

TEMPORARY CHANGE ADDENDUM
FORM 606-TCA

**APPLICATION FOR CHANGE OF A WATER RIGHT
TEMPORARY CHANGE ADDENDUM**

§ 85-2-407; § 85-2-408; § 85-2-436, MCA
ARM 36.12.1901

This addendum must be completed and the required information attached to a change application when a temporary change is requested under the statutes shown above. A temporary change can be made to a point of diversion, place of use, purpose of use, or place of storage of a water right. Complete an addendum for each water right that is proposed to be temporarily changed.

On a separate attachment provide the following information. Attachments must be labeled as shown in the sections below. (i.e. TCA.1.a) If a section is not applicable, label the section as Not Applicable or NA. Improperly labeled attachments will not be considered. Conclusions, calculations, references, data, and assumptions used must be included in the application materials.

Water Right No. 41P 192877 00 and 41P 192879 00

Complete this form for each water right being changed.

Section 1. Temporary Change Details

TCA.1.a Who is the owner of the water right?
City of Shelby

TCA.1.b Yes No Is the owner of record changing the water right for another's use? If no, explain whose use is it being changed for?
The water right use will remain as municipal beneficial use. The water right will be changed to change the places of use (service area) and points of diversion.

TCA.1.c How many years will the water right will be temporarily changed? 10 years

TCA.1.d Yes No Will the temporary change will be intermittent over the years? If yes, explain how it will be used.

TCA.1.e For what purpose will the water right be temporarily used?
Municipal water supply until the North Central Montana Regional Water System is operational.

TCA.1.f Yes No Is the quantity of water subject to the temporary change being made available from the development of a new water conservation or storage project? If yes, explain the water conservation or storage project.

WELL LOGS

31 N 22 W 21 ED - 1002

Copy of log of Shelby No. 5 well

Form W & S 17-1M-443

MONTANA STATE BOARD OF HEALTH
Water and Sewage Division
WELL DRILLER'S REPORT

Top of Ground
(Elev. above sea level)
0
to
1 ft.- Soil
to
7 ft. 6 in.-Sand
to
15 ft.-Gravel & Sand
to
18 ft.- Dark Clay
to
36 ft.-Gravel & Sand
to
48 ft. 6 in.-Dark Clay

coded

Registration No. 16

Driller M.M. Ulrich

Address Missoula, Montana

Owner of Well City of Shelby

Exact Location of Well On river bottom about 200 feet from the other well

Water to Be Used for Domestic

Drilling Begun May 29, 1940

Well Finished June 6, 1940

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which the water rises in the well.

Casing Record

Size of Pipe	Kind and Weight of Material Used	From (Feet)	to (Feet)	PERFORATIONS		
				Kind Size	From (Feet)	to (Feet)
15 1/2	L.D. 70 lb. oil well casing	4 Ft. above surface	26 Ft. 2 in. below surface	Screen 28 ft. to 36 ft.	26 ft.	36 ft.

*#5
by Voorheese*

Describe the type of joints in casing Screw

Describe any screens used 6 ft. of 12 1/2 inch pipe above screen- 12 1/2 ft. of 12 1/2 inch pipe below screen. The screen is a Johnson Copper screen

Capacity of Well 500 to 600 G.P.M.
(In Gallons or Barrels)

How Determined Will be tried out with a pump
(Pump, Bailor, Weir, Etc.)

Signed M.M. Ulrich

Date June 10, 1940

(Law and Regulations on Reverse Side)

Show exact depth of bottom.

27581

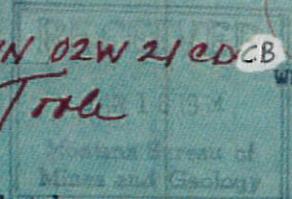
File No. 101 31N 02W 21 R 2 CB

WELL NO. 2

County Toole

TRIPPLICATE

True



STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Top of Ground

(Elev. above sea level 3000)

3100 (2)

Notice of Completion of Groundwater
Appropriation by Means of Well

(Under Chapter 237, Montana Session Laws, 1961)

- to 8' clay
- to 18' clay and gravel
- to 15' gravel sand & water
- to 18 clay & gravel
- to 20 some water
- to 24 loose gravel & water
- to 29' tight gravel, clay & seepage
- to 32' loose gravel some clay
- to 48' shale

Owner City of Shelby #2 Address Box 743, Shelby, Montana

Driller J. M. Ulrich Address Unknown

Date of Notice of Appropriation of Groundwater _____

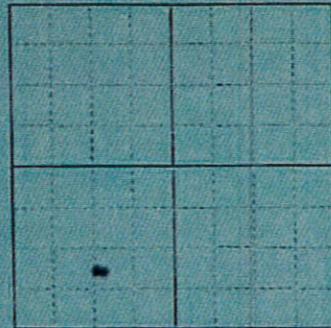
Date well started 9/11/46 Date Completed 10/1/46

Type of well Drilled Equipment Used Drill Rig
(dug, driven, bored or drilled) (Churn, drill, rotary or other)

Water Use: Domestic Municipal Other Irrigation
Industrial Drainage Stock

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which water rises in the well.

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS		
				Kind and Size	From (Feet)	To (Feet)
	15 1/2 I. D.	0	34	5/8 x 1 slots	5/8 13'	13'
	12 1/2 I.D.	32'	46		19'	32'



1/4 Sec. 21 T 31 R 2

Indicate location of well and place of use, if possible. Each small square represents 10 acres.

Show exact depth of bottom.

Static Water Level for non-flowing Well 15 feet.

Shut-in Pressure for Flowing Well _____

Pumping Water Level 30 feet at 300 gal. per minute.

Discharge in gal. per min. of flowing well Not known

How Tested gauge Length of Test Not known

Remarks: (Gravel packing, cementing, packers, type of shutoff, location of place of use of groundwater if not at well, and any other similar pertinent information, including number of acres irrigated, if used for irrigation)

Not known
Driller's License Number

J. M. Ulrich
Driller's Signature

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.

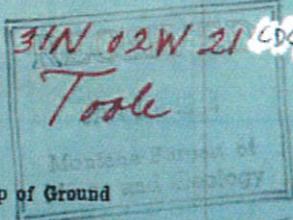
M: 87577

File No. 101 31N 02W 21 CDCB

WELL NO. 3

101 T 31 N R 2 W 21 CDCB

TRIPLICATE



County Toole

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Top of Ground (Elev. above sea level -3094)

Notice of Completion of Groundwater Appropriation by Means of Well

(Under Chapter 237, Montana Session Laws, 1961)

Owner City of Shelby #3 Address Box 743 Shelby, Montana

Driller J. M. Ulrich Address Unknown

Date of Notice of Appropriation of Groundwater Unknown

Date well started 6/27/39 Date Completed 7/7/39

Type of well Drilled Equipment Used Spudder
(dug, driven, bored or drilled) (Churn, drill, rotary or other)

Water Use: Domestic Municipal Other Irrigation
Industrial Drainage Stock

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which water rises in the well.

to 7' top soil
water at 10'
to sand & gravel 22
to 23 sand & clay with some gravel
to 27 gravel & sand
to 30' sand & little fine gravel
to 34' sand & gravel
to 48' shale

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS		
				Kind Size	From (Feet)	To (Feet)
	2 15" 90 lb steel casing	0	24	screen	24'	34'

Static Water Level for non-flowing Well Not known feet.

Shut-in Pressure for Flowing Well Not known

Pumping Water Level Not known feet at Not known gal. per minute.

Discharge in gal. per min. of flowing well Not known

How Tested Not known Length of Test Not known

Remarks: (Gravel packing, cementing, packers, type of shutoff, location of place of use of groundwater if not at well, and any other similar pertinent information, including number of acres irrigated, if used for irrigation)

1/4 Sec. 21 T. 31 R. 2

Indicate location of well and place of use, if possible. Each small square represents 10 acres.

Show exact depth of bottom.

Not known
Driller's License Number

J. M. Ulrich
Driller's Signature

ELEV: 3100 (2)

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triuplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.

M: 37576

File No.

101 31N 02W 21CDBC

WELL NO. 4

1

101 T. 31N R. 2W 21

TRIPLICATE

Toole

County Toole

CDBC

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Notice of Completion of Groundwater
Appropriation by Means of Well

(Under Chapter 237, Montana Session Laws, 1961)

Owner City of Shelby #4 Address Shelby, Montana
Box 743

Driller J. M. Ulrich Address Not known

Date of Notice of Appropriation of Groundwater _____

Date well started 10/3/46 Date Completed 10/12/46

Type of well Drilled Equipment Used spudder
(dug, driven, bored or drilled) (Churn, drill, rotary or other)

Top of Ground _____
(Elev. above sea level 3000)

to 8' clay

to 10' clay & sand

to 15' clay, sand & seepage

to 20' gravel and water

to 25' coarse sand & fine gravel & water

to 30' coarse sand & gravel
clay mixed with water

to 50' shale
Show exact depth of bottom.

Water Use: Domestic Municipal Other Irrigation
Industrial Drainage Stock

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which water rises in the well.

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS		
				Kind Size	From (Feet)	To (Feet)
	15 1/2" ID	0	33'	5/8x3/8	15'	30'
	12 1/2" ID	31'	49' 6"			

Static Water Level for non-flowing Well 19' 6" feet.

Shut-in Pressure for Flowing Well Not known

Pumping Water Level 29' feet at 300 gal. per minute.

Discharge in gal. per min. of flowing well Not known

How Tested Not known Length of Test Not known

Remarks: (Gravel packing, cementing, packers, type of shutoff, location of place of use of groundwater if not at well, and any other similar pertinent information, including number of acres irrigated, if used for irrigation)

1/4 Sec. 21 T. 31 R. 2

Indicate location of well and place of use, if possible. Each small square represents 10 acres.

50' shale
Show exact depth of bottom.

ELEV: 3100 (2)

Not known
Driller's License Number

J. M. Ulrich
Driller's Signature

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate to the Appropriator.

M: 87578

File N 101 31N 02W 21CDBD

WELL NO. 5

101 31N R 2W

TRIPLICATE Toole

County Toole

CDBD

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Notice of Completion of Groundwater
Appropriation by Means of Well

(Under Chapter 237, Montana Session Laws, 1961)

Owner City of Shelby #5 Address Shelby, Montana
Box 743

Driller Layne-Minnesota Address Minneapolis, Minn.

Date of Notice of Appropriation of Groundwater _____

Date well started 1962 Date Completed 1962

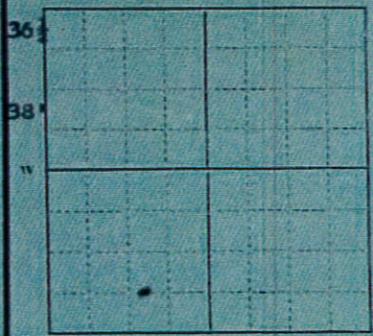
Type of well Gravel Well Equipment Used Caisson
(dug, driven, bored or drilled) (Churn, drill, rotary or other)

Water Use: Domestic Municipal Other Irrigation
Industrial Drainage Stock

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which water rises in the well.

0' Top of Ground
(Elev. above sea level 3094)
Fill Rock & Gravel 310
8"
Coarse gravel
16'
Sand, gravel, rock
23'
Sand, gravel, rock & hard clay
27'
Fine sand, rock, clay
30' rock and gravel
32'
Sand, gravel, rock & Shale

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS		
				Kind Size	From (Feet)	To (Feet)
60"	38"	6	4'0"			
38"		"	21'			
24"		"	34'28"			
24"	34'2"		44'28"	5	34'2"	44'28"



1/4 Sec. 21 T. 31 R. 2
Indicate location of well and place of use, if possible. Each small square represents 10 acres.

Show exact depth of bottom.

Static Water Level for non-flowing Well 19' 11" feet.

Shut-in Pressure for Flowing Well Not known

Pumping Water Level 34' feet at 350 gal. per minute.

Discharge in gal. per min. of flowing well Not known

How Tested Turbine Pump Length of Test 8 hrs

Remarks: (Gravel packing, cementing, packers, type of shutoff, location of place of use of groundwater if not at well, and any other similar pertinent information, including number of acres irrigated, if used for irrigation)

Double gravel wall - 52" dia. to 24" screen, 38" casing cemented in 60" hole. 1 1/2" PW treatment coil around screen

208
Driller's License Number

Layne-Minnesota Company
Driller's Signature

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.

M: 867579

File No.

101 31 N 02 W 21 C 2 BC

WELL NO. 6

101 T 31 N R 2 W 21 C 2 BC

TRIPPLICATE

Toole

County Toole

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Notice of Completion of Groundwater
Appropriation by Means of Well

(Under Chapter 237, Montana Session Laws, 1961)

0' Top of Ground
(Elev. above sea level 3094)
Sandy clay 3095

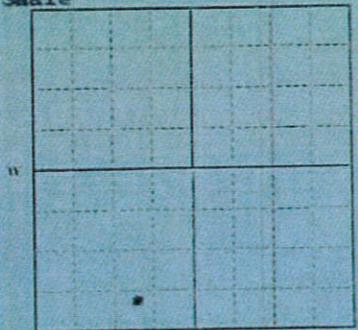
4 1/2' Sand - fine to coarse

11' Sand & Gravel

17 1/2' Soft clay

21' Sand, gravel & Rock

34 1/2' Shale



1/4 Sec. 21 T 31 R 2
Indicate location of well and place of use, if possible. Each small square represents 10 acres.

Show exact depth of bottom.

Owner City of Shelby #6 Address Shelby, Montana
Driller Layne-Minnesota Address Minneapolis, Minn.
Date of Notice of Appropriation of Groundwater
Date well started 6/22/62 Date Completed 8/4/62
Type of well Gravel well Equipment Used Caisson
(dug, driven, bored or drilled) (Churn, drill, rotary or other)
Water Use: Domestic Municipal Other Irrigation
Industrial Drainage Stock

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which water rises in the well.

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS		
				Kind Size	From (Feet)	To (Feet)
52"	Steel	5 1/2'	18'			
24"	Steel	"	30 1/2'			
24"	Stainless	30 1/2'	40 1/2'	#5	30 1/2'	40 1/2'

Static Water Level for non-flowing Well 19' 11" feet.

Shut-in Pressure for Flowing Well Not known

Pumping Water Level 30' feet at 250 gal. per minute.

Discharge in gal. per min. of flowing well Not known

How Tested Turbine pump & Orifice Length of Test 8 hrs

Remarks: (Gravel packing, cementing, packers, type of shutoff, location of place of use of groundwater if not at well, and any other similar pertinent information, including number of acres irrigated, if used for irrigation)

Double gravel wall - 52" dia. to 24" screen, outer casing cemented in 60" dia. hole. 1 1/2" PVC treatment coil around screen

208

Driller's License Number

Layne-Minnesota Company

Driller's Signature

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.

M: 87580

STATE OF MONTANA
Department of Natural Resources and Conservation

GOLDENROD - DRILLER

WELL LOG REPORT

State law requires that this form be filed by the water well driller on any water well completed by him on and after July 1, 1973 within sixty (60) days after completion of the well.

1. WELL OWNER: Name City of Shelby # 8 Address Shelby, Mont. 59625

2. WELL LOCATION: County Toole Lot 5; 1/4 1/4 1/4, Sec. 21, Twp. 31N N-S, Rg. 2W E-W

3. PROPOSED USE: Domestic Stock Municipal Industrial Lawn and Garden
Irrigation Other (if other, specify) _____

4. METHOD DRILLED: Cable Bored
 Forward Rotary Reverse Rotary
 Jetted Other (if other, specify) _____

5. WELL CONSTRUCTION:
Diameter of hole 13 inches. Depth 31 ft.
Casing: Steel Plastic Concrete
 Threaded Welded Other (if other, specify) _____
Pipe Weight: Dia.: From: To:
40 lb/ft. 1 1/2 inches 0 feet 21 feet
 lb/ft. inches feet feet
 lb/ft. inches feet feet
Was perforated pipe used? Yes No
Length of pipe perforated none feet
Was casing left open end? Yes No
Was a well screen installed? Yes No
Material stainless steel Dia. 1 1/2 inches
(stainless steel, bronze, etc.)
Perforation type: slots holes
Size 20 set from 20 feet to 24 feet
Size 40 set from 24 feet to 30 feet
Size set from feet to feet
Was a packer or seal used? Yes No
If so, what material lead
Well type: Straight screen Graveled
Was the well grouted? Yes No
To what depth? 0-10 feet
Material used in grouting port cement
Well head completion: Pitless adapter
12" above grade Other _____
(If other, specify) _____
Was the well disinfected? Yes No

6. WATER LEVEL:
Static water level 7 ft. below land surface
If flowing: closed-in pressure _____ psi
GPM flow _____ through _____ inch pipe
Controlled by: Valve Reducers
 Other, specify _____

7. WELL TEST DATA: Pump Bailer Other
(If other, specify) not tested
Pumping level below land surface:
 ft. after hrs. pumping gpm
 ft. after hrs. pumping gpm

8. WELL LOG:
Depth (ft.)
From To Formation
0 30 gravel & sand
 water @ 17 ft.
30 31 dark shale

9. DATE STARTED: Jan. 15 1975
(Use separate sheet if necessary)

10. DATE COMPLETED: Feb. 25 1975

11. WAS WELL PLUGGED OR ABANDONED? Yes No
If so, how _____

12. DRILLER'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Alkins Drilling Co. 3 09
Driller's or Firm Name License No.
Shelby, Mont 59625
Address
Randy Alkins
Signed by Date

M: 87573

Toole

101 31N 02W 21 CDBA
Department of Natural Resources and Conservation

CODED

White-Department
Yellow-Department
Pink-Well Owner
Gold-Driller

WELL LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after completion of the well, or
of Completion of Groundwater Development, be filed by the well owner within 60 days after the water has been

009481

1. WELL OWNER Name Shelby City Water Well #9

2. CURRENT MAILING ADDRESS City Hall
Shelby Mt 59474

3. PROPOSED USE _____ domestic (includes lawn and garden); _____ stock; municipal; _____ industrial;
_____ irrigation; _____ other (specify)

4. WELL LOCATION

	NW		NE
	SW		SE

_____ 1/4 _____ 1/4 _____ 1/4 _____ 1/4 Section 21
T. 31N R. 2W
OR, Lot #9 N or S _____ E or W
Subdivision _____ Block _____
City _____ County Toole
Elevation _____ Accuracy: _____ +10'; _____ +50'; _____ ±100';

8. WELL TEST DATA pump _____ bailer _____ other _____
(if other, specify) _____
Pumping level below land surface:
10 ft. after 8 hrs. pumping 235 gpm
_____ ft. after _____ hrs. pumping _____ gpm

9. WAS WELL PLUGGED OR ABANDONED? Yes No _____
If yes, how? _____

10. DATE STARTED Aug 15 84
DATE COMPLETED March 13 85

11. WELL LOG

Depth (ft.)

From	To	Formation
0	15	sand + silt
15	16	gravel water
16	26	gravel
26	29	Multi colored gravel
29	40	gravel
40		hard shale

Received State water test 3/13/85

5. DRILLING METHOD cable, _____ bored,
_____ forward rotary, _____ reverse rotary, _____ jetted,
_____ other (specify)

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations and/or Screen
8	8 5/8 300	0	24	X Kind: _____ Size: _____ From (feet): <u>40</u> To (feet): <u>24</u> <u>Johnson</u> <u>Stanley</u> <u>received</u>

Was casing left open end? Yes, _____ No _____
Was a packer or seal used? Yes, _____ No _____
If so, what material neoprene
Was the well gravel packed? _____ Yes, _____ No
Was the well grouted? Yes, _____ No _____
To what depth? 20 ft
Material used in grouting cement
Well head completion: Pflits adapter _____
12 in. above grade _____ other _____
(if other, specify) _____
Pump horsepower _____, pump type _____
Pump intake level _____ feet below land surface
Power (electric, diesel, etc.) _____

7. WATER LEVEL
Static water level 10 feet below land surface
If flowing, closed-in pressure _____ psi
_____ gpm flow through _____ inch pipe
Controlled by: _____ valve, _____ reducers, _____ other
(if other, specify)

12. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Harold Aikin 3/21/85
Signature Date
Aikin Drilling Co 99
Firm name License No.
157-10th Ave N Shelby Mt 59474
Address
M: 87574

WELL LOG REPORT

CODED

009482

State law requires that this form be filed by the water well driller within 60 days after completion of the well, and of Completion of Groundwater Development, be filed by the well owner within 60 days after the water has been

1. WELL OWNER Name Shelby City Well #10

2. CURRENT MAILING ADDRESS City Hall Shelby MT 59474

3. PROPOSED USE _____ domestic (includes lawn and garden); _____ stock; municipal; _____ industrial; _____ irrigation; _____ other (specify)

4. WELL LOCATION

	NW	NE
	SW	SE

T. 31N R. 2W Section 21
 N or S E or W
 OR, Lot #10 Block _____
 Subdivision _____
 City _____ County Toole
 Elevation _____ Accuracy: +10'; +50'; +100'

8. WELL TEST DATA pump _____ bailer _____ other (if other, specify) _____
 Pumping level below land surface: 14.5 ft. after 8 hrs. pumping 320 gpm
 _____ ft. after _____ hrs. pumping _____ gpm

9. WAS WELL PLUGGED OR ABANDONED? Yes No
 If yes, how? _____

10. DATE STARTED Oct 20 1984
 DATE COMPLETED March 13 1985

11. WELL LOG

Depth (ft.)	From	To	Formation
	0	15	silt + sand
	15	17	gravel water
	17	40	sand + gravel
	40	41	dash shale

Received state water test 3/13/85

5. DRILLING METHOD cable, _____ bored, _____ forward rotary, _____ reverse rotary, _____ jetted, _____ other (specify)

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations and/or Screen	Kind	From (feet)	To (feet)
8	3 3/8 60lb	0	29	X	Johnson	41	29
					Stalys		
					Steel		

Was casing left open end? Yes, _____ No
 Was a packer or seal used? Yes, _____ No
 If so, what material nylon
 Was the well gravel packed? Yes, No
 Was the well grouted? Yes, _____ No
 To what depth? 0-80
 Material used in grouting Cement
 Well head completion: Pitless adapter _____
 12 in. above grade other _____
 (if other, specify) _____
 Pump horsepower _____, pump type _____
 Pump intake level _____ feet below land surface
 Power (electric, diesel, etc.) _____

7. WATER LEVEL
 Static water level 9 feet below land surface
 If flowing, closed-in pressure _____ psi
 _____ gpm flow through _____ inch pipe
 Controlled by: _____ valve, _____ reducers, _____ other (if other, specify)

12. DRILLER'S CERTIFICATION
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
 Signature Shawn Akis Date 3/21/85
 Firm name Akis Drilling Co License No. 99
 Address 151-10th Ave N Shelby MT 59474

M:87575

WELL LOG REPORT

File No. 41P-1058129

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

<p>1. WELL OWNER Name <u>City of Shelby</u></p> <p>2. CURRENT MAILING ADDRESS <u>P.O. Box 743</u> <u>Shelby, MT 59474</u></p> <p>3. WELL LOCATION <u>NE</u> $\frac{1}{4}$ <u>SE</u> $\frac{1}{4}$ <u>SW</u> $\frac{1}{4}$ Section <u>21</u> Township <u>31</u> Range <u>2</u> County <u>Toole</u> Gov'n't Lot _____ or Lot _____ Block _____ Subdivision Name _____ Tract Number _____</p> <p>4. PROPOSED USE: Domestic <input checked="" type="checkbox"/> Stock <input type="checkbox"/> Irrigation <input type="checkbox"/> Other <input type="checkbox"/> specify <u>PWS</u></p> <p>5. TYPE OF WORK: New well <input checked="" type="checkbox"/> Method: Dug <input type="checkbox"/> Bored <input type="checkbox"/> Deepened <input type="checkbox"/> Cable <input type="checkbox"/> Driven <input checked="" type="checkbox"/> Reconditioned <input type="checkbox"/> Rotary <input type="checkbox"/> Jetted <input type="checkbox"/></p> <p>6. DIMENSIONS: Diameter of Hole Dia. <u>12</u> in. from <u>0</u> ft. to <u>20</u> ft. Dia. <u>8</u> in. from <u>20</u> ft. to <u>38</u> ft. Dia. _____ in. from _____ ft. to _____ ft.</p> <p>7. CONSTRUCTION DETAILS: Casing: Steel Dia. <u>8</u> from <u>10</u> ft. to <u>26</u> ft. Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Dia. _____ from _____ ft. to _____ ft. Type <u>38.55 lb</u> Wall Thickness <u>.322</u> Casing: Plastic Dia. _____ from _____ ft. to _____ ft. Weight _____ Dia. _____ from _____ ft. to _____ ft. PERFORATIONS: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Type of perforator used _____ Size of perforations _____ in. by _____ in. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. SCREENS: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Manufacturer's Name <u>Houston Well Screen</u> Type <u>Stainless Steel</u> Model No. <u>304SS</u> Dia. <u>8</u> Slot size <u>.060</u> from <u>26</u> ft. to <u>36</u> ft. Dia. _____ Slot size _____ from _____ ft. to _____ ft. GRAVEL PACKED: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Size of gravel _____ Gravel placed from _____ ft. to _____ ft. GROUTED: To what depth? <u>20</u> ft. Material used in grouting <u>Cement</u></p> <p>8. WELL HEAD COMPLETION: Pitless Adapter <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>9. PUMP (if installed) Manufacturer's name _____ Type _____ Model No. _____ HP _____</p> <p>10. WELL TEST DATA The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing. 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In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form. NOTE: All wells shall be equipped with an access port 1/2 inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.</p> <p>11. WAS WELL PLUGGED OR ABANDONED? Yes <input checked="" type="checkbox"/> No _____ If yes, how? _____</p> <p>12. WELL LOG</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Depth (ft.)</th> <th rowspan="2">Formation</th> </tr> <tr> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4 1/2</td> <td>Brown Sand - Medium Grain</td> </tr> <tr> <td>4 1/2</td> <td>9</td> <td>Brown Sand - Small Gravel</td> </tr> <tr> <td>9</td> <td>12</td> <td>Brown Sand - Medium Grain</td> </tr> <tr> <td>12</td> <td>23</td> <td>Brown Sand - 1/2" - 1" Gravel</td> </tr> <tr> <td>23</td> <td>26</td> <td>Gravel Sand - Medium Grain</td> </tr> <tr> <td>26</td> <td>36</td> <td>Gravel Sand - 3/4" - 1 1/2" Gravel</td> </tr> <tr> <td>36</td> <td>38</td> <td>Gravel Shaly Clay</td> </tr> </tbody> </table> <p style="text-align: center; font-size: 2em; font-weight: bold; color: red;">RECEIVED</p> <p style="text-align: center;">OCT 22 1993</p> <p style="text-align: center;">MONTANA D.N.R.C. HAVRE FIELD OFFICE</p> <p style="text-align: center; font-size: 1.5em; font-weight: bold; color: red;">RECEIVED</p> <p style="text-align: center; color: red;">M.B.M.G.</p> <p style="text-align: center; font-size: 0.8em;">ATTACH ADDITIONAL SHEETS IF NECESSARY</p> <p>13. DATE COMPLETED <u>5-31-93</u></p> <p>14. DRILLER/CONTRACTOR'S CERTIFICATION This well was drilled under my jurisdiction and this report is true to the best of my knowledge. <u>152-1888</u> Date <u>7-24-93</u> <u>Boland Drilling Co.</u> Firm Name <u>4601 7th Ave. N. Great Falls,</u> Address <u>Chi Boland</u> <u>482</u> Signature License No.</p>	Depth (ft.)		Formation	From	To	0	4 1/2	Brown Sand - Medium Grain	4 1/2	9	Brown Sand - Small Gravel	9	12	Brown Sand - Medium Grain	12	23	Brown Sand - 1/2" - 1" Gravel	23	26	Gravel Sand - Medium Grain	26	36	Gravel Sand - 3/4" - 1 1/2" Gravel	36	38	Gravel Shaly Clay
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MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION
1520 EAST SIXTH AVENUE HELENA, MONTANA 59620-2301 444-6810

DNRC

Well No 11

PWS# 00328012

RECEIVED

SEP 08 2005

MT DEQ PUBLIC WATER & SUBDIVISIONS BUREAU

M-251163

WELL LOG REPORT

File No. 41P-0058129

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

<p>1. WELL OWNER Name <u>City of Shelby</u></p> <p>2. CURRENT MAILING ADDRESS <u>P.O. Box 743</u> <u>Shelby, MT 59474</u></p> <p>3. WELL LOCATION <u>NE 1/4 SE 1/4 SW 1/4</u> Section <u>21</u> Township <u>31 N</u> Range <u>2 E</u> County <u>Deer</u> Gov't Lot _____ or Lot _____ Block _____ Subdivision Name _____ Tract Number _____</p> <p>4. PROPOSED USE Domestic <input checked="" type="checkbox"/> Stock <input type="checkbox"/> Irrigation <input type="checkbox"/> Other <input checked="" type="checkbox"/> specify <u>PWS</u></p> <p>5. TYPE OF WORK: New well <input checked="" type="checkbox"/> Method: Dug <input type="checkbox"/> Bored <input type="checkbox"/> Deepened <input type="checkbox"/> Cable <input type="checkbox"/> Driven <input checked="" type="checkbox"/> Reconditioned <input type="checkbox"/> Rotary <input type="checkbox"/> Jetted <input type="checkbox"/></p> <p>6. DIMENSIONS: Diameter of Hole Dia. <u>12"</u> in. from <u>0</u> ft. to <u>20</u> ft. Dia. <u>8"</u> in. from <u>20</u> ft. to <u>38</u> ft. Dia. _____ in. from _____ ft. to _____ ft.</p> <p>7. CONSTRUCTION DETAILS: Casing: Steel Dia. <u>8"</u> from <u>10</u> ft. to <u>24</u> ft. Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Dia. _____ from _____ ft. to _____ ft. Type <u>2855B</u> Wall Thickness <u>3/32</u> Casing: Plastic Dia. _____ from _____ ft. to _____ ft. Weight _____ Dia. _____ from _____ ft. to _____ ft. PERFORATIONS: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Type of perforator used _____ Size of perforations _____ in. by _____ in. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. SCREENS: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Manufacturer's Name <u>Houston Well Screen</u> Type <u>Stainless Steel</u> Model No. <u>30455</u> Dia. <u>8"</u> Slot size <u>100</u> from <u>24</u> ft. to <u>36</u> ft. Dia. _____ Slot size _____ from _____ ft. to _____ ft. GRAVEL PACKED: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Size of gravel _____ Gravel placed from _____ ft. to _____ ft. GROUTED: To what depth? <u>20</u> ft. Material used in grouting <u>Cement</u></p> <p>8. WELL HEAD COMPLETION: Pitless Adapter <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>9. PUMP (if installed) Manufacturer's name _____ Type _____ Model No. _____ HP _____</p> <p>10. WELL TEST DATA The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing. 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MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION
1520 EAST SIXTH AVENUE HELENA, MONTANA 59620-2301 444-6610

DNRC

well No 12

PWS # 00328013

RECEIVED

SEP 08 2005

MT DEQ PUBLIC WATER & SUBDIVISIONS BUREAU

KLJ WELL FIELD PUMPING TEST REPORT



Shelby Well Field Pump Test

Date: 10/2/2013 - 10/3/2013

To: Larry Bonderud (Shelby, NCMRWA)

Copy to: Julie Titchbourne (Missoula-KLJ)
Brad Koon (Helena-KLJ)
Mark Peterson (Helena-AE2S)

From: Jason Crawford (Helena-KLJ)

RE: NCMRWA Cut Bank to Shelby



PURPOSE

On October 2nd and 3rd 2013, the City of Shelby Public Works Department and KLJ conducted pump tests on Shelby's well field. The purpose of the tests was to determine the quantity of water that could be pumped from the wells to the 100,000 gallon tank situated near Williamson Park.

WELL FIELD

All of the water for the City of Shelby is supplied from eleven wells located in Williamson Park near the Marias River. The wells vary in depth from 31 to 50 feet. Seven of the eleven wells are shut down during the winter months. Six (Wells No. 7-12) of the seven wells that are shut down in the winter months are removed from service to prevent them from freezing and the other well (Well No. 5, which is capable of operating during the winter months) is shut down because the additional water is not needed during the winter months. Following is a summary of the operations of the eleven wells:

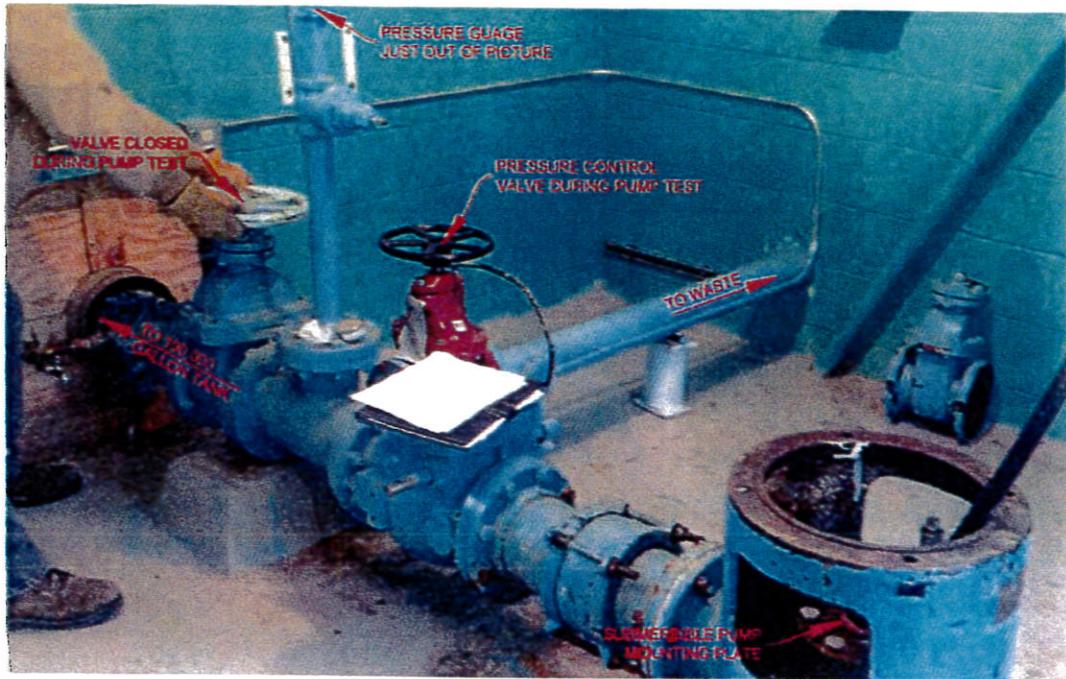


Well No.	Well Operation	Well Status
1	Pumps into the 100,000 gallon tank	Is used all year.
2	Pumps into the 100,000 gallon tank	Is used all year.
3	Pumps into the 100,000 gallon tank	Is used all year.
4	Pumps into the 100,000 gallon tank	Is shut down during winter months
5	Pumps into the 100,000 gallon tank	Must be shut down during winter months
6	Pumps into the 100,000 gallon tank	Must be shut down during winter months
7	Pumps into the casing of Well No. 1	Must be shut down during winter months
8	Pumps into the casing of Well No. 3	Must be shut down during winter months
9	Pumps into the casing of Well No. 5	Must be shut down during winter months
10	Pumps into the casing of Well No. 7	Must be shut down during winter months
11	Pumps into the casing of Well No. 1	Must be shut down during winter months
12	Pumps into the casing of Well No. 3	Must be shut down during winter months
13	Pumps into the 100,000 gallon tank	Is used all year.

PUMP TESTING

The tests were conducted by pumping those wells that directly supply water to the 100,000 gallon tank. The wells were pumped at a known flow rate and pressure. The rate and pressures were incrementally adjusted until a maximum pumping rate was achieved. The testing setup for the wells generally consisted of the well, pump, pressure gauge, meter, and the plumbing.

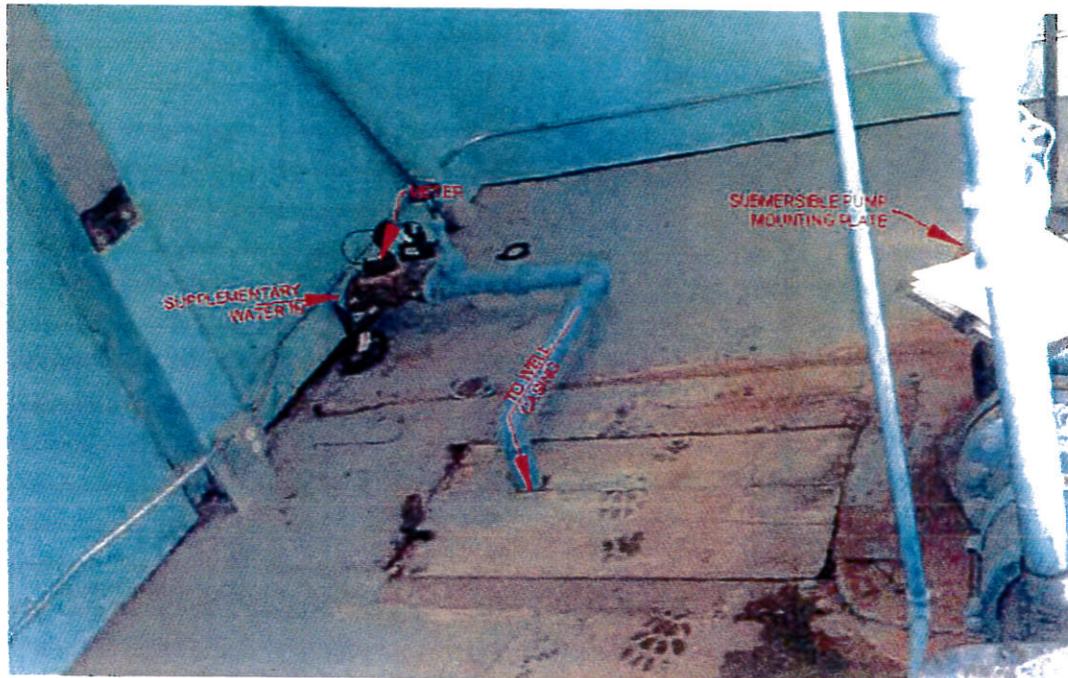
The following picture represents the typical well house plumbing:



Wells 1-8 were pumped to waste.



Wells 1,3,5, and 7 receive supplementary water from wells 9-12. The supplementary water is pumped from the supplementary well to its corresponding receiving well casing.



The specifics of each test are as follows:

Well No. 1

Well No. 1 was pumped to waste. Well No. 9 pumps supplementary water into the casing of well No. 1. Prior to starting the pump test, well no. 9 was turned on and the pumping rate was recorded to be 160 gpm by review of the meter. Once the supplementary rate was recorded, well no. 1 was turned on. The pressure and pumping rate were incrementally adjusted and recorded. The following table provides a summary of the pump test results for well no. 1.



WELL # 1 - WITH WELL NO. 9 PUMPING TO IT AT 160 GPM	PRESSURE (PSI)	PUMPING RATE (GPM)	TIME (10/2/13)	COMMENT
	30	191	13:40	
	28	231		
	26	250		
	24	271		
	22	293		
	20	307		
	18	330		
	16	357		
	14	370		
	12	389		
	10	401		
	8	415		
	6	428		
5.5	437	14:13	VALVE WIDE OPEN	

Well No. 2

Well No. 2 was pumped to waste. Well No. 2 does not have supplementary water pumping to it. Well no. 2 was turned on and the pressure and pumping rate were incrementally adjusted and recorded. The following table provides a summary of the pump test results for well no. 2.

WELL # 2	PRESSURE (PSI)	PUMPING RATE (GPM)	TIME (10/3/13)	COMMENT
	40	35	9:28	
	35	70		
	32	73	9:45	MAXIMUM RATE

Well No. 3

Well No. 3 was pumped to waste. Well No. 10 pumps supplementary water into the casing of well No. 3. Prior to starting the pump test, well no. 10 was turned on and the



pumping rate was recorded to be 140 gpm by review of the meter. Once the supplementary rate was recorded, well no. 3 was turned on. The pressure and pumping rate were incrementally adjusted and recorded. The following table provides a summary of the pump test results for well no. 3.

WELL # 3 - WITH WELL NO. 10 PUMPING TO IT AT 140 GPM	PRESSURE (PSI)	PUMPING RATE (GPM)	TIME (10/2/13)	COMMENT
	30	87	15:07	
	25	163		
	20	235		
	15	271		
	10	298		
	6	370	15:30	VALVE WIDE OPEN

Well No. 5

Well No. 5 was pumped to waste. Well No. 11 pumps supplementary water into the casing of well No. 5. Prior to starting the pump test, well no. 11 was turned on and the pumping rate was recorded to be 175 gpm by review of the meter. Once the supplementary rate was recorded, well no. 5 was turned on. The pressure and pumping rate were incrementally adjusted and recorded. The following table provides a summary of the pump test results for well no. 5.

WELL # 5 - WITH WELL NO. 11 PUMPING TO IT AT 175 GPM	PRESSURE (PSI)	PUMPING RATE (GPM)	TIME (10/3/13)	COMMENT
	30	350	9:53	
	28	365		
	26	386		
	24	406		
	22	425		
	20	431		
	18	455		
	16	476		
	14	484		
12	508	10:10	MAXIMUM RATE	



Well No. 13

Well No. 13 was pumped to the tank because is it equipped with a meter inside the pump house unlike all of the other wells. Well No. 13 does not have supplementary water pumping to it. Well no. 13 was turned on and the pressure and pumping rate were incrementally adjusted and recorded. The following table provides a summary of the pump test results for well no. 13.

	PRESSURE (PSI)	PUMPING RATE (GPM)	TIME (10/3/13)	COMMENT
WELL # 13	54	40	10:30	
	40	190		
	35	265		
	32	320		
	24	340	10:45	VALVE WIDE OPEN

While well No. 13 was being test pumped to the tank, wells 1,2,3, and 5 were also pumping to the tank. Wells No. 3 and 13 both pump to the same 12" PVC water main that leads to the 100,000 gallon tank; therefore, resulting in a higher pressure reading when the valve was wide open than if pumped to waste or pumped to the tank on its own. Wells 1,2, & 5 all pump to a different 12" water main that leads to the 100,000 gallon tank.



SUMMARY

Well No.	Pumping Rate (GPM)	Volumes		Comments
		GPD	ACRE- FEET/YEAR	
1	437	629,280	704.9	Well No. 9 pumps to Well No. 1 at 160 gpm
2	73	105,120	117.8	
3	370	532,800	596.9	Well No. 10 pumps to Well No. 3 at 140 gpm
5	508	731,520	819.5	Well No. 11 pumps to Well No. 5 at 175 gpm
7	240	345,600	387.1	Well No. 12 pumps to Well No. 7 at 130 gpm
8	111	159,840	179.1	
9	160	230,400	258.1	These wells pump to the other wells as indicated above.
10	140	201,600	225.8	
11	175	252,000	282.3	
12	130	187,200	209.7	
13	340	489,600	548.5	
Totals	2,079	2,993,760	3,353.7	The rates from wells 9-12 have been included in the rates for 1,3,5, & 7.

KLJ WATER SYSTEM MODELING REPORT



Shelby Water System Model

Date: 1/22/2014

To: File

Copy to: Julie Titchbourne (Missoula-KLJ)
Brad Koon (Helena-KLJ)
Tyrel Clark (Billings-KLJ)
Doug Whitney (Billings-KLJ)
Mark Peterson (Helena-AE2S)

From: Jason Crawford (Helena-KLJ)

RE: NCMRWA Cut Bank to Shelby



PURPOSE

A WaterCAD model was prepared for the City of Shelby's water system. The model will be used to analyze the operations of the components of the City's system during the various demands that the system experiences and to determine if the system can handle additional demands at various locations. The purpose of this report is to document the strategies used to model the different components of the system.

MODELED OPERATIONS

The critical components of the system were included for modelling purposes. Those critical components include the well pumps, clear well, clear well booster station, south tank, shop tank, airport tank, prison tank booster station, prison tank, and water mains connecting the critical components. A schematic of the modeled operations is included in Exhibit A. The critical components are all placed at surveyed elevations. The pipe sizes, types, and lengths included in the model are all representative of actual conditions. Specific components of the system (i.e individual hydrants, services, and distribution pipes, etc.) have been excluded from this model.

Well Pumps

Pump testing was recently completed on the well field indicating that during the summer months the well field is capable of producing a maximum of 2,079 gpm. Instead of



modeling each of the wells and well pumps separately the well field was modeled as a reservoir with the water elevation set to the average static water elevation of the wells (3,055.00'). A single pump with a maximum operating point of 2,079 gpm was used in place of the 11 separate well pumps. The pump was set at the same elevation as the reservoir water level (3,055.00'). The well pumps are controlled by the water level of the clear well.

Clear Well

The 11 wells pump to a central 12" pvc water main. The 12" water main is approximately 400' long and delivers water to the 100,000 gallon clear well. The clear well is 34' in diameter which equates to 6,791 gallons per foot. The clear well has the ability to operate between 3,112.81' and 3,125.81'. The well field pump has been modeled to turn on when the clear well reaches a water level of 3,122.81' and off at 3,124.81'.

Clear Well Booster Station

The clear well booster station (CWBS) is situated adjacent to the clear well at an elevation of 3,106.31'. The CWBS pumps water from the clear well to the south tank, the shop tank, and the airport tank through approximately 7 miles of 16" asbestos concrete pipe. The CWBS consists of 4 constant speed pumps. The pumps have each been included in the model along with the corresponding constant speed pump curves. The booster station pump curves are included in Exhibit B. The CWBS pumps are controlled by the water level of the south tank, shop tank, and airport tank.

South Tank, Shop Tank, and Airport Tank(Low Pressure Zone)

The 1,000,000 gallon south tank is 67' in diameter which equates to 26,372 gallons per foot. The south tank has the ability to operate between 3,452.03' and 3,478.96'.

The 100,000 gallon airport tank is 28' in diameter which equates to 4,606 gallons per foot. The airport tank has the ability to operate between 3,450.41' and 3,478.96'.

The 1,500,000 gallon shop tank shop tank is 80.5' in diameter which equates to 38,070 gallons per foot. The shop tank has the ability to operate between 3,439.96' and 3,478.96'.

The total storage for the Low Pressure Zone is 2,600,000 gallons, based on the above mentioned tank diameters a fluctuation of 1' equates to 69,048 gallons.



CWBS Pump 1 is set to turn on when the water level of the tanks drops to 3,475.96', CWBS Pump 2 is set to turn on only if CWBS Pump 1 is on and the water level of the tanks drops to 3,475.46', CWBS Pump 3 is set to turn on only if CWBS Pumps 1 & 2 are on and the water level of the tanks drops to 3,474.96', CWBS Pump 4 is set to turn on only if CWBS Pumps 1, 2, & 3 are on and the water level of the tanks drops to 3,474.46'. CWBS Pumps 1, 2, 3, and 4 all turn off when the water level of the tanks reaches 3,477.96'.

Prison Tank Booster Station

The prison tank booster station (PTBS) is situated adjacent to the south tank at an elevation of 3,456.79'. The PTBS draws water from the south tank and pumps water into the 500,000 gallon prison tank through approximately 2 miles of 12" PVC pipe. The PTBS is made up of 3 constant speed pumps. The pumps have each been included in the model along with corresponding constant speed pump curves. The pumps were pump tested in September of 2013. The pump tests results were as follows:

- 1 Pump = 365 gpm, 91 psi

The pump curve used to define each of the pumps was created based on the pump test information. The PTBS pumps are controlled by the water level of the Prison Tank.

Prison Tank(High and Middle Pressure Zones)

The 500,000 gallon prison tank is 49.5' in diameter which equates to 14,395 gallons per foot. The prison tank has the ability to operate between 3,637.53' and 3,663.38'. PTBS Pump 1 is set to turn on when the water level drops to 3,660.38, PTBS Pump 2 is set to turn on only if PTBS Pump 1 is on and the water level drops to 3,659.88', and PTBS Pump 3 is set to turn on only if PTBS Pumps 1 & 2 are on and the water level drops to 3,659.38'.

PTBS Pumps 1, 2, and 3 all turn off at a water level of 3,662.38.

MODELED DEMANDS

The demands that have been modeled are the annual peak day demands for Shelby and Cut Bank. The Shelby demands have been calculated based on 2012 meter information from various metered locations throughout Shelby's system. The meter results and demand calculations are included in Exhibit C. The modeled Cut Bank demands include a peak day demand of 1 MGD. The demands were applied at appropriate locations and elevations throughout the model. The daily pattern applied to the demands was determined based on the Prison Tank Level monitoring equipment for 8/5/2013 - 8/12/2013. The output from the Prison Tank Level monitoring equipment has been included in Exhibit D. Model results of the system at peak day demands with Cut Bank



have been included in Exhibit E. It is important to note that when reviewing the “System Pressures @ Peak Day Demand Plus Cut Bank” reports that the following junctions are situated near the base of the various tanks around town: J21, J385, J551, J572, J577, J580-J585, J594, J597, J599.

The City is divided into three different pressure zones: high, middle and low. The high and middle pressure zones are controlled by the prison tank and are separated by a PRV. The low pressure zone is controlled by the south tank, the airport tank, and the shop tank.

High & Middle Pressure Zone (Prison Tank)

The high pressure zone is made up of Ethridge and the Prison, both of which are metered and the middle pressure zone is made up of Shelby Heights. To determine the demands of Shelby Heights, the Ethridge demands plus the Prison demands were subtracted from the total number of gallons pumped to the prison tank. Following are the high and middle pressure zone 2012 calculated demands:

- Ethridge (High Press. Zone)
 - o Avg Day - 13,345 gallons (9.27 gpm)
 - o Peak Day - 35,304 gallons (24.52 gpm)
- Prison (High Press Zone)
 - o Avg Day - 65,682 gallons (45.61 gpm)
 - o Peak Day - 173,755 gallons (120.66 gpm)
- Shelby Heights (Middle Press. Zone)
 - o Avg Day - 83,710 gallons (58.13 gpm)
 - o Peak Day - 221,446 gallons (153.78 gpm)

Low Pressure Zone (South Tank, Airport Tank, and Shop Tank)

The low pressure zone is made up of the remainder of the town. To determine the demands of the low pressure zone the total number of gallons pumped to the prison tank were subtracted from the total number of gallons pumped to town. Following are the low pressure zone 2012 calculated demands:

- Remainder of Shelby (Low Press. Zone)
 - o Avg Day - 472,326 gallons (328.00 gpm)
 - o Peak Day - 1,249,494 gallons (867.70 gpm)



EXHIBIT A

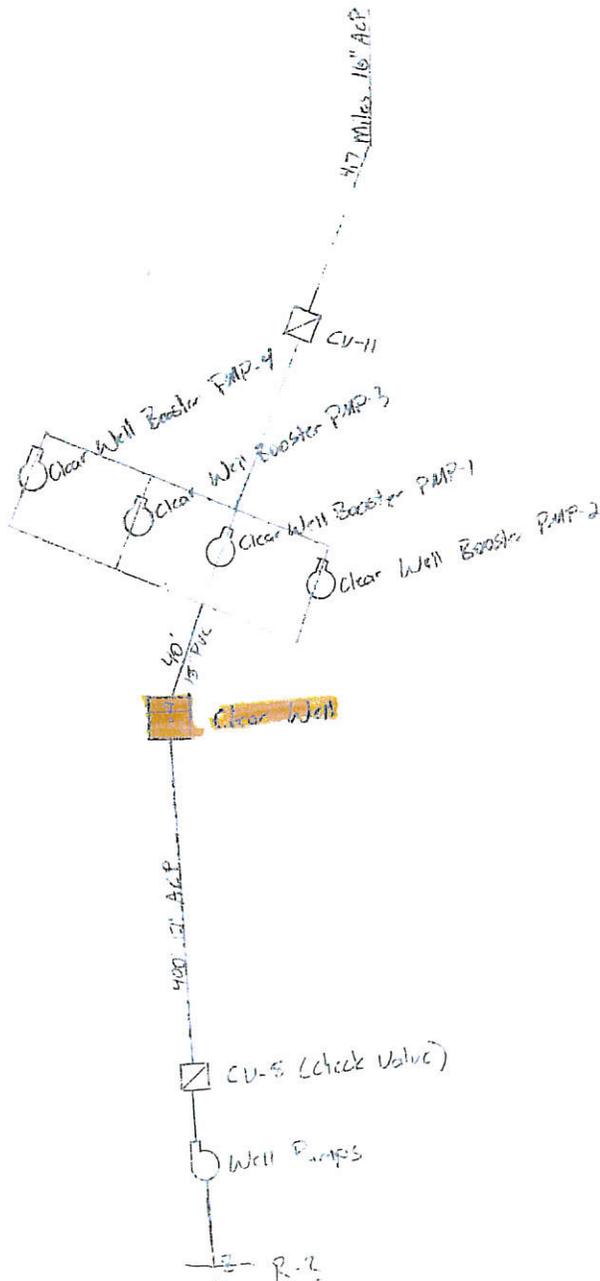
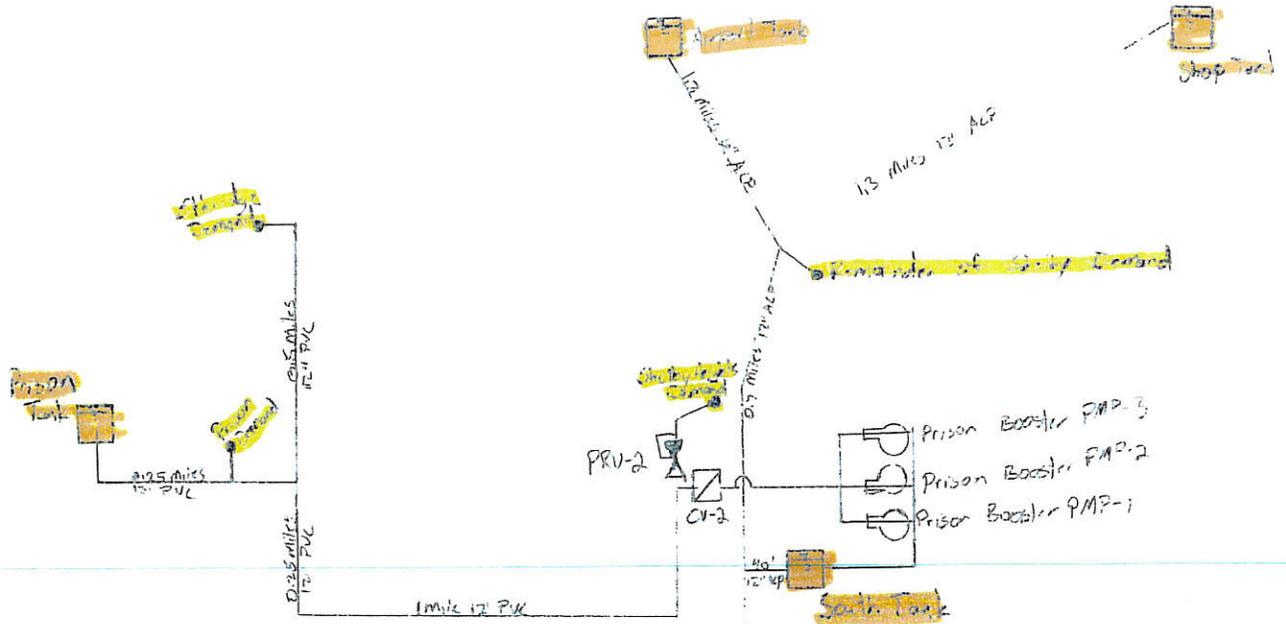
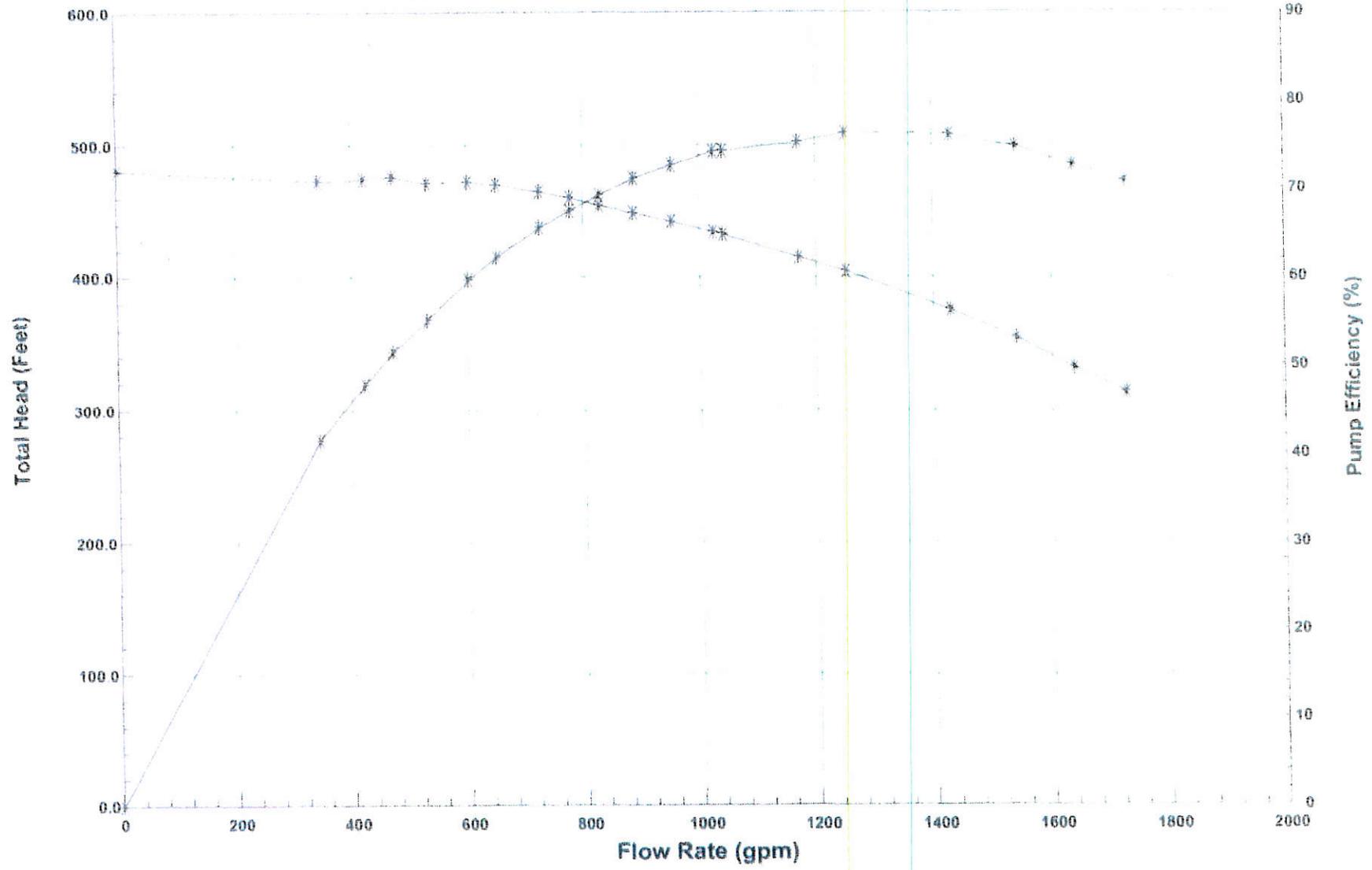




EXHIBIT B

5AE12 S/N: RH-9927017069A



Date: 11/30/10

International Center for Water Technology



EXHIBIT C

PRISON TANK	Ethridge - 2012	
	Month	Usage (gal)
	January	198,900
	February	128,800
	March	165,800
	April	204,200
	May	654,800
	June	470,000
	July	906,400
	August	731,100
	September	883,500
	October	246,900
	November	120,600
	December	160,100
	Avg Day - 13,345 gallons	
	9.27 gpm	
	Peak Day - 35,304 gallons	
	24.517 gpm	
	Prison - 2012	
	Month	Usage (gal)
	January	2,082,400
	February	1,827,600
	March	1,887,800
	April	2,208,700
May	2,142,000	
June	2,057,700	
July	1,779,800	
August	2,011,900	
September	1,995,800	
October	2,059,300	
November	1,882,800	
December	2,038,100	
Avg Day - 65,682 gallons		
45.61 gpm		
Peak Day - 173,755 gallons		
120.66 gpm		
Shelby Heights - 2012		
Month	Usage (gal)	
January	788,700	
February	950,600	
March	1,058,400	
April	1,879,100	
May	2,933,200	
June	2,305,300	
July	6,423,800	
August	6,696,000	
September	3,178,700	
October	1,473,800	
November	1,498,600	
December	1,367,800	
Avg Day - 83,710 gallons		
58.13 gpm		
Peak Day - 221,446 gallons		
153.78 gpm		

HIGH PRESSURE ZONE

MIDDLE PRESSURE ZONE

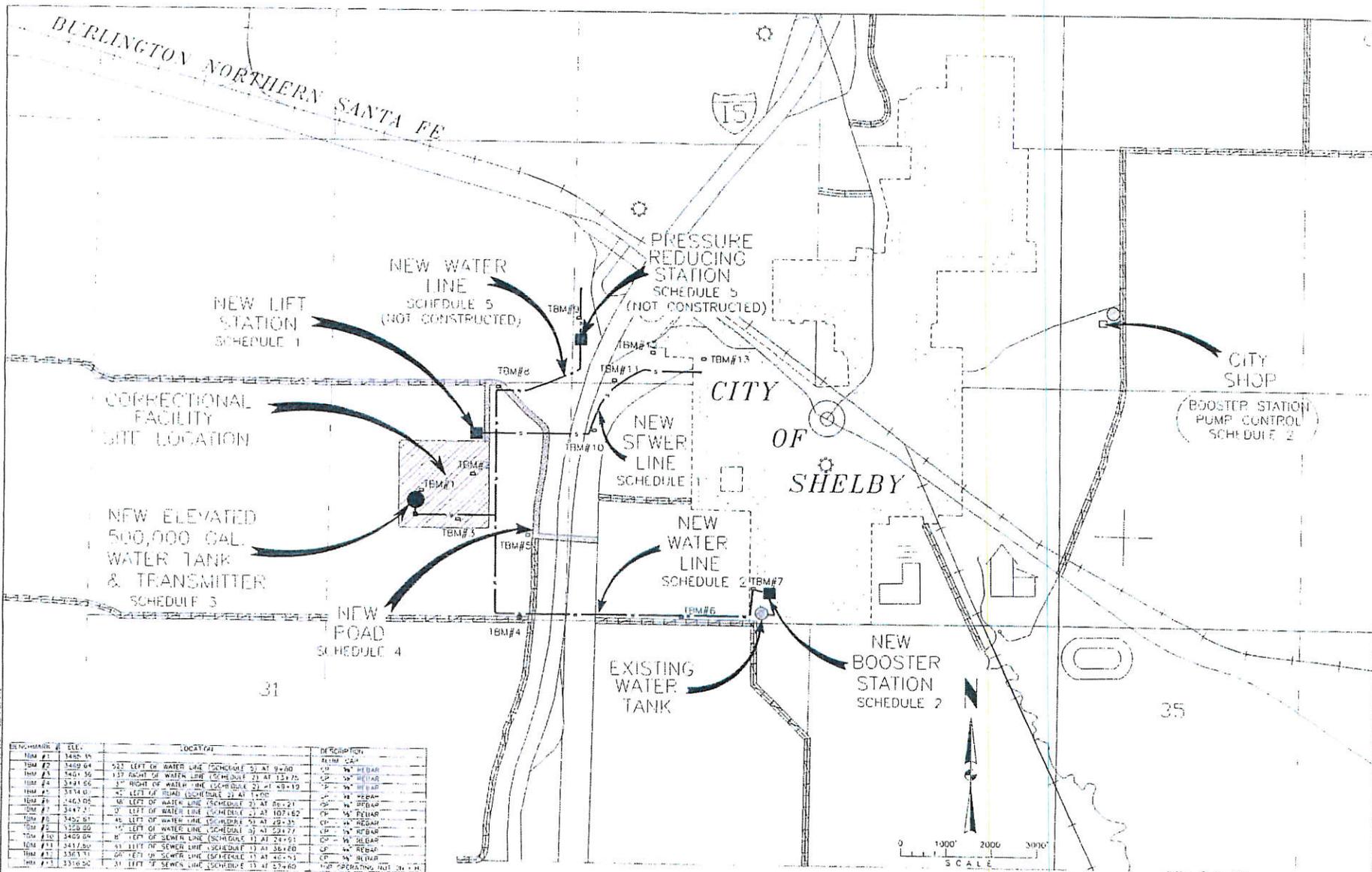
LOW PRESSURE ZONE - ALL OTHER TANKS	Remainder of Town - 2012	
	Month	Usage (gal)
	January	10,251,000
	February	7,194,000
	March	7,552,000
	April	12,490,000
	May	17,728,000
	June	16,357,000
	July	28,493,000
	August	27,344,000
	September	18,644,000
	October	11,679,000
	November	7,230,000
December	7,437,000	
Avg Day - 472,326 gallons		
328.00 gpm		
Peak Day - 1,249,494 gallons		
867.70 gpm		

TOTAL PUMPED TO TOWN - 2012	Total to Town - 2012		
	Month	Usage (gal)	Max Day (gal)
	January	13,321,000	457,000
	February	10,101,000	793,000
	March	10,664,000	638,000
	April	16,782,000	872,000
	May	23,458,000	1,303,000
	June	21,190,000	817,000
	July	37,603,000	1,680,000
	August	36,783,000	1,659,000
	September	24,702,000	903,000
	October	15,459,000	889,000
	November	10,732,000	519,000
December	11,003,000	662,000	
Avg Day - 635,063 gallons			
441.02 gpm			
Peak Day - 1,680,000 gallons			
1166.67 gpm			

TOTAL PUMPED TO PRISON TANK - 2012	Total to Prison Tank - 2012	
	Month	Usage (gal)
	January	3,070,000
	February	2,907,000
	March	3,112,000
	April	4,292,000
	May	5,730,000
	June	4,833,000
	July	9,110,000
	August	9,439,000
	September	6,058,000
	October	3,780,000
	November	3,502,000
December	3,566,000	

WATER SERVICE AREA DESIGN AND RECORD DRAWINGS

J:\1108098_13\RECORD.DWG, 04/24/2002 04:28:16 PM, ldr, TDH Great Falls

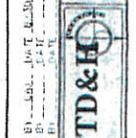


BENCH-MARK #	ELE.	LOCATION	DESCRIPTION
TBM #1	3405.14	522 LEFT OF WATER LINE (SCHEDULE 5) AT 0+70	CP 1/2" REBAR
TBM #2	3400.04	137 RIGHT OF WATER LINE (SCHEDULE 2) AT 13+75	CP 1/2" REBAR
TBM #3	3421.66	37 RIGHT OF WATER LINE (SCHEDULE 2) AT 43+10	CP 1/2" REBAR
TBM #4	3474.01	40 LEFT OF TBM#10 (SCHEDULE 2) AT 1+00	CP 1/2" REBAR
TBM #5	3463.06	40 LEFT OF WATER LINE (SCHEDULE 2) AT 88+21	CP 1/2" REBAR
TBM #6	3447.21	0 LEFT OF WATER LINE (SCHEDULE 2) AT 107+62	CP 1/2" REBAR
TBM #7	3452.67	45 LEFT OF WATER LINE (SCHEDULE 2) AT 28+35	CP 1/2" REBAR
TBM #8	3459.80	45 LEFT OF WATER LINE (SCHEDULE 2) AT 22+77	CP 1/2" REBAR
TBM #9	3400.04	0 LEFT OF SEWER LINE (SCHEDULE 1) AT 2+91	CP 1/2" REBAR
TBM #10	3417.80	51 LEFT OF SEWER LINE (SCHEDULE 1) AT 36+00	CP 1/2" REBAR
TBM #11	3350.71	00 LEFT OF SEWER LINE (SCHEDULE 1) AT 30+43	CP 1/2" REBAR
TBM #12	3376.26	31 LEFT OF SEWER LINE (SCHEDULE 1) AT 53+40	CP 1/2" REBAR

PROJECT LOCATION & SCHEDULING MAP

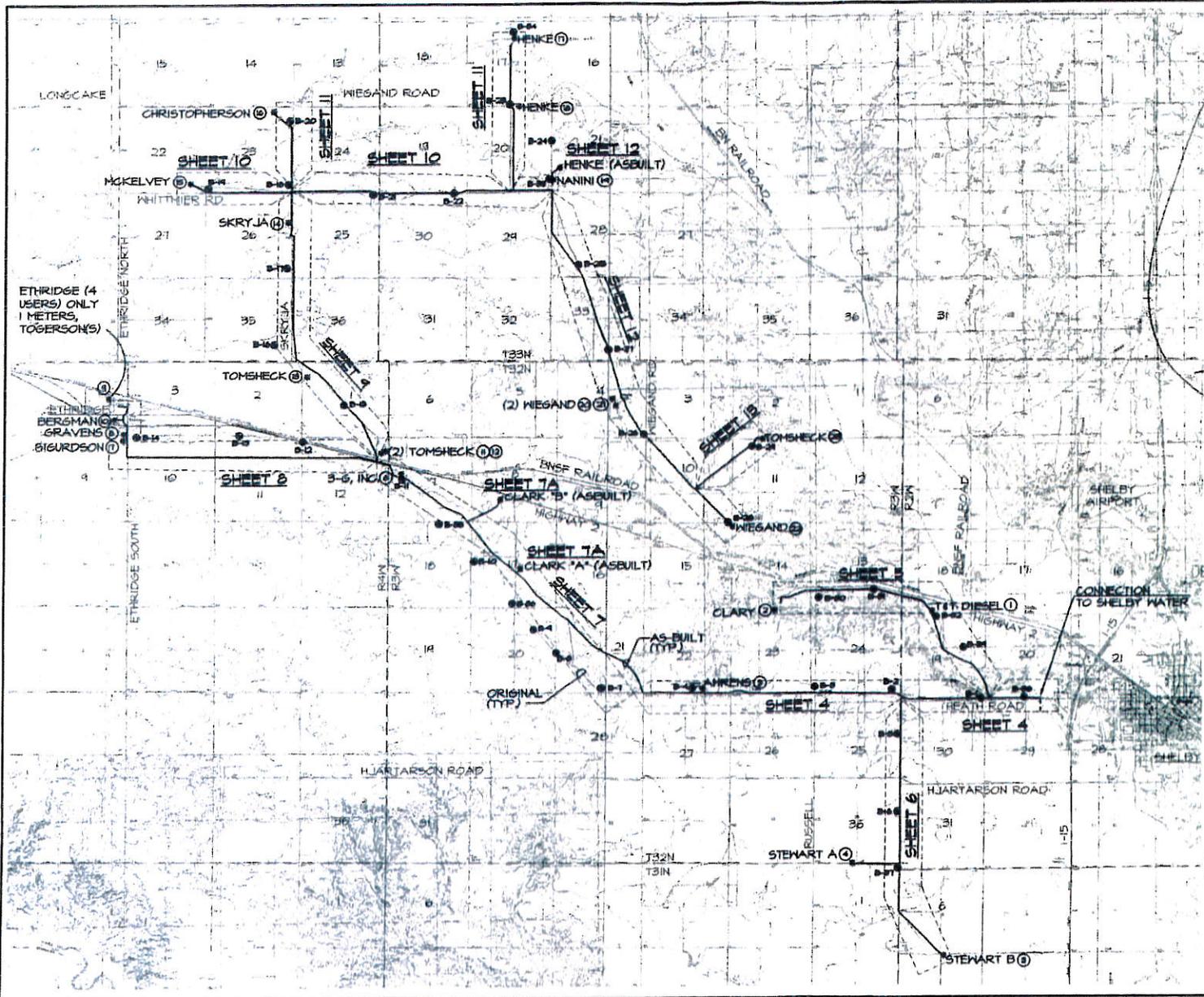


THOMAS, DEAN & HOSKINS, INC.
ENGINEERING CONSULTANTS
SPOKANE - BOZEMAN - HILLSBORO - LEWISTON
IDAHO



DRAWN BY: MAM
DESIGNED BY: KEW
QUALITY CHECK: JAW
DATE: 7/31/99
TDM (JOB NO) 58-139

SHELBY INFRASTRUCTURE IMPROVEMENTS
SHELBY, MONTANA
PROJECT LOCATION & SCHEDULING MAP



USERS - NAMES

- ① TET DIESEL
- ② CLARY
- ③ STEWART B *
- ④ STEWART A
- ⑤ ANDREWS
- ⑥ S-S, INC.
- ⑦ SIGURDSON
- ⑧ GRAVENS
- ⑨ TONGERSON (ETHRIDGE)
- ⑩ BERGMAN (ETHRIDGE)
- ⑪ TOMEHECK
- ⑫ SKRYJA
- ⑬ SKRYJA *
- ⑭ MCKELVEY *
- ⑮ CHRISTOPHERSON *
- ⑯ HENKE **
- ⑰ MANING *
- ⑱ WEGAND
- ⑳ TOMEHECK

* INSTALL PRESSURE REDUCING VALVE IN MEYER PIT TO LOCATIONS

This does not reflect any 26 + add 15

RECEIVED

NOV 17 2003

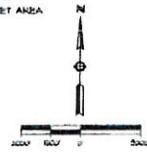
MONTANA
DEPT. OF ENVIRONMENTAL QUALITY
COMMUNITY SERVICES BUREAU

*AS-RECORDED
SEPTEMBER 2003
SULLIVAN BROTHERS
CONSTRUCTION

POINT	NORTHING	EASTING	ELEVATION
1	19520.043	14224.021	2563.00
2	19220.000	20000.000	2441.00
3	19224.262	23267.024	2429.10
4	19202.691	18164.804	2531.11

LEGEND

- ▲ CONTROL POINTS (MAJOR)
- BORE HOLE (B-36)
- ⊙ USER NAME
- WATER MAIN
- - - PLAN SHEET AREA



Revision	By	Date

File No.	Job No.
224.02	0207 0207-02
Date	Scale
2/20/03	AS SHOWN

Professional Seal

**ENGINEERS
PLANNERS
DESIGNERS**

NEIL CONSULTANTS, INC.
4509 North Star Boulevard
R.O. Box 6350
Great Falls, MT 59406
Phone 406-453-5878
Fax 406-453-3899

Client

**ETHRIDGE
WATER
DISTRICT**

Project Title

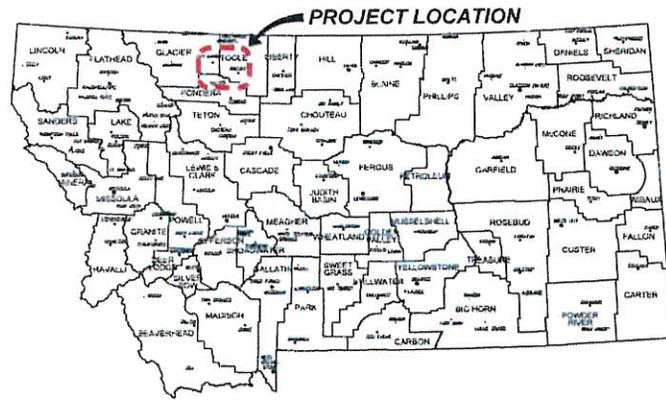
**ETHRIDGE
RURAL WATER
DISTRIBUTION
SYSTEM**

Sheet Title

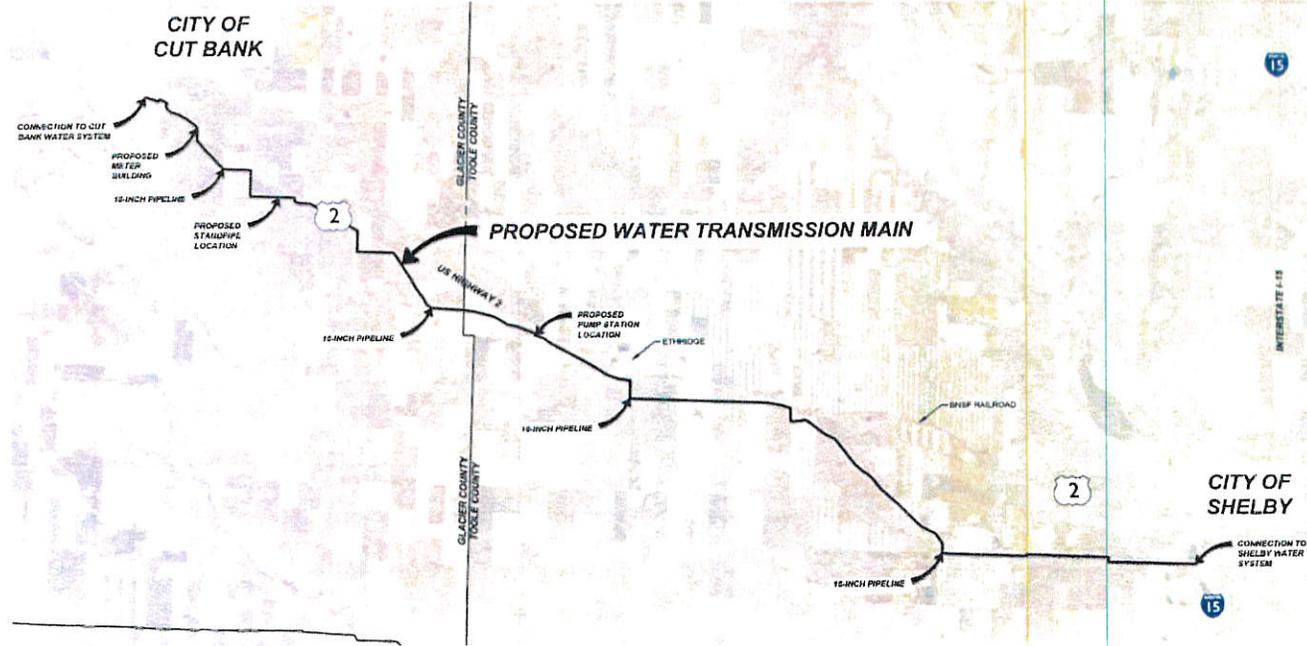
OVERALL MAP

Sheet **3** of **14**
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File # 224.02

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 KLEIN P.C. 300 14th Street S.W., Suite 107, Great Falls, MT 59405-7495 • T (406) 759-9528 • www.kpc.com

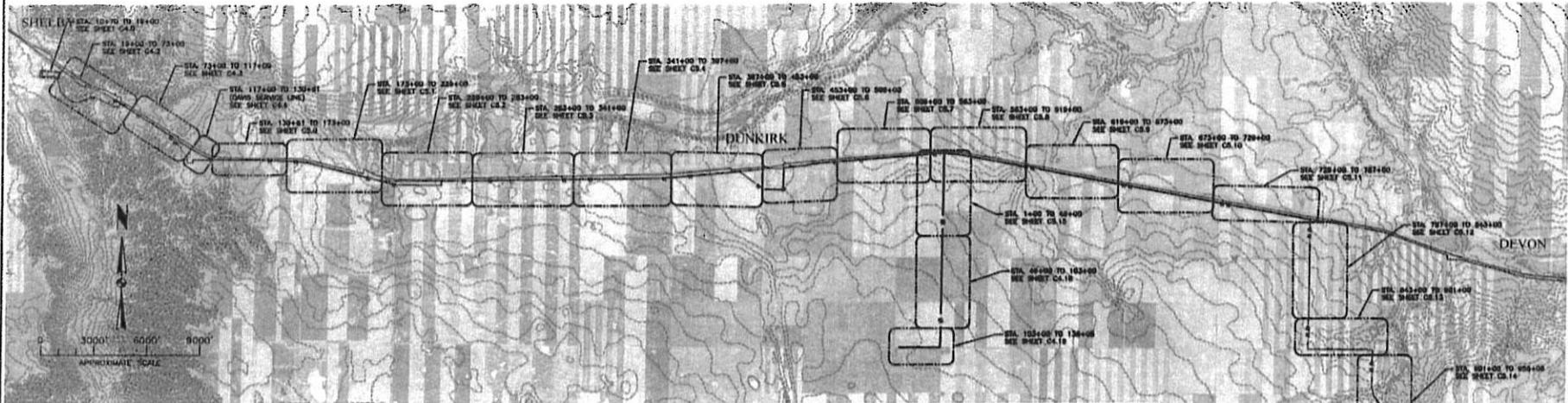


1 LOCATION MAP
NOT TO SCALE

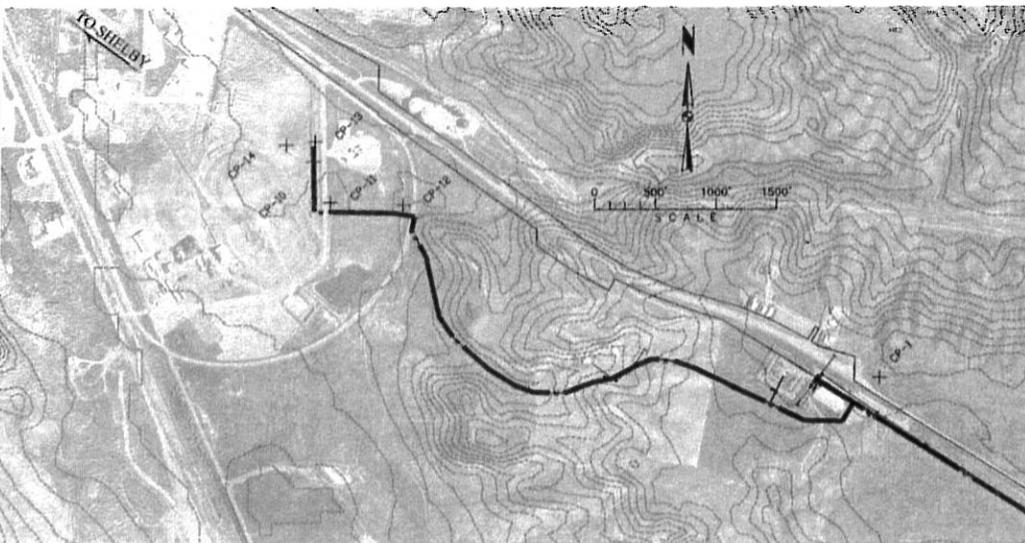


2 PROJECT MAP
NOT TO SCALE

KLJ KLEIN P.C.
AES ANNE E. SHAW
GEN-G3 SEGMENT W3: SHELBY TO CUT BANK NORTH-CENTRAL MONTANA REGIONAL WATER AUTHORITY LOCATION AND VERTICAL MAP
DESIGN TYPE REVIEW CHECKED BY: JAV/PW/P DESIGNED BY: JAV/PW/P DRAWN BY: JAV/PW/P DATE: FEB 2015 SHEET: 3 OF 12 GEN-G3



SHEET LOCATION MAP



SURVEY CONTROL DATA

NOTE:
ALL CONTROL POINTS ARE LARGE NAILS (30g) 1/2" UNLESS OTHERWISE NOTED
(CONTRACTOR TO VERIFY FOR ELEVATION ACCURACY BEFORE USING)

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP-1	1554513.29	1407811.64	3421.10	HUB WITH NAIL ON NORTH SIDE OF HWY 2 ±300' EAST OF HISTORICAL INFORMATION SIGN ±1 MALE EAST OF SHELBY
CP-10	1556403.85	1402802.86	3276.86	5/8" REBAR WITH YPC MARKED 17784LS ON WEST SIDE OF MARIAS PARK RD ±555' SOUTH OF E HWY 2
CP-11	1555970.47	1402885.33	3277.27	5/8" REBAR WITH YPC MARKED 4038LS ON EAST SIDE OF MARIAS PARK RD ±1280' SOUTH OF E HWY 2
CP-12	1556952.00	1403574.23	3279.90	5/8" REBAR WITH YPC MARKED 4038LS ±820' EAST OF E MARIAS PARK RD AND ±775' SOUTH OF E HWY 2
CP-13	1556519.92	1402804.93	3277.30	5/8" REBAR WITH YPC MARKED 17784LS ON WEST SIDE OF MARIAS PARK RD ±715' SOUTH OF E HWY 2
CP-14	1556527.79	1402858.17	3277.34	5/8" REBAR WITH YPC MARKED 17784LS ±280' WEST OF E MARIAS PARK RD AND ±300' SOUTH OF E HWY 2

HORIZONTAL COORDINATES ARE GROUND, INTERNATIONAL FEET, AND WERE ESTABLISHED BY AN AUTONAMOUS READING USING SURVEY QUALITY GPS. TO CONVERT TO MONTANA STATE PLANE COORDINATES, MULTIPLY TIMES THE COMBINED SCALE FACTOR OF 0.9995639075, ABOUT AN ORIGIN OF (0,0).

BENCHMARK:

VERTICAL DATUM IS NAVD88, AND WAS PROJECTED BY SURVEY QUALITY GPS FROM THE NGS MARK L433.



REV	DATE	REVISION



DRAWN BY: BWC
DESIGNED BY: MJO
QUALITY CHECK: MJO
DATE: 02.27.15
JOB NO. 12.291
SHEET 001

DEVON WATER INC., IMPROVEMENTS
DEVON, MONTANA
SHEET LOCATION MAP
SURVEY DATA

J:\2014\12-291 Devon Water inc\ADD\12291-CES-0-DHW.dwg, 2/27/2015 11:52:49 AM, rev/C