

**RAW WATER PUMPS, P-6020/30/40**

**PUMP**  
 TYPE: VERTICAL CENTRIFUGAL  
 MANUFACTURER: WILCO  
 MATERIALS 1 (FRAME): CS  
 MATERIALS 2 (INTERNAL): ANSI SS316L  
 MODEL: MV-80-05  
 INLET/OUTLET: 2" / 2"  
 FITTING: #300 RF

**MOTOR**  
 TYPE: TEFC  
 MANUFACTURER: BALDOR  
 FRAME: 213TC  
 POWER: 7.5 HP/5.6 KW  
 RPM: 3,450  
 VOLTAGE (VAC): 460/3/60  
 AMP DRAW (A): 8.6  
 RATED CAPACITY (IMP): 89 USGPM @ 91 PSI  
 RATED CAPACITY (MET): 20.2 m<sup>3</sup>/hr @ 630 KPA  
 MISC #1: N/A

**CARTRIDGE PRE-FILTERS, F-6010/6020**

TYPE: VERTICAL FILTER SUITED FOR 5 ROUND CARTRIDGE FILTERS  
 SERVICE: SOUR  
 MATERIALS: SS 316L  
 FLOW CAPACITY [IMP]: 100 USGPM @ 25 PSI, 200/-20 F  
 FLOW CAPACITY [MET]: 22.7 M<sup>3</sup>/HR @ 1661 KPA  
 INLET/OUTLET: 2" / 2"  
 FLANGED CONNECTIONS: #150 RFWN (QTY 2)  
 THREADED CONNECTIONS: #6000 FNPT (QTY 2)  
 MISC #1: 100% RADIOGRAPHY ON ALL BUTT WELDS  
 MISC #2: NO OTHER NDE REQUIRED  
 MISC #3: NO PWHT  
 MISC #4: BUILT TO ASME CODE SEC VIII DIV.1  
 MISC #5: UM STAMP  
 MISC #6: SWING CLOSURE W LIFTING HANDLE AND VITON O-RING SEAL  
 MISC #7: HOLDS FIVE (5) 2.5" OD X 40" LONG FILTER CARTRIDGES

**SODIUM BISULFITE INJECTION PUMP, P-6160**

TYPE: DIAPHRAGM PISTON PUMP  
 MANUFACTURER: PROMINENT  
 MODEL: S1CAH10050PVT00700D3110C  
 MATERIALS (INTERNAL): PVDF W/ PTFE VITON SEALS  
 SEAL: STANDARD DIAPHRAGM / PTFE SEAL  
 DIAPHRAGM TYPE: STANDARD DIAPHRAGM PTFE  
 LIQUID END VERSION: W/O VALVE SPRINGS  
 CONNECTION: PVDF CLAMPING NUT AND INSERT  
 CONTROL: 1 PH, 115-230 V, 50/60Hz  
 CABLE AND PLUG: 115 VAC PLUG  
 CONTROL VERSION: MANUAL+EXTERNAL W/ PULSE CONTROL AND ANALOG CONT.  
 STROKE ADJ: AUTO + CALIBRATION  
 FLOW [IMP]: 15.8 USGPH @ 145 PSI  
 FLOW [MET]: 0.06 M<sup>3</sup>/HR @ 1,000 KPA  
 POWER SUPPLY: 120/1/60  
 POWER: TBD  
 FAULT RELAY: 120/1/60  
 TANK LEVEL SWITCH: 120/1/60

**SODIUM BISULFITE STORAGE TANK, TK-6160**

VOLUME [IMP]: 56 USGAL  
 VOLUME [MET]: 250 L  
 MATERIALS: PE  
 MISC #1: INCLUDES CHEMICAL CONTAINMENT

**NOTES**  
**NOTE 1**  
 - MAINTENANCE DRAIN FITTINGS ROUTED TO COMMON FLOOR DRAIN  
 - SYSTEM EQUIPPED WITH THREE (3) COMMON FLOOR DRAINS  
 - ALL THREE (3) FLOOR DRAINS ARE HYDRAULICALLY CONNECTED AND ROUTED TO SKID EDGE FOR DRAINAGE  
 - SUMP AT SOUTH END OF SKID IS EQUIPPED WITH SUMP DRAIN PUMP, P-6060, THAT DISCHARGES AT NOZZLE N6 AT WEST SIDE OF BUILDING ENCLOSURE.  
 - DETAILS ON 011026-PID-004

**REFERENCE DRAWINGS**

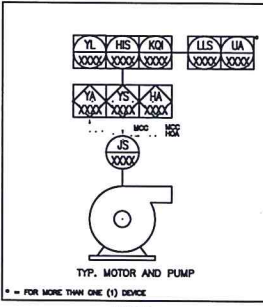
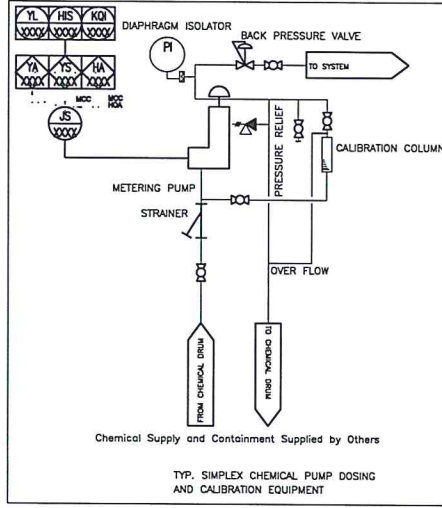
REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
05	11 01 07	AS BUILT	MA	GC		
04	10 11 24	RE-ISSUED FOR CONSTRUCTION	GC	MA		
03	10 11 10	CLIENT COMMENTS INCORPORATED	GC	MA		
02	10 11 02	ISSUED FOR CONSTRUCTION	SC	GC		
01	10 10 22	ISSUED FOR APPROVAL	AP	GC		
00	10 10 20	ISSUED FOR INFORMATION	AP	GC		

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**TITLE**  
 PIPING AND INSTRUMENT DIAGRAM  
 PENNVEST ENERGY - COLEVILLE ASP  
 WTS - RAW WATER FEED

PLANT AREA

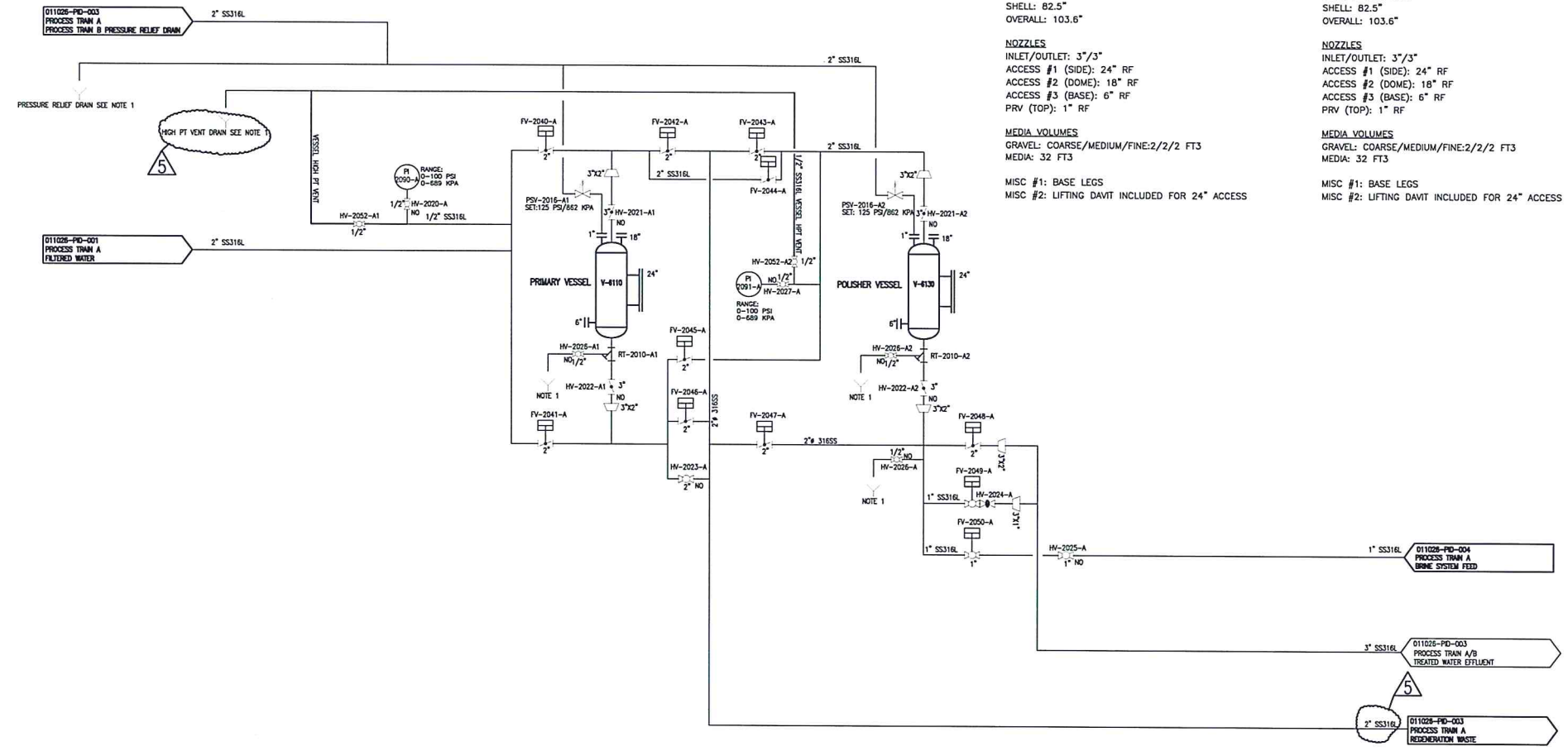
SCALE	
DRAWN BY	A.FERNIS
CHECKED BY	M.M.
APPROVED	G.C.
SHEET	1 OF 5
DRAWING NO.	011026-PID-001
REV.	5



DRAWING NO. 011026-PID-002

8                      7                      6                      5                      4                      3                      2                      1

E  
D  
C  
B



**SOFTENER FILTER VESSELS, V-6110**  
**PRIMARY FILTER**  
 TYPE: VERTICAL  
 MATERIALS: CS  
 INTERNAL COATING: DEVOE DEVCHEM 253  
 RATING: ASME  
 MAWP [IMP]: 125 PSI AT 60 C  
 MAWP [MET]: 861 KPA AT 60 C  
 RATED FLOW [IMP]: 86 USGPM  
 RATED FLOW [MET]: 19.5 m3/hr  
 MEDIA: PUROLITE C-100

**DIMENSIONS**  
 DIAMETER: 42"  
 DOME HEIGHT: 10.5"  
 SHELL: 82.5"  
 OVERALL: 103.6"

**NOZZLES**  
 INLET/OUTLET: 3"/3"  
 ACCESS #1 (SIDE): 24" RF  
 ACCESS #2 (DOME): 18" RF  
 ACCESS #3 (BASE): 6" RF  
 PRV (TOP): 1" RF

**MEDIA VOLUMES**  
 GRAVEL: COARSE/MEDIUM/FINE: 2/2/2 FT3  
 MEDIA: 32 FT3

**MISC #1: BASE LEGS**  
**MISC #2: LIFTING DAVIT INCLUDED FOR 24" ACCESS**

**SOFTENER FILTER VESSELS, V-6130**  
**POLISHER FILTER**  
 TYPE: VERTICAL  
 MATERIALS: CS  
 INTERNAL COATING: DEVOE DEVCHEM 253  
 RATING: ASME  
 MAWP [IMP]: 125 PSI AT 60 C  
 MAWP [MET]: 861 KPA AT 60 C  
 RATED FLOW [IMP]: 86 USGPM  
 RATED FLOW [MET]: 19.5 m3/hr  
 MEDIA: PUROLITE C-100

**DIMENSIONS**  
 DIAMETER: 42"  
 DOME HEIGHT: 10.5"  
 SHELL: 82.5"  
 OVERALL: 103.6"

**NOZZLES**  
 INLET/OUTLET: 3"/3"  
 ACCESS #1 (SIDE): 24" RF  
 ACCESS #2 (DOME): 18" RF  
 ACCESS #3 (BASE): 6" RF  
 PRV (TOP): 1" RF

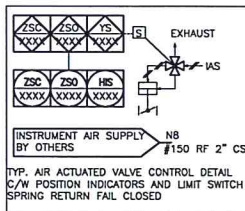
**MEDIA VOLUMES**  
 GRAVEL: COARSE/MEDIUM/FINE: 2/2/2 FT3  
 MEDIA: 32 FT3

**MISC #1: BASE LEGS**  
**MISC #2: LIFTING DAVIT INCLUDED FOR 24" ACCESS**

**NOTES**  
**NOTE 1**  
 - MAINTENANCE DRAIN FITTINGS ROUTED TO COMMON FLOOR DRAIN  
 - SYSTEM EQUIPPED WITH THREE (3) COMMON FLOOR DRAINS  
 - ALL THREE (3) FLOOR DRAINS ARE HYDRAULICALLY CONNECTED AND ROUTED TO SKID EDGE FOR DRAINAGE  
 - SUMP AT SOUTH END OF SKID IS EQUIPPED WITH SUMP DRAIN PUMP, P-6060, THAT DISCHARGES AT NOZZLE N6 AT WEST SIDE OF BUILDING ENCLOSURE.

**REFERENCE DRAWINGS**

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.				
05	11	01	07			AS BUILT	MA	GC		
04	10	11	24			RE-ISSUED FOR CONSTRUCTION	GC	MA		
03	10	11	11			CLIENT COMMENTS INCORPORATED	GC	MA		
02	10	11	02			ISSUED FOR CONSTRUCTION	SC	GC		
01	10	10	22			ISSUED FOR APPROVAL	AP	GC		
00	10	10	20			ISSUED FOR INFORMATION	AP	GC		



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Filter Solutions

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**TITLE**  
 PIPING AND INSTRUMENT DIAGRAM  
 PENNWEST ENERGY - COLEVILLE ASP  
 WTS - PROCESS TRAIN A

**PLANT AREA**

SCALE	
NTS	
DRAWN BY	CHECKED BY
ALPERKINS	MJM
	APPROVED
	G.C.
SHEET	DRAWING NO.
2 OF 5	011026-PID-002
	REV.
	5

8                      7                      6                      5                      4                      3                      2                      1



DRAWING NO. 011026-PID-003

**SOFTENER FILTER VESSELS**

**V-6120**  
**PRIMARY FILTER**  
 TYPE: VERTICAL  
 MATERIALS: CS  
 INTERNAL COATING: DEVOE DEVCHEM 253  
 RATING: ASME  
 MAWP [MP]: 125 PSI AT 60 C  
 MAWP [MET]: 861 KPA AT 60 C  
 RATED FLOW [MP]: 86 USGPM  
 RATED FLOW [MET]: 19.5 m3/hr  
 MEDIA: PUROLITE C-100

**DIMENSIONS**  
 DIAMETER: 42"  
 DOME HEIGHT: 10.5"  
 SHELL: 82.5"  
 OVERALL: 103.6"

**NOZZLES**  
 INLET/OUTLET: 3"/3"  
 ACCESS #1 (SIDE): 24" RF  
 ACCESS #2 (DOME): 18" RF  
 ACCESS #3 (BASE): 6" RF  
 PRV (TOP): 1" RF

**MEDIA VOLUMES**  
 GRAVEL: COARSE/MEDIUM/FINE:2/2/2 FT3  
 MEDIA: 32 FT3

MISC #1: BASE LEGS  
 MISC #2: LIFTING DAVIT INCLUDED FOR 24" ACCESS

**SOFTENER FILTER VESSELS**

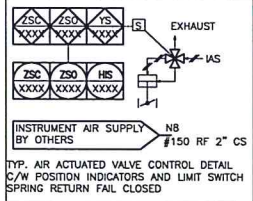
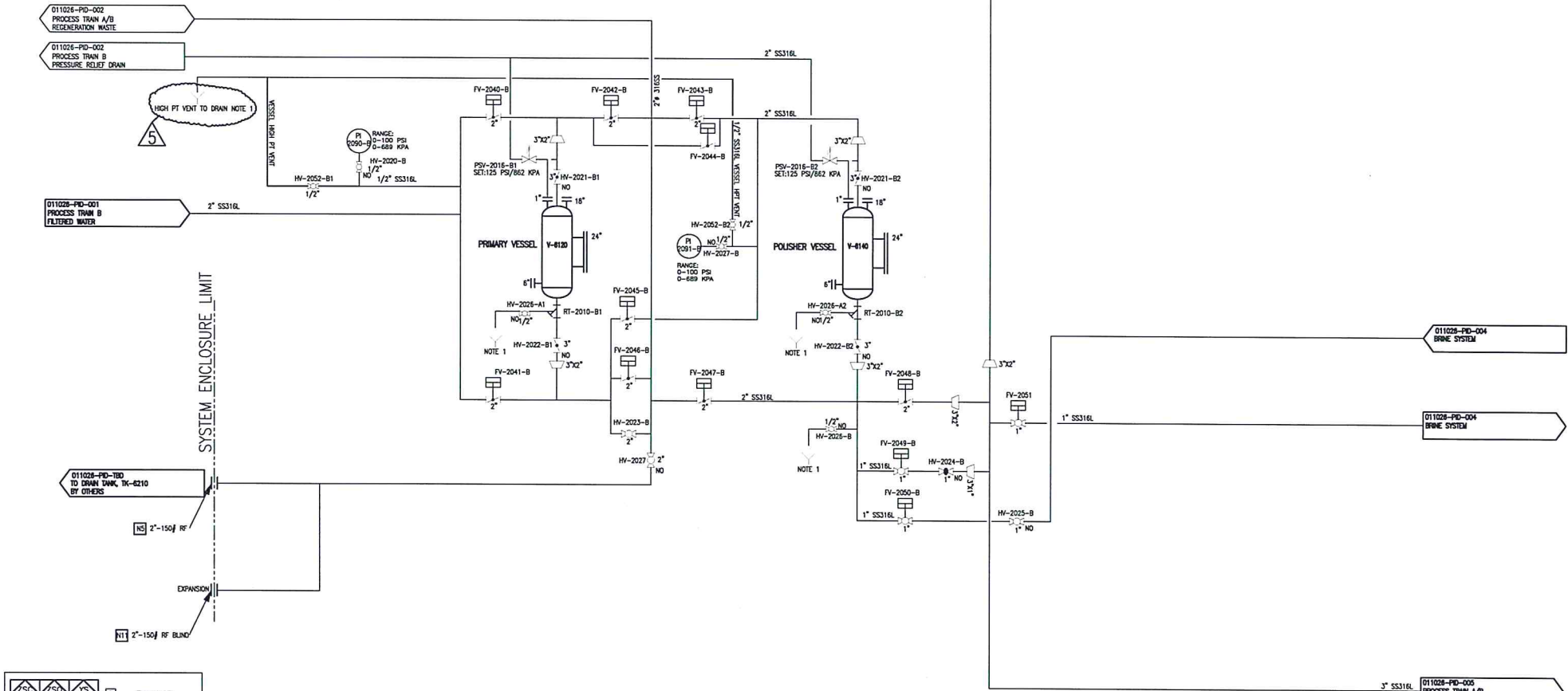
**V-6140**  
**POLISHER FILTER**  
 TYPE: VERTICAL  
 MATERIALS: CS  
 INTERNAL COATING: DEVOE DEVCHEM 253  
 RATING: ASME  
 MAWP [MP]: 125 PSI AT 60 C  
 MAWP [MET]: 861 KPA AT 60 C  
 RATED FLOW [MP]: 86 USGPM  
 RATED FLOW [MET]: 19.5 m3/hr  
 MEDIA: PUROLITE C-100

**DIMENSIONS**  
 DIAMETER: 42"  
 DOME HEIGHT: 10.5"  
 SHELL: 82.5"  
 OVERALL: 103.6"

**NOZZLES**  
 INLET/OUTLET: 3"/3"  
 ACCESS #1 (SIDE): 24" RF  
 ACCESS #2 (DOME): 18" RF  
 ACCESS #3 (BASE): 6" RF  
 PRV (TOP): 1" RF

**MEDIA VOLUMES**  
 GRAVEL: COARSE/MEDIUM/FINE:2/2/2 FT3  
 MEDIA: 32 FT3

MISC #1: BASE LEGS  
 MISC #2: LIFTING DAVIT INCLUDED FOR 24" ACCESS



**NOTES**  
**NOTE 1**  
 - MAINTENANCE DRAIN FITTINGS ROUTED TO COMMON FLOOR DRAIN  
 - SYSTEM EQUIPPED WITH THREE (3) COMMON FLOOR DRAINS  
 - ALL THREE (3) FLOOR DRAINS ARE HYDRAULICALLY CONNECTED AND ROUTED TO SKID EDGE FOR DRAINAGE  
 - SUMP AT SOUTH END OF SKID IS EQUIPPED WITH SUMP DRAIN PUMP, P-6060, THAT DISCHARGES AT NOZZLE N6 AT WEST SIDE OF BUILDING ENCLOSURE.

**REFERENCE DRAWINGS**

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
05	11 01 07	AS BUILT	MA	GC		
04	10 11 24	RE-ISSUED FOR CONSTRUCTION	GC	MA		
03	10 11 11	CLIENT COMMENTS INCORPORATED	GC	MA		
02	10 11 02	ISSUED FOR CONSTRUCTION	SC	GC		
01	10 10 22	ISSUED FOR APPROVAL	AP	GC		
00	10 10 20	ISSUED FOR INFORMATION	AP	GC		

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**TITLE**  
 PIPING AND INSTRUMENT DIAGRAM  
 PENNWEST ENERGY - COLEVILLE ASP  
 WTS - PROCESS TRAIN B

PLANT AREA		
SCALE		
NTS		
DRAWN BY	CHECKED BY	APPROVED
A.PERRINS	M.M.	G.C.
SHEET	DRAWING NO.	REV.
3 OF 5	011026-PID-003	5

8 7 6 5 4 3 2 1

**SYSTEM FLOOR DRAIN PUMP, P-6060**

**PUMP**  
 TYPE: TRASH PUMP  
 MANUFACTURER: AMT  
 MATERIALS 1 (FRAME): CS  
 MATERIALS 2 (INTERNAL): CS  
 MODEL: 316A-95  
 INLET/OUTLET: 2" 1/2" MNPT

**MOTOR**  
 TYPE: TEFC  
 MANUFACTURER: TBO  
 FRAME: 56J  
 POWER: 3.0 HP/2.25 KW  
 RPM: 3,450  
 VOLTAGE (VAC): 230/460/3/60  
 AMP DRAW (A): 8/4  
 RATED CAPACITY [IMP]: 40 USGPM @ 40 PSI  
 RATED CAPACITY [MET]: 9.0 m<sup>3</sup>/hr @ 370 KPA  
 MISC #1: N/A

**SYSTEM BRINE PUMPS, P-6110/20**

**PUMP**  
 TYPE: VERTICAL CENTRIFUGAL  
 MANUFACTURER: WILD  
 MATERIALS 1 (FRAME): CS  
 MATERIALS 2 (INTERNAL): ANSI SS316L  
 MODEL: MVI-15-03  
 INLET/OUTLET: 1" 1/4"  
 FLANGE: #300 RF

**MOTOR**  
 TYPE: TEFC  
 MANUFACTURER: BALDOR  
 FRAME: 56C  
 POWER: 1.0 HP/0.75 KW  
 RPM: 3,450  
 VOLTAGE (VAC): 460/3/60  
 AMP DRAW (A): 1.8  
 RATED CAPACITY [IMP]: 10 USGPM @ 46 PSI  
 RATED CAPACITY [MET]: 2.27 m<sup>3</sup>/hr @ 314 KPA  
 MISC #1: N/A

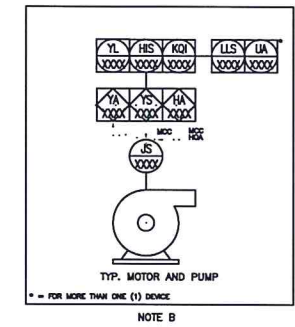
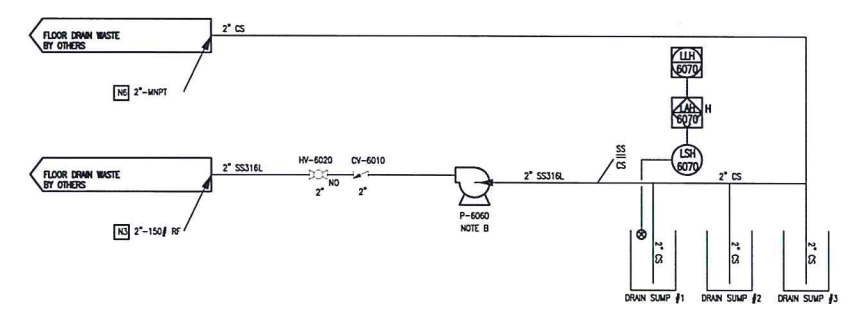
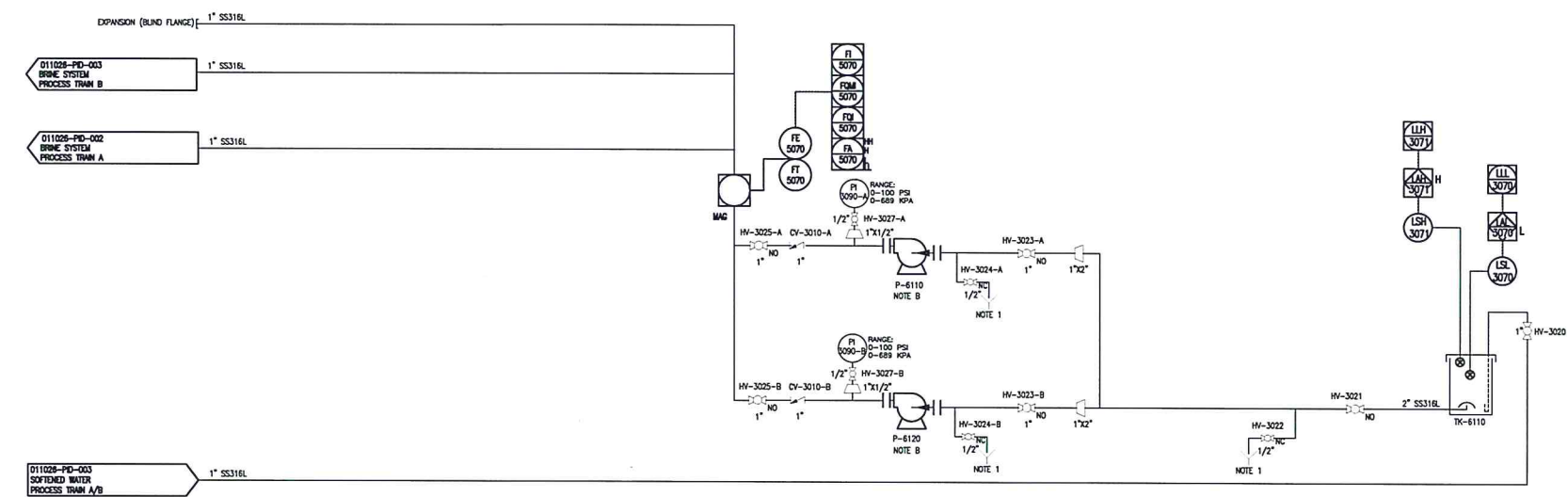
**BRINE STORAGE TANK, TK-6110**

TYPE: STORAGE TANK  
 VOLUME [SI]: 1.25 m<sup>3</sup>  
 VOLUME [IMP]: 1,250 L  
 MATERIALS: PE  
 MISC #1: INCLUDES CHEMICAL CONTAINMENT TRAY

**NOTES**  
**NOTE 1**  
 - MAINTENANCE DRAIN FITTINGS ROUTED TO COMMON FLOOR DRAIN  
 - SYSTEM EQUIPPED WITH THREE (3) COMMON FLOOR DRAINS  
 - ALL THREE (3) FLOOR DRAINS ARE HYDRAULICALLY CONNECTED AND ROUTED TO SKID EDGE FOR DRAINAGE  
 - SUMP AT SOUTH END OF SKID IS EQUIPPED WITH SUMP DRAIN PUMP, P-6060, THAT DISCHARGES AT NOZZLE N6 AT WEST SIDE OF BUILDING ENCLOSURE.

**REFERENCE DRAWINGS**

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
05	11 01 7	AS BUILT	MA	GC		
04	10 11 24	RE-ISSUED FOR CONSTRUCTION	GC	MA		
03	10 11 11	CLIENT COMMENTS INCORPORATED	GC	MA		
02	10 11 02	ISSUED FOR CONSTRUCTION	SC	GC		
01	10 10 22	ISSUED FOR APPROVAL	AP	GC		
00	10 10 20	ISSUED FOR INFORMATION	AP	GC		



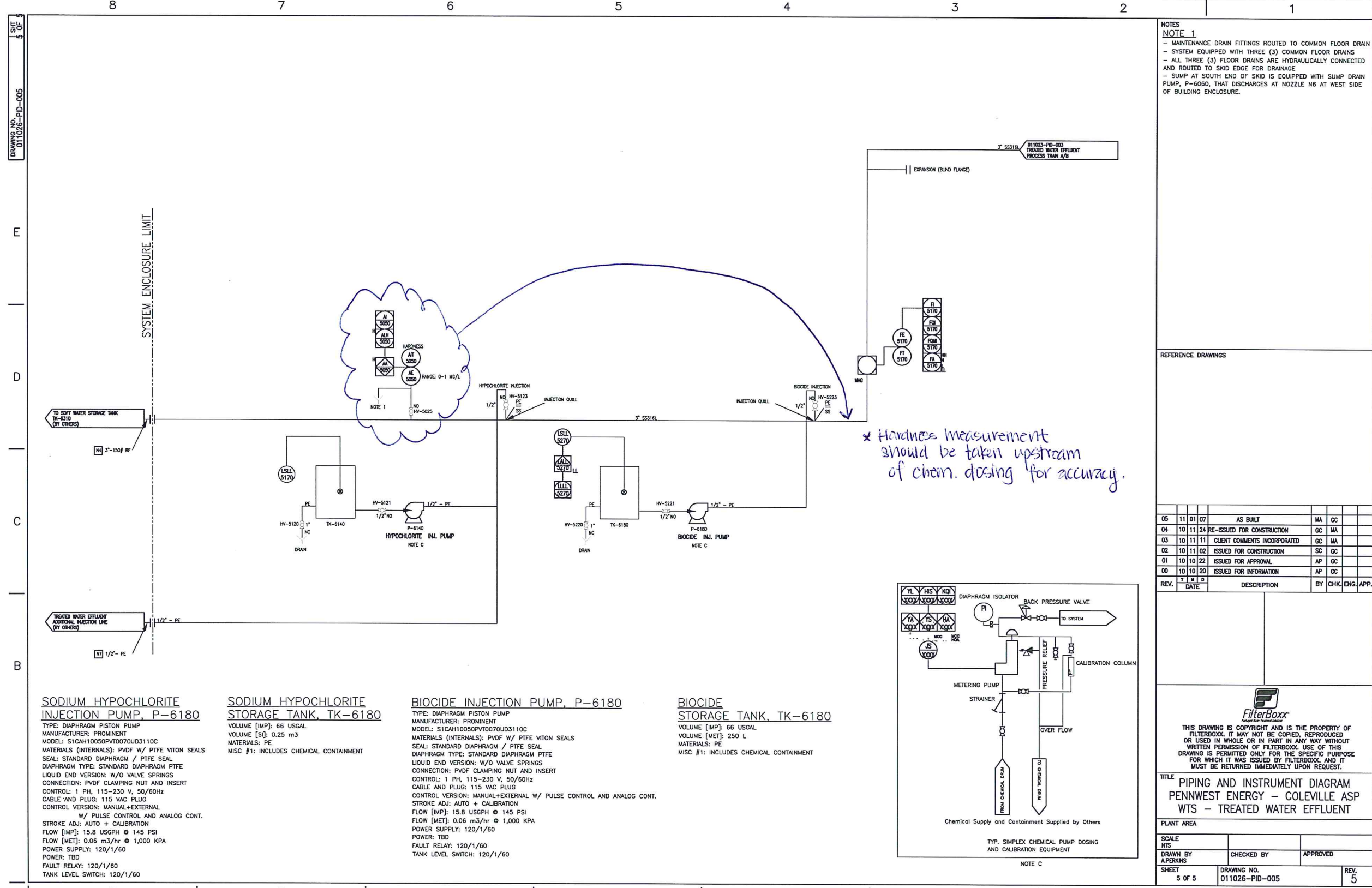
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**TITLE**  
 PIPING AND INSTRUMENT DIAGRAM  
 PENNWEST ENERGY - COLEVILLE ASP  
 WTS - BRINE SYSTEM

PLANT AREA		
SCALE		
NTS		
DRAWN BY	CHECKED BY	APPROVED
A.PERSING	M.M.	G.C.
SHEET	DRAWING NO.	REV.
4 OF 5	011026-PID-004	5

8 7 6 5 4 3 2 1





DRAWING NO. 011026-PID-005  
SHEET 5 OF 5

SYSTEM ENCLOSURE LIMIT

TO SOFT WATER STORAGE TANK TK-6310 (BY OTHERS)

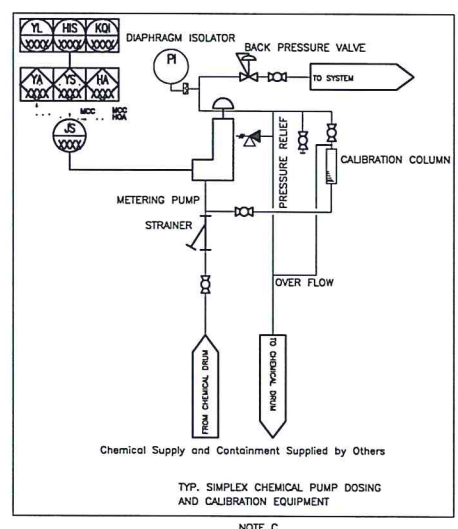
TREATED WATER EFFLUENT ADDITIONAL INJECTION LINE (BY OTHERS)

**SODIUM HYPOCHLORITE INJECTION PUMP, P-6180**  
 TYPE: DIAPHRAGM PISTON PUMP  
 MANUFACTURER: PROMINENT  
 MODEL: S1CAH10050PVT0070UD3110C  
 MATERIALS (INTERNAL): PVDF W/ PTFE VITON SEALS  
 SEAL: STANDARD DIAPHRAGM / PTFE SEAL  
 DIAPHRAGM TYPE: STANDARD DIAPHRAGM PTFE  
 LIQUID END VERSION: W/O VALVE SPRINGS  
 CONNECTION: PVDF CLAMPING NUT AND INSERT  
 CONTROL: 1 PH, 115-230 V, 50/60Hz  
 CABLE AND PLUG: 115 VAC PLUG  
 CONTROL VERSION: MANUAL+EXTERNAL  
 W/ PULSE CONTROL AND ANALOG CONT.  
 STROKE ADJ: AUTO + CALIBRATION  
 FLOW [IMP]: 15.8 USGPH @ 145 PSI  
 FLOW [MET]: 0.06 m<sup>3</sup>/hr @ 1,000 KPA  
 POWER SUPPLY: 120/1/60  
 POWER: TBD  
 FAULT RELAY: 120/1/60  
 TANK LEVEL SWITCH: 120/1/60

**SODIUM HYPOCHLORITE STORAGE TANK, TK-6180**  
 VOLUME [IMP]: 66 USGAL  
 VOLUME [SI]: 0.25 m<sup>3</sup>  
 MATERIALS: PE  
 MISC #1: INCLUDES CHEMICAL CONTAINMENT

**BIOCIDE INJECTION PUMP, P-6180**  
 TYPE: DIAPHRAGM PISTON PUMP  
 MANUFACTURER: PROMINENT  
 MODEL: S1CAH10050PVT0070UD3110C  
 MATERIALS (INTERNAL): PVDF W/ PTFE VITON SEALS  
 SEAL: STANDARD DIAPHRAGM / PTFE SEAL  
 DIAPHRAGM TYPE: STANDARD DIAPHRAGM PTFE  
 LIQUID END VERSION: W/O VALVE SPRINGS  
 CONNECTION: PVDF CLAMPING NUT AND INSERT  
 CONTROL: 1 PH, 115-230 V, 50/60Hz  
 CABLE AND PLUG: 115 VAC PLUG  
 CONTROL VERSION: MANUAL+EXTERNAL W/ PULSE CONTROL AND ANALOG CONT.  
 STROKE ADJ: AUTO + CALIBRATION  
 FLOW [IMP]: 15.8 USGPH @ 145 PSI  
 FLOW [MET]: 0.06 m<sup>3</sup>/hr @ 1,000 KPA  
 POWER SUPPLY: 120/1/60  
 POWER: TBD  
 FAULT RELAY: 120/1/60  
 TANK LEVEL SWITCH: 120/1/60

**BIOCIDE STORAGE TANK, TK-6180**  
 VOLUME [IMP]: 66 USGAL  
 VOLUME [MET]: 250 L  
 MATERIALS: PE  
 MISC #1: INCLUDES CHEMICAL CONTAINMENT



*\* Hardness measurement should be taken upstream of chem. dosing for accuracy.*

**NOTES**  
**NOTE 1**  
 - MAINTENANCE DRAIN FITTINGS ROUTED TO COMMON FLOOR DRAIN  
 - SYSTEM EQUIPPED WITH THREE (3) COMMON FLOOR DRAINS  
 - ALL THREE (3) FLOOR DRAINS ARE HYDRAULICALLY CONNECTED AND ROUTED TO SKID EDGE FOR DRAINAGE  
 - SUMP AT SOUTH END OF SKID IS EQUIPPED WITH SUMP DRAIN PUMP, P-6060, THAT DISCHARGES AT NOZZLE N6 AT WEST SIDE OF BUILDING ENCLOSURE.

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
05	11 01 07	AS BUILT	MA	GC		
04	10 11 24	RE-ISSUED FOR CONSTRUCTION	GC	MA		
03	10 11 11	CLIENT COMMENTS INCORPORATED	GC	MA		
02	10 11 02	ISSUED FOR CONSTRUCTION	SC	GC		
01	10 10 22	ISSUED FOR APPROVAL	AP	GC		
00	10 10 20	ISSUED FOR INFORMATION	AP	GC		

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**TITLE**  
 PIPING AND INSTRUMENT DIAGRAM  
 PENNWEST ENERGY - COLEVILLE ASP  
 WTS - TREATED WATER EFFLUENT

**PLANT AREA**

SCALE		
NTS		
DRAWN BY	CHECKED BY	APPROVED
ALPERKINS		
SHEET	DRAWING NO.	REV.
5 OF 5	011026-PID-005	5

8 7 6 5 4 3 2 1

DRAWING NO. 011026-PFD-01

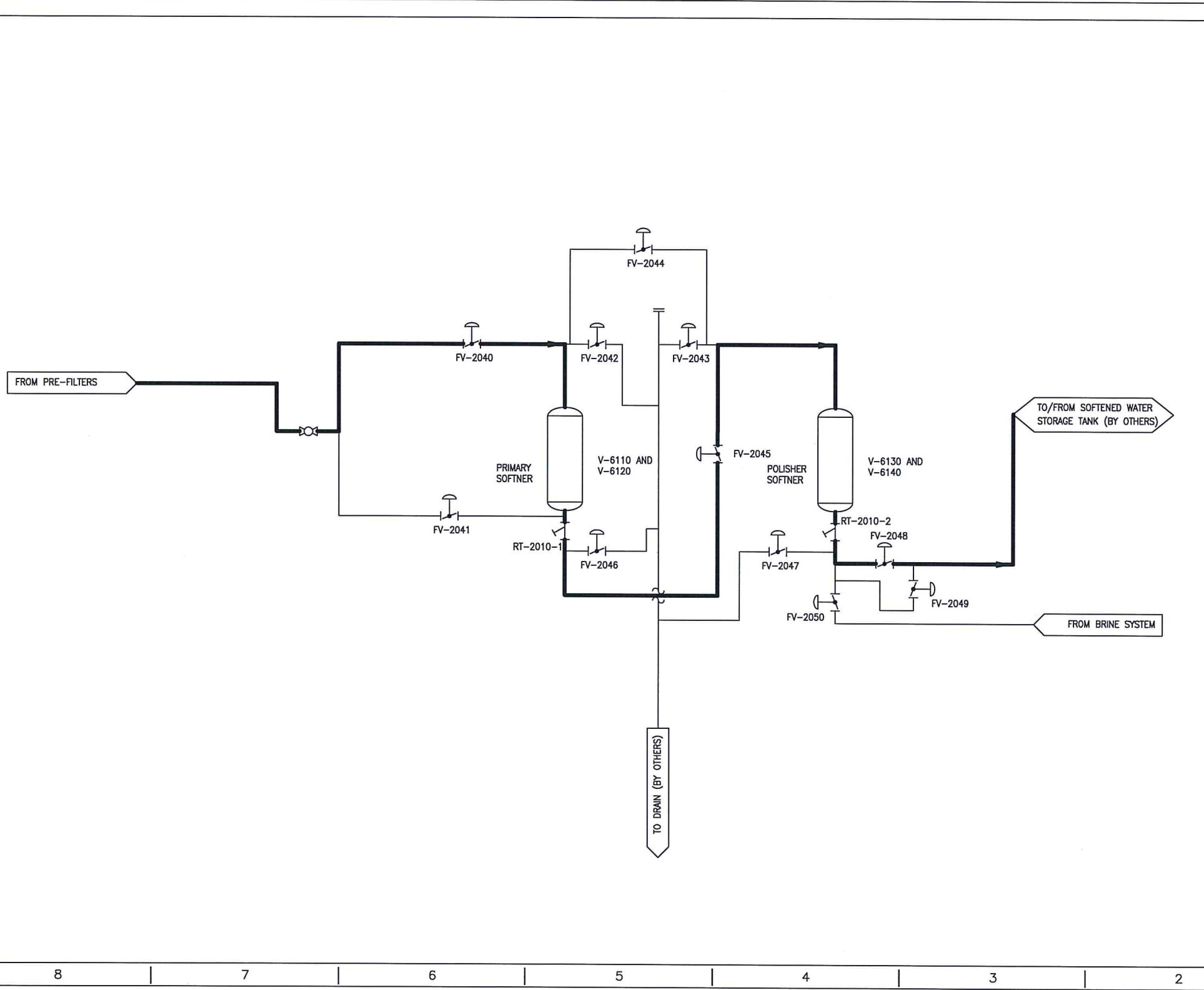
E

D

C

B

8



NOTES

- CAPACITY
- 1) MAX ONE TRAIN IN SERVICE: 18.6 M<sup>3</sup>/hr
  - 2) MAX TWO TRAINS IN SERVICE: 39.2 M<sup>3</sup>/hr
  - 3) MIN ONE TRAIN IN SERVICE: 6.33 M<sup>3</sup>/hr

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
01	110203	AS BUILT	GC	GC		
00	101020	PRELIMINARY-FOR REVIEW	AP	GC		

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Water Treatment Solutions

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TITLE  
**SOFTENER PROCESS FLOW DIAGRAM  
 SERVICE CYCLE TRAIN A/B  
 PENNWEST ENERGY**

PLANT AREA

SCALE	NTS	
DRAWN BY	CHECKED BY	APPROVED
AP	GC	GC
SHEET	DRAWING NO.	REV.
1 OF 7	011026-PFD-01	01

8 7 6 5 4 3 2 1

F

E

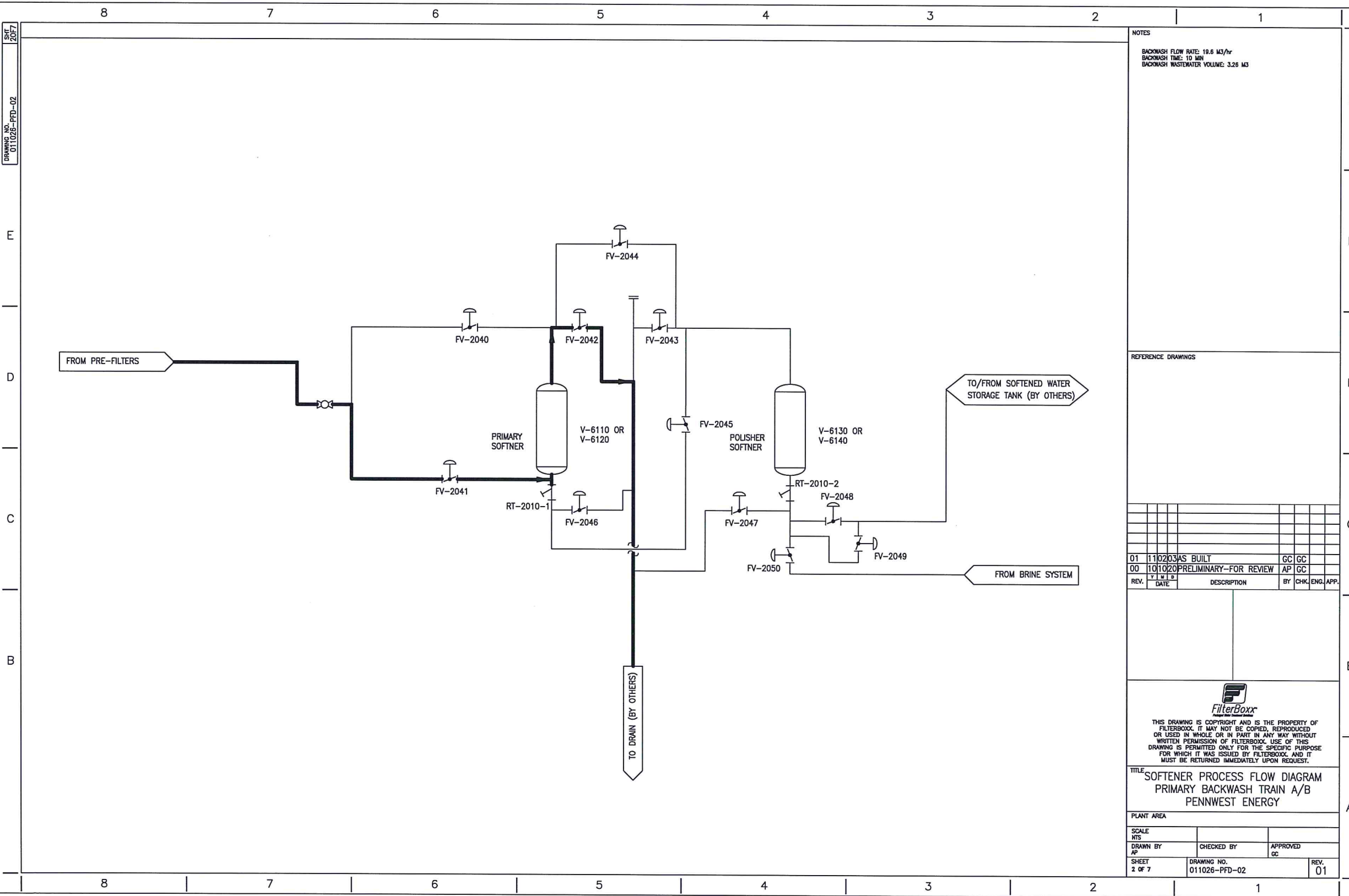
D

C

B

A

DRAWING NO. 011026-PFD-02  
SHEET 2 OF 7



NOTES  
 BACKWASH FLOW RATE: 18.6 M<sup>3</sup>/hr  
 BACKWASH TIME: 10 MIN  
 BACKWASH WASTEWATER VOLUME: 3.26 M<sup>3</sup>

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
01	11/02/03	AS BUILT	GC	GC		
00	10/10/20	PRELIMINARY-FOR REVIEW	AP	GC		

PLANT AREA

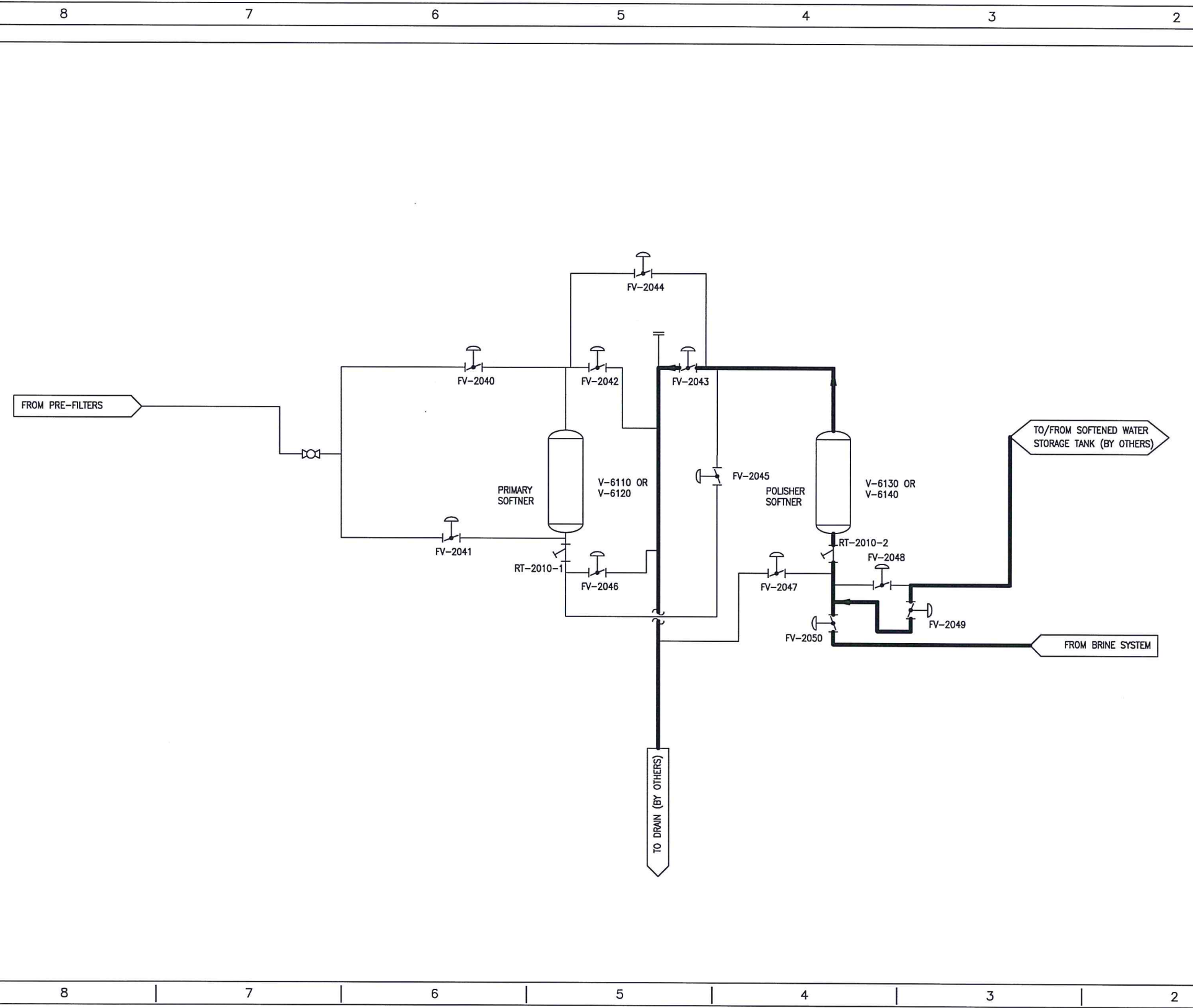
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TITLE  
 SOFTENER PROCESS FLOW DIAGRAM  
 PRIMARY BACKWASH TRAIN A/B  
 PENNWEST ENERGY

SCALE N.T.S.	DRAWN BY AP	CHECKED BY	APPROVED GC
SHEET 2 OF 7	DRAWING NO. 011026-PFD-02	REV. 01	



SHT 307  
DRAWING NO. 011026-PFD-03



NOTES  
 BACKWASH FLOW RATE: 22.3 M<sup>3</sup>/hr  
 BACKWASH TIME: 10 MIN  
 BACKWASH WASTEWATER VOLUME: 3.71 M<sup>3</sup>

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK	ENG.	APP.
01	11/02/03	AS BUILT	AP	GC		
00	10/10/20	PRELIMINARY-FOR REVIEW	AP	GC		



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TITLE  
 SOFTENER PROCESS FLOW DIAGRAM  
 POLISHER BACKWASH TRAIN A/B  
 PENNWEST ENERGY

PLANT AREA		
SCALE N/A	CHECKED BY	APPROVED
DRAWN BY A. PERONS		
SHEET 3 OF 7	DRAWING NO. 011026-PFD-03	REV. 00

DRAWING NO. 011026-PFD-04  
SHT 4 OF 7

8 7 6 5 4 3 2 1

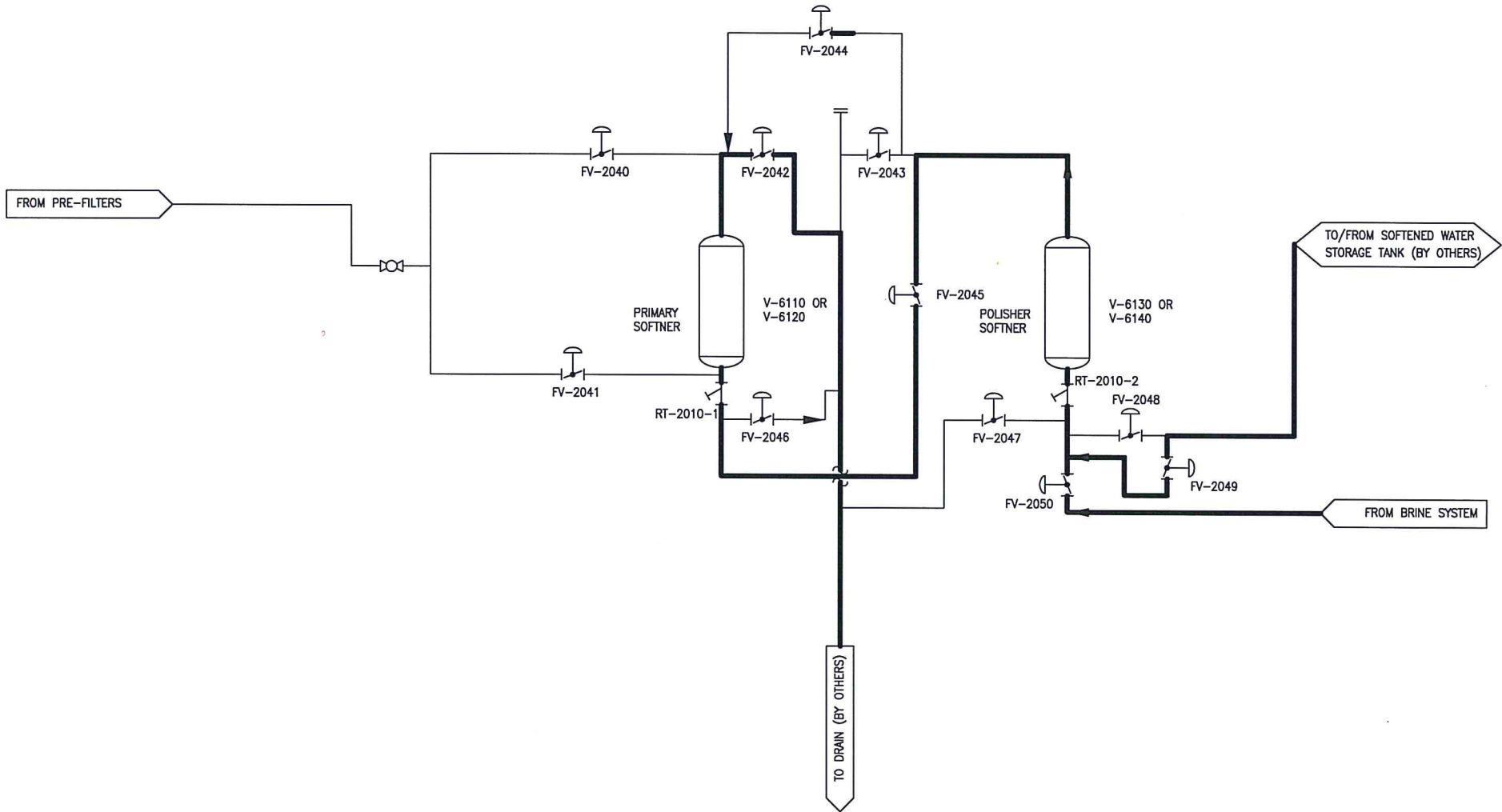
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8 7 6 5 4 3 2 1



NOTES  
 BRINE INJECTION:  
 SOFT WATER FLOW RATE: 22.3 M3/hr  
 SOFT WATER TIME: 10 MIN  
 WASTEWATER VOLUME: 3.71 M3  
 FLOW TYPE: PRIMARY COUNTER-CURRENT REGENERATION  
 BRINE CONCENTRATION: 10% SODIUM CHLORIDE

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
01	11/02/03	AS BUILT	GC	GC		
00	10/10/20	PRELIMINARY-FOR REVIEW	AP	GC		

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TITLE  
 SOFTENER PROCESS FLOW DIAGRAM  
 BRINE DRAW  
 PENNWEST ENERGY

PLANT AREA		
SCALE HTS	CHECKED BY	APPROVED
DRAWN BY AP		GC
SHEET 4 OF 7	DRAWING NO. 011026-PFD-04	REV. 01

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DRAWING NO. 011026-PFD-05

SIT SCF7

F

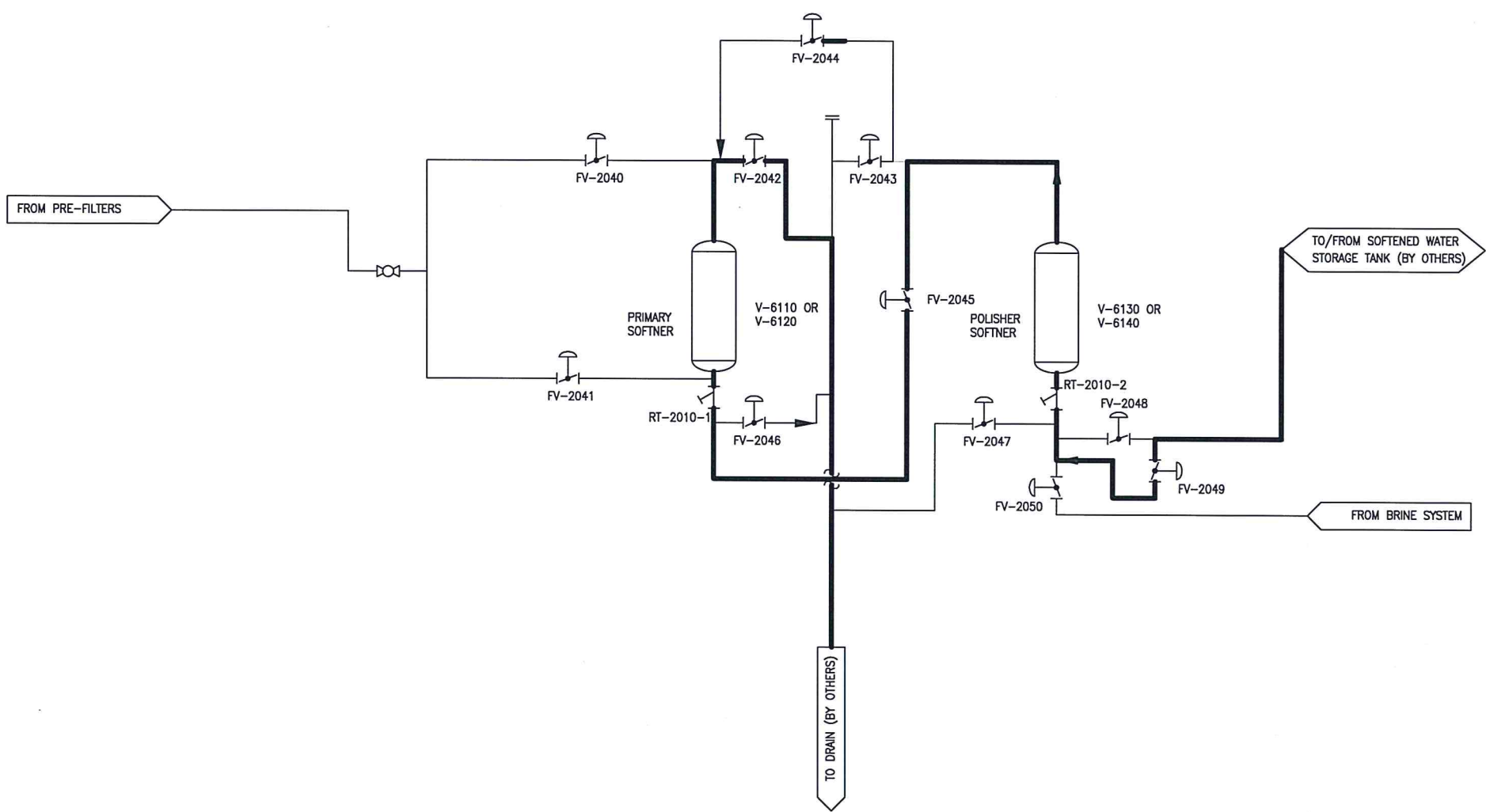
D

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B

A

8 7 6 5 4 3 2 1



NOTES  
 BRINE INJECTION:  
 SOFT WATER FLOW RATE: 22.3 M<sup>3</sup>/hr  
 SOFT WATER TIME: 10 MIN  
 WASTEWATER VOLUME: 3.71 M<sup>3</sup>  
 FLOW TYPE: PRIMARY COUNTER-CURRENT REGENERATION  
 BRINE CONCENTRATION: 10% SODIUM CHLORIDE

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
01	11/02/03	AS BUILT	GC	GC		
00	10/10/20	PRELIMINARY-FOR REVIEW	AP	GC		

**FilterBoxx**  
Water Filtration Systems

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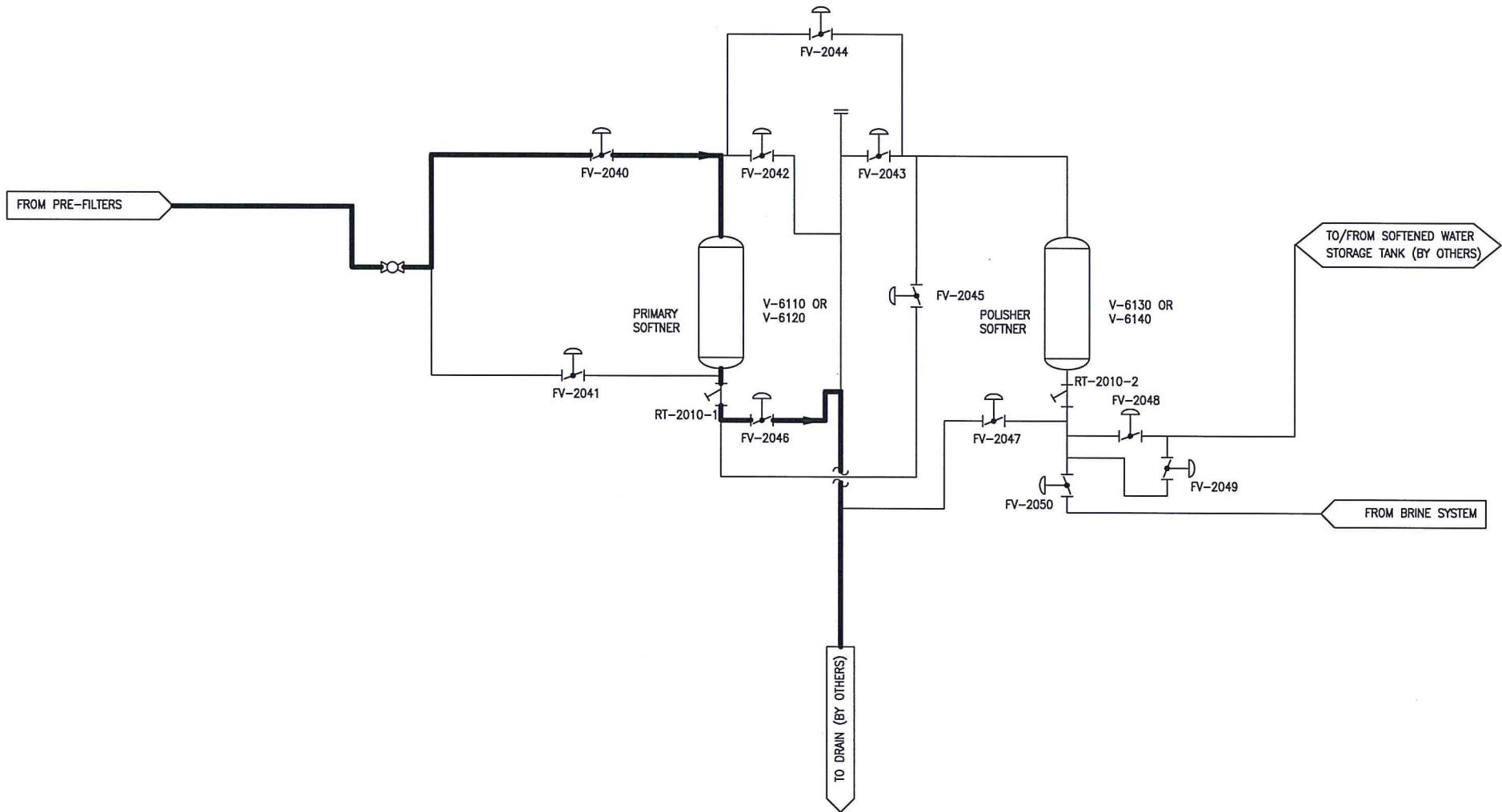
TITLE  
**SOFTENER PROCESS FLOW DIAGRAM  
 SLOW RINSE POLISHER  
 PENNWEST ENERGY**

PLANT AREA		
SCALE N/A	CHECKED BY GC	APPROVED GC
DRAWN BY AP	DRAWING NO. 011026-PFD-05	REV. 01
SHEET 5 OF 7		

8 7 6 5 4 3 2 1



SHEET 6077  
DRAWING NO. 011026-PFD-06



NOTES  
CAPACITY  
1) FAST RINSE: 19.6 M<sup>3</sup>/hr  
2) TIME: 5 MIN  
3) WASTE WATER VOLUME: 1.6 M<sup>3</sup>

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
01	11/02/03	AS BUILT	GC	GC		
00	10/10/20	PRELIMINARY-FOR REVIEW	AP	GC		

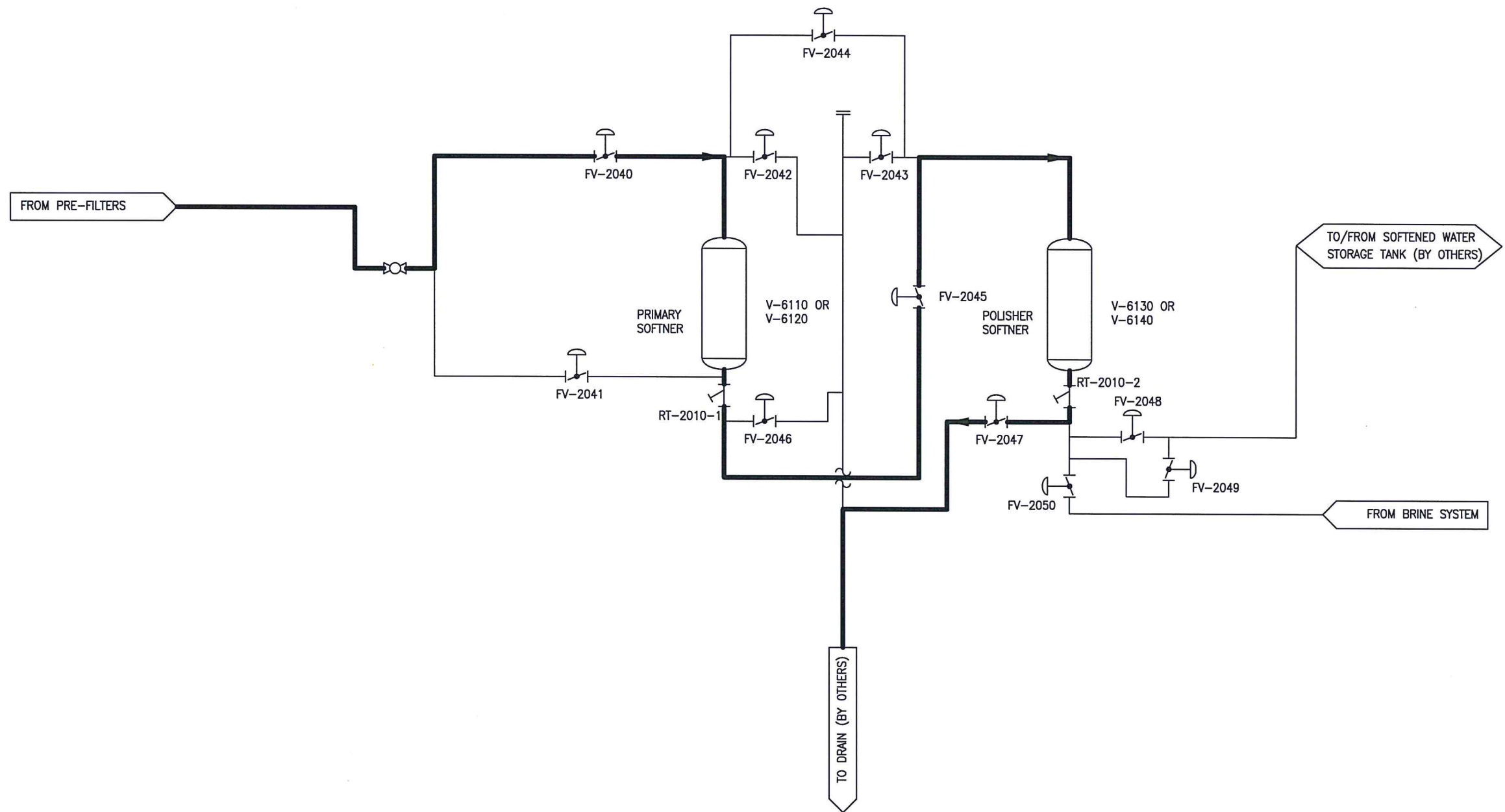


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TITLE  
SOFTENER PROCESS FLOW DIAGRAM  
FAST RINSE PRIMARY  
PENNWEST ENERGY

PLANT AREA		
SCALE HTS	CHECKED BY	APPROVED
DRAWN BY AP		GC
SHEET 6 OF 7	DRAWING NO. 011026-PFD-06	REV. 01

DRAWING NO. 011026-PFD-07  
SHT 7 OF 7



NOTES  
CAPACITY  
1) FINAL RINSE: 19.6 M3/hr  
2) TIME: 10 MIN  
3) WASTE WATER VOLUME: 3.3 M3

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
01	11/02/03	AS BUILT	GC	GC		
00	10/10/20	PRELIMINARY-FOR REVIEW	AP	GC		

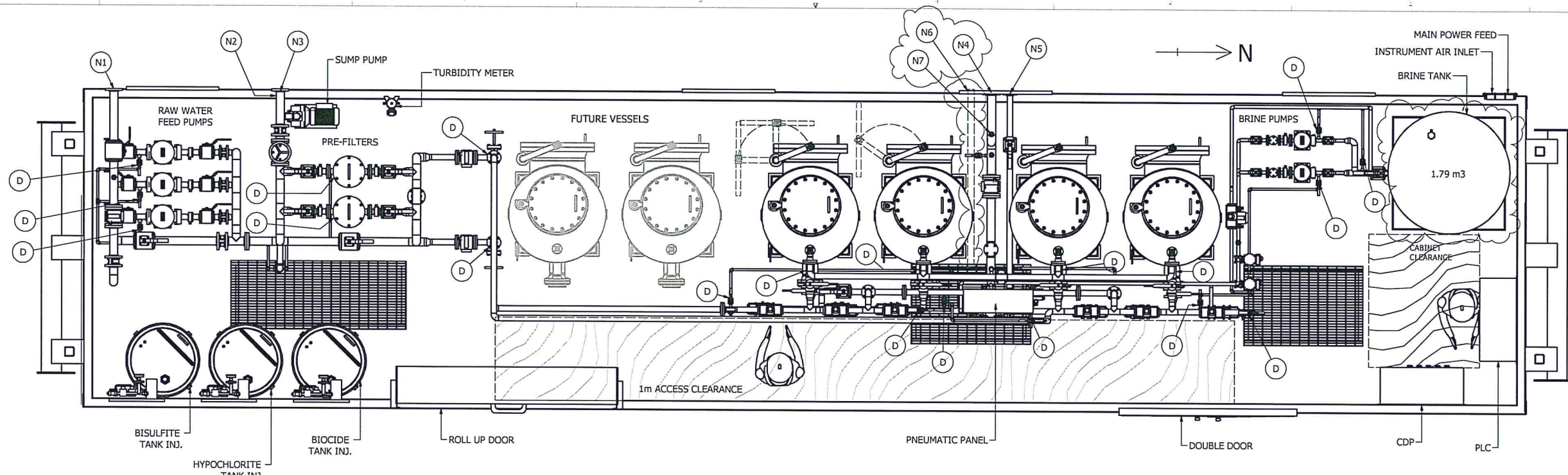


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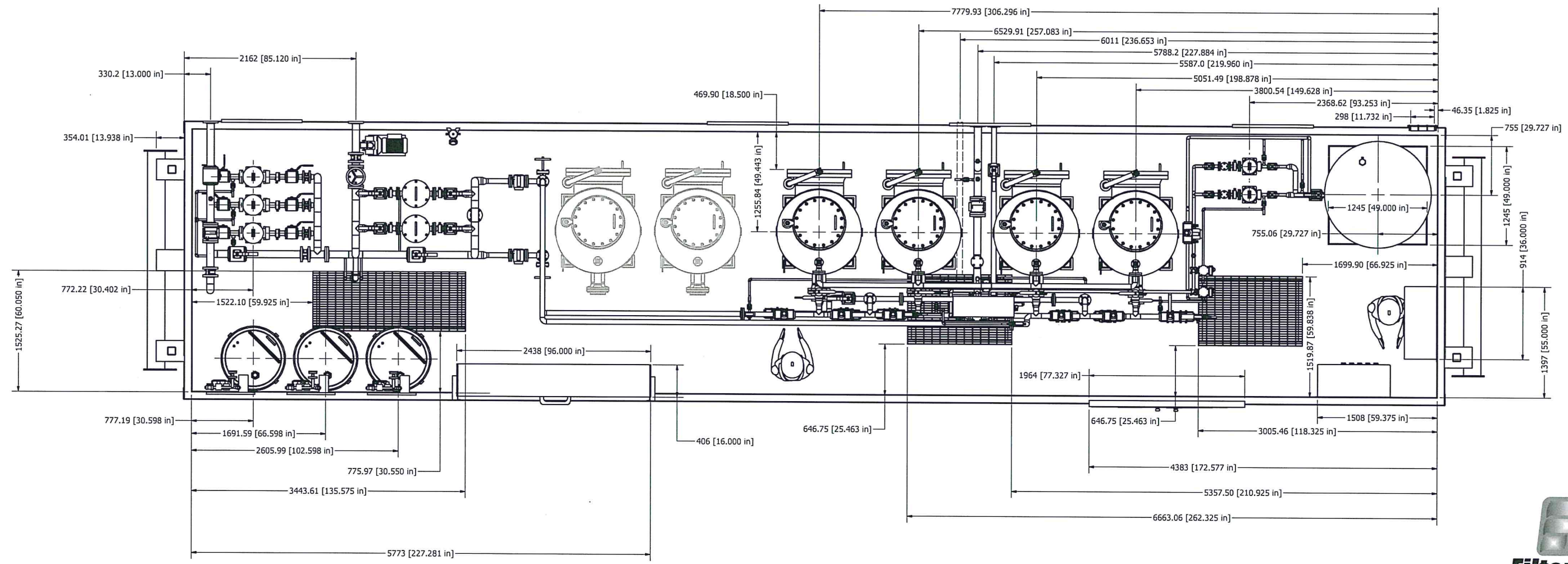
TITLE: SOFTENER PROCESS FLOW DIAGRAM  
FINAL RINSE  
PENNWEST ENERGY

PLANT AREA		
SCALE		
DRAWN BY A. PERKINS	CHECKED BY	APPROVED
SHEET 7 OF 7	DRAWING NO. 011026-PFD-07	REV. 01





PARTS LIST	
ITEM	DESCRIPTION
N1	RAW WATER INLET
N2	BYPASS TO RAW WATER TANK
N3	SUMP PUMP EFFLUENT OUTLET
N4	TREATED WATER EFFLUENT
N5	DRAIN/ WASTE WATER OUTLET
N6	MNTP FLOOR DRAIN
N7	ADDITIONAL HYPO DOSING DRAIN POINT
D	



REVISED		
NO.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	03/11/10

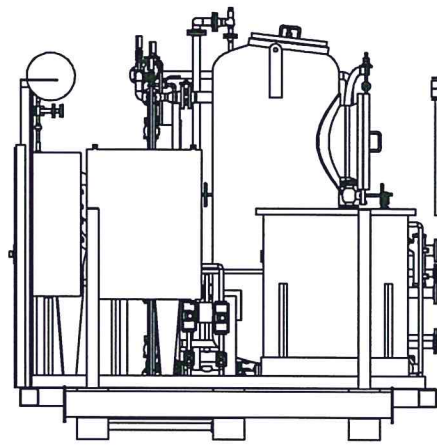
PROPRIETARY AND CONFIDENTIAL			
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PROJECT	DATE	SCALE	1/25
CLIENT	T C	DATE	20 OCT 2010
DESIGNER	G C	PROJECT NO.	011026-GA-001
CHECKER	G C	DATE	03/11/10



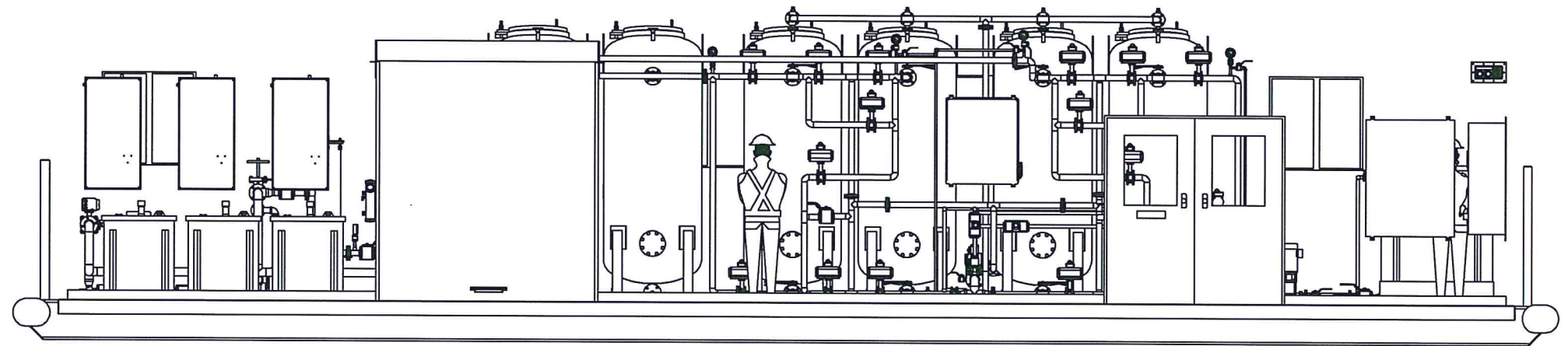
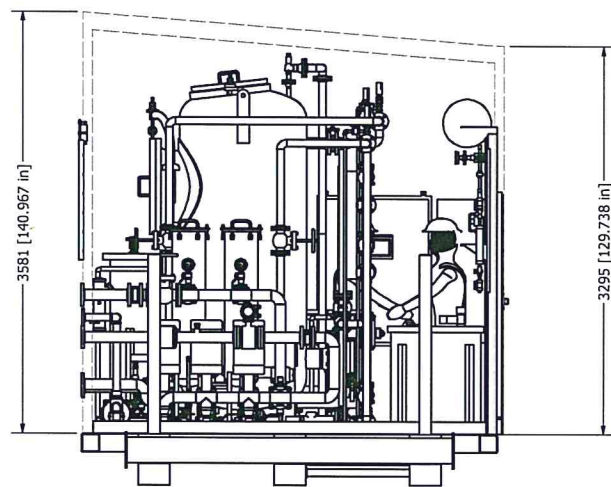
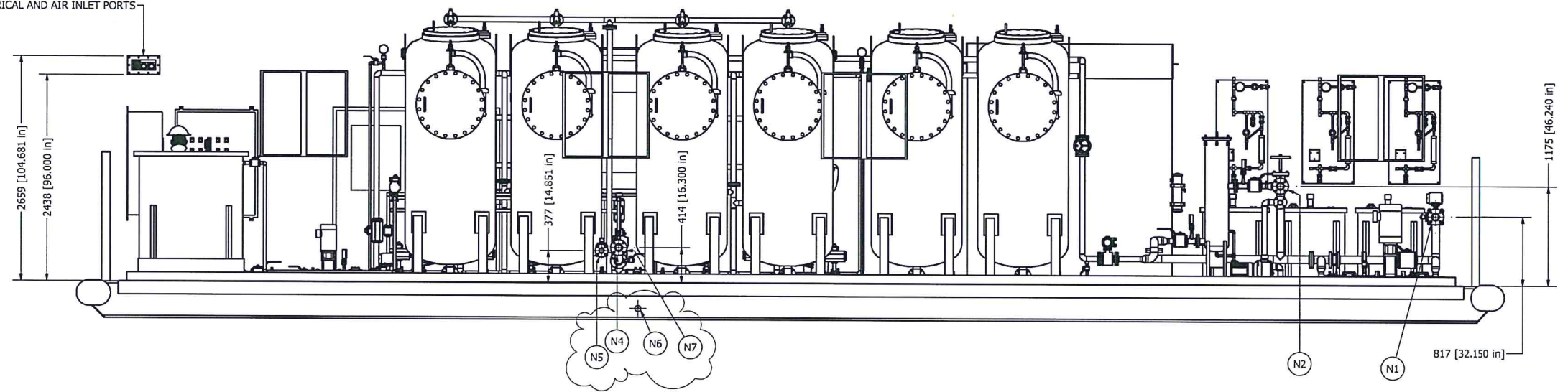
GENERAL ARRANGEMENT - PENN WEST SKID

1/25





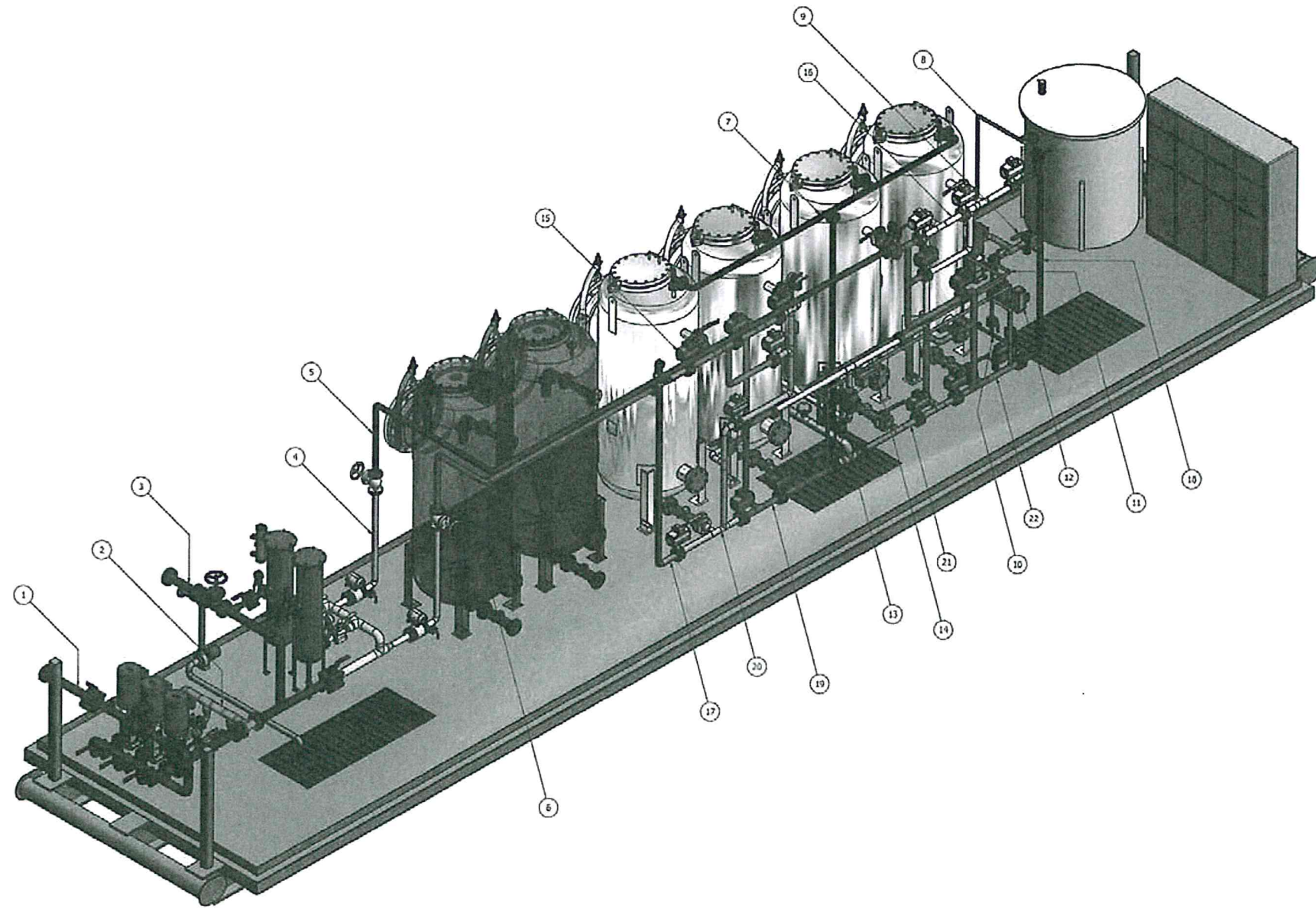
ELECTRICAL AND AIR INLET PORTS



REV.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	03/11/10

PROPRIETARY AND CONFIDENTIAL		TITLE	
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DATE	BY	DATE	BY
20 OCT 2010	T C	03/11/10	PENN WEST
	G C		011026-GA-002
	G C		1/30





PARTS LIST	
SPOOL	DRAWING
1	011026-PIP-001
2	011026-PIP-002
3	011026-PIP-003
4	011026-PIP-004
5	011026-PIP-005
6	011026-PIP-006
7	011026-PIP-007
8	011026-PIP-008
9	011026-PIP-009
10	011026-PIP-010
11	011026-PIP-011
12	011026-PIP-012
13	011026-PIP-013
14	011026-PIP-014
15	011026-PIP-015
16	011026-PIP-016
17	011026-PIP-017
18	011026-PIP-018
19	011026-PIP-019
20	011026-PIP-020
21	011026-PIP-021
22	011026-PIP-022

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REV	DATE	BY
1	ISSUED FOR CONSTRUCTION	03/11/10

G.C.  
NOV 04 2010



PROPERTY AND COMPANY		VISTA PENN WEST	
PROJECT NAME AND LOCATION		PIPING ISOMETRIC (GENERAL LAYOUT)	
DATE	SCALE	PROJECT NO.	REV
03/11/10	1/2" = 1'	0311105	122



SYSTEM ENCLOSURE LIMIT

FROM RAW WATER TK-6010  
FLOW: 36.7-172.5 USGPM/138-652 LPM  
TEMP: 5-60C/PRESS: 5.8 PSIG/40 KPA

NI1 4"-150# RF  
40 KPSig ATM (NORM)

RAW/FILTERED WATER SUPPLY

NI2 3"-150# RF BLIND

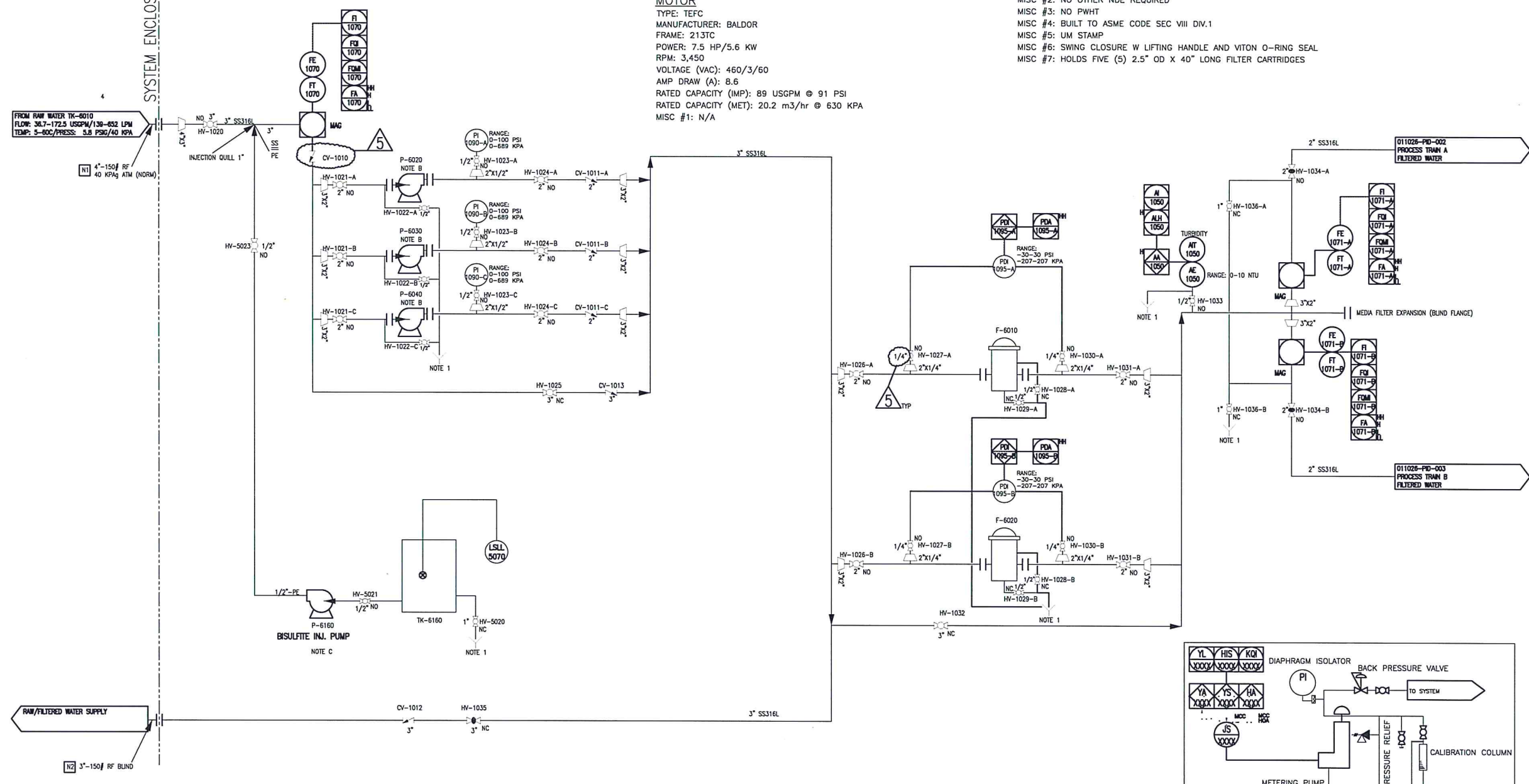
**RAW WATER PUMPS, P-6020/30/40**

**PUMP**  
TYPE: VERTICAL CENTRIFUGAL  
MANUFACTURER: WILCO  
MATERIALS 1 (FRAME): CS  
MATERIALS 2 (INTERNAL): ANSI SS316L  
MODEL: MVI-80-05  
INLET/OUTLET: 2"/2"  
FITTING: #300 RF

**MOTOR**  
TYPE: TEFC  
MANUFACTURER: BALDOR  
FRAME: 213TC  
POWER: 7.5 HP/5.6 KW  
RPM: 3,450  
VOLTAGE (VAC): 460/3/60  
AMP DRAW (A): 8.6  
RATED CAPACITY (IMP): 89 USGPM @ 91 PSI  
RATED CAPACITY (MET): 20.2 m<sup>3</sup>/hr @ 630 KPA  
MISC #1: N/A

**CARTRIDGE PRE-FILTERS, F-6010/6020**

TYPE: VERTICAL FILTER SUITED FOR 5 ROUND CARTRIDGE FILTERS  
SERVICE: SOUR  
MATERIALS: SS 316L  
FLOW CAPACITY [IMP]: 100 USGPM @ 125 PSI, 200/-20 F  
FLOW CAPACITY [MET]: 22.7 M<sup>3</sup>/HR @ 861 KPA  
INLET/OUTLET: 2"/2"  
FLANGED CONNECTIONS: #150 RFWN (QTY 2)  
THREADED CONNECTIONS: #6000 FNPT (QTY 2)  
MISC #1: 100% RADIOGRAPHY ON ALL BUTT WELDS  
MISC #2: NO OTHER NDE REQUIRED  
MISC #3: NO PWHT  
MISC #4: BUILT TO ASME CODE SEC VIII DIV.1  
MISC #5: UM STAMP  
MISC #6: SWING CLOSURE W LIFTING HANDLE AND VITON O-RING SEAL  
MISC #7: HOLDS FIVE (5) 2.5" OD X 40" LONG FILTER CARTRIDGES

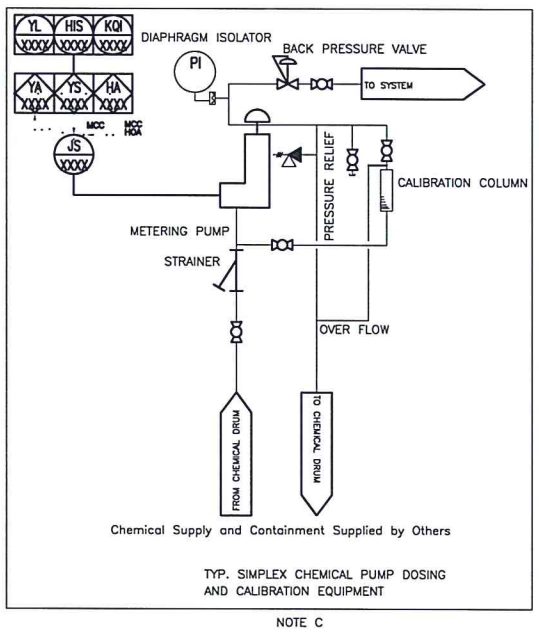
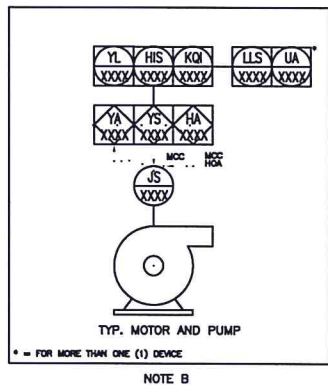


**SODIUM BISULFITE INJECTION PUMP, P-6160**

TYPE: DIAPHRAGM PISTON PUMP  
MANUFACTURER: PROMINENT  
MODEL: S1CAH10050PVT0070UD3110C  
MATERIALS (INTERNAL): PVDF W/ PTFE VITON SEALS  
SEAL: STANDARD DIAPHRAGM / PTFE SEAL  
DIAPHRAGM TYPE: STANDARD DIAPHRAGM PTFE  
LIQUID END VERSION: W/O VALVE SPRINGS  
CONNECTION: PVDF CLAMPING NUT AND INSERT  
CONTROL: 1 PH, 115-230 V, 50/60Hz  
CABLE AND PLUG: 115 VAC PLUG  
CONTROL VERSION: MANUAL+EXTERNAL W/ PULSE CONTROL AND ANALOG CONT.  
STROKE ADJ: AUTO + CALIBRATION  
FLOW [IMP]: 15.8 USGPH @ 145 PSI  
FLOW [MET]: 0.06 M<sup>3</sup>/HR @ 1,000 KPA  
POWER SUPPLY: 120/1/60  
POWER: TBD  
FAULT RELAY: 120/1/60  
TANK LEVEL SWITCH: 120/1/60

**SODIUM BISULFITE STORAGE TANK, TK-6160**

VOLUME [IMP]: 66 USGAL  
VOLUME [MET]: 250 L  
MATERIALS: PE  
MISC #1: INCLUDES CHEMICAL CONTAINMENT



**NOTES**  
NOTE 1  
- MAINTENANCE DRAIN FITTINGS ROUTED TO COMMON FLOOR DRAIN  
- SYSTEM EQUIPPED WITH THREE (3) COMMON FLOOR DRAINS  
- ALL THREE (3) FLOOR DRAINS ARE HYDRAULICALLY CONNECTED AND ROUTED TO SKID EDGE FOR DRAINAGE  
- SUMP AT SOUTH END OF SKID IS EQUIPPED WITH SUMP DRAIN PUMP, P-6060, THAT DISCHARGES AT NOZZLE N6 AT WEST SIDE OF BUILDING ENCLOSURE.  
- DETAILS ON 011026-PID-004

**REFERENCE DRAWINGS**

REV.	DATE	DESCRIPTION	BY	CHK.	ENG.	APP.
05	11 01 07	AS BUILT	MA	GC		
04	10 11 24	RE-ISSUED FOR CONSTRUCTION	GC	MA		
03	10 11 10	CLIENT COMMENTS INCORPORATED	GC	MA		
02	10 11 02	ISSUED FOR CONSTRUCTION	SC	GC		
01	10 10 22	ISSUED FOR APPROVAL	AP	GC		
00	10 10 20	ISSUED FOR INFORMATION	AP	GC		

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**TITLE**  
PIPING AND INSTRUMENT DIAGRAM  
PENNWEST ENERGY - COLEVILLE ASP  
WTS - RAW WATER FEED

PLANT AREA		
SCALE		
DRAWN BY	CHECKED BY	APPROVED
A PERKINS	M.M.	G.C.
SHEET	DRAWING NO.	REV.
1 OF 5	011026-PID-001	5