

APPENDIX F

IDEQ Correspondence and Rules Interpretation



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON • BOISE, IDAHO 83706 • (208) 373-0502

JAMES E. RISCH, GOVERNOR
TONI HARDESTY, DIRECTOR

TSCPE-237/2006

October 23, 2006

Mr. James M. Rees, P.E.
MTC, Inc.
707 N. 27th Street
Boise, Idaho 83702-3113

RE: Rule Interpretation Changes Affecting July 27, 2006 Comments
Eagle Water System (*Eagle, Ada County*)

Dear Mr. Rees:

Please be advised that DEQ has recently changed our interpretation of the Idaho Rules for Public Drinking Water Systems regarding pumping redundancy and fire flow requirements. Attached is a memorandum setting forth those changes.

DEQ provided you comments regarding the Eagle Water Company Preliminary Engineering Report in a letter from Diane Bacongus to Robert DeShazo dated July 27, 2006. The above rule interpretation changes affect several of the comments in that letter. Eagle Water Company should, therefore, adjust your pending responses to the July 27 letter to take into account these changed interpretations.

Please contact me with any questions at 373-0514, or via e-mail at peter.bair@deq.idaho.gov if you have any questions in this regard.

Sincerely,

Peter S. Bair, P.E.
Technical I Engineer

PSB:slt

Attachment: Burnell memo of October 10, 2006 entitled "Drinking Water Rule Interpretation - Pumping Redundancy and Fire Flow"

C: Tiffany Floyd, Acting Regional Engineering Manager, DEQ Boise Regional Office
Mike Stambulis, P.E., DEQ Technical Services
Monty Marchus, P.E., DEQ Boise Regional Office
Todd Crutcher, E.I.T., DEQ Boise Regional Office
Robert DeShazo, Eagle Water Company, 172 W. State Street, Eagle Idaho 83616
BRO Source File 2
TSCPE Reading File



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON • BOISE, ID 83706-1255 • (208) 373-0502

JAMES E. RISCH, GOVERNOR
TONI HARDESTY, DIRECTOR

MEMORANDUM

TO: Kirby Cole, Lewiston Regional Office Administrator
Mark Dietrick, Pocatello Regional Office Administrator
Gwen Fransen, Coeur d'Alene Regional Office Administrator
Doug Howard, Twin Falls Regional Office Administrator
Jim Johnston, Idaho Falls Regional Office Administrator
Jon Sandoval, Boise Regional Office Administrator

FROM: *Burg 10/6/06*
Barry Burhell, Water Quality Division Administrator

SUBJECT: Drinking Water Rule Interpretation—Pumping Redundancy and Fire Flow

DATE: October 10, 2006

Proposal: The proposed phase 2 drinking water facility standards rule has sections that address pumping redundancy and fire flow. The proposed rule language, as modified in response to public comments during August, separates fire flow requirements from the more general requirement that public water systems be designed with pumping capabilities sufficient to provide peak demands with the largest pump out of service. This memo directs DEQ engineers performing plan and specification reviews for public water systems to use the framework agreed upon in the proposed rule before it becomes final in the spring of 2007.

Current Rule Interpretation: The most literal reading of Recommended Standards for Waterworks (“Ten States”) would require that public water systems be designed with sufficient pumping capacity to supply peak day demand plus fire flow where provided. Any pumping facility within the water system would need to have sufficient redundancy to provide this peak day demand plus fire flow when the largest pump is out of service. DEQ has not been consistent in application and interpretation of this requirement. Most offices have not held to the most literal reading of Ten States. This is understandable by the fact that Ten States makes an assumption that all systems will be designed with storage in the amount of average daily demand. In Idaho, many systems do not install storage and depend upon pumping to supply all of their needs. The challenge of providing fire flow differs substantially between systems that have storage and those that depend on pumping alone.

New Proposed Facility Standards Rule: The proposed rule only requires pumping redundancy for domestic flows. Fire flows are now treated separately in the proposed rule. Public water system owners are allowed to reduce or eliminate redundancy for fire flow systems, if local fire authorities certify that the water system’s fire fighting capabilities are compatible with the water demand of existing and planned fire fighting equipment and fire fighting practices in the area served by the system. The system may be designed to provide slightly lower total flows during a fire event, taking into account the drop in distribution pressure that will occur when fire flow is provided. The proposed rule provides definitions for the terms that refer to design flows and uses these key terms in a consistent manner throughout sections that deal with redundancy criteria.

As a condition for DEQ approval of fire flow designs that do not incorporate full redundancy, the proposed rule language includes a requirement that existing or potential customers be informed of the system’s firefighting capabilities and the acceptance of these capabilities by the local fire authority. Although there was some

opposition to this provision, this requirement is consistent with similar language negotiated for the proposed rule section dealing with standby power. In both situations, the operative principle is that systems that obtain approval for a reduction in reliability or redundancy should be willing to inform customers of this fact. This notification does not need to be stated in negative terms, because the system design is in compliance with regulation. In this interim time, prior to the proposed rule becoming effective, DEQ will waive the notice requirement so long as the system complies with Section 501.17(b)(i), as quoted in the Attachment to this memo. Once the proposed rule becomes effective, the notice requirement must be met as part of the plan review.

Summary: The framework provided in the proposed rule is consistent with past practices in Idaho and allows for system designs that provide a reasonable level of redundancy. The proposed rule establishes a standard for redundancy that is consistent with Ten States and then provides for departures from that standard when doing so is acceptable to the local fire authority and does not compromise the ability of the water system to reliably meet domestic flows. Standardizing around this approach will help to improve consistency in the way these requirements are implemented around the state.

BNB:jt

Attachment

Summary of Proposed Facility Standards Rule Language Dealing with Pumping Redundancy and Fire Flows

1. The terms used to describe design flows in the rule are average day demand, peak hour demand, maximum day demand, and fire flow capacity. These terms may be assigned slightly different meanings in various engineering references. Because these terms are of key importance in interpreting the rule requirements, they are defined as follows.

Average Day Demand. The volume of water used by a system on an average day based on a one (1) year period.

Peak Hour Demand. The highest hourly flow, excluding fire flow, a water system or distribution system pressure zone is likely to experience in the design year.

Maximum Day Demand. The average rate of consumption for the twenty-four (24) hour period in which total consumption is the largest for the design year.

Fire Flow Capacity. The water system capacity, in addition to maximum day demand, that is available for fire fighting purposes within the water system or distribution system pressure zone. Adequacy of the water system fire flow capacity is determined by the local fire authority.

2. The above terms are then used throughout those sections of the rule that deal with redundancy requirements. The pertinent sections are shown below. Highlighting is used to emphasize the key terms. These excerpts may be viewed in context by accessing a copy of the proposed rule through DEQ's website at http://www.deq.idaho.gov/rules/drinking_water/58_0108_0602_proposed.cfm or by calling Tom John at 373-0191.

513. FACILITY AND DESIGN STANDARDS - NUMBER OF GROUND WATER SOURCES REQUIRED. New community water systems served by ground water and constructed after July 1, 1985, or existing community water systems served by ground water that are substantially modified after July, 2002, shall have a minimum of two (2) sources if they are intended to serve more than twenty-five (25) homes or equivalent. Under normal operating conditions, with any source out of service, the remaining source or sources shall be capable of providing either the peak hour demand of the system or maximum day demand plus equalization storage. See section 501.17 for general design requirements concerning fire flow capacity. for the purpose of section 513 only, the department shall consider a system to be "substantially modified" when there is a combined increase of twenty-five percent (25%) or more above the system's existing configuration in the following factors:

541.02. Pumping Units. At least two (2) pumping units shall be provided for raw water and surface source pumps. Pumps using seals containing mercury shall not be used in public drinking water system facilities. With any pump out of service, the remaining pump or pumps shall be capable of providing the peak hour demand or maximum day demand plus equalization storage. See Section 501.17 for general design requirements concerning fire flow capacity. The pumping units shall meet the following requirements: [Remaining language from this subsection is not listed because it does not deal with redundancy]

541.04. c. Each booster pumping station shall contain not less than two (2) pumps with capacities such that peak hour demand, or maximum day demand plus equalization storage, can be satisfied with the largest pump out of service. See Section 501.17 for general design requirements concerning fire flow capacity.

Page 2—Pumping Redundancy and Fire Flows

544.01. **Sizing.** Storage facilities shall have sufficient capacity, as determined from engineering studies that consider peak flows, fire flow capacity, and analysis of the need for various components of finished storage as defined under the term "Components of Finished Water Storage" in Section 003. The requirement for storage may be reduced when the source and treatment facilities have sufficient capacity with standby power to supply peak demand of the system.

3. Finally, a new provision in General Design Considerations (Section 501) to address the requirements and exceptions that apply to fire flow capacity.

501.17. Redundant Fire Flow Capacity.

a. Public water systems that provide fire flow shall be designed to provide maximum day demand plus fire flow instead of peak hour demand plus fire flow. This allowance is made because distribution pressures can be expected to fall during a fire event and overall demand would be less than peak hour. Pumping systems supporting fire flow capacity must be designed so that fire flow may be provided with the largest pump out of service.

b. The requirement for redundant pumping capacity specified in 501.17.a. may be reduced to the extent that storage is provided in sufficient quantity to meet some or all of fire flow demands. Where storage is not provided, the requirement for fire flow pumping redundancy may be reduced or eliminated if the following conditions are met:

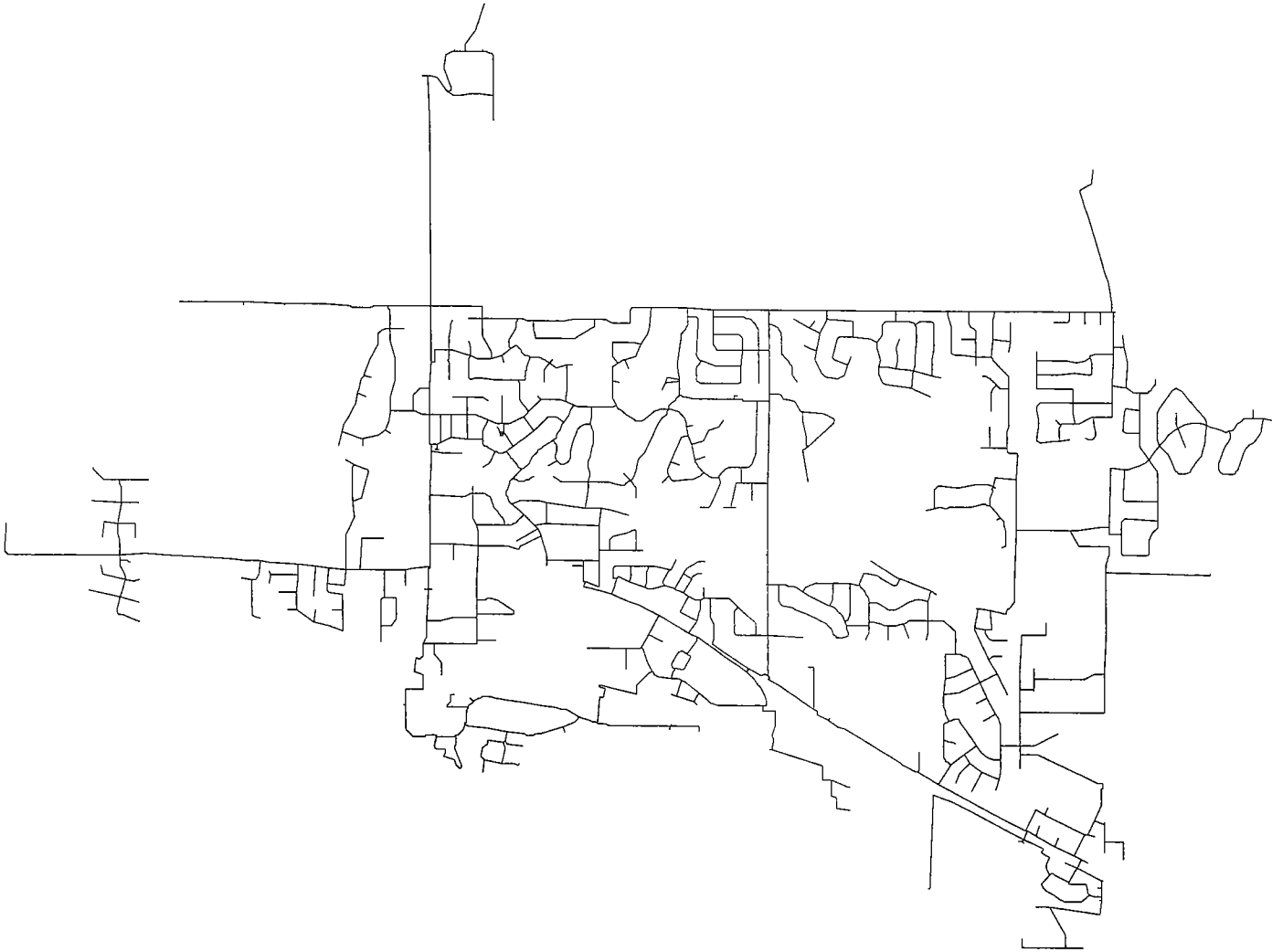
i. The local fire authority states in writing that the fire flow capacity of the system is acceptable and is compatible with the water demand of existing and planned fire fighting equipment and fire fighting practices in the area served by the system.

ii. In a manner appropriate to the system type and situation, positive notification is provided to customers that describes the design of the system's fire fighting capability and explains how it differs from the requirements of 501.17.a. The notice shall indicate that the local fire authority has provided written acceptance of the system's fire flow capacity.

APPENDIX G

Modeling Output

2006 Scenario w/ Approved Developments



Scenario: 2006 APPROVED DEV.

Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-1	false	4.28	0.00	N/A	N/A	N/A	N/A	N/A
J-2	false	9.81	0.00	N/A	N/A	N/A	N/A	N/A
J-3	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-4	true	1.36	1,500.00	1,501.36	79.56	J-416	20.00	3,422.02
J-5	true	2.51	1,500.00	1,502.51	78.68	J-416	20.00	3,327.50
J-6	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-7	false	1.06	0.00	N/A	N/A	N/A	N/A	N/A
J-8	true	94.85	1,500.00	1,594.85	79.50	J-416	20.00	3,280.27
J-9	false	5.50	0.00	N/A	N/A	N/A	N/A	N/A
J-10	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-11	true	0.01	1,500.00	1,500.01	78.61	J-416	20.00	3,259.79
J-12	true	9.76	1,500.00	1,509.76	79.27	J-416	20.00	3,272.41
J-13	true	15.09	1,500.00	1,515.09	78.44	J-416	20.00	3,276.74
J-14	true	4.44	1,500.00	1,504.44	80.23	J-416	20.00	3,270.77
J-15	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-16	false	10.65	0.00	N/A	N/A	N/A	N/A	N/A
J-17	true	6.21	1,500.00	1,506.21	80.27	J-416	20.00	3,246.66
J-18	true	1.78	1,500.00	1,501.78	80.15	J-416	20.00	3,244.73
J-19	false	8.61	0.00	N/A	N/A	N/A	N/A	N/A
J-20	true	5.56	1,500.00	1,505.56	77.29	J-416	20.00	3,238.35
J-21	true	0.00	1,500.00	1,500.00	78.18	J-416	20.00	3,223.87
J-22	true	7.24	1,500.00	1,507.24	78.97	J-416	20.00	3,227.88
J-23	false	11.54	0.00	N/A	N/A	N/A	N/A	N/A
J-24	true	5.46	1,500.00	1,505.46	79.53	J-416	20.00	3,221.46
J-25	true	0.00	1,500.00	1,500.00	77.65	J-416	20.00	3,224.73
J-26	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-27	false	8.88	0.00	N/A	N/A	N/A	N/A	N/A
J-28	true	14.20	1,500.00	1,514.20	78.04	J-416	20.00	3,228.95
J-29	true	12.43	1,500.00	1,512.43	79.94	J-416	20.00	3,237.77
J-30	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-31	false	4.17	0.00	N/A	N/A	N/A	N/A	N/A
J-32	true	11.54	1,500.00	1,511.54	67.30	J-416	20.01	3,234.88
J-33	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-34	true	3.55	1,500.00	1,503.55	59.49	J-416	20.00	3,035.33
J-35	false	10.65	0.00	N/A	N/A	N/A	N/A	N/A
J-36	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-37	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-38	true	3.55	1,500.00	1,503.55	60.77	J-416	20.00	3,242.15
J-39	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-40	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-41	false	3.56	0.00	N/A	N/A	N/A	N/A	N/A
J-42	true	0.00	1,500.00	1,500.00	67.01	J-416	20.00	3,203.78
J-43	true	9.05	1,500.00	1,509.05	70.53	J-416	20.00	3,173.73
J-44	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-45	true	2.66	1,500.00	1,502.66	63.68	J-416	20.00	3,242.36
J-46	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-47	true	4.44	1,500.00	1,504.44	49.22	J-416	20.00	2,249.98
J-48	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A

Title: INITIAL RUN

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01/17/07 11:49:10 AM Bentley Systems, Inc.

Haestad Methods Solution Center

Watertown, CT 06795 USA

+1-203-755-1666

Project Engineer: DMC

WaterCAD v7.0 [07.00.049.00]

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Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-49	false	7.99	0.00	N/A	N/A	N/A	N/A	N/A
J-50	false	7.99	0.00	N/A	N/A	N/A	N/A	N/A
J-51	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-52	true	8.88	1,500.00	1,508.88	24.01	J-416	44.70	1,569.38
J-53	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-54	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-55	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-56	true	6.21	1,500.00	1,506.21	58.65	J-416	20.00	3,205.46
J-57	true	19.53	1,500.00	1,519.53	56.99	J-416	20.00	3,177.84
J-58	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-59	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-60	true	2.57	1,500.00	1,502.57	44.87	J-416	33.46	2,274.69
J-61	true	9.76	1,500.00	1,509.76	59.79	J-416	20.00	3,170.30
J-62	false	9.79	0.00	N/A	N/A	N/A	N/A	N/A
J-63	true	9.79	1,500.00	1,509.79	63.37	J-416	20.01	3,239.27
J-64	false	5.34	0.00	N/A	N/A	N/A	N/A	N/A
J-65	true	12.43	1,500.00	1,512.43	58.73	J-416	21.94	2,950.18
J-66	true	14.20	1,500.00	1,514.20	47.73	J-416	20.00	2,291.70
J-67	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-68	true	26.63	1,500.00	1,526.63	59.28	J-416	20.00	3,156.04
J-69	true	21.30	1,500.00	1,521.30	66.13	J-416	20.00	3,177.60
J-70	false	7.99	0.00	N/A	N/A	N/A	N/A	N/A
J-71	true	17.75	1,500.00	1,517.75	43.64	J-72	20.00	2,049.87
J-72	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-73	false	8.88	0.00	N/A	N/A	N/A	N/A	N/A
J-74	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-75	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-76	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-77	true	3.55	1,500.00	1,503.55	51.77	J-416	20.00	2,895.44
J-78	false	4.44	1,500.00	N/A	N/A	N/A	N/A	N/A
J-79	false	9.76	0.00	N/A	N/A	N/A	N/A	N/A
J-80	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-81	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-83	true	10.65	1,500.00	1,510.65	50.60	J-416	24.32	2,857.33
J-84	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-85	false	1.78	0.00	N/A	N/A	N/A	N/A	N/A
J-86	true	11.54	1,500.00	1,511.54	48.49	J-587	21.69	2,693.99
J-87	false	7.98	0.00	N/A	N/A	N/A	N/A	N/A
J-88	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-89	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-90	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-91	true	7.10	1,500.00	1,507.10	48.42	J-587	22.44	2,540.81
J-92	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-93	false	5.33	0.00	N/A	N/A	N/A	N/A	N/A
J-94	true	3.56	1,500.00	1,503.56	36.15	J-917	20.00	1,845.24
J-95	false	13.31	0.00	N/A	N/A	N/A	N/A	N/A
J-96	false	3.38	0.00	N/A	N/A	N/A	N/A	N/A
J-97	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A

Title: INITIAL RUN

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01/17/07 11:49:10 AM Bentley Systems, Inc.

Haestad Methods Solution Center

Watertown, CT 06795 USA

+1-203-755-1666

Project Engineer: DMC

WaterCAD v7.0 [07.00.049.00]

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Scenario: 2006 APPROVED DEV.

Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-98	false	2.65	0.00	N/A	N/A	N/A	N/A	N/A
J-99	false	3.56	0.00	N/A	N/A	N/A	N/A	N/A
J-100	true	4.18	1,500.00	1,504.18	31.20	J-101	20.00	1,725.72
J-101	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-102	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-103	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-104	true	0.00	1,500.00	1,500.00	47.46	J-917	21.73	2,350.79
J-105	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-106	false	9.77	0.00	N/A	N/A	N/A	N/A	N/A
J-107	false	10.33	0.00	N/A	N/A	N/A	N/A	N/A
J-108	true	7.10	1,500.00	1,507.10	48.48	J-587	20.86	2,515.44
J-109	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-110	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-111	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-112	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-113	false	5.33	0.00	N/A	N/A	N/A	N/A	N/A
J-114	true	5.33	1,500.00	1,505.33	48.79	J-587	22.18	2,651.63
J-115	true	4.44	1,500.00	1,504.44	70.11	J-416	20.00	3,084.28
J-116	true	5.33	1,500.00	1,505.33	50.93	J-587	20.00	2,834.97
J-117	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-118	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-119	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-120	true	7.10	1,500.00	1,507.10	49.97	J-587	20.00	2,651.50
J-121	true	7.10	1,500.00	1,507.10	48.38	J-587	20.02	2,531.50
J-122	false	5.33	0.00	N/A	N/A	N/A	N/A	N/A
J-123	true	12.43	1,500.00	1,512.43	37.38	J-125	20.66	1,991.73
J-124	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-125	true	14.20	1,500.00	1,514.20	23.27	J-126	21.08	1,564.99
J-126	false	2.67	0.00	N/A	N/A	N/A	N/A	N/A
J-127	true	0.00	1,500.00	1,500.00	59.75	J-416	20.00	3,309.29
J-128	true	1.76	1,500.00	1,501.76	39.32	J-917	20.02	2,050.45
J-131	false	2.68	0.00	N/A	N/A	N/A	N/A	N/A
J-132	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-133	false	12.43	0.00	N/A	N/A	N/A	N/A	N/A
J-134	false	10.65	0.00	N/A	N/A	N/A	N/A	N/A
J-135	false	26.74	0.00	N/A	N/A	N/A	N/A	N/A
J-136	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-137	false	1.78	0.00	N/A	N/A	N/A	N/A	N/A
J-138	false	10.65	1,500.00	N/A	N/A	N/A	N/A	N/A
J-139	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-140	true	0.14	1,500.00	1,500.14	66.26	J-416	31.06	2,617.71
J-141	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-142	true	7.10	1,500.00	1,507.10	71.40	J-416	25.15	2,947.84
J-143	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-144	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-145	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-146	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-147	false	6.22	0.00	N/A	N/A	N/A	N/A	N/A

Title: INITIAL RUN

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Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-148	true	9.65	1,500.00	1,509.65	48.50	J-587	20.77	2,659.01
J-149	true	26.64	1,500.00	1,526.64	47.09	J-587	25.37	2,501.92
J-150	false	8.89	1,500.00	N/A	N/A	N/A	N/A	N/A
J-151	true	11.54	1,500.00	1,511.54	49.64	J-587	20.00	2,664.94
J-152	true	12.43	1,500.00	1,512.43	48.88	J-587	20.00	2,657.05
J-153	true	4.44	1,500.00	1,504.44	49.17	J-587	20.00	2,656.06
J-154	true	12.43	1,500.00	1,512.43	69.08	J-416	22.16	2,945.00
J-155	true	15.09	1,500.00	1,515.09	68.53	J-416	20.13	2,786.88
J-156	true	0.00	1,500.00	1,500.00	64.58	J-416	31.38	2,541.19
J-157	false	2.76	0.00	N/A	N/A	N/A	N/A	N/A
J-158	true	22.90	1,500.00	1,522.90	62.26	J-416	41.34	2,498.11
J-159	true	18.64	1,500.00	1,518.64	58.17	J-416	20.00	2,275.22
J-160	true	1.03	1,500.00	1,501.03	78.21	J-416	20.00	3,989.57
J-161	true	12.43	1,500.00	1,512.43	53.40	J-416	20.22	2,163.47
J-162	false	0.89	0.00	N/A	N/A	N/A	N/A	N/A
J-163	true	6.44	1,500.00	1,506.44	78.42	J-416	23.73	3,973.52
J-164	true	14.20	1,500.00	1,514.20	76.16	J-416	20.00	3,470.30
J-165	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-166	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-167	true	6.10	1,500.00	1,506.10	76.66	J-416	20.00	3,417.60
J-168	true	1.25	1,500.00	1,501.25	77.54	J-416	20.00	3,519.41
J-169	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-170	false	5.94	0.00	N/A	N/A	N/A	N/A	N/A
J-171	false	8.88	0.00	N/A	N/A	N/A	N/A	N/A
J-172	true	6.21	1,500.00	1,506.21	79.61	J-416	20.00	3,935.33
J-173	false	2.04	0.00	N/A	N/A	N/A	N/A	N/A
J-174	true	1.79	1,500.00	1,501.79	67.84	J-416	31.84	2,713.50
J-175	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-176	false	4.29	0.00	N/A	N/A	N/A	N/A	N/A
J-177	false	14.30	0.00	N/A	N/A	N/A	N/A	N/A
J-178	false	9.76	0.00	N/A	N/A	N/A	N/A	N/A
J-179	false	24.90	0.00	N/A	N/A	N/A	N/A	N/A
J-180	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-181	false	7.09	0.00	N/A	N/A	N/A	N/A	N/A
J-182	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-183	false	9.76	0.00	N/A	N/A	N/A	N/A	N/A
J-184	true	3.55	1,500.00	1,503.55	99.14	J-416	20.00	3,573.82
J-185	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-186	true	7.10	1,500.00	1,507.10	62.07	J-416	44.70	1,501.00
J-187	true	0.00	1,500.00	1,500.00	99.79	J-416	42.47	3,120.66
J-188	false	9.76	0.00	N/A	N/A	N/A	N/A	N/A
J-189	false	5.33	0.00	N/A	N/A	N/A	N/A	N/A
J-190	false	5.33	0.00	N/A	N/A	N/A	N/A	N/A
J-191	true	3.54	1,500.00	1,503.54	95.20	J-416	20.00	4,783.62
J-192	false	2.02	0.00	N/A	N/A	N/A	N/A	N/A
J-193	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-194	true	4.44	1,500.00	1,504.44	93.96	J-416	20.00	4,621.84
J-195	false	22.21	0.00	N/A	N/A	N/A	N/A	N/A

Title: INITIAL RUN

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Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-196	false	4.45	0.00	N/A	N/A	N/A	N/A	N/A
J-197	true	20.66	1,500.00	1,520.66	86.79	J-416	20.00	4,523.10
J-198	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-199	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-200	false	4.28	0.00	N/A	N/A	N/A	N/A	N/A
J-201	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-202	false	2.66	0.00	N/A	N/A	N/A	N/A	N/A
J-203	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-204	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-205	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-206	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-207	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-208	false	1.78	0.00	N/A	N/A	N/A	N/A	N/A
J-209	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-210	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-211	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-212	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-213	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-214	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-215	false	10.65	0.00	N/A	N/A	N/A	N/A	N/A
J-216	true	7.99	1,500.00	1,507.99	71.98	J-416	20.01	2,993.70
J-217	false	5.33	0.00	N/A	N/A	N/A	N/A	N/A
J-218	true	1.59	1,500.00	1,501.59	77.74	J-416	20.01	3,224.85
J-219	false	22.69	0.00	N/A	N/A	N/A	N/A	N/A
J-220	true	0.00	1,500.00	1,500.00	74.66	J-416	20.00	3,213.61
J-221	true	0.00	1,500.00	1,500.00	71.16	J-416	20.00	3,206.89
J-222	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-223	false	0.44	0.00	N/A	N/A	N/A	N/A	N/A
J-224	true	1.65	1,500.00	1,501.65	70.54	J-416	20.41	3,181.09
J-225	true	4.62	1,500.00	1,504.62	71.03	J-416	20.00	3,191.63
J-226	true	8.88	1,500.00	1,508.88	62.08	J-416	31.64	2,525.58
J-227	true	15.98	1,500.00	1,515.98	63.56	J-416	20.00	2,612.05
J-228	false	11.54	0.00	N/A	N/A	N/A	N/A	N/A
J-229	true	7.10	1,500.00	1,507.10	57.30	J-416	20.00	2,367.91
J-230	true	9.76	1,500.00	1,509.76	56.27	J-416	20.00	2,332.36
J-231	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-232	true	15.11	1,500.00	1,515.11	58.67	J-416	20.00	2,376.70
J-233	true	7.02	1,500.00	1,507.02	58.46	J-416	20.00	2,353.39
J-234	false	11.63	0.00	N/A	N/A	N/A	N/A	N/A
J-235	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-236	false	12.43	0.00	N/A	N/A	N/A	N/A	N/A
J-237	false	0.59	0.00	N/A	N/A	N/A	N/A	N/A
J-238	true	0.83	1,500.00	1,500.83	81.25	J-416	20.00	3,594.61
J-239	false	2.43	0.00	N/A	N/A	N/A	N/A	N/A
J-240	false	23.75	0.00	N/A	N/A	N/A	N/A	N/A
J-241	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-242	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-243	true	6.21	1,500.00	1,506.21	78.92	J-416	20.00	3,460.63

Title: INITIAL RUN

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Scenario: 2006 APPROVED DEV.

Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-244	true	10.65	1,500.00	1,510.65	80.16	J-416	20.00	3,438.30
J-245	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-246	true	8.88	1,500.00	1,508.88	79.96	J-416	20.01	3,449.00
J-247	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-248	true	7.99	1,500.00	1,507.99	78.88	J-416	20.00	3,427.89
J-249	true	5.33	1,500.00	1,505.33	77.69	J-416	20.06	3,446.20
J-250	false	2.93	0.00	N/A	N/A	N/A	N/A	N/A
J-251	true	7.10	1,500.00	1,507.10	77.31	J-416	20.00	3,365.41
J-252	false	1.17	0.00	N/A	N/A	N/A	N/A	N/A
J-253	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-254	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-255	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-256	false	0.23	0.00	N/A	N/A	N/A	N/A	N/A
J-257	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-258	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-259	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-260	true	2.66	1,500.00	1,502.66	41.58	J-587	20.43	2,260.23
J-261	false	1.78	0.00	N/A	N/A	N/A	N/A	N/A
J-262	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-263	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-264	true	8.88	1,500.00	1,508.88	40.52	J-587	20.43	2,183.40
J-265	false	5.33	0.00	N/A	N/A	N/A	N/A	N/A
J-266	true	15.09	1,500.00	1,515.09	38.85	J-267	20.00	2,094.21
J-267	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-268	true	13.31	1,500.00	1,513.31	43.96	J-587	20.00	2,324.69
J-269	true	7.99	1,500.00	1,507.99	43.66	J-587	20.00	2,315.96
J-270	true	10.65	1,500.00	1,510.65	43.26	J-587	20.02	2,213.29
J-271	true	2.25	1,500.00	1,502.25	41.27	J-587	20.00	2,142.19
J-272	false	7.99	0.00	N/A	N/A	N/A	N/A	N/A
J-273	true	7.99	1,500.00	1,507.99	39.94	J-587	20.00	2,146.88
J-274	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-275	true	9.76	1,500.00	1,509.76	40.98	J-587	20.00	2,212.58
J-276	true	13.31	1,500.00	1,513.31	39.01	J-587	20.01	2,118.08
J-277	false	12.43	0.00	N/A	N/A	N/A	N/A	N/A
J-278	true	17.75	1,500.00	1,517.75	38.97	J-587	23.06	2,183.04
J-279	false	4.07	0.00	N/A	N/A	N/A	N/A	N/A
J-280	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-281	false	5.70	0.00	N/A	N/A	N/A	N/A	N/A
J-282	false	10.65	0.00	N/A	N/A	N/A	N/A	N/A
J-283	true	3.87	1,500.00	1,503.87	34.95	J-416	20.03	1,577.52
J-284	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-285	true	0.00	1,500.00	1,500.00	37.57	J-416	20.04	1,577.43
J-286	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-287	true	9.76	1,500.00	1,509.76	53.39	J-416	20.00	1,577.89
J-288	true	14.20	1,500.00	1,514.20	52.70	J-416	20.00	1,577.89
J-289	true	6.21	1,500.00	1,506.21	51.59	J-416	20.00	1,577.90
J-290	true	4.44	1,500.00	1,504.44	45.45	J-416	20.05	1,577.34
J-291	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A

Title: INITIAL RUN

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Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-292	false	7.99	0.00	N/A	N/A	N/A	N/A	N/A
J-293	false	5.02	0.00	N/A	N/A	N/A	N/A	N/A
J-294	false	7.33	0.00	N/A	N/A	N/A	N/A	N/A
J-295	true	2.93	1,500.00	1,502.93	83.02	J-416	20.01	3,874.62
J-296	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-297	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-298	true	0.00	1,500.00	1,500.00	50.08	J-416	20.05	1,582.79
J-299	false	6.21	0.00	N/A	N/A	N/A	N/A	N/A
J-300	false	0.89	0.00	N/A	N/A	N/A	N/A	N/A
J-301	false	8.88	0.00	N/A	N/A	N/A	N/A	N/A
J-302	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-303	true	0.00	1,500.00	1,500.00	51.24	J-416	20.00	1,583.43
J-304	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-305	true	13.31	1,500.00	1,513.31	52.16	J-416	20.00	1,583.42
J-306	true	14.20	1,500.00	1,514.20	53.90	J-416	20.00	1,583.42
J-307	true	9.76	1,500.00	1,509.76	55.86	J-416	20.00	1,583.43
J-308	true	9.76	1,500.00	1,509.76	52.56	J-416	20.00	1,573.16
J-309	true	15.09	1,500.00	1,515.09	58.52	J-416	20.00	1,596.59
J-310	true	23.08	1,500.00	1,523.08	58.06	J-416	20.00	1,605.33
J-311	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-312	false	250.71	0.00	N/A	N/A	N/A	N/A	N/A
J-313	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-314	true	0.00	1,500.00	1,500.00	49.90	J-416	20.05	1,582.71
J-315	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-316	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-317	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-318	true	13.31	1,500.00	1,513.31	69.41	J-416	20.00	3,186.67
J-319	false	12.43	0.00	N/A	N/A	N/A	N/A	N/A
J-320	false	10.66	0.00	N/A	N/A	N/A	N/A	N/A
J-321	true	16.87	1,500.00	1,516.87	65.92	J-416	20.00	1,623.57
J-322	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-323	true	7.99	1,500.00	1,507.99	72.84	J-416	20.01	2,836.88
J-325	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-326	true	0.00	1,500.00	1,500.00	81.56	J-416	20.01	3,459.70
J-327	false	7.99	0.00	N/A	N/A	N/A	N/A	N/A
J-328	true	4.44	1,500.00	1,504.44	52.12	J-416	39.17	2,085.66
J-329	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-330	true	6.11	1,500.00	1,506.11	74.02	J-416	22.13	3,349.61
J-331	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-332	false	9.76	0.00	N/A	N/A	N/A	N/A	N/A
J-333	false	0.94	0.00	N/A	N/A	N/A	N/A	N/A
J-334	true	9.76	1,500.00	1,509.76	77.07	J-416	20.03	3,351.55
J-335	false	7.99	0.00	N/A	N/A	N/A	N/A	N/A
J-336	true	7.10	1,500.00	1,507.10	77.50	J-416	20.02	3,350.17
J-337	true	7.10	1,500.00	1,507.10	77.82	J-416	20.00	3,321.35
J-338	true	5.33	1,500.00	1,505.33	77.54	J-416	20.00	3,342.70
J-339	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A
J-340	false	3.55	0.00	N/A	N/A	N/A	N/A	N/A

Title: INITIAL RUN

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Project Engineer: DMC

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Scenario: 2006 APPROVED DEV.

Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-341	true	6.21	1,500.00	1,506.21	76.60	J-416	20.00	3,183.37
J-342	false	4.44	0.00	N/A	N/A	N/A	N/A	N/A
J-343	true	6.21	1,500.00	1,506.21	76.16	J-416	20.00	3,086.69
J-344	true	8.88	1,500.00	1,508.88	73.10	J-416	20.00	2,915.62
J-345	false	11.11	0.00	N/A	N/A	N/A	N/A	N/A
J-346	true	5.86	1,500.00	1,505.86	52.51	J-416	20.05	1,577.32
J-347	true	4.44	1,500.00	1,504.44	48.55	J-416	20.05	1,577.33
J-348	false	12.43	0.00	N/A	N/A	N/A	N/A	N/A
J-349	false	7.10	0.00	N/A	N/A	N/A	N/A	N/A
J-350	true	7.10	1,500.00	1,507.10	48.50	J-416	20.05	1,577.32
J-351	false	7.99	1,500.00	N/A	N/A	N/A	N/A	N/A
J-352	false	12.43	1,500.00	N/A	N/A	N/A	N/A	N/A
J-353	true	3.55	1,500.00	1,503.55	47.68	J-416	24.73	1,501.00
J-354	true	11.55	1,500.00	1,511.55	40.79	J-416	20.00	1,559.26
J-355	false	6.21	1,500.00	N/A	N/A	N/A	N/A	N/A
J-356	false	5.33	1,500.00	N/A	N/A	N/A	N/A	N/A
J-357	true	10.65	1,500.00	1,510.65	37.78	J-416	20.00	1,547.26
J-358	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-359	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-360	true	0.00	1,500.00	1,500.00	21.08	J-416	25.14	1,512.09
J-361	true	0.00	1,500.00	1,500.00	97.20	J-416	29.62	5,000.00
J-364	false	5.30	1,500.00	N/A	N/A	N/A	N/A	N/A
J-365	false	0.88	1,500.00	N/A	N/A	N/A	N/A	N/A
J-366	false	2.76	1,500.00	N/A	N/A	N/A	N/A	N/A
J-367	false	9.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-368	false	6.54	1,500.00	N/A	N/A	N/A	N/A	N/A
J-369	false	1.05	1,500.00	N/A	N/A	N/A	N/A	N/A
J-370	true	0.00	1,500.00	1,500.00	66.07	J-416	30.79	2,949.59
J-371	false	17.34	1,500.00	N/A	N/A	N/A	N/A	N/A
J-372	true	8.69	1,500.00	1,508.69	77.65	J-416	20.01	3,280.38
J-373	false	2.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-374	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-375	false	0.66	1,500.00	N/A	N/A	N/A	N/A	N/A
J-376	false	13.76	1,500.00	N/A	N/A	N/A	N/A	N/A
J-377	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-378	false	11.22	1,500.00	N/A	N/A	N/A	N/A	N/A
J-379	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-380	false	12.03	1,500.00	N/A	N/A	N/A	N/A	N/A
J-381	true	1.48	1,500.00	1,501.48	56.91	J-416	29.93	2,697.75
J-382	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-383	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-384	true	5.14	1,500.00	1,505.14	79.60	J-416	20.01	3,260.30
J-385	true	0.86	1,500.00	1,500.86	74.90	J-416	20.00	3,214.54
J-386	true	16.22	1,500.00	1,516.22	76.74	J-416	20.01	3,253.21
J-387	false	1.58	1,500.00	N/A	N/A	N/A	N/A	N/A
J-388	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-389	true	0.00	1,500.00	1,500.00	77.01	J-416	20.01	3,216.41
J-390	false	0.20	1,500.00	N/A	N/A	N/A	N/A	N/A

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Project Engineer: DMC

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Scenario: 2006 APPROVED DEV.

Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-391	true	0.00	1,500.00	1,500.00	51.38	J-416	39.31	2,043.20
J-392	true	7.09	1,500.00	1,507.09	75.85	J-416	20.00	3,216.67
J-393	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-394	true	0.00	1,500.00	1,500.00	76.07	J-416	20.00	3,218.01
J-395	true	0.98	1,500.00	1,500.98	75.59	J-416	20.01	3,220.56
J-396	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-397	false	0.31	1,500.00	N/A	N/A	N/A	N/A	N/A
J-398	true	0.00	1,500.00	1,500.00	78.07	J-416	20.00	3,215.76
J-399	true	16.87	1,500.00	1,516.87	76.33	J-416	20.01	3,212.87
J-400	true	12.26	1,500.00	1,512.26	74.99	J-416	20.00	3,211.98
J-401	true	0.00	1,500.00	1,500.00	74.31	J-416	20.01	3,210.42
J-402	true	2.25	1,500.00	1,502.25	75.99	J-416	20.01	3,213.80
J-403	true	0.00	1,500.00	1,500.00	76.37	J-416	20.01	3,214.20
J-404	true	0.39	1,500.00	1,500.39	72.49	J-416	20.00	3,212.54
J-405	false	3.34	1,500.00	N/A	N/A	N/A	N/A	N/A
J-406	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-407	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-408	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-409	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-410	false	9.76	1,500.00	N/A	N/A	N/A	N/A	N/A
J-411	true	6.98	1,500.00	1,506.98	52.94	J-416	20.00	3,095.75
J-412	true	11.54	1,500.00	1,511.54	61.14	J-416	20.00	3,123.63
J-413	true	4.44	1,500.00	1,504.44	62.79	J-416	20.00	3,136.88
J-414	true	3.54	1,500.00	1,503.54	30.12	J-416	20.04	1,536.58
J-415	true	7.99	1,500.00	1,507.99	29.04	J-416	20.04	1,533.52
J-416	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-417	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-418	true	9.76	1,500.00	1,509.76	58.88	J-416	20.00	2,280.05
J-419	true	7.10	1,500.00	1,507.10	58.67	J-416	20.00	2,277.39
J-420	false	11.54	1,500.00	N/A	N/A	N/A	N/A	N/A
J-421	true	14.21	1,500.00	1,514.21	49.70	J-416	20.00	2,142.06
J-422	true	0.00	1,500.00	1,500.00	50.67	J-416	20.43	2,174.09
J-423	false	4.44	1,500.00	N/A	N/A	N/A	N/A	N/A
J-424	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-425	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-426	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-427	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-428	false	0.53	1,500.00	N/A	N/A	N/A	N/A	N/A
J-429	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-430	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-431	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-432	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-433	false	0.00	1,500.00	N/A	N/A	N/A	N/A	N/A
J-434	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-435	false	1.78	1,500.00	N/A	N/A	N/A	N/A	N/A
J-436	true	3.55	1,500.00	1,503.55	57.66	J-416	20.00	2,424.12
J-437	true	1.78	1,500.00	1,501.78	54.13	J-416	27.53	2,260.92
J-438	false	1.78	0.00	N/A	N/A	N/A	N/A	N/A

Scenario: 2006 APPROVED DEV.

Fire Flow Analysis

Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Base Flow (gpm)	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Calculated Residual Pressure @ Total Flow Needed (psi)	Calculated Minimum Zone Junction @ Total Flow Needed	Calculated Minimum Zone Pressure (psi)	Available Fire Flow (gpm)
J-439	true	1.78	1,500.00	1,501.78	31.60	J-416	37.27	1,668.59
J-440	true	0.74	1,500.00	1,500.74	40.88	J-416	27.06	1,852.38
J-441	false	10.18	0.00	N/A	N/A	N/A	N/A	N/A
J-442	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-443	true	6.89	2,500.00	2,506.89	53.40	J-587	20.00	3,251.02
J-444	true	0.66	1,500.00	1,500.66	77.49	J-416	20.01	3,249.08
J-445	false	0.10	0.00	N/A	N/A	N/A	N/A	N/A
J-446	true	7.96	1,500.00	1,507.96	77.00	J-416	20.01	3,247.00
J-447	true	0.00	1,500.00	1,500.00	76.41	J-416	20.01	3,245.08
J-448	true	0.00	1,500.00	1,500.00	72.66	J-416	20.22	3,146.82
J-449	true	1.14	1,500.00	1,501.14	71.47	J-416	20.65	3,018.35
J-450	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-451	true	0.00	2,500.00	2,500.00	55.35	J-587	20.01	3,242.76
J-452	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-453	true	0.11	1,500.00	1,500.11	76.00	J-416	20.01	3,241.88
J-454	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-455	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-456	true	1.68	1,500.00	1,501.68	75.42	J-416	20.01	3,239.10
J-457	true	0.00	1,500.00	1,500.00	75.33	J-416	20.01	3,236.50
J-458	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-459	true	0.22	1,500.00	1,500.22	72.28	J-416	21.17	3,182.72
J-460	true	0.01	2,500.00	2,500.01	46.28	J-587	20.00	3,194.32
J-461	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-462	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-463	true	0.00	1,500.00	1,500.00	65.23	J-416	31.14	2,622.80
J-464	true	0.50	1,500.00	1,500.50	66.87	J-416	21.51	2,728.81
J-465	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-466	true	0.00	1,500.00	1,500.00	69.04	J-416	20.00	2,887.07
J-467	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-468	true	0.03	1,500.00	1,500.03	61.82	J-416	32.41	2,455.34
J-469	true	0.06	2,500.00	2,500.06	29.72	J-470	20.01	2,702.44
J-470	true	0.01	1,500.00	1,500.01	63.30	J-416	28.29	2,531.48
J-471	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-472	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-473	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-474	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-475	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-476	true	0.02	1,500.00	1,500.02	67.88	J-416	29.71	2,711.49
J-477	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-478	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-479	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-480	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-481	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-482	true	0.00	1,500.00	1,500.00	76.63	J-416	20.00	3,233.76
J-483	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-484	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A
J-485	true	0.00	1,500.00	1,500.00	74.82	J-416	20.00	3,233.90
J-486	false	0.00	0.00	N/A	N/A	N/A	N/A	N/A

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