

Barstow Groundwater Nitrate Pollution

Lahontan Regional Water Quality
Control Board

Meeting of April 24, 2012

Barstow CA

Ghasem Pour-ghasemi



Presentation Outline

- Overview of the Wastewater Treatment Facility and historical discharges
- Nitrate Pollution
- Actions taken
- What is next



City of Barstow Wastewater Treatment Facility

- Current flow - 2.4 million gallons per day
- Effluent – discharged to ponds and irrigation fields
- Bio-solid - Organic matter recovered from wastewater (sludge)





Not in Use

North Field

South Field

Mojave River

Soapmine Road Area

Treatment Facility

Barstow Wastewater Treatment Facility and Discharge Areas



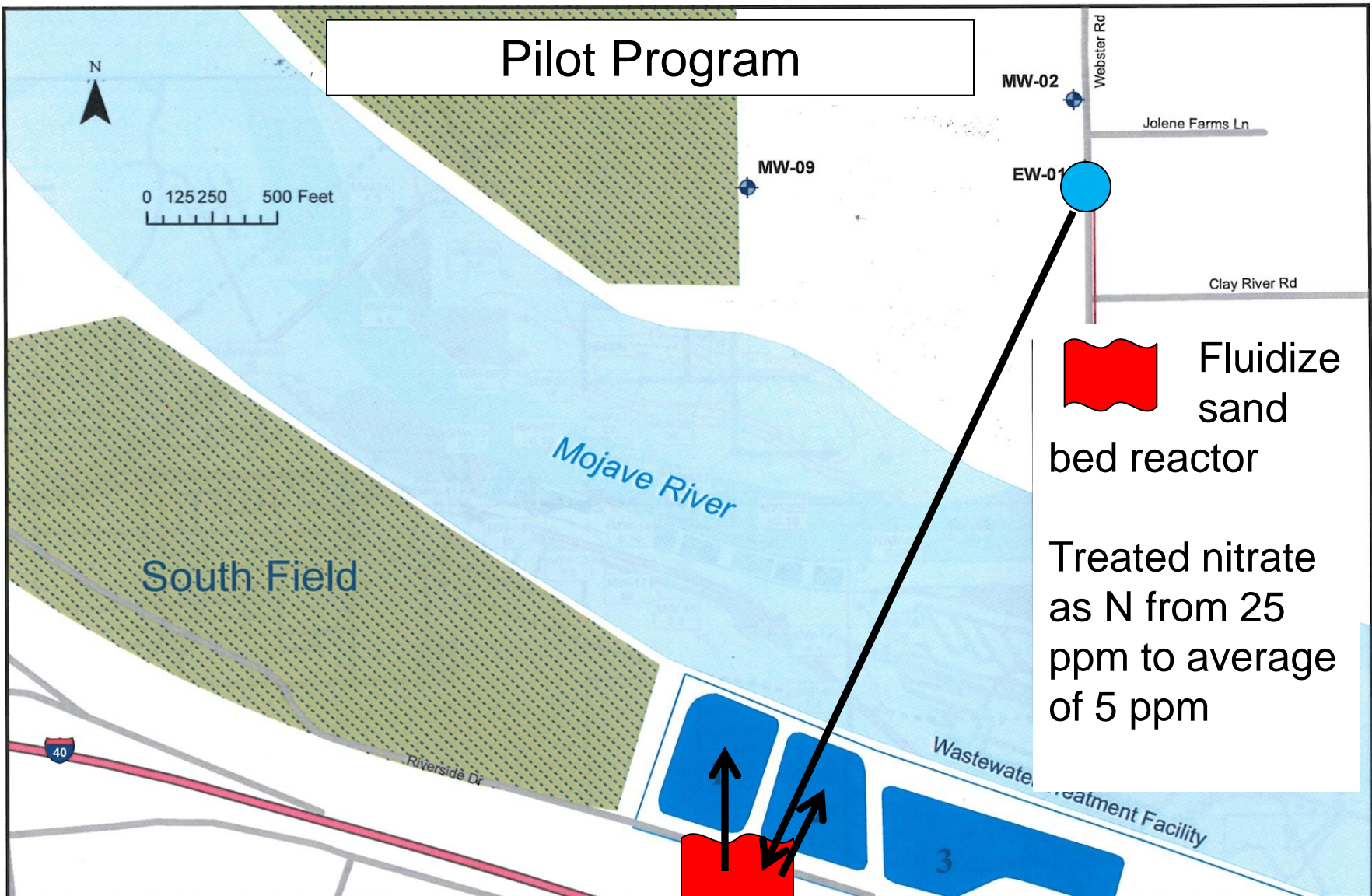
Nitrate Pollution

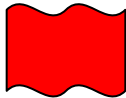
- Nitrate drinking water standard
 - 10 ppm nitrate as nitrogen (N)
 - 45 ppm nitrate as nitrate (NO₃)
- Monitoring well - groundwater Nitrate as N concentration 34 ppm
- Pollution in groundwater
- Beneficial uses affected- Municipal

Orders Issued by Water Board

- **July 2004 - Cease and Desist Order**
 - Stop application of bio-solids to fields
 - Upgrade wastewater treatment to reduce effluent nitrogen. (Completed July 2010)
- **May 2007 - Cleanup and Abatement Order**
 - Provide replacement water to residences where nitrate as N concentration is ≥ 5 ppm
- **Investigative Orders- 2007-2009**

Pilot Program



 Fluidize sand bed reactor

Treated nitrate as N from 25 ppm to average of 5 ppm



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Legend



Well



Pond



River

Fig Title:

EW-1 Site Location Map

Job Num: 04573

Fig Num: 01

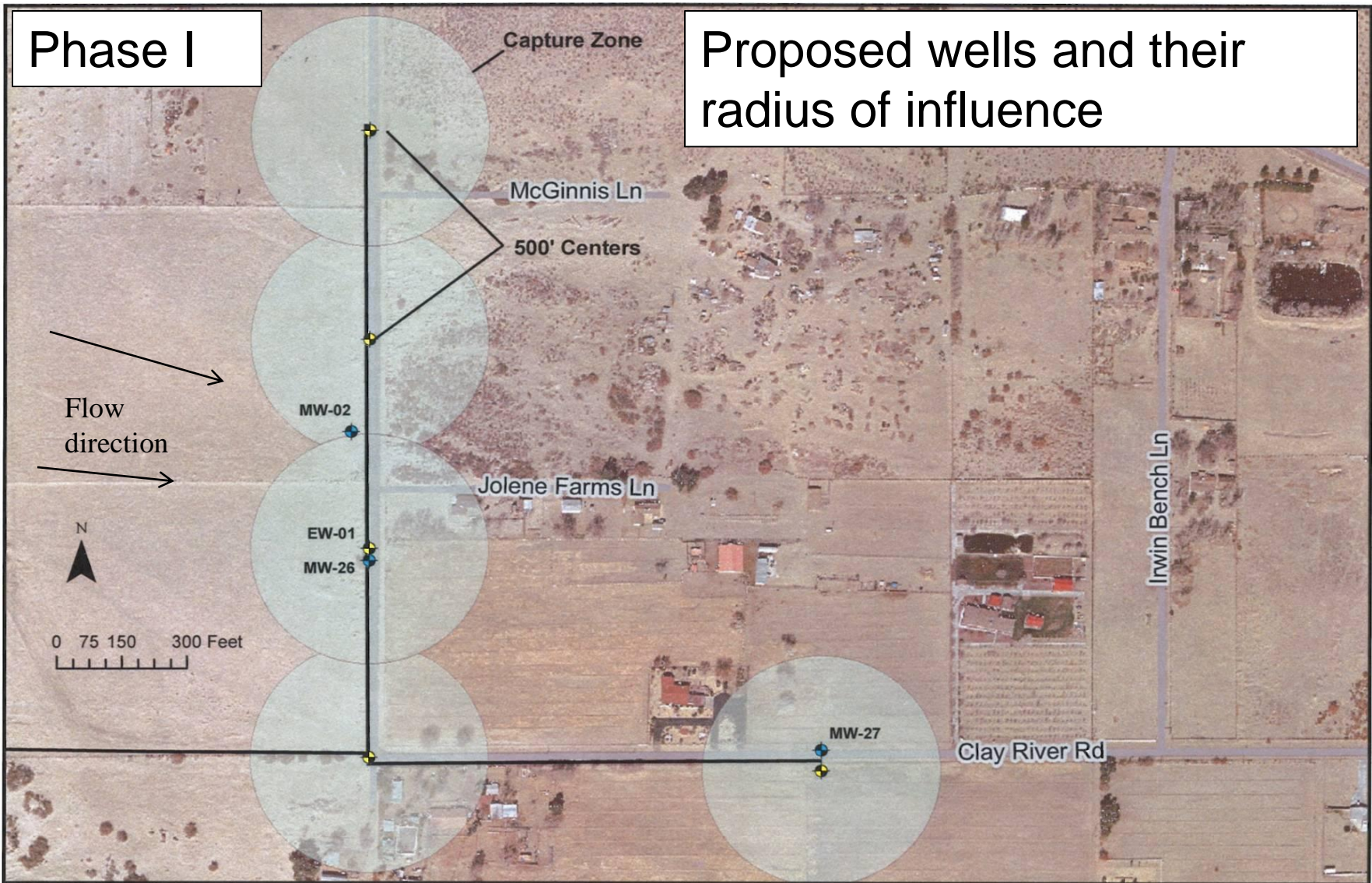
Date: 2/2/2012

Path:

WE-1 Site Location Map.mxd

Phase I

Proposed wells and their radius of influence



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Legend

Concrete Pad

Well

Pond

River

12" Pipeline

8" Pipeline

Fig Title: Proposed Groundwater Extraction Well Locations

Job Num: 04573

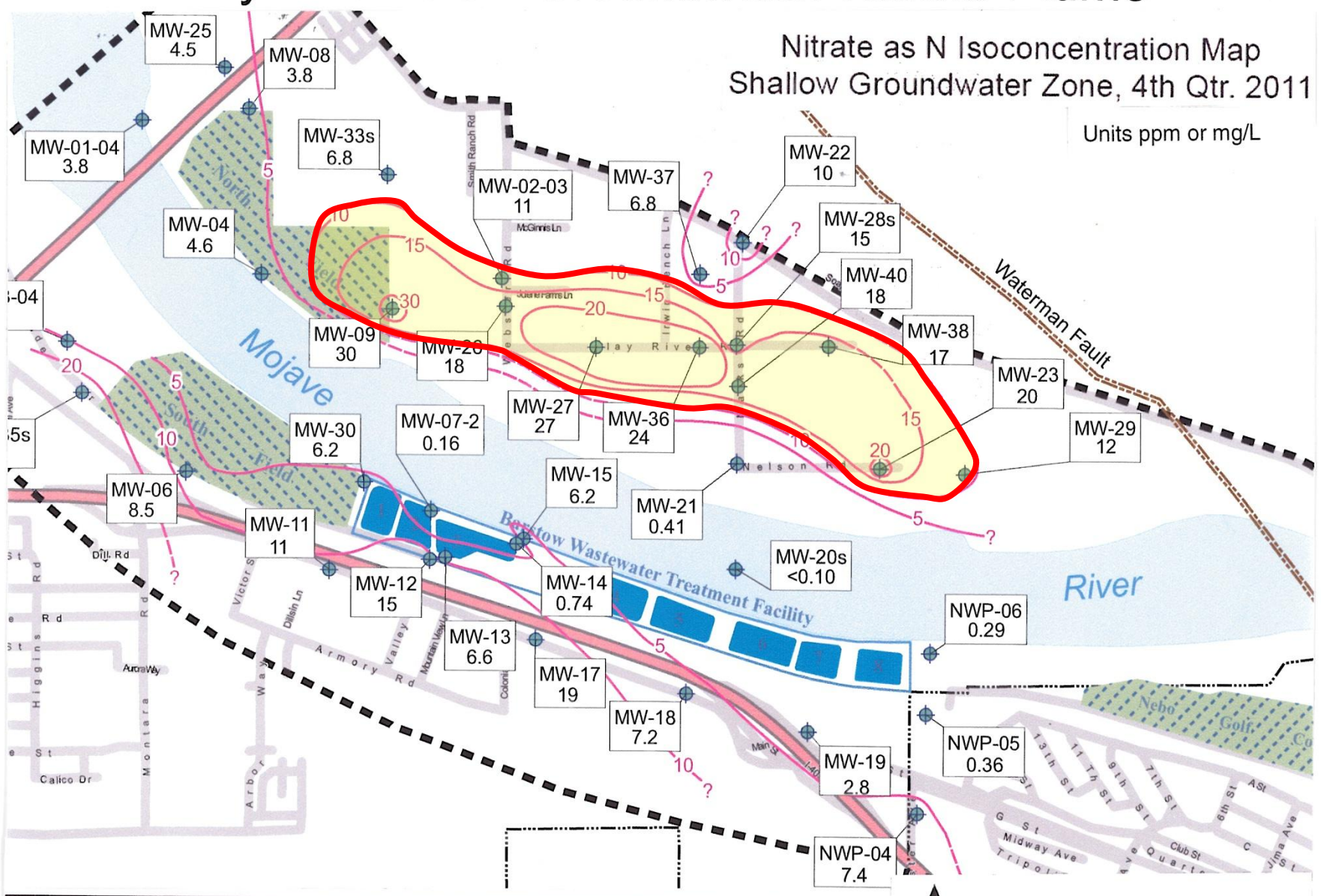
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Path: Proposed Groundwater Extraction Well Locations.mxd

Nitrate as N Isoconcentration Map Shallow Groundwater Zone, 4th Qtr. 2011

Units ppm or mg/L



	Study Area		Isoconcentration Line		Monitoring Wells
	MCLB		Isoconcentration Line (Inferred)		
	River		MW-01 Well Name & Results in mg/L		

1:18,000

NAD 1983 StatePlane California V FIPS 0405 Feet





Major points

- Treatment technology works
- Pump and treat may lower groundwater elevation between 1.5 to 3 feet
- Water Board and Barstow are working on the other issues related to nitrate plume



Next steps

- Water Board to issue a Cleanup and Abatement Order
- City intends to implement five well extraction system proposed along Webster Road and Clay River Road pending regulatory approval.
- City intend to investigate and develop further cleanup strategies