



Steven L. Beshear  
Governor

Leonard K. Peters  
Secretary  
Energy and Environment Cabinet

Commonwealth of Kentucky  
**Public Service Commission**  
211 Sower Blvd.  
P.O. Box 615  
Frankfort, Kentucky 40602-0615  
Telephone: (502) 564-3940  
Fax: (502) 564-3460  
psc.ky.gov

David L. Armstrong  
Chairman

James W. Gardner  
Vice Chairman

February 24, 2012

Mr. Kenny Barber  
Bath County Water District  
P.O. Box 369  
Salt Lick, Kentucky 40371

Re: Case No. 2012-00004  
Bath County Water District

Dear Mr. Barber:

The enclosed documents have been filed in the record of the above-referenced case. Any objections to this action should be submitted to the Commission within five days of receipt of this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Derouen".

Jeff Derouen  
Executive Director

gw  
Enclosure

**DOCUMENT FILING DATED 24 FEBRUARY 2012**

<b>Doc No</b>	<b>Document Description</b>	<b>Pages</b>
1	E-Mail Message from DOW Open Records Section to Gerald Wuetcher (6 January 2012 1257)	000001-000002
2	E-Mail Message from DOW Open Records Section to Gerald Wuetcher (6 January 2012 1258)	000003-000004
3	Letter from Mark Rashe, DOW Water Infrastructure Branch, to Kenny Barber, Bath County Water District (11 November 2011) – Approval Letter	000005
4	Project Summary	000006
5	E-Mail Message from Lissa Doss, Engineering Section, Water Infrastructure Branch, Kentucky DOW to James C. Thompson, Kentucky Engineering Group (undated)	000007
6	Construction Application for Drinking Water Distribution	000008-000011
7	Letter from Kenny Barber, Bath County Water District, to Kentucky DOW (15 October 2011)	000012
8	Letter from James C. Thompson, Kentucky Engineering Group, to Review Section, Drinking Water Branch, Kentucky DOW (20 October 2011)	000013
9	Preliminary Engineering Cost Estimate	000014
10	Hydraulic Study Results	000015-000067
11	Aerial Plan	000068-000069

**Wuetcher, Jerry (PSC)**

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**From:** DOWOpenRecords (EEC)  
**Sent:** Friday, January 06, 2012 12:57 PM  
**To:** Wuetcher, Jerry (PSC)  
**Subject:** RE: Request for Records for Public Service Commission Proceeding

**Attachments:** Application, Utility letter, Engineer letter, Cost Sheet & Site M(11299DEPC139968).pdf; DW-33781-Starshader Lane WME (4695779).xls; Email 2 James Thompson 10-28-2011 (4671456).htm; Hydraulics(11299DEPC139970).pdf; Plan Approval Letter (4695481).rtf

Mr. Wuetcher,

I have attached files for the request below to this email and there will be one more email forthcoming with more files. Please review the files from AI 33781, APE20110004 and let me know if what you are needing is included. If you have any questions or need additional information please let me know. Thanks and have a good day.

Sincerely,

Mike Reed  
 Division of Water



Application, Utility letter, E... DW-33781-Starsha der Lane WME (... Thompson 10-28-2... Hydraulics(11299DE PC139970).pd... Plan Approval Letter (4695481)...

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**From:** Wuetcher, Jerry (PSC)  
**Sent:** Friday, January 06, 2012 9:29 AM  
**To:** DOWOpenRecords (EEC)  
**Cc:** Ashley, Stella G (PSC); Roney, Julie (EEC); Rice, James D (PSC); Lyons, Debbie K (PSC)  
**Subject:** Request for Records for Public Service Commission Proceeding

TO WHOM IT CONCERNS:

The Public Service Commission requests all DOW records related to the following project:

Bath County Water District  
 AI # 33781, APE20110004  
 PWSID # 0060022-11-004  
 Starshader Lane Water Main Extension

On 18 Nov 2011 the Division of Water approved the plans and specifications for this project. A copy of approval letter is attached. Bath County Water District has requests Public Service Commission approval of the project in accordance with 807 KAR 5:066, Section 10. The Commission wishes to avoid imposing unnecessary expense and delay on the water system by requesting documents that are already within the possession of the Commonwealth.

I am under the impression that DOW has agreed not to assess the Public Service Commission any fees related to written requests for records for official proceedings. If this is not the case, please advise so that arrangements can be made to interaccount the cost of duplicating and furnishing the records. An electronic copy of the request records is acceptable. If DOW wishes to e-mail the documents, please e-mail to me.

Thank you for your assistance in this matter. Please contact me if there are any questions.

Sincerely,

Gerald E. Wuetcher  
Executive Advisor  
Public Service Commission of Kentucky  
(502) 564-3940, Extension 259  
(502) 229-6500 (cell)  
[gerald.wuetcher@ky.gov](mailto:gerald.wuetcher@ky.gov)

<< File: Pages from 20111205\_Bath County Water District\_Request.pdf >>



**Wuetcher, Jerry (PSC)**

**From:** DOWOpenRecords (EEC)  
**Sent:** Friday, January 06, 2012 12:58 PM  
**To:** Wuetcher, Jerry (PSC)  
**Subject:** RE: Request for Records for Public Service Commission Proceeding

**Attachments:** Plans-1(11299DEPC139973).PDF; PR for AI#33781-Kenny Barber (4671419).doc

Here are the last of the files for AI 33781, APE20110004. Please let me know if you need anything else. Thanks,



Plans-1(11299DEPC  
139973).PDF (... 33781-Kenny Barber

Mike

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**From:** Wuetcher, Jerry (PSC)  
**Sent:** Friday, January 06, 2012 9:29 AM  
**To:** DOWOpenRecords (EEC)  
**Cc:** Ashley, Stella G (PSC); Roney, Julie (EEC); Rice, James D (PSC); Lyons, Debbie K (PSC)  
**Subject:** Request for Records for Public Service Commission Proceeding

TO WHOM IT CONCERNS:

The Public Service Commission requests all DOW records related to the following project:

Bath County Water District  
 AI # 33781, APE20110004  
 PWSID # 0060022-11-004  
 Starshader Lane Water Main Extension

On 18 Nov 2011 the Division of Water approved the plans and specifications for this project. A copy of approval letter is attached. Bath County Water District has requests Public Service Commission approval of the project in accordance with 807 KAR 5:066, Section 10. The Commission wishes to avoid imposing unnecessary expense and delay on the water system by requesting documents that are already within the possession of the Commonwealth.

I am under the impression that DOW has agreed not to assess the Public Service Commission any fees related to written requests for records for official proceedings. If this is not the case, please advise so that arrangements can be made to interaccount the cost of duplicating and furnishing the records. An electronic copy of the request records is acceptable. If DOW wishes to e-mail the documents, please e-mail to me.

Thank you for your assistance in this matter. Please contact me if there are any questions.

Sincerely,

Gerald E. Wuetcher  
 Executive Advisor  
 Public Service Commission of Kentucky  
 (502) 564-3940, Extension 259  
 (502) 229-6500 (cell)  
[gerald.wuetcher@ky.gov](mailto:gerald.wuetcher@ky.gov)

<< File: Pages from 20111205\_Bath County Water District\_Request.pdf >>



STEVEN L. BESHEAR  
GOVERNOR

LEONARD K. PETERS  
SECRETARY

**ENERGY AND ENVIRONMENT CABINET**  
DEPARTMENT FOR ENVIRONMENTAL PROTECTION  
DIVISION OF WATER  
200 FAIR OAKS LANE, 4TH FLOOR  
FRANKFORT, KENTUCKY 40601  
[www.kentucky.gov](http://www.kentucky.gov)

November 18, 2011

Mr. Kenney Barber,  
Bath Co Water District  
PO Box 369  
Salt Lick, KY 40371

RE: Bath Co Water District  
AI # 33781, APE20110004  
PWSID # 0060022-11-004  
Starshader Lane Water main Ext  
Bath County Health Department, KY

Dear Mr. Barber:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of approximately 4,585 LF of 2-inch PVC Waterline. This is to advise that plans and specifications for the above referenced project are APPROVED with respect to sanitary features of design, as of this date with the requirements contained in the attached construction permit.

For the purpose of review, DOW will not approve lines less than 3-inches for distribution. When 2-inch lines are proposed for distribution they are approved on a case-by-case basis with the stipulations that such cannot be extended. In areas where lines may be extended in the future, DOW reserves the right to approve 3-inch waterlines as a minimum diameter.

If you have any questions concerning this project, please contact Mr. Mohammed Mohiuddin at 502-564-8158 x4827.

Sincerely,

E-Signed by Mark Rasche  
VERIFY authenticity with ApproveIt

Mark Rasche, PE  
Supervisor, Engineering Section  
Water Infrastructure Branch  
Division of Water

MR: MM  
Enclosures

C: Kentucky Engineering Group, PLLC  
Bath County Health Department  
Public Service Commission  
Division of Plumbing

**County** Bath  
**Type** WLE  
**Name of Proj** Starshader Lane Water Main Extension  
**Utility name** Bath County Water District  
 21 Church St.  
 Salt Lick, KY 40371  
**System Engineer** Kentucky Engineering Group, PLLC  
 P. O. Box 1034  
 161 Locust Street  
 Versailles, KY 40383  
**Eng Phone** 859-251-4127  
**Fax** 859-251-4137  
**e-mail** [N/A](#)  
**Reviewed by** MM

**Project No** 0060022-11-004  
**Agency Interest ID** 33781APE20110004  
**Fee Amt** \$0.00 **Code** 1-H  
**Submission Date**  
**Admin NOD Is'ued** NA **Rec'vd** NA  
**Tech NOD Issued** NA **Rec'vd** NA

**Response Code** A  
 A-approved,B-accepted  
 as-built,D-denied,N-no action

W-withdrawn,X-dead  
 Date at desk

**Response Date**  
**Approval**  
**EPA info.**  
**Attention to:**

<b>Miles or Ft of Line</b>	4,585 LF of 2- inch water main
<b>Projected Cost (\$)</b>	\$34,000
<b>Project Demand (GPD):</b>	150

**Date mailed:**

(C-facilities, M-mailed, P-Plumbing, F-filed)

**Source:**  
**Letter Code** TEMPO

**Certification:**  
**Remarks**

**Proposed Customers:**

1 customer

**Project Latitude/Longitude:** X: 83 40 46 W  
 Y: 38 1 57 N

HUC11# 05100101140

**Connection between new line and existent line:**

Tapping Sleeve and Valve

**Type of valve at end of proposed line:**

Blow off Assembly

**Hydraulic Analysis:**

**Peak demand**  
 minimum pressure > 30 psi

**Flushing Test**

demand 24 gpm  
 flushing velocity 2.5 ft/sec  
 Min Pressure > 20 psi

**C: Engineer** James Thompson P.E.  
 Bath County H.D.  
 Public Service Commission

**To:** James C. Thompson **DOCUMENT NO. 5**  
**Cc:** kennybcwd@roadrunner.com; Mohiuddin, Mohammed (EEC); Aspari, Kanakalakshmi  
(EEC)  
**Subject:** Starshader Lane Watermain Extension-AI#33781-Bath County

Good Morning Jim,

We received your submittal for the Starshader Lane Waterline Extension and it has been assigned today to Mohammed Mohiuddin at extension 4827. Also if you have not sent the requested extra set of plans, please send ASAP, thanks. If you have any questions please call or email anytime.

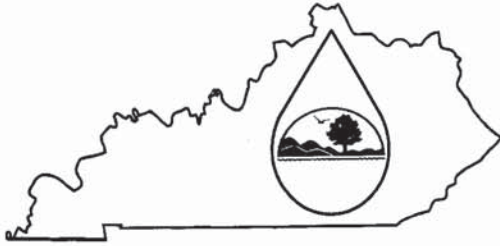
Thank you and have a nice day.

***Lissa Doss***

Lissa Doss  
Engineering Section  
Water Infrastructure Branch  
Division of Water  
200 Fair Oaks Lane  
4<sup>th</sup> Floor  
Frankfort, KY 40601  
502-564-3410 ext. 4801

 MC900410761[1]

000007



**Commonwealth of Kentucky**  
 Energy and Environment Cabinet  
**Division of Water**

**Construction Application  
 For Drinking Water Distribution**

See the instructions for more information about selected portions of this checklist.

Questions on completing this checklist? Contact the Water Infrastructure Branch at 502/564-3410 or visit our website at <http://www.water.kv.gov/dw> for more information.

**I. Construction Project Information**

Project Name: Starshader Lane Water Main Extension

Project County: Bath Estimated Project Cost: \$ 34,000.00

Project Latitude/Longitude (DMS): Varies - Bath County, KY

11 Digit Hydrologic Unit Code (HUC): \_\_\_\_\_

Is this a federally funded project:

DWSRF

SPAP

Other: \_\_\_\_\_

If yes, has an Environmental Information Document been reviewed and approved? \_\_\_\_\_

If the project has been submitted to the State Clearinghouse for review, provide the SAI number: NA

Identify all other funding sources: N/A

Does the project contain any of the following:

Booster Pump Stations

Water Storage Tanks

Waterlines

Waterline Material	Waterline Size	Linear Feet
PVC	2"	4,585

Provide a brief description of the work to be performed for waterlines less than 10,000 linear feet. All other distribution projects should be accompanied by a DETAILED project description. Installation of approximately 4,585 L.F of 2-inch water main to serve a resident that is currently unserved. There will be no further development or any additional residences connecting to this extension.



Identify how the sanitary wastewater produced as a result of this project will be handled:

- Sanitary Sewer WWTP: \_\_\_\_\_
- Septic Tank
- Other: N/A

**II. Utility Information**

Utility Name: Bath County Water District PWSID: 0060022 AI # 33781  
Street Address: 21 Church St. County: Bath  
City, State, Zip: Salt Lick, Kentucky 40371  
Phone: (606) 683-6363 Fax: (606) 683-9917 Email: kennybcwd@roadrunner.com

If another utility will serve any portion of the proposed project, provide the name and PWSID No.

Utility Name: N/A PWSID No. \_\_\_\_\_

If the utility serving the project purchases water from another utility, provide the name and PWSID No. and purchase contract amount.

Utility Name: \_\_\_\_\_ PWSID No. \_\_\_\_\_ Purchase Contract Amount: \_\_\_\_\_  
Utility Name: \_\_\_\_\_ PWSID No. \_\_\_\_\_ Purchase Contract Amount: \_\_\_\_\_  
Utility Name: \_\_\_\_\_ PWSID No. \_\_\_\_\_ Purchase Contract Amount: \_\_\_\_\_

Is the system currently under any type of waterline or sewer sanctions? No

If yes, submit an exception request and attach supporting documentation to justify its approval.

**III. Design Considerations**

**A. Plans and Specifications**

Plans and specifications shall comply with **401 KAR 8:100** and “Recommended Standards for Water Works” (Ten States’ Standards). All plans must contain a P.E. seal, signature and date of signature with at least one set having an original seal and signature.

**Plans and specifications submittals shall meet one of the following options:**

- At least **two** printed sets of detailed plans (**no larger than 24” X 36”**) and a PDF copy of the plans and specifications on CD/DVD. The PDF copy shall contain a PE seal, signature and date. The plans on the CD/DVD shall be in a folder named “Engineering Plans” and the specifications manual shall be in a folder named “Specifications”.  
**(preferred)**
- At least **2** printed sets of detailed plans (**one shall be no larger than 24” X 36” and the other set shall be 11” X 17”**) and **one** printed copy of the specifications manual.

**B. Design Engineer**

Name: James C. Thompson, PE Firm: Kentucky Engineering Group, PLLC  
Street Address: P.O. Box 1034, 161 North Locust Street  
City, State, Zip: Versailles, Kentucky 40383  
Phone #: 859-251-4127 Fax #: 859-251-4137 Email: jthompson@kyengr.com

### Design Capacities

Identify the number of new connections and the projected average daily demand: 1 at 150 gpd

Identify the number of existing residents, and their projected water demand, that may be served as a result of this project:

---

Identify the number of connections in the service area: 0

### Other Information to be Submitted with the Project

- 1. Provide a copy of the U.S.G.S. 7 ½ minute topographic map with the location(s) of the proposed project.
- 2. If the project includes a new or upgraded pump station(s), provide the pump sizing calculations and the proposed pump's characteristics curve along with the efficiency, horsepower and NPSHR data. Also, identify each pump station's locations coordinates (DMS).
- 3. If the project proposes the addition of storage tanks, provide engineering calculations which demonstrates a complete fill and drain cycle every 72 hours. Also, identify each storage tank's location coordinates (DMS).
- 4. Provide engineering calculations or an electronic model demonstrating the availability of 30 psig in the waterline under peak demand conditions.
- 5. Provide engineering calculations or an electronic model that demonstrates if the proposed waterlines are capable of a 2.5 ft/sec flow velocity and show associated residual system pressures.
- 6. Provide a signed letter of acceptance from the utility, which states that the utility has reviewed and approved the plans and specifications and agrees to serve the proposed project upon completion. If another utility will own, operate and maintain any portion of this project provide an acceptance letter from that utility as well.
- 7. If the utility is a purchaser and the project demand is over 10,000 gallons per day or the utility has exceeded 85% of its purchase contract, provide a valid acceptance letter from the seller.
- 8. If the project will provide water service to existing residences, provide the names and addresses of all existing residences to be served by the project, if known.
- 9. If the project is funded by a State Revolving Fund Loan (SRF) provide a completed SRF Plans and Specifications Checklist along with 1 complete printed copy of the project specifications.

### IV. Environmental Benefits

Identify the environmental benefit(s) of the project by checking all that apply.

- Construction of new waterlines serving existing residences previously without public water.
- Modifies/upgrades existing waterlines:
  - Inadequately sized waterlines.
  - Leaks, breaks, restrictive flow.
  - Replaces lead, copper or asbestos cement waterlines.
  - Other: \_\_\_\_\_
- Provides fire protection.
- Replaces tanks/pumps due to age/condition.
- Installation of high efficiency/energy saving pumps.
- Other. Provide a brief description in the space below. \_\_\_\_\_



**V. Fees**

Check or money order must be made payable to "Kentucky State Treasurer" for the total amount. Fees do not apply to projects FUNDED by a municipality, water district, or other publicly owned utility.

Project Category: N/A Total Amount: \$ N/A

# BATH COUNTY WATER DISTRICT

POST OFFICE BOX 369  
SALT LICK, KENTUCKY 40371  
TELEPHONE: (606) 683-6363

DOCUMENT NO. 7

TDD/TTY 1-800-648-6056

October 15, 2011

Kentucky Division of Water  
Drinking Water Branch – Review Section  
200 Fair Oaks Road  
Frankfort, KY 40601

RE: Starshader Lane Water Main Extension

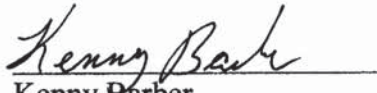
Dear Sir/Madam:

The Bath County Water District has reviewed the plans and specifications for the above referenced project. This project consists of the installation of approximately 4,585 LF of 2-inch water main. The Bath County Water District will own and maintain the water main upon the completed installation.

We realize the Division of Water normally prefers at least a 3-inch water line be used for a main line. This 2-inch will only be serving one residential customer with no possibility of future development or additional customers being connected due to its remote location.

If you have any questions or would like to request additional information please contact myself or Mr. James C. Thompson, PE of Kentucky Engineering Group, PLLC at 859-251-4127.

Sincerely,

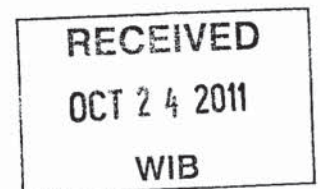


Kenny Barber  
Bath County Water District

pc: Kentucky Engineering Group, PLLC  
James C. Thompson, PE

File

0060022-11-00h



33781APE2011000h



October 20, 2011

Kentucky Division of Water  
Drinking Water Branch – Review Section  
Attn. Mr. Solitha Dharma  
200 Fair Oaks Lane  
Frankfort, KY 40601

RE: Starshader Lane - Water Main Extension  
Bath County Water District  
Bath County, Kentucky

Dear Sir,

Please find enclosed plans and specifications for the above referenced projects. Also enclosed is the "Water Line Submittal Checklist" and all the items required by the checklist. The project includes the construction of approximately 4,585 lf of 2-inch water main.

We realize the Division of Water normally prefers at least a 3-inch water line be used for a main line. This 2-inch will only be serving one residential customer with no possibility of future development or additional customers being connected due to its remote location.

These plans and specifications are submitted for your review and approval. If you have any questions or need additional information please contact me.

Sincerely,

KENTUCKY ENGINEERING GROUP, PLLC

  
James C. Thompson, PE

pc: Bath County Water District  
Mr. Kenny Barber

Mr. Mike Campbell

File

P.O. Box 1034  
Versailles, Kentucky 40383  
Phone: (859) 251.4127  
Fax: (859) 251.4137  
Email: info@kyengr.com  
www.kyengr.com

000013



**Preliminary Project Cost Estimate**

Project : Starshadrer Lane  
 Date : 10/12/11 Job No. : 11016  
 Revised : 10/12/11 Est. By: JCT

ITEM NO.	SUMMARY OF:	QUANTITY			TOTAL COST
		NO. OF UNITS	UNIT MEAS.	COST PER UNIT	
1	2" PVC, SDR 21 Water Main	4,585	LF	\$ 5.00	\$ 22,925.00
2	Connection to Existing W.M.	1	EA	\$ 1,500.00	\$ 1,500.00
3	2" G.V. & Box	2	EA	\$ 650.00	\$ 1,300.00
4	Roadbore w/PVC Casing	30	LF	\$ 75.00	\$ 2,250.00
5	Creek Crossing	40	LF	\$ 75.00	\$ 3,000.00
6	Flushing Hydrant	1	EA	\$ 2,000.00	\$ 2,000.00
7	Customer Connection	1	EA	\$ 500.00	\$ 500.00
<b>SUBTOTAL AMOUNT</b>					<b>\$ 33,475.00</b>
<b>ENGINEERING DESIGN</b>					<b>\$ 500.00</b>
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>					<b>\$ 33,975.00</b>



```

***** KYPIPE 4 *****
*
*           Pipe Network Modeling Software           *
*
*           Copyrighted by KYPIPE LLC               *
*           Version 4 - April 2008                  *
*
*****

```

Date & Time: Thu Oct 20 09:47:40 2011

INPUT DATA FILENAME ----- C:\Projects\HYDRAU~1\BCWD\BCWD\_Str.DT2  
 TABULATED OUTPUT FILENAME ----- C:\Projects\HYDRAU~1\BCWD\BCWD\_Str.OT2  
 POSTPROCESSOR RESULTS FILENAME --- C:\Projects\HYDRAU~1\BCWD\BCWD\_Str.RS2

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute  
 HEAD (HGL) ..... = feet  
 PRESSURE ..... = psig

*AVERAGE USAGE AND  
 FLUSHING VELOCITY  
 CALCULATIONS*

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT  
 MAXIMUM AND MINIMUM PRESSURES = 5  
 MAXIMUM AND MINIMUM VELOCITIES = 5  
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SUPPLY ZONE DATA

THIS SYSTEM HAS MULTIPLE SUPPLY ZONES

ZONE NO. 1 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
                                   ~@RV-1                  ~@RV-5                  ~@T-8  
                   ~@T-2                  ~@RV-6                  ~@T-9                  ~@T-10  
                   ~@T-3                  ~@T-6                  ~@RV-7                  ~@RV-2  
                   ~@T-7                  ~@RV-4                  ~@R-4                  ~@RV-3

ZONE NO. 2 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
                   ~@R-2

ZONE NO. 3 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
                   ~@R-3

SYSTEM CONFIGURATION

NUMBER OF PIPES ..... (p) = 519  
 NUMBER OF END NODES ..... (j) = 473  
 NUMBER OF PRIMARY LOOPS ..... (l) = 38  
 NUMBER OF SUPPLY NODES ..... (f) = 11  
 NUMBER OF SUPPLY ZONES ..... (z) = 3

Case: 0

RESULTS OBTAINED AFTER 16 TRIALS: ACCURACY = 0.00010

SIMULATION DESCRIPTION (LABEL)

Bath County Water District  
 Starshader Ln Water Line Extension

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/ 1000 (ft/ft)	HL/ 1000 (ft/ft)
	#1	#2						
1	J-1	139	955.42	9.69	0.00	2.71	2.33	2.33
2	306	144	189.52	0.61	0.00	0.54	0.12	0.12
3	145	5	28.43	0.53	0.00	0.32	0.10	0.10
4	O-Pump-5	309	1154.56	0.16	0.00	4.72	8.04	8.04
5	5	307	28.08	0.27	0.00	0.32	0.10	0.10
6	180	6	131.65	0.11	0.00	0.84	0.43	0.43
7	6	163	130.25	0.32	0.00	0.83	0.42	0.42
8	8	437	0.42	0.00	0.00	0.02	0.00	0.00
9	7	8	2.52	0.00	0.00	0.02	0.00	0.00
10	7	9	208.49	2.20	0.00	1.33	1.00	1.00
11	9	10	18.76	1.42	0.00	0.85	1.37	1.37
12	9	12	187.00	0.35	0.00	1.19	0.82	0.82
13	10	103	15.68	3.02	0.00	0.71	0.99	0.99
14	10	14	2.10	0.04	0.00	0.10	0.02	0.02
15	14	13	0.35	0.00	0.00	0.02	0.00	0.00
16	14	15	0.70	0.03	0.00	0.03	0.00	0.00
17	11	113	4.90	0.57	0.00	0.22	0.11	0.11
18	16	115	3.14	0.52	0.00	0.14	0.05	0.05
19	19	18	1.47	0.03	0.00	0.07	0.01	0.01
20	197	19	1.48	0.03	0.00	0.07	0.01	0.01
21	20	350	2.24	0.00	0.00	0.06	0.01	0.01
22	O-Pump-9	353	0.00	0.00	0.00	0.00	0.00	0.00
23	22	195	1.22	0.03	0.00	0.06	0.01	0.01
24	20	117	4.10	0.02	0.00	0.05	0.00	0.00
25	22	20	7.39	0.00	0.00	0.08	0.01	0.01
26	16	22	9.80	0.04	0.00	0.11	0.01	0.01
27	27	224	0.81	0.02	0.00	0.04	0.00	0.00
28	193	25	3.86	0.65	0.00	0.18	0.07	0.07
29	28	I-Pump-8	0.00	0.00	0.00	0.00	0.00	0.00
30	O-Pump-8	194	0.00	0.00	0.00	0.00	0.00	0.00
31	30	118	0.00	0.00	0.00	0.00	0.00	0.00
32	314	16	16.09	0.01	0.00	0.18	0.04	0.04
33-XX	29	37						
34	29	119	1.96	0.08	0.00	0.09	0.02	0.02
35	374	32	23.52	0.13	0.00	0.27	0.07	0.07
36	32	35	4.14	0.06	0.00	0.19	0.08	0.08
37	160	33	18.54	0.04	0.00	0.21	0.05	0.05
38	33	36	0.42	0.00	0.00	0.02	0.00	0.00
39	26	37	14.21	0.10	0.00	0.16	0.03	0.03
40	37	38	5.81	0.46	0.00	0.26	0.16	0.16
41	38	120	2.80	0.04	0.00	0.13	0.04	0.04
42	38	40	0.28	0.00	0.00	0.01	0.00	0.00
43	26	121	69.42	3.45	0.00	0.79	0.53	0.53
44	39	71	66.27	3.30	0.00	0.75	0.49	0.49
45	42	72	75.09	1.71	0.00	0.85	0.61	0.61
46	43	290	60.11	0.85	0.00	0.68	0.41	0.41
47	42	45	11.48	0.07	0.00	0.13	0.02	0.02
48	46	280	153.54	15.30	0.00	1.74	2.31	2.31
49	47	44	12.45	0.04	0.00	0.14	0.02	0.02
50	47	T-7	88.79	0.83	0.00	1.01	0.84	0.84
51	49	47	114.69	4.42	0.00	1.30	1.34	1.34
52	342	281	151.44	0.25	0.00	1.72	2.25	2.25
53	48	317	148.50	1.23	0.00	1.68	2.17	2.17
54	49	50	15.75	0.53	0.00	0.18	0.03	0.03
55	50	53	6.58	0.09	0.00	0.17	0.05	0.05
56	50	51	0.84	0.02	0.00	0.04	0.00	0.00
57	53	52	4.83	0.04	0.00	0.12	0.03	0.03
58	53	54	0.56	0.01	0.00	0.03	0.00	0.00
59	44	55	6.30	0.02	0.00	0.07	0.01	0.01



60	55	399	3.92	0.02	0.00	0.04	0.00	0.00
61	44	279	4.05	0.00	0.00	0.05	0.00	0.00
62	57	259	9.38	0.05	0.00	0.11	0.01	0.01
63	57	59	0.70	0.00	0.00	0.01	0.00	0.00
64	58	60	0.35	0.00	0.00	0.01	0.00	0.00
65	58	61	2.45	0.06	0.00	0.06	0.01	0.01
66	62	57	12.32	0.04	0.00	0.14	0.02	0.02
67	62	63	0.70	0.01	0.00	0.03	0.00	0.00
68	65	46	36.16	0.67	0.00	0.41	0.16	0.16
69	67	65	38.61	0.56	0.00	0.44	0.18	0.18
70	65	124	1.12	0.01	0.00	0.03	0.00	0.00
71	415	67	39.10	2.06	0.00	1.00	1.32	1.32
72	68	64	1.40	0.02	0.00	0.04	0.00	0.00
73	128	68	47.08	0.84	0.00	0.53	0.26	0.26
74	69	135	94.13	1.69	0.00	1.07	0.93	0.93
75	335	70	95.82	0.66	0.00	1.09	0.96	0.96
76	70	129	45.80	0.36	0.00	0.52	0.25	0.25
77	72	131	122.98	9.19	0.00	1.40	1.53	1.53
78	71	43	65.22	0.81	0.00	0.74	0.47	0.47
79	262	294	91.33	0.02	0.00	1.04	0.88	0.88
80	137	74	5.04	0.01	0.00	0.06	0.00	0.00
81	286	73	7.77	0.06	0.00	0.09	0.01	0.01
82	76	296	44.22	0.22	0.00	0.50	0.23	0.23
83-XX	170	262						
84	2	92	161.39	0.14	0.00	1.03	0.62	0.62
85	142	77	4.89	0.00	0.00	0.03	0.00	0.00
86	77	122	3.08	0.04	0.00	0.08	0.01	0.01
87	423	39	67.25	1.94	0.00	0.76	0.50	0.50
88	77	78	1.39	0.00	0.00	0.01	0.00	0.00
89	79	321	1.05	0.02	0.00	0.05	0.01	0.01
90	143	322	160.20	0.93	0.00	1.02	0.61	0.61
91	304	2	563.95	1.60	0.00	1.60	0.88	0.88
92	80	2	91.49	1.40	0.00	1.04	0.88	0.88
93	304	80	92.68	0.21	0.00	1.05	0.91	0.91
94	T-3	84	19.60	0.04	0.00	0.22	0.05	0.05
95	84	413	14.91	0.11	0.00	0.17	0.03	0.03
96	83	157	3.08	0.05	0.00	0.08	0.01	0.01
97	83	87	0.21	0.00	0.00	0.01	0.00	0.00
98	85	86	0.42	0.00	0.00	0.01	0.00	0.00
99	85	159	0.28	0.00	0.00	0.01	0.00	0.00
100	88	89	0.70	0.00	0.00	0.02	0.00	0.00
101	97	90	2.38	0.02	0.00	0.06	0.01	0.01
102	92	143	161.04	0.22	0.00	1.03	0.62	0.62
103	93	82	149.98	1.13	0.00	0.96	0.54	0.54
104	93	94	1.05	0.03	0.00	0.05	0.01	0.01
105	82	91	148.16	2.04	0.00	0.95	0.53	0.53
106	91	95	100.70	0.27	0.00	0.64	0.26	0.26
107	91	365	45.36	0.43	0.00	1.16	1.74	1.74
108	O-Pump-6	381	45.36	0.87	0.00	1.16	1.74	1.74
109	96	98	1.89	0.04	0.00	0.09	0.02	0.02
110	332	97	3.08	0.02	0.00	0.08	0.01	0.01
111	406	99	941.28	3.43	0.00	2.67	2.27	2.27
112	99	I-Pump-1	940.72	1.03	0.00	2.67	2.26	2.26
113	T-6	129	8.04	0.01	0.00	0.09	0.01	0.01
114	101	100	7.35	0.01	0.00	0.08	0.01	0.01
115	101	102	22.05	7.56	0.00	1.00	1.85	1.85
116	100	146	4.90	0.65	0.00	0.22	0.11	0.11
117	102	149	4.27	0.33	0.00	0.19	0.09	0.09
118	102	151	13.79	0.64	0.00	0.35	0.19	0.19
119	105	106	1.75	0.03	0.00	0.04	0.00	0.00
120	105	107	3.78	0.03	0.00	0.10	0.02	0.02
121	108	105	7.98	0.05	0.00	0.20	0.07	0.07
122	108	110	1.82	0.16	0.00	0.08	0.02	0.02
123	107	434	2.03	0.12	0.00	0.09	0.02	0.02
124	103	112	12.18	4.52	0.00	0.55	0.62	0.62
125	112	11	7.07	0.98	0.00	0.32	0.23	0.23
126	113	114	2.87	0.37	0.00	0.13	0.04	0.04
127	114	17	0.84	0.01	0.00	0.04	0.00	0.00
128	115	19	1.04	0.01	0.00	0.05	0.01	0.01
129	116	23	0.42	0.00	0.00	0.01	0.00	0.00
130	117	27	2.77	0.00	0.00	0.03	0.00	0.00
131	118	439	0.00	0.00	0.00	0.00	0.00	0.00

132	119	34	0.70	0.02	0.00	0.03	0.00	0.00
133	120	41	1.89	0.08	0.00	0.09	0.02	0.02
134	122	79	1.96	0.01	0.00	0.05	0.01	0.01
135	348	297	662.01	1.20	0.00	1.88	1.18	1.18
136	33	123	17.42	0.23	0.00	0.20	0.04	0.04
137	124	66	0.42	0.00	0.00	0.01	0.00	0.00
138	126	125	40.99	3.56	0.00	1.05	1.44	1.44
139	127	126	42.18	10.40	0.00	1.08	1.52	1.52
140	68	127	43.30	4.81	0.00	1.11	1.59	1.59
141	161	128	48.48	0.83	0.00	0.55	0.27	0.27
142	129	130	51.39	0.68	0.00	0.58	0.30	0.30
143	130	72	50.27	1.77	0.00	0.57	0.29	0.29
144	131	132	121.58	10.21	0.00	1.38	1.50	1.50
145	132	46	120.60	4.16	0.00	1.37	1.48	1.48
146	133	42	88.88	2.43	0.00	1.01	0.84	0.84
147	134	133	91.33	3.36	0.00	1.04	0.88	0.88
148	135	134	92.73	0.37	0.00	1.05	0.91	0.91
149	69	136	97.71	3.35	0.00	1.11	1.00	1.00
150	73	137	5.74	0.02	0.00	0.07	0.01	0.01
151	138	219	2.45	0.05	0.00	0.11	0.03	0.03
152	139	140	954.30	22.10	0.00	2.71	2.33	2.33
153	140	212	954.30	1.06	0.00	2.71	2.33	2.33
154	O-Pump-1	31	940.72	1.05	0.00	2.67	2.26	2.26
155	172	142	4.89	0.00	0.00	0.03	0.00	0.00
156	75	301	84.11	0.00	0.00	0.24	0.03	0.03
157	306	145	124.79	0.11	0.00	1.42	1.57	1.57
158	145	75	94.26	5.25	0.00	1.07	0.93	0.93
159	146	104	1.40	0.03	0.00	0.06	0.01	0.01
160	147	101	33.39	0.21	0.00	0.38	0.14	0.14
161	148	147	39.90	0.98	0.00	0.45	0.19	0.19
162	149	150	2.03	0.04	0.00	0.09	0.02	0.02
163	150	385	1.33	0.01	0.00	0.06	0.01	0.01
164	151	108	12.25	0.64	0.00	0.31	0.15	0.15
165	152	93	156.00	2.47	0.00	1.00	0.59	0.59
166	153	I-RV-2	10.36	0.00	0.00	0.12	0.02	0.02
167	154	155	9.80	0.02	0.00	0.11	0.01	0.01
168	155	156	7.35	0.04	0.00	0.08	0.01	0.01
169	156	83	4.06	0.01	0.00	0.05	0.00	0.00
170	157	271	2.45	0.04	0.00	0.06	0.01	0.01
171	158	85	1.68	0.02	0.00	0.04	0.00	0.00
172	356	253	1.14	0.00	0.00	0.01	0.00	0.00
173	32	160	18.82	0.05	0.00	0.21	0.05	0.05
174	147	382	2.87	0.14	0.00	0.13	0.04	0.04
175	129	162	0.84	0.01	0.00	0.04	0.00	0.00
176	70	161	49.39	0.31	0.00	0.56	0.28	0.28
177	78	170	1.39	0.00	0.00	0.01	0.00	0.00
178	O-Pump-3	285	204.44	1.02	0.00	2.32	3.92	3.92
179	163	7	128.29	0.32	0.00	0.82	0.41	0.41
180	324	179	116.14	1.13	0.00	0.74	0.34	0.34
181	164	180	133.58	4.41	0.00	0.85	0.44	0.44
182	4	I-Pump-5	1154.56	2.41	0.00	4.72	8.04	8.04
183	165	4	1158.06	89.53	0.00	4.73	8.09	8.09
184	O-RV-1	165	1161.56	0.04	0.00	4.74	8.13	8.13
185	164	166	167.51	0.35	0.00	1.07	0.67	0.67
186	166	I-Pump-7	10.00	1.25	0.00	0.45	0.43	0.43
187	O-Pump-7	168	10.00	0.33	0.00	0.45	0.43	0.43
188	322	152	159.50	0.70	0.00	1.02	0.61	0.61
189	O-RV-2	154	10.36	0.04	0.00	0.12	0.02	0.02
190	144	3	189.52	0.28	0.00	0.54	0.12	0.12
191	31	306	897.53	2.66	0.00	2.55	2.08	2.08
192	169	148	42.00	0.75	0.00	0.48	0.21	0.21
193	31	169	42.70	0.16	0.00	0.48	0.22	0.22
194	171	26	91.33	0.02	0.00	1.04	0.88	0.88
195	197	173	0.70	0.01	0.00	0.03	0.00	0.00
196	96	I-RV-4	4.20	0.04	0.00	0.11	0.02	0.02
197	75	172	8.40	0.00	0.00	0.05	0.00	0.00
198	172	174	3.51	0.00	0.00	0.04	0.00	0.00
199	174	175	3.02	0.01	0.00	0.03	0.00	0.00
200	175	176	1.69	0.00	0.00	0.02	0.00	0.00
201	176	178	0.57	0.00	0.00	0.01	0.00	0.00
202	170	177	1.39	0.00	0.00	0.02	0.00	0.00
203	177	178	0.55	0.00	0.00	0.01	0.00	0.00



204	186	7	89.93	0.14	0.00	0.57	0.21	0.21
205	179	182	110.40	0.20	0.00	0.70	0.31	0.31
206	182	181	109.96	0.16	0.00	0.70	0.31	0.31
207	182	180	0.44	0.00	0.00	0.00	0.00	0.00
208	181	185	108.56	0.25	0.00	0.69	0.30	0.30
209-XX	181	308						
210	183	186	94.34	0.13	0.00	0.60	0.23	0.23
211	185	184	10.02	0.06	0.00	0.11	0.01	0.01
212	185	183	96.44	0.07	0.00	0.62	0.24	0.24
213	189	186	1.90	0.00	0.00	0.02	0.00	0.00
214	184	190	7.15	0.07	0.00	0.08	0.01	0.01
215	187	189	4.00	0.01	0.00	0.05	0.00	0.00
216	190	188	5.40	0.01	0.00	0.06	0.00	0.00
217	191	187	4.70	0.02	0.00	0.05	0.00	0.00
218	192	191	5.40	0.01	0.00	0.06	0.00	0.00
219	188	192	5.40	0.00	0.00	0.02	0.00	0.00
220-XX	188	141						
221	35	193	4.14	0.07	0.00	0.19	0.08	0.08
222	194	30	0.00	0.00	0.00	0.00	0.00	0.00
223	195	225	0.80	0.01	0.00	0.04	0.00	0.00
224	25	21	3.58	0.05	0.00	0.16	0.06	0.06
225	18	196	1.05	0.01	0.00	0.05	0.01	0.01
226	21	197	3.58	0.07	0.00	0.16	0.06	0.06
227	196	223	0.63	0.01	0.00	0.03	0.00	0.00
228	223	199	0.14	0.00	0.00	0.01	0.00	0.00
229	200	184	0.28	0.00	0.00	0.00	0.00	0.00
230	206	200	1.33	0.00	0.00	0.02	0.00	0.00
231	198	201	2.10	0.02	0.00	0.10	0.02	0.02
232	198	400	1.33	0.05	0.00	0.06	0.01	0.01
233	201	204	1.40	0.04	0.00	0.06	0.01	0.01
234-XX	204	202						
235	204	205	0.35	0.01	0.00	0.02	0.00	0.00
236	206	198	4.20	0.01	0.00	0.05	0.00	0.00
237	208	206	6.09	3.37	0.00	0.62	1.23	1.23
238	209	208	6.30	2.71	0.00	0.64	1.31	1.31
239	390	209	7.35	0.50	0.00	0.33	0.24	0.24
240	209	210	0.63	0.04	0.00	0.06	0.02	0.02
241	210	211	0.21	0.00	0.00	0.01	0.00	0.00
242	408	207	8.26	0.69	0.00	0.37	0.30	0.30
243	212	141	944.22	5.05	0.00	2.68	2.28	2.28
244	387	202	0.28	0.00	0.00	0.01	0.00	0.00
245-XX	43	283						
246	215	218	5.60	0.06	0.00	0.14	0.04	0.04
247	216	274	3.08	0.03	0.00	0.08	0.01	0.01
248	216	217	0.21	0.00	0.00	0.01	0.00	0.00
249	218	216	4.55	0.10	0.00	0.12	0.02	0.02
250	218	220	0.35	0.00	0.00	0.02	0.00	0.00
251	222	215	8.68	1.63	0.00	0.39	0.33	0.33
252-XX	221	138						
253	222	221	1.19	0.08	0.00	0.05	0.01	0.01
254	224	28	0.00	0.00	0.00	0.00	0.00	0.00
255	225	224	0.31	0.00	0.00	0.01	0.00	0.00
256	24	244	18.06	0.05	0.00	0.20	0.04	0.04
257	226	255	6.49	0.03	0.00	0.07	0.01	0.01
258	226	229	5.41	0.01	0.00	0.06	0.00	0.00
259	228	227	0.56	0.00	0.00	0.01	0.00	0.00
260	228	231	1.26	0.01	0.00	0.03	0.00	0.00
261	231	230	0.21	0.00	0.00	0.01	0.00	0.00
262	231	232	0.21	0.00	0.00	0.01	0.00	0.00
263	227	252	0.42	0.00	0.00	0.00	0.00	0.00
264	251	234	0.10	0.00	0.00	0.00	0.00	0.00
265	235	233	9.10	0.08	0.00	0.10	0.01	0.01
266	233	450	5.43	0.02	0.00	0.06	0.00	0.00
267	236	234	2.49	0.01	0.00	0.03	0.00	0.00
268	237	236	2.98	0.00	0.00	0.03	0.00	0.00
269	248	235	14.49	0.12	0.00	0.16	0.03	0.03
270	235	258	4.06	0.00	0.00	0.05	0.00	0.00
271	238	240	21.56	0.32	0.00	0.24	0.06	0.06
272	240	243	3.57	0.02	0.00	0.04	0.00	0.00
273	242	241	1.61	0.02	0.00	0.04	0.00	0.00
274	243	242	2.52	0.00	0.00	0.03	0.00	0.00
275	243	245	0.28	0.00	0.00	0.01	0.00	0.00

276	229	256	5.20	0.00	0.00	0.06	0.00	0.00
277	244	226	15.26	0.18	0.00	0.17	0.03	0.03
278	240	247	16.24	0.09	0.00	0.18	0.04	0.04
279	247	248	15.47	0.09	0.00	0.18	0.03	0.03
280	233	249	2.48	0.01	0.00	0.06	0.01	0.01
281	249	250	2.13	0.03	0.00	0.05	0.01	0.01
282	250	251	1.01	0.01	0.00	0.03	0.00	0.00
283	252	338	0.21	0.00	0.00	0.00	0.00	0.00
284	253	228	2.66	0.00	0.00	0.03	0.00	0.00
285	254	253	2.92	0.01	0.00	0.03	0.00	0.00
286	255	254	5.09	0.02	0.00	0.06	0.00	0.00
287	256	246	4.43	0.02	0.00	0.05	0.00	0.00
288	257	239	0.56	0.00	0.00	0.01	0.00	0.00
289	258	257	2.59	0.01	0.00	0.03	0.00	0.00
290	R-2	24	18.06	0.05	0.00	0.20	0.04	0.04
291	R-3	238	22.54	0.00	0.00	0.26	0.07	0.07
292	259	420	8.12	0.01	0.00	0.09	0.01	0.01
293	137	260	0.00	0.00	0.00	0.00	0.00	0.00
294	260	261	0.00	0.00	0.00	0.00	0.00	0.00
295	74	426	1.68	0.00	0.00	0.08	0.02	0.02
296	263	287	0.42	0.00	0.00	0.02	0.00	0.00
297	234	266	1.82	0.06	0.00	0.08	0.02	0.02
298	265	264	0.21	0.00	0.00	0.01	0.00	0.00
299	266	265	0.98	0.03	0.00	0.04	0.01	0.01
300	94	268	0.00	0.00	0.00	0.00	0.00	0.00
301	268	267	0.00	0.00	0.00	0.00	0.00	0.00
302	98	269	1.47	0.03	0.00	0.07	0.01	0.01
303	269	I-RV-3	1.26	0.00	0.00	0.06	0.01	0.01
304	90	344	1.96	0.01	0.00	0.05	0.01	0.01
305	271	158	2.03	0.01	0.00	0.05	0.01	0.01
306	271	272	0.00	0.00	0.00	0.00	0.00	0.00
307	273	305	0.00	0.00	0.00	0.00	0.00	0.00
308	274	214	2.31	0.10	0.00	0.10	0.03	0.03
309	214	275	0.77	0.01	0.00	0.03	0.00	0.00
310	52	277	4.48	0.24	0.00	0.20	0.10	0.10
311	277	278	3.64	0.34	0.00	0.17	0.07	0.07
312	47	276	13.03	0.02	0.00	0.15	0.02	0.02
313	279	62	15.33	0.07	0.00	0.17	0.03	0.03
314	276	279	13.03	0.02	0.00	0.15	0.02	0.02
315	280	342	151.44	0.35	0.00	1.72	2.25	2.25
316	281	343	150.88	3.64	0.00	1.71	2.23	2.23
317	282	270	0.63	0.01	0.00	0.03	0.00	0.00
318	278	138	3.01	0.12	0.00	0.14	0.05	0.05
319	284	69	194.57	3.33	0.00	2.21	3.58	3.58
320	284	286	9.38	0.03	0.00	0.11	0.01	0.01
321	285	284	204.44	1.42	0.00	2.32	3.92	3.92
322	290	292	54.86	0.07	0.00	0.62	0.34	0.34
323	288	289	91.33	0.63	0.00	0.58	0.22	0.22
324	288	291	160.77	1.73	0.00	1.03	0.62	0.62
325	291	293	160.77	8.97	0.00	1.03	0.62	0.62
326	292	76	49.75	0.66	0.00	0.56	0.29	0.29
327	289	377	91.33	0.11	0.00	0.58	0.22	0.22
328	294	171	91.33	0.02	0.00	1.04	0.88	0.88
329	307	376	108.80	0.03	0.00	1.23	1.22	1.22
330	293	378	160.77	1.47	0.00	1.03	0.62	0.62
331	295	303	663.34	2.07	0.00	1.88	1.19	1.19
332	298	I-Pump-3	204.44	0.04	0.00	2.32	3.92	3.92
333	299	295	663.62	2.69	0.00	1.88	1.19	1.19
334	300	305	665.30	5.14	0.00	1.89	1.19	1.19
335	301	300	666.49	2.94	0.00	1.89	1.20	1.20
336	302	301	582.73	5.30	0.00	1.65	0.93	0.93
337	382	213	2.38	0.04	0.00	0.11	0.03	0.03
338	303	I-Pump-10	663.34	1.49	0.00	1.88	1.19	1.19
339	297	304	659.14	2.77	0.00	1.87	1.17	1.17
340	304	371	0.28	0.00	0.00	0.00	0.00	0.00
341	305	299	664.18	2.51	0.00	1.88	1.19	1.19
342	3	307	189.52	0.03	0.00	0.54	0.12	0.12
343	306	302	582.73	0.07	0.00	1.65	0.93	0.93
344	296	298	204.58	0.47	0.00	2.32	3.93	3.93
345	308	J-1	956.54	1.65	0.00	2.71	2.34	2.34
346	311	308	956.54	6.27	0.00	2.71	2.34	2.34
347	309	I-RV-5	305.22	0.10	0.00	1.25	0.68	0.68



348	309	310	849.34	0.47	0.00	2.41	1.87	1.87
349	310	311	849.34	14.95	0.00	2.41	1.87	1.87
350	T-8	311	107.20	0.04	0.00	0.30	0.04	0.04
351	O-RV-3	282	1.26	0.01	0.00	0.06	0.01	0.01
352	312	96	42.07	2.03	0.00	1.07	1.51	1.51
353	74	313	1.54	0.00	0.00	0.02	0.00	0.00
354	215	283	1.40	0.03	0.00	0.04	0.00	0.00
355	45	222	11.06	0.11	0.00	0.28	0.13	0.13
356	241	315	0.35	0.00	0.00	0.01	0.00	0.00
357	275	397	0.07	0.00	0.00	0.00	0.00	0.00
358	316	49	139.61	12.89	0.00	1.58	1.93	1.93
359	316	318	0.63	0.01	0.00	0.03	0.00	0.00
360	317	316	143.18	4.49	0.00	1.62	2.03	2.03
361	317	319	2.87	0.20	0.00	0.13	0.04	0.04
362	319	320	0.56	0.01	0.00	0.03	0.00	0.00
363	321	81	0.63	0.00	0.00	0.03	0.00	0.00
364	81	323	0.21	0.00	0.00	0.01	0.00	0.00
365	O-RV-5	164	305.22	0.08	0.00	1.25	0.68	0.68
366	326	324	127.20	1.09	0.00	0.81	0.40	0.40
367	324	325	0.35	0.00	0.00	0.02	0.00	0.00
368	166	326	146.17	1.65	0.00	0.93	0.52	0.52
369	326	339	8.47	0.09	0.00	0.38	0.32	0.32
370	328	I-RV-1	1161.56	0.04	0.00	4.74	8.13	8.13
371	R-1	328	1161.56	0.04	0.00	4.74	8.13	8.13
372	112	329	0.63	0.00	0.00	0.03	0.00	0.00
373	329	333	0.21	0.00	0.00	0.02	0.00	0.00
374	327	331	1.12	0.00	0.00	0.05	0.01	0.01
375	327	395	0.21	0.00	0.00	0.01	0.00	0.00
376	333	330	0.07	0.00	0.00	0.01	0.00	0.00
377	334	432	0.14	0.00	0.00	0.01	0.00	0.00
378	430	334	0.28	0.00	0.00	0.01	0.00	0.00
379	336	431	0.84	0.00	0.00	0.04	0.00	0.00
380	236	337	0.07	0.00	0.00	0.00	0.00	0.00
381	339	327	4.97	0.29	0.00	0.23	0.12	0.12
382	339	340	0.35	0.00	0.00	0.02	0.00	0.00
383	O-Pump-4	341	150.32	0.11	0.00	1.71	2.22	2.22
384	341	48	149.48	4.69	0.00	1.70	2.20	2.20
385	343	I-Pump-4	150.32	0.11	0.00	1.71	2.22	2.22
386	61	345	1.40	0.00	0.00	0.04	0.00	0.00
387	345	346	0.70	0.00	0.00	0.02	0.00	0.00
388	344	366	1.82	0.01	0.00	0.05	0.00	0.00
389	344	347	0.14	0.00	0.00	0.01	0.00	0.00
390	347	349	0.07	0.00	0.00	0.01	0.00	0.00
391	156	384	0.77	0.02	0.00	0.03	0.00	0.00
392	T-9	355	279.27	0.09	0.00	1.78	1.72	1.72
393	351	375	279.27	1.81	0.00	1.78	1.72	1.72
394	352	351	279.27	1.68	0.00	1.78	1.72	1.72
395	350	I-Pump-9	0.00	0.00	0.00	0.00	0.00	0.00
396	353	116	1.54	0.02	0.00	0.04	0.00	0.00
397	350	353	2.24	0.00	0.00	0.06	0.01	0.01
398-XX	194	28						
399	354	352	279.27	0.17	0.00	1.78	1.72	1.72
400	354	I-RV-6	0.00	0.00	0.00	0.00	0.00	0.00
401-CV	355	354	279.27	0.09	0.00	1.78	1.72	1.72
402	O-RV-6	355	0.00	0.00	0.00	0.00	0.00	0.00
403	246	358	3.52	0.00	0.00	0.04	0.00	0.00
404	357	364	1.42	0.00	0.00	0.02	0.00	0.00
405	358	359	3.24	0.00	0.00	0.04	0.00	0.00
406	359	360	3.10	0.00	0.00	0.04	0.00	0.00
407	360	361	3.10	0.00	0.00	0.04	0.00	0.00
408	361	362	3.10	0.00	0.00	0.04	0.00	0.00
409	362	363	3.10	0.00	0.00	0.04	0.00	0.00
410	363	357	2.96	0.00	0.00	0.03	0.00	0.00
411	364	356	1.28	0.00	0.00	0.01	0.00	0.00
412	155	367	0.49	0.01	0.00	0.02	0.00	0.00
413	366	88	1.40	0.01	0.00	0.04	0.00	0.00
414	366	368	0.21	0.00	0.00	0.01	0.00	0.00
415	367	379	0.21	0.00	0.00	0.01	0.00	0.00
416-CV	2	369	492.78	7.98	0.00	5.59	20.00	20.00
417	369	370	492.78	21.94	0.00	5.59	20.00	20.00
418	370	T-10	387.78	1.41	0.00	4.40	12.83	12.83
419-XXCV	372	371						

420-XX	371	372						
421	84	372	0.91	0.00	0.00	0.01	0.00	0.00
422	370	373	52.50	3.16	0.00	0.60	0.32	0.32
423	2	369	0.00	7.98	0.00	0.00	0.00	0.00
424	374	29	2.94	0.00	0.00	0.03	0.00	0.00
425	375	425	252.11	4.95	0.00	1.61	1.42	1.42
426	375	374	27.16	0.00	0.00	0.17	0.02	0.02
427	376	T-2	217.60	0.04	0.00	2.47	4.40	4.40
428	307	376	108.80	0.03	0.00	1.23	1.22	1.22
429	377	262	91.33	0.02	0.00	0.58	0.22	0.22
430-XX	377	177						
431	378	296	160.77	0.59	0.00	1.03	0.62	0.62
432	290	380	0.28	0.00	0.00	0.01	0.00	0.00
433	365	I-Pump-6	45.36	1.29	0.00	1.16	1.74	1.74
434	381	312	43.61	7.30	0.00	1.11	1.62	1.62
435-XX	365	381						
436	384	383	0.14	0.00	0.00	0.01	0.00	0.00
437	109	403	0.21	0.00	0.00	0.01	0.00	0.00
438	385	109	0.77	0.01	0.00	0.03	0.00	0.00
439	110	386	0.21	0.00	0.00	0.01	0.00	0.00
440	213	387	1.68	0.11	0.00	0.08	0.02	0.02
441	387	388	0.28	0.00	0.00	0.01	0.00	0.00
442	388	389	0.00	0.00	0.00	0.00	0.00	0.00
443	389	404	0.00	0.00	0.00	0.00	0.00	0.00
444	207	390	7.84	0.57	0.00	0.36	0.27	0.27
445	357	394	1.40	0.02	0.00	0.06	0.01	0.01
446	391	392	0.14	0.00	0.00	0.01	0.00	0.00
447	393	391	0.28	0.00	0.00	0.01	0.00	0.00
448	394	393	0.84	0.02	0.00	0.04	0.00	0.00
449	41	412	0.49	0.01	0.00	0.02	0.00	0.00
450	325	410	0.00	0.00	0.00	0.00	0.00	0.00
451	O-RV-4	332	4.20	0.02	0.00	0.11	0.02	0.02
452	332	396	0.28	0.00	0.00	0.01	0.00	0.00
453	123	314	16.79	0.06	0.00	0.19	0.04	0.04
454	398	411	0.14	0.00	0.00	0.01	0.00	0.00
455	314	398	0.28	0.00	0.00	0.01	0.00	0.00
456	399	56	1.40	0.00	0.00	0.02	0.00	0.00
457	399	401	0.35	0.00	0.00	0.02	0.00	0.00
458	400	203	0.07	0.00	0.00	0.00	0.00	0.00
459-XX	205	405						
460	402	395	0.00	0.00	0.00	0.00	0.00	0.00
461-XX	403	107						
462-XX	404	386						
463	400	405	0.21	0.00	0.00	0.01	0.00	0.00
464	141	406	942.33	2.95	0.00	2.67	2.27	2.27
465	406	409	0.00	0.00	0.00	0.00	0.00	0.00
466	212	408	8.54	0.62	0.00	0.39	0.32	0.32
467	408	407	0.00	0.00	0.00	0.00	0.00	0.00
468-XX	409	407						
469-XX	410	402						
470-XX	397	411						
471-XX	412	15						
472	413	153	11.06	0.01	0.00	0.13	0.02	0.02
473	413	414	0.00	0.00	0.00	0.00	0.00	0.00
474	125	415	40.43	2.35	0.00	1.03	1.40	1.40
475	415	417	0.98	0.01	0.00	0.03	0.00	0.00
476	417	419	0.00	0.00	0.00	0.00	0.00	0.00
477	417	416	0.84	0.00	0.00	0.04	0.00	0.00
478	416	418	0.35	0.00	0.00	0.02	0.00	0.00
479	420	58	5.46	0.02	0.00	0.06	0.00	0.00
480	420	422	0.77	0.00	0.00	0.03	0.00	0.00
481	422	421	0.21	0.00	0.00	0.01	0.00	0.00
482	121	423	67.60	0.61	0.00	0.77	0.50	0.50
483	56	424	0.28	0.00	0.00	0.01	0.00	0.00
484	425	288	252.11	0.78	0.00	1.61	1.42	1.42
485	425	427	0.00	0.00	0.00	0.00	0.00	0.00
486	426	263	0.84	0.01	0.00	0.04	0.00	0.00
487	426	429	0.84	0.00	0.00	0.04	0.00	0.00
488	429	428	0.84	0.00	0.00	0.04	0.00	0.00
489	431	430	0.56	0.00	0.00	0.03	0.00	0.00
490	428	336	0.84	0.00	0.00	0.04	0.00	0.00
491	111	433	0.14	0.00	0.00	0.01	0.00	0.00



492	136	335	96.66	2.73	0.00	1.10	0.98	0.98
493	335	435	0.28	0.00	0.00	0.01	0.00	0.00
494	434	111	0.63	0.00	0.00	0.03	0.00	0.00
495	437	436	0.21	0.00	0.00	0.01	0.00	0.00
496	167	439	0.98	0.01	0.00	0.03	0.00	0.00
497	441	447	51.68	0.42	0.00	0.33	0.08	0.08
498	449	438	50.00	0.08	0.00	0.32	0.07	0.07
499	219	445	2.03	0.05	0.00	0.09	0.02	0.02
500	214	440	0.56	0.00	0.00	0.03	0.00	0.00
501	440	442	0.14	0.00	0.00	0.01	0.00	0.00
502	447	23a	50.28	0.17	0.00	0.32	0.07	0.07
503	J-24	446	0.35	0.01	0.00	0.02	0.00	0.00
504	27	21a	0.42	0.00	0.00	0.00	0.00	0.00
505	O-RV-7	22a	50.28	0.00	0.00	0.32	0.07	0.07
506	448	449	50.00	0.05	0.00	0.32	0.07	0.07
507	439	443	0.14	0.00	0.00	0.01	0.00	0.00
508	443	444	0.07	0.00	0.00	0.01	0.00	0.00
509	445	167	1.82	0.05	0.00	0.08	0.02	0.02
510	450	237	4.03	0.03	0.00	0.05	0.00	0.00
10A	O-Pump-10	348	663.34	0.12	0.00	1.88	1.19	1.19
P-17	R-4	J-15	54.48	0.11	0.00	0.35	0.08	0.08
P-24-XX	21a	449						
P-25	22a	448	50.14	0.19	0.00	0.32	0.07	0.07
P-28	J-24	441	53.08	0.26	0.00	0.34	0.08	0.08
P-29	J-25	J-24	54.13	0.39	0.00	0.35	0.08	0.08
P-30	J-26	J-25	54.48	0.34	0.00	0.35	0.08	0.08
P-32	J-15	J-26	54.48	0.09	0.00	0.35	0.08	0.08
P-136	23a	I-RV-7	50.28	0.00	0.00	0.32	0.07	0.07

P U M P / L O S S   E L E M E N T   R E S U L T S

NPSH Avail. (ft)	NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	PUMP HEAD (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREM TL COST (\$)	TOTAL COST (\$)	#PUMPS PARALLEL	#PUMPS SERIES
181.8	Pump-1	940.72	148.73	301.70	153.0	75.00	0.	0.0	0.0	**	**
280.3	Pump-3	204.44	247.18	325.86	78.7	75.00	0.	0.0	0.0	**	**
180.5	Pump-4	150.32	147.31	273.66	126.3	75.00	0.	0.0	0.0	**	**
189.3	Pump-5	1154.56	156.48	275.54	119.1	75.00	0.	0.0	0.0	**	**
360.1	Pump-6	45.36	326.95	653.81	326.9	75.00	0.	0.0	0.0	**	**
152.2	Pump-7	10.00	119.01	269.01	150.0	75.00	0.	0.0	0.0	**	**
	Device "Pump-8" is closed										
278.8	Pump-8	0.00	245.56	348.73	0.0	75.00	0.	0.0	0.0	**	**
	Device "Pump-9" is closed										
353.8	Pump-9	0.00	320.60	320.59	0.0	75.00	0.	0.0	0.0	**	**
136.9	Pump-10	663.34	103.79	267.01	163.2	75.00	0.	0.0	0.0	**	**

N O D E   R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
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2	1.26	1171.32	990.00	181.32	78.57
3	0.00	1035.11			
4	3.50	838.89	670.00	168.89	73.18
5	0.35	1035.34	800.00	235.34	101.98
6	1.40	891.09	680.00	211.09	91.47
7	7.21	890.45	680.00	210.45	91.19
8	2.10	890.45	690.00	200.45	86.86
9	2.73	888.25	670.00	218.25	94.57
10	0.98	886.82	670.00	216.82	93.96
11	2.17	878.31	704.00	174.31	75.54
12	187.00	887.90	670.00	217.90	94.42
13	0.35	886.78	680.00	206.78	89.60
14	1.05	886.78	660.00	226.78	98.27
15	0.70	886.75	700.00	186.75	80.93
16	3.15	1020.64	710.00	310.64	134.61
17	0.84	877.37	740.00	137.37	59.52
18	0.42	1020.08	700.00	320.08	138.70
19	1.05	1020.12	695.00	325.12	140.88
20	1.05	1020.60	720.00	300.60	130.26
21	0.00	1020.21	700.00	320.21	138.76
22	1.19	1020.60	724.00	296.60	128.53
23	0.42	1020.57	901.00	119.57	51.82
24	0.00	1180.95	1000.00	180.95	78.41
25	0.28	1020.26	720.00	300.26	130.11
26	7.70	1014.61	774.00	240.61	104.26
27	1.54	1020.58	773.00	247.58	107.28
28	0.00	1020.56	774.00	246.56	106.84
29	0.98	1021.16	773.00	248.16	107.54
30	0.00	1123.73	780.00	343.73	148.95
31	0.49	1038.65	738.00	300.65	130.28
32	0.56	1021.04	777.00	244.04	105.75
33	0.70	1020.95	850.00	170.95	74.08
34	0.70	1021.06	760.00	261.06	113.12
35	0.00	1020.98	800.00	220.98	95.76
36	0.42	1020.94	800.00	220.94	95.74
37	8.40	1014.51	760.00	254.51	110.29
38	2.73	1014.05	775.00	239.05	103.59
39	0.98	1008.61	700.00	308.61	133.73
40	0.28	1014.05	780.00	234.05	101.42
41	1.40	1013.93	720.00	293.93	127.37
42	2.31	1067.24	840.00	227.24	98.47
43	5.11	1004.50	770.00	234.50	101.62
44	2.10	1120.79	840.00	280.79	121.68
45	0.42	1067.18	790.00	277.18	120.11
46	3.22	1041.96	800.00	241.96	104.85
47	0.42	1120.83	870.00	250.83	108.69
48	0.98	1143.86	927.00	216.86	93.97
49	9.17	1125.25	840.00	285.25	123.61
50	8.33	1124.72	940.00	184.72	80.05
51	0.84	1124.71	975.00	149.71	64.87
52	0.35	1124.60	986.00	138.60	60.06
53	1.19	1124.63	930.00	194.63	84.34
54	0.56	1124.63	980.00	144.63	62.67
55	2.38	1120.77	860.00	260.77	113.00
56	1.12	1120.75	940.00	180.75	78.32
57	2.24	1120.68	859.00	261.68	113.39
58	2.66	1120.59	912.00	208.59	90.39
59	0.70	1120.68	990.00	130.68	56.63
60	0.35	1120.59	930.00	190.59	82.59
61	1.05	1120.53	950.00	170.53	73.90
62	2.31	1120.72	850.00	270.72	117.31
63	0.70	1120.71	880.00	240.71	104.31
64	1.40	1066.35	951.00	115.35	49.98
65	1.33	1042.63	788.00	254.63	110.34
66	0.42	1042.62	850.00	192.62	83.47
67	0.49	1043.19	800.00	243.19	105.38
68	2.38	1066.36	902.00	164.36	71.22
69	2.73	1075.09	790.00	285.09	123.54
70	0.63	1068.35	867.00	201.35	87.25
71	1.05	1005.31	730.00	275.31	119.30
72	2.38	1065.53	836.00	229.53	99.46



73	2.03	1078.33	862.00	216.33	93.74
74	1.82	1078.30	910.00	168.30	72.93
75	1.75	1030.63	710.00	320.63	138.94
76	5.53	1002.91	750.00	252.91	109.59
77	0.42	1030.62	796.00	234.62	101.67
78	0.00	1030.62	800.00	230.62	99.93
79	0.91	1030.56	770.00	260.56	112.91
80	1.19	1172.72	960.00	212.72	92.18
81	0.42	1030.54	800.00	230.54	99.90
82	1.82	1165.72	800.00	365.72	158.48
83	0.77	943.73	670.00	273.73	118.62
84	3.78	1076.96	960.00	116.96	50.68
85	0.98	943.62	654.00	289.62	125.50
86	0.42	943.61	650.00	293.61	127.23
87	0.21	943.73	660.00	283.73	122.95
88	0.70	1016.84	740.00	276.84	119.97
89	0.70	1016.84	700.00	316.84	137.30
90	0.42	1016.86	785.00	231.86	100.47
91	2.10	1163.68	820.00	343.68	148.93
92	0.35	1171.18	950.00	221.18	95.84
93	4.97	1166.85	775.00	391.85	169.80
94	1.05	1166.82	830.00	336.82	145.96
95	100.70	1163.41	830.00	333.41	144.48
96	35.98	1478.61	1068.00	410.61	177.93
97	0.70	1016.88	800.00	216.88	93.98
98	0.42	1478.56	1050.00	428.56	185.71
99	0.56	887.76	730.00	157.76	68.36
100	2.45	1036.55	860.00	176.55	76.50
101	3.99	1036.55	864.00	172.55	74.77
102	3.99	1029.00	812.00	217.00	94.03
103	3.50	883.81	671.00	212.81	92.22
104	1.40	1035.86	700.00	335.86	145.54
105	2.45	1027.67	820.00	207.67	89.99
106	1.75	1027.64	770.00	257.64	111.65
107	1.75	1027.64	814.00	213.64	92.58
108	2.45	1027.71	808.00	219.71	95.21
109	0.56	1028.62	710.00	318.62	138.07
110	1.61	1027.56	755.00	272.56	118.11
111	0.49	1027.51	800.00	227.51	98.59
112	4.48	879.29	693.00	186.29	80.73
113	2.03	877.75	720.00	157.75	68.36
114	2.03	877.38	700.00	177.38	76.86
115	2.10	1020.13	740.00	280.13	121.39
116	1.12	1020.58	901.00	119.58	51.82
117	1.33	1020.58	800.00	220.58	95.59
118	0.00	1123.73	800.00	323.73	140.28
119	1.26	1021.08	800.00	221.08	95.80
120	0.91	1014.01	800.00	214.01	92.74
121	1.82	1011.16	900.00	111.16	48.17
122	1.12	1030.58	700.00	330.58	143.25
123	0.63	1020.72	733.00	287.72	124.68
124	0.70	1042.62	830.00	212.62	92.14
125	0.56	1047.60	830.00	217.60	94.29
126	1.19	1051.15	855.00	196.15	85.00
127	1.12	1061.55	900.00	161.55	70.01
128	1.40	1067.21	780.00	287.21	124.46
129	1.61	1067.99	878.00	189.99	82.33
130	1.12	1067.30	920.00	147.30	63.83
131	1.40	1056.34	923.00	133.34	57.78
132	0.98	1046.13	805.00	241.13	104.49
133	2.45	1069.67	853.00	216.67	93.89
134	1.40	1073.02	850.00	223.02	96.64
135	1.40	1073.40	750.00	323.40	140.14
136	1.05	1071.74	835.00	236.74	102.59
137	0.70	1078.31	900.00	178.31	77.27
138	0.56	1123.89	900.00	223.89	97.02
139	1.12	922.34	669.00	253.34	109.78
140	0.00	900.25	708.00	192.25	83.31
141	1.89	894.14	740.00	154.14	66.80
142	0.00	1030.62	785.00	245.62	106.44
143	0.84	1170.96	975.00	195.96	84.91
144	0.00	1035.38	800.00	235.38	102.00

145	2.10	1035.88			
146	3.50	1035.89	853.00	182.89	79.25
147	3.64	1036.76	833.00	203.76	88.30
148	2.10	1037.74	790.00	247.74	107.35
149	2.24	1028.67	850.00	178.67	77.42
150	0.70	1028.63	850.00	178.63	77.41
151	1.54	1028.36	820.00	208.36	90.29
152	3.50	1169.33	750.00	419.33	181.71
153	0.70	1076.84	880.00	196.84	85.30
154	0.56	943.80	691.00	252.80	109.55
155	1.96	943.78	678.00	265.78	115.17
156	2.52	943.74	674.00	269.74	116.89
157	0.63	943.68	659.00	284.68	123.36
158	0.35	943.63	660.00	283.63	122.91
159	0.28	943.62	686.00	257.62	111.63
160	0.28	1020.99	800.00	220.99	95.76
161	0.91	1068.04	875.00	193.04	83.65
162	0.84	1067.97	880.00	187.97	81.45
163	1.96	890.77	680.00	210.77	91.33
164	4.13	895.61	688.00	207.61	89.97
165	3.50	928.42	670.00	258.42	111.98
166	11.34	895.26	680.00	215.26	93.28
167	0.84	1123.74	900.00	223.74	96.95
168	10.00	1043.69	900.00	143.69	62.26
169	0.70	1038.48	720.00	318.48	138.01
170	0.00	1030.62	780.00	250.62	108.60
171	0.00	1014.63	774.00	240.63	104.27
172	0.00	1030.63	715.00	315.63	136.77
173	0.70	1020.13	700.00	320.13	138.72
174	0.49	1030.62	715.00	315.62	136.77
175	1.33	1030.62	785.00	245.62	106.44
176	1.12	1030.62	796.00	234.62	101.67
177	0.84	1030.62	780.00	250.62	108.60
178	1.12	1030.62	800.00	230.62	99.93
179	5.74	891.40	690.00	201.40	87.27
180	2.38	891.20	680.00	211.20	91.52
181	1.40	891.04	675.00	216.04	93.62
182	0.00	891.20	680.00	211.20	91.52
183	2.10	890.72	680.00	210.72	91.31
184	3.15	890.72	669.00	221.72	96.08
185	2.10	890.79	675.00	215.79	93.51
186	6.30	890.59	680.00	210.59	91.26
187	0.70	890.60			
188	0.00	890.64	740.00	150.64	65.28
189	2.10	890.59	669.00	221.59	96.02
190	1.75	890.65	708.00	182.65	79.15
191	0.70	890.62	708.00	182.62	79.14
192	0.00	890.64	740.00	150.64	65.28
193	0.28	1020.92	820.00	200.92	87.06
194	0.00	1123.73	775.00	348.73	151.12
195	0.42	1020.57	750.00	270.57	117.25
196	0.42	1020.08	720.00	300.08	130.03
197	1.40	1020.14	680.00	340.14	147.39
198	0.77	890.72	673.00	217.72	94.35
199	0.14	1020.07	680.00	340.07	147.36
200	1.05	890.72	650.00	240.72	104.31
201	0.70	890.69			
202	0.28	1036.46	720.00	316.46	137.13
203	0.07	890.67	660.00	230.67	99.96
204	1.05	890.65	738.00	152.65	66.15
205	0.35	890.65	685.00	205.65	89.11
206	0.56	890.72	660.00	230.72	99.98
207	0.42	897.87	740.00	157.87	68.41
208	0.21	894.10	740.00	154.10	66.78
209	0.42	896.81	693.00	203.81	88.32
210	0.42	896.77	680.00	216.77	93.93
211	0.21	896.76	660.00	236.76	102.60
212	1.54	899.19	700.00	199.19	86.32
213	0.70	1036.58	787.00	249.58	108.15
214	0.98	1065.14	900.00	165.14	71.56
215	1.68	1065.44	767.00	298.44	129.32
216	1.26	1065.27	759.00	306.27	132.72



217	0.21	1065.27	760.00	305.27	132.29
218	0.70	1065.37	785.00	280.37	121.50
219	0.42	1123.84	900.00	223.84	97.00
220	0.35	1065.37	800.00	265.37	114.99
221	1.19	1066.98	837.00	229.98	99.66
222	1.19	1067.07	809.00	258.07	111.83
223	0.49	1020.07	700.00	320.07	138.70
224	1.12	1020.56	770.00	250.56	108.57
225	0.49	1020.56	830.00	190.56	82.58
226	3.36	1180.72	960.00	220.72	95.65
227	0.14	1180.66	1000.00	180.66	78.29
228	0.84	1180.66	951.00	229.66	99.52
229	0.21	1180.71	990.00	190.71	82.64
230	0.21	1180.65	900.00	280.65	121.62
231	0.84	1180.65	949.00	231.65	100.38
232	0.21	1180.65	830.00	350.65	151.95
233	1.19	1180.30	920.00	260.30	112.80
234	0.77	1180.25	750.00	430.25	186.44
235	1.33	1180.38	1010.00	170.38	73.83
236	0.42	1180.26	830.00	350.26	151.78
237	1.05	1180.26	830.00	350.26	151.78
238	0.98	1181.00	1020.00	161.00	69.77
239	0.56	1180.37	955.00	225.37	97.66
240	1.75	1180.68	994.00	186.68	80.90
241	1.26	1180.65	850.00	330.65	143.28
242	0.91	1180.67	870.00	310.67	134.62
243	0.77	1180.67	880.00	300.67	130.29
244	2.80	1180.90	950.00	230.90	100.06
245	0.28	1180.67	930.00	250.67	108.62
246	0.91	1180.69	1000.00	180.69	78.30
247	0.77	1180.59	1019.00	161.59	70.02
248	0.98	1180.50	970.00	210.50	91.22
249	0.35	1180.29	1000.00	180.29	78.13
250	1.12	1180.26	870.00	310.26	134.45
251	0.91	1180.25	800.00	380.25	164.78
252	0.21	1180.66	1020.00	160.66	69.62
253	1.40	1180.67	790.00	390.67	169.29
254	2.17	1180.68	818.00	362.68	157.16
255	1.40	1180.69	870.00	310.69	134.63
256	0.77	1180.71	950.00	230.71	99.97
257	2.03	1180.37	879.00	301.37	130.59
258	1.47	1180.37	918.00	262.37	113.70
259	1.26	1120.62	870.00	250.62	108.60
260	0.00	1078.31	920.00	158.31	68.60
261	0.00	1078.31	800.00	278.31	120.60
262	0.00	1014.67	780.00	234.67	101.69
263	0.42	1078.29	800.00	278.29	120.59
264	0.21	1180.16	790.00	390.16	169.07
265	0.77	1180.16	790.00	390.16	169.07
266	0.84	1180.19	804.00	376.19	163.02
267	0.00	1166.82	930.00	236.82	102.62
268	0.00	1166.82	880.00	286.82	124.29
269	0.21	1478.54	1050.00	428.54	185.70
270	0.63	1112.29	800.00	312.29	135.32
271	0.42	943.64	661.00	282.64	122.48
272	0.00	943.64	850.00	93.64	40.58
273	0.00	1022.55	850.00	172.55	74.77
274	0.77	1065.25	780.00	285.25	123.61
275	0.70	1065.13	900.00	165.13	71.56
276	0.00	1120.81	850.00	270.81	117.35
277	0.84	1124.35	1000.00	124.35	53.89
278	0.63	1124.01	900.00	224.01	97.07
279	1.75	1120.79	850.00	270.79	117.34
280	2.10	1026.67	855.00	171.67	74.39
281	0.56	1026.06	855.00	171.06	74.13
282	0.63	1112.30	900.00	212.30	92.00
283	1.40	1065.41	770.00	295.41	128.01
284	0.49	1078.42	770.00	308.42	133.65
285	0.00	1079.84	770.00	309.84	134.26
286	1.61	1078.38	750.00	328.38	142.30
287	0.42	1078.29	750.00	328.29	142.26
288	0.00	1015.44	770.00	245.44	106.36

289	0.00	1014.81	774.00	240.81	104.35
290	4.97	1003.65	750.00	253.65	109.91
291	0.00	1013.72	810.00	203.72	88.28
292	5.11	1003.57	750.00	253.57	109.88
293	0.00	1004.74	750.00	254.74	110.39
294	0.00	1014.65	780.00	234.65	101.68
295	0.28	1017.35	700.00	317.35	137.52
296	0.42	1002.69	770.00	232.69	100.83
297	2.87	1175.69	900.00	275.69	119.47
298	0.14	1002.22	770.00	232.22	100.63
299	0.56	1020.04	703.00	317.04	137.38
300	1.19	1027.69	700.00	327.69	142.00
301	0.35	1030.62	710.00	320.62	138.94
302	0.00	1035.92	765.00	270.92	117.40
303	0.00	1015.29	820.00	195.29	84.62
304	2.24	1172.92	940.00	232.92	100.93
305	1.12	1022.55	690.00	332.55	144.10
306	0.49	1035.99			
307	0.00	1035.07	1016.00	19.07	8.27
308	0.00	933.69	675.00	258.69	112.10
309	0.00	955.38	688.00	267.38	115.86
310	0.00	954.91	690.00	264.91	114.79
311	0.00	939.96	660.00	279.96	121.31
312	1.54	1480.64	1084.00	396.64	171.88
313	1.54	1078.30	860.00	218.30	94.60
314	0.42	1020.65	810.00	210.65	91.28
315	0.35	1180.64	1054.00	126.64	54.88
316	2.94	1138.14	900.00	238.14	103.19
317	2.45	1142.63	915.00	227.63	98.64
318	0.63	1138.13	1020.00	118.13	51.19
319	2.31	1142.43	1000.00	142.43	61.72
320	0.56	1142.43	950.00	192.43	83.38
321	0.42	1030.54	800.00	230.54	99.90
322	0.70	1170.03	850.00	320.03	138.68
323	0.21	1030.54	820.00	210.54	91.23
324	10.71	892.53	700.00	192.53	83.43
325	0.35	892.53	700.00	192.53	83.43
326	10.50	893.62	675.00	218.62	94.73
327	3.64	893.23	760.00	133.23	57.73
328	0.00	999.96	670.00	329.96	142.98
329	0.42	879.29	700.00	179.29	77.69
330	0.07	879.28	740.00	139.28	60.36
331	1.12	893.23	740.00	153.23	66.40
332	0.84	1016.90	840.00	176.90	76.66
333	0.14	879.28	738.00	141.28	61.22
334	0.14	1078.28	950.00	128.28	55.59
335	0.56	1069.01	870.00	199.01	86.24
336	0.00	1078.29	940.00	138.29	59.92
337	0.07	1180.26	920.00	260.26	112.78
338	0.21	1180.66	1000.00	180.66	78.29
339	3.15	893.52	700.00	193.52	83.86
340	0.35	893.52	710.00	183.52	79.53
341	0.84	1148.54	880.00	268.54	116.37
342	0.00	1026.31	835.00	191.31	82.90
343	0.56	1022.42	875.00	147.42	63.88
344	0.00	1016.86	770.00	246.86	106.97
345	0.70	1120.52	960.00	160.52	69.56
346	0.70	1120.52	1040.00	80.52	34.89
347	0.07	1016.85	850.00	166.85	72.30
348	1.33	1176.89	910.00	266.89	115.65
349	0.07	1016.85	900.00	116.85	50.64
350	0.00	1020.60	700.00	320.60	138.92
351	0.00	1022.98	760.00	262.98	113.96
352	0.00	1024.66	900.00	124.66	54.02
353	0.70	1020.59	700.00	320.59	138.92
354	0.00	1024.83	1000.00	24.83	10.76
355	0.00	1024.91	1000.00	24.91	10.80
356	0.14	1180.67	790.00	390.67	169.29
357	0.14	1180.67	915.00	265.67	115.12
358	0.28	1180.68	930.00	250.68	108.63
359	0.14	1180.68	980.00	200.68	86.96
360	0.00	1180.68	940.00	240.68	104.29



361	0.00	1180.68	1000.00	180.68	78.29
362	0.00	1180.67	880.00	300.67	130.29
363	0.14	1180.67	950.00	230.67	99.96
364	0.14	1180.67	770.00	410.67	177.96
365	0.00	1163.25	820.00	343.25	148.74
366	0.21	1016.85	750.00	266.85	115.63
367	0.28	943.77	700.00	243.77	105.63
368	0.21	1016.85	830.00	186.85	80.97
369	0.00	1163.34	990.00	173.34	75.12
370	52.50	1141.41	990.00	151.41	65.61
371	0.28	1172.92	950.00	222.92	96.60
372	0.91	1076.96	950.00	126.96	55.02
373	52.50	1138.25	900.00	238.25	103.24
374	0.70	1021.17	780.00	241.17	104.51
375	0.00	1021.17	780.00	241.17	104.51
376	0.00	1035.04	1016.00	19.04	8.25
377	0.00	1014.70	780.00	234.70	101.70
378	0.00	1003.28	750.00	253.28	109.75
379	0.21	943.77	720.00	223.77	96.97
380	0.28	1003.64	780.00	223.64	96.91
381	1.75	1487.94			
382	0.49	1036.62	800.00	236.62	102.54
383	0.14	943.72	700.00	243.72	105.61
384	0.63	943.72	680.00	263.72	114.28
385	0.56	1028.63	848.00	180.63	78.27
386	0.21	1027.56	750.00	277.56	120.28
387	1.12	1036.47	760.00	276.47	119.80
388	0.28	1036.46	700.00	336.46	145.80
389	0.00	1036.46	650.00	386.46	167.47
390	0.49	897.31	700.00	197.31	85.50
391	0.14	1180.63	840.00	340.63	147.60
392	0.14	1180.63	780.00	400.63	173.60
393	0.56	1180.63	870.00	310.63	134.61
394	0.56	1180.65	920.00	260.65	112.95
395	0.21	893.23	800.00	93.23	40.40
396	0.28	1016.90	850.00	166.90	72.32
397	0.07	1065.13	900.00	165.13	71.56
398	0.14	1020.65	810.00	210.65	91.28
399	2.17	1120.75	850.00	270.75	117.33
400	1.05	890.67	660.00	230.67	99.96
401	0.35	1120.75	900.00	220.75	95.66
402	0.00	893.23	740.00	153.23	66.40
403	0.21	1028.62	814.00	214.62	93.00
404	0.00	1036.46	750.00	286.46	124.13
405	0.21	890.67	685.00	205.67	89.12
406	1.05	891.19	740.00	151.19	65.52
407	0.00	898.57	710.00	188.57	81.71
408	0.28	898.57	720.00	178.57	77.38
409	0.00	891.19	710.00	181.19	78.52
410	0.00	892.53	740.00	152.53	66.10
411	0.14	1020.65	900.00	120.65	52.28
412	0.49	1013.92	700.00	313.92	136.03
413	3.85	1076.85	910.00	166.85	72.30
414	0.00	1076.85	860.00	216.85	93.97
415	0.35	1045.25	814.00	231.25	100.21
416	0.49	1045.24	860.00	185.24	80.27
417	0.14	1045.24	840.00	205.24	88.94
418	0.35	1045.24	850.00	195.24	84.60
419	0.00	1045.24	790.00	255.24	110.60
420	1.89	1120.61	870.00	250.61	108.60
421	0.21	1120.61	900.00	220.61	95.60
422	0.56	1120.61	900.00	220.61	95.60
423	0.35	1010.55	810.00	200.55	86.90
424	0.28	1120.75	1000.00	120.75	52.32
425	0.00	1016.23	770.00	246.23	106.70
426	0.00	1078.30	910.00	168.30	72.93
427	0.00	1016.23	795.00	221.23	95.86
428	0.00	1078.29	840.00	238.29	103.26
429	0.00	1078.29	910.00	168.29	72.93
430	0.28	1078.28	960.00	118.28	51.25
431	0.28	1078.28	890.00	188.28	81.59
432	0.14	1078.28	800.00	278.28	120.59

433	0.14	1027.51	700.00	327.51	141.92
434	1.40	1027.52	830.00	197.52	85.59
435	0.28	1069.01	875.00	194.01	84.07
436	0.21	890.45	720.00	170.45	73.86
437	0.21	890.45	680.00	210.45	91.19
438	50.00	1016.60	700.00	316.60	137.19
439	0.84	1123.73	800.00	323.73	140.28
440	0.42	1065.14	920.00	145.14	62.89
441	1.40	1114.81	780.00	334.81	145.08
442	0.14	1065.14	920.00	145.14	62.89
443	0.07	1123.73	860.00	263.73	114.28
444	0.07	1123.72	940.00	183.72	79.61
445	0.21	1123.79	960.00	163.79	70.98
446	0.35	1115.07	900.00	215.07	93.19
447	1.40	1114.39	750.00	364.39	157.90
448	0.14	1016.73	720.00	296.73	128.58
449	0.00	1016.68	720.00	296.68	128.56
450	1.40	1180.28	1050.00	130.28	56.46
21a	0.42	1020.58	726.00	294.58	127.65
22a	0.14	1016.92	740.00	276.92	120.00
23a	0.00	1114.22	740.00	374.22	162.16
J-1	1.12	932.03	660.00	272.03	117.88
J-15	0.00	1115.89	880.00	235.89	102.22
J-24	0.70	1115.07	822.00	293.07	127.00
J-25	0.35	1115.46	1040.00	75.46	32.70
J-26	0.00	1115.80	891.00	224.80	97.41
I-Pump-1	0.00	886.73	738.00	148.73	64.45
O-Pump-3	0.00	1080.86	755.00	325.86	141.21
I-Pump-4	0.00	1022.31	875.00	147.31	63.84
I-Pump-5	0.00	836.48	680.00	156.48	67.81
O-Pump-6	0.00	1488.81	835.00	653.81	283.32
O-Pump-7	0.00	1044.01	775.00	269.01	116.57
I-Pump-8	0.00	1020.56	775.00	245.56	106.41
O-Pump-9	0.00	1020.59	700.00	320.59	138.92
I-Pump-10	0.00	1013.79	910.00	103.79	44.98
R-1	----	1000.00	670.00	330.00	143.00
R-2	----	1181.00	1181.00	0.00	0.00
R-3	----	1181.00	1181.00	0.00	0.00
R-4	----	1116.00	1092.00	24.00	10.40
I-RV-1	0.00	999.92	670.00	329.92	142.96
O-RV-2	----	943.85	840.00	103.85	45.00
O-RV-3	----	1112.31	1020.00	92.31	40.00
O-RV-4	----	1016.92	890.00	126.92	55.00
I-RV-5	0.00	955.28	688.00	267.28	115.82
O-RV-6	0.00	1024.91	1016.00	8.91	3.86
I-RV-7	0.00	1114.22	740.00	374.22	162.16
T-2	----	1035.00	1016.00	19.00	8.23
T-3	----	1077.00	960.00	117.00	50.70
T-6	----	1068.00	1040.00	28.00	12.13
T-7	----	1120.00	1090.00	30.00	13.00
T-8	----	940.00	920.00	20.00	8.67
T-9	----	1025.00	998.00	27.00	11.70
T-10	----	1140.00	990.00	150.00	65.00
I-RV-2	0.00	1076.84	840.00	236.84	102.63
I-RV-3	0.00	1478.53	1020.00	458.53	198.70
I-RV-4	0.00	1478.57	890.00	588.57	255.05
O-Pump-5	0.00	955.54	680.00	275.54	119.40
O-Pump-8	0.00	1123.73	775.00	348.73	151.12
O-Pump-1	0.00	1039.70	738.00	301.70	130.74
O-RV-1	----	928.46	670.00	258.46	112.00
I-Pump-7	0.00	894.01	775.00	119.01	51.57
I-Pump-3	0.00	1002.18	755.00	247.18	107.11
O-RV-5	----	895.69	688.00	207.69	90.00
O-Pump-4	0.00	1148.66	875.00	273.66	118.58
I-Pump-9	0.00	1020.60	700.00	320.60	138.92
I-RV-6	----	1024.83	1016.00	8.83	3.83
I-Pump-6	0.00	1161.95	835.00	326.95	141.68
O-RV-7	----	1016.92	740.00	276.92	120.00
O-Pump-10	0.00	1177.01	910.00	267.01	115.70



M A X I M U M   A N D   M I N I M U M   V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
O-Pump-6	283.32	I-RV-6	3.83
I-RV-4	255.05	O-RV-6	3.86
I-RV-3	198.70	T-2	8.23
234	186.44	376	8.25
98	185.71	307	8.27

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
417	5.59	423	0.00
416	5.59	380	0.00
184	4.74	283	0.00
370	4.74	264	0.00
371	4.74	207	0.00

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
417	20.00	380	0.00
416	20.00	207	0.00
418	12.83	283	0.00
184	8.13	229	0.00
370	8.13	340	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
417	20.00	380	0.00
416	20.00	207	0.00
418	12.83	283	0.00
184	8.13	229	0.00
370	8.13	340	0.00

R E G U L A T I N G   V A L V E   R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1	PRV-1	112.00	ACTIVATED	142.96	112.00	1161.56
RV-2	PRV-1	45.00	ACTIVATED	102.63	45.00	10.36
RV-3	PRV-1	40.00	ACTIVATED	198.70	40.00	1.26
RV-4	PRV-1	55.00	ACTIVATED	255.05	55.00	4.20
RV-5	PRV-1	90.00	ACTIVATED	115.82	90.00	305.22
RV-6	PSV	0.50	CLOSED	3.83	3.86	0.00
RV-7	PRV-1	120.00	ACTIVATED	162.16	120.00	50.28

S U M M A R Y   O F   I N F L O W S   A N D   O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES

000031

(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	1161.56	
R-2	18.06	
R-3	22.54	
R-4	54.48	
T-2	-217.60	
T-3	19.60	
T-6	8.04	
T-7	-88.79	
T-8	107.20	
T-9	279.27	
T-10	-387.78	

NET SYSTEM INFLOW = 1670.75  
 NET SYSTEM OUTFLOW = -694.17  
 NET SYSTEM DEMAND = 976.58

Case: 1

CHANGES FOR NEXT SIMULATION (Change Number = 1)

Demand added to end of Starshader Ln (Node 444) to show flushing velocity of 2.5 fps.

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.00010

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/1000 (ft/ft)	HL/1000 (ft/ft)
1	J-1	139	955.42	9.69	0.00	2.71	2.33	2.33
2	306	144	189.52	0.61	0.00	0.54	0.12	0.12
3	145	5	28.43	0.53	0.00	0.32	0.10	0.10
4	O-Pump-5	309	1154.57	0.16	0.00	4.72	8.04	8.04
5	5	307	28.08	0.27	0.00	0.32	0.10	0.10
6	180	6	131.65	0.11	0.00	0.84	0.43	0.43
7	6	163	130.25	0.32	0.00	0.83	0.42	0.42
8	8	437	0.42	0.00	0.00	0.02	0.00	0.00
9	7	8	2.52	0.00	0.00	0.02	0.00	0.00
10	7	9	208.49	2.20	0.00	1.33	1.00	1.00
11	9	10	18.76	1.42	0.00	0.85	1.37	1.37
12	9	12	187.00	0.35	0.00	1.19	0.82	0.82
13	10	103	15.68	3.02	0.00	0.71	0.99	0.99
14	10	14	2.10	0.04	0.00	0.10	0.02	0.02
15	14	13	0.35	0.00	0.00	0.02	0.00	0.00
16	14	15	0.70	0.03	0.00	0.03	0.00	0.00
17	11	113	4.90	0.57	0.00	0.22	0.11	0.11
18	16	115	3.14	0.52	0.00	0.14	0.05	0.05
19	19	18	1.47	0.03	0.00	0.07	0.01	0.01
20	197	19	1.48	0.03	0.00	0.07	0.01	0.01
21	20	350	2.24	0.00	0.00	0.06	0.01	0.01
22	O-Pump-9	353	0.00	0.00	0.00	0.00	0.00	0.00
23	22	195	1.22	0.03	0.00	0.06	0.01	0.01
24	20	117	4.10	0.02	0.00	0.05	0.00	0.00
25	22	20	7.39	0.00	0.00	0.08	0.01	0.01

000032

26	16	22	9.80	0.04	0.00	0.11	0.01	0.01
27	27	224	0.81	0.02	0.00	0.04	0.00	0.00
28	193	25	3.86	0.65	0.00	0.18	0.07	0.07
29	28	I-Pump-8	0.00	0.00	0.00	0.00	0.00	0.00
30	O-Pump-8	194	0.00	0.00	0.00	0.00	0.00	0.00
31	30	118	0.00	0.00	0.00	0.00	0.00	0.00
32	314	16	16.09	0.01	0.00	0.18	0.04	0.04
33-XX	29	37						
34	29	119	1.96	0.08	0.00	0.09	0.02	0.02
35	374	32	23.52	0.13	0.00	0.27	0.07	0.07
36	32	35	4.14	0.06	0.00	0.19	0.08	0.08
37	160	33	18.54	0.04	0.00	0.21	0.05	0.05
38	33	36	0.42	0.00	0.00	0.02	0.00	0.00
39	26	37	14.21	0.10	0.00	0.16	0.03	0.03
40	37	38	5.81	0.46	0.00	0.26	0.16	0.16
41	38	120	2.80	0.04	0.00	0.13	0.04	0.04
42	38	40	0.28	0.00	0.00	0.01	0.00	0.00
43	26	121	69.46	3.45	0.00	0.79	0.53	0.53
44	39	71	66.31	3.30	0.00	0.75	0.49	0.49
45	42	72	75.36	1.72	0.00	0.86	0.62	0.62
46	43	290	60.15	0.86	0.00	0.68	0.41	0.41
47	42	45	11.48	0.07	0.00	0.13	0.02	0.02
48	46	280	155.16	15.60	0.00	1.76	2.35	2.35
49	47	44	12.45	0.04	0.00	0.14	0.02	0.02
50	47	T-7	66.48	0.49	0.00	0.75	0.49	0.49
51	49	47	92.38	2.96	0.00	1.05	0.90	0.90
52	342	281	153.06	0.25	0.00	1.74	2.29	2.29
53	48	317	150.12	1.26	0.00	1.70	2.21	2.21
54	49	50	39.68	2.92	0.00	0.45	0.19	0.19
55	50	53	30.51	1.55	0.00	0.78	0.83	0.83
56	50	51	0.84	0.02	0.00	0.04	0.00	0.00
57	53	52	28.76	1.04	0.00	0.73	0.75	0.75
58	53	54	0.56	0.01	0.00	0.03	0.00	0.00
59	44	55	6.30	0.02	0.00	0.07	0.01	0.01
60	55	399	3.92	0.02	0.00	0.04	0.00	0.00
61	44	279	4.05	0.00	0.00	0.05	0.00	0.00
62	57	259	9.38	0.05	0.00	0.11	0.01	0.01
63	57	59	0.70	0.00	0.00	0.01	0.00	0.00
64	58	60	0.35	0.00	0.00	0.01	0.00	0.00
65	58	61	2.45	0.06	0.00	0.06	0.01	0.01
66	62	57	12.32	0.04	0.00	0.14	0.02	0.02
67	62	63	0.70	0.01	0.00	0.03	0.00	0.00
68	65	46	36.59	0.68	0.00	0.42	0.16	0.16
69	67	65	39.04	0.58	0.00	0.44	0.18	0.18
70	65	124	1.12	0.01	0.00	0.03	0.00	0.00
71	415	67	39.53	2.10	0.00	1.01	1.35	1.35
72	68	64	1.40	0.02	0.00	0.04	0.00	0.00
73	128	68	47.51	0.86	0.00	0.54	0.26	0.26
74	69	135	94.40	1.70	0.00	1.07	0.94	0.94
75	335	70	95.66	0.66	0.00	1.09	0.96	0.96
76	70	129	45.21	0.35	0.00	0.51	0.24	0.24
77	72	131	124.17	9.36	0.00	1.41	1.56	1.56
78	71	43	65.26	0.81	0.00	0.74	0.47	0.47
79	262	294	91.37	0.02	0.00	1.04	0.88	0.88
80	137	74	5.04	0.01	0.00	0.06	0.00	0.00
81	286	73	7.77	0.06	0.00	0.09	0.01	0.01
82	76	296	44.26	0.22	0.00	0.50	0.23	0.23
83-XX	170	262						
84	2	92	161.39	0.14	0.00	1.03	0.62	0.62
85	142	77	4.89	0.00	0.00	0.03	0.00	0.00
86	77	122	3.08	0.04	0.00	0.08	0.01	0.01
87	423	39	67.29	1.94	0.00	0.76	0.50	0.50
88	77	78	1.39	0.00	0.00	0.01	0.00	0.00
89	79	321	1.05	0.02	0.00	0.05	0.01	0.01
90	143	322	160.20	0.93	0.00	1.02	0.61	0.61
91	304	2	563.95	1.60	0.00	1.60	0.88	0.88
92	80	2	91.49	1.40	0.00	1.04	0.88	0.88
93	304	80	92.68	0.21	0.00	1.05	0.91	0.91
94	T-3	84	19.60	0.04	0.00	0.22	0.05	0.05
95	84	413	14.91	0.11	0.00	0.17	0.03	0.03
96	83	157	3.08	0.05	0.00	0.08	0.01	0.01
97	83	87	0.21	0.00	0.00	0.01	0.00	0.00



98		85	86	0.42	0.00	0.00	0.01	0.00	0.00
99		85	159	0.28	0.00	0.00	0.01	0.00	0.00
100		88	89	0.70	0.00	0.00	0.02	0.00	0.00
101		97	90	2.38	0.02	0.00	0.06	0.01	0.01
102		92	143	161.04	0.22	0.00	1.03	0.62	0.62
103		93	82	149.98	1.13	0.00	0.96	0.54	0.54
104		93	94	1.05	0.03	0.00	0.05	0.01	0.01
105		82	91	148.16	2.04	0.00	0.95	0.53	0.53
106		91	95	100.70	0.27	0.00	0.64	0.26	0.26
107		91	365	45.36	0.43	0.00	1.16	1.74	1.74
108	O-Pump-6		381	45.36	0.87	0.00	1.16	1.74	1.74
109		96	98	1.89	0.04	0.00	0.09	0.02	0.02
110		332	97	3.08	0.02	0.00	0.08	0.01	0.01
111		406	99	941.28	3.43	0.00	2.67	2.27	2.27
112		99	I-Pump-1	940.72	1.03	0.00	2.67	2.26	2.26
113		T-6	129	9.56	0.02	0.00	0.11	0.01	0.01
114		101	100	7.35	0.01	0.00	0.08	0.01	0.01
115		101	102	22.05	7.56	0.00	1.00	1.85	1.85
116		100	146	4.90	0.65	0.00	0.22	0.11	0.11
117		102	149	4.27	0.33	0.00	0.19	0.09	0.09
118		102	151	13.79	0.64	0.00	0.35	0.19	0.19
119		105	106	1.75	0.03	0.00	0.04	0.00	0.00
120		105	107	3.78	0.03	0.00	0.10	0.02	0.02
121		108	105	7.98	0.05	0.00	0.20	0.07	0.07
122		108	110	1.82	0.16	0.00	0.08	0.02	0.02
123		107	434	2.03	0.12	0.00	0.09	0.02	0.02
124		103	112	12.18	4.52	0.00	0.55	0.62	0.62
125		112	11	7.07	0.98	0.00	0.32	0.23	0.23
126		113	114	2.87	0.37	0.00	0.13	0.04	0.04
127		114	17	0.84	0.01	0.00	0.04	0.00	0.00
128		115	19	1.04	0.01	0.00	0.05	0.01	0.01
129		116	23	0.42	0.00	0.00	0.01	0.00	0.00
130		117	27	2.77	0.00	0.00	0.03	0.00	0.00
131		118	439	0.00	0.00	0.00	0.00	0.00	0.00
132		119	34	0.70	0.02	0.00	0.03	0.00	0.00
133		120	41	1.89	0.08	0.00	0.09	0.02	0.02
134		122	79	1.96	0.01	0.00	0.05	0.01	0.01
135		348	297	662.01	1.20	0.00	1.88	1.18	1.18
136		33	123	17.42	0.23	0.00	0.20	0.04	0.04
137		124	66	0.42	0.00	0.00	0.01	0.00	0.00
138		126	125	41.42	3.63	0.00	1.06	1.47	1.47
139		127	126	42.61	10.60	0.00	1.09	1.55	1.55
140		68	127	43.73	4.90	0.00	1.12	1.62	1.62
141		161	128	48.91	0.84	0.00	0.55	0.28	0.28
142		129	130	52.32	0.71	0.00	0.59	0.31	0.31
143		130	72	51.20	1.84	0.00	0.58	0.30	0.30
144		131	132	122.77	10.40	0.00	1.39	1.52	1.52
145		132	46	121.79	4.24	0.00	1.38	1.50	1.50
146		133	42	89.15	2.44	0.00	1.01	0.84	0.84
147		134	133	91.60	3.37	0.00	1.04	0.89	0.89
148		135	134	93.00	0.38	0.00	1.06	0.91	0.91
149		69	136	97.55	3.34	0.00	1.11	1.00	1.00
150		73	137	5.74	0.02	0.00	0.07	0.01	0.01
151		138	219	26.38	3.87	0.00	1.20	2.58	2.58
152		139	140	954.30	22.10	0.00	2.71	2.33	2.33
153		140	212	954.30	1.06	0.00	2.71	2.33	2.33
154	O-Pump-1		31	940.72	1.05	0.00	2.67	2.26	2.26
155		172	142	4.89	0.00	0.00	0.03	0.00	0.00
156		75	301	84.11	0.00	0.00	0.24	0.03	0.03
157		306	145	124.79	0.11	0.00	1.42	1.57	1.57
158		145	75	94.26	5.25	0.00	1.07	0.93	0.93
159		146	104	1.40	0.03	0.00	0.06	0.01	0.01
160		147	101	33.39	0.21	0.00	0.38	0.14	0.14
161		148	147	39.90	0.98	0.00	0.45	0.19	0.19
162		149	150	2.03	0.04	0.00	0.09	0.02	0.02
163		150	385	1.33	0.01	0.00	0.06	0.01	0.01
164		151	108	12.25	0.64	0.00	0.31	0.15	0.15
165		152	93	156.00	2.47	0.00	1.00	0.59	0.59
166		153	I-RV-2	10.36	0.00	0.00	0.12	0.02	0.02
167		154	155	9.80	0.02	0.00	0.11	0.01	0.01
168		155	156	7.35	0.04	0.00	0.08	0.01	0.01
169		156	83	4.06	0.01	0.00	0.05	0.00	0.00



170		157	271	2.45	0.04	0.00	0.06	0.01	0.01
171		158	85	1.68	0.02	0.00	0.04	0.00	0.00
172		356	253	1.14	0.00	0.00	0.01	0.00	0.00
173		32	160	18.82	0.05	0.00	0.21	0.05	0.05
174		147	382	2.87	0.14	0.00	0.13	0.04	0.04
175		129	162	0.84	0.01	0.00	0.04	0.00	0.00
176		70	161	49.82	0.32	0.00	0.57	0.29	0.29
177		78	170	1.39	0.00	0.00	0.01	0.00	0.00
178	O-Pump-3		285	204.55	1.02	0.00	2.32	3.92	3.92
179		163	7	128.29	0.32	0.00	0.82	0.41	0.41
180		324	179	116.14	1.13	0.00	0.74	0.34	0.34
181		164	180	133.58	4.41	0.00	0.85	0.44	0.44
182		4	I-Pump-5	1154.57	2.41	0.00	4.72	8.04	8.04
183		165	4	1158.07	89.53	0.00	4.73	8.09	8.09
184	O-RV-1		165	1161.57	0.04	0.00	4.74	8.13	8.13
185		164	166	167.51	0.35	0.00	1.07	0.67	0.67
186		166	I-Pump-7	10.00	1.25	0.00	0.45	0.43	0.43
187	O-Pump-7		168	10.00	0.33	0.00	0.45	0.43	0.43
188		322	152	159.50	0.70	0.00	1.02	0.61	0.61
189	O-RV-2		154	10.36	0.04	0.00	0.12	0.02	0.02
190		144	3	189.52	0.28	0.00	0.54	0.12	0.12
191		31	306	897.53	2.66	0.00	2.55	2.08	2.08
192		169	148	42.00	0.75	0.00	0.48	0.21	0.21
193		31	169	42.70	0.16	0.00	0.48	0.22	0.22
194		171	26	91.37	0.02	0.00	1.04	0.88	0.88
195		197	173	0.70	0.01	0.00	0.03	0.00	0.00
196		96	I-RV-4	4.20	0.04	0.00	0.11	0.02	0.02
197		75	172	8.40	0.00	0.00	0.05	0.00	0.00
198		172	174	3.51	0.00	0.00	0.04	0.00	0.00
199		174	175	3.02	0.01	0.00	0.03	0.00	0.00
200		175	176	1.69	0.00	0.00	0.02	0.00	0.00
201		176	178	0.57	0.00	0.00	0.01	0.00	0.00
202		170	177	1.39	0.00	0.00	0.02	0.00	0.00
203		177	178	0.55	0.00	0.00	0.01	0.00	0.00
204		186	7	89.93	0.14	0.00	0.57	0.21	0.21
205		179	182	110.40	0.20	0.00	0.70	0.31	0.31
206		182	181	109.96	0.16	0.00	0.70	0.31	0.31
207		182	180	0.44	0.00	0.00	0.00	0.00	0.00
208		181	185	108.56	0.25	0.00	0.69	0.30	0.30
209-XX		181	308						
210		183	186	94.34	0.13	0.00	0.60	0.23	0.23
211		185	184	10.02	0.06	0.00	0.11	0.01	0.01
212		185	183	96.44	0.07	0.00	0.62	0.24	0.24
213		189	186	1.90	0.00	0.00	0.02	0.00	0.00
214		184	190	7.15	0.07	0.00	0.08	0.01	0.01
215		187	189	4.00	0.01	0.00	0.05	0.00	0.00
216		190	188	5.40	0.01	0.00	0.06	0.00	0.00
217		191	187	4.70	0.02	0.00	0.05	0.00	0.00
218		192	191	5.40	0.01	0.00	0.06	0.00	0.00
219		188	192	5.40	0.00	0.00	0.02	0.00	0.00
220-XX		188	141						
221		35	193	4.14	0.07	0.00	0.19	0.08	0.08
222		194	30	0.00	0.00	0.00	0.00	0.00	0.00
223		195	225	0.80	0.01	0.00	0.04	0.00	0.00
224		25	21	3.58	0.05	0.00	0.16	0.06	0.06
225		18	196	1.05	0.01	0.00	0.05	0.01	0.01
226		21	197	3.58	0.07	0.00	0.16	0.06	0.06
227		196	223	0.63	0.01	0.00	0.03	0.00	0.00
228		223	199	0.14	0.00	0.00	0.01	0.00	0.00
229		200	184	0.28	0.00	0.00	0.00	0.00	0.00
230		206	200	1.33	0.00	0.00	0.02	0.00	0.00
231		198	201	2.10	0.02	0.00	0.10	0.02	0.02
232		198	400	1.33	0.05	0.00	0.06	0.01	0.01
233		201	204	1.40	0.04	0.00	0.06	0.01	0.01
234-XX		204	202						
235		204	205	0.35	0.01	0.00	0.02	0.00	0.00
236		206	198	4.20	0.01	0.00	0.05	0.00	0.00
237		208	206	6.09	3.37	0.00	0.62	1.23	1.23
238		209	208	6.30	2.71	0.00	0.64	1.31	1.31
239		390	209	7.35	0.50	0.00	0.33	0.24	0.24
240		209	210	0.63	0.04	0.00	0.06	0.02	0.02
241		210	211	0.21	0.00	0.00	0.01	0.00	0.00

242	408	207	8.26	0.69	0.00	0.37	0.30	0.30
243	212	141	944.22	5.05	0.00	2.68	2.28	2.28
244	387	202	0.28	0.00	0.00	0.01	0.00	0.00
245-XX	43	283						
246	215	218	5.60	0.06	0.00	0.14	0.04	0.04
247	216	274	3.08	0.03	0.00	0.08	0.01	0.01
248	216	217	0.21	0.00	0.00	0.01	0.00	0.00
249	218	216	4.55	0.10	0.00	0.12	0.02	0.02
250	218	220	0.35	0.00	0.00	0.02	0.00	0.00
251	222	215	8.68	1.63	0.00	0.39	0.33	0.33
252-XX	221	138						
253	222	221	1.19	0.08	0.00	0.05	0.01	0.01
254	224	28	0.00	0.00	0.00	0.00	0.00	0.00
255	225	224	0.31	0.00	0.00	0.01	0.00	0.00
256	24	244	18.06	0.05	0.00	0.20	0.04	0.04
257	226	255	6.49	0.03	0.00	0.07	0.01	0.01
258	226	229	5.41	0.01	0.00	0.06	0.00	0.00
259	228	227	0.56	0.00	0.00	0.01	0.00	0.00
260	228	231	1.26	0.01	0.00	0.03	0.00	0.00
261	231	230	0.21	0.00	0.00	0.01	0.00	0.00
262	231	232	0.21	0.00	0.00	0.01	0.00	0.00
263	227	252	0.42	0.00	0.00	0.00	0.00	0.00
264	251	234	0.10	0.00	0.00	0.00	0.00	0.00
265	235	233	9.10	0.08	0.00	0.10	0.01	0.01
266	233	450	5.43	0.02	0.00	0.06	0.00	0.00
267	236	234	2.49	0.01	0.00	0.03	0.00	0.00
268	237	236	2.98	0.00	0.00	0.03	0.00	0.00
269	248	235	14.49	0.12	0.00	0.16	0.03	0.03
270	235	258	4.06	0.00	0.00	0.05	0.00	0.00
271	238	240	21.56	0.32	0.00	0.24	0.06	0.06
272	240	243	3.57	0.02	0.00	0.04	0.00	0.00
273	242	241	1.61	0.02	0.00	0.04	0.00	0.00
274	243	242	2.52	0.00	0.00	0.03	0.00	0.00
275	243	245	0.28	0.00	0.00	0.01	0.00	0.00
276	229	256	5.20	0.00	0.00	0.06	0.00	0.00
277	244	226	15.26	0.18	0.00	0.17	0.03	0.03
278	240	247	16.24	0.09	0.00	0.18	0.04	0.04
279	247	248	15.47	0.09	0.00	0.18	0.03	0.03
280	233	249	2.48	0.01	0.00	0.06	0.01	0.01
281	249	250	2.13	0.03	0.00	0.05	0.01	0.01
282	250	251	1.01	0.01	0.00	0.03	0.00	0.00
283	252	338	0.21	0.00	0.00	0.00	0.00	0.00
284	253	228	2.66	0.00	0.00	0.03	0.00	0.00
285	254	253	2.92	0.01	0.00	0.03	0.00	0.00
286	255	254	5.09	0.02	0.00	0.06	0.00	0.00
287	256	246	4.43	0.02	0.00	0.05	0.00	0.00
288	257	239	0.56	0.00	0.00	0.01	0.00	0.00
289	258	257	2.59	0.01	0.00	0.03	0.00	0.00
290	R-2	24	18.06	0.05	0.00	0.20	0.04	0.04
291	R-3	238	22.54	0.00	0.00	0.26	0.07	0.07
292	259	420	8.12	0.01	0.00	0.09	0.01	0.01
293	137	260	0.00	0.00	0.00	0.00	0.00	0.00
294	260	261	0.00	0.00	0.00	0.00	0.00	0.00
295	74	426	1.68	0.00	0.00	0.08	0.02	0.02
296	263	287	0.42	0.00	0.00	0.02	0.00	0.00
297	234	266	1.82	0.06	0.00	0.08	0.02	0.02
298	265	264	0.21	0.00	0.00	0.01	0.00	0.00
299	266	265	0.98	0.03	0.00	0.04	0.01	0.01
300	94	268	0.00	0.00	0.00	0.00	0.00	0.00
301	268	267	0.00	0.00	0.00	0.00	0.00	0.00
302	98	269	1.47	0.03	0.00	0.07	0.01	0.01
303	269	I-RV-3	1.26	0.00	0.00	0.06	0.01	0.01
304	90	344	1.96	0.01	0.00	0.05	0.01	0.01
305	271	158	2.03	0.01	0.00	0.05	0.01	0.01
306	271	272	0.00	0.00	0.00	0.00	0.00	0.00
307	273	305	0.00	0.00	0.00	0.00	0.00	0.00
308	274	214	2.31	0.10	0.00	0.10	0.03	0.03
309	214	275	0.77	0.01	0.00	0.03	0.00	0.00
310	52	277	28.41	7.43	0.00	1.29	2.96	2.96
311	277	278	27.57	14.56	0.00	1.25	2.80	2.80
312	47	276	13.03	0.02	0.00	0.15	0.02	0.02
313	279	62	15.33	0.07	0.00	0.17	0.03	0.03

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314	276	279	13.03	0.02	0.00	0.15	0.02	0.02
315	280	342	153.06	0.36	0.00	1.74	2.29	2.29
316	281	343	152.50	3.71	0.00	1.73	2.28	2.28
317	282	270	0.63	0.01	0.00	0.03	0.00	0.00
318	278	138	26.94	7.02	0.00	1.22	2.69	2.69
319	284	69	194.68	3.33	0.00	2.21	3.58	3.58
320	284	286	9.38	0.03	0.00	0.11	0.01	0.01
321	285	284	204.55	1.42	0.00	2.32	3.92	3.92
322	290	292	54.90	0.07	0.00	0.62	0.34	0.34
323	288	289	91.37	0.63	0.00	0.58	0.22	0.22
324	288	291	160.85	1.73	0.00	1.03	0.62	0.62
325	291	293	160.85	8.98	0.00	1.03	0.62	0.62
326	292	76	49.79	0.66	0.00	0.56	0.29	0.29
327	289	377	91.37	0.11	0.00	0.58	0.22	0.22
328	294	171	91.37	0.02	0.00	1.04	0.88	0.88
329	307	376	108.80	0.03	0.00	1.23	1.22	1.22
330	293	378	160.85	1.47	0.00	1.03	0.62	0.62
331	295	303	663.34	2.07	0.00	1.88	1.19	1.19
332	298	I-Pump-3	204.55	0.04	0.00	2.32	3.92	3.92
333	299	295	663.62	2.69	0.00	1.88	1.19	1.19
334	300	305	665.30	5.14	0.00	1.89	1.19	1.19
335	301	300	666.49	2.94	0.00	1.89	1.20	1.20
336	302	301	582.73	5.30	0.00	1.65	0.93	0.93
337	382	213	2.38	0.04	0.00	0.11	0.03	0.03
338	303	I-Pump-10	663.34	1.49	0.00	1.88	1.19	1.19
339	297	304	659.14	2.77	0.00	1.87	1.17	1.17
340	304	371	0.28	0.00	0.00	0.00	0.00	0.00
341	305	299	664.18	2.51	0.00	1.88	1.19	1.19
342	3	307	189.52	0.03	0.00	0.54	0.12	0.12
343	306	302	582.73	0.07	0.00	1.65	0.93	0.93
344	296	298	204.69	0.47	0.00	2.32	3.93	3.93
345	308	J-1	956.54	1.65	0.00	2.71	2.34	2.34
346	311	308	956.54	6.27	0.00	2.71	2.34	2.34
347	309	I-RV-5	305.22	0.10	0.00	1.25	0.68	0.68
348	309	310	849.34	0.47	0.00	2.41	1.87	1.87
349	310	311	849.34	14.95	0.00	2.41	1.87	1.87
350	T-8	311	107.20	0.04	0.00	0.30	0.04	0.04
351	O-RV-3	282	1.26	0.01	0.00	0.06	0.01	0.01
352	312	96	42.07	2.03	0.00	1.07	1.51	1.51
353	74	313	1.54	0.00	0.00	0.02	0.00	0.00
354	215	283	1.40	0.03	0.00	0.04	0.00	0.00
355	45	222	11.06	0.11	0.00	0.28	0.13	0.13
356	241	315	0.35	0.00	0.00	0.01	0.00	0.00
357	275	397	0.07	0.00	0.00	0.00	0.00	0.00
358	316	49	141.23	13.17	0.00	1.60	1.98	1.98
359	316	318	0.63	0.01	0.00	0.03	0.00	0.00
360	317	316	144.80	4.59	0.00	1.64	2.07	2.07
361	317	319	2.87	0.20	0.00	0.13	0.04	0.04
362	319	320	0.56	0.01	0.00	0.03	0.00	0.00
363	321	81	0.63	0.00	0.00	0.03	0.00	0.00
364	81	323	0.21	0.00	0.00	0.01	0.00	0.00
365	O-RV-5	164	305.22	0.08	0.00	1.25	0.68	0.68
366	326	324	127.20	1.09	0.00	0.81	0.40	0.40
367	324	325	0.35	0.00	0.00	0.02	0.00	0.00
368	166	326	146.17	1.65	0.00	0.93	0.52	0.52
369	326	339	8.47	0.09	0.00	0.38	0.32	0.32
370	328	I-RV-1	1161.57	0.04	0.00	4.74	8.13	8.13
371	R-1	328	1161.57	0.04	0.00	4.74	8.13	8.13
372	112	329	0.63	0.00	0.00	0.03	0.00	0.00
373	329	333	0.21	0.00	0.00	0.02	0.00	0.00
374	327	331	1.12	0.00	0.00	0.05	0.01	0.01
375	327	395	0.21	0.00	0.00	0.01	0.00	0.00
376	333	330	0.07	0.00	0.00	0.01	0.00	0.00
377	334	432	0.14	0.00	0.00	0.01	0.00	0.00
378	430	334	0.28	0.00	0.00	0.01	0.00	0.00
379	336	431	0.84	0.00	0.00	0.04	0.00	0.00
380	236	337	0.07	0.00	0.00	0.00	0.00	0.00
381	339	327	4.97	0.29	0.00	0.23	0.12	0.12
382	339	340	0.35	0.00	0.00	0.02	0.00	0.00
383	O-Pump-4	341	151.94	0.11	0.00	1.72	2.26	2.26
384	341	48	151.10	4.78	0.00	1.71	2.24	2.24
385	343	I-Pump-4	151.94	0.11	0.00	1.72	2.26	2.26

386	61	345	1.40	0.00	0.00	0.04	0.00	0.00
387	345	346	0.70	0.00	0.00	0.02	0.00	0.00
388	344	366	1.82	0.01	0.00	0.05	0.00	0.00
389	344	347	0.14	0.00	0.00	0.01	0.00	0.00
390	347	349	0.07	0.00	0.00	0.01	0.00	0.00
391	156	384	0.77	0.02	0.00	0.03	0.00	0.00
392	T-9	355	279.38	0.09	0.00	1.78	1.72	1.72
393	351	375	279.38	1.81	0.00	1.78	1.72	1.72
394	352	351	279.38	1.68	0.00	1.78	1.72	1.72
395	350	I-Pump-9	0.00	0.00	0.00	0.00	0.00	0.00
396	353	116	1.54	0.02	0.00	0.04	0.00	0.00
397	350	353	2.24	0.00	0.00	0.06	0.01	0.01
398-XX	194	28						
399	354	352	279.38	0.17	0.00	1.78	1.72	1.72
400	354	I-RV-6	0.00	0.00	0.00	0.00	0.00	0.00
401-CV	355	354	279.38	0.09	0.00	1.78	1.72	1.72
402	O-RV-6	355	0.00	0.00	0.00	0.00	0.00	0.00
403	246	358	3.52	0.00	0.00	0.04	0.00	0.00
404	357	364	1.42	0.00	0.00	0.02	0.00	0.00
405	358	359	3.24	0.00	0.00	0.04	0.00	0.00
406	359	360	3.10	0.00	0.00	0.04	0.00	0.00
407	360	361	3.10	0.00	0.00	0.04	0.00	0.00
408	361	362	3.10	0.00	0.00	0.04	0.00	0.00
409	362	363	3.10	0.00	0.00	0.04	0.00	0.00
410	363	357	2.96	0.00	0.00	0.03	0.00	0.00
411	364	356	1.28	0.00	0.00	0.01	0.00	0.00
412	155	367	0.49	0.01	0.00	0.02	0.00	0.00
413	366	88	1.40	0.01	0.00	0.04	0.00	0.00
414	366	368	0.21	0.00	0.00	0.01	0.00	0.00
415	367	379	0.21	0.00	0.00	0.01	0.00	0.00
416-CV	2	369	492.78	7.98	0.00	5.59	20.00	20.00
417	369	370	492.78	21.94	0.00	5.59	20.00	20.00
418	370	T-10	387.78	1.41	0.00	4.40	12.83	12.83
419-XXCV	372	371						
420-XX	371	372						
421	84	372	0.91	0.00	0.00	0.01	0.00	0.00
422	370	373	52.50	3.16	0.00	0.60	0.32	0.32
423	2	369	0.00	7.98	0.00	0.00	0.00	0.00
424	374	29	2.94	0.00	0.00	0.03	0.00	0.00
425	375	425	252.22	4.95	0.00	1.61	1.42	1.42
426	375	374	27.16	0.00	0.00	0.17	0.02	0.02
427	376	T-2	217.60	0.04	0.00	2.47	4.40	4.40
428	307	376	108.80	0.03	0.00	1.23	1.22	1.22
429	377	262	91.37	0.02	0.00	0.58	0.22	0.22
430-XX	377	177						
431	378	296	160.85	0.59	0.00	1.03	0.62	0.62
432	290	380	0.28	0.00	0.00	0.01	0.00	0.00
433	365	I-Pump-6	45.36	1.29	0.00	1.16	1.74	1.74
434	381	312	43.61	7.30	0.00	1.11	1.62	1.62
435-XX	365	381						
436	384	383	0.14	0.00	0.00	0.01	0.00	0.00
437	109	403	0.21	0.00	0.00	0.01	0.00	0.00
438	385	109	0.77	0.01	0.00	0.03	0.00	0.00
439	110	386	0.21	0.00	0.00	0.01	0.00	0.00
440	213	387	1.68	0.11	0.00	0.08	0.02	0.02
441	387	388	0.28	0.00	0.00	0.01	0.00	0.00
442	388	389	0.00	0.00	0.00	0.00	0.00	0.00
443	389	404	0.00	0.00	0.00	0.00	0.00	0.00
444	207	390	7.84	0.57	0.00	0.36	0.27	0.27
445	357	394	1.40	0.02	0.00	0.06	0.01	0.01
446	391	392	0.14	0.00	0.00	0.01	0.00	0.00
447	393	391	0.28	0.00	0.00	0.01	0.00	0.00
448	394	393	0.84	0.02	0.00	0.04	0.00	0.00
449	41	412	0.49	0.01	0.00	0.02	0.00	0.00
450	325	410	0.00	0.00	0.00	0.00	0.00	0.00
451	O-RV-4	332	4.20	0.02	0.00	0.11	0.02	0.02
452	332	396	0.28	0.00	0.00	0.01	0.00	0.00
453	123	314	16.79	0.06	0.00	0.19	0.04	0.04
454	398	411	0.14	0.00	0.00	0.01	0.00	0.00
455	314	398	0.28	0.00	0.00	0.01	0.00	0.00
456	399	56	1.40	0.00	0.00	0.02	0.00	0.00
457	399	401	0.35	0.00	0.00	0.02	0.00	0.00



458	400	203	0.07	0.00	0.00	0.00	0.00	0.00	0.00
459-XX	205	405							
460	402	395	0.00	0.00	0.00	0.00	0.00	0.00	0.00
461-XX	403	107							
462-XX	404	386							
463	400	405	0.21	0.00	0.00	0.01	0.00	0.00	0.00
464	141	406	942.33	2.95	0.00	2.67	2.27	2.27	
465	406	409	0.00	0.00	0.00	0.00	0.00	0.00	0.00
466	212	408	8.54	0.62	0.00	0.39	0.32	0.32	
467	408	407	0.00	0.00	0.00	0.00	0.00	0.00	0.00
468-XX	409	407							
469-XX	410	402							
470-XX	397	411							
471-XX	412	15							
472	413	153	11.06	0.01	0.00	0.13	0.02	0.02	0.02
473	413	414	0.00	0.00	0.00	0.00	0.00	0.00	0.00
474	125	415	40.86	2.39	0.00	1.04	1.43	1.43	
475	415	417	0.98	0.01	0.00	0.03	0.00	0.00	0.00
476	417	419	0.00	0.00	0.00	0.00	0.00	0.00	0.00
477	417	416	0.84	0.00	0.00	0.04	0.00	0.00	0.00
478	416	418	0.35	0.00	0.00	0.02	0.00	0.00	0.00
479	420	58	5.46	0.02	0.00	0.06	0.00	0.00	0.00
480	420	422	0.77	0.00	0.00	0.03	0.00	0.00	0.00
481	422	421	0.21	0.00	0.00	0.01	0.00	0.00	0.00
482	121	423	67.64	0.62	0.00	0.77	0.51	0.51	
483	56	424	0.28	0.00	0.00	0.01	0.00	0.00	0.00
484	425	288	252.22	0.78	0.00	1.61	1.42	1.42	
485	425	427	0.00	0.00	0.00	0.00	0.00	0.00	0.00
486	426	263	0.84	0.01	0.00	0.04	0.00	0.00	0.00
487	426	429	0.84	0.00	0.00	0.04	0.00	0.00	0.00
488	429	428	0.84	0.00	0.00	0.04	0.00	0.00	0.00
489	431	430	0.56	0.00	0.00	0.03	0.00	0.00	0.00
490	428	336	0.84	0.00	0.00	0.04	0.00	0.00	0.00
491	111	433	0.14	0.00	0.00	0.01	0.00	0.00	0.00
492	136	335	96.50	2.72	0.00	1.09	0.98	0.98	
493	335	435	0.28	0.00	0.00	0.01	0.00	0.00	0.00
494	434	111	0.63	0.00	0.00	0.03	0.00	0.00	0.00
495	437	436	0.21	0.00	0.00	0.01	0.00	0.00	0.00
496	167	439	24.91	5.22	0.00	0.64	0.57	0.57	
497	441	447	51.68	0.42	0.00	0.33	0.08	0.08	0.08
498	449	438	50.00	0.08	0.00	0.32	0.07	0.07	0.07
499	219	445	25.96	5.79	0.00	1.18	2.51	2.51	
500	214	440	0.56	0.00	0.00	0.03	0.00	0.00	0.00
501	440	442	0.14	0.00	0.00	0.01	0.00	0.00	0.00
502	447	23a	50.28	0.17	0.00	0.32	0.07	0.07	0.07
503	J-24	446	0.35	0.01	0.00	0.02	0.00	0.00	0.00
504	27	21a	0.42	0.00	0.00	0.00	0.00	0.00	0.00
505	O-RV-7	22a	50.28	0.00	0.00	0.32	0.07	0.07	0.07
506	448	449	50.00	0.05	0.00	0.32	0.07	0.07	0.07
507	439	443	24.07	50.58	0.00	2.46	15.71	15.71	
508	443	444	24.00	17.58	0.00	2.45	15.63	15.63	
509	445	167	25.75	6.43	0.00	1.17	2.47	2.47	
510	450	237	4.03	0.03	0.00	0.05	0.00	0.00	0.00
10A	O-Pump-10	348	663.34	0.12	0.00	1.88	1.19	1.19	
P-17	R-4	J-15	54.48	0.11	0.00	0.35	0.08	0.08	0.08
P-24-XX	21a	449							
P-25	22a	448	50.14	0.19	0.00	0.32	0.07	0.07	0.07
P-28	J-24	441	53.08	0.26	0.00	0.34	0.08	0.08	0.08
P-29	J-25	J-24	54.13	0.39	0.00	0.35	0.08	0.08	0.08
P-30	J-26	J-25	54.48	0.34	0.00	0.35	0.08	0.08	0.08
P-32	J-15	J-26	54.48	0.09	0.00	0.35	0.08	0.08	0.08
P-136	23a	I-RV-7	50.28	0.00	0.00	0.32	0.07	0.07	0.07

P U M P / L O S S   E L E M E N T   R E S U L T S

NPSH		INLET	OUTLET	PUMP	EFFIC-	USEFUL	INCREM TL	TOTAL	#PUMPS	#PUMPS
NAME	FLOWRATE	HEAD	HEAD	HEAD	ENCY	POWER	COST	COST	PARALLEL	SERIES

000039

Avail. (ft)	(gpm)	(ft)	(ft)	(ft)	(%)	(Hp)	(\$)	(\$)			
181.8	Pump-1	940.72	148.73	301.70	153.0	75.00	0.	0.0	0.0	**	**
280.3	Pump-3	204.55	247.16	325.83	78.7	75.00	0.	0.0	0.0	**	**
179.6	Pump-4	151.94	146.41	272.35	125.9	75.00	0.	0.0	0.0	**	**
189.3	Pump-5	1154.57	156.48	275.54	119.1	75.00	0.	0.0	0.0	**	**
360.1	Pump-6	45.36	326.95	653.81	326.9	75.00	0.	0.0	0.0	**	**
152.2	Pump-7	10.00	119.01	269.01	150.0	75.00	0.	0.0	0.0	**	**
278.8	Device "Pump-8" is closed										
	Pump-8	0.00	245.55	292.61	0.0	75.00	0.	0.0	0.0	**	**
353.8	Device "Pump-9" is closed										
	Pump-9	0.00	320.59	320.59	0.0	75.00	0.	0.0	0.0	**	**
136.9	Pump-10	663.34	103.79	267.01	163.2	75.00	0.	0.0	0.0	**	**

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
2		1.26	1171.32	990.00	181.32	78.57
3		0.00	1035.11			
4		3.50	838.89	670.00	168.89	73.18
5		0.35	1035.34	800.00	235.34	101.98
6		1.40	891.09	680.00	211.09	91.47
7		7.21	890.45	680.00	210.45	91.19
8		2.10	890.45	690.00	200.45	86.86
9		2.73	888.25	670.00	218.25	94.57
10		0.98	886.82	670.00	216.82	93.96
11		2.17	878.31	704.00	174.31	75.54
12		187.00	887.90	670.00	217.90	94.42
13		0.35	886.78	680.00	206.78	89.60
14		1.05	886.78	660.00	226.78	98.27
15		0.70	886.75	700.00	186.75	80.93
16		3.15	1020.64	710.00	310.64	134.61
17		0.84	877.37	740.00	137.37	59.52
18		0.42	1020.08	700.00	320.08	138.70
19		1.05	1020.11	695.00	325.11	140.88
20		1.05	1020.59	720.00	300.59	130.26
21		0.00	1020.21	700.00	320.21	138.76
22		1.19	1020.60	724.00	296.60	128.53
23		0.42	1020.57	901.00	119.57	51.81
24		0.00	1180.95	1000.00	180.95	78.41
25		0.28	1020.26	720.00	300.26	130.11
26		7.70	1014.60	774.00	240.60	104.26
27		1.54	1020.58	773.00	247.58	107.28
28		0.00	1020.55	774.00	246.55	106.84
29		0.98	1021.16	773.00	248.16	107.54
30		0.00	1067.61	780.00	287.61	124.63
31		0.49	1038.65	738.00	300.65	130.28
32		0.56	1021.03	777.00	244.03	105.75
33		0.70	1020.95	850.00	170.95	74.08
34		0.70	1021.05	760.00	261.05	113.12
35		0.00	1020.98	800.00	220.98	95.76
36		0.42	1020.94	800.00	220.94	95.74
37		8.40	1014.50	760.00	254.50	110.28
38		2.73	1014.04	775.00	239.04	103.58



39	0.98	1008.60	700.00	308.60	133.73
40	0.28	1014.04	780.00	234.04	101.42
41	1.40	1013.92	720.00	293.92	127.37
42	2.31	1067.16	840.00	227.16	98.44
43	5.11	1004.48	770.00	234.48	101.61
44	2.10	1120.45	840.00	280.45	121.53
45	0.42	1067.10	790.00	277.10	120.08
46	3.22	1041.44	800.00	241.44	104.63
47	0.42	1120.49	870.00	250.49	108.54
48	0.98	1142.45	927.00	215.45	93.36
49	9.17	1123.45	840.00	283.45	122.83
50	8.33	1120.53	940.00	180.53	78.23
51	0.84	1120.51	975.00	145.51	63.06
52	0.35	1117.93	986.00	131.93	57.17
53	1.19	1118.98	930.00	188.98	81.89
54	0.56	1118.97	980.00	138.97	60.22
55	2.38	1120.43	860.00	260.43	112.85
56	1.12	1120.40	940.00	180.40	78.17
57	2.24	1120.33	859.00	261.33	113.24
58	2.66	1120.24	912.00	208.24	90.24
59	0.70	1120.33	990.00	130.33	56.48
60	0.35	1120.24	930.00	190.24	82.44
61	1.05	1120.18	950.00	170.18	73.75
62	2.31	1120.37	850.00	270.37	117.16
63	0.70	1120.37	880.00	240.37	104.16
64	1.40	1066.30	951.00	115.30	49.96
65	1.33	1042.12	788.00	254.12	110.12
66	0.42	1042.12	850.00	192.12	83.25
67	0.49	1042.70	800.00	242.70	105.17
68	2.38	1066.32	902.00	164.32	71.20
69	2.73	1075.05	790.00	285.05	123.52
70	0.63	1068.33	867.00	201.33	87.24
71	1.05	1005.29	730.00	275.29	119.29
72	2.38	1065.44	836.00	229.44	99.42
73	2.03	1078.30	862.00	216.30	93.73
74	1.82	1078.27	910.00	168.27	72.92
75	1.75	1030.63	710.00	320.63	138.94
76	5.53	1002.89	750.00	252.89	109.59
77	0.42	1030.62	796.00	234.62	101.67
78	0.00	1030.62	800.00	230.62	99.93
79	0.91	1030.56	770.00	260.56	112.91
80	1.19	1172.72	960.00	212.72	92.18
81	0.42	1030.54	800.00	230.54	99.90
82	1.82	1165.72	800.00	365.72	158.48
83	0.77	943.73	670.00	273.73	118.62
84	3.78	1076.96	960.00	116.96	50.68
85	0.98	943.62	654.00	289.62	125.50
86	0.42	943.61	650.00	293.61	127.23
87	0.21	943.73	660.00	283.73	122.95
88	0.70	1016.84	740.00	276.84	119.97
89	0.70	1016.84	700.00	316.84	137.30
90	0.42	1016.86	785.00	231.86	100.47
91	2.10	1163.68	820.00	343.68	148.93
92	0.35	1171.18	950.00	221.18	95.84
93	4.97	1166.85	775.00	391.85	169.80
94	1.05	1166.82	830.00	336.82	145.96
95	100.70	1163.41	830.00	333.41	144.48
96	35.98	1478.61	1068.00	410.61	177.93
97	0.70	1016.88	800.00	216.88	93.98
98	0.42	1478.56	1050.00	428.56	185.71
99	0.56	887.76	730.00	157.76	68.36
100	2.45	1036.55	860.00	176.55	76.50
101	3.99	1036.55	864.00	172.55	74.77
102	3.99	1029.00	812.00	217.00	94.03
103	3.50	883.81	671.00	212.81	92.22
104	1.40	1035.86	700.00	335.86	145.54
105	2.45	1027.67	820.00	207.67	89.99
106	1.75	1027.64	770.00	257.64	111.65
107	1.75	1027.64	814.00	213.64	92.58
108	2.45	1027.71	808.00	219.71	95.21
109	0.56	1028.62	710.00	318.62	138.07
110	1.61	1027.56	755.00	272.56	118.11

111	0.49	1027.51	800.00	227.51	98.59
112	4.48	879.29	693.00	186.29	80.73
113	2.03	877.75	720.00	157.75	68.36
114	2.03	877.38	700.00	177.38	76.86
115	2.10	1020.12	740.00	280.12	121.39
116	1.12	1020.57	901.00	119.57	51.82
117	1.33	1020.58	800.00	220.58	95.58
118	0.00	1067.61	800.00	267.61	115.96
119	1.26	1021.08	800.00	221.08	95.80
120	0.91	1014.00	800.00	214.00	92.73
121	1.82	1011.15	900.00	111.15	48.16
122	1.12	1030.58	700.00	330.58	143.25
123	0.63	1020.72	733.00	287.72	124.68
124	0.70	1042.12	830.00	212.12	91.92
125	0.56	1047.19	830.00	217.19	94.12
126	1.19	1050.82	855.00	195.82	84.86
127	1.12	1061.42	900.00	161.42	69.95
128	1.40	1067.18	780.00	287.18	124.44
129	1.61	1067.98	878.00	189.98	82.33
130	1.12	1067.28	920.00	147.28	63.82
131	1.40	1056.08	923.00	133.08	57.67
132	0.98	1045.68	805.00	240.68	104.30
133	2.45	1069.60	853.00	216.60	93.86
134	1.40	1072.98	850.00	222.98	96.62
135	1.40	1073.35	750.00	323.35	140.12
136	1.05	1071.72	835.00	236.72	102.58
137	0.70	1078.28	900.00	178.28	77.25
138	0.56	1088.93	900.00	188.93	81.87
139	1.12	922.34	669.00	253.34	109.78
140	0.00	900.25	708.00	192.25	83.31
141	1.89	894.14	740.00	154.14	66.80
142	0.00	1030.62	785.00	245.62	106.44
143	0.84	1170.96	975.00	195.96	84.91
144	0.00	1035.38	800.00	235.38	102.00
145	2.10	1035.88			
146	3.50	1035.89	853.00	182.89	79.25
147	3.64	1036.76	833.00	203.76	88.30
148	2.10	1037.74	790.00	247.74	107.35
149	2.24	1028.67	850.00	178.67	77.42
150	0.70	1028.63	850.00	178.63	77.41
151	1.54	1028.36	820.00	208.36	90.29
152	3.50	1169.33	750.00	419.33	181.71
153	0.70	1076.84	880.00	196.84	85.30
154	0.56	943.80	691.00	252.80	109.55
155	1.96	943.78	678.00	265.78	115.17
156	2.52	943.74	674.00	269.74	116.89
157	0.63	943.68	659.00	284.68	123.36
158	0.35	943.63	660.00	283.63	122.91
159	0.28	943.62	686.00	257.62	111.63
160	0.28	1020.98	800.00	220.98	95.76
161	0.91	1068.02	875.00	193.02	83.64
162	0.84	1067.97	880.00	187.97	81.45
163	1.96	890.77	680.00	210.77	91.33
164	4.13	895.61	688.00	207.61	89.97
165	3.50	928.42	670.00	258.42	111.98
166	11.34	895.26	680.00	215.26	93.28
167	0.84	1072.83	900.00	172.83	74.89
168	10.00	1043.69	900.00	143.69	62.26
169	0.70	1038.48	720.00	318.48	138.01
170	0.00	1030.62	780.00	250.62	108.60
171	0.00	1014.62	774.00	240.62	104.27
172	0.00	1030.63	715.00	315.63	136.77
173	0.70	1020.13	700.00	320.13	138.72
174	0.49	1030.62	715.00	315.62	136.77
175	1.33	1030.62	785.00	245.62	106.44
176	1.12	1030.62	796.00	234.62	101.67
177	0.84	1030.62	780.00	250.62	108.60
178	1.12	1030.62	800.00	230.62	99.93
179	5.74	891.40	690.00	201.40	87.27
180	2.38	891.20	680.00	211.20	91.52
181	1.40	891.04	675.00	216.04	93.62
182	0.00	891.20	680.00	211.20	91.52



183	2.10	890.72	680.00	210.72	91.31
184	3.15	890.72	669.00	221.72	96.08
185	2.10	890.79	675.00	215.79	93.51
186	6.30	890.59	680.00	210.59	91.26
187	0.70	890.60			
188	0.00	890.64	740.00	150.64	65.28
189	2.10	890.59	669.00	221.59	96.02
190	1.75	890.65	708.00	182.65	79.15
191	0.70	890.62	708.00	182.62	79.14
192	0.00	890.64	740.00	150.64	65.28
193	0.28	1020.91	820.00	200.91	87.06
194	0.00	1067.61	775.00	292.61	126.80
195	0.42	1020.57	750.00	270.57	117.25
196	0.42	1020.07	720.00	300.07	130.03
197	1.40	1020.14	680.00	340.14	147.39
198	0.77	890.72	673.00	217.72	94.35
199	0.14	1020.07	680.00	340.07	147.36
200	1.05	890.72	650.00	240.72	104.31
201	0.70	890.69			
202	0.28	1036.46	720.00	316.46	137.13
203	0.07	890.67	660.00	230.67	99.96
204	1.05	890.65	738.00	152.65	66.15
205	0.35	890.65	685.00	205.65	89.11
206	0.56	890.72	660.00	230.72	99.98
207	0.42	897.87	740.00	157.87	68.41
208	0.21	894.10	740.00	154.10	66.78
209	0.42	896.81	693.00	203.81	88.32
210	0.42	896.76	680.00	216.76	93.93
211	0.21	896.76	660.00	236.76	102.60
212	1.54	899.19	700.00	199.19	86.32
213	0.70	1036.58	787.00	249.58	108.15
214	0.98	1065.07	900.00	165.07	71.53
215	1.68	1065.36	767.00	298.36	129.29
216	1.26	1065.20	759.00	306.20	132.69
217	0.21	1065.20	760.00	305.20	132.25
218	0.70	1065.30	785.00	280.30	121.46
219	0.42	1085.06	900.00	185.06	80.19
220	0.35	1065.29	800.00	265.29	114.96
221	1.19	1066.91	837.00	229.91	99.63
222	1.19	1066.99	809.00	257.99	111.80
223	0.49	1020.07	700.00	320.07	138.70
224	1.12	1020.55	770.00	250.55	108.57
225	0.49	1020.56	830.00	190.56	82.57
226	3.36	1180.72	960.00	220.72	95.65
227	0.14	1180.66	1000.00	180.66	78.29
228	0.84	1180.66	951.00	229.66	99.52
229	0.21	1180.71	990.00	190.71	82.64
230	0.21	1180.65	900.00	280.65	121.62
231	0.84	1180.65	949.00	231.65	100.38
232	0.21	1180.65	830.00	350.65	151.95
233	1.19	1180.30	920.00	260.30	112.80
234	0.77	1180.25	750.00	430.25	186.44
235	1.33	1180.38	1010.00	170.38	73.83
236	0.42	1180.26	830.00	350.26	151.78
237	1.05	1180.26	830.00	350.26	151.78
238	0.98	1181.00	1020.00	161.00	69.77
239	0.56	1180.37	955.00	225.37	97.66
240	1.75	1180.68	994.00	186.68	80.90
241	1.26	1180.65	850.00	330.65	143.28
242	0.91	1180.67	870.00	310.67	134.62
243	0.77	1180.67	880.00	300.67	130.29
244	2.80	1180.90	950.00	230.90	100.06
245	0.28	1180.67	930.00	250.67	108.62
246	0.91	1180.69	1000.00	180.69	78.30
247	0.77	1180.59	1019.00	161.59	70.02
248	0.98	1180.50	970.00	210.50	91.22
249	0.35	1180.29	1000.00	180.29	78.13
250	1.12	1180.26	870.00	310.26	134.45
251	0.91	1180.25	800.00	380.25	164.78
252	0.21	1180.66	1020.00	160.66	69.62
253	1.40	1180.67	790.00	390.67	169.29
254	2.17	1180.68	818.00	362.68	157.16

255	1.40	1180.69	870.00	310.69	134.63
256	0.77	1180.71	950.00	230.71	99.97
257	2.03	1180.37	879.00	301.37	130.59
258	1.47	1180.37	918.00	262.37	113.70
259	1.26	1120.28	870.00	250.28	108.45
260	0.00	1078.28	920.00	158.28	68.59
261	0.00	1078.28	800.00	278.28	120.59
262	0.00	1014.67	780.00	234.67	101.69
263	0.42	1078.26	800.00	278.26	120.58
264	0.21	1180.16	790.00	390.16	169.07
265	0.77	1180.16	790.00	390.16	169.07
266	0.84	1180.19	804.00	376.19	163.02
267	0.00	1166.82	930.00	236.82	102.62
268	0.00	1166.82	880.00	286.82	124.29
269	0.21	1478.54	1050.00	428.54	185.70
270	0.63	1112.29	800.00	312.29	135.32
271	0.42	943.64	661.00	282.64	122.48
272	0.00	943.64	850.00	93.64	40.58
273	0.00	1022.55	850.00	172.55	74.77
274	0.77	1065.17	780.00	285.17	123.57
275	0.70	1065.05	900.00	165.05	71.52
276	0.00	1120.47	850.00	270.47	117.20
277	0.84	1110.50	1000.00	110.50	47.88
278	0.63	1095.95	900.00	195.95	84.91
279	1.75	1120.44	850.00	270.44	117.19
280	2.10	1025.85	855.00	170.85	74.03
281	0.56	1025.23	855.00	170.23	73.77
282	0.63	1112.30	900.00	212.30	92.00
283	1.40	1065.33	770.00	295.33	127.98
284	0.49	1078.39	770.00	308.39	133.63
285	0.00	1079.81	770.00	309.81	134.25
286	1.61	1078.35	750.00	328.35	142.29
287	0.42	1078.25	750.00	328.25	142.24
288	0.00	1015.43	770.00	245.43	106.35
289	0.00	1014.80	774.00	240.80	104.35
290	4.97	1003.63	750.00	253.63	109.90
291	0.00	1013.71	810.00	203.71	88.27
292	5.11	1003.56	750.00	253.56	109.87
293	0.00	1004.73	750.00	254.73	110.38
294	0.00	1014.64	780.00	234.64	101.68
295	0.28	1017.35	700.00	317.35	137.52
296	0.42	1002.67	770.00	232.67	100.82
297	2.87	1175.69	900.00	275.69	119.47
298	0.14	1002.20	770.00	232.20	100.62
299	0.56	1020.04	703.00	317.04	137.38
300	1.19	1027.69	700.00	327.69	142.00
301	0.35	1030.62	710.00	320.62	138.94
302	0.00	1035.92	765.00	270.92	117.40
303	0.00	1015.29	820.00	195.29	84.62
304	2.24	1172.92	940.00	232.92	100.93
305	1.12	1022.55	690.00	332.55	144.10
306	0.49	1035.99			
307	0.00	1035.07	1016.00	19.07	8.27
308	0.00	933.69	675.00	258.69	112.10
309	0.00	955.38	688.00	267.38	115.86
310	0.00	954.91	690.00	264.91	114.79
311	0.00	939.96	660.00	279.96	121.31
312	1.54	1480.64	1084.00	396.64	171.88
313	1.54	1078.27	860.00	218.27	94.58
314	0.42	1020.65	810.00	210.65	91.28
315	0.35	1180.64	1054.00	126.64	54.88
316	2.94	1136.61	900.00	236.61	102.53
317	2.45	1141.20	915.00	226.20	98.02
318	0.63	1136.61	1020.00	116.61	50.53
319	2.31	1141.00	1000.00	141.00	61.10
320	0.56	1141.00	950.00	191.00	82.77
321	0.42	1030.54	800.00	230.54	99.90
322	0.70	1170.03	850.00	320.03	138.68
323	0.21	1030.54	820.00	210.54	91.23
324	10.71	892.53	700.00	192.53	83.43
325	0.35	892.53	700.00	192.53	83.43
326	10.50	893.62	675.00	218.62	94.73



327	3.64	893.23	760.00	133.23	57.73
328	0.00	999.96	670.00	329.96	142.98
329	0.42	879.29	700.00	179.29	77.69
330	0.07	879.28	740.00	139.28	60.36
331	1.12	893.23	740.00	153.23	66.40
332	0.84	1016.90	840.00	176.90	76.66
333	0.14	879.28	738.00	141.28	61.22
334	0.14	1078.25	950.00	128.25	55.57
335	0.56	1069.00	870.00	199.00	86.23
336	0.00	1078.26	940.00	138.26	59.91
337	0.07	1180.26	920.00	260.26	112.78
338	0.21	1180.66	1000.00	180.66	78.29
339	3.15	893.52	700.00	193.52	83.86
340	0.35	893.52	710.00	183.52	79.53
341	0.84	1147.23	880.00	267.23	115.80
342	0.00	1025.48	835.00	190.48	82.54
343	0.56	1021.52	875.00	146.52	63.49
344	0.00	1016.86	770.00	246.86	106.97
345	0.70	1120.18	960.00	160.18	69.41
346	0.70	1120.18	1040.00	80.18	34.74
347	0.07	1016.85	850.00	166.85	72.30
348	1.33	1176.89	910.00	266.89	115.65
349	0.07	1016.85	900.00	116.85	50.64
350	0.00	1020.59	700.00	320.59	138.92
351	0.00	1022.98	760.00	262.98	113.96
352	0.00	1024.66	900.00	124.66	54.02
353	0.70	1020.59	700.00	320.59	138.92
354	0.00	1024.83	1000.00	24.83	10.76
355	0.00	1024.91	1000.00	24.91	10.80
356	0.14	1180.67	790.00	390.67	169.29
357	0.14	1180.67	915.00	265.67	115.12
358	0.28	1180.68	930.00	250.68	108.63
359	0.14	1180.68	980.00	200.68	86.96
360	0.00	1180.68	940.00	240.68	104.29
361	0.00	1180.68	1000.00	180.68	78.29
362	0.00	1180.67	880.00	300.67	130.29
363	0.14	1180.67	950.00	230.67	99.96
364	0.14	1180.67	770.00	410.67	177.96
365	0.00	1163.25	820.00	343.25	148.74
366	0.21	1016.85	750.00	266.85	115.63
367	0.28	943.77	700.00	243.77	105.63
368	0.21	1016.85	830.00	186.85	80.97
369	0.00	1163.34	990.00	173.34	75.12
370	52.50	1141.41	990.00	151.41	65.61
371	0.28	1172.92	950.00	222.92	96.60
372	0.91	1076.96	950.00	126.96	55.02
373	52.50	1138.25	900.00	238.25	103.24
374	0.70	1021.17	780.00	241.17	104.51
375	0.00	1021.17	780.00	241.17	104.51
376	0.00	1035.04	1016.00	19.04	8.25
377	0.00	1014.69	780.00	234.69	101.70
378	0.00	1003.26	750.00	253.26	109.75
379	0.21	943.77	720.00	223.77	96.97
380	0.28	1003.63	780.00	223.63	96.90
381	1.75	1487.94			
382	0.49	1036.62	800.00	236.62	102.54
383	0.14	943.72	700.00	243.72	105.61
384	0.63	943.72	680.00	263.72	114.28
385	0.56	1028.63	848.00	180.63	78.27
386	0.21	1027.56	750.00	277.56	120.28
387	1.12	1036.47	760.00	276.47	119.80
388	0.28	1036.46	700.00	336.46	145.80
389	0.00	1036.46	650.00	386.46	167.47
390	0.49	897.31	700.00	197.31	85.50
391	0.14	1180.63	840.00	340.63	147.60
392	0.14	1180.63	780.00	400.63	173.60
393	0.56	1180.63	870.00	310.63	134.61
394	0.56	1180.65	920.00	260.65	112.95
395	0.21	893.23	800.00	93.23	40.40
396	0.28	1016.90	850.00	166.90	72.32
397	0.07	1065.05	900.00	165.05	71.52
398	0.14	1020.65	810.00	210.65	91.28

399	2.17	1120.41	850.00	270.41	117.18
400	1.05	890.67	660.00	230.67	99.96
401	0.35	1120.40	900.00	220.40	95.51
402	0.00	893.23	740.00	153.23	66.40
403	0.21	1028.62	814.00	214.62	93.00
404	0.00	1036.46	750.00	286.46	124.13
405	0.21	890.67	685.00	205.67	89.12
406	1.05	891.19	740.00	151.19	65.52
407	0.00	898.57	710.00	188.57	81.71
408	0.28	898.57	720.00	178.57	77.38
409	0.00	891.19	710.00	181.19	78.52
410	0.00	892.53	740.00	152.53	66.10
411	0.14	1020.65	900.00	120.65	52.28
412	0.49	1013.91	700.00	313.91	136.03
413	3.85	1076.85	910.00	166.85	72.30
414	0.00	1076.85	860.00	216.85	93.97
415	0.35	1044.80	814.00	230.80	100.01
416	0.49	1044.79	860.00	184.79	80.08
417	0.14	1044.79	840.00	204.79	88.74
418	0.35	1044.79	850.00	194.79	84.41
419	0.00	1044.79	790.00	254.79	110.41
420	1.89	1120.27	870.00	250.27	108.45
421	0.21	1120.26	900.00	220.26	95.45
422	0.56	1120.26	900.00	220.26	95.45
423	0.35	1010.53	810.00	200.53	86.90
424	0.28	1120.40	1000.00	120.40	52.17
425	0.00	1016.22	770.00	246.22	106.69
426	0.00	1078.27	910.00	168.27	72.92
427	0.00	1016.22	795.00	221.22	95.86
428	0.00	1078.26	840.00	238.26	103.25
429	0.00	1078.26	910.00	168.26	72.91
430	0.28	1078.25	960.00	118.25	51.24
431	0.28	1078.25	890.00	188.25	81.58
432	0.14	1078.25	800.00	278.25	120.57
433	0.14	1027.51	700.00	327.51	141.92
434	1.40	1027.52	830.00	197.52	85.59
435	0.28	1068.99	875.00	193.99	84.06
436	0.21	890.45	720.00	170.45	73.86
437	0.21	890.45	680.00	210.45	91.19
438	50.00	1016.60	700.00	316.60	137.19
439	0.84	1067.61	800.00	267.61	115.96
440	0.42	1065.06	920.00	145.06	62.86
441	1.40	1114.81	780.00	334.81	145.08
442	0.14	1065.06	920.00	145.06	62.86
443	0.07	1017.03	860.00	157.03	68.04
444	24.00 ( ** )	999.44	940.00	59.44	25.76
445	0.21	1079.26	960.00	119.26	51.68
446	0.35	1115.07	900.00	215.07	93.19
447	1.40	1114.39	750.00	364.39	157.90
448	0.14	1016.73	720.00	296.73	128.58
449	0.00	1016.68	720.00	296.68	128.56
450	1.40	1180.28	1050.00	130.28	56.46
21a	0.42	1020.58	726.00	294.58	127.65
22a	0.14	1016.92	740.00	276.92	120.00
23a	0.00	1114.22	740.00	374.22	162.16
J-1	1.12	932.03	660.00	272.03	117.88
J-15	0.00	1115.89	880.00	235.89	102.22
J-24	0.70	1115.07	822.00	293.07	127.00
J-25	0.35	1115.46	1040.00	75.46	32.70
J-26	0.00	1115.80	891.00	224.80	97.41
I-Pump-1	0.00	886.73	738.00	148.73	64.45
O-Pump-3	0.00	1080.83	755.00	325.83	141.19
I-Pump-4	0.00	1021.41	875.00	146.41	63.44
I-Pump-5	0.00	836.48	680.00	156.48	67.81
O-Pump-6	0.00	1488.81	835.00	653.81	283.32
O-Pump-7	0.00	1044.01	775.00	269.01	116.57
I-Pump-8	0.00	1020.55	775.00	245.55	106.41
O-Pump-9	0.00	1020.59	700.00	320.59	138.92
I-Pump-10	0.00	1013.79	910.00	103.79	44.98
R-1	----	1000.00	670.00	330.00	143.00
R-2	----	1181.00	1181.00	0.00	0.00
R-3	----	1181.00	1181.00	0.00	0.00



R-4	----	1116.00	1092.00	24.00	10.40
I-RV-1	0.00	999.92	670.00	329.92	142.96
O-RV-2	----	943.85	840.00	103.85	45.00
O-RV-3	----	1112.31	1020.00	92.31	40.00
O-RV-4	----	1016.92	890.00	126.92	55.00
I-RV-5	0.00	955.28	688.00	267.28	115.82
O-RV-6	0.00	1024.91	1016.00	8.91	3.86
I-RV-7	0.00	1114.22	740.00	374.22	162.16
T-2	----	1035.00	1016.00	19.00	8.23
T-3	----	1077.00	960.00	117.00	50.70
T-6	----	1068.00	1040.00	28.00	12.13
T-7	----	1120.00	1090.00	30.00	13.00
T-8	----	940.00	920.00	20.00	8.67
T-9	----	1025.00	998.00	27.00	11.70
T-10	----	1140.00	990.00	150.00	65.00
I-RV-2	0.00	1076.84	840.00	236.84	102.63
I-RV-3	0.00	1478.53	1020.00	458.53	198.70
I-RV-4	0.00	1478.57	890.00	588.57	255.05
O-Pump-5	0.00	955.54	680.00	275.54	119.40
O-Pump-8	0.00	1067.61	775.00	292.61	126.80
O-Pump-1	0.00	1039.70	738.00	301.70	130.74
O-RV-1	----	928.46	670.00	258.46	112.00
I-Pump-7	0.00	894.01	775.00	119.01	51.57
I-Pump-3	0.00	1002.16	755.00	247.16	107.10
O-RV-5	----	895.69	688.00	207.69	90.00
O-Pump-4	0.00	1147.35	875.00	272.35	118.02
I-Pump-9	0.00	1020.59	700.00	320.59	138.92
I-RV-6	----	1024.83	1016.00	8.83	3.83
I-Pump-6	0.00	1161.95	835.00	326.95	141.68
O-RV-7	----	1016.92	740.00	276.92	120.00
O-Pump-10	0.00	1177.01	910.00	267.01	115.70

M A X I M U M   A N D   M I N I M U M   V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
O-Pump-6	283.32	I-RV-6	3.83
I-RV-4	255.05	O-RV-6	3.86
I-RV-3	198.70	T-2	8.23
234	186.44	376	8.25
98	185.71	307	8.27

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
417	5.59	423	0.00
416	5.59	380	0.00
184	4.74	283	0.00
370	4.74	264	0.00
371	4.74	207	0.00

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
417	20.00	380	0.00
416	20.00	207	0.00
507	15.71	283	0.00
508	15.63	229	0.00
418	12.83	340	0.00

000047



PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
417	20.00	380	0.00
416	20.00	207	0.00
507	15.71	283	0.00
508	15.63	229	0.00
418	12.83	340	0.00

REGULATING VALVE REPORT

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1	PRV-1	112.00	ACTIVATED	142.96	112.00	1161.57
RV-2	PRV-1	45.00	ACTIVATED	102.63	45.00	10.36
RV-3	PRV-1	40.00	ACTIVATED	198.70	40.00	1.26
RV-4	PRV-1	55.00	ACTIVATED	255.05	55.00	4.20
RV-5	PRV-1	90.00	ACTIVATED	115.82	90.00	305.22
RV-6	PSV	0.50	CLOSED	3.83	3.86	0.00
RV-7	PRV-1	120.00	ACTIVATED	162.16	120.00	50.28

SUMMARY OF INFLOWS AND OUTFLOWS

- (+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
- (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	1161.57	
R-2	18.06	
R-3	22.54	
R-4	54.48	
T-2	-217.60	
T-3	19.60	
T-6	9.56	
T-7	-66.48	
T-8	107.20	
T-9	279.38	
T-10	-387.78	

NET SYSTEM INFLOW = 1672.37  
 NET SYSTEM OUTFLOW = -671.86  
 NET SYSTEM DEMAND = 1000.51

\*\*\*\*\* HYDRAULIC ANALYSIS COMPLETED \*\*\*\*\*



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***** KYPIPE 4 *****
*
*           Pipe Network Modeling Software           *
*
*           Copyrighted by KYPIPE LLC               *
*           Version 4 - April 2008                   *
*
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Date & Time: Thu Oct 20 10:33:16 2011

INPUT DATA FILENAME ----- C:\Projects\HYDRAU~1\BCWD\BCWD\_Str.DT2  
 TABULATED OUTPUT FILENAME ----- C:\Projects\HYDRAU~1\BCWD\BCWD\_Str.OT2  
 POSTPROCESSOR RESULTS FILENAME --- C:\Projects\HYDRAU~1\BCWD\BCWD\_Str.RS2

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute  
 HEAD (HGL) ..... = feet  
 PRESSURE ..... = psig

*PEAK DEMAND  
 CALCULATIONS*

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT  
 MAXIMUM AND MINIMUM PRESSURES = 5  
 MAXIMUM AND MINIMUM VELOCITIES = 5  
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SUPPLY ZONE DATA

THIS SYSTEM HAS MULTIPLE SUPPLY ZONES

ZONE NO. 1 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
           ~@RV-1                                  ~@RV-5                                  ~@T-8  
           ~@T-2                                  ~@RV-6                                  ~@T-9  
           ~@T-3                                  ~@T-6                                  ~@RV-7                                  ~@RV-2  
           ~@T-7                                  ~@RV-4                                  ~@R-4                                  ~@RV-3

ZONE NO. 2 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
           ~@R-2

ZONE NO. 3 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
           ~@R-3

SYSTEM CONFIGURATION

NUMBER OF PIPES ..... (p) = 519  
 NUMBER OF END NODES ..... (j) = 473  
 NUMBER OF PRIMARY LOOPS ..... (l) = 38  
 NUMBER OF SUPPLY NODES ..... (f) = 11  
 NUMBER OF SUPPLY ZONES ..... (z) = 3

Case: 0

RESULTS OBTAINED AFTER 17 TRIALS: ACCURACY = 0.00457

SIMULATION DESCRIPTION (LABEL)

000050



Bath County Water District  
 Starshader Ln Water Line Extension  
 Peak Demand Calculations  
 0.14 (avg) x 3.6 (peaking factor) = 0.50

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/ 1000 (ft/ft)	HL/ 1000 (ft/ft)
	#1	#2						
1	J-1	139	975.04	10.06	0.00	2.77	2.42	2.42
2	306	144	46.44	0.04	0.00	0.13	0.01	0.01
3	5	145	3.28	0.01	0.00	0.04	0.00	0.00
4	O-Pump-5	309	1189.20	0.17	0.00	4.86	8.49	8.49
5	307	5	4.53	0.01	0.00	0.05	0.00	0.00
6	180	6	207.97	0.26	0.00	1.33	1.00	1.00
7	6	163	202.97	0.72	0.00	1.30	0.95	0.95
8	8	437	1.50	0.02	0.00	0.07	0.01	0.01
9	7	8	9.00	0.00	0.00	0.06	0.00	0.00
10	7	9	263.75	3.40	0.00	1.68	1.55	1.55
11	9	10	67.00	15.05	0.00	3.04	14.52	14.52
12	9	12	187.00	0.35	0.00	1.19	0.82	0.82
13	10	103	56.00	31.87	0.00	2.54	10.42	10.42
14	10	14	7.50	0.46	0.00	0.34	0.25	0.25
15	14	13	1.25	0.03	0.00	0.06	0.01	0.01
16	14	15	2.50	0.28	0.00	0.11	0.03	0.03
17	11	113	17.50	5.99	0.00	0.79	1.21	1.21
18	16	115	11.20	5.46	0.00	0.51	0.53	0.53
19	19	18	5.25	0.34	0.00	0.24	0.13	0.13
20	197	19	5.30	0.27	0.00	0.24	0.13	0.13
21	20	350	8.00	0.02	0.00	0.20	0.07	0.07
22	O-Pump-9	353	0.00	0.00	0.00	0.00	0.00	0.00
23	22	195	4.35	0.31	0.00	0.20	0.09	0.09
24	20	117	14.65	0.16	0.00	0.17	0.03	0.03
25	22	20	26.40	0.04	0.00	0.30	0.09	0.09
26	16	22	35.00	0.44	0.00	0.40	0.15	0.15
27	27	224	2.90	0.23	0.00	0.13	0.04	0.04
28	193	25	13.80	6.88	0.00	0.63	0.78	0.78
29	28	I-Pump-8	0.00	0.00	0.00	0.00	0.00	0.00
30	O-Pump-8	194	0.00	0.00	0.00	0.00	0.00	0.00
31	30	118	0.00	0.00	0.00	0.00	0.00	0.00
32	314	16	57.45	0.11	0.00	0.65	0.37	0.37
33-XX	29	37						
34	29	119	7.00	0.88	0.00	0.32	0.22	0.22
35	374	32	84.00	1.39	0.00	0.95	0.75	0.75
36	32	35	14.80	0.60	0.00	0.67	0.89	0.89
37	160	33	66.20	0.41	0.00	0.75	0.49	0.49
38	33	36	1.50	0.04	0.00	0.07	0.01	0.01
39	26	37	50.75	1.06	0.00	0.58	0.30	0.30
40	37	38	20.75	4.83	0.00	0.94	1.66	1.66
41	38	120	10.00	0.44	0.00	0.45	0.43	0.43
42	38	40	1.00	0.00	0.00	0.05	0.01	0.01
43	26	121	86.59	5.19	0.00	0.98	0.80	0.80
44	39	71	75.34	4.19	0.00	0.85	0.62	0.62
45	42	72	42.53	0.60	0.00	0.48	0.21	0.21
46	43	290	53.34	0.68	0.00	0.61	0.33	0.33
47	42	45	41.00	0.70	0.00	0.47	0.20	0.20
48	46	280	151.38	14.90	0.00	1.72	2.25	2.25
49	47	44	44.47	0.45	0.00	0.50	0.23	0.23
50	T-7	47	79.87	0.68	0.00	0.91	0.69	0.69
51	49	47	12.63	0.07	0.00	0.14	0.02	0.02
52	342	281	143.88	0.23	0.00	1.63	2.05	2.05
53	48	317	133.38	1.01	0.00	1.51	1.78	1.78
54	49	50	56.25	5.56	0.00	0.64	0.36	0.36
55	50	53	23.50	0.96	0.00	0.60	0.51	0.51
56	50	51	3.00	0.19	0.00	0.14	0.05	0.05
57	53	52	17.25	0.40	0.00	0.44	0.29	0.29

58		53	54	2.00	0.08	0.00	0.09	0.02	0.02
59		44	55	22.50	0.19	0.00	0.26	0.07	0.07
60		55	399	14.00	0.22	0.00	0.16	0.03	0.03
61		44	279	14.47	0.04	0.00	0.16	0.03	0.03
62		57	259	33.50	0.57	0.00	0.38	0.14	0.14
63		57	59	2.50	0.00	0.00	0.03	0.00	0.00
64		58	60	1.25	0.00	0.00	0.03	0.00	0.00
65		58	61	8.75	0.62	0.00	0.22	0.08	0.08
66		62	57	44.00	0.45	0.00	0.50	0.23	0.23
67		62	63	2.50	0.09	0.00	0.11	0.03	0.03
68		65	46	30.70	0.49	0.00	0.35	0.12	0.12
69		67	65	39.45	0.59	0.00	0.45	0.19	0.19
70		65	124	4.00	0.05	0.00	0.10	0.02	0.02
71		415	67	41.20	2.26	0.00	1.05	1.45	1.45
72		68	64	5.00	0.17	0.00	0.13	0.03	0.03
73		128	68	69.70	1.75	0.00	0.79	0.53	0.53
74		69	135	110.53	2.28	0.00	1.25	1.26	1.26
75		335	70	20.48	0.04	0.00	0.23	0.06	0.06
76		129	70	59.72	0.59	0.00	0.68	0.40	0.40
77		72	131	140.68	11.79	0.00	1.60	1.96	1.96
78		71	43	71.59	0.96	0.00	0.81	0.56	0.56
79		262	294	164.84	0.07	0.00	1.87	2.63	2.63
80		137	74	18.00	0.07	0.00	0.20	0.04	0.04
81		286	73	27.75	0.59	0.00	0.31	0.10	0.10
82		296	76	3.41	0.00	0.00	0.04	0.00	0.00
83-XX		170	262						
84		2	92	229.25	0.27	0.00	1.46	1.19	1.19
85		142	77	17.47	0.04	0.00	0.11	0.01	0.01
86		77	122	11.00	0.45	0.00	0.28	0.13	0.13
87		423	39	78.84	2.60	0.00	0.89	0.67	0.67
88		77	78	4.97	0.00	0.00	0.03	0.00	0.00
89		79	321	3.75	0.19	0.00	0.17	0.07	0.07
90		143	322	225.00	1.74	0.00	1.44	1.15	1.15
91		304	2	562.18	1.59	0.00	1.59	0.87	0.87
92		80	2	90.81	1.38	0.00	1.03	0.87	0.87
93		304	80	95.06	0.22	0.00	1.08	0.95	0.95
94		T-3	84	70.00	0.41	0.00	0.79	0.54	0.54
95		84	413	53.25	1.15	0.00	0.60	0.32	0.32
96		83	157	11.00	0.51	0.00	0.28	0.13	0.13
97		83	87	0.75	0.00	0.00	0.02	0.00	0.00
98		85	86	1.50	0.03	0.00	0.04	0.00	0.00
99		85	159	1.00	0.01	0.00	0.03	0.00	0.00
100		88	89	2.50	0.05	0.00	0.06	0.01	0.01
101		97	90	8.50	0.17	0.00	0.22	0.08	0.08
102		92	143	228.00	0.42	0.00	1.46	1.18	1.18
103		93	82	188.50	1.73	0.00	1.20	0.83	0.83
104		93	94	3.75	0.34	0.00	0.17	0.07	0.07
105		82	91	182.00	2.99	0.00	1.16	0.78	0.78
106		91	95	102.50	0.28	0.00	0.65	0.27	0.27
107		91	365	72.00	1.01	0.00	1.84	4.09	4.09
108	O-Pump-6		381	72.00	2.06	0.00	1.84	4.09	4.09
109		96	98	6.75	0.47	0.00	0.31	0.21	0.21
110		332	97	11.00	0.24	0.00	0.28	0.13	0.13
111		406	99	938.65	3.41	0.00	2.66	2.26	2.26
112		99	I-Pump-1	936.65	1.02	0.00	2.66	2.25	2.25
113		T-6	129	179.12	4.26	0.00	2.03	3.07	3.07
114		101	100	26.25	0.08	0.00	0.30	0.09	0.09
115		101	102	78.75	79.82	0.00	3.57	19.59	19.59
116		100	146	17.50	6.88	0.00	0.79	1.21	1.21
117		102	149	15.25	3.46	0.00	0.69	0.94	0.94
118		102	151	49.25	6.76	0.00	1.26	2.02	2.02
119		105	106	6.25	0.28	0.00	0.16	0.04	0.04
120		105	107	13.50	0.32	0.00	0.34	0.18	0.18
121		108	105	28.50	0.49	0.00	0.73	0.73	0.73
122		108	110	6.50	1.64	0.00	0.30	0.19	0.19
123		107	434	7.25	1.26	0.00	0.33	0.24	0.24
124		103	112	43.50	47.74	0.00	1.97	6.53	6.53
125		112	11	25.25	10.30	0.00	1.15	2.38	2.38
126		113	114	10.25	3.88	0.00	0.47	0.45	0.45
127		114	17	3.00	0.16	0.00	0.14	0.05	0.05
128		115	19	3.70	0.11	0.00	0.17	0.07	0.07
129		116	23	1.50	0.02	0.00	0.04	0.00	0.00



130		117	27	9.90	0.04	0.00	0.11	0.01	0.01
131		118	439	0.00	0.00	0.00	0.00	0.00	0.00
132		119	34	2.50	0.26	0.00	0.11	0.03	0.03
133		120	41	6.75	0.83	0.00	0.31	0.21	0.21
134		122	79	7.00	0.14	0.00	0.18	0.05	0.05
135		348	297	676.49	1.24	0.00	1.92	1.23	1.23
136		33	123	62.20	2.43	0.00	0.71	0.43	0.43
137		124	66	1.50	0.00	0.00	0.04	0.00	0.00
138		126	125	47.95	4.76	0.00	1.22	1.93	1.93
139		127	126	52.20	15.43	0.00	1.33	2.25	2.25
140		68	127	56.20	7.80	0.00	1.43	2.58	2.58
141		161	128	74.70	1.85	0.00	0.85	0.61	0.61
142		129	130	110.65	2.83	0.00	1.26	1.26	1.26
143		130	72	106.65	7.15	0.00	1.21	1.17	1.17
144		131	132	135.68	12.51	0.00	1.54	1.83	1.83
145		132	46	132.18	4.94	0.00	1.50	1.75	1.75
146		133	42	91.78	2.57	0.00	1.04	0.89	0.89
147		134	133	100.53	4.01	0.00	1.14	1.05	1.05
148		135	134	105.53	0.48	0.00	1.20	1.15	1.15
149		69	136	27.23	0.31	0.00	0.31	0.09	0.09
150		73	137	20.50	0.23	0.00	0.23	0.06	0.06
151		138	219	8.75	0.50	0.00	0.40	0.33	0.33
152		139	140	971.04	22.82	0.00	2.75	2.40	2.40
153		140	212	971.04	1.09	0.00	2.75	2.40	2.40
154	O-Pump-1	172	31	936.65	1.04	0.00	2.66	2.25	2.25
155		172	142	17.47	0.03	0.00	0.11	0.01	0.01
156		75	301	65.75	0.00	0.00	0.19	0.02	0.02
157		306	145	106.23	0.09	0.00	1.21	1.17	1.17
158		145	75	102.00	6.08	0.00	1.16	1.08	1.08
159		146	104	5.00	0.32	0.00	0.23	0.12	0.12
160		147	101	119.25	2.20	0.00	1.35	1.44	1.44
161		148	147	142.50	10.33	0.00	1.62	2.01	2.01
162		149	150	7.25	0.38	0.00	0.33	0.24	0.24
163		150	385	4.75	0.06	0.00	0.22	0.11	0.11
164		151	108	43.75	6.80	0.00	1.12	1.62	1.62
165		152	93	210.00	4.29	0.00	1.34	1.01	1.01
166		153	I-RV-2	37.00	0.02	0.00	0.42	0.17	0.17
167		154	155	35.00	0.26	0.00	0.40	0.15	0.15
168		155	156	26.25	0.43	0.00	0.30	0.09	0.09
169		156	83	14.50	0.07	0.00	0.16	0.03	0.03
170		157	271	8.75	0.45	0.00	0.22	0.08	0.08
171		158	85	6.00	0.18	0.00	0.15	0.04	0.04
172		356	253	4.06	0.00	0.00	0.05	0.00	0.00
173		32	160	67.20	0.53	0.00	0.76	0.50	0.50
174		147	382	10.25	1.48	0.00	0.47	0.45	0.45
175		129	162	3.00	0.15	0.00	0.14	0.05	0.05
176		70	161	77.95	0.72	0.00	0.88	0.66	0.66
177		78	170	4.97	0.00	0.00	0.03	0.00	0.00
178	O-Pump-3	285		182.76	0.83	0.00	2.07	3.19	3.19
179		163	7	195.97	0.71	0.00	1.25	0.89	0.89
180		324	179	183.09	2.63	0.00	1.17	0.79	0.79
181		164	180	242.02	13.27	0.00	1.54	1.32	1.32
182		4	I-Pump-5	1189.20	2.54	0.00	4.86	8.49	8.49
183		165	4	1201.70	95.88	0.00	4.91	8.66	8.66
184	O-RV-1	165		1214.20	0.04	0.00	4.96	8.83	8.83
185		164	166	340.84	1.30	0.00	2.18	2.49	2.49
186		166	I-Pump-7	10.00	1.25	0.00	0.45	0.43	0.43
187	O-Pump-7	168		10.00	0.33	0.00	0.45	0.43	0.43
188		322	152	222.50	1.30	0.00	1.42	1.13	1.13
189	O-RV-2	154		37.00	0.45	0.00	0.42	0.17	0.17
190		144	3	46.44	0.02	0.00	0.13	0.01	0.01
191		31	306	782.40	2.06	0.00	2.22	1.61	1.61
192		169	148	150.00	7.88	0.00	1.70	2.21	2.21
193		31	169	152.50	1.70	0.00	1.73	2.28	2.28
194		171	26	164.84	0.07	0.00	1.87	2.63	2.63
195		197	173	2.50	0.13	0.00	0.11	0.03	0.03
196		96	I-RV-4	15.00	0.40	0.00	0.38	0.22	0.22
197		75	172	30.00	0.00	0.00	0.19	0.03	0.03
198		172	174	12.53	0.00	0.00	0.14	0.02	0.02
199		174	175	10.78	0.06	0.00	0.12	0.02	0.02
200		175	176	6.03	0.02	0.00	0.07	0.01	0.01
201		176	178	2.03	0.00	0.00	0.02	0.00	0.00



202	170	177	4.97	0.00	0.00	0.06	0.00	0.00
203	177	178	1.97	0.00	0.00	0.02	0.00	0.00
204	186	7	102.53	0.18	0.00	0.65	0.27	0.27
205	179	182	162.59	0.41	0.00	1.04	0.63	0.63
206	182	181	188.14	0.44	0.00	1.20	0.83	0.83
207	180	182	25.55	0.00	0.00	0.16	0.02	0.02
208	181	185	183.14	0.66	0.00	1.17	0.79	0.79
209-XX	181	308						
210	183	186	137.89	0.26	0.00	0.88	0.47	0.47
211	185	184	30.25	0.49	0.00	0.34	0.11	0.11
212	185	183	145.39	0.15	0.00	0.93	0.51	0.51
213	186	189	12.86	0.11	0.00	0.15	0.02	0.02
214	184	190	5.89	0.05	0.00	0.07	0.01	0.01
215	189	187	5.36	0.02	0.00	0.06	0.00	0.00
216	188	190	0.36	0.00	0.00	0.00	0.00	0.00
217	187	191	2.86	0.01	0.00	0.03	0.00	0.00
218	191	192	0.36	0.00	0.00	0.00	0.00	0.00
219	192	188	0.36	0.00	0.00	0.00	0.00	0.00
220-XX	188	141						
221	35	193	14.80	0.69	0.00	0.67	0.89	0.89
222	194	30	0.00	0.00	0.00	0.00	0.00	0.00
223	195	225	2.85	0.15	0.00	0.13	0.04	0.04
224	25	21	12.80	0.58	0.00	0.58	0.68	0.68
225	18	196	3.75	0.09	0.00	0.17	0.07	0.07
226	21	197	12.80	0.72	0.00	0.58	0.68	0.68
227	196	223	2.25	0.06	0.00	0.10	0.03	0.03
228	223	199	0.50	0.00	0.00	0.02	0.00	0.00
229	184	200	13.11	0.16	0.00	0.15	0.02	0.02
230	200	206	9.36	0.06	0.00	0.11	0.01	0.01
231	198	201	7.50	0.26	0.00	0.34	0.25	0.25
232	198	400	4.75	0.56	0.00	0.22	0.11	0.11
233	201	204	5.00	0.46	0.00	0.23	0.12	0.12
234-XX	204	202						
235	204	205	1.25	0.06	0.00	0.06	0.01	0.01
236	206	198	15.00	0.06	0.00	0.17	0.03	0.03
237	208	206	7.64	5.14	0.00	0.78	1.88	1.88
238	209	208	8.39	4.61	0.00	0.86	2.23	2.23
239	390	209	12.14	1.27	0.00	0.55	0.61	0.61
240	209	210	2.25	0.46	0.00	0.23	0.19	0.19
241	210	211	0.75	0.01	0.00	0.03	0.00	0.00
242	408	207	15.39	2.20	0.00	0.70	0.95	0.95
243	212	141	949.15	5.10	0.00	2.69	2.30	2.30
244	387	202	1.00	0.02	0.00	0.05	0.01	0.01
245-XX	43	283						
246	215	218	20.00	0.69	0.00	0.51	0.38	0.38
247	216	274	11.00	0.30	0.00	0.28	0.13	0.13
248	216	217	0.75	0.00	0.00	0.02	0.00	0.00
249	218	216	16.25	1.07	0.00	0.41	0.26	0.26
250	218	220	1.25	0.03	0.00	0.06	0.01	0.01
251	222	215	31.00	17.19	0.00	1.41	3.48	3.48
252-XX	221	138						
253	222	221	4.25	0.87	0.00	0.19	0.09	0.09
254	224	28	0.00	0.00	0.00	0.00	0.00	0.00
255	225	224	1.10	0.02	0.00	0.05	0.01	0.01
256	24	244	64.50	0.52	0.00	0.73	0.46	0.46
257	226	255	23.19	0.29	0.00	0.26	0.07	0.07
258	226	229	19.31	0.11	0.00	0.22	0.05	0.05
259	228	227	2.00	0.00	0.00	0.02	0.00	0.00
260	228	231	4.50	0.13	0.00	0.11	0.02	0.02
261	231	230	0.75	0.00	0.00	0.02	0.00	0.00
262	231	232	0.75	0.01	0.00	0.03	0.00	0.00
263	227	252	1.50	0.00	0.00	0.02	0.00	0.00
264	251	234	0.36	0.00	0.00	0.01	0.00	0.00
265	235	233	32.50	0.82	0.00	0.37	0.13	0.13
266	233	450	19.39	0.17	0.00	0.22	0.05	0.05
267	236	234	8.89	0.05	0.00	0.10	0.01	0.01
268	237	236	10.64	0.00	0.00	0.12	0.02	0.02
269	248	235	51.75	1.26	0.00	0.59	0.31	0.31
270	235	258	14.50	0.04	0.00	0.16	0.03	0.03
271	238	240	77.00	3.34	0.00	0.87	0.64	0.64
272	240	243	12.75	0.17	0.00	0.14	0.02	0.02
273	242	241	5.75	0.22	0.00	0.15	0.04	0.04

274	243	242	9.00	0.01	0.00	0.10	0.01	0.01
275	243	245	1.00	0.01	0.00	0.05	0.01	0.01
276	229	256	18.56	0.04	0.00	0.21	0.05	0.05
277	244	226	54.50	1.86	0.00	0.62	0.34	0.34
278	240	247	58.00	0.98	0.00	0.66	0.38	0.38
279	247	248	55.25	0.99	0.00	0.63	0.35	0.35
280	233	249	8.86	0.13	0.00	0.23	0.08	0.08
281	249	250	7.61	0.29	0.00	0.19	0.06	0.06
282	250	251	3.61	0.12	0.00	0.09	0.02	0.02
283	252	338	0.75	0.00	0.00	0.01	0.00	0.00
284	253	228	9.50	0.03	0.00	0.11	0.01	0.01
285	254	253	10.44	0.10	0.00	0.12	0.02	0.02
286	255	254	18.19	0.18	0.00	0.21	0.04	0.04
287	256	246	15.81	0.22	0.00	0.18	0.03	0.03
288	257	239	2.00	0.00	0.00	0.02	0.00	0.00
289	258	257	9.25	0.08	0.00	0.10	0.01	0.01
290	R-2	24	64.50	0.56	0.00	0.73	0.46	0.46
291	R-3	238	80.50	0.01	0.00	0.91	0.70	0.70
292	259	420	29.00	0.12	0.00	0.33	0.11	0.11
293	137	260	0.00	0.00	0.00	0.00	0.00	0.00
294	260	261	0.00	0.00	0.00	0.00	0.00	0.00
295	74	426	6.00	0.04	0.00	0.27	0.17	0.17
296	263	287	1.50	0.04	0.00	0.07	0.01	0.01
297	234	266	6.50	0.61	0.00	0.30	0.19	0.19
298	265	264	0.75	0.01	0.00	0.03	0.00	0.00
299	266	265	3.50	0.36	0.00	0.16	0.06	0.06
300	94	268	0.00	0.00	0.00	0.00	0.00	0.00
301	268	267	0.00	0.00	0.00	0.00	0.00	0.00
302	98	269	5.25	0.28	0.00	0.24	0.13	0.13
303	269	I-RV-3	4.50	0.05	0.00	0.20	0.10	0.10
304	90	344	7.00	0.08	0.00	0.18	0.05	0.05
305	271	158	7.25	0.07	0.00	0.19	0.06	0.06
306	271	272	0.00	0.00	0.00	0.00	0.00	0.00
307	273	305	0.00	0.00	0.00	0.00	0.00	0.00
308	274	214	8.25	1.08	0.00	0.37	0.30	0.30
309	214	275	2.75	0.14	0.00	0.12	0.04	0.04
310	52	277	16.00	2.57	0.00	0.73	1.02	1.02
311	277	278	13.00	3.62	0.00	0.59	0.70	0.70
312	47	276	46.53	0.22	0.00	0.53	0.25	0.25
313	279	62	54.75	0.71	0.00	0.62	0.34	0.34
314	276	279	46.53	0.26	0.00	0.53	0.25	0.25
315	280	342	143.88	0.32	0.00	1.63	2.05	2.05
316	281	343	141.88	3.25	0.00	1.61	1.99	1.99
317	282	270	2.25	0.11	0.00	0.10	0.03	0.03
318	278	138	10.75	1.28	0.00	0.49	0.49	0.49
319	284	69	147.51	1.99	0.00	1.67	2.14	2.14
320	284	286	33.50	0.33	0.00	0.38	0.14	0.14
321	285	284	182.76	1.16	0.00	2.07	3.19	3.19
322	290	292	34.59	0.03	0.00	0.39	0.15	0.15
323	288	289	164.84	1.88	0.00	1.05	0.65	0.65
324	288	291	188.16	2.31	0.00	1.20	0.83	0.83
325	291	293	188.16	12.01	0.00	1.20	0.83	0.83
326	292	76	16.34	0.08	0.00	0.19	0.04	0.04
327	289	377	164.84	0.34	0.00	1.05	0.65	0.65
328	294	171	164.84	0.07	0.00	1.87	2.63	2.63
329	307	376	20.96	0.00	0.00	0.24	0.06	0.06
330	293	378	188.16	1.96	0.00	1.20	0.83	0.83
331	295	303	681.24	2.17	0.00	1.93	1.25	1.25
332	298	I-Pump-3	182.76	0.03	0.00	2.07	3.19	3.19
333	299	295	682.24	2.83	0.00	1.94	1.25	1.25
334	300	305	688.24	5.47	0.00	1.95	1.27	1.27
335	301	300	692.49	3.15	0.00	1.96	1.28	1.28
336	302	301	627.98	6.09	0.00	1.78	1.07	1.07
337	382	213	8.50	0.45	0.00	0.39	0.32	0.32
338	303	I-Pump-10	681.24	1.57	0.00	1.93	1.25	1.25
339	297	304	666.24	2.83	0.00	1.89	1.20	1.20
340	304	371	1.00	0.00	0.00	0.01	0.00	0.00
341	305	299	684.24	2.65	0.00	1.94	1.26	1.26
342	3	307	46.44	0.00	0.00	0.13	0.01	0.01
343	306	302	627.98	0.08	0.00	1.78	1.07	1.07
344	296	298	183.26	0.39	0.00	2.08	3.20	3.20
345	308	J-1	979.04	1.73	0.00	2.78	2.44	2.44

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346		311	308	979.04	6.55	0.00	2.78	2.44	2.44
347		309	I-RV-5	597.61	0.35	0.00	2.44	2.38	2.38
348		309	310	591.59	0.24	0.00	1.68	0.96	0.96
349		310	311	591.59	7.65	0.00	1.68	0.96	0.96
350		T-8	311	387.45	0.47	0.00	1.10	0.44	0.44
351	O-RV-3		282	4.50	0.11	0.00	0.20	0.10	0.10
352		312	96	60.25	3.96	0.00	1.54	2.94	2.94
353		74	313	5.50	0.02	0.00	0.06	0.00	0.00
354		215	283	5.00	0.29	0.00	0.13	0.03	0.03
355		45	222	39.50	1.15	0.00	1.01	1.34	1.34
356		241	315	1.25	0.01	0.00	0.03	0.00	0.00
357		275	397	0.25	0.00	0.00	0.01	0.00	0.00
358		316	49	101.63	7.16	0.00	1.15	1.07	1.07
359		316	318	2.25	0.07	0.00	0.10	0.03	0.03
360		317	316	114.38	2.96	0.00	1.30	1.34	1.34
361		317	319	10.25	2.08	0.00	0.47	0.45	0.45
362		319	320	2.00	0.07	0.00	0.09	0.02	0.02
363		321	81	2.25	0.03	0.00	0.10	0.03	0.03
364		81	323	0.75	0.01	0.00	0.03	0.00	0.00
365	O-RV-5		164	597.61	0.28	0.00	2.44	2.38	2.38
366		326	324	222.59	3.06	0.00	1.42	1.13	1.13
367		324	325	1.25	0.02	0.00	0.06	0.01	0.01
368		166	326	290.34	5.87	0.00	1.85	1.85	1.85
369		326	339	30.25	0.98	0.00	1.37	3.33	3.33
370		328	I-RV-1	1214.20	0.04	0.00	4.96	8.83	8.83
371		R-1	328	1214.20	0.04	0.00	4.96	8.83	8.83
372		112	329	2.25	0.04	0.00	0.10	0.03	0.03
373		329	333	0.75	0.03	0.00	0.08	0.03	0.03
374		327	331	4.00	0.03	0.00	0.18	0.08	0.08
375		327	395	0.75	0.00	0.00	0.03	0.00	0.00
376		333	330	0.25	0.00	0.00	0.03	0.00	0.00
377		334	432	0.50	0.00	0.00	0.02	0.00	0.00
378		430	334	1.00	0.01	0.00	0.05	0.01	0.01
379		336	431	3.00	0.04	0.00	0.14	0.05	0.05
380		236	337	0.25	0.00	0.00	0.00	0.00	0.00
381		339	327	17.75	3.10	0.00	0.81	1.24	1.24
382		339	340	1.25	0.00	0.00	0.06	0.01	0.01
383	O-Pump-4		341	139.88	0.10	0.00	1.59	1.94	1.94
384		341	48	136.88	3.98	0.00	1.55	1.86	1.86
385		343	I-Pump-4	139.88	0.10	0.00	1.59	1.94	1.94
386		61	345	5.00	0.05	0.00	0.13	0.03	0.03
387		345	346	2.50	0.03	0.00	0.06	0.01	0.01
388		344	366	6.50	0.07	0.00	0.17	0.05	0.05
389		344	347	0.50	0.04	0.00	0.05	0.01	0.01
390		347	349	0.25	0.00	0.00	0.03	0.00	0.00
391		156	384	2.75	0.19	0.00	0.12	0.04	0.04
392		T-9	355	450.01	0.21	0.00	2.87	4.16	4.16
393		351	375	450.01	4.37	0.00	2.87	4.16	4.16
394		352	351	450.01	4.06	0.00	2.87	4.16	4.16
395		350	I-Pump-9	0.00	0.00	0.00	0.00	0.00	0.00
396		353	116	5.50	0.18	0.00	0.14	0.03	0.03
397		350	353	8.00	0.01	0.00	0.20	0.07	0.07
398-XX		194	28						
399		354	352	450.01	0.42	0.00	2.87	4.16	4.16
400		354	I-RV-6	0.00	0.00	0.00	0.00	0.00	0.00
401-CV		355	354	450.01	0.21	0.00	2.87	4.16	4.16
402	O-RV-6		355	0.00	0.00	0.00	0.00	0.00	0.00
403		246	358	12.56	0.03	0.00	0.14	0.02	0.02
404		357	364	5.06	0.00	0.00	0.06	0.00	0.00
405		358	359	11.56	0.02	0.00	0.13	0.02	0.02
406		359	360	11.06	0.01	0.00	0.13	0.02	0.02
407		360	361	11.06	0.01	0.00	0.13	0.02	0.02
408		361	362	11.06	0.03	0.00	0.13	0.02	0.02
409		362	363	11.06	0.03	0.00	0.13	0.02	0.02
410		363	357	10.56	0.03	0.00	0.12	0.02	0.02
411		364	356	4.56	0.01	0.00	0.05	0.00	0.00
412		155	367	1.75	0.08	0.00	0.08	0.02	0.02
413		366	88	5.00	0.07	0.00	0.13	0.03	0.03
414		366	368	0.75	0.01	0.00	0.03	0.00	0.00
415		367	379	0.75	0.01	0.00	0.03	0.00	0.00
416-CV		2	369	419.24	5.91	0.00	4.76	14.82	14.82
417		369	370	419.24	16.26	0.00	4.76	14.82	14.82



418	370	T-10	44.24	0.03	0.00	0.50	0.23	0.23
419-XXCV	372	371						
420-XX	371	372						
421	84	372	3.25	0.00	0.00	0.04	0.00	0.00
422	370	373	187.50	33.40	0.00	2.13	3.34	3.34
423	2	369	0.00	5.91	0.00	0.00	0.00	0.00
424	374	29	10.50	0.05	0.00	0.12	0.02	0.02
425	375	425	353.01	9.23	0.00	2.25	2.66	2.66
426	375	374	97.00	0.02	0.00	0.62	0.24	0.24
427	376	T-2	41.91	0.00	0.00	0.48	0.21	0.21
428	307	376	20.96	0.00	0.00	0.24	0.06	0.06
429	377	262	164.84	0.07	0.00	1.05	0.65	0.65
430-XX	377	177						
431	378	296	188.16	0.79	0.00	1.20	0.83	0.83
432	290	380	1.00	0.01	0.00	0.05	0.01	0.01
433	365	I-Pump-6	72.00	3.05	0.00	1.84	4.09	4.09
434	381	312	65.75	15.61	0.00	1.68	3.46	3.46
435-XX	365	381						
436	384	383	0.50	0.00	0.00	0.02	0.00	0.00
437	109	403	0.75	0.01	0.00	0.03	0.00	0.00
438	385	109	2.75	0.11	0.00	0.12	0.04	0.04
439	110	386	0.75	0.00	0.00	0.03	0.00	0.00
440	213	387	6.00	1.19	0.00	0.27	0.17	0.17
441	387	388	1.00	0.01	0.00	0.05	0.01	0.01
442	388	389	0.00	0.00	0.00	0.00	0.00	0.00
443	389	404	0.00	0.00	0.00	0.00	0.00	0.00
444	207	390	13.89	1.64	0.00	0.63	0.79	0.79
445	357	394	5.00	0.25	0.00	0.23	0.12	0.12
446	391	392	0.50	0.00	0.00	0.02	0.00	0.00
447	393	391	1.00	0.00	0.00	0.05	0.01	0.01
448	394	393	3.00	0.19	0.00	0.14	0.05	0.05
449	41	412	1.75	0.09	0.00	0.08	0.02	0.02
450	325	410	0.00	0.00	0.00	0.00	0.00	0.00
451	O-RV-4	332	15.00	0.21	0.00	0.38	0.22	0.22
452	332	396	1.00	0.01	0.00	0.05	0.01	0.01
453	123	314	59.95	0.69	0.00	0.68	0.40	0.40
454	398	411	0.50	0.00	0.00	0.02	0.00	0.00
455	314	398	1.00	0.00	0.00	0.05	0.01	0.01
456	399	56	5.00	0.04	0.00	0.06	0.00	0.00
457	399	401	1.25	0.03	0.00	0.06	0.01	0.01
458	400	203	0.25	0.00	0.00	0.01	0.00	0.00
459-XX	205	405						
460	402	395	0.00	0.00	0.00	0.00	0.00	0.00
461-XX	403	107						
462-XX	404	386						
463	400	405	0.75	0.01	0.00	0.03	0.00	0.00
464	141	406	942.40	2.95	0.00	2.67	2.27	2.27
465	406	409	0.00	0.00	0.00	0.00	0.00	0.00
466	212	408	16.39	2.09	0.00	0.74	1.07	1.07
467	408	407	0.00	0.00	0.00	0.00	0.00	0.00
468-XX	409	407						
469-XX	410	402						
470-XX	397	411						
471-XX	412	15						
472	413	153	39.50	0.14	0.00	0.45	0.19	0.19
473	413	414	0.00	0.00	0.00	0.00	0.00	0.00
474	125	415	45.95	2.98	0.00	1.17	1.78	1.78
475	415	417	3.50	0.09	0.00	0.09	0.02	0.02
476	417	419	0.00	0.00	0.00	0.00	0.00	0.00
477	417	416	3.00	0.01	0.00	0.14	0.05	0.05
478	416	418	1.25	0.01	0.00	0.06	0.01	0.01
479	420	58	19.50	0.26	0.00	0.22	0.05	0.05
480	420	422	2.75	0.05	0.00	0.12	0.04	0.04
481	422	421	0.75	0.00	0.00	0.03	0.00	0.00
482	121	423	80.09	0.84	0.00	0.91	0.69	0.69
483	56	424	1.00	0.00	0.00	0.03	0.00	0.00
484	425	288	353.01	1.46	0.00	2.25	2.66	2.66
485	425	427	0.00	0.00	0.00	0.00	0.00	0.00
486	426	263	3.00	0.09	0.00	0.14	0.05	0.05
487	426	429	3.00	0.02	0.00	0.14	0.05	0.05
488	429	428	3.00	0.05	0.00	0.14	0.05	0.05
489	431	430	2.00	0.04	0.00	0.09	0.02	0.02

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490	428	336	3.00	0.03	0.00	0.14	0.05	0.05
491	111	433	0.50	0.00	0.00	0.02	0.00	0.00
492	136	335	23.48	0.20	0.00	0.27	0.07	0.07
493	335	435	1.00	0.01	0.00	0.05	0.01	0.01
494	434	111	2.25	0.05	0.00	0.10	0.03	0.03
495	437	436	0.75	0.01	0.00	0.03	0.00	0.00
496	167	439	3.50	0.14	0.00	0.09	0.02	0.02
497	441	447	56.00	0.49	0.00	0.36	0.09	0.09
498	449	438	50.00	0.08	0.00	0.32	0.07	0.07
499	219	445	7.25	0.55	0.00	0.33	0.24	0.24
500	214	440	2.00	0.04	0.00	0.09	0.02	0.02
501	440	442	0.50	0.00	0.00	0.02	0.00	0.00
502	447	23a	51.00	0.18	0.00	0.33	0.07	0.07
503	J-24	446	1.25	0.07	0.00	0.06	0.01	0.01
504	27	21a	1.50	0.00	0.00	0.02	0.00	0.00
505	O-RV-7	22a	51.00	0.00	0.00	0.33	0.07	0.07
506	448	449	50.00	0.05	0.00	0.32	0.07	0.07
507	439	443	0.50	0.04	0.00	0.05	0.01	0.01
508	443	444	0.25	0.00	0.00	0.03	0.00	0.00
509	445	167	6.50	0.50	0.00	0.30	0.19	0.19
510	450	237	14.39	0.30	0.00	0.16	0.03	0.03
10A	O-Pump-10	348	681.24	0.12	0.00	1.93	1.25	1.25
P-17	R-4	J-15	66.00	0.16	0.00	0.42	0.12	0.12
P-24-XX	21a	449						
P-25	22a	448	50.50	0.19	0.00	0.32	0.07	0.07
P-28	J-24	441	61.00	0.34	0.00	0.39	0.10	0.10
P-29	J-25	J-24	64.75	0.55	0.00	0.41	0.11	0.11
P-30	J-26	J-25	66.00	0.48	0.00	0.42	0.12	0.12
P-32	J-15	J-26	66.00	0.13	0.00	0.42	0.12	0.12
P-136	23a	I-RV-7	51.00	0.00	0.00	0.33	0.07	0.07

P U M P / L O S S   E L E M E N T   R E S U L T S

NPSH		INLET	OUTLET	PUMP	EFFIC-	USEFUL	INCREMTL	TOTAL	#PUMPS	#PUMPS	
Avail.	NAME	FLOWRATE	HEAD	HEAD	ENCY	POWER	COST	COST	PARALLEL	SERIES	
(ft)		(gpm)	(ft)	(ft)	(%)	(Hp)	(\$)	(\$)			
179.9	Pump-1	936.65	146.80	300.17	153.4	75.00	0.	0.0	0.0	**	**
265.7	Pump-3	182.76	232.57	312.68	80.1	75.00	0.	0.0	0.0	**	**
163.9	Pump-4	139.88	130.74	259.60	128.9	75.00	0.	0.0	0.0	**	**
182.8	Pump-5	1189.20	149.99	267.59	117.6	75.00	0.	0.0	0.0	**	**
343.5	Device	Pump-6 IS OPERATING OUT OF RANGE ....									
151.1	Pump-6	72.00	310.40	497.93	187.5	75.00	0.	0.0	0.0	**	**
267.4	Pump-7	10.00	117.87	267.87	150.0	75.00	0.	0.0	0.0	**	**
342.9	Device "Pump-8" is closed										
134.2	Pump-8	0.00	234.24	328.31	0.0	75.00	0.	0.0	0.0	**	**
	Device "Pump-9" is closed										
	Pump-9	0.00	309.66	309.64	0.0	75.00	0.	0.0	0.0	**	**
	Pump-10	681.24	101.07	257.99	156.9	75.00	0.	0.0	0.0	**	**

N O D E   R E S U L T S

000058



NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
2		4.50	1162.20	990.00	172.20	74.62
3		0.00	1035.01			
4		12.50	832.53	670.00	162.53	70.43
5		1.25	1034.99	800.00	234.99	101.83
6		5.00	881.89	680.00	201.89	87.49
7		25.75	880.46	680.00	200.46	86.87
8		7.50	880.46	690.00	190.46	82.53
9		9.75	877.06	670.00	207.06	89.73
10		3.50	862.01	670.00	192.01	83.21
11		7.75	772.10	704.00	68.10	29.51
12		187.00	876.71	670.00	206.71	89.58
13		1.25	861.53	680.00	181.53	78.66
14		3.75	861.55	660.00	201.55	87.34
15		2.50	861.27	700.00	161.27	69.89
16		11.25	1010.15	710.00	300.15	130.07
17		3.00	762.07	740.00	22.07	9.56
18		1.50	1004.25	700.00	304.25	131.84
19		3.75	1004.59	695.00	309.59	134.15
20		3.75	1009.68	720.00	289.68	125.53
21		0.00	1005.57	700.00	305.57	132.41
22		4.25	1009.72	724.00	285.72	123.81
23		1.50	1009.44	901.00	108.44	46.99
24		0.00	1180.44	1000.00	180.44	78.19
25		1.00	1006.15	720.00	286.15	124.00
26		27.50	1002.56	774.00	228.56	99.04
27		5.50	1009.48	773.00	236.48	102.47
28		0.00	1009.24	774.00	235.24	101.94
29		3.50	1015.67	773.00	242.67	105.16
30		0.00	1103.31	780.00	323.31	140.10
31		1.75	1037.13	738.00	299.13	129.62
32		2.00	1014.32	777.00	237.32	102.84
33		2.50	1013.38	850.00	163.38	70.80
34		2.50	1014.53	760.00	254.53	110.30
35		0.00	1013.73	800.00	213.73	92.61
36		1.50	1013.34	800.00	213.34	92.45
37		30.00	1001.50	760.00	241.50	104.65
38		9.75	996.67	775.00	221.67	96.06
39		3.50	993.93	700.00	293.93	127.37
40		1.00	996.67	780.00	216.67	93.89
41		5.00	995.41	720.00	275.41	119.35
42		8.25	1054.37	840.00	214.37	92.89
43		18.25	988.78	770.00	218.78	94.80
44		7.50	1118.87	840.00	278.87	120.84
45		1.50	1053.67	790.00	263.67	114.26
46		11.50	1024.53	800.00	224.53	97.30
47		1.50	1119.32	870.00	249.32	108.04
48		3.50	1130.52	927.00	203.52	88.19
49		32.75	1119.39	840.00	279.39	121.07
50		29.75	1113.83	940.00	173.83	75.32
51		3.00	1113.64	975.00	138.64	60.08
52		1.25	1112.46	986.00	126.46	54.80
53		4.25	1112.87	930.00	182.87	79.24
54		2.00	1112.79	980.00	132.79	57.54
55		8.50	1118.68	860.00	258.68	112.10
56		4.00	1118.42	940.00	178.42	77.32
57		8.00	1117.67	859.00	258.67	112.09
58		9.50	1116.72	912.00	204.72	88.71
59		2.50	1117.66	990.00	127.66	55.32
60		1.25	1116.71	930.00	186.71	80.91
61		3.75	1116.10	950.00	166.10	71.98
62		8.25	1118.12	850.00	268.12	116.18
63		2.50	1118.03	880.00	238.03	103.15
64		5.00	1058.67	951.00	107.67	46.66
65		4.75	1025.02	788.00	237.02	102.71
66		1.50	1024.96	850.00	174.96	75.82
67		1.75	1025.61	800.00	225.61	97.76
68		8.50	1058.83	902.00	156.83	67.96
69		9.75	1063.70	790.00	273.70	118.60

70	2.25	1063.15	867.00	196.15	85.00
71	3.75	989.74	730.00	259.74	112.55
72	8.50	1053.77	836.00	217.77	94.37
73	7.25	1064.78	862.00	202.78	87.87
74	6.50	1064.47	910.00	154.47	66.94
75	6.25	1028.91	710.00	318.91	138.19
76	19.75	987.98	750.00	237.98	103.12
77	1.50	1028.83	796.00	232.83	100.89
78	0.00	1028.83	800.00	228.83	99.16
79	3.25	1028.24	770.00	258.24	111.90
80	4.25	1163.58	960.00	203.58	88.22
81	1.50	1028.03	800.00	228.03	98.81
82	6.50	1152.44	800.00	352.44	152.73
83	2.75	942.64	670.00	272.64	118.14
84	13.50	1076.59	960.00	116.59	50.52
85	3.50	941.43	654.00	287.43	124.55
86	1.50	941.40	650.00	291.40	126.28
87	0.75	942.64	660.00	282.64	122.48
88	2.50	1016.07	740.00	276.07	119.63
89	2.50	1016.03	700.00	316.03	136.95
90	1.50	1016.29	785.00	231.29	100.23
91	7.50	1149.46	820.00	329.46	142.76
92	1.25	1161.92	950.00	211.92	91.83
93	17.75	1154.18	775.00	379.18	164.31
94	3.75	1153.83	830.00	323.83	140.33
95	102.50	1149.18	830.00	319.18	138.31
96	38.50	1311.31	1068.00	243.31	105.43
97	2.50	1016.47	800.00	216.47	93.80
98	1.50	1310.84	1050.00	260.84	113.03
99	2.00	885.83	730.00	155.83	67.52
100	8.75	1014.94	860.00	154.94	67.14
101	14.25	1015.02	864.00	151.02	65.44
102	14.25	935.20	812.00	123.20	53.39
103	12.50	830.14	671.00	159.14	68.96
104	5.00	1007.73	700.00	307.73	133.35
105	8.75	921.16	820.00	101.16	43.83
106	6.25	920.88	770.00	150.88	65.38
107	6.25	920.84	814.00	106.84	46.30
108	8.75	921.64	808.00	113.64	49.25
109	2.00	931.18	710.00	221.18	95.85
110	5.75	920.00	755.00	165.00	71.50
111	1.75	919.53	800.00	119.53	51.80
112	16.00	782.40	693.00	89.40	38.74
113	7.25	766.11	720.00	46.11	19.98
114	7.25	762.23	700.00	62.23	26.97
115	7.50	1004.70	740.00	264.70	114.70
116	4.00	1009.46	901.00	108.46	47.00
117	4.75	1009.52	800.00	209.52	90.79
118	0.00	1103.31	800.00	303.31	131.43
119	4.50	1014.79	800.00	214.79	93.08
120	3.25	996.24	800.00	196.24	85.04
121	6.50	997.37	900.00	97.37	42.19
122	4.00	1028.38	700.00	328.38	142.30
123	2.25	1010.95	733.00	277.95	120.45
124	2.50	1024.97	830.00	194.97	84.49
125	2.00	1030.85	830.00	200.85	87.03
126	4.25	1035.61	855.00	180.61	78.26
127	4.00	1051.04	900.00	151.04	65.45
128	5.00	1060.58	780.00	280.58	121.59
129	5.75	1063.74	878.00	185.74	80.49
130	4.00	1060.91	920.00	140.91	61.06
131	5.00	1041.98	923.00	118.98	51.56
132	3.50	1029.47	805.00	224.47	97.27
133	8.75	1056.94	853.00	203.94	88.37
134	5.00	1060.95	850.00	210.95	91.41
135	5.00	1061.43	750.00	311.43	134.95
136	3.75	1063.39	835.00	228.39	98.97
137	2.50	1064.54	900.00	164.54	71.30
138	2.00	1105.00	900.00	205.00	88.83
139	4.00	921.20	669.00	252.20	109.29
140	0.00	898.38	708.00	190.38	82.50
141	6.75	892.19	740.00	152.19	65.95



142	0.00	1028.87	785.00	243.87	105.68
143	3.00	1161.50	975.00	186.50	80.82
144	0.00	1035.03	800.00	235.03	101.84
145	7.50	1034.98			
146	12.50	1008.06	853.00	155.06	67.19
147	13.00	1017.22	833.00	184.22	79.83
148	7.50	1027.55	790.00	237.55	102.94
149	8.00	931.74	850.00	81.74	35.42
150	2.50	931.36	850.00	81.36	35.25
151	5.50	928.44	820.00	108.44	46.99
152	12.50	1158.46	750.00	408.46	177.00
153	2.50	1075.30	880.00	195.30	84.63
154	2.00	943.40	691.00	252.40	109.37
155	7.00	943.13	678.00	265.13	114.89
156	9.00	942.71	674.00	268.71	116.44
157	2.25	942.13	659.00	283.13	122.69
158	1.25	941.61	660.00	281.61	122.03
159	1.00	941.42	686.00	255.42	110.68
160	1.00	1013.79	800.00	213.79	92.64
161	3.25	1062.43	875.00	187.43	81.22
162	3.00	1063.59	880.00	183.59	79.56
163	7.00	881.17	680.00	201.17	87.17
164	14.75	895.41	688.00	207.41	89.88
165	12.50	928.42	670.00	258.42	111.98
166	40.50	894.12	680.00	214.12	92.78
167	3.00	1103.45	900.00	203.45	88.16
168	10.00	1042.54	900.00	142.54	61.77
169	2.50	1035.43	720.00	315.43	136.69
170	0.00	1028.83	780.00	248.83	107.82
171	0.00	1002.62	774.00	228.62	99.07
172	0.00	1028.91	715.00	313.91	136.03
173	2.50	1004.72	700.00	304.72	132.05
174	1.75	1028.90	715.00	313.90	136.03
175	4.75	1028.85	785.00	243.85	105.67
176	4.00	1028.83	796.00	232.83	100.89
177	3.00	1028.83	780.00	248.83	107.82
178	4.00	1028.82	800.00	228.82	99.16
179	20.50	882.55	690.00	192.55	83.44
180	8.50	882.15	680.00	202.15	87.60
181	5.00	881.71	675.00	206.71	89.57
182	0.00	882.14	680.00	202.14	87.60
183	7.50	880.90	680.00	200.90	87.06
184	11.25	880.56	669.00	211.56	91.68
185	7.50	881.05	675.00	206.05	89.29
186	22.50	880.64	680.00	200.64	86.94
187	2.50	880.52			
188	0.00	880.51	740.00	140.51	60.89
189	7.50	880.53	669.00	211.53	91.66
190	6.25	880.51	708.00	172.51	74.75
191	2.50	880.51	708.00	172.51	74.75
192	0.00	880.51	740.00	140.51	60.89
193	1.00	1013.03	820.00	193.03	83.65
194	0.00	1103.31	775.00	328.31	142.27
195	1.50	1009.41	750.00	259.41	112.41
196	1.50	1004.16	720.00	284.16	123.14
197	5.00	1004.85	680.00	324.85	140.77
198	2.75	880.29	673.00	207.29	89.82
199	0.50	1004.10	680.00	324.10	140.44
200	3.75	880.40	650.00	230.40	99.84
201	2.50	880.03			
202	1.00	1014.07	720.00	294.07	127.43
203	0.25	879.72	660.00	219.72	95.21
204	3.75	879.57	738.00	141.57	61.35
205	1.25	879.51	685.00	194.51	84.29
206	2.00	880.35	660.00	220.35	95.48
207	1.50	893.00	740.00	153.00	66.30
208	0.75	885.49	740.00	145.49	63.04
209	1.50	890.10	693.00	197.10	85.41
210	1.50	889.64	680.00	209.64	90.84
211	0.75	889.63	660.00	229.63	99.50
212	5.50	897.29	700.00	197.29	85.49
213	2.50	1015.28	787.00	228.28	98.92

214	3.50	1032.20	900.00	132.20	57.28
215	6.00	1035.33	767.00	268.33	116.28
216	4.50	1033.58	759.00	274.58	118.98
217	0.75	1033.57	760.00	273.57	118.55
218	2.50	1034.64	785.00	249.64	108.18
219	1.50	1104.50	900.00	204.50	88.62
220	1.25	1034.61	800.00	234.61	101.67
221	4.25	1051.65	837.00	214.65	93.02
222	4.25	1052.52	809.00	243.52	105.53
223	1.75	1004.10	700.00	304.10	131.78
224	4.00	1009.24	770.00	239.24	103.67
225	1.75	1009.26	830.00	179.26	77.68
226	12.00	1178.05	960.00	218.05	94.49
227	0.50	1177.45	1000.00	177.45	76.90
228	3.00	1177.45	951.00	226.45	98.13
229	0.75	1177.94	990.00	187.94	81.44
230	0.75	1177.32	900.00	277.32	120.17
231	3.00	1177.32	949.00	228.32	98.94
232	0.75	1177.31	830.00	347.31	150.50
233	4.25	1173.61	920.00	253.61	109.90
234	2.75	1173.08	750.00	423.08	183.33
235	4.75	1174.43	1010.00	164.43	71.25
236	1.50	1173.13	830.00	343.13	148.69
237	3.75	1173.14	830.00	343.14	148.69
238	3.50	1180.99	1020.00	160.99	69.76
239	2.00	1174.31	955.00	219.31	95.03
240	6.25	1177.65	994.00	183.65	79.58
241	4.50	1177.25	850.00	327.25	141.81
242	3.25	1177.48	870.00	307.48	133.24
243	2.75	1177.49	880.00	297.49	128.91
244	10.00	1179.92	950.00	229.92	99.63
245	1.00	1177.48	930.00	247.48	107.24
246	3.25	1177.68	1000.00	177.68	76.99
247	2.75	1176.68	1019.00	157.68	68.33
248	3.50	1175.69	970.00	205.69	89.13
249	1.25	1173.48	1000.00	173.48	75.18
250	4.00	1173.20	870.00	303.20	131.39
251	3.25	1173.08	800.00	373.08	161.67
252	0.75	1177.45	1020.00	157.45	68.23
253	5.00	1177.49	790.00	387.49	167.91
254	7.75	1177.59	818.00	359.59	155.82
255	5.00	1177.77	870.00	307.77	133.37
256	2.75	1177.90	950.00	227.90	98.76
257	7.25	1174.31	879.00	295.31	127.97
258	5.25	1174.39	918.00	256.39	111.10
259	4.50	1117.10	870.00	247.10	107.08
260	0.00	1064.54	920.00	144.54	62.64
261	0.00	1064.54	800.00	264.54	114.64
262	0.00	1002.76	780.00	222.76	96.53
263	1.50	1064.35	800.00	264.35	114.55
264	0.75	1172.09	790.00	382.09	165.57
265	2.75	1172.11	790.00	382.11	165.58
266	3.00	1172.47	804.00	368.47	159.67
267	0.00	1153.83	930.00	223.83	96.99
268	0.00	1153.83	880.00	273.83	118.66
269	0.75	1310.56	1050.00	260.56	112.91
270	2.25	1112.09	800.00	312.09	135.24
271	1.50	941.68	661.00	280.68	121.63
272	0.00	941.68	850.00	91.68	39.73
273	0.00	1020.28	850.00	170.28	73.79
274	2.75	1033.27	780.00	253.27	109.75
275	2.50	1032.06	900.00	132.06	57.22
276	0.00	1119.09	850.00	269.09	116.61
277	3.00	1109.90	1000.00	109.90	47.62
278	2.25	1106.28	900.00	206.28	89.39
279	6.25	1118.83	850.00	268.83	116.49
280	7.50	1009.63	855.00	154.63	67.01
281	2.00	1009.08	855.00	154.08	66.77
282	2.25	1112.20	900.00	212.20	91.95
283	5.00	1035.04	770.00	265.04	114.85
284	1.75	1065.69	770.00	295.69	128.13
285	0.00	1066.85	770.00	296.85	128.64



286	5.75	1065.36	750.00	315.36	136.66
287	1.50	1064.32	750.00	314.32	136.20
288	0.00	1005.05	770.00	235.05	101.85
289	0.00	1003.16	774.00	229.16	99.30
290	17.75	988.09	750.00	238.09	103.17
291	0.00	1002.74	810.00	192.74	83.52
292	18.25	988.06	750.00	238.06	103.16
293	0.00	990.73	750.00	240.73	104.32
294	0.00	1002.69	780.00	222.69	96.50
295	1.00	1014.80	700.00	314.80	136.41
296	1.50	987.98	770.00	217.98	94.46
297	10.25	1166.62	900.00	266.62	115.54
298	0.50	987.60	770.00	217.60	94.29
299	2.00	1017.63	703.00	314.63	136.34
300	4.25	1025.75	700.00	325.75	141.16
301	1.25	1028.91	710.00	318.91	138.19
302	0.00	1034.99	765.00	269.99	117.00
303	0.00	1012.63	820.00	192.63	83.47
304	8.00	1163.79	940.00	223.79	96.98
305	4.00	1020.28	690.00	330.28	143.12
306	1.75	1035.07			
307	0.00	1035.00	1016.00	19.00	8.23
308	0.00	932.99	675.00	257.99	111.79
309	0.00	947.42	688.00	259.42	112.41
310	0.00	947.18	690.00	257.18	111.45
311	0.00	939.53	660.00	279.53	121.13
312	5.50	1315.26	1084.00	231.26	100.21
313	5.50	1064.45	860.00	204.45	88.60
314	1.50	1010.27	810.00	200.27	86.78
315	1.25	1177.25	1054.00	123.25	53.41
316	10.50	1126.55	900.00	226.55	98.17
317	8.75	1129.51	915.00	214.51	92.95
318	2.25	1126.48	1020.00	106.48	46.14
319	8.25	1127.44	1000.00	127.44	55.22
320	2.00	1127.37	950.00	177.37	76.86
321	1.50	1028.05	800.00	228.05	98.82
322	2.50	1159.77	850.00	309.77	134.23
323	0.75	1028.02	820.00	208.02	90.14
324	38.25	885.18	700.00	185.18	80.25
325	1.25	885.17	700.00	185.17	80.24
326	37.50	888.24	675.00	213.24	92.41
327	13.00	884.16	760.00	124.16	53.80
328	0.00	999.96	670.00	329.96	142.98
329	1.50	782.36	700.00	82.36	35.69
330	0.25	782.33	740.00	42.33	18.34
331	4.00	884.13	740.00	144.13	62.46
332	3.00	1016.71	840.00	176.71	76.58
333	0.50	782.33	738.00	44.33	19.21
334	0.50	1064.24	950.00	114.24	49.50
335	2.00	1063.19	870.00	193.19	83.72
336	0.00	1064.33	940.00	124.33	53.88
337	0.25	1173.13	920.00	253.13	109.69
338	0.75	1177.45	1000.00	177.45	76.90
339	11.25	887.26	700.00	187.26	81.15
340	1.25	887.26	710.00	177.26	76.81
341	3.00	1134.50	880.00	254.50	110.28
342	0.00	1009.31	835.00	174.31	75.53
343	2.00	1005.83	875.00	130.83	56.69
344	0.00	1016.22	770.00	246.22	106.69
345	2.50	1116.05	960.00	156.05	67.62
346	2.50	1116.02	1040.00	76.02	32.94
347	0.25	1016.18	850.00	166.18	72.01
348	4.75	1167.86	910.00	257.86	111.74
349	0.25	1016.18	900.00	116.18	50.34
350	0.00	1009.66	700.00	309.66	134.18
351	0.00	1020.11	760.00	260.11	112.71
352	0.00	1024.17	900.00	124.17	53.81
353	2.50	1009.64	700.00	309.64	134.18
354	0.00	1024.58	1000.00	24.58	10.65
355	0.00	1024.79	1000.00	24.79	10.74
356	0.50	1177.49	790.00	387.49	167.91
357	0.50	1177.51	915.00	262.51	113.75

358	1.00	1177.64	930.00	247.64	107.31
359	0.50	1177.62	980.00	197.62	85.63
360	0.00	1177.61	940.00	237.61	102.96
361	0.00	1177.59	1000.00	177.59	76.96
362	0.00	1177.56	880.00	297.56	128.94
363	0.50	1177.54	950.00	227.54	98.60
364	0.50	1177.50	770.00	407.50	176.58
365	0.00	1148.44	820.00	328.44	142.33
366	0.75	1016.14	750.00	266.14	115.33
367	1.00	943.05	700.00	243.05	105.32
368	0.75	1016.13	830.00	186.13	80.66
369	0.00	1156.29	990.00	166.29	72.06
370	187.50	1140.03	990.00	150.03	65.01
371	1.00	1163.79	950.00	213.79	92.64
372	3.25	1076.59	950.00	126.59	54.86
373	187.50	1106.63	900.00	206.63	89.54
374	2.50	1015.71	780.00	235.71	102.14
375	0.00	1015.74	780.00	235.74	102.15
376	0.00	1035.00	1016.00	19.00	8.23
377	0.00	1002.82	780.00	222.82	96.56
378	0.00	988.77	750.00	238.77	103.47
379	0.75	943.04	720.00	223.04	96.65
380	1.00	988.08	780.00	208.08	90.17
381	6.25	1330.88			
382	1.75	1015.73	800.00	215.73	93.48
383	0.50	942.52	700.00	242.52	105.09
384	2.25	942.52	680.00	262.52	113.76
385	2.00	931.29	848.00	83.29	36.09
386	0.75	920.00	750.00	170.00	73.66
387	4.00	1014.09	760.00	254.09	110.11
388	1.00	1014.08	700.00	314.08	136.10
389	0.00	1014.08	650.00	364.08	157.77
390	1.75	891.36	700.00	191.36	82.92
391	0.50	1177.06	840.00	337.06	146.06
392	0.50	1177.05	780.00	397.05	172.06
393	2.00	1177.06	870.00	307.06	133.06
394	2.00	1177.25	920.00	257.25	111.48
395	0.75	884.16	800.00	84.16	36.47
396	1.00	1016.70	850.00	166.70	72.24
397	0.25	1032.06	900.00	132.06	57.22
398	0.50	1010.27	810.00	200.27	86.78
399	7.75	1118.46	850.00	268.46	116.33
400	3.75	879.72	660.00	219.72	95.21
401	1.25	1118.43	900.00	218.43	94.65
402	0.00	884.16	740.00	144.16	62.47
403	0.75	931.18	814.00	117.18	50.78
404	0.00	1014.08	750.00	264.08	114.44
405	0.75	879.71	685.00	194.71	84.38
406	3.75	889.24	740.00	149.24	64.67
407	0.00	895.20	710.00	185.20	80.25
408	1.00	895.20	720.00	175.20	75.92
409	0.00	889.24	710.00	179.24	77.67
410	0.00	885.17	740.00	145.17	62.91
411	0.50	1010.26	900.00	110.26	47.78
412	1.75	995.32	700.00	295.32	127.97
413	13.75	1075.44	910.00	165.44	71.69
414	0.00	1075.44	860.00	215.44	93.36
415	1.25	1027.87	814.00	213.87	92.68
416	1.75	1027.77	860.00	167.77	72.70
417	0.50	1027.79	840.00	187.79	81.37
418	1.25	1027.77	850.00	177.77	77.03
419	0.00	1027.79	790.00	237.79	103.04
420	6.75	1116.97	870.00	246.97	107.02
421	0.75	1116.92	900.00	216.92	94.00
422	2.00	1116.93	900.00	216.93	94.00
423	1.25	996.53	810.00	186.53	80.83
424	1.00	1118.42	1000.00	118.42	51.31
425	0.00	1006.51	770.00	236.51	102.49
426	0.00	1064.44	910.00	154.44	66.92
427	0.00	1006.51	795.00	211.51	91.65
428	0.00	1064.37	840.00	224.37	97.23
429	0.00	1064.41	910.00	154.41	66.91



430	1.00	1064.25	960.00	104.25	45.17
431	1.00	1064.29	890.00	174.29	75.53
432	0.50	1064.24	800.00	264.24	114.50
433	0.50	919.53	700.00	219.53	95.13
434	5.00	919.58	830.00	89.58	38.82
435	1.00	1063.18	875.00	188.18	81.54
436	0.75	880.43	720.00	160.43	69.52
437	0.75	880.44	680.00	200.44	86.86
438	50.00	1016.59	700.00	316.59	137.19
439	3.00	1103.31	800.00	303.31	131.43
440	1.50	1032.16	920.00	112.16	48.60
441	5.00	1114.35	780.00	334.35	144.89
442	0.50	1032.15	920.00	112.15	48.60
443	0.25	1103.27	860.00	243.27	105.42
444	0.25	1103.27	940.00	163.27	70.75
445	0.75	1103.95	960.00	143.95	62.38
446	1.25	1114.62	900.00	214.62	93.00
447	5.00	1113.86	750.00	363.86	157.67
448	0.50	1016.73	720.00	296.73	128.58
449	0.00	1016.67	720.00	296.67	128.56
450	5.00	1173.44	1050.00	123.44	53.49
21a	1.50	1009.48	726.00	283.48	122.84
22a	0.50	1016.92	740.00	276.92	120.00
23a	0.00	1113.69	740.00	373.69	161.93
J-1	4.00	931.26	660.00	271.26	117.55
J-15	0.00	1115.84	880.00	235.84	102.20
J-24	2.50	1114.69	822.00	292.69	126.83
J-25	1.25	1115.24	1040.00	75.24	32.60
J-26	0.00	1115.72	891.00	224.72	97.38
I-Pump-1	0.00	884.80	738.00	146.80	63.62
O-Pump-3	0.00	1067.68	755.00	312.68	135.50
I-Pump-4	0.00	1005.74	875.00	130.74	56.65
I-Pump-5	0.00	829.99	680.00	149.99	65.00
O-Pump-6	0.00	1332.93	835.00	497.93	215.77
O-Pump-7	0.00	1042.87	775.00	267.87	116.08
I-Pump-8	0.00	1009.24	775.00	234.24	101.51
O-Pump-9	0.00	1009.64	700.00	309.64	134.18
I-Pump-10	0.00	1011.07	910.00	101.07	43.80
R-1	----	1000.00	670.00	330.00	143.00
R-2	----	1181.00	1181.00	0.00	0.00
R-3	----	1181.00	1181.00	0.00	0.00
R-4	----	1116.00	1092.00	24.00	10.40
I-RV-1	0.00	999.91	670.00	329.91	142.96
O-RV-2	----	943.85	840.00	103.85	45.00
O-RV-3	----	1112.31	1020.00	92.31	40.00
O-RV-4	----	1016.92	890.00	126.92	55.00
I-RV-5	0.00	947.07	688.00	259.07	112.26
O-RV-6	0.00	1024.79	1016.00	8.79	3.81
I-RV-7	0.00	1113.69	740.00	373.69	161.93
T-2	----	1035.00	1016.00	19.00	8.23
T-3	----	1077.00	960.00	117.00	50.70
T-6	----	1068.00	1040.00	28.00	12.13
T-7	----	1120.00	1090.00	30.00	13.00
T-8	----	940.00	920.00	20.00	8.67
T-9	----	1025.00	998.00	27.00	11.70
T-10	----	1140.00	990.00	150.00	65.00
I-RV-2	0.00	1075.28	840.00	235.28	101.95
I-RV-3	0.00	1310.51	1020.00	290.51	125.89
I-RV-4	0.00	1310.91	890.00	420.91	182.39
O-Pump-5	0.00	947.59	680.00	267.59	115.96
O-Pump-8	0.00	1103.31	775.00	328.31	142.27
O-Pump-1	0.00	1038.17	738.00	300.17	130.08
O-RV-1	----	928.46	670.00	258.46	112.00
I-Pump-7	0.00	892.87	775.00	117.87	51.08
I-Pump-3	0.00	987.57	755.00	232.57	100.78
O-RV-5	----	895.69	688.00	207.69	90.00
O-Pump-4	0.00	1134.60	875.00	259.60	112.49
I-Pump-9	0.00	1009.66	700.00	309.66	134.18
I-RV-6	----	1024.58	1016.00	8.58	3.72
I-Pump-6	0.00	1145.40	835.00	310.40	134.51
O-RV-7	----	1016.92	740.00	276.92	120.00
O-Pump-10	0.00	1167.99	910.00	257.99	111.79

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
O-Pump-6	215.77	I-RV-6	3.72
234	183.33	O-RV-6	3.81
I-RV-4	182.39	T-2	8.23
152	177.00	376	8.23
364	176.58	307	8.23

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
184	4.96	423	0.00
370	4.96	219	0.00
371	4.96	380	0.00
183	4.91	218	0.00
4	4.86	216	0.00

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
115	19.59	219	0.00
417	14.82	380	0.00
416	14.82	218	0.00
11	14.52	216	0.00
13	10.42	283	0.00

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
115	19.59	219	0.00
417	14.82	380	0.00
416	14.82	218	0.00
11	14.52	216	0.00
13	10.42	283	0.00

REGULATING VALVE REPORT

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1	PRV-1	112.00	ACTIVATED	142.96	112.00	1214.20
RV-2	PRV-1	45.00	ACTIVATED	101.95	45.00	37.00
RV-3	PRV-1	40.00	ACTIVATED	125.89	40.00	4.50
RV-4	PRV-1	55.00	ACTIVATED	182.39	55.00	15.00
RV-5	PRV-1	90.00	ACTIVATED	112.26	90.00	597.61
RV-6	PSV	0.50	CLOSED	3.72	3.81	0.00
RV-7	PRV-1	120.00	ACTIVATED	161.93	120.00	51.00



S U M M A R Y   O F   I N F L O W S   A N D   O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES  
 (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	1214.20	
R-2	64.50	
R-3	80.50	
R-4	66.00	
T-2	-41.91	
T-3	70.00	
T-6	179.12	
T-7	79.87	
T-8	387.45	
T-9	450.01	
T-10	-44.24	

NET SYSTEM INFLOW = 2591.65  
 NET SYSTEM OUTFLOW = -86.15  
 NET SYSTEM DEMAND = 2505.50

\*\*\*\*\* HYDRAULIC ANALYSIS COMPLETED \*\*\*\*\*



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NO.	DATE	REVISIONS	BY

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PROJECT MGR:	LRS
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**STARSHADER LANE  
WATER MAIN EXTENSION**

**AERIAL PLAN  
STARSHADER LN**

0060022-11-004  
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PROJECT NO.	11016
SHEET NO.	1
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**STARSHADER LANE  
WATER MAIN EXTENSION**

**AERIAL PLAN  
STARSHADER LN**



PROJECT NO.	11016
SHEET NO.	2
OF 2	

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