

Presentation
For
Water Resources Commission

Design and Engineering considerations for the
installation of a coupler-well to mitigate saltwater
encroachment in the Baton Rouge area

By
P.R. (Randy) Hollis, P.E.
&

Roy A. Waggenpack, P.E.

7/30/14

July 29, 2014 Presentation

- Background
- Analysis
- Physical construction of the scavenger well
- Startup
- Data, chloride concentration and flow for the well couple

July 29, 2014 Presentation

- Objective: To intercept salt water in the 1,500 ft aquifer that is migrating northward from the Baton Rouge fault toward the Lula, North 45th, and Government Street potable water well fields.

July 29, 2014 Presentation

- Premise: The construction of a fresh water well pulling fresh water from the upper part of an aquifer in combination with a salt water well pulling salt water from the lower part of an aquifer will allow for a much greater capture of salt water than the installation of a single salt water well in this same aquifer.



Remedial Options for Saltwater Encroachment in the 1,500-Foot Sand

January 3, 2012

Prepared by
Layne Hydro
a division of Layne Christensen Company
Bloomington, Indiana

Authors:

Rhett Moore, PH

Vic Kelson, PhD, CGWP

Erik Anderson, PhD, PE

Final Report

Scavenger Well Operation Model to Assist BRWC to Identify Cost-Effective Approaches to Stop Saltwater Intrusion toward the BRWC Water Wells in the "1,500-Foot" Sand of the Baton Rouge Area

Prepared by

Frank T.-C. Tsai, Ph.D., P.E.
Louisiana State University
Civil and Environmental Engineering Department
3418G Patrick F. Taylor Hall
Baton Rouge, LA 70803-6405
Tel: (225) 578-4246
Fax: (225) 578-4945
Email: ftsai@lsu.edu

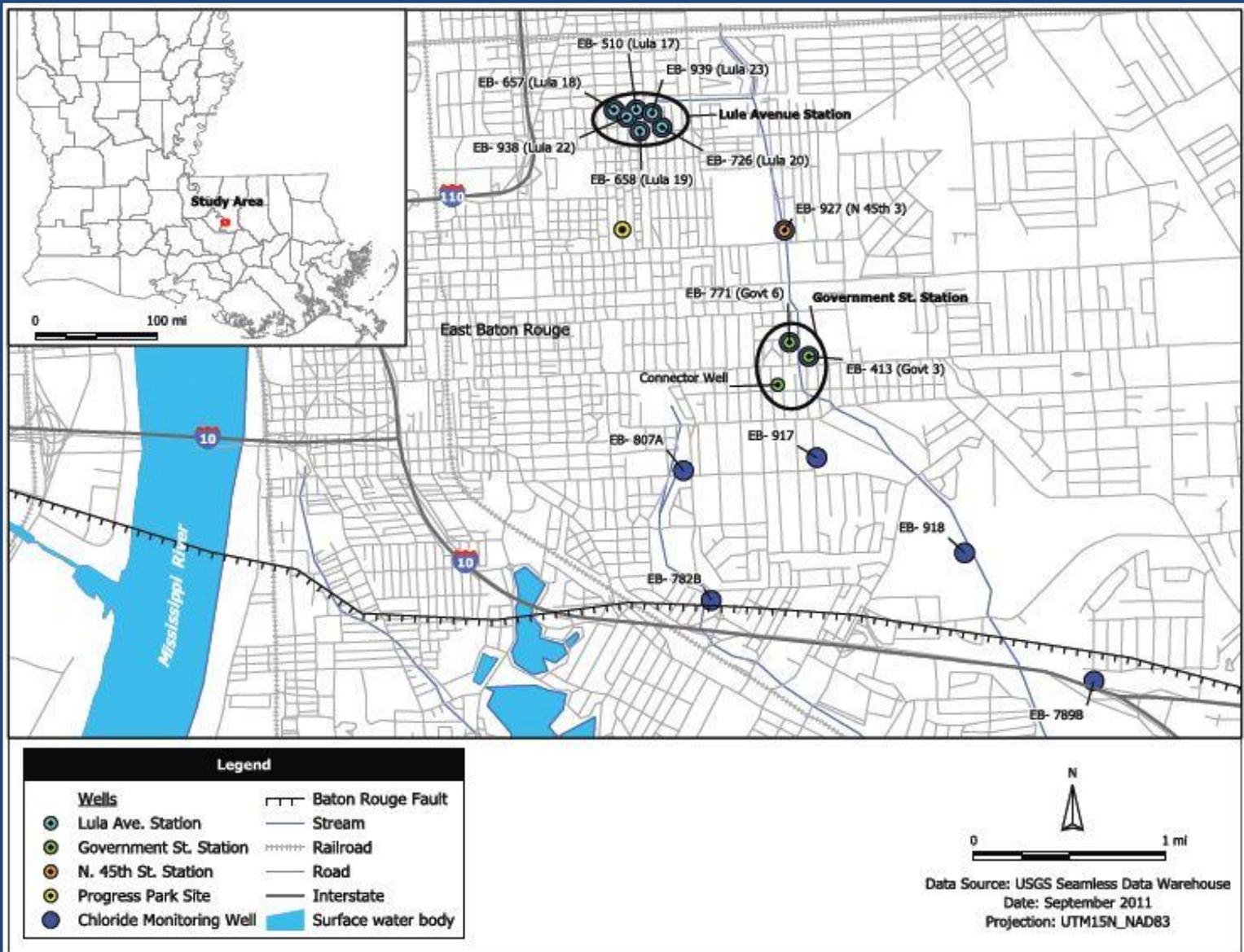


Figure 1: Location map showing the area of interest.

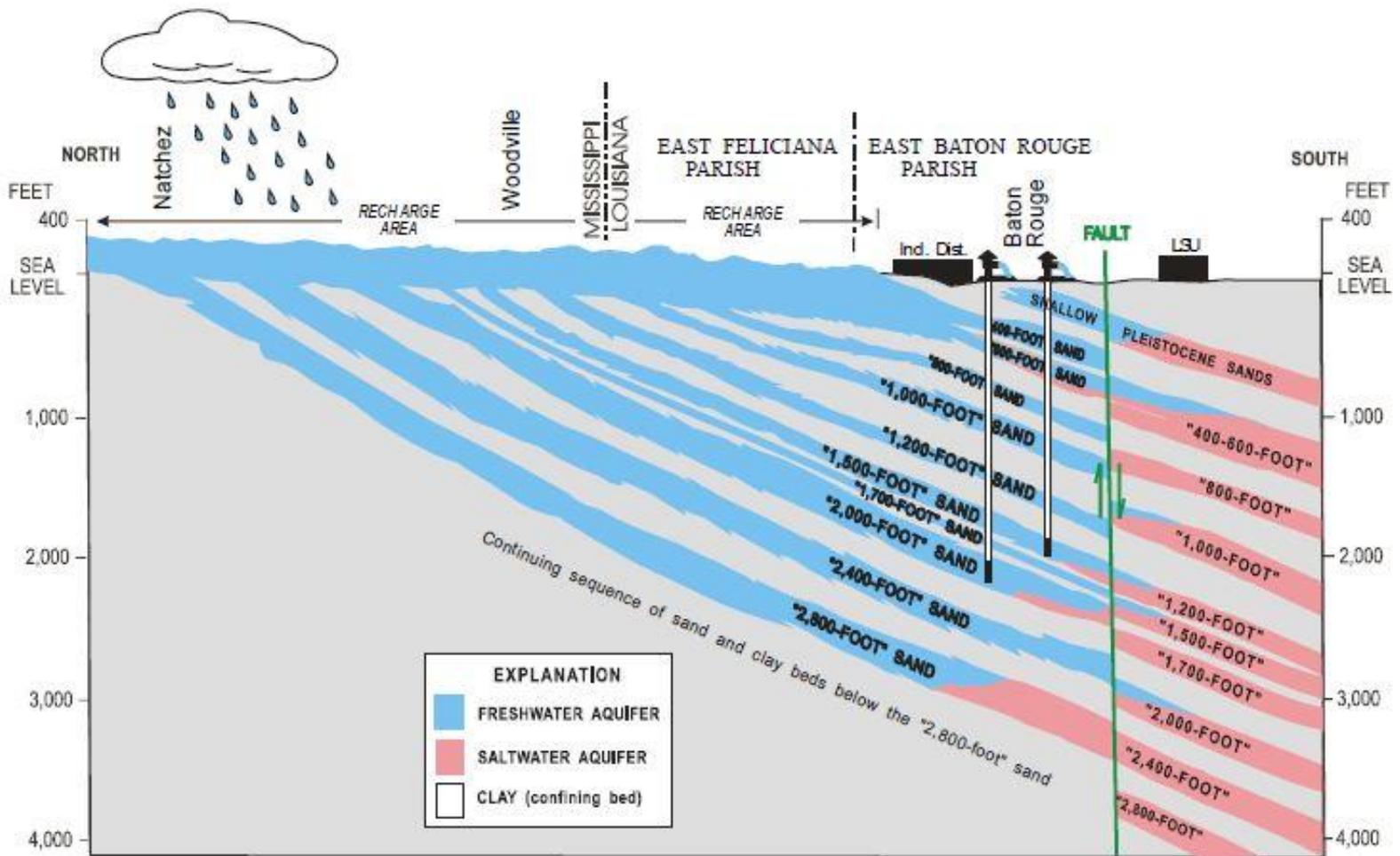


Figure 2: Conceptual sketch of the aquifer system in a north-south cross section (Tomaszewski, 1996).

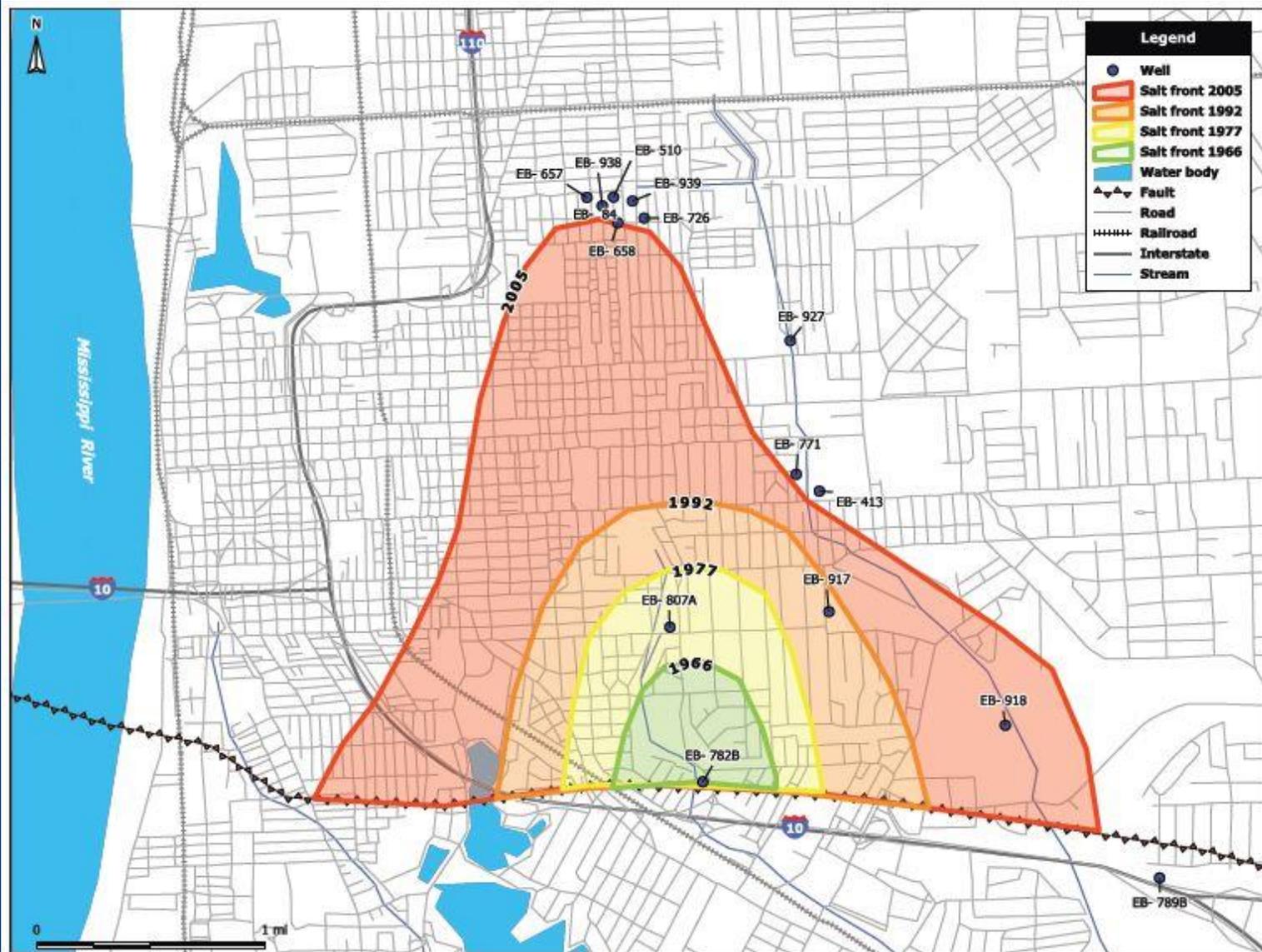


Figure 5: Chloride Monitoring Network and estimated location of the saltwater front through time (Whiteman, 1979; Tomaszewski, 1996; Prakken, 2004).

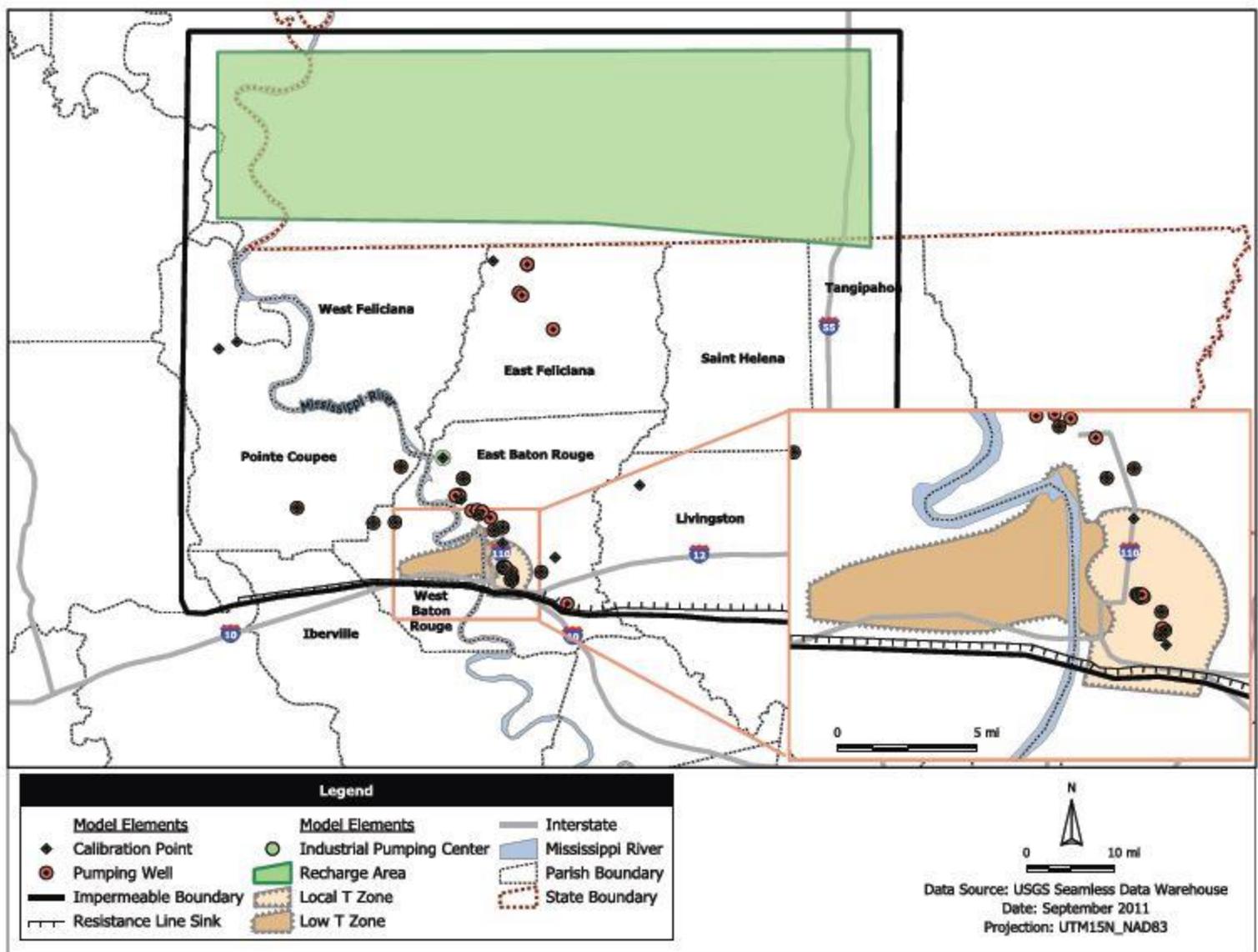


Figure 17: Extent and features of the groundwater flow model.

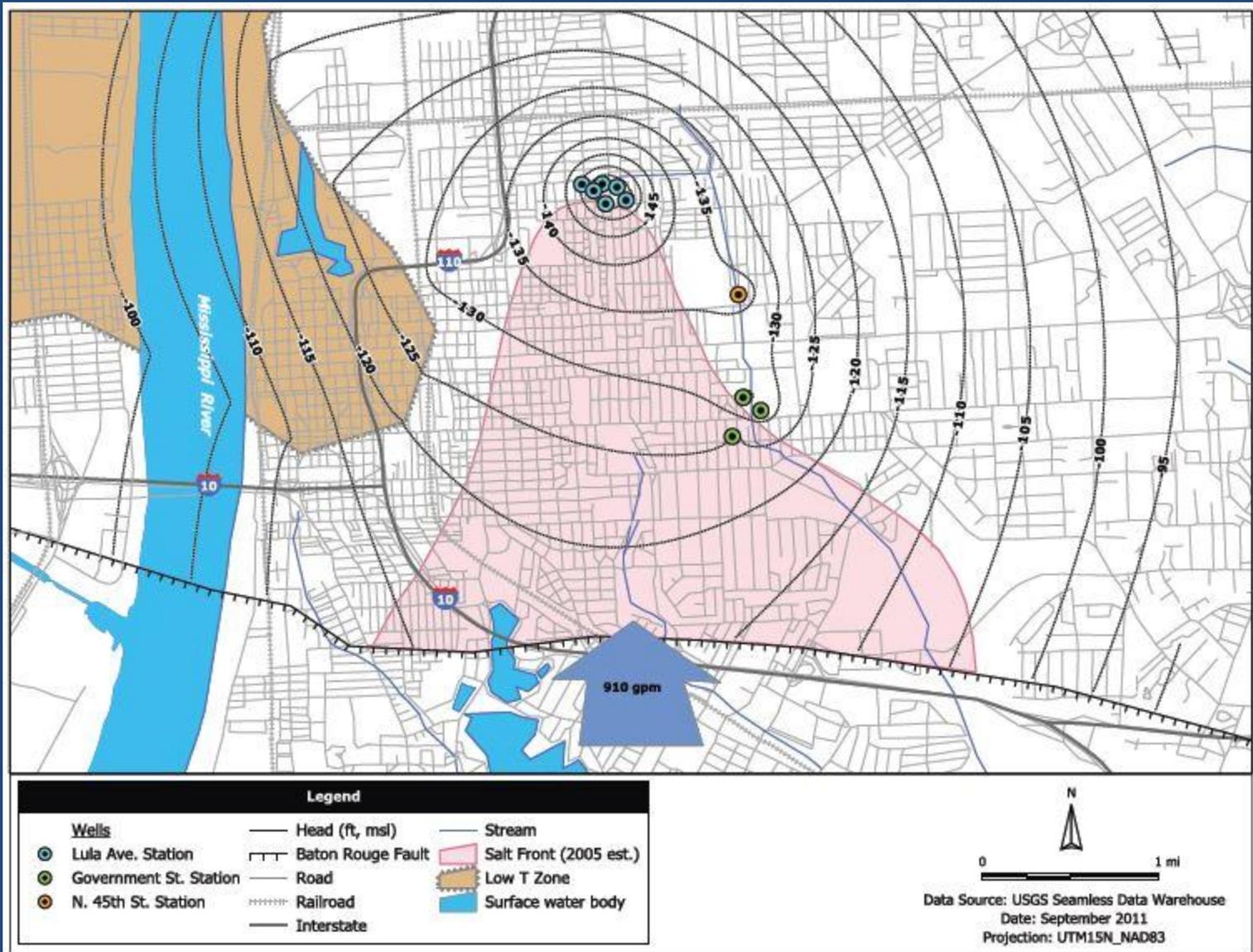


Figure 21: Model results: contours of head in the 1,500-Foot sand in and around East Baton Rouge Parish, 2009 pumping rates.

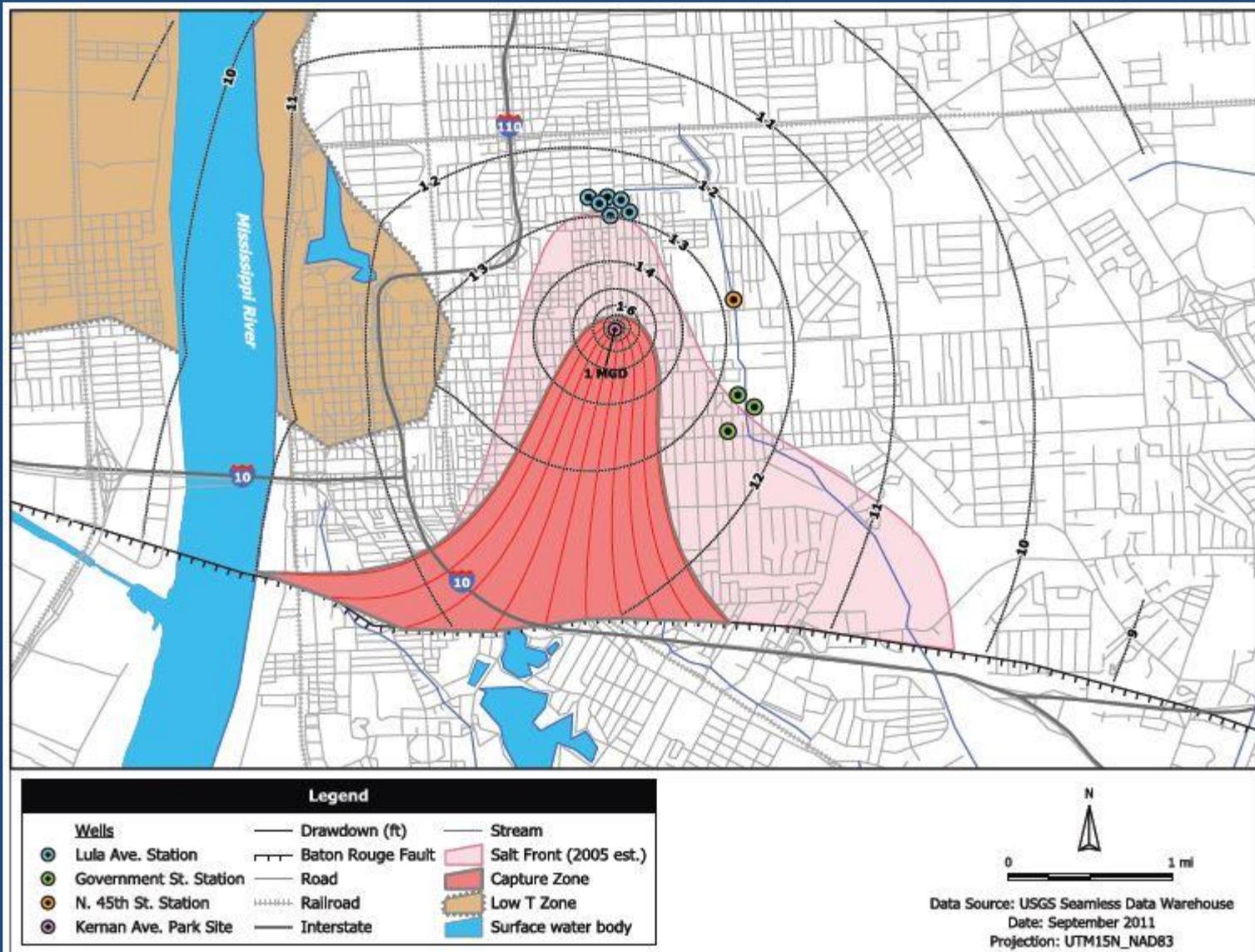


Figure 26: A single interceptor well pumping 1 mgd (694 gpm) at Kernan Park.

Table Summary: I. Summary of Hydrophysical Logging Results.

Interval No.	Top of Interval (ft)	Bottom of Interval (ft)	Interval-Specific Flow Rate: 75 GPM Test (gpm)	Interval-Specific Hydraulic Conductivity (ft/day)	Interval-Specific Transmissivity (ft ² /day)	Specific Capacity (gpm/foot-drawdown)	Interval-Specific Chloride Concentration (mg/L)
1	1600.0	1612.8	32.7	3.74E+01	4.78E+02	1.95	ND
2	1614.0	1620.3	25.3	5.87E+01	3.70E+02	1.51	722
3	1642.0	1645.6	17.7	7.19E+01	2.59E+02	1.05	1955
4	1645.6	1652.3	0.11	2.29E-01	1.54E+00	0.01	
5	1653.8	1659.3	0.11	2.85E-01	1.57E+00	0.01	

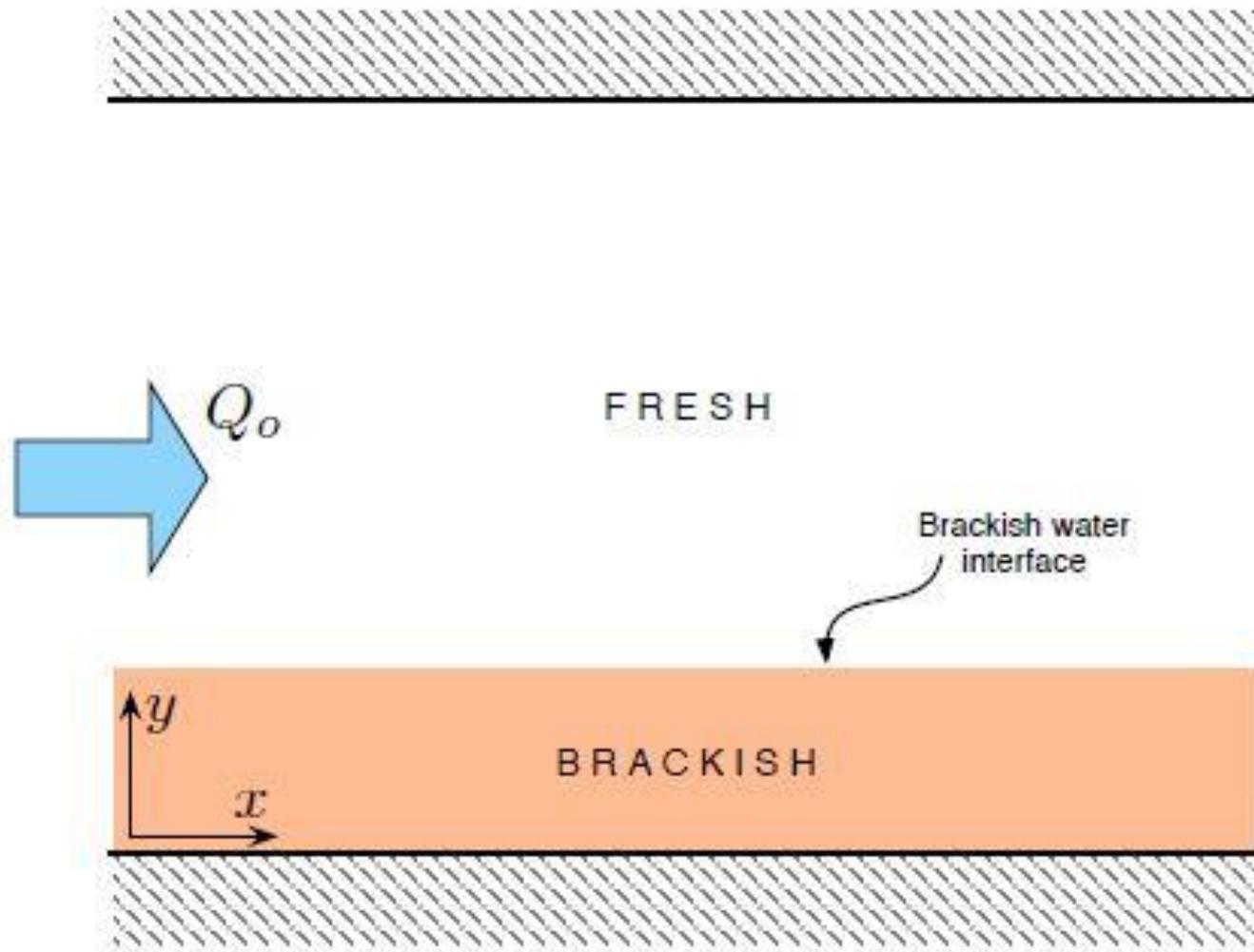


Figure 1: Ambient flow conditions in the 1500-foot sand aquifer in central Baton Rouge.

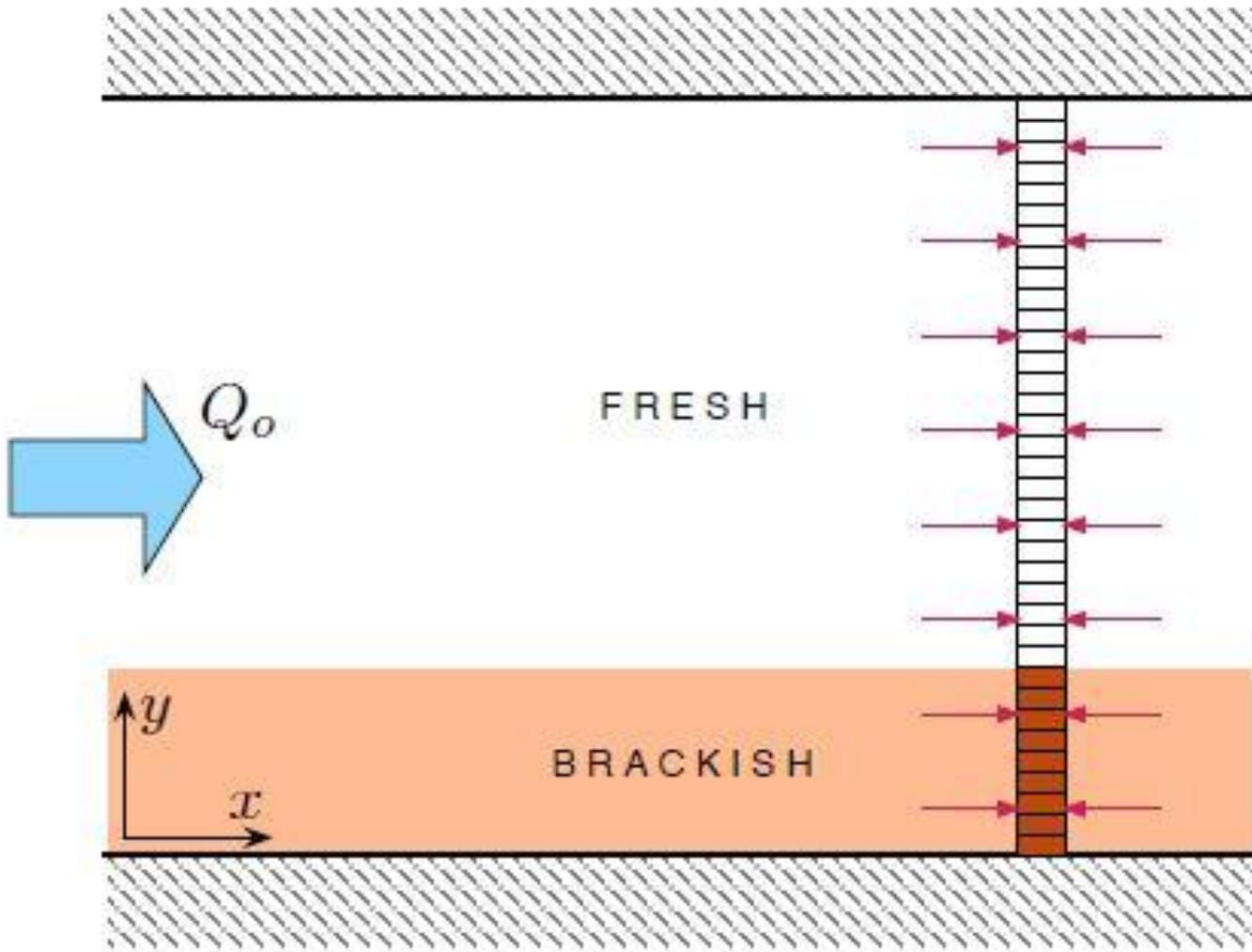


Figure 2: Idealized scavenger well couple. Flow very near the well is horizontal and radially symmetric about the well screens.

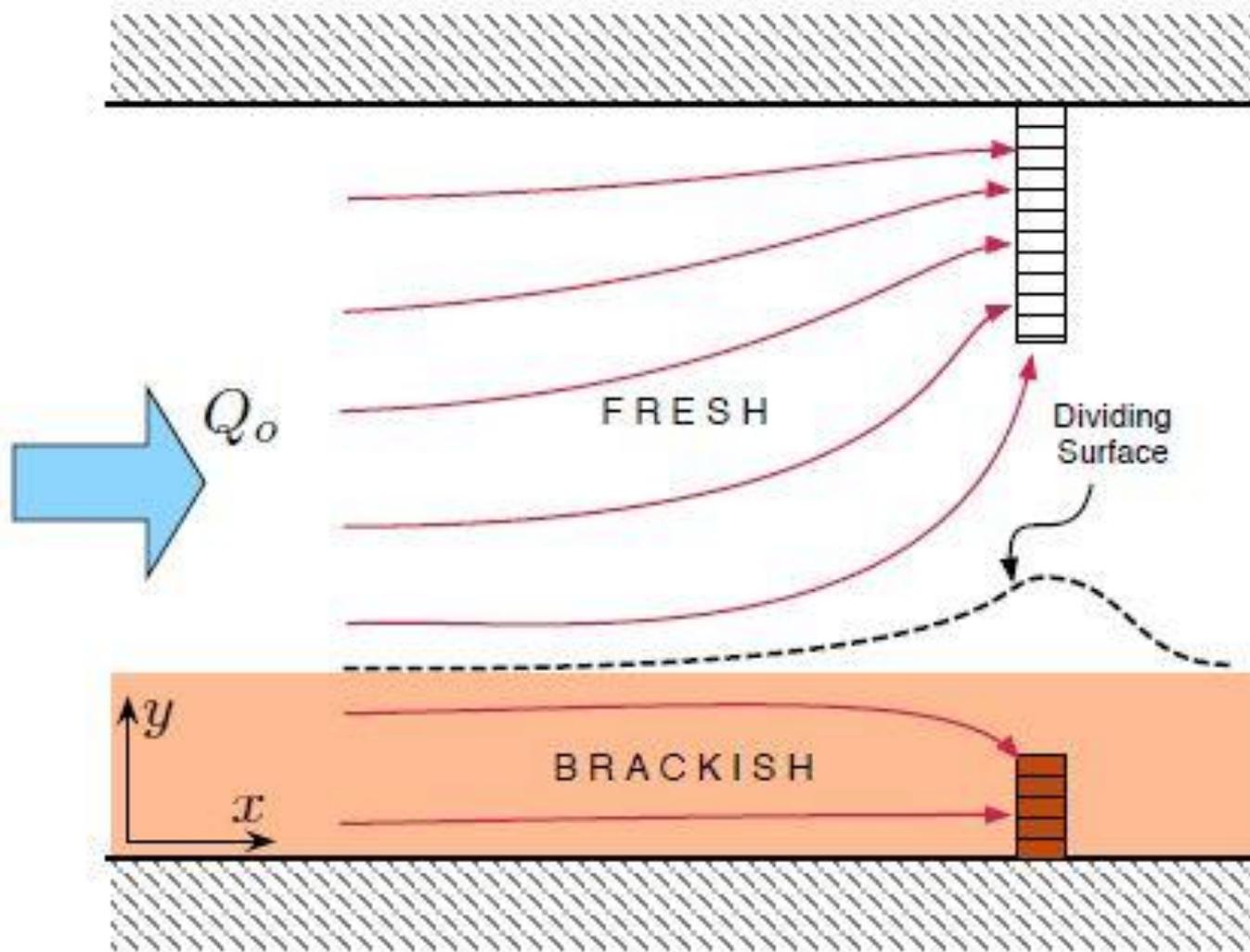
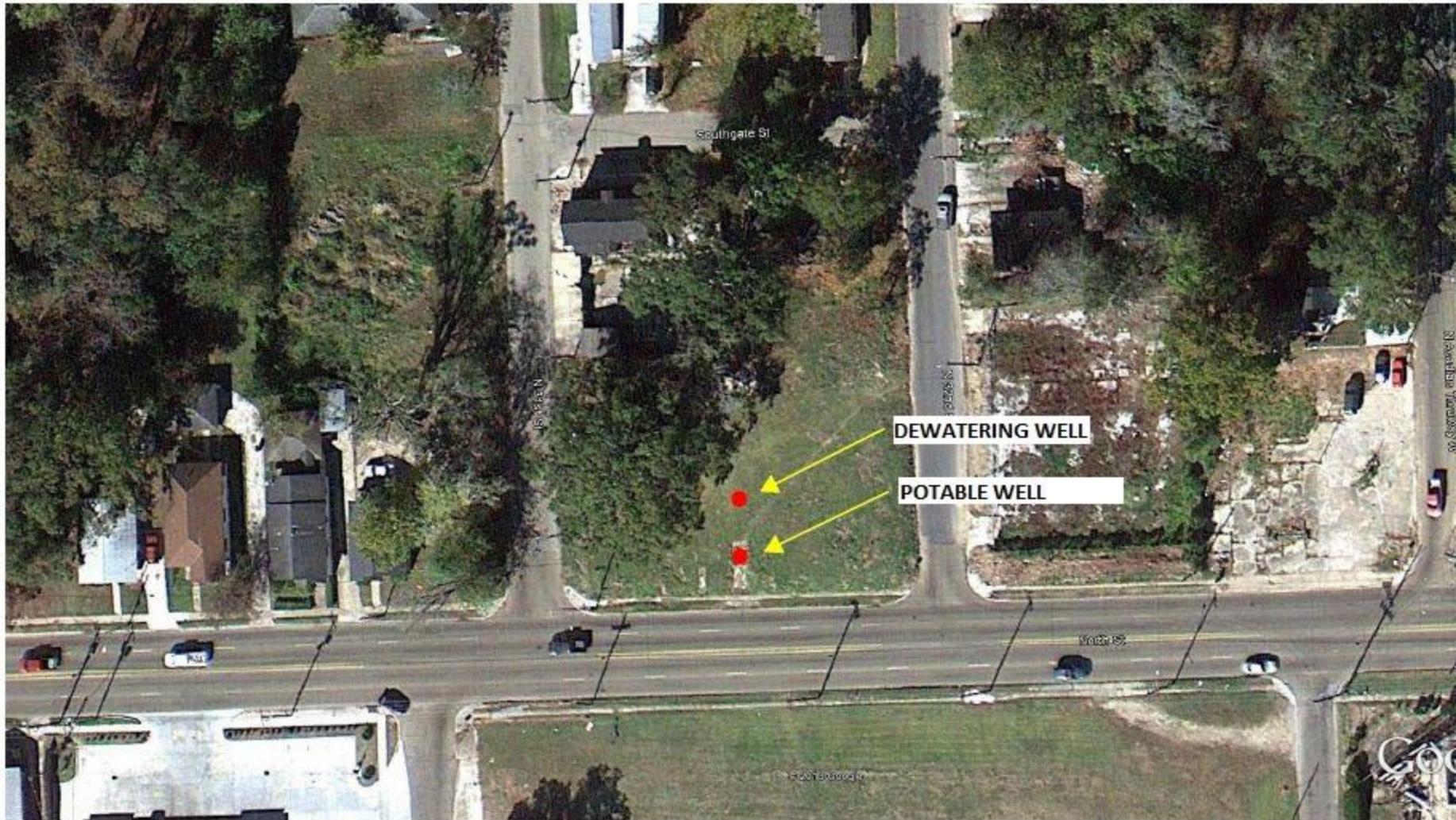


Figure 3: Flow to a scavenger couple with partially penetrating well screens installed directly above each other. The dividing surface between the wells is shown as a dashed line.

BATON ROUGE WATER COMPANY



Google earth

feet
meters



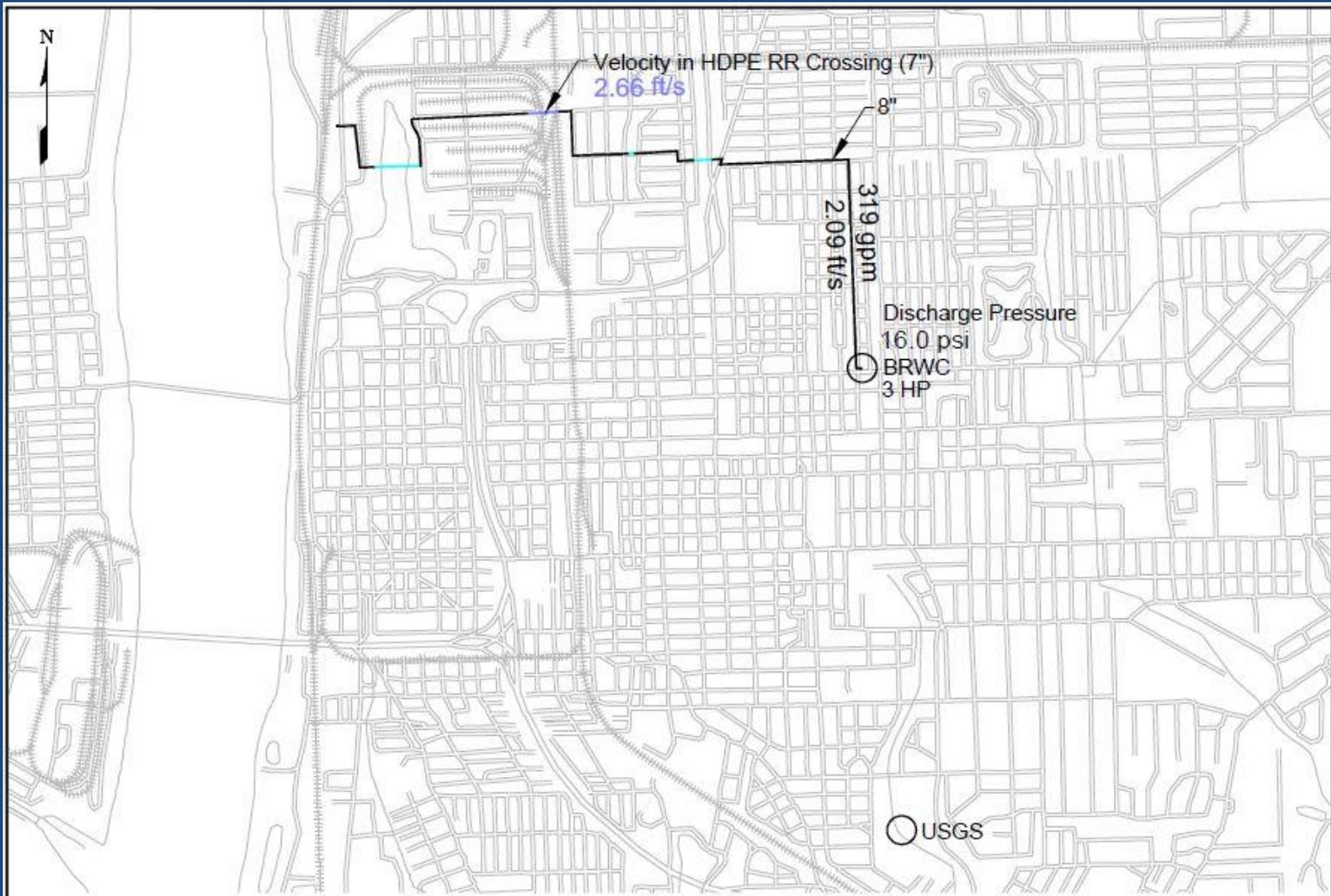
REMEDIAL OPTIONS FOR SALTWATER ENCROACHMENT

IN THE 1,500-FOOT SAND

LOCATION OF POTABLE WELL AND DEWATERING WELL



























Scavenger Project Baseline Chloride Discrete Sample Results

Depth in Feet	North St Production Well 2/5/2014		North St Scavenger Well 2/6/2014		Progress Park Observation Well 2/7/2014	
	G.Elev. 59'		G.Elev. 59'		G.Elev. 60'	
1570	TOS 1572					
1575		135				
1580						
1585		129				
1590						
1595		129				
1600					TOS 1605	
1605		125				55
1610						
1615	BOS 1616	124				55
1620						
1625						179
1630			TOS 1634.7			
1635				573		340
1640						
1645				570		373
1650						
1655				608		1171
1660						
1665			BOS 1664.7	1491	BOS 1665	1008

Scavenger Well Couple Chloride and Production

