



# Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

## ILLINOIS EPA RCRA CORRECTIVE ACTION CERTIFICATION

This certification must accompany any document submitted to Illinois EPA in accordance with the corrective action requirements set forth in a facility's RCRA permit. The original and two copies of all documents submitted must be provided.

### 1.0 Facility Identification

Name WRB Refining LP-Wood River Refinery County Madison  
 Street Address 900 South Central Ave. Site No. (IEPA) 1191150002  
 City Roxana, IL 62084 Site No. (USEPA) ILD 080 012 305

### 2.0 Owner Information

Name Not applicable  
 Mail Address \_\_\_\_\_  
 City \_\_\_\_\_  
 State \_\_\_\_\_ Zip Code \_\_\_\_\_  
 Contact Name \_\_\_\_\_  
 Contact Title \_\_\_\_\_  
 Phone \_\_\_\_\_

### 3.0 Operator Information

Name Equilon Enterprises LLC d/b/a SOPUS  
 Mail Address 17 Junction Drive, PMB #399  
 City Glen Carbon  
 State IL Zip Code 62034  
 Contact Name Kevin Dyer  
 Contact Title Principal Program Manager  
 Phone 618-288-7237

### 4.0 Type of Submission (check applicable item and provide requested information, as applicable)

RFI Phase I Workplan/Report IEPA Permit Log No. B-43R  
 RFI Phase II Workplan/Report Date of Last IEPA Letter on Project Jan 3, 2013  
 CMP Report; Log No. of Last IEPA Letter on Project B-43R-CA-39  
 Other (describe): \_\_\_\_\_ Does this submittal include groundwater information:  Yes  No  
 Groundwater Gauging Request \_\_\_\_\_  
 Date of Submittal Jan 23, 2013

### 5.0 Description of Submittal: (briefly describe what is being submitted and its purpose)

Updated information related to February 4, 2011 Groundwater Flow Notification and Request to Reduce the Frequency of Groundwater Gauging. Letter modified from Nov 8, 2012 version at IEPA's request.

### 6.0 Documents Submitted (identify all documents in submittal, including cover letter; give dates of all documents)

RCRA Cor Action Cert & ltr dated Jan 23, 2013. Also incl groundwater contour maps as add'l info for following dates: 2012:1/5,2/7,3/12,4/10,5/7,6/5,7/2,8/7,9/11,10/10,11/7,12/6; 2013:1/10, 2/12

### 7.0 Certification Statement

(This statement is part of the overall certification being provided by the owner/operator, professional and laboratory in Items 7.1, 7.2 and 7.3 below). The activities described in the subject submittals have been carried out in accordance with procedures approved by Illinois EPA. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date of Submission: Mar 13, 2013

**7.1 Owner/Operator Certification**

(Must be completed for all submittals. Certification and signature requirements are set forth in 35 IAC 702.126.) All submittals pertaining to the corrective action requirements set forth in a RCRA Permit must be signed by the person designated below (or by a duly authorized representative of that person):

1. For a Corporation, by a principal executive officer of at least the level of vice president.
2. For a Partnership or Sole Proprietorship, by a general partner or the proprietor, respectively.
3. For a Governmental Entity, by either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. the authorization is made in writing by a person described above; and
2. the written authorization is provided with this submittal (a copy of a previously submitted authorization can be used).

Owner Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title: [Signature] \_\_\_\_\_

Operator Signature: [Signature] \_\_\_\_\_ Date: 03/13/13

Title: Principal Program Manager

**7.2 Professional Certification (if necessary)**

Work carried out in this submittal or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. No one is relieved from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44 (h))

Professional's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Professional's Name \_\_\_\_\_

Address \_\_\_\_\_

Professional's Seal:

City \_\_\_\_\_

State \_\_\_\_\_ Zip Code \_\_\_\_\_

Phone \_\_\_\_\_

**7.3 Laboratory Certification (if necessary)**

The sample collection, handling, preservation, preparation and analysis efforts for which this laboratory was responsible were carried out in accordance with procedures approved by Illinois EPA.

Name of Laboratory \_\_\_\_\_

Date: \_\_\_\_\_

Signature of Laboratory Responsible Officer

Mailing Address of Laboratory

Address \_\_\_\_\_

City \_\_\_\_\_

Name and Title of Laboratory Responsible Officer

State \_\_\_\_\_ Zip Code \_\_\_\_\_



January 23, 2013

BY CERTIFIED MAIL

Mr. Steven F. Nightingale, P.E.  
Manager, Permit Section  
Illinois Environmental Protection Agency  
Bureau of Land  
1021 North Grand Avenue East  
Springfield, Illinois 62794

**Subject: Update to February 4, 2011 Groundwater Flow Control Notification,  
Updated Response to Violation Notice L-2011-01126 &  
Request to Reduce Groundwater Gauging Frequency  
WRB Refining LP, Wood River Refinery  
Roxana, Illinois  
119115002 – Madison County  
Equilon Enterprises LLC d/b/a Shell Oil Products US  
Log B-43R**

Dear Mr. Nightingale:

On behalf of Shell Oil Products US (SOPUS), URS Corporation (URS) requests to reduce the frequency of groundwater gauging at the WRB Refining LP Wood River Refinery from weekly to quarterly. On November 8, 2012 URS submitted on behalf of SOPUS an update to SOPUS' February 4, 2011 Groundwater Flow Control Notification letter to the Illinois Environmental Protection Agency (IEPA) and SOPUS' June 10, 2011 Response to Violation Notice L-2011-01126 including a request for reduction of frequency of groundwater gauging. Based on a telephone conversation between Kevin Dyer (SOPUS) and Amy Boley (IEPA) on January 22, 2013, it was requested that Shell revise and resubmit the request regarding groundwater gauging frequency separately, which is hereby provided.

In January 2011, SOPUS began conducting weekly gauging of a subset of the refinery groundwater monitoring wells and selected wells in Roxana in response to learning of temporary reductions in groundwater pumping by the operator of the refinery, WRB Refining LP, an affiliate of Phillips 66 (P66). As reported in a letter to the Illinois Environmental Protection Agency (IEPA) dated February 4, 2011, SOPUS originally believed that "there may have been an instance where control along the west fenceline of the North Property," as required by SOPUS' RCRA permit, may not have been maintained.

Since that time, WRB has conducted maintenance work on several wells and piping and installed new groundwater depression wells. This has resulted in increased pumping rates on a more reliable basis. Additionally, a permit modification was submitted July 29, 2011 to maintain groundwater withdrawal rates at a minimum of 3,000 gallons per minute (gpm) from Main and North Properties. The groundwater contour maps that have been submitted for the Wood River Refinery Corrective Action Program and Roxana Interim Groundwater Monitoring Program (on a semiannual and quarterly basis, respectively) demonstrate capture.

1001 Highland Plaza Drive West, Suite 300  
St. Louis, MO 63110  
Phone: 314.429.0100  
Fax: 314.429.0462



Mr. Steven Nightingale  
Illinois Environmental Protection Agency  
January 23, 2013  
Page 2

During 2012, SOPUS developed a groundwater flow model to better understand conditions for groundwater capture. The modeling report was submitted to IEPA on July 27, 2012. One conclusion of the model was that the minimum pumping rates to maintain groundwater capture under differing water level conditions are on the order of 2,500-2,700 gpm (specifically 2,523 to 2,668 gpm as predicted by the model). Based on this and our understanding of the WRB pumping rates, groundwater capture would have been maintained during the period when it was suspect (i.e., January 2011).

In light of the modeling results, we reevaluated the actual measured groundwater data by using smaller contour intervals. Contour maps from before (October and November 2010), during (January 2011), and after (February 2011) the suspect period were produced using a contour interval of 0.25 feet. The maps are included in this submittal as **Figures 1 through 4**. These maps indicate that groundwater capture was maintained along the west fenceline of North Property.

Based on the above information, SOPUS believes it is no longer necessary to continue gauging monitoring wells on a weekly basis to assess groundwater capture. SOPUS requests the Agency's concurrence to stop weekly gauging and return to quarterly gauging as required by the RCRA permit. As a separate but related matter, SOPUS will continue to gauge monitoring wells that display separate phase product on a weekly basis.

If you have any questions concerning this request, please contact Kevin Dyer, SOPUS Principal Program Manager, at [kevin.dyer@shell.com](mailto:kevin.dyer@shell.com) (618/288-7237), or me at [bob.billman@urs.com](mailto:bob.billman@urs.com) (314/743-4108). We look forward to your response.

Sincerely,

Robert B. Billman  
Senior Project Manager

Enclosures:

- Figure 1 – Groundwater Contour Map, October 2010
- Figure 2 – Groundwater Contour Map, November 2010
- Figure 3 – Groundwater Contour Map, January 2011
- Figure 4 – Groundwater Contour Map, February 2011

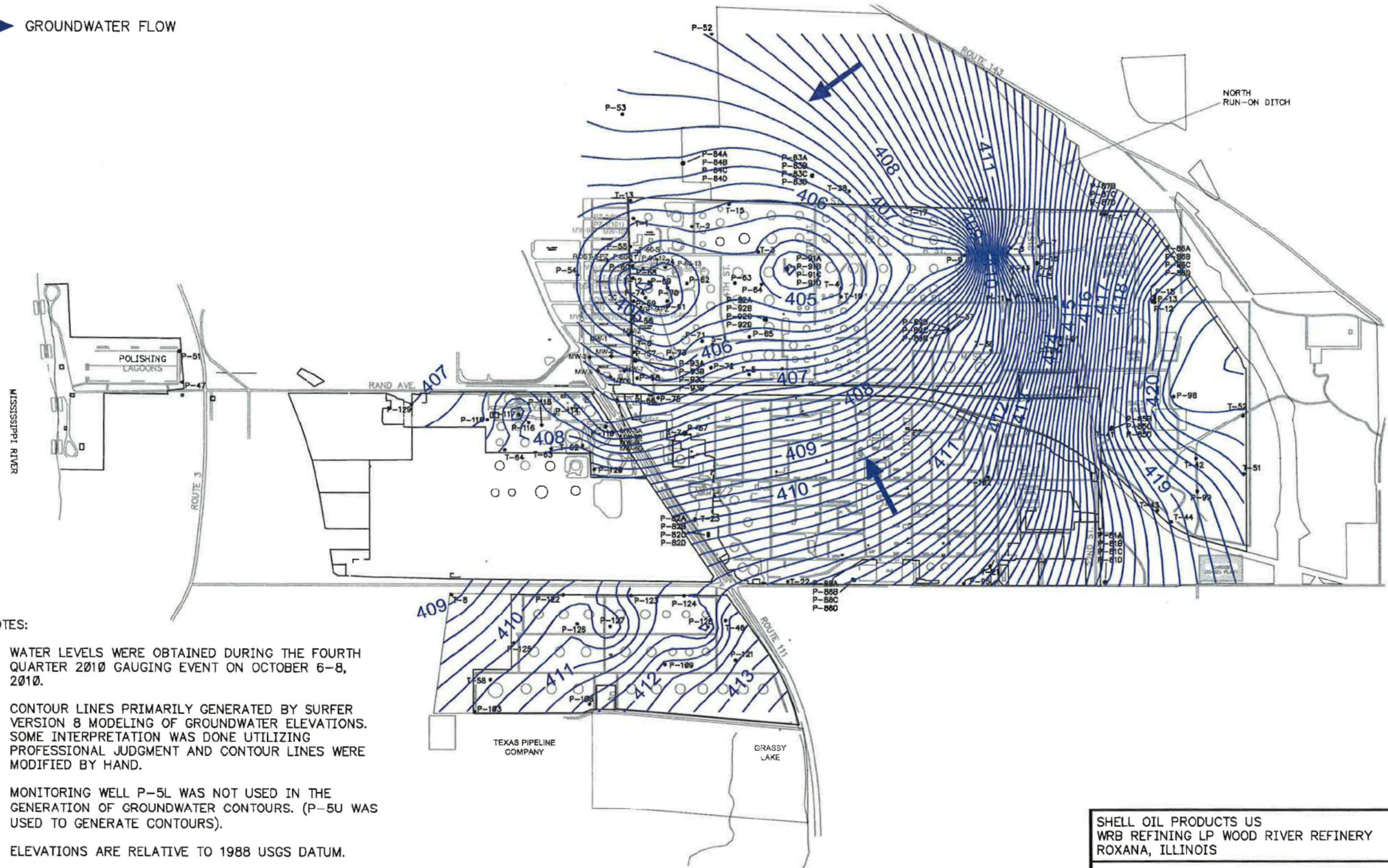
cc: Kevin Dyer, SOPUS  
Amy Boley, Illinois Environmental Protection Agency  
Mike Bechtol, Phillips 66

**LEGEND**

• MONITORING WELLS

—407— GROUNDWATER CONTOUR (0.25 FEET INTERVAL)

➔ GROUNDWATER FLOW



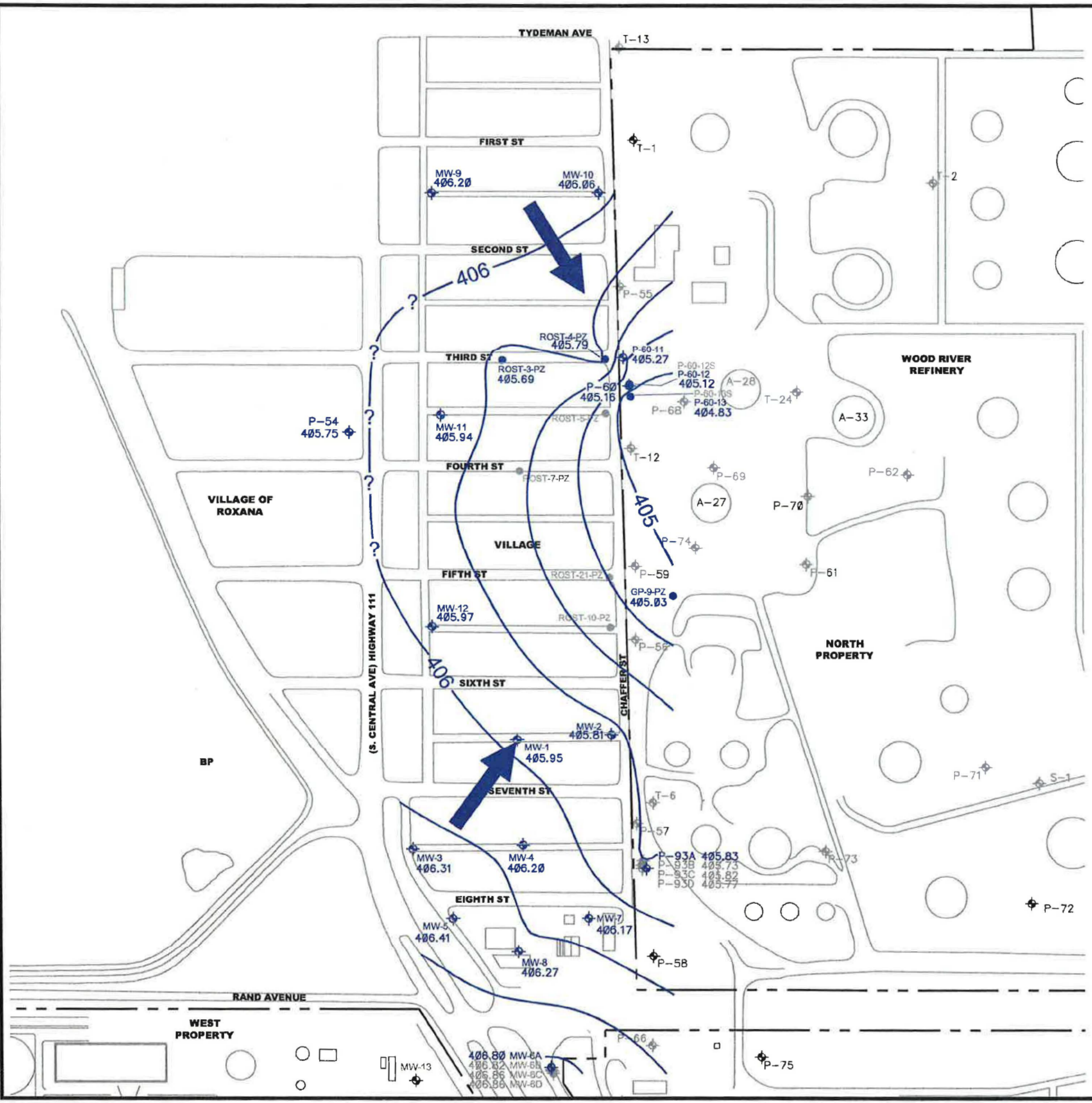
**NOTES:**

1. WATER LEVELS WERE OBTAINED DURING THE FOURTH QUARTER 2010 GAUGING EVENT ON OCTOBER 6-8, 2010.
2. CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILIZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
3. MONITORING WELL P-5L WAS NOT USED IN THE GENERATION OF GROUNDWATER CONTOURS. (P-5U WAS USED TO GENERATE CONTOURS).
4. ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.
5. REFINERY GROUNDWATER PUMPING RATES RANGED FROM 3,289 TO 3,316 GALLONS PER MINUTE FOR THE DAYS DURING WHICH THIS GAUGING EVENT WAS PERFORMED.

SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:wmp Oct 2012 DSGN. BY:djd CHKD. BY:b3	Groundwater Contour Map October 2010	FIG. NO. 1

P:\ENVIRONMENTAL\SHELL\_OIL\_PRODUCT\US\_C-WRB-COPI\21562736\_2010\_SHELL\_WRB\_GW\_MONITORING\US\_DELIVERABLE\PRODUCTION & FINAL\_PRODUCT\DEL\_10 - GW LOSS (JAN 2011) EVALUATION\FIGURE\4010 GW CONTOUR FIGURE.DWG Last edited: OCT\_30\_12 @ 12:47 p.m. by: wmp, jannaboston

P:\ENVIRONMENTAL\SHILL\_OIL\_PRODUCT\USG-WR-03A-01\127724\_2012\_SHELL\_WRR\_OIL\_MONITORING\_OF\_ENVIRONMENTAL\_PRODUCTION\_FINAL\_PRODUCT.DWG 10 - GW LOSS (AM 2011) (MILLIKOV\JULIUS\ROXANA\_4010\_CONTOUR\_MAP (NOV2010).DWG Last edited: OCT 30, 12 1:10 p.m. by: wmp, wmp, wmp



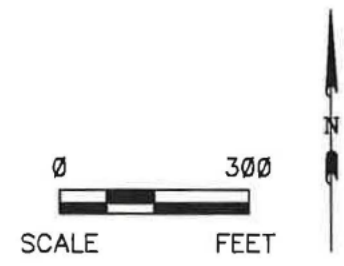
**LEGEND**

- ◆ MONITORING WELL LOCATION GAUGED (USED FOR CONTOURING)
- PIEZOMETER LOCATION GAUGED (USED FOR CONTOURING)
- PIEZOMETER LOCATION GAUGED (NOT USED FOR CONTOURING)
- ◆ MONITORING WELL LOCATION NOT GAUGED FOR THIS EVENT
- 405— GROUNDWATER CONTOUR (0.25 FEET INTERVAL)
- ➔ GROUNDWATER FLOW

**NOTES:**

- 1) WATER LEVELS WERE OBTAINED DURING THE FOURTH QUARTER 2010 GAUGING EVENT ON NOVEMBER 11-12, 2010.
- 2) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
- 3) PRODUCT WAS IDENTIFIED IN MONITORING WELL P-60 (0.04 FT\*) AND PIEZOMETER P-60-13 (0.37 FT). THE ELEVATIONS PRESENTED ON THIS FIGURE WERE CORRECTED BY A SPECIFIC GRAVITY OF 0.74 FOR THESE WELLS.
- 4) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.
- 5) REFINERY GROUNDWATER PUMPING RATES RANGED FROM 3,058 TO 3,106 GALLONS PER MINUTE FOR THE DAYS DURING WHICH THIS GAUGING EVENT WAS PERFORMED.

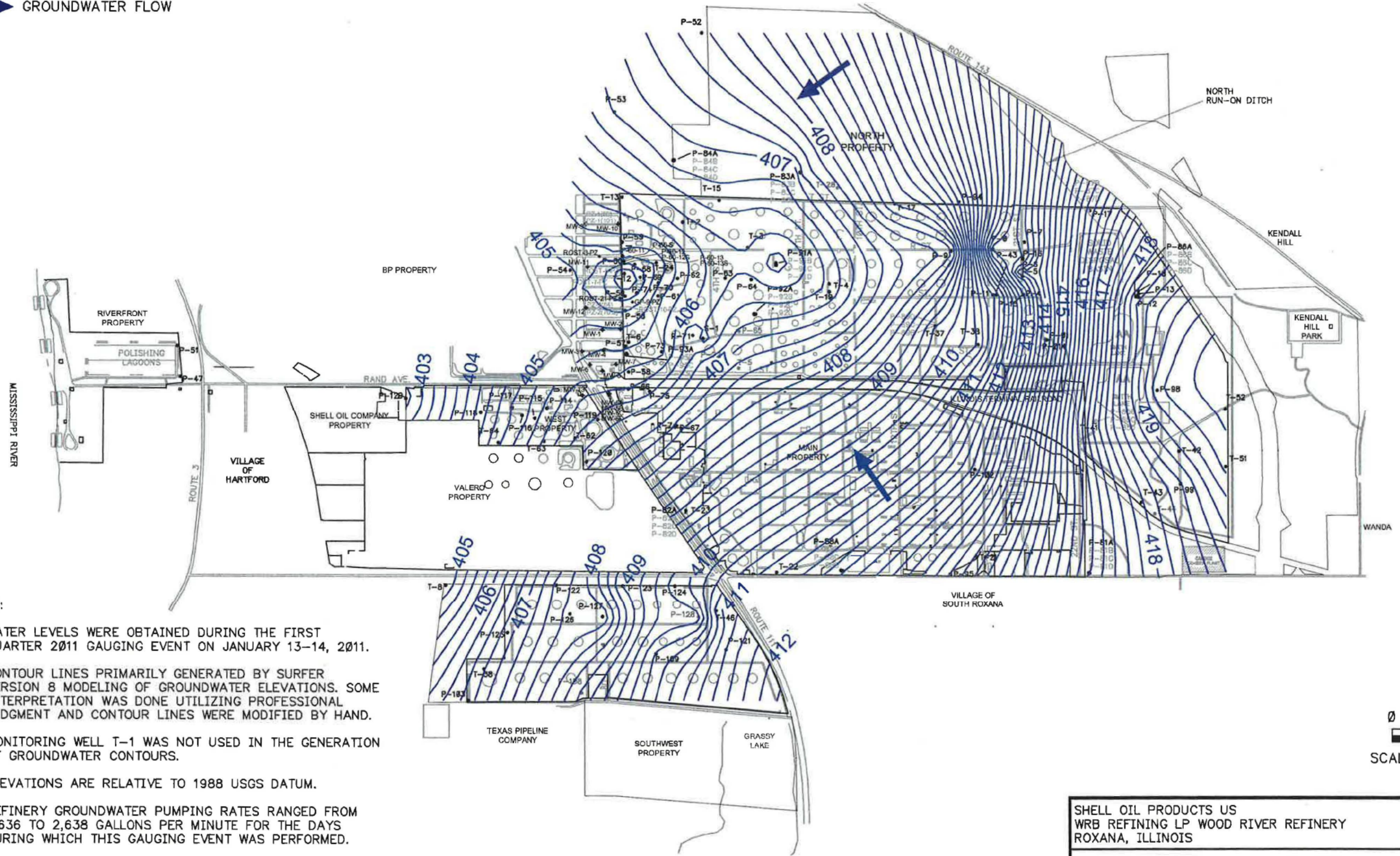
\* INDICATES THAT THE PRODUCT AND/OR WATER LEVEL IS ABOVE THE TOP OF THE WELL SCREEN.



SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY: wmp Oct 2012 DSGN. BY: wmp CHKD. BY: b3	Groundwater Contour Map November 2010	FIG. NO. 2

**LEGEND**

- MONITORING WELLS
- 407- GROUNDWATER CONTOUR (0.25 FEET INTERVAL)
- ➔ GROUNDWATER FLOW



**NOTES:**

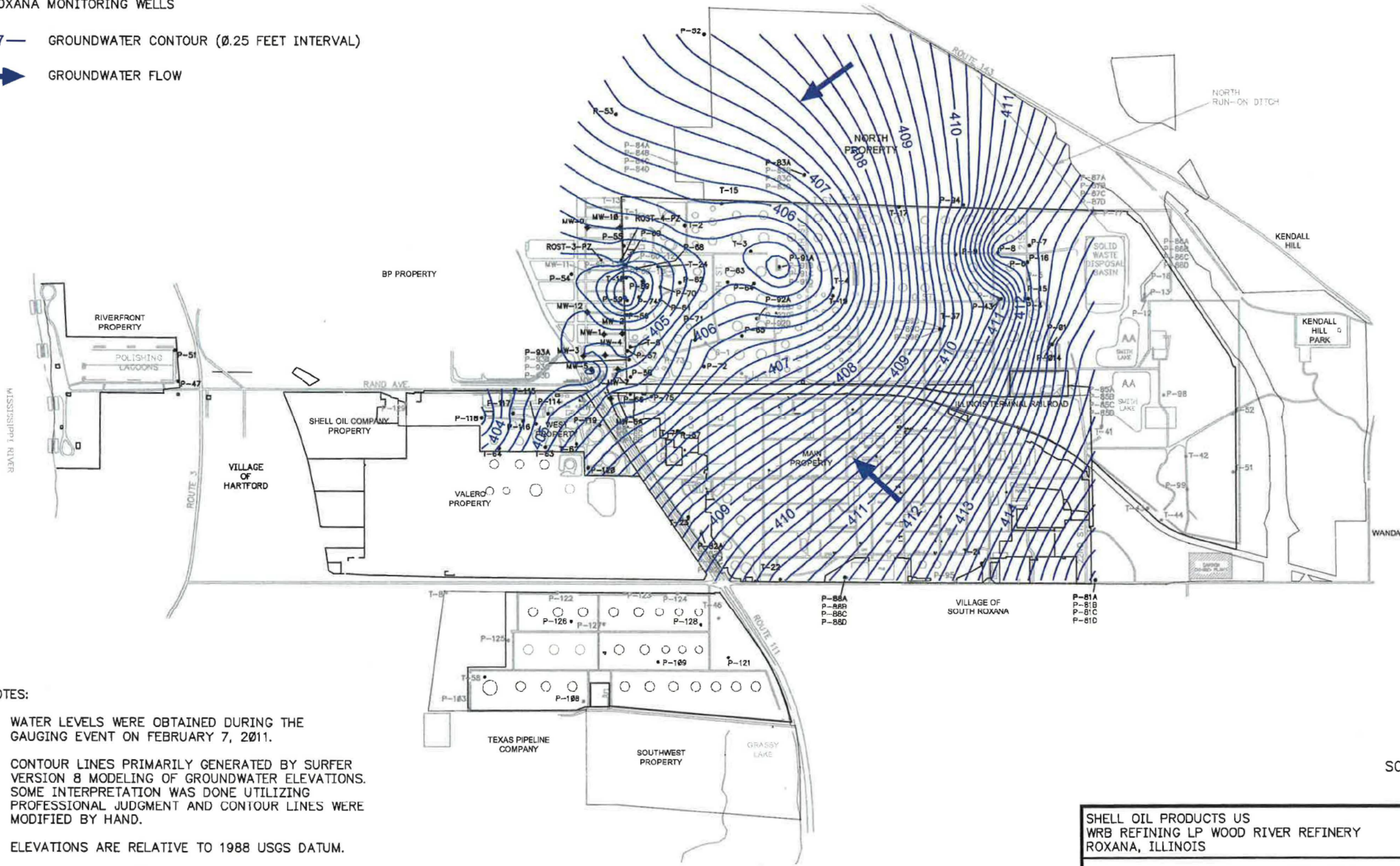
1. WATER LEVELS WERE OBTAINED DURING THE FIRST QUARTER 2011 GAUGING EVENT ON JANUARY 13-14, 2011.
2. CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILIZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
3. MONITORING WELL T-1 WAS NOT USED IN THE GENERATION OF GROUNDWATER CONTOURS.
4. ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.
5. REFINERY GROUNDWATER PUMPING RATES RANGED FROM 2,636 TO 2,638 GALLONS PER MINUTE FOR THE DAYS DURING WHICH THIS GAUGING EVENT WAS PERFORMED.

SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:wmp Oct 2012 DSGN. BY:djd CHKD. BY:b3	Groundwater Contour Map January 2011	FIG. NO. 3

FILE: P:\ENVIRONMENTAL\SHLL\_OIL\_PRODUCT\US\_C-WRS-COP\11022236\_2012\_SHELL\_WRRB\_GW\_MONITORING\05\_DELIVERABLE\_PRODUCTION\_FINAL\_PRODUCT\DEL\_10 -- GW DGS (Jan 2011) EVALUATION\FIGURES\0111 GW CONTOUR FIGURE.DWG Last saved: OCT. 30, 12 @ 1:14 p.m. by: wmp55\_penningson

**LEGEND**

- MONITORING WELLS
- ⊕ ROXANA MONITORING WELLS
- 407— GROUNDWATER CONTOUR (0.25 FEET INTERVAL)
- ➔ GROUNDWATER FLOW



**NOTES:**

1. WATER LEVELS WERE OBTAINED DURING THE GAUGING EVENT ON FEBRUARY 7, 2011.
2. CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILIZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
3. ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.
4. REFINERY GROUNDWATER PUMPING RATE WAS 3,495 GALLONS PER MINUTE FOR THE DAY ON WHICH THIS GAUGING EVENT WAS PERFORMED.

SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:wmp Oct 2012 DSGN. BY:djd CHKD. BY:b3	Groundwater Contour Map February 2011	FIG. NO. 4

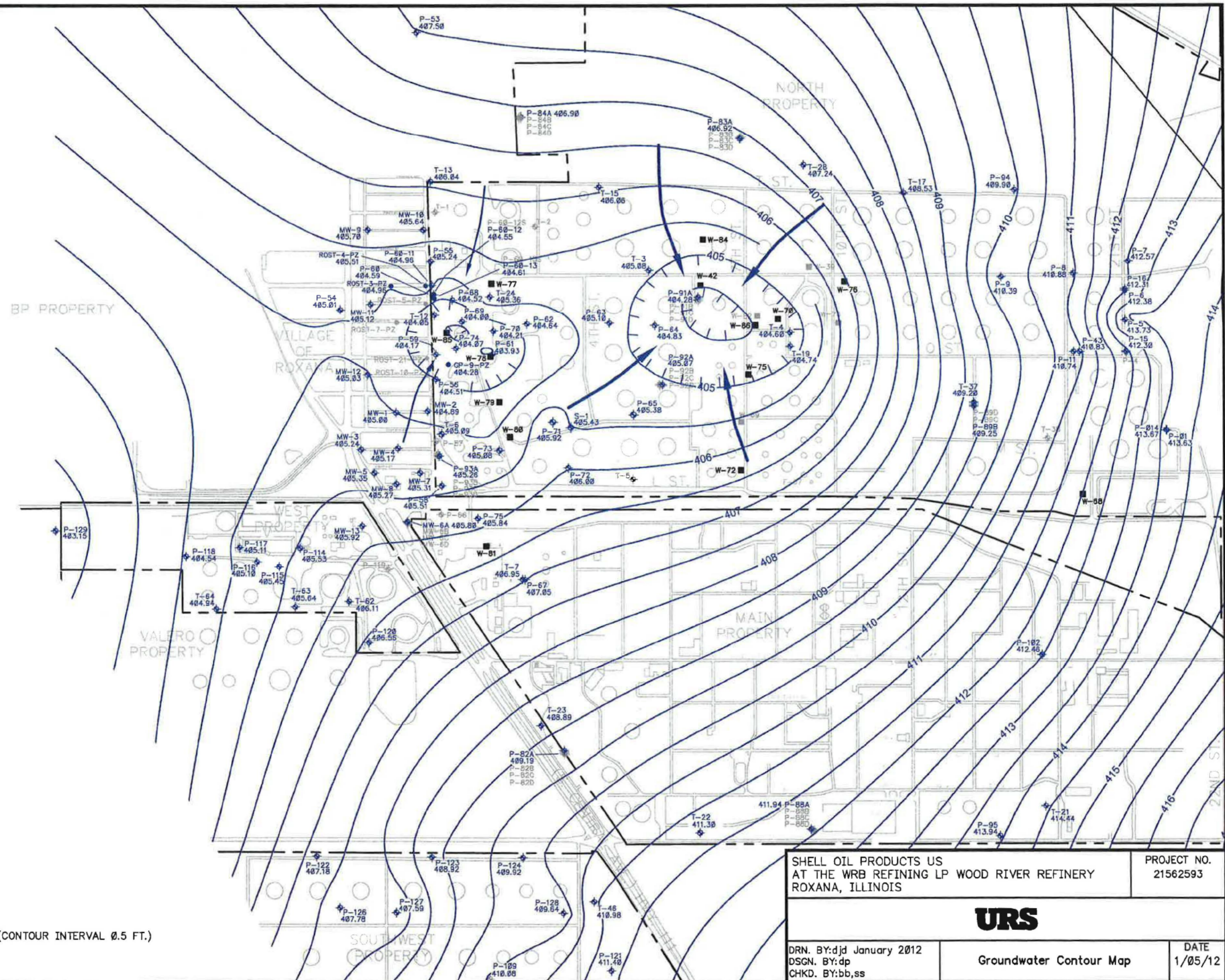
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NOTES:

- 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
- 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

File: P:\ENVIRONMENTAL\SHELL\_OIL\_PRODUCT\_US\C-WRR-COP\WRR WEEKLY WELL GAUGING\FIGURES\1112\ROXANNA 1012 CONTOUR MAP (CONTOURS ON 1-05-12).DWG Last edited: FEB 08, 12 @ 10:30 a.m. by: david\_dreuzer



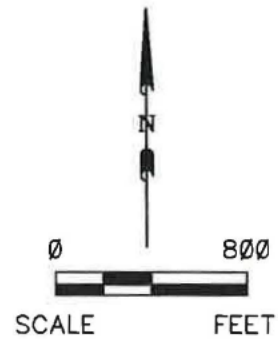
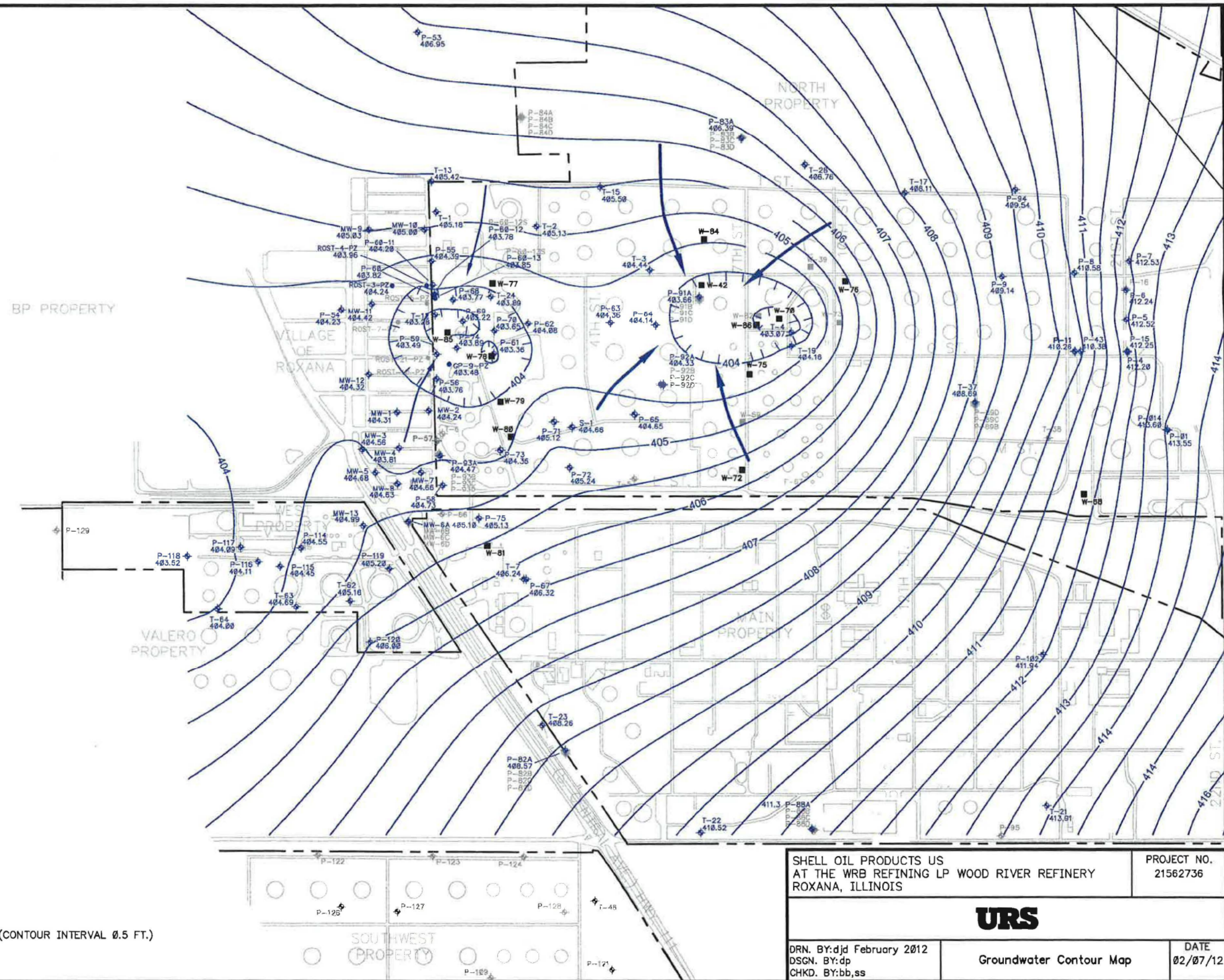
- LEGEND**
- ◆ MONITORING WELL LOCATION GAUGED
  - PIEZOMETER LOCATION GAUGED
  - WATER WELLS (OPERATING)
  - ➔ GROUNDWATER GRADIENT
  - 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US AT THE WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562593
<b>URS</b>		
DRN. BY:djd January 2012 DSGN. BY:dp CHKD. BY:bb,ss	Groundwater Contour Map	DATE 1/05/12

NOTES:

- 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
- 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

File: P:\ENVIRONMENTAL\SHELL\_OIL\_PRODUCT\_US\C-NRR-COP\WRB\_WEEKLY\_WELL\_GAUGING\FIGURES\1112\ROXANA\_1112\_CONTOUR\_MAP.dwg Contours on 02-07-12, DWG Last edited: MAR\_06\_12 @ 12:49 p.m. by: douda\_douda



LEGEND

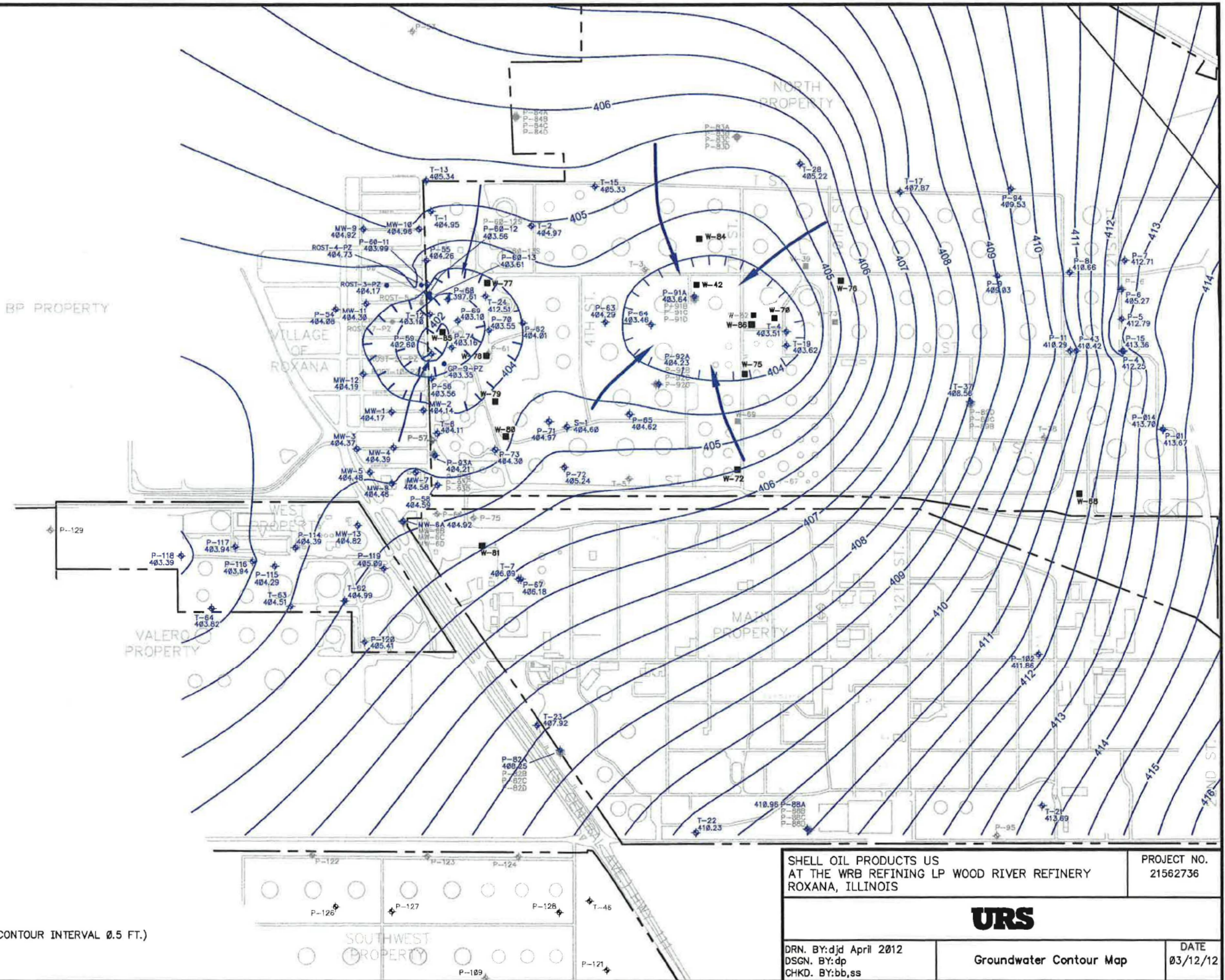
- ◆ MONITORING WELL LOCATION GAUGED
- PIEZOMETER LOCATION GAUGED
- WATER WELLS (OPERATING)
- ➔ GROUNDWATER GRADIENT
- 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US AT THE WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd February 2012 DSGN. BY:dp CHKD. BY:bb,ss	Groundwater Contour Map	DATE 02/07/12

NOTES:  
 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.

2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

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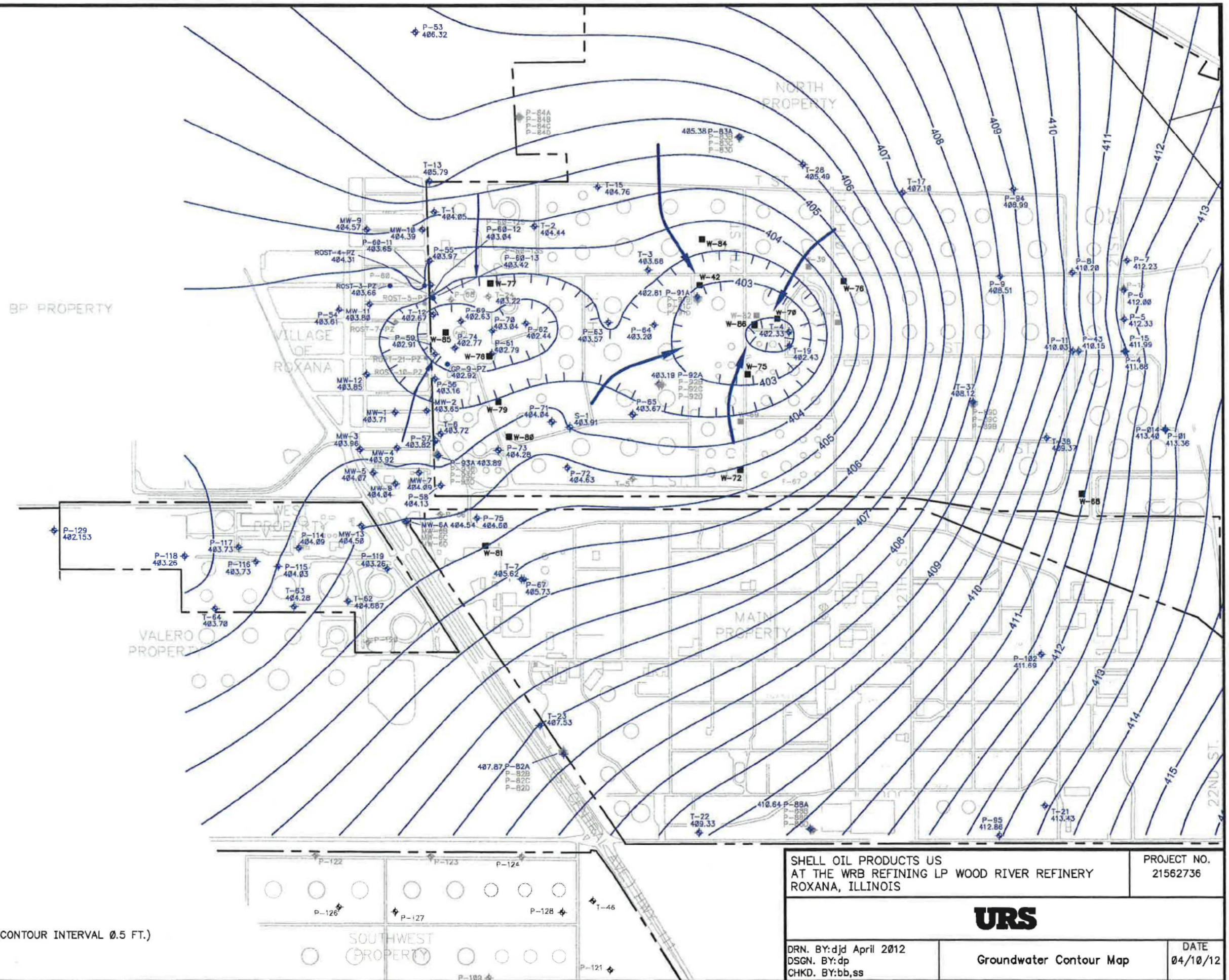
- LEGEND**
- ◆ MONITORING WELL LOCATION GAUGED
  - PIEZOMETER LOCATION GAUGED
  - WATER WELLS (OPERATING)
  - ➔ GROUNDWATER GRADIENT
  - 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US AT THE WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd April 2012 DSGN. BY:dp CHKD. BY:bb,ss	Groundwater Contour Map	DATE 03/12/12

NOTES:

1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILIZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.

2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.



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LEGEND

- MONITORING WELL LOCATION GAUGED
- PIEZOMETER LOCATION GAUGED
- WATER WELLS (OPERATING)
- GROUNDWATER GRADIENT
- 407 — GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US  
AT THE WRB REFINING LP WOOD RIVER REFINERY  
ROXANA, ILLINOIS

PROJECT NO.  
21562736



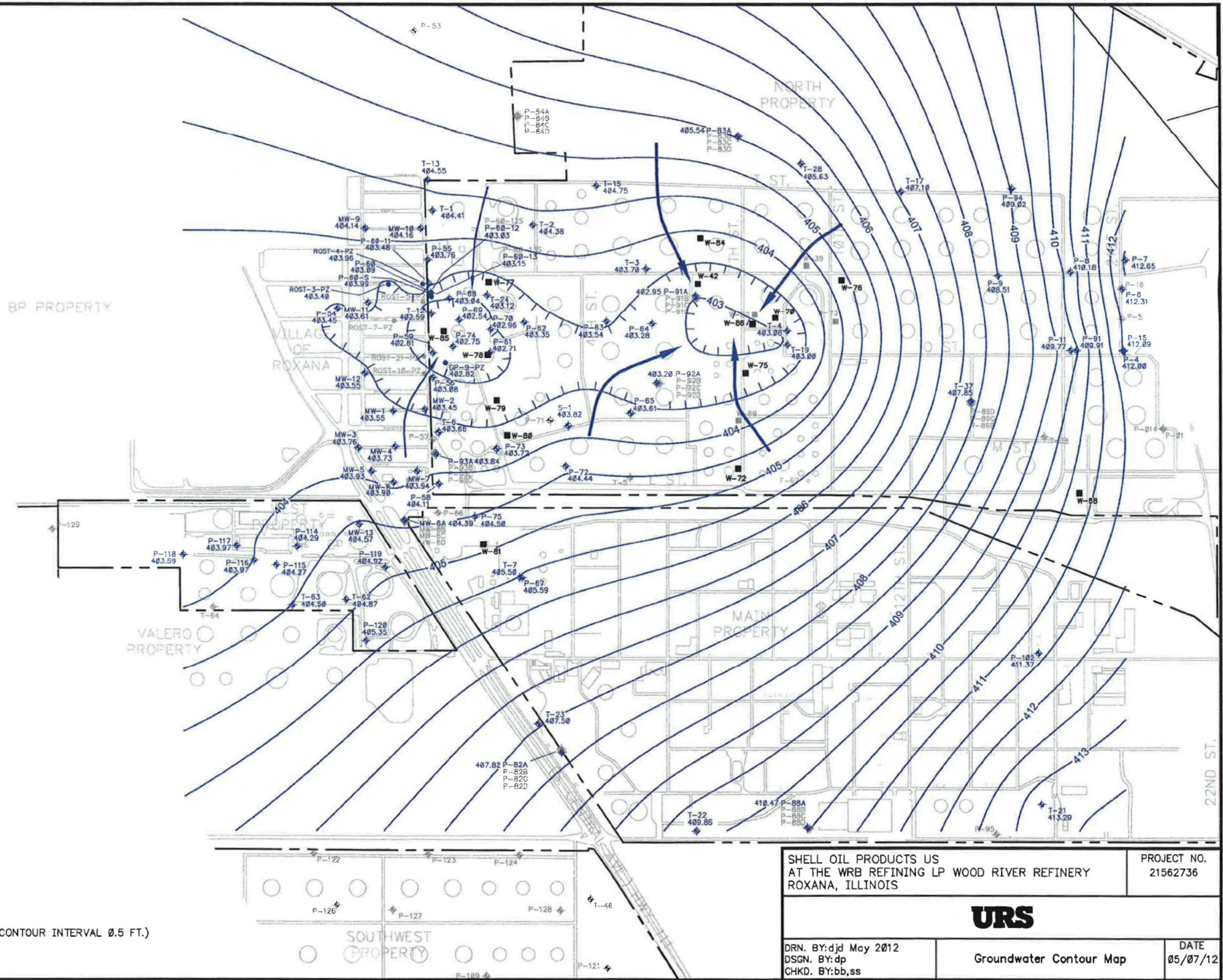
DRN. BY:djd April 2012  
DSGN. BY:dp  
CHKD. BY:bb,ss

Groundwater Contour Map

DATE  
04/10/12

Fig. P-1 ENVIRONMENTAL SHELL OIL PRODUCTS US SHELL OIL PRODUCTS US 2012A 21562736-WRR GAUGING & SAMPLING 21562736-10 - GAUGING & MONITORING WRR WEEKLY WELL GAUGING FIGURES 1H12 CONTOUR MAP (CONTOURS ON 05-07-12).DWG Lot

- NOTES:
- 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
  - 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.



- LEGEND
- ◆ MONITORING WELL LOCATION GAUGED
  - PIEZOMETER LOCATION GAUGED
  - WATER WELLS (OPERATING)
  - GROUNDWATER GRADIENT
  - 407 — GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US AT THE WRR REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd May 2012 DSGN. BY:dp CHKD. BY:bb,ss	Groundwater Contour Map	DATE 05/07/12

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCTS US\2012\21562736-WRR GAUGING & MONITORING\WRR WEEKLY WELL GAUGING FIGURES\1H12 CONTOUR MAP (CONTOURS ON 06-05-12).DWG Lot

NOTES:  
 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.  
 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

BP PROPERTY

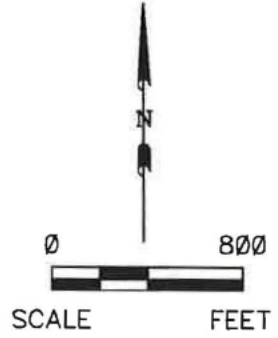
VILLAGE OF ROXANA

NORTH PROPERTY

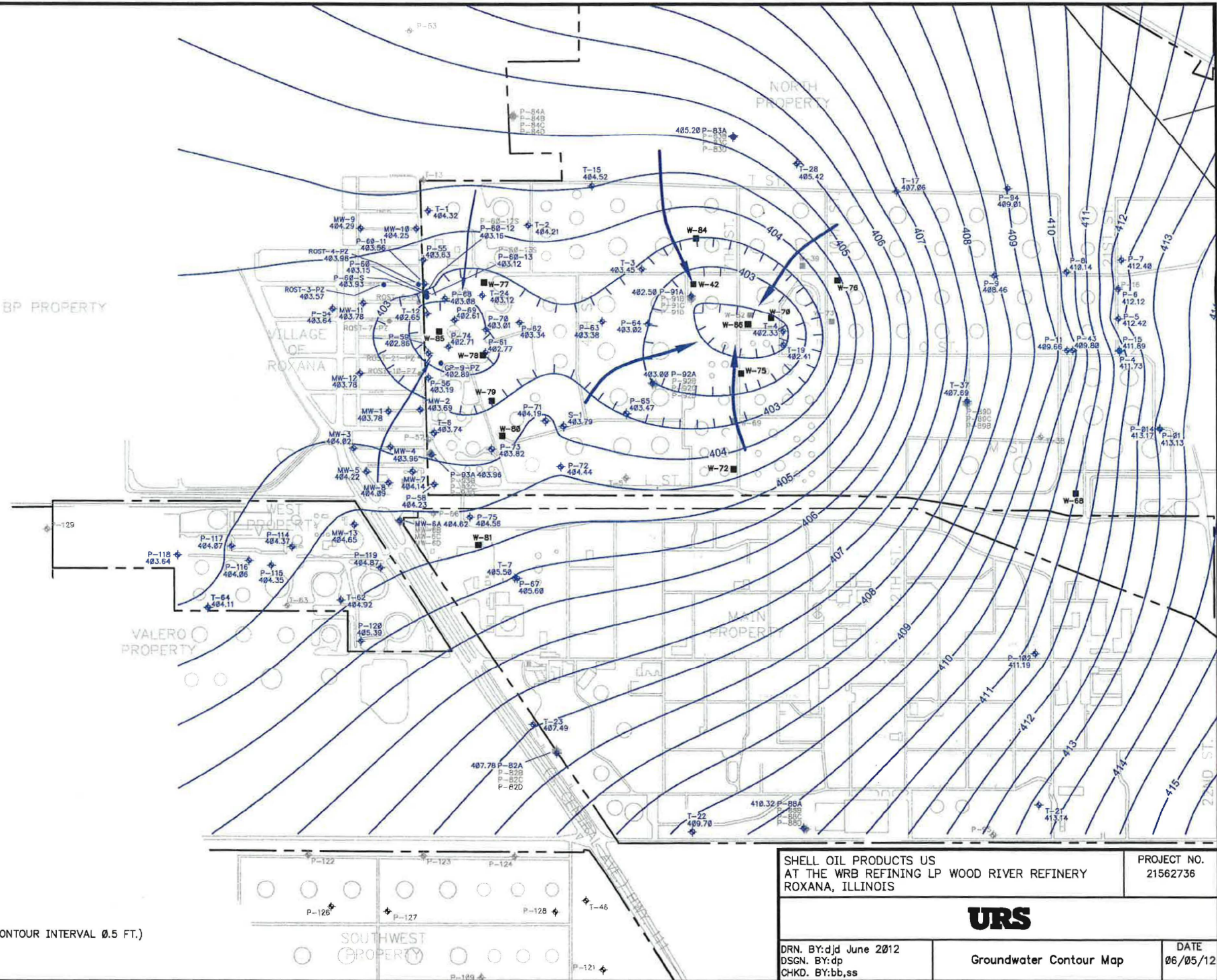
VALERO PROPERTY

MAIN PROPERTY

SOUTHWEST PROPERTY



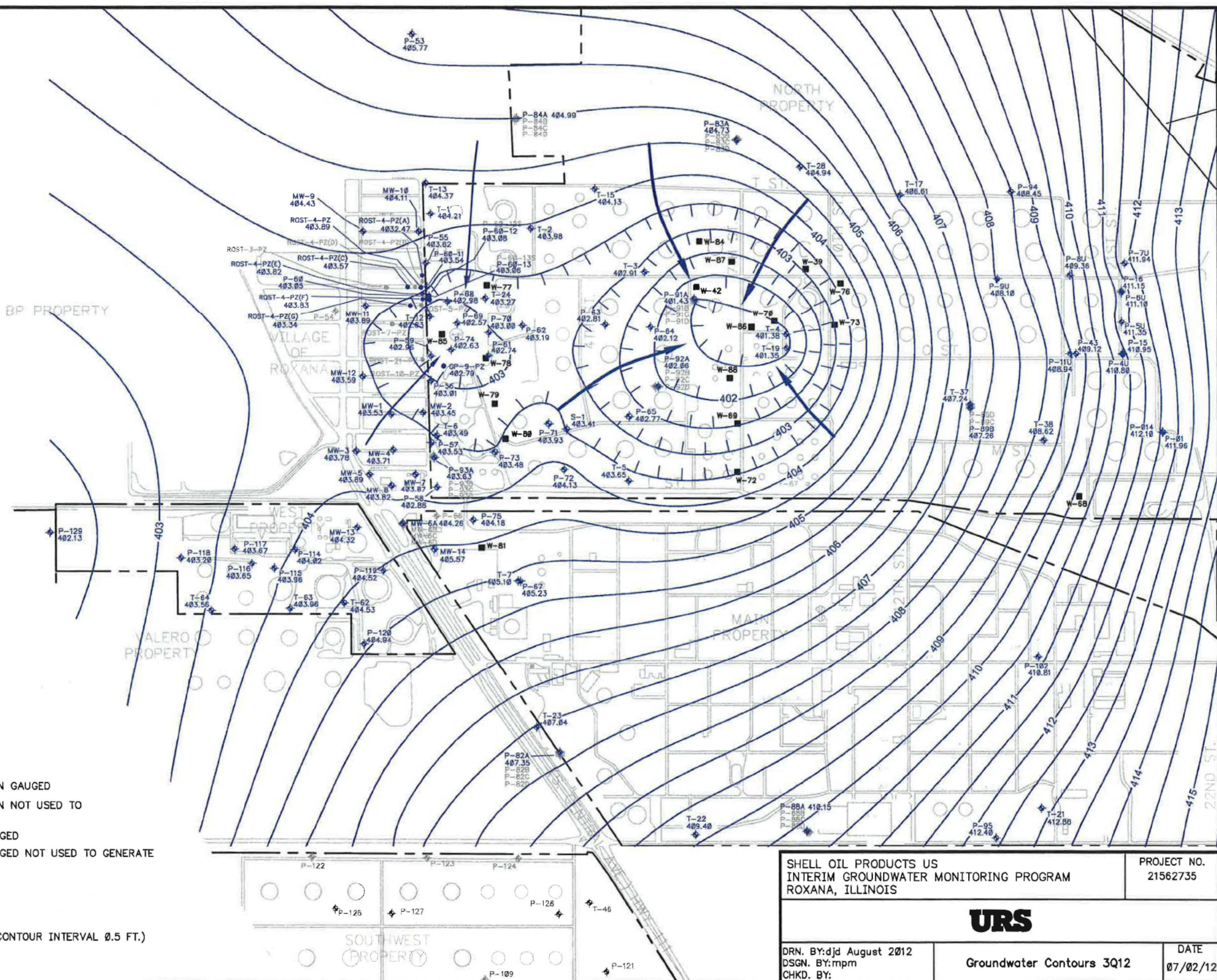
- LEGEND**
- ◆ MONITORING WELL LOCATION GAUGED
  - PIEZOMETER LOCATION GAUGED
  - WATER WELLS (OPERATING)
  - GROUNDWATER GRADIENT
  - 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)



SHELL OIL PRODUCTS US AT THE WRR REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd June 2012 DSGN. BY:dp CHKD. BY:bb,ss	Groundwater Contour Map	DATE 06/05/12

NOTES:

- 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILIZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
- 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.
- 3) COMPREHENSIVE GROUNDWATER ELEVATIONS WERE MEASURED JULY 2-3, 5-6, AND 9, 2012.



LEGEND

- ◆ GROUNDWATER MONITORING WELL LOCATION GAUGED
- ◇ GROUNDWATER MONITORING WELL LOCATION NOT USED TO GENERATE GROUNDWATER CONTOURS
- GROUNDWATER PIEZOMETER LOCATION GAUGED
- GROUNDWATER PIEZOMETER LOCATION GAUGED NOT USED TO GENERATE GROUNDWATER CONTOURS
- WRR GROUNDWATER DEPRESSION WELLS
- ➔ GROUNDWATER GRADIENT
- 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US INTERIM GROUNDWATER MONITORING PROGRAM ROXANA, ILLINOIS		PROJECT NO. 21562735
<b>URS</b>		DATE 07/02/12
DRN. BY:djd August 2012 DSGN. BY:mpr CHKD. BY:	Groundwater Contours 3Q12	

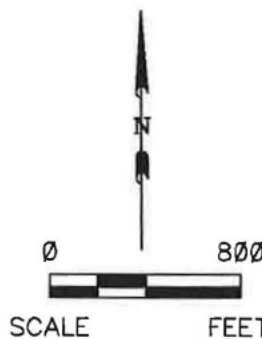
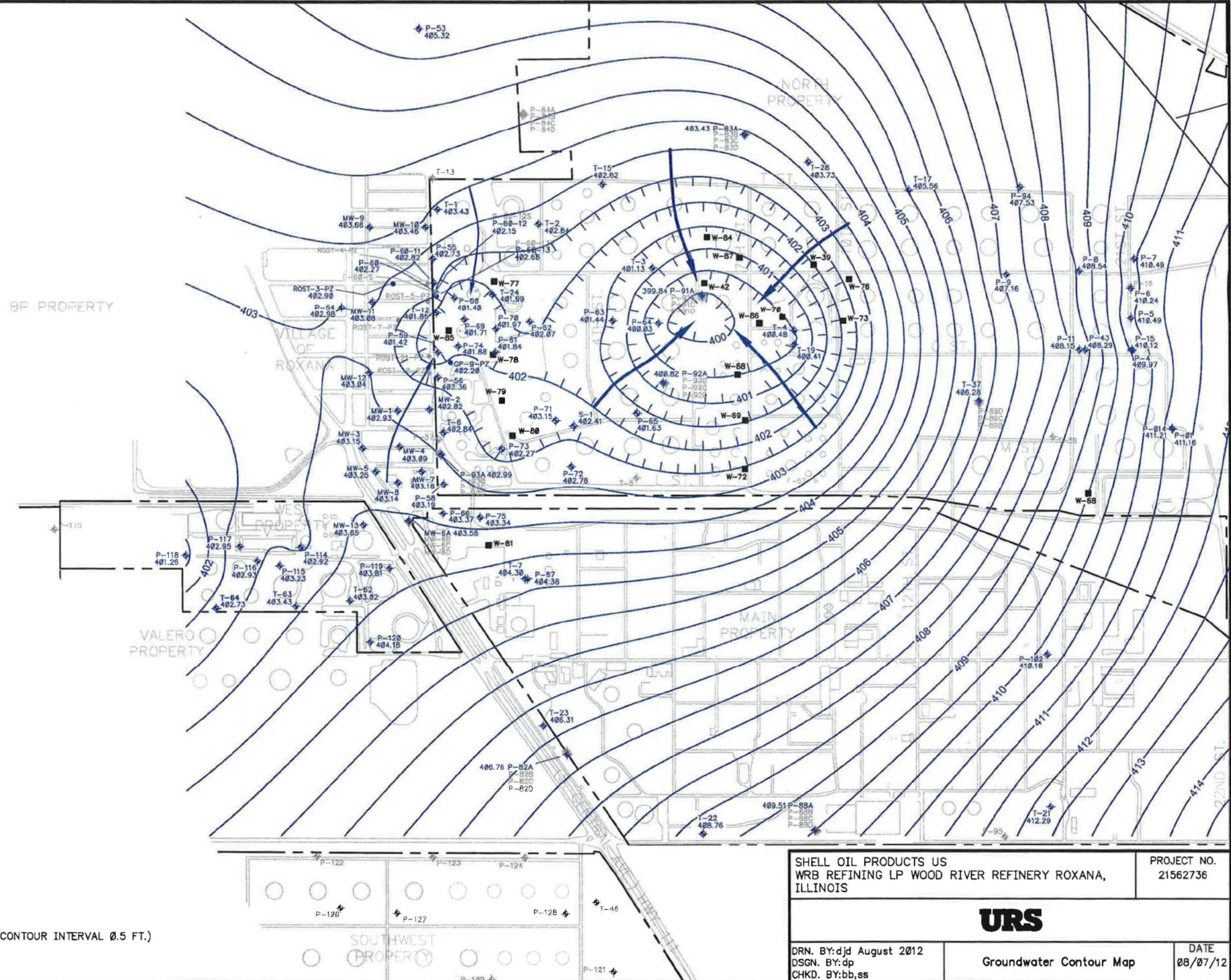
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NOTES:

1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.

2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

File: P:\ENVIRONMENTAL\SHLL OIL PRODUCT US\G-WRR-COPA\WRR WEEKLY WELL GAUGING\FIGURES\2H12\ROXANNA 2H12 CONTOUR MAP (CONTOURS ON 08-07-12).DWG Last edited: SEP. 10. 12 @ 11:19 a.m. by: david\_greiner



- LEGEND**
- ◆ MONITORING WELL LOCATION GAUGED
  - PIEZOMETER LOCATION GAUGED
  - WRR GROUNDWATER DEPRESSION WELLS
  - ➔ GROUNDWATER GRADIENT
  - 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US WRR REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd August 2012 DSGN. BY:dp CHKD. BY:bb,ss	Groundwater Contour Map	DATE 08/07/12



File: P:\ENVIRONMENTAL\SHELL\_OIL\_PRODUCT\_USA\C-WRR-WRR-COP-WRR WEEKLY WELL GAUGING FIGURES\2112\ROXANA\_2112 CONTOUR MAP (CONTOURS ON 09-11-12) DWG Last edited: OCT\_01\_12 @ 2:08 p.m. by: david\_duquain

- NOTES:
- 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
  - 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

BP PROPERTY

NORTH PROPERTY

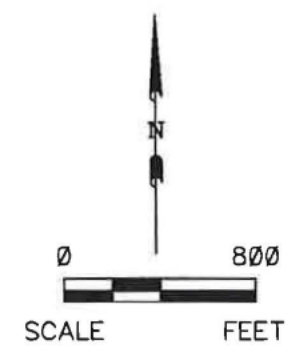
ROXANA

WEST PROPERTY

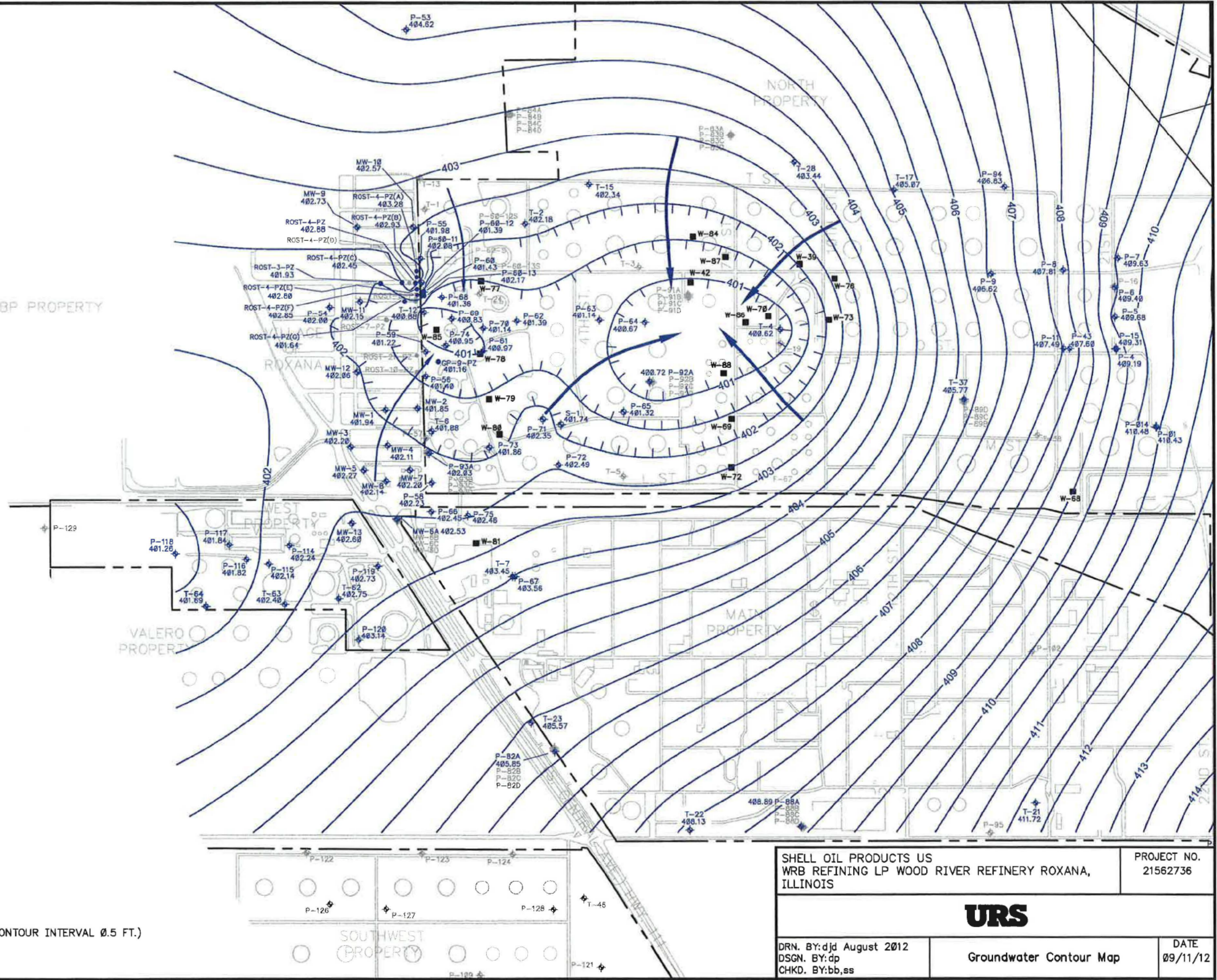
VALERO PROPERTY

MATX PROPERTY

SOUTHWEST PROPERTY



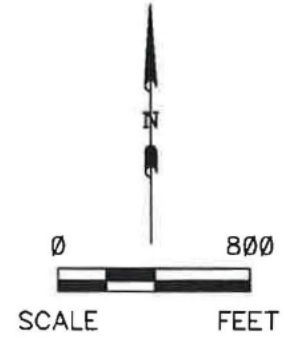
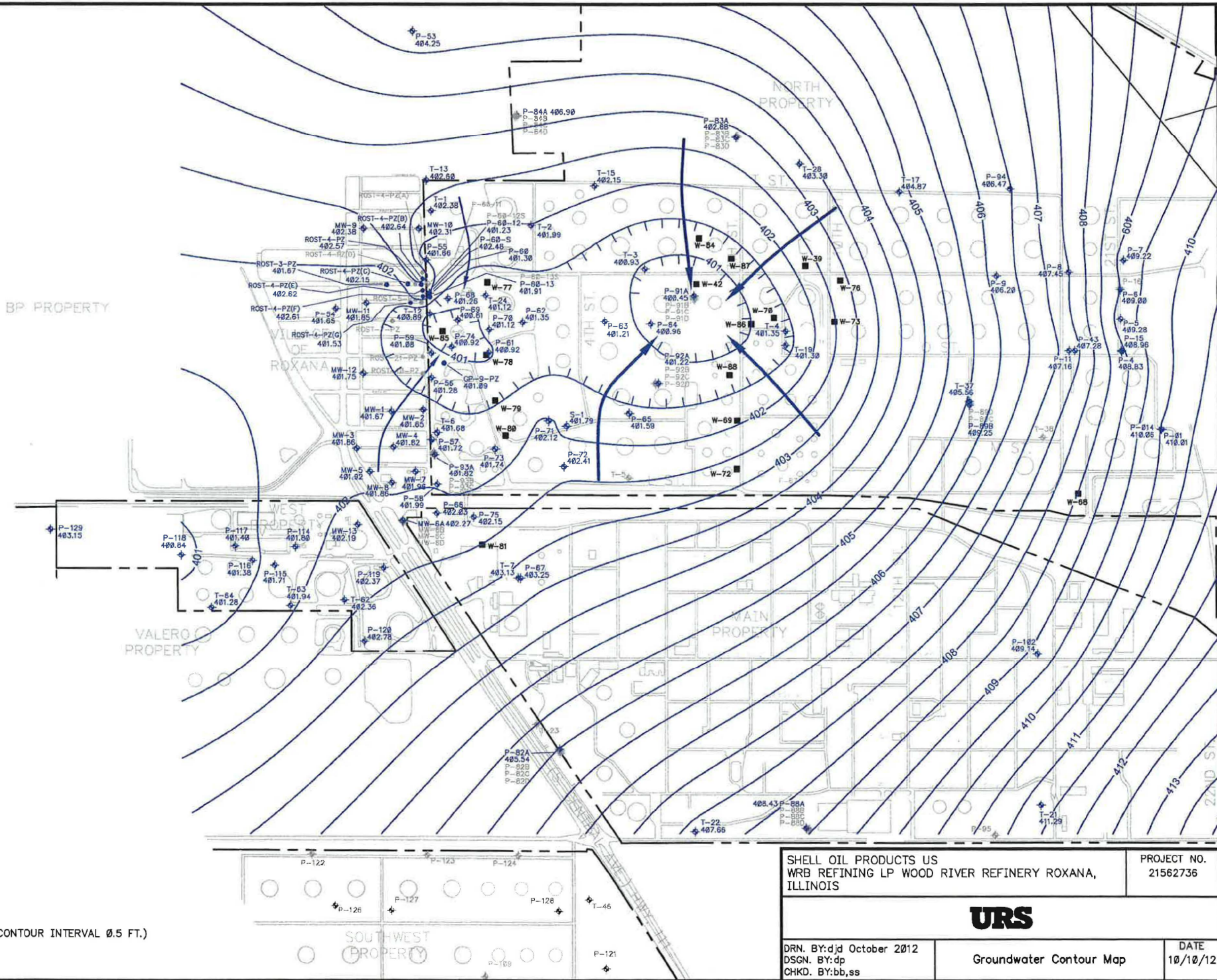
- LEGEND**
- ◆ MONITORING WELL LOCATION GAUGED
  - PIEZOMETER LOCATION GAUGED
  - WRR GROUNDWATER DEPRESSION WELLS
  - GROUNDWATER GRADIENT
  - 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)



SHELL OIL PRODUCTS US WRR REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY: djd August 2012 DSGN. BY: dp CHKD. BY: bb, ss	Groundwater Contour Map	DATE 09/11/12

NOTES:  
 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.  
 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

File: P:\ENVIRONMENTAL\SHILL OIL PRODUCT US\G-WRR-600\WRR WEEKLY WELL GAUGING\FIGURES\2112\ROXANA\_2112\_CONTOUR MAP (CONTOURS ON 10-10-12).DWG Last edited: OCT. 29. 12 @ 11:42 a.m. by: david\_denigre

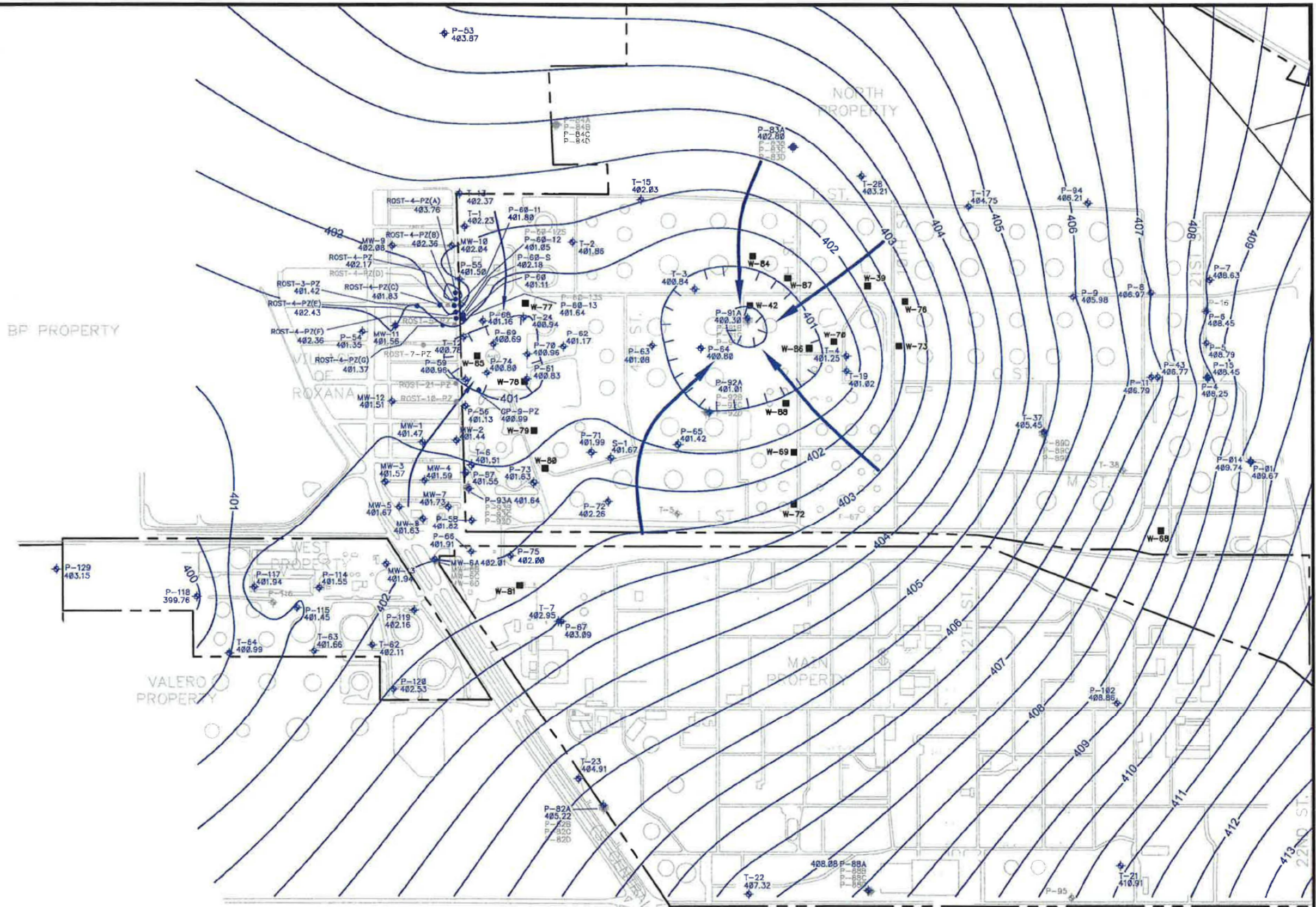


- LEGEND**
- ◆ MONITORING WELL LOCATION GAUGED
  - PIEZOMETER LOCATION GAUGED
  - WRR GROUNDWATER DEPRESSION WELLS
  - GROUNDWATER GRADIENT
  - 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US WRR REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd October 2012 DSGN. BY:dp CHKD. BY:bb,ss	Groundwater Contour Map	DATE 10/10/12

**NOTES:**

- 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
- 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.



**LEGEND**

- ◆ MONITORING WELL LOCATION GAUGED
- PIEZOMETER LOCATION GAUGED
- WRR GROUNDWATER DEPRESSION WELLS
- ➔ GROUNDWATER GRADIENT
- 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd October 2012 DSGN. BY:dp CHKD. BY:bbb,kh	Groundwater Contour Map	DATE 11/07/12

NOTES:

1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.

2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

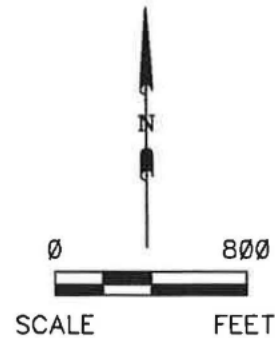
BP PROPERTY

ROXANA

VALERO PROPERTY

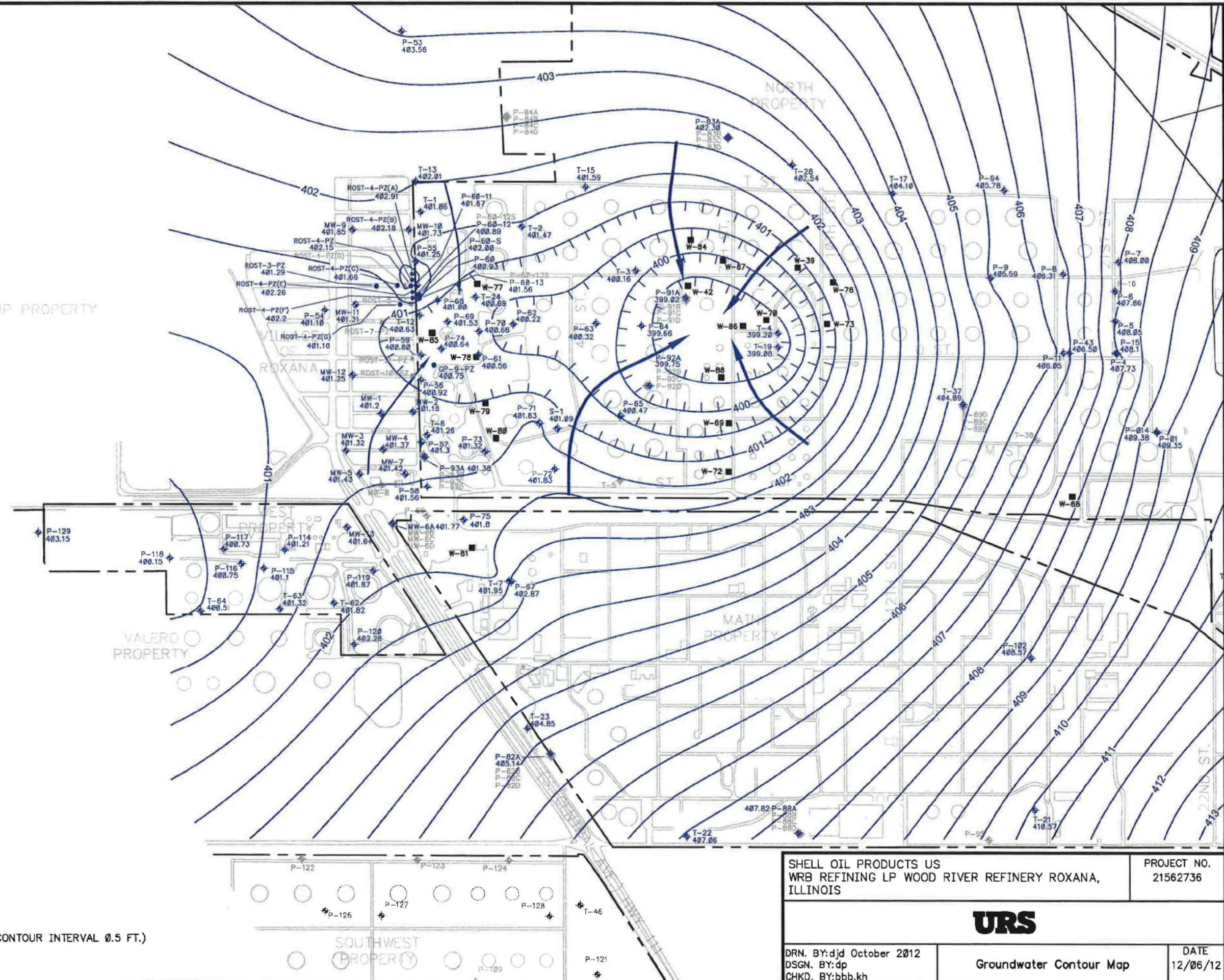
MATH PROPERTY

SOUTHWEST PROPERTY



LEGEND

- ◆ MONITORING WELL LOCATION GAUGED
- PIEZOMETER LOCATION GAUGED
- WRR GROUNDWATER DEPRESSION WELLS
- ➔ GROUNDWATER GRADIENT
- 407 — GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)



SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd October 2012 DSGN. BY:dp CHKD. BY:bbb,kh	Groundwater Contour Map	DATE 12/06/12

NOTES:

1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILITZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.

2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.

BP PROPERTY

ROXANA

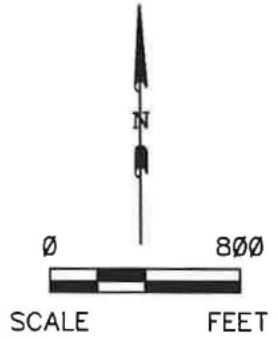
WEST PROPERTY

VALERO PROPERTY

NORTH PROPERTY

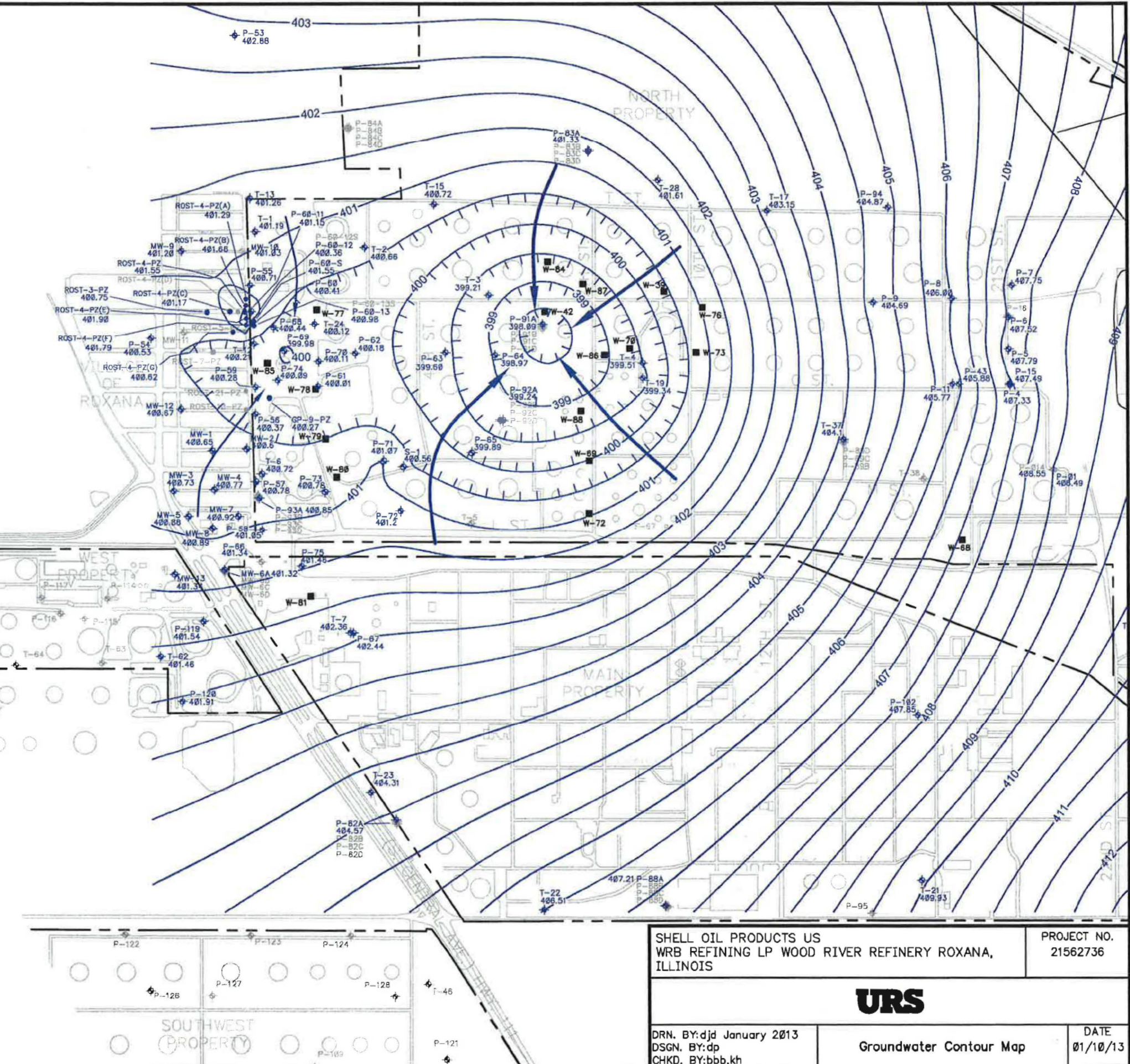
MAIN PROPERTY

SOUTHWEST PROPERTY



LEGEND

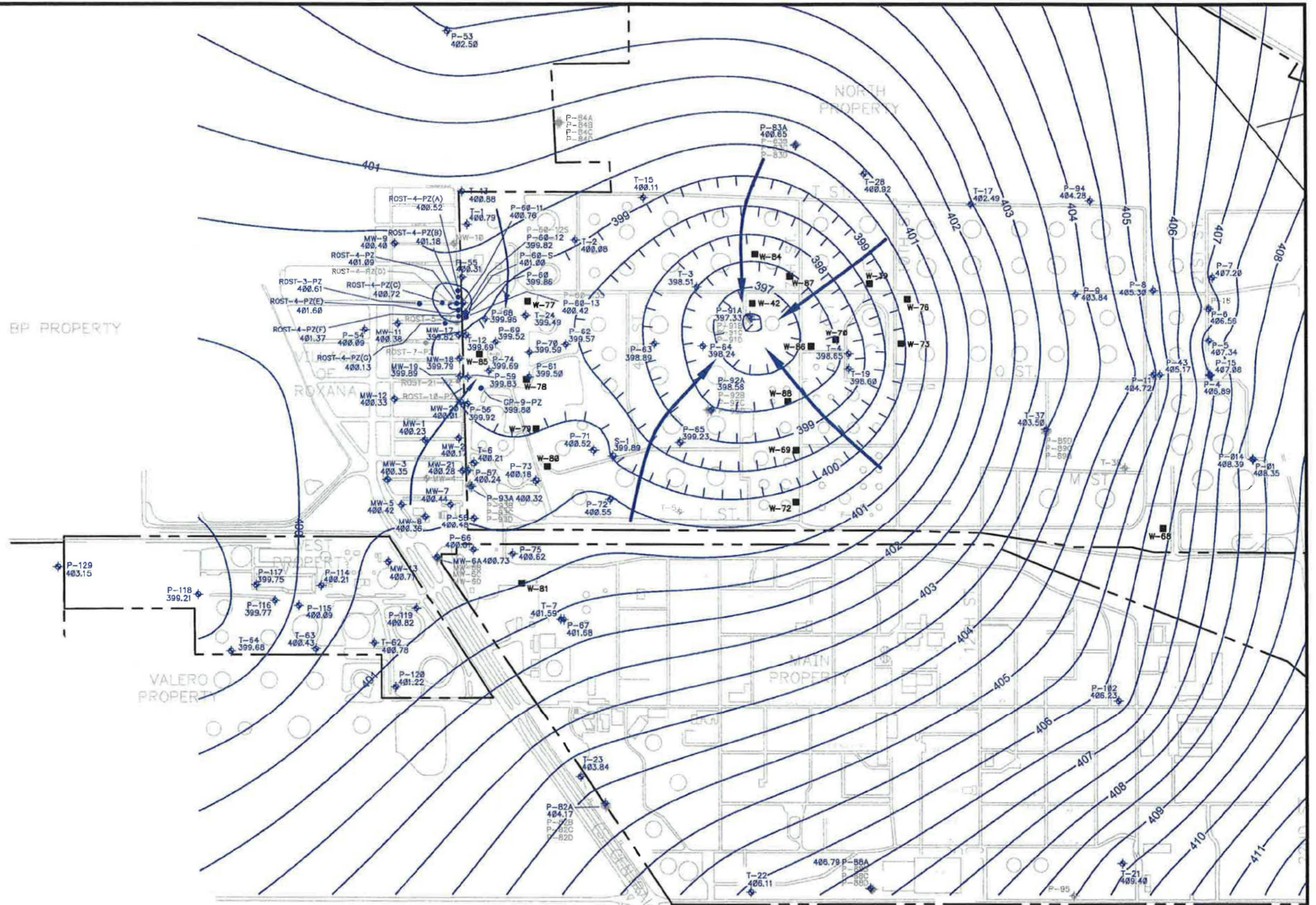
- ◆ MONITORING WELL LOCATION GAUGED
- PIEZOMETER LOCATION GAUGED
- WRR GROUNDWATER DEPRESSION WELLS
- ➔ GROUNDWATER GRADIENT
- 407— GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)



SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd January 2013 DSGN. BY:dp CHKD. BY:bbb,kh	Groundwater Contour Map	DATE 01/10/13

**NOTES:**

- 1) CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILIZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
- 2) ELEVATIONS ARE RELATIVE TO 1988 USGS DATUM.



**LEGEND**

- MONITORING WELL LOCATION GAUGED
- PIEZOMETER LOCATION GAUGED
- WRR GROUNDWATER DEPRESSION WELLS
- GROUNDWATER GRADIENT
- 407 — GROUNDWATER SURFACE CONTOUR NGVD (CONTOUR INTERVAL 0.5 FT.)

SHELL OIL PRODUCTS US WRB REFINING LP WOOD RIVER REFINERY ROXANA, ILLINOIS		PROJECT NO. 21562736
<b>URS</b>		
DRN. BY:djd Febraury 2013 DSGN. BY:dp CHKD. BY:bbb,kh	Groundwater Contour Map	DATE 02/12/13