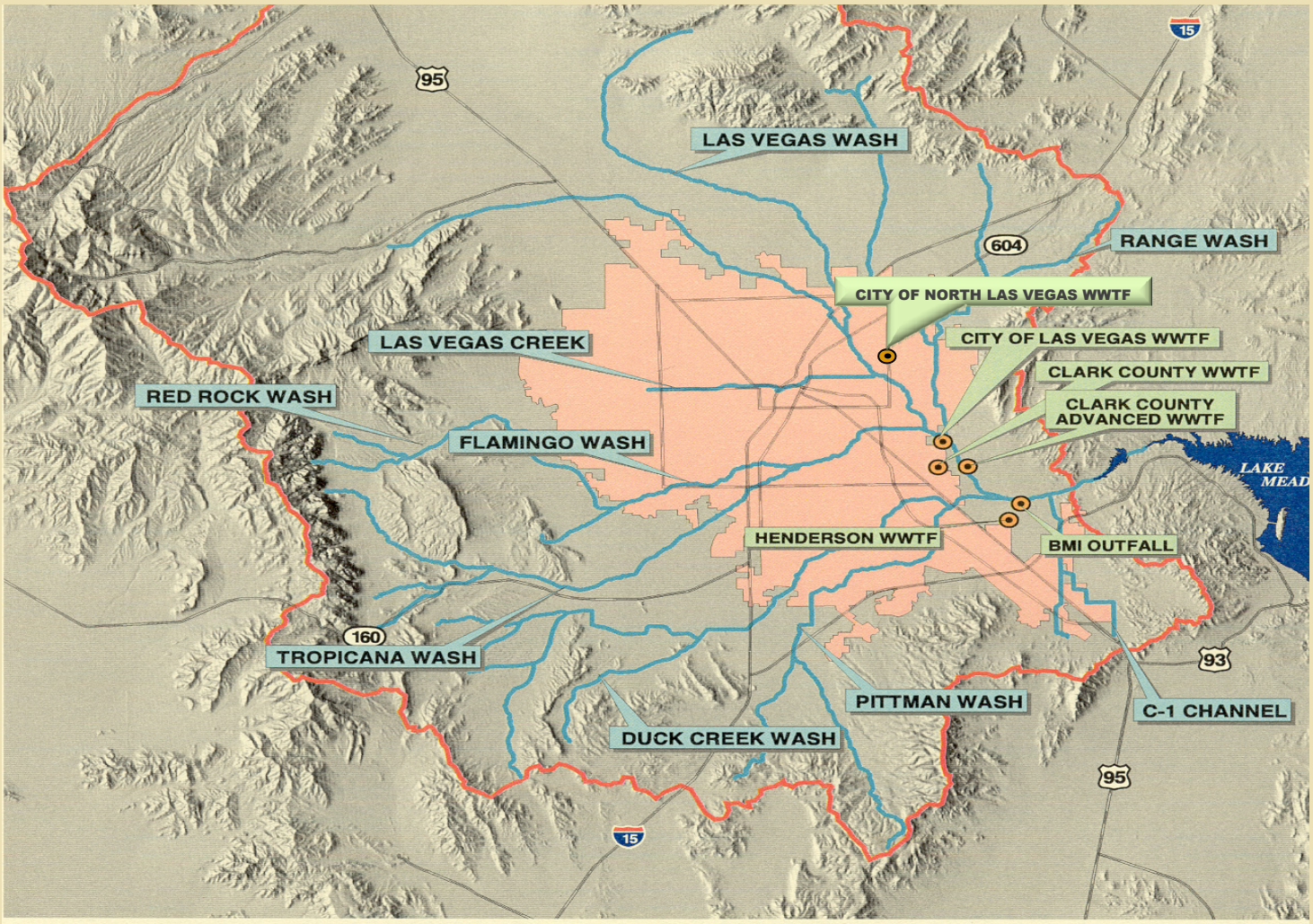
July 11, 2012

The Wash & Tributaries



Wastewater Treatment in the LV Valley

- National Pollutant Discharge Elimination System (NPDES) permits - issued and reviewed by Nevada Division of Environmental Protection (NDEP)

- Permits are issued for 5 years to:
  CCWRD
  CLV
  COH
  CNLV

Wastewater Treatment in the LV Valley

In accordance with their respective discharge permits, the dischargers collect and analyze samples from:

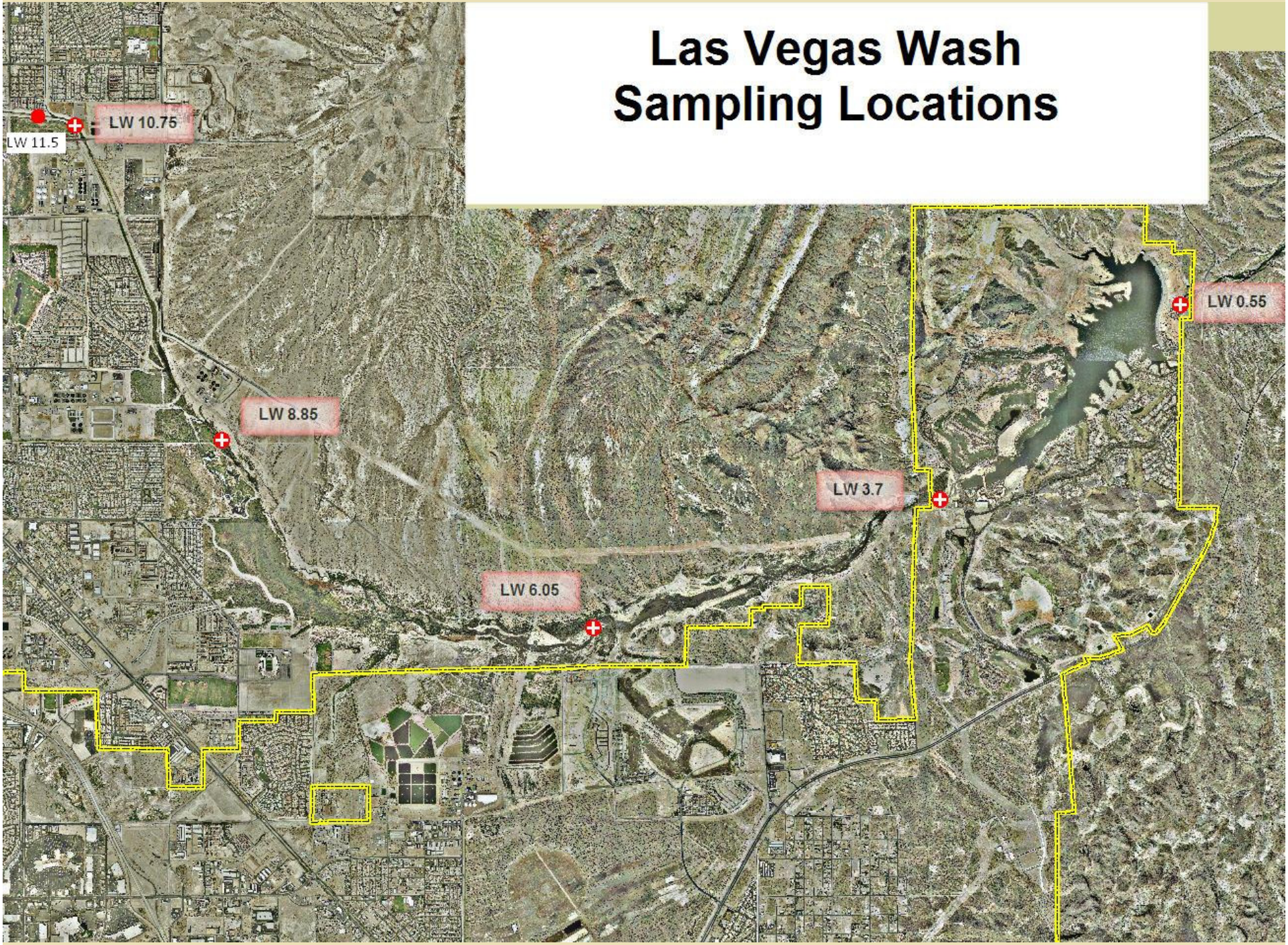
- Las Vegas Wash
- Las Vegas Bay
- Lake Mead

Data collected with this monitoring plan is used to

- assess compliance with water quality standards
- maintain water-quality model
- assess water quality trends

Data is uploaded to the Lower Colorado River Regional Water Quality Database

Las Vegas Wash Sampling Locations



Las Vegas Wash sampling locations

LW 11.5 (LW11.5) Las Vegas Wash just upstream of where Sloan Channel meets Las Vegas Wash. This is upstream where the City of North Las Vegas discharge enters the Las Vegas Wash (via the Sloan Channel). The purpose of this station is to determine the water quality of the Las Vegas Wash prior to discharges from any of the four wastewater treatment plants.

Las Vegas Wash sampling locations

LW 10.75 (LW11.1) Las Vegas Wash between the confluence of Las Vegas Wash with Flamingo Wash, and the City of Las Vegas Water Pollution Control Facility discharge. This station is also downstream of the confluence of the Sloan Channel and the Las Vegas Wash.

Las Vegas Wash sampling locations

LW 8.85 (LW8.85) Las Vegas Wash downstream of where the City of Las Vegas and Clark County Water Reclamation District discharge enters the Wash

Las Vegas Wash sampling locations

LW 6.05 (LW5.55)

Las Vegas Wash near Telephone Line Road, downstream of where the City of Henderson Water Reclamation Facility discharge enters the Las Vegas Wash.
The purpose of this station is to determine compliance for the upper Las Vegas Wash reach.

Las Vegas Wash sampling locations

LW 3.7 (LW 3.1) Las Vegas Wash before the sedimentation basin for Lake Las Vegas

Las Vegas Wash sampling locations

LW 0.55 (LW0.9) Las Vegas Wash at Northshore Road – Egress of pipe under Lake Las Vegas

Wastewater Treatment in the LV Valley

NDEP Permit Condition for Monitoring Program for the Las Vegas Wash

Biweekly (LW 11.5, 10.75, 8.85, 6.05, 3.7, 0.55)

- Field Measurements
- Microbiological and Lab Physical Measurements
- Nutrients

Biannually (LW 0.55)

- Toxic parameters

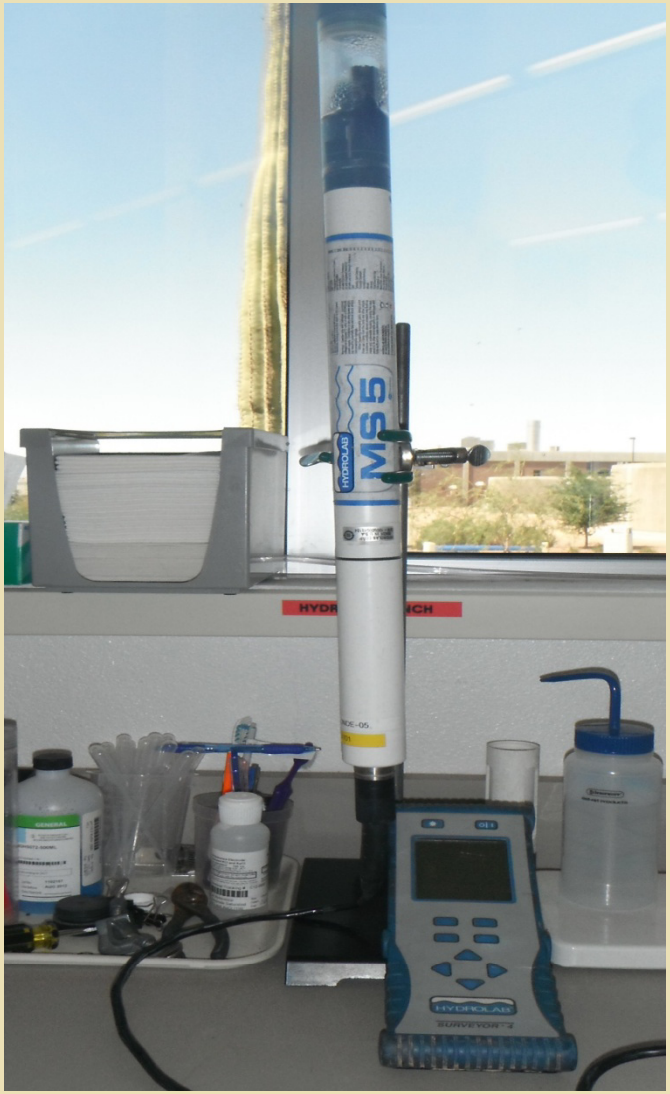
Field Measurements

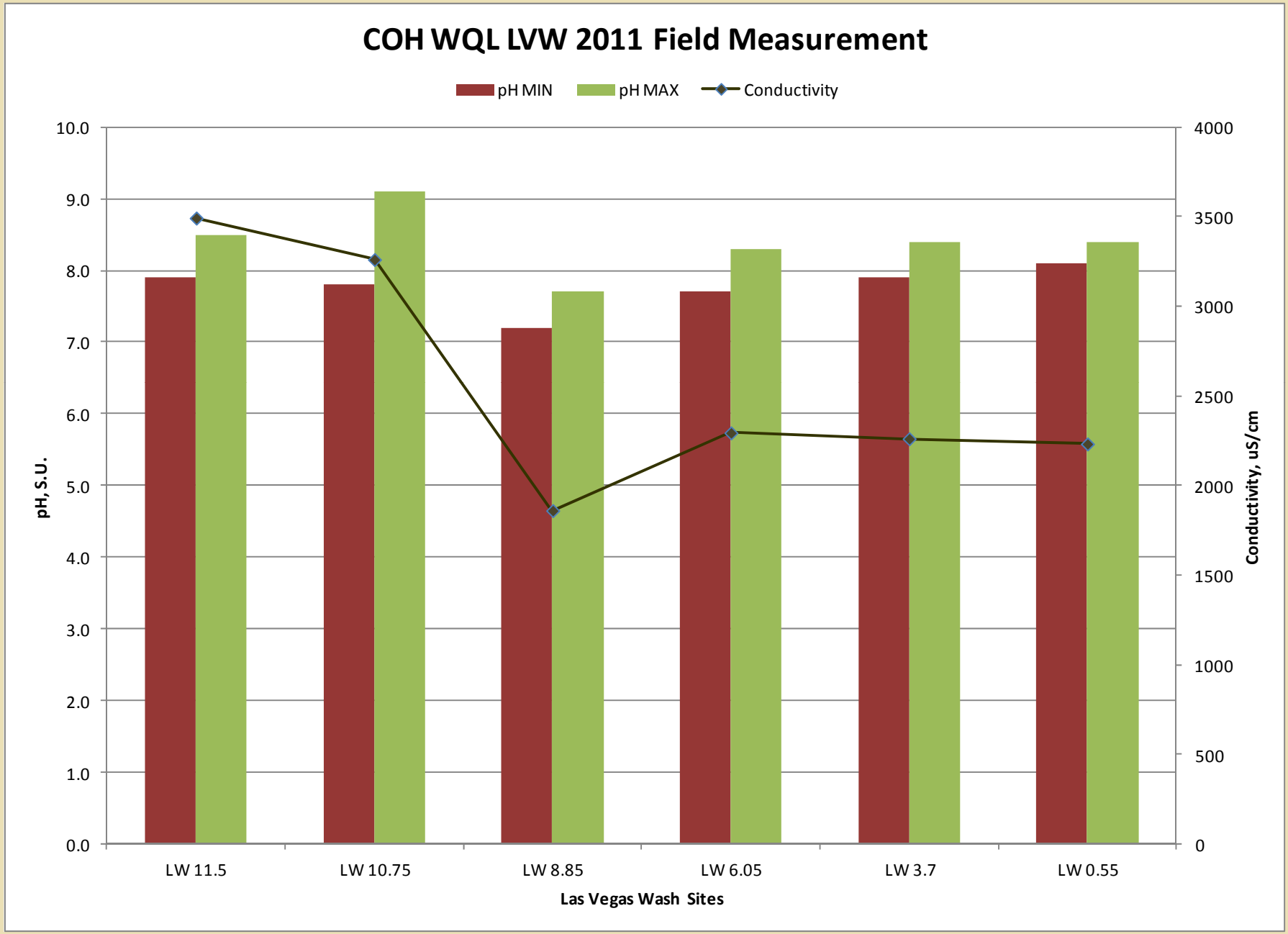
pH

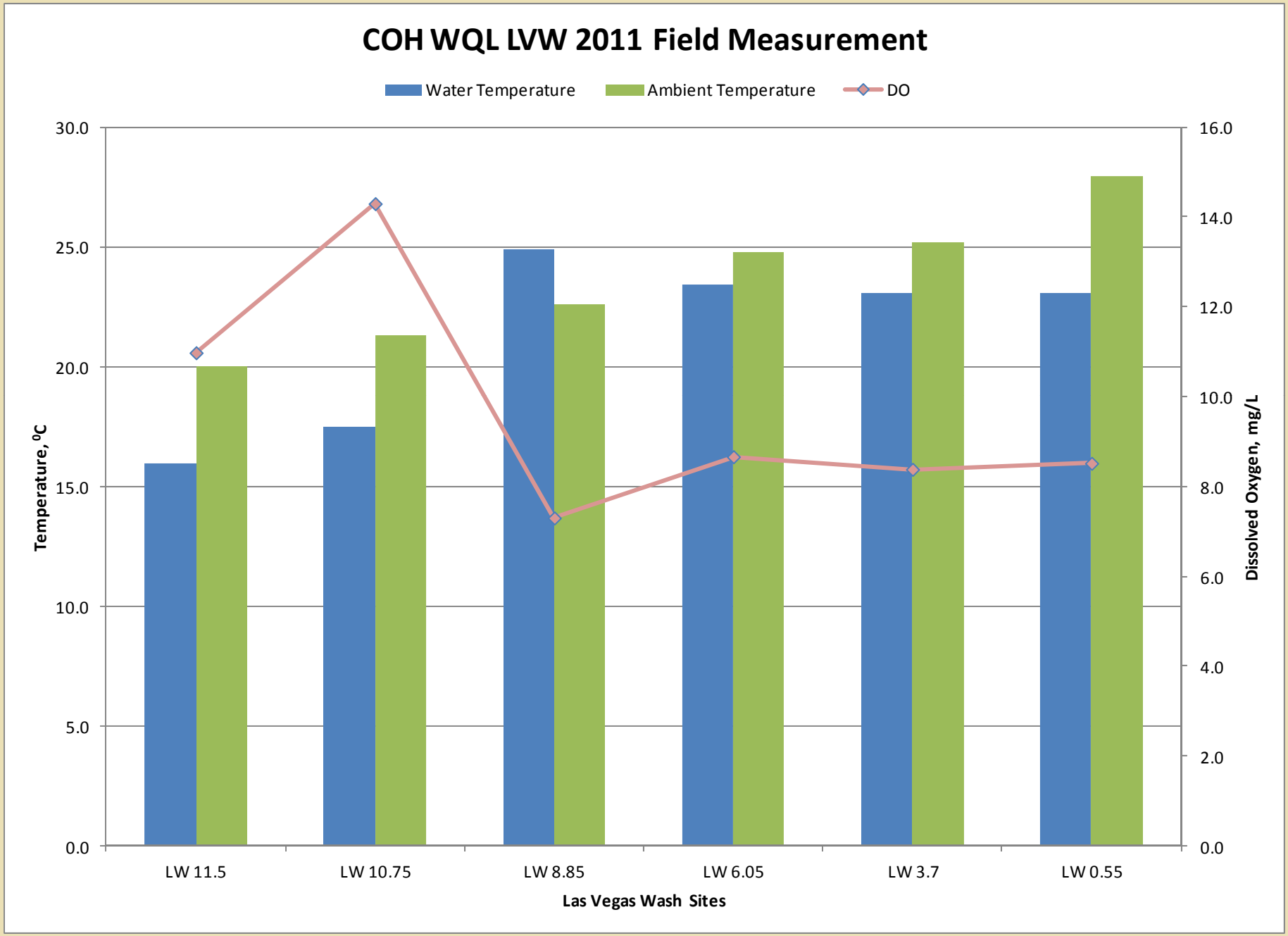
Temperature

DO

Specific Conductance




COH WQL LVW 2011 Field Measurement
pH MIN
pH MAX
Conductivity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
pH, S.U.
4000
3500
3000
2500
2000
1500
1000
500
0
Conductivity, uS/cm
LW 11.5
LW 10.75
LW 8.85
LW 6.05
LW 3.7
LW 0.55
Las Vegas Wash Sites


COH WQL LVW 2011 Field Measurement
Water Temperature
Ambient Temperature
DO
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Temperature, ⁰C
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Dissolved Oxygen, mg/L
LW 11.5
LW 10.75
LW 8.85
LW 6.05
LW 3.7
LW 0.55
Las Vegas Wash Sites

Microbiological and Lab Physical Measurements

Total Dissolved Solids (SM 21st 2540 C)

Total Suspended Solids (SM 21st 2540 D)

Turbidity (SM 21st 2130 B)

Sulfate
Chloride (EPA 300.0)

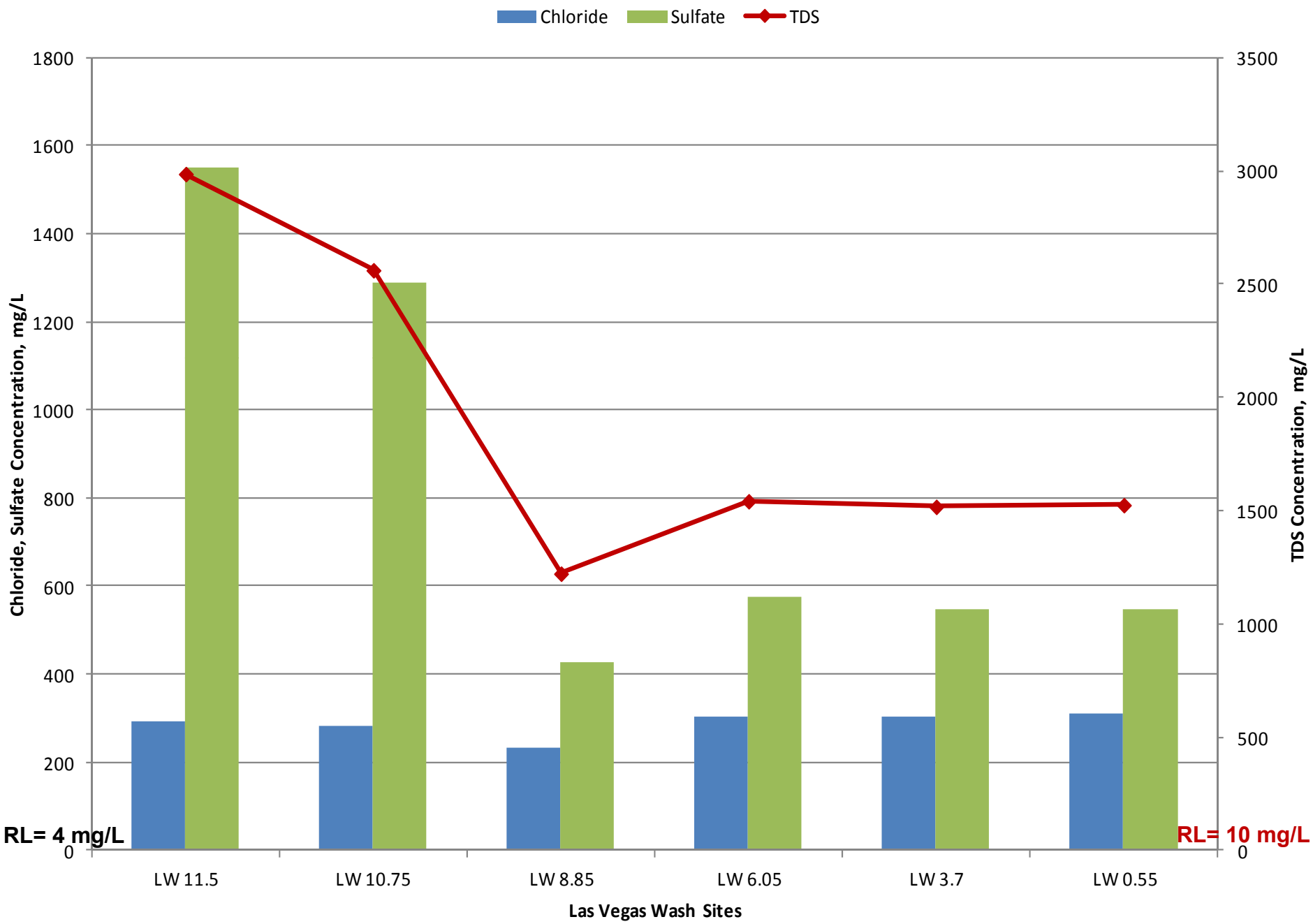
Fecal Coliform (SM 20th 9221 C,E)

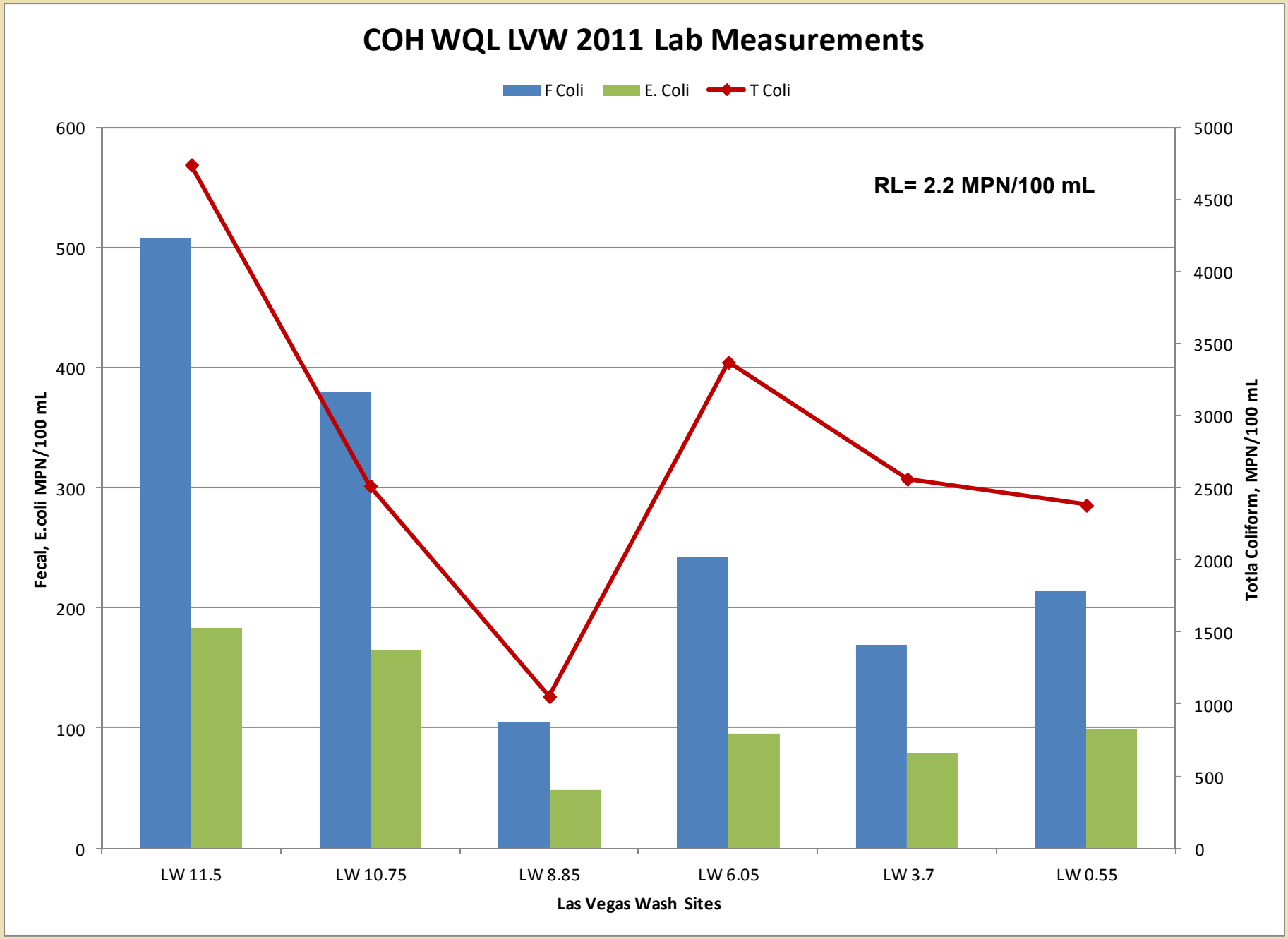
E. Coli (SM 20th 9221 F)

Total Coliform (SM 20th 9221 B,C,E)

COH WQL LVW 2011 Lab Measurements

COH WQL LVW 2011 Lab Measurements




COH WQL LVW 2011 Lab Measurements
F Coli
E. Coli
T Coli
RL= 2.2 MPN/100 mL
Fecal, E.coli MPN/100 mL
Totla Coliform, MPN/100 mL
600
500
400
300
200
100
0
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
LW 11.5
LW 10.75
LW 8.85
LW 6.05
LW 3.7
LW 0.55
Las Vegas Wash Sites

Nutrients

Total phosphorus, as P (ASTM 1998 D515-88 A)

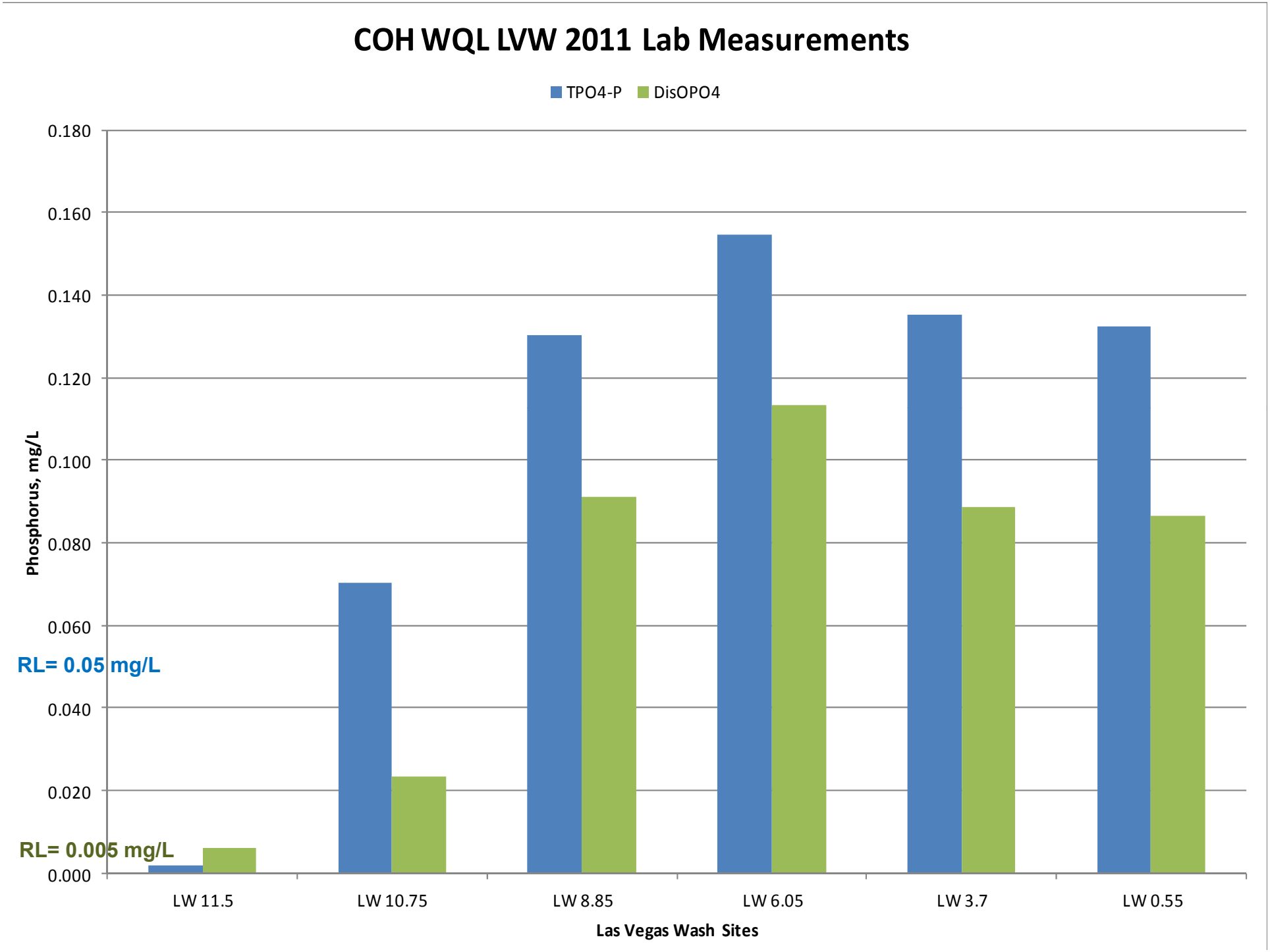
Dissolved ortho-phosphorus, as P (SM 21st 4500-P F)

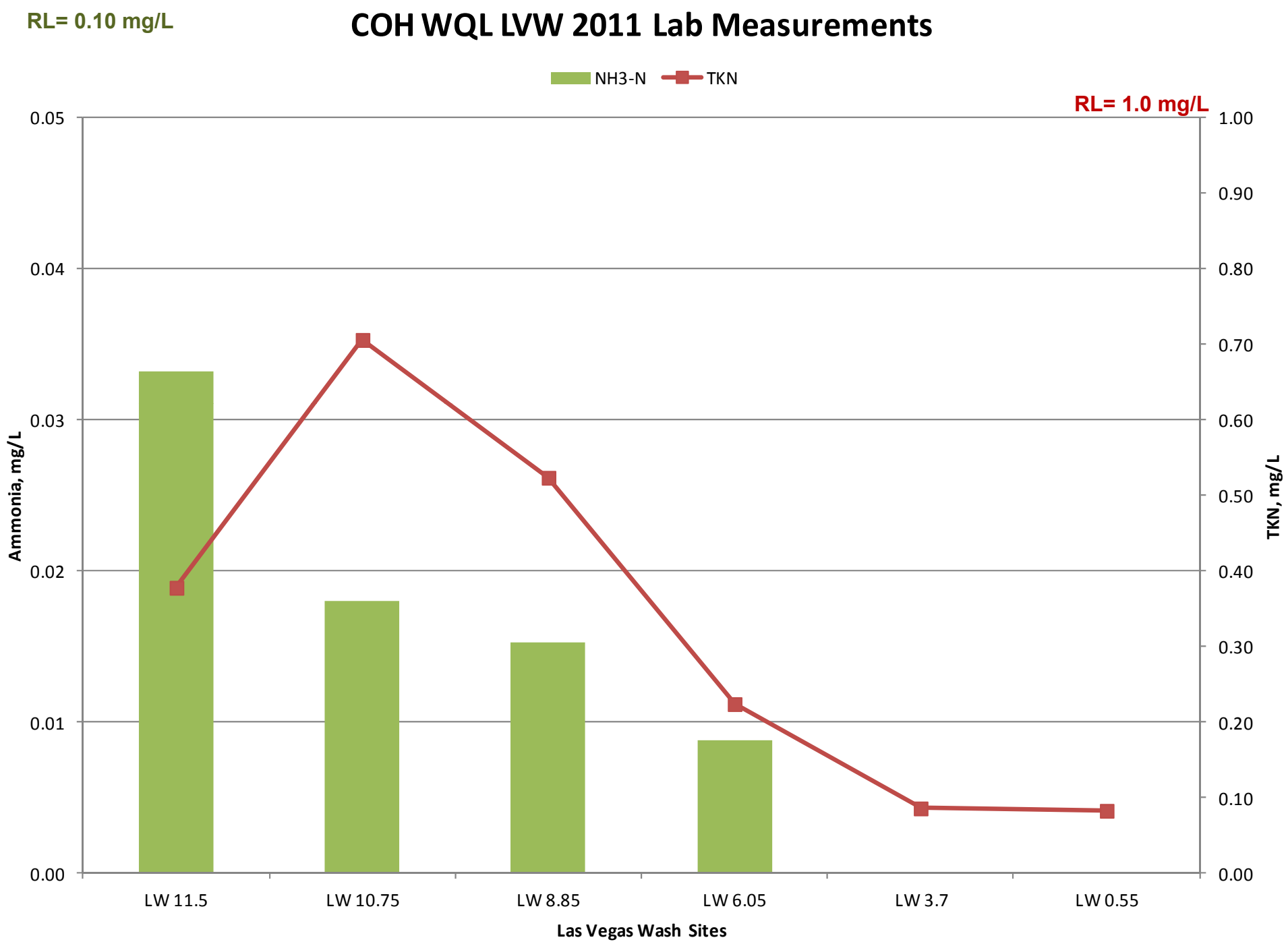
Ammonia, as N (EPA 350.1)

Total Kjeldahl Nitrogen, as N (EPA 351.2)

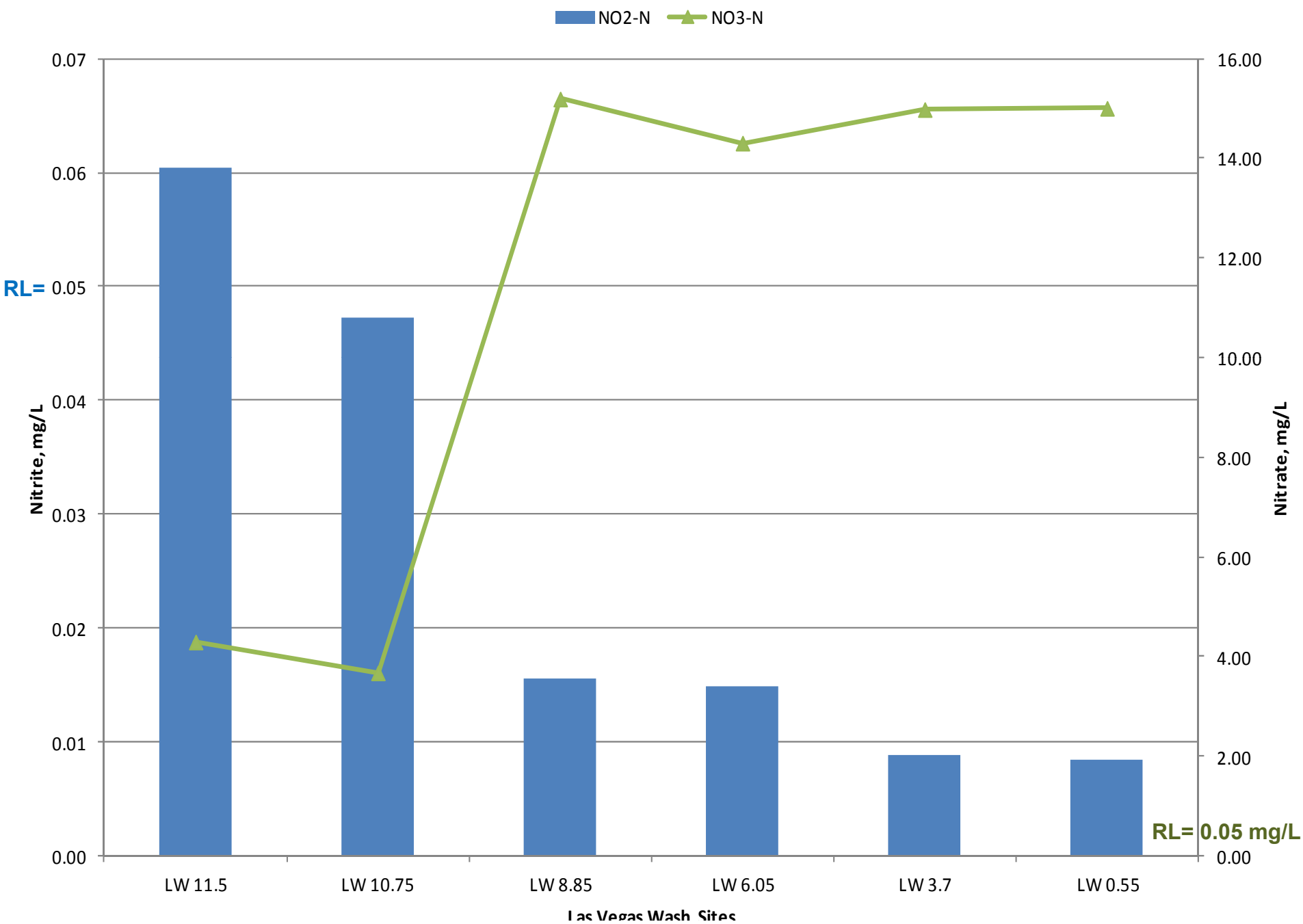
Nitrite, as N (EPA 300.0)

Nitrate, as N (EPA 300.0)


COH WQL LVW 2011 Lab Measurements
TPO4-P
DisOPO4
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
Phosphorus, mg/L
RL= 0.05 mg/L
RL= 0.005 mg/L
LW 11.5
LW 10.75
LW 8.85
LW 6.05
LW 3.7
LW 0.55
Las Vegas Wash Sites


RL= 0.10 mg/L
COH WQL LVW 2011 Lab Measurements
NH3-N
TKN
RL= 1.0 mg/L
0.05
0.04
0.03
0.02
0.01
0.00
Ammonia, mg/L
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
TKN, mg/L
LW 11.5
LW 10.75
LW 8.85
LW 6.05
LW 3.7
LW 0.55
Las Vegas Wash Sites

COH WQL LVW 2011 Lab Measurements



Toxic parameters (LW 0.55)

Total Metals (EPA 200.8, EPA 245.1)

Pesticides (EPA 608)

Volatiles (EPA 624)

Semi-Volatiles (EPA 625)

Additional compounds (Various)

Attachment A
Priority Pollutants

Base Neutral Extractibles

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
Bis(2-Chloroisopropyl) ether
Bis(2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Bis(2-ethylhexyl) phthalate
n-Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Antracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Pyrene

Volatile Organics

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
1,1-Dichloroethene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropane
Ethylbenzene
Dichloromethane
Chloromethane
Bromomethane
Bromoform
Bromodichloromethane
Dibromochloromethane
Tetrachloroethene
Toluene
Trichloroethene
Vinyl chloride

Pesticides

Aldrin
Dieldrin
Chlordane (Technical)
4,4'-DDT
4,4'-DDE
4,4'-DDD
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC (Lindane)
Delta-BHC
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260
Toxaphene

Acid Extractibles

2,4,6-Trichlorophenol
4-Chloro-3-methylphenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Pentachlorophenol
Phenol

Metals

~~Antimony~~
Arsenic
~~Beryllium~~
~~Cadmium~~
Chromium
Copper
Lead
Mercury
Nickel
Selenium
~~Silver~~
~~Thallium~~
Zinc

Dioxins

~~TCDD~~

Other

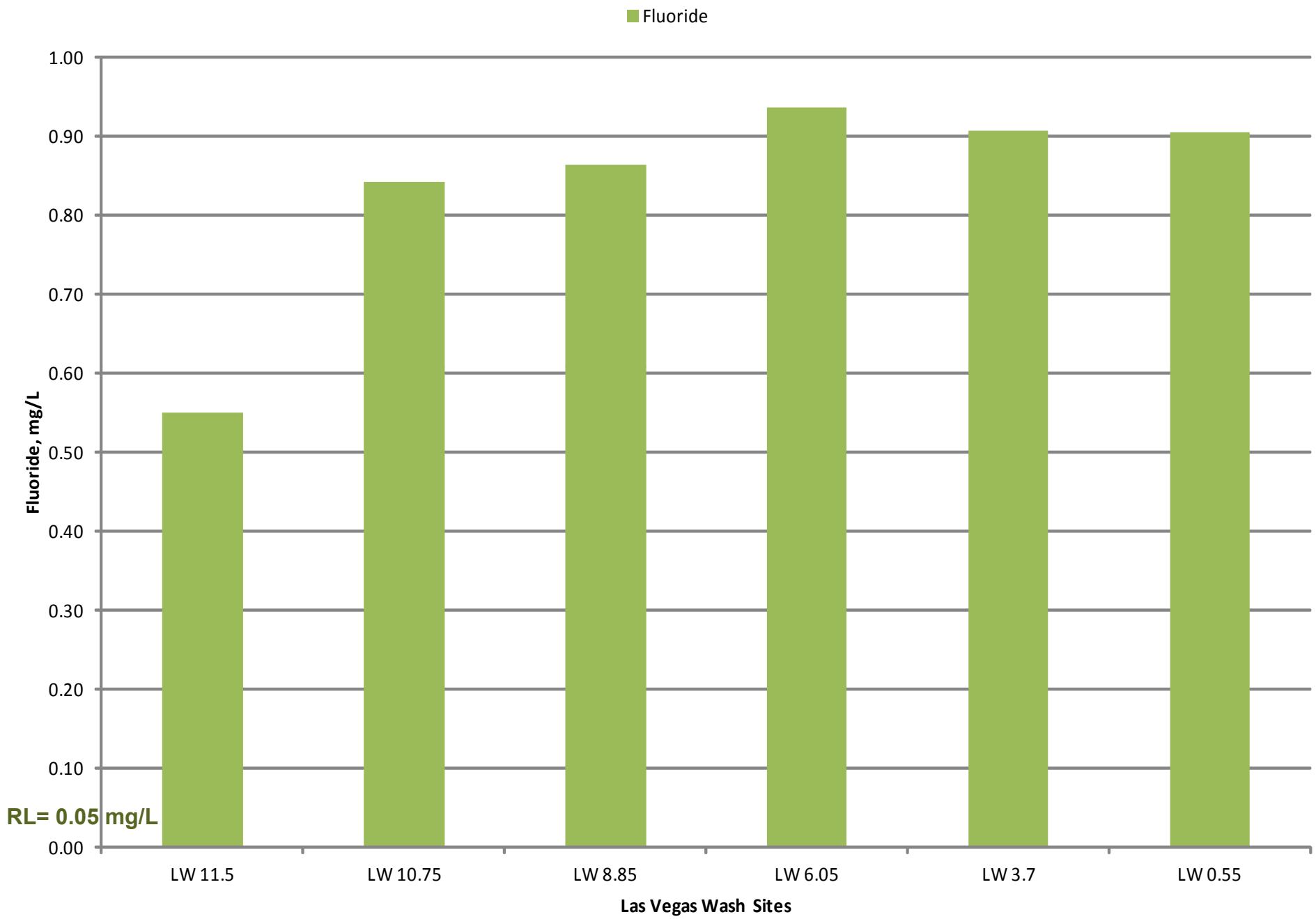
~~Cyanide~~
~~Asbestos~~

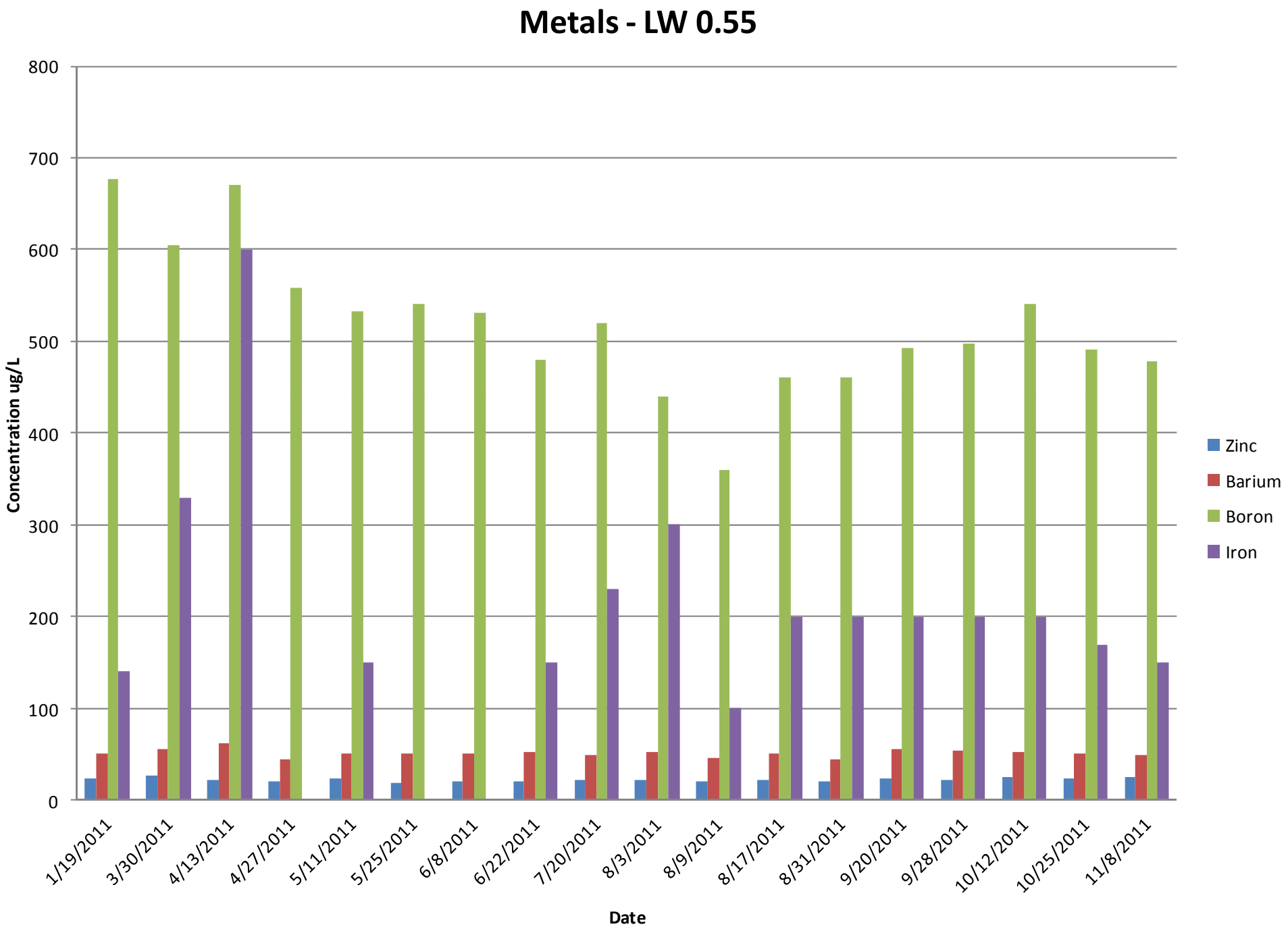
~~Arsenic III~~
Barium
Boron
~~Chromium III~~
~~Chromium VI~~
Fluoride
Iron
~~Manganese~~
Molybdenum
~~Sulfide~~
~~2,4-D~~

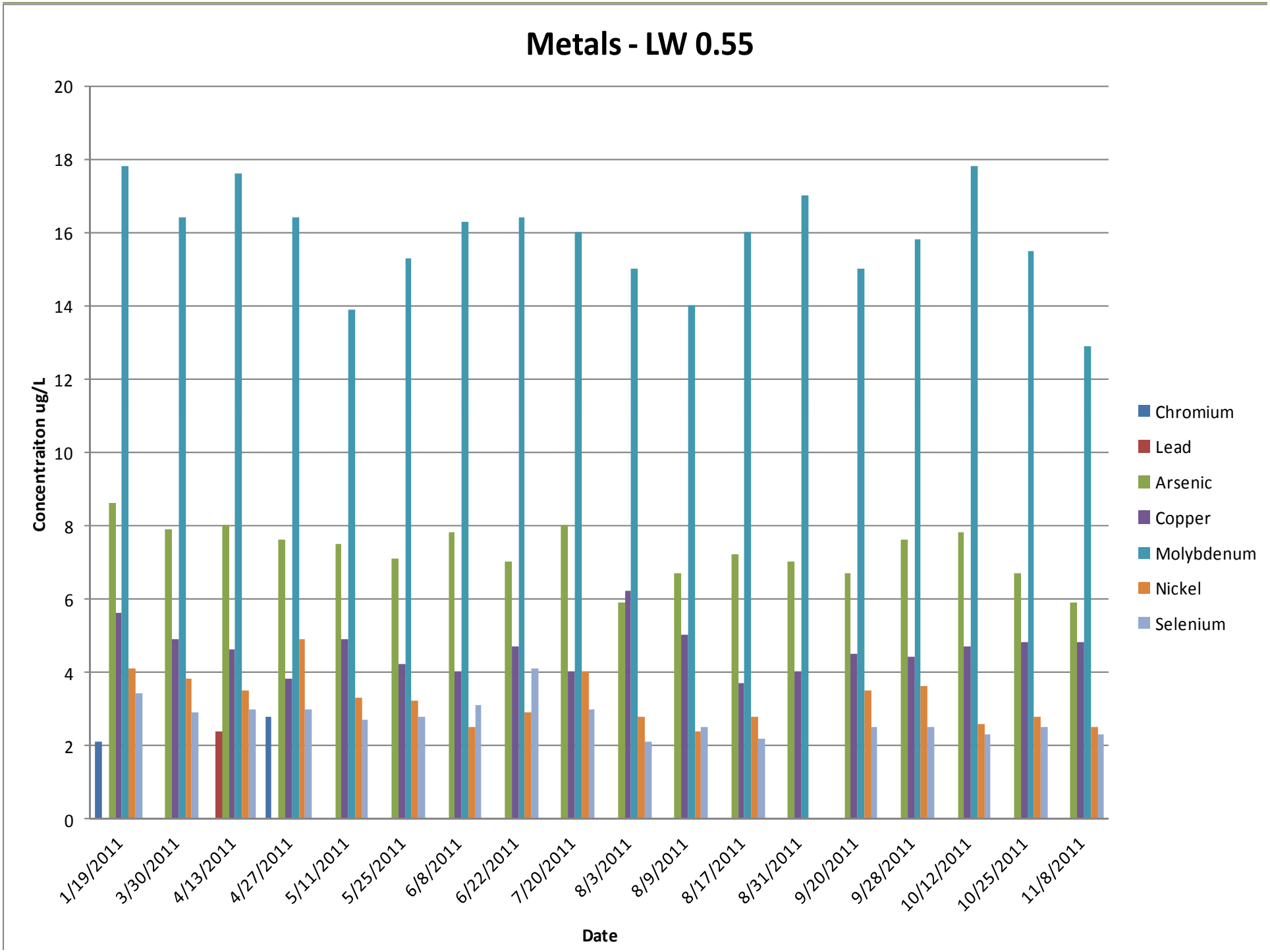
Demeton
Guthion
Malathion
Methoxychlor
Mirex
Parathion
Silvex
Dichloropropenes

Note: Priority Pollutants to be analyzed using Environmental Protection Agency (EPA) Methods 200 Series, 353.3, 420.2, 624,625, 608, and/or an appropriate combination of these methods to verify compliance with permit-specified effluent discharge limitations.

COH WQL LVW 2011 Lab Measurements




Metals - LW 0.55
Concentration ug/L
800
700
600
500
400
300
200
100
0
1/19/2011
3/30/2011
4/13/2011
4/27/2011
5/11/2011
5/25/2011
6/8/2011
6/22/2011
7/20/2011
8/3/2011
8/9/2011
8/17/2011
8/31/2011
9/20/2011
9/28/2011
10/12/2011
10/25/2011
11/8/2011
Date
Zinc
Barium
Boron
Iron


Metals - LW 0.55
Concentraiton ug/L
20
18
16
14
12
10
8
6
4
2
0
1/19/2011
3/30/2011
4/13/2011
4/27/2011
5/11/2011
5/25/2011
6/8/2011
6/22/2011
7/20/2011
8/3/2011
8/9/2011
8/17/2011
8/31/2011
9/20/2011
9/28/2011
10/12/2011
10/25/2011
11/8/2011
Date
Chromium
Lead
Arsenic
Copper
Molybdenum
Nickel
Selenium