

Clean Water Diversion Calculations

Diversion Berm Design Storms

According to the PADEP Erosion and Sediment Pollution Control Program Manual, temporary channels and berms must be designed to convey 1.6 cfs/acre or peak discharge from a 2-year/1-hour storm. Temporary channels in special protection watersheds must be designed to convey 2.25 cfs/acre or the peak discharge from a 5-year/1-hour storm.

The diversions were designed using the peak flow using the Rational Method. The intensity used in the peak flow calculations was based on a 2-year storm using Steel's Formula (for Region 3), which is located on page 114 of the E&S manual,

$$I = \frac{106}{(T_c + 17)}, \text{ in/hr}$$

Typically when using the Rational Method, the time of concentration is used for the storm duration to produce a conservative (highest) intensity since this is the time it takes for the entire drainage area to contribute to the flow. Therefore, the peak flow for all diversions with a time of concentration of less than 60 minutes, will be greater than using the 2-year/1-hour storm for the rainfall intensity.

The rainfall intensity can also be found for specific locations using the National Oceanic and Atmospheric Administration Atlas 14. For example, the intensity for the 2-year/1-hour storm using Steel's Formula is,

$$I = \frac{106}{(60 + 17)} = 1.38 \text{ in/hr}$$

Compare this to the 2-year/1-hour rainfall intensity from NOAA Atlas 14 for western Pennsylvania in Washington County (1.18 in/hr) and eastern Pennsylvania in Delaware County (1.45 in/hr).

For special protection watersheds, the required design storm is the 5-year/1-hour storm if not using the multiplier. Using the Steel's Formula, the design intensity is

$$I = \frac{135}{(T_c + 19)} = \frac{135}{(60 + 19)} = 1.70 \text{ in/hr}$$

The intensity for the 2-year/1-hour storm from NOAA Atlas 14 ranges from 1.48 in/hr in western Pennsylvania to 1.80 in/hr in eastern Pennsylvania.

The 2-year return period storm was used for all of the runoff calculations. However, since the time of concentration was used for the storm duration, the vast majority of the diversions were designed conservatively compared to strictly using the 5-year/1-hour storm event. Since most of the drainage areas are relatively small, time of concentration values were typically between 5 minutes, which corresponds to an intensity of 4.8 in/hr and 35 minutes, which corresponds to an intensity of 2.03 in/hr. The intensities used can be found on the flow summary tables entitled

“TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSIONS”. The calculations have been reviewed to identify if any intensity values were less than the 1.70 in/hr requirement. Revised tables have been provided that use an intensity of the greater of either the 2-year storm with the time of concentration as the duration or the 5-year/1-hour storm.

Level Spreader Design

The clean water diversions must discharge to a stabilized area. In order to prevent damage to downstream properties, the concentrated flow through the pipe must be returned to sheet flow prior to entering receiving waters.

According to the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual, drainage areas to earthen level spreaders must be limited to 1.0 acre. Due to the temporary nature of the work and lack of real estate and workspace, structural level spreaders are not feasible. Therefore, we have designed a more construction-friendly level spreader that will be adequate for the limited lifespan of the level spreader.

The clean water diversion will direct the clean runoff to a rock filter to slow the water and allow some filtering and infiltration. Once the water passes through the rock filter, it will enter a pipe that conveys the clean water across the workspace. In order to dissipate energy and return the concentrated flow to sheet flow, the pipe will be connected to a capped perforated pipe situated parallel to the contours. The level spreader will be wrapped with and placed on geotextile fabric for additional protection. AASHTO No. 1 Stone will be placed over the level spreader with a minimum stone depth over the pipe of 4-inches. Compost filter sock will be located up grade from the level spreader acting as a sediment barrier from the workspace. An 18-inch compost filter sock will also be placed down grade of the level spreader.

The pipe specification used was taken from the JM Eagle Technical Bulletin (Eagle Corr PE). A nominal pipe size of 12-inches was chosen in order to be used for a wide range of flows. The 12-inch perforated pipe has circular perforations with a diameter of 0.375 inches. There are six (6) rows of perforations for the 12-inch pipe which corresponds to a nominal water inlet area of 4.10 in²/ft.

The orifice flow equation, $Q = C_d A_o (2gh)^{1/2}$, is used to find the flow through an orifice. The six (6) openings per row is known. Using the nominal water inlet area, the spacing of the rows is calculated and then turned into a ft³/s/ft value based on the number of openings. The peak flow for a diversion is known from the diversion calculations and then a length of level spreader is calculated based on the available static head, the elevation difference across the workspace.

All lengths were then rounded up to the next multiple of 5 feet. The minimum level spreader length was also 5 feet.

After construction and once the disturbed area tributary to the compost filter sock in the vicinity is permanently stabilized with vegetation, the diversions and level spreaders will be removed along with other erosion and sedimentation control BMPs.

Washington County

**Washington County
Temporary Diversion Berm Calculations**

STATION	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Left Side Slope (ft/ft (H:V))	Right Side Slope (ft/ft (H:V))	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Flow Type
648+38 to 653+40 CHN	0.025	0.02	0.35	0.1	7	1.05	0.43	2.83	0.15	2.49	0.35	0.0193	2.41	0.09	0.44	1.02	Supercritical
678+18 to 679+88 CHN	0.025	0.02	0.41	0.1	8	1.86	0.68	3.73	0.18	3.33	0.42	0.0178	2.72	0.11	0.53	1.06	Supercritical
679+90 to 681+86 CHN	0.025	0.03	0.34	0.1	7	1.22	0.42	2.77	0.15	2.44	0.37	0.0189	2.92	0.13	0.48	1.24	Supercritical
683+63 to 683+95 CHN	0.025	0.1	0.15	0.1	5	0.16	0.05	0.89	0.06	0.75	0.19	0.0254	2.92	0.13	0.28	1.9	Supercritical
696+41 to 698+18 CHN	0.025	0.02	0.3	0.1	8	0.8	0.36	2.72	0.13	2.43	0.3	0.0199	2.2	0.08	0.37	1	Supercritical
698+19 to 699+97 CHN	0.025	0.03	0.26	0.1	7	0.59	0.24	2.11	0.11	1.86	0.28	0.0208	2.43	0.09	0.35	1.19	Supercritical
698+19 to 699+97 CHN	0.025	0.03	0.26	0.1	7	0.59	0.24	2.11	0.11	1.86	0.28	0.0208	2.43	0.09	0.35	1.19	Supercritical
700+00 to 701+69 CHN	0.025	0.05	0.26	0.1	7	0.74	0.24	2.09	0.11	1.84	0.31	0.0202	3.12	0.15	0.41	1.53	Supercritical
701+75 to 703+02 CHN	0.025	0.06	0.25	0.1	4	0.42	0.13	1.3	0.1	1.04	0.3	0.023	3.17	0.16	0.41	1.57	Supercritical
703+05 to 705+43 CHN	0.025	0.06	0.25	0.1	5	0.5	0.16	1.51	0.1	1.26	0.3	0.0218	3.21	0.16	0.41	1.61	Supercritical
708+92 to 709+36 CHN	0.025	0.1	0.6	0.1	16	23.26	2.87	10.18	0.28	9.62	0.88	0.0129	8.09	1.02	1.62	2.61	Supercritical
709+35 to 709+39 CHN	0.025	0.06	0.16	0.1	10	0.32	0.13	1.75	0.07	1.6	0.19	0.0225	2.53	0.1	0.26	1.58	Supercritical
716+59 to 716+98 CHN	0.025	0.04	0.13	0.1	6	0.09	0.05	0.92	0.06	0.79	0.14	0.027	1.74	0.05	0.18	1.2	Supercritical
717+02 to 718+00 CHN	0.025	0.05	0.23	0.1	6	0.48	0.17	1.66	0.1	1.43	0.27	0.0216	2.88	0.13	0.36	1.48	Supercritical
721+35 to 722+35 CHN	0.025	0.05	0.45	0.1	6	2.75	0.62	3.19	0.19	2.75	0.55	0.0171	4.45	0.31	0.76	1.65	Supercritical
723+05 to 724+96 CHN	0.025	0.11	0.36	0.1	4	1.47	0.27	1.86	0.15	1.49	0.5	0.0195	5.44	0.46	0.82	2.25	Supercritical
724+97 to 726+86 CHN	0.025	0.09	0.47	0.1	3	1.88	0.34	1.95	0.17	1.45	0.62	0.02	5.55	0.48	0.95	2.03	Supercritical
762+78 to 763+55 CHN	0.025	0.06	0.46	0.1	6	3.12	0.63	3.23	0.2	2.78	0.58	0.0168	4.92	0.38	0.83	1.81	Supercritical
795+60 to 796+67 CHN	0.025	0.04	0.49	0.1	10	5.4	1.23	5.45	0.23	4.98	0.59	0.0154	4.4	0.3	0.79	1.56	Supercritical
865+90 to 868+95 CHN	0.025	0.01	0.46	0.1	9.5	2.07	1	4.81	0.21	4.37	0.41	0.0175	2.08	0.07	0.52	0.77	Subcritical
877+90 to 879+15 CHN	0.025	0.02	0.41	0.1	7	1.65	0.61	3.35	0.18	2.94	0.42	0.0182	2.7	0.11	0.53	1.05	Supercritical
914+15 to 916+40 CHN	0.025	0.04	0.39	0.1	7.5	2.15	0.58	3.35	0.17	2.97	0.46	0.0175	3.7	0.21	0.6	1.47	Supercritical
916+40 to 918+00 CHN	0.025	0.01	0.43	0.1	7.5	1.4	0.71	3.7	0.19	3.28	0.38	0.0185	1.98	0.06	0.49	0.75	Subcritical
985+45 to 987+35 CHN	0.025	0.15	0.18	0.1	4	0.28	0.07	0.94	0.07	0.75	0.26	0.0243	4.05	0.25	0.44	2.35	Supercritical

**Washington County
Temporary Slope Pipe Calculations**

701+75 to 703+02 PIPE	0.012	0.15	0.14	0.5	0.42	0.05	0.56	0.08	0.45	0.33	28.6	0.008	9.07	1.28	1.42	5	2.53	2.35	0.00477	SuperCritical
703+05 to 705+43 PIPE	0.012	0.2	0.15	0.5	0.5	0.05	0.57	0.08	0.45	0.36	29	0.0089	10.58	1.74	1.88	5.78	2.92	2.72	0.00677	SuperCritical
708+92 to 709+36 PIPE C	0.012	0.05	1	1	8.63	0.79	3.14	0.25	0	0.99	100	0.0459	10.99	1.88	2.88	0	9.28	8.63	0.05	SubCritical
708+92 to 709+36 PIPE	0.012	0.05	0.74	1	7.75	0.62	2.07	0.3	0.88	0.98	74	0.0364	12.43	2.4	3.14	2.6	9.28	8.63	0.04032	SuperCritical
716+59 to 716+98 PIPE	0.012	0.27	0.06	0.5	0.09	0.01	0.35	0.04	0.32	0.15	11.6	0.006	7.08	0.78	0.84	6.27	3.4	3.16	0.00022	SuperCritical
717+02 to 718+00 PIPE	0.012	0.2	0.14	0.5	0.48	0.05	0.56	0.08	0.45	0.35	28.4	0.0087	10.44	1.69	1.84	5.77	2.92	2.72	0.00624	SuperCritical
721+35 to 722+35 PIPE	0.012	0.11	0.38	0.67	2.75	0.21	1.15	0.18	0.66	0.66	57.3	0.0386	13.17	2.69	3.08	4.14	4.73	4.4	0.04297	SuperCritical
724+97 to 726+86 PIPE	0.012	0.23	0.29	0.5	1.88	0.12	0.87	0.14	0.49	0.5	58.4	0.0902	15.78	3.87	4.16	5.66	3.14	2.92	0.09566	SuperCritical
795+60 to 796+67 PIPE	0.012	0.08	0.5	1	5.4	0.39	1.56	0.25	1	0.94	49.7	0.0169	13.87	2.99	3.49	3.92	11.74	10.92	0.01958	SuperCritical
985+45 to 987+35 PIPE	0.023	0.3	0.14	0.5	0.28	0.04	0.55	0.08	0.44	0.27	27.2	0.025	6.48	0.65	0.79	3.67	1.87	1.74	0.0078	SuperCritical
865+90 to 989+95 PIPE	0.023	0.13	0.47	0.67	2.07	0.26	1.32	0.2	0.62	0.63	69.5	0.0773	7.91	0.97	1.44	2.14	2.68	2.5	0.08945	SuperCritical
877+90 to 879+15 PIPE	0.023	0.14	0.39	0.67	1.65	0.21	1.16	0.18	0.66	0.59	58	0.0508	7.78	0.94	1.33	2.42	2.79	2.59	0.05683	SuperCritical
914+15 to 916+40 PIPE	0.023	0.02	0.65	1	2.15	0.54	1.87	0.29	0.95	0.63	64.9	0.0222	3.98	0.25	0.9	0.93	3.06	2.85	0.0114	SubCritical
916+40 to 918+00 PIPE	0.023	0.02	0.49	1	1.4	0.39	1.56	0.25	1	0.5	49.5	0.0192	3.61	0.2	0.7	1.02	3.06	2.85	0.00483	SuperCritical

**Washington County
Temporary Diversion Berm
Erosion Control Blanket Calculations**

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
014+85 to 15+40 CHN	0.04	0.17	0.14	2	V	8.0	2.00	0.42	SC150
015+40 to 15+95 CHN	0.07	0.19	0.17	2.73	V	8.0	2.00	0.83	SC150
017+30 to 18+70 CHN	0.03	0.39	0.95	3	V	8.0	2.00	0.73	SC150
018+70 to 20+00 CHN	0.02	0.21	0.09	1.5	V	8.0	2.00	0.26	SC150
027+70 to 29+75 CHN	0.01	0.12	0.04	0.84	V	8.0	2.00	0.07	SC150
031+20 to 31+25 CHN	0.05	0.18	0.17	2.32	V	8.0	2.00	0.56	SC150
032+85 to 33+05 CHN	0.1	0.43	2.56	5.94	S	8.0	2.00	2.68	SC150
033+80 to 35+35 CHN	0.04	0.26	0.38	2.66	V	8.0	2.00	0.65	SC150
035+35 to 40+05 CHN	0.02	0.57	3.34	3.31	V	8.0	2.00	0.71	SC150
049+75 to 50+55 CHN	0.01	0.22	0.33	1.29	V	8.0	2.00	0.14	SC150
067+40 to 72+50 CHN	0.06	0.57	3.15	5.34	V	9.5	3.00	2.13	SC250
075+15 to 76+05 CHN	0.04	0.2	0.32	2.33	V	8.0	2.00	0.50	SC150
109+70 to 110+40 CHN	0.01	0.36	0.63	1.71	V	8.0	2.00	0.22	SC150
110+40 to 111+65 CHN	0.02	0.36	1.06	2.45	V	8.0	2.00	0.45	SC150
114+25 to 115+00 CHN	0.03	0.22	0.2	2.03	V	8.0	2.00	0.41	SC150
115+00 to 116+95 CHN	0.01	0.42	0.55	1.76	V	8.0	2.00	0.26	SC150
119+25 to 122+10 CHN	0.02	0.57	2.64	3.22	V	8.0	2.00	0.71	SC150
127+05 to 128+05 CHN	0.01	1.07	27.83	3.73	V	8.0	2.00	0.67	SC150
147+00 to 147+35 CHN	0.2	0.13	0.11	3.62	S	8.0	2.00	1.62	SC150
148+15 to 150+25 CHN	0.01	0.43	1.11	1.94	V	8.0	2.00	0.27	SC150
150+25 to 152+50 CHN	0.07	0.35	1.06	4.24	V	8.0	2.00	1.53	SC150
152+50 to 153+80 CHN	0.1	0.37	3.36	5.69	S	9.5	3.00	2.31	SC250
153+80 to 156+75 CHN	0.11	0.43	2.31	6.1	S	9.5	3.00	2.95	SC250
156+90 to 159+55 CHN	0.04	0.41	1.23	3.56	V	8.0	2.00	1.02	SC150
159+55 to 164+80 CHN	0.04	0.63	3.82	4.73	V	8.0	2.00	1.57	SC150
164+90 to 167+50 CHN	0.03	0.39	1.09	3.05	V	8.0	2.00	0.73	SC150
170+75 to 171+90 CHN	0.04	0.16	0.08	1.83	V	8.0	2.00	0.40	SC150
171+90 to 172+65 CHN	0.07	0.19	0.4	3	V	8.0	2.00	0.83	SC150
225+35 to 227+50 CHN	0.01	0.25	0.35	1.38	V	8.0	2.00	0.16	SC150
225+35 to 228+05 CHN	0.01	0.16	0.1	1.02	V	8.0	2.00	0.10	SC150
228+10 to 229+30 CHN	0.15	0.23	0.42	4.55	S	9.5	3.00	2.15	SC250
229+30 to 231+75 CHN	0.04	0.31	0.25	2.55	V	8.0	2.00	0.77	SC150
234+15 to 234+90 CHN	0.03	0.22	0.25	2.08	V	8.0	2.00	0.41	SC150
264+30 to 265+85 CHN	0.05	0.33	0.8	3.48	V	8.0	2.00	1.03	SC150
265+85 to 266+30 CHN	0.05	0.16	0.15	2.21	V	8.0	2.00	0.50	SC150
270+20 to 271+25 CHN	0.01	0.41	0.79	1.84	V	8.0	2.00	0.26	SC150
271+25 to 272+20 CHN	0.03	0.34	0.83	2.81	V	8.0	2.00	0.64	SC150
297+40 to 301+30 CHN	0.05	0.56	4.05	5.05	V	8.0	2.00	1.75	SC150
301+30 to 304+00 CHN	0.06	0.51	3.38	5.17	V	8.0	2.00	1.91	SC150
304+00 to 305+80 CHN	0.1	0.48	2.9	6.23	S	9.5	3.00	3.00	SC250
305+80 to 309+25 CHN	0.06	0.34	1.04	3.91	V	8.0	2.00	1.27	SC150

Washington County
Temporary Diversion Berm
Erosion Control Blanket Calculations

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
337+65 to 341+60 CHN	0.05	0.56	3.16	4.9	V	8.0	2.00	1.75	SC150
341+60 to 342+70 CHN	0.03	0.36	0.56	2.72	V	8.0	2.00	0.67	SC150
342+70 to 343+35 CHN	0.03	0.31	0.35	2.42	V	8.0	2.00	0.58	SC150
350+65 to 354+30 CHN	0.04	0.7	5.93	5.2	V	8.0	2.00	1.75	SC150
368+05 to 373+20 CHN	0.03	0.67	5.06	4.41	V	8.0	2.00	1.25	SC150
373+20 to 375+45 CHN	0.06	0.47	3.3	4.99	V	8.0	2.00	1.76	SC150
375+45 to 380+25 CHN	0.03	0.7	6.85	4.62	V	8.0	2.00	1.31	SC150
396+00 to 396+75 CHN	0.03	0.43	1.58	3.3	V	8.0	2.00	0.80	SC150
396+75 to 398+45 CHN	0.02	0.53	2.16	3.06	V	8.0	2.00	0.66	SC150
398+45 to 399+05 CHN	0.02	0.35	0.72	2.33	V	8.0	2.00	0.44	SC150
399+05 to 400+10 CHN	0.05	0.31	0.82	3.39	V	8.0	2.00	0.97	SC150
476+15 to 480+60 CHN	0.06	0.54	5.01	5.53	V	9.5	3.00	2.02	SC250
480+60 to 481+85 CHN	0.02	0.56	4.29	3.35	V	8.0	2.00	0.70	SC150
484+35 to 485+05 CHN	0.11	0.17	1.02	3.65	S	8.0	2.00	1.17	SC150
515+95 to 521+15 CHN	0.04	0.77	6.49	5.4	V	8.0	2.00	1.92	SC150
521+15 to 523+50 CHN	0.03	0.52	2.01	3.62	V	8.0	2.00	0.97	SC150
540+10 to 540+83 CHN	0.01	0.28	0.45	1.47	V	8.0	2.00	0.17	SC150
558+33 to 558+91 CHN	0.1	0.12	0.1	2.59	S	8.0	2.00	0.75	SC150
558+91 to 560+22 CHN	0.1	0.3	2	4.94	S	8.0	2.00	1.87	SC150
560+74 to 565+10 CHN	0.04	0.6	6.12	4.86	V	8.0	2.00	1.50	SC150
565+45 to 569+37 CHN	0.08	0.47	5.18	5.9	V	9.5	3.00	2.35	SC250
612+03 to 613+16 CHN	0.07	0.37	6.88	4.97	V	8.0	2.00	1.62	SC150
612+17 to 618+53 CHN	0.02	0.62	4.91	3.55	V	8.0	2.00	0.77	SC150
618+55 to 620+09 CHN	0.03	0.28	0.58	2.49	V	8.0	2.00	0.52	SC150
624+31 to 625+28 CHN	0.11	0.24	1.2	4.51	S	8.0	2.00	1.65	SC150
634+54 to 637+94 CHN	0.03	0.47	1.98	3.49	V	8.0	2.00	0.88	SC150
637+94 to 641+37 CHN	0.04	0.43	2.65	3.95	V	8.0	2.00	1.07	SC150
646+09 to 648+34 CHN	0.05	0.3	0.93	3.39	V	8.0	2.00	0.94	SC150
648+38 to 653+40 CHN	0.02	0.35	1.05	2.41	V	8.0	2.00	0.44	SC150
678+18 to 679+88 CHN	0.02	0.41	1.86	2.72	V	8.0	2.00	0.51	SC150
679+90 to 681+86 CHN	0.03	0.34	1.22	2.92	V	8.0	2.00	0.64	SC150
683+63 to 683+95 CHN	0.1	0.15	0.16	2.92	S	8.0	2.00	0.94	SC150
696+41 to 698+18 CHN	0.02	0.3	0.8	2.2	V	8.0	2.00	0.37	SC150
698+19 to 699+97 CHN	0.03	0.26	0.59	2.43	V	8.0	2.00	0.49	SC150
698+19 to 699+97 CHN	0.03	0.26	0.59	2.43	V	8.0	2.00	0.49	SC150
700+00 to 701+69 CHN	0.05	0.26	0.74	3.12	V	8.0	2.00	0.81	SC150
701+75 to 703+02 CHN	0.06	0.25	0.42	3.17	V	8.0	2.00	0.94	SC150
703+05 to 705+43 CHN	0.06	0.25	0.5	3.21	V	8.0	2.00	0.94	SC150
708+92 to 709+36 CHN	0.1	0.6	23.26	8.09	S	12.5	4.00	3.74	P550
709+35 to 709+39 CHN	0.06	0.16	0.32	2.53	V	8.0	2.00	0.60	SC150
716+59 to 716+98 CHN	0.04	0.13	0.09	1.74	V	8.0	2.00	0.32	SC150

**Washington County
Temporary Diversion Berm
Erosion Control Blanket Calculations**

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
717+02 to 718+00 CHN	0.05	0.23	0.48	2.88	V	8.0	2.00	0.72	SC150
721+35 to 722+35 CHN	0.05	0.45	2.75	4.45	V	8.0	2.00	1.40	SC150
723+05 to 724+96 CHN	0.11	0.36	1.47	5.44	S	9.5	3.00	2.47	SC250
724+97 to 726+86 CHN	0.09	0.47	1.88	5.55	V	9.5	3.00	2.64	SC250
762+78 to 763+55 CHN	0.06	0.46	3.12	4.92	V	8.0	2.00	1.72	SC150
795+60 to 796+67 CHN	0.04	0.49	5.4	4.4	V	8.0	2.00	1.22	SC150
865+90 to 868+95 CHN	0.01	0.46	2.07	2.08	V	8.0	2.00	0.29	SC150
877+90 to 879+15 CHN	0.02	0.41	1.65	2.7	V	8.0	2.00	0.51	SC150
914+15 to 916+40 CHN	0.04	0.39	2.15	3.7	V	8.0	2.00	0.97	SC150
916+40 to 918+00 CHN	0.01	0.43	1.4	1.98	V	8.0	2.00	0.27	SC150
985+45 to 987+35 CHN	0.15	0.18	0.28	4.05	S	8.0	2.00	1.68	SC150

Washington County
Temporary Perforated Pipe Level Spreader Calculations

STATION	Diversion Discharge (ft ³ /s)	Available Static Head (ft)	Level Spreader Pipe Diameter (in.)	Perforation Diameter (in.)	Number of Perforations per Row	Orifice Area per Foot (in ² /ft)	Row Spacing (in.)	Orifice Coefficient (Cd)	Level Spreader Capacity per foot of length (ft ³ /s per ft)	Required Length (ft)	Nominal Length (ft)	Overall Level Spreader Capacity(ft ³ /s)
014+85 to 15+40 PIPE	0.14	17	12	0.375	6	4.10	1.94	0.61	0.575	0.24	5	2.87
015+40 to 15+95 PIPE	0.17	20	12	0.375	6	4.10	1.94	0.61	0.623	0.27	5	3.12
017+30 to 18+70 PIPE	0.95	7.5	12	0.375	6	4.10	1.94	0.61	0.382	2.49	5	1.91
018+70 to 20+00 PIPE	0.09	6.5	12	0.375	6	4.10	1.94	0.61	0.355	0.25	5	1.78
027+70 to 29+75 PIPE	0.04	13.5	12	0.375	6	4.10	1.94	0.61	0.512	0.08	5	2.56
031+20 to 31+25 PIPE	0.17	17	12	0.375	6	4.10	1.94	0.61	0.575	0.30	5	2.87
032+85 to 33+05 PIPE	2.56	9.5	12	0.375	6	4.10	1.94	0.61	0.430	5.96	10	4.30
033+80 to 35+35 PIPE	0.38	1	12	0.375	6	4.10	1.94	0.61	0.139	2.73	5	0.70
035+35 to 40+05 PIPE	3.34	4.5	12	0.375	6	4.10	1.94	0.61	0.296	11.30	15	4.43
049+75 to 50+55 PIPE	0.33	13	12	0.375	6	4.10	1.94	0.61	0.503	0.66	5	2.51
067+40 to 72+50 PIPE	3.15	14	12	0.375	6	4.10	1.94	0.61	0.522	6.04	10	5.22
075+15 to 76+05 PIPE	0.32	10	12	0.375	6	4.10	1.94	0.61	0.441	0.73	5	2.20
109+70 to 110+40 PIPE	0.63	11	12	0.375	6	4.10	1.94	0.61	0.462	1.36	5	2.31
110+40 to 111+65 PIPE	1.06	11	12	0.375	6	4.10	1.94	0.61	0.462	2.29	5	2.31
114+25 to 115+00 PIPE	0.2	10.5	12	0.375	6	4.10	1.94	0.61	0.452	0.44	5	2.26
115+00 to 116+95 PIPE	0.55	9.5	12	0.375	6	4.10	1.94	0.61	0.430	1.28	5	2.15
119+25 to 122+10 PIPE	2.64	6	12	0.375	6	4.10	1.94	0.61	0.341	7.73	10	3.41
127+05 to 128+05 PIPE	4.64	4.5	12	0.375	6	4.10	1.94	0.61	0.296	15.69	20	5.91
147+00 to 147+35 PIPE	0.11	4	12	0.375	6	4.10	1.94	0.61	0.279	0.39	5	1.39
148+15 to 150+25 PIPE	1.11	18	12	0.375	6	4.10	1.94	0.61	0.591	1.88	5	2.96
150+25 to 152+50 PIPE	1.06	14	12	0.375	6	4.10	1.94	0.61	0.522	2.03	5	2.61
152+50 to 153+80 PIPE	3.36	10	12	0.375	6	4.10	1.94	0.61	0.441	7.62	10	4.41
153+80 to 156+75 PIPE	2.31	10	12	0.375	6	4.10	1.94	0.61	0.441	5.24	10	4.41
156+90 to 159+55 PIPE	1.23	21	12	0.375	6	4.10	1.94	0.61	0.639	1.93	5	3.19
159+55 to 164+80 PIPE	3.82	25	12	0.375	6	4.10	1.94	0.61	0.697	5.48	10	6.97
164+90 to 167+50 PIPE	1.09	15	12	0.375	6	4.10	1.94	0.61	0.540	2.02	5	2.70
170+75 to 171+90 PIPE	0.08	5	12	0.375	6	4.10	1.94	0.61	0.312	0.26	5	1.56
171+90 to 172+65 PIPE	0.4	10.5	12	0.375	6	4.10	1.94	0.61	0.452	0.89	5	2.26
225+35 to 227+50 PIPE	0.35	28	12	0.375	6	4.10	1.94	0.61	0.738	0.47	5	3.69
225+35 to 228+05 PIPE	0.1	27.5	12	0.375	6	4.10	1.94	0.61	0.731	0.14	5	3.65
228+10 to 229+30 PIPE	0.42	13	12	0.375	6	4.10	1.94	0.61	0.503	0.84	5	2.51
229+30 to 231+75 PIPE	0.25	20.5	12	0.375	6	4.10	1.94	0.61	0.631	0.40	5	3.16
234+15 to 234+90 PIPE	0.32	21	12	0.375	6	4.10	1.94	0.61	0.639	0.50	5	3.19
264+30 to 265+85 PIPE	0.8	10.5	12	0.375	6	4.10	1.94	0.61	0.452	1.77	5	2.26
265+85 to 266+30 PIPE	0.15	17.5	12	0.375	6	4.10	1.94	0.61	0.583	0.26	5	2.92
270+20 to 271+25 PIPE	0.79	7.5	12	0.375	6	4.10	1.94	0.61	0.382	2.07	5	1.91
271+25 to 272+20 PIPE	0.83	13	12	0.375	6	4.10	1.94	0.61	0.503	1.65	5	2.51
297+40 to 301+30 PIPE	4.05	14	12	0.375	6	4.10	1.94	0.61	0.522	7.77	10	5.22
301+30 to 304+00 PIPE	3.38	21	12	0.375	6	4.10	1.94	0.61	0.639	5.29	10	6.39
304+00 to 305+80 PIPE	2.9	25	12	0.375	6	4.10	1.94	0.61	0.697	4.16	5	3.48
305+80 to 309+25 PIPE	1.04	24	12	0.375	6	4.10	1.94	0.61	0.683	1.52	5	3.41
337+65 to 341+60 PIPE	3.16	8	12	0.375	6	4.10	1.94	0.61	0.394	8.02	10	3.94
341+60 to 342+70 PIPE	0.56	16	12	0.375	6	4.10	1.94	0.61	0.558	1.00	5	2.79
342+70 to 343+35 PIPE	0.35	18	12	0.375	6	4.10	1.94	0.61	0.591	0.59	5	2.96
350+65 to 354+30 PIPE	5.93	18	12	0.375	6	4.10	1.94	0.61	0.591	10.03	15	8.87
368+05 to 373+20 PIPE	5.06	12	12	0.375	6	4.10	1.94	0.61	0.483	10.48	15	7.24
373+20 to 375+45 PIPE	3.3	9.5	12	0.375	6	4.10	1.94	0.61	0.430	7.68	10	4.30
375+45 to 380+25 PIPE	6.85	12	12	0.375	6	4.10	1.94	0.61	0.483	14.19	15	7.24
396+00 to 396+75 PIPE	1.58	8	12	0.375	6	4.10	1.94	0.61	0.394	4.01	5	1.97

**Washington County
Temporary Perforated Pipe Level Spreader Calculations**

396+75 to 398+45 PIPE	2.16	7.5	12	0.375	6	4.10	1.94	0.61	0.382	5.66	10	3.82
398+45 to 399+05 PIPE	0.72	9	12	0.375	6	4.10	1.94	0.61	0.418	1.72	5	2.09
399+05 to 400+10 PIPE	0.82	8.5	12	0.375	6	4.10	1.94	0.61	0.406	2.02	5	2.03
476+15 to 480+60 PIPE	5.01	6.5	12	0.375	6	4.10	1.94	0.61	0.355	14.10	15	5.33
480+60 to 481+85 PIPE	4.29	3	12	0.375	6	4.10	1.94	0.61	0.241	17.77	20	4.83
484+35 to 485+05 PIPE	1.02	6	12	0.375	6	4.10	1.94	0.61	0.341	2.99	5	1.71
515+95 to 521+15 PIPE	6.49	10	12	0.375	6	4.10	1.94	0.61	0.441	14.72	15	6.61
521+15 to 523+50 PIPE	2.01	13.5	12	0.375	6	4.10	1.94	0.61	0.512	3.92	5	2.56
540+10 to 540+83 PIPE	0.45	11.5	12	0.375	6	4.10	1.94	0.61	0.473	0.95	5	2.36
558+33 to 558+91 PIPE	0.1	5.5	12	0.375	6	4.10	1.94	0.61	0.327	0.31	5	1.63
558+91 to 560+22 PIPE	2	7	12	0.375	6	4.10	1.94	0.61	0.369	5.42	10	3.69
560+74 to 565+10 PIPE	6.12	9.5	12	0.375	6	4.10	1.94	0.61	0.430	14.25	15	6.44
565+45 to 569+37 PIPE	5.18	12.5	12	0.375	6	4.10	1.94	0.61	0.493	10.51	15	7.39
612+03 to 613+16 PIPE	6.88	2	12	0.375	6	4.10	1.94	0.61	0.197	34.90	35	6.90
612+17 to 618+53 PIPE	4.91	9	12	0.375	6	4.10	1.94	0.61	0.418	11.74	15	6.27
618+55 to 620+09 PIPE	0.58	17	12	0.375	6	4.10	1.94	0.61	0.575	1.01	5	2.87
624+31 to 625+28 PIPE	1.2	8	12	0.375	6	4.10	1.94	0.61	0.394	3.04	5	1.97
634+54 to 637+94 PIPE	1.98	5	12	0.375	6	4.10	1.94	0.61	0.312	6.35	10	3.12
637+94 to 641+37 PIPE	2.65	15.5	12	0.375	6	4.10	1.94	0.61	0.549	4.83	5	2.74
646+09 to 648+34 PIPE	0.93	12	12	0.375	6	4.10	1.94	0.61	0.483	1.93	5	2.41
648+38 to 653+40 PIPE	1.05	2	12	0.375	6	4.10	1.94	0.61	0.197	5.33	10	1.97
678+18 to 679+88 PIPE	1.86	6	12	0.375	6	4.10	1.94	0.61	0.341	5.45	10	3.41
679+90 to 681+86 PIPE	1.22	8	12	0.375	6	4.10	1.94	0.61	0.394	3.09	5	1.97
696+41 to 698+18 PIPE	0.8	5	12	0.375	6	4.10	1.94	0.61	0.312	2.57	5	1.56
698+19 to 699+97 PIPE	0.59	7	12	0.375	6	4.10	1.94	0.61	0.369	1.60	5	1.84
700+00 to 701+69 PIPE	0.74	8.5	12	0.375	6	4.10	1.94	0.61	0.406	1.82	5	2.03
701+75 to 703+02 PIPE	0.42	11	12	0.375	6	4.10	1.94	0.61	0.462	0.91	5	2.31
703+05 to 705+43 PIPE	0.5	13	12	0.375	6	4.10	1.94	0.61	0.503	0.99	5	2.51
708+92 to 709+36 PIPE	7.75	3	12	0.375	6	4.10	1.94	0.61	0.241	32.10	35	8.45
716+59 to 716+98 PIPE	0.09	19	12	0.375	6	4.10	1.94	0.61	0.608	0.15	5	3.04
717+02 to 718+00 PIPE	0.48	13	12	0.375	6	4.10	1.94	0.61	0.503	0.96	5	2.51
721+35 to 722+35 PIPE	2.75	9.5	12	0.375	6	4.10	1.94	0.61	0.430	6.40	10	4.30
724+97 to 726+86 PIPE	1.88	22	12	0.375	6	4.10	1.94	0.61	0.654	2.88	5	3.27
795+60 to 796+67 PIPE	5.4	8	12	0.375	6	4.10	1.94	0.61	0.394	13.70	15	5.91
985+45 to 987+35 PIPE	0.28	18	12	0.375	6	4.10	1.94	0.61	0.591	0.47	5	2.96
865+90 to 868+95 PIPE	2.07	13	12	0.375	6	4.10	1.94	0.61	0.503	4.12	5	2.51
877+90 to 879+15 PIPE	1.65	15	12	0.375	6	4.10	1.94	0.61	0.540	3.06	5	2.70
914+15 to 916+40 PIPE	2.15	12	12	0.375	6	4.10	1.94	0.61	0.483	4.45	5	2.41
916+40 to 918+00 PIPE	1.4	12	12	0.375	6	4.10	1.94	0.61	0.483	2.90	5	2.41

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
234+15	234+90	12,404	100	0.21	Type D	0.300	5.84	145	0.28	1.40	1.73	7.57	4.32	0.20	0.03	5:1	0.25	12	0.32	6
228+10	229+30	18,785	95	0.49	Type D	0.300	4.67	0				5.00	4.82	0.20	0.15	3.5:1	0.42	12	0.44	6
229+30	231+75	11,101	85	0.52	Type D	0.300	4.38	0				5.00	4.82	0.20	0.04	2:1	0.25	12	0.37	6
225+35	227+50	15,929	85	0.39	Type D	0.300	4.69	0				5.00	4.82	0.20	0.01	8:1	0.35	12	0.44	6
225+35	228+05	4,356	70	0.47	Type D	0.300	4.09	0				5.00	4.82	0.20	0.01	7.5:1	0.10	12	0.47	6
170+75	171+90	3,620	100	1.13	Type D	0.300	3.94	0				5.00	4.82	0.20	0.04	3.5:1	0.08	12	0.23	6
171+90	172+65	20,699	100	0.30	Type D	0.300	5.37	315	0.43	1.70	3.09	8.46	4.16	0.20	0.07	7.5:1	0.40	12	0.01	8
147+00	147+35	5,432	100	0.26	Type D	0.300	5.55	170	0.21	1.20	2.36	7.92	4.25	0.20	0.20	3.5:1	0.11	12	0.13	6
148+15	150+25	67,071	100	0.17	Type D	0.300	6.13	445	0.23	1.20	6.18	12.32	3.62	0.20	0.01	6:1	1.11	12	0.21	6
150+25	152+50	65,332	100	0.19	Type D	0.300	5.98	510	0.22	1.20	7.08	13.06	3.53	0.20	0.07	4:1	1.06	12	0.16	6
152+50	153+80	217,884	100	0.17	Type D	0.300	6.13	605	0.22	1.20	8.40	14.54	3.36	0.20	0.10	8.5:1	3.36	12	0.22	6
153+80	156+75	134,029	100	0.18	Type D	0.300	6.05	370	0.23	1.20	5.14	11.19	3.76	0.20	0.11	4:1	2.31	12	0.25	6
156+90	159+55	69,275	100	0.16	Type D	0.300	6.22	300	0.22	1.20	4.17	10.39	3.87	0.20	0.04	4:1	1.23	12	0.18	6
159+55	164+80	215,939	100	0.18	Type D	0.300	6.05	320	0.21	1.20	4.44	10.50	3.85	0.20	0.04	4:1	3.82	18	0.19	12
164+90	167+50	60,280	100	0.12	Type D	0.300	6.65	230	0.20	1.20	3.19	9.85	3.95	0.20	0.03	4.5:1	1.09	12	0.16	8
127+05	128+05	637,955	100	0.10	Type D	0.800	10.98	1285	0.12	0.85	25.20	36.18	1.99	0.35						
		392,503			Type D								6.24	0.20						
		143,718			Type D								6.24	0.31	0.01	13:1	27.83	24	0.06	6 - 12"
119+25	122+10	42,573	100	0.17	Type D	0.300	6.13	185	0.18	3.00	1.03	7.16	4.39	0.35						
		39,826			Type D								6.24	0.20	0.02	5:1	2.64	18	0.18	8
114+25	115+00	10,110	100	0.17	Type D	0.300	6.13	80	0.36	1.50	0.89	7.02	4.41	0.20	0.03	4:1	0.20	12	0.54	6
115+00	116+95	27,270	100	0.14	Type D	0.300	6.42	80	0.35	1.50	0.89	7.31	4.36	0.20	0.01	3.5:1	0.55	12	0.22	6
109+70	110+40	34,328	100	0.19	Type D	0.300	5.98	275	0.24	1.30	3.53	9.50	4.00	0.20	0.01	5.5:1	0.63	12	0.24	6
110+40	111+65	58,939	100	0.19	Type D	0.300	5.98	285	0.23	1.20	3.96	9.94	3.94	0.20	0.02	6.5:1	1.06	12	0.19	8
75+15	76+05	19,165	100	0.15	Type D	0.300	6.32	295	0.13	0.85	5.78	12.10	3.64	0.20	0.04	7:1	0.32	12	0.15	6
67+40	72+50	151,165	100	0.08	Type D	0.300	7.32	450	0.14	0.90	8.33	15.65	3.25	0.20						
		10,807			Type D								6.24	0.35						
		2,825			Type D								6.24	0.87	0.06	3.5:1	3.15	18	0.19	8
49+75	50+55	18,225	100	0.23	Type D	0.300	5.72	260	0.16	0.95	4.56	10.28	3.89	0.20	0.01	10.5:1	0.33	12	0.22	6
33+80	35+35	19,606	100	0.23	Type D	0.300	5.72	195	0.18	1.20	2.71	8.42	4.17	0.20	0.04	4:1	0.38	12	0.13	6
35+35	40+05	214,183	100	0.22	Type D	0.400	6.61	550	0.18	1.20	7.64	14.25	3.39	0.20	0.02	6:1	3.34	18	0.15	12
32+85	33+05	132,634	100	0.13	Type D	0.300	6.53	90	0.14	0.90	1.67	8.20	4.21	0.20	0.10	4.5:1	2.56	12	0.50	8
31+20	31+25	8,757	100	0.23	Type D	0.300	5.72	205	0.21	1.20	2.85	8.56	4.15	0.20	0.05	4.5:1	0.17	12	0.24	6
27+70	29+75	3,021	100	0.14	Type D	0.300	6.42	730	0.26	1.30	9.36	15.78	3.23	0.20	0.01	6:1	0.04	12	0.16	6
14+85	15+40	7,114	100	0.18	Type D	0.300	6.05	150	0.24	1.20	2.08	8.14	4.22	0.20	0.04	5:1	0.14	12	0.27	6
15+40	15+95	8,498	100	0.23	Type D	0.300	5.72	160	0.26	1.30	2.05	7.77	4.28	0.20	0.07	3.5:1	0.17	12	0.30	6
17+30	18+70	13,996	100	0.10	Type D	0.500	8.82	320	0.26	1.30	4.10	12.92	3.54	0.35						
		19,316											6.24	0.20	0.03	4:1	0.95	12	0.13	6
18+70	20+00	4,937	100	0.12	Type D	0.500	8.45	195	0.33	1.40	2.32	10.77	3.82	0.20						
		10,268													0.02	2.5:1	0.09	12	0.11	6

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
264+30	265+85	55,396	100	0.06	Type D	0.300	7.82	540	0.18	1.00	9.00	16.82	3.13	0.20	0.05	4:1	0.80	12	0.23	6
265+85	266+30	9,970	100	0.15	Type D	0.300	6.32	460	0.17	0.95	8.07	14.39	3.38	0.20	0.05	5:1	0.15	12	0.22	6
270+20	271+25	21,518	100	0.11	Type D	0.400	7.77	201	0.17	1.80	1.86	9.63	3.98	0.40	0.01	5:1	0.79	12	0.13	6
271+25	272+20	21,136	100	0.33	Type D	0.400	6.01	196	0.18	1.90	1.72	7.73	4.29	0.40	0.03	5:1	0.83	12	0.17	6
297+40	301+30	124,917	100	0.08	Type D	0.400	8.37	559	0.21	2.00	4.66	13.03	3.53	0.40	0.05	5:1	4.05	18	0.18	12
301+30	304+00	108,636	100	0.03	Type D	0.400	10.52	450	0.21	2.00	3.75	14.27	3.39	0.40	0.06	5:1	3.38	18	0.27	8
304+00	305+80	91,221	100	0.05	Type D	0.400	9.34	462	0.17	1.80	4.28	13.62	3.46	0.40	0.10	4:1	2.90	12	0.30	8
305+80	309+25	70,318	100	0.03	Type D	0.300	9.20	349	0.15	0.85	6.84	16.04	3.21	0.20	0.06	4.5:1	1.04	12	0.34	6
337+65	341+60	181,711	100	0.14	Type D	0.300	6.42	290	0.19	1.05	4.60	11.02	3.78	0.20	0.05	4:1	3.16	18	0.21	12
341+60	342+70	31,944	100	0.12	Type D	0.300	6.65	223	0.17	0.95	3.91	10.57	3.85	0.20	0.03	3:1	0.56	12	0.22	6
342+70	343+35	19,983	100	0.10	Type D	0.300	6.94	220	0.18	1.00	3.67	10.61	3.84	0.20	0.03	3:1	0.35	12	0.26	6
350+65	354+30	105,894	100	0.14	Type D	0.300	6.42	310	0.20	1.95	2.65	9.07	4.07	0.60	0.04	4.5:1	5.93	18	0.27	12
368+05	373+20	134,882	100	0.17	Type D	0.400	7.02	219	0.18	1.90	1.92	8.94	4.09	0.40	0.03	5:1	5.06	18	0.16	12
373+20	375+45	88,254	100	0.17	Type D	0.400	7.02	229	0.18	1.90	2.01	9.03	4.07	0.40	0.06	6:1	3.30	12	0.15	12
375+45	380+25	189,085	100	0.22	Type D	0.400	6.61	370	0.18	1.90	3.25	9.85	3.95	0.40	0.03	6:1	6.85	18	0.20	12
396+00	396+75	46,572	100	0.17	Type D	0.400	7.02	567	0.21	2.00	4.73	11.74	3.69	0.40	0.03	5:1	1.58	12	0.12	8
396+75	398+45	63,967	100	0.17	Type D	0.400	7.02	581	0.21	2.00	4.84	11.86	3.67	0.40	0.02	5:1	2.16	18	0.11	8
398+45	399+05	22,045	100	0.17	Type D	0.400	7.02	638	0.18	1.90	5.60	12.61	3.58	0.40	0.02	5:1	0.72	12	0.14	6
399+05	400+10	23,814	100	0.18	Type D	0.400	6.92	466	0.17	1.80	4.31	11.24	3.75	0.40	0.05	5:1	0.82	12	0.17	6
476+15	480+60	147,225	100	0.09	Type D	0.400	8.14	406	0.20	1.95	3.47	11.61	3.70	0.40	0.06	6:1	5.01	18	0.09	12
480+60	481+85	141,248	100	0.07	Type D	0.400	8.63	658	0.14	1.70	6.45	15.08	3.30	0.40	0.02	8:1	4.29	18	0.06	12
484+35	485+05	27,509	100	0.09	Type D	0.400	8.14	133	0.19	1.90	1.17	9.31	4.03	0.40	0.11	20:1	1.02	12	0.13	6
515+95	521+15	194,218	100	0.08	Type D	0.400	8.37	397	0.15	1.75	3.78	12.15	3.64	0.40	0.04	4:1	6.49	18	0.16	12
521+15	523+50	57,955	100	0.05	Type D	0.400	9.34	195	0.18	1.90	1.71	11.05	3.78	0.40	0.03	4:1	2.01	18	0.22	8

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
540+10	540+83	28,778	100	0.05	HSG D	0.400	9.34	215	0.13	0.80	4.48	13.82	3.44	0.20	0.01	8:1	0.45	12	0.11	6
558+33	558+91	5,470	100	0.14	HSG D	0.300	6.42	185	0.14	0.85	3.63	10.05	3.92	0.20	0.10	5:1	0.10	12	0.06	6
558+91	560+22	115,912	100	0.07	HSG D	0.300	7.55	500	0.13	2.30	3.62	11.17	3.76	0.20	0.10	9:1	2.00	12	0.09	8
560+74	565+10	139,552	100	0.08	HSG D	0.400	8.37	353	0.14	2.50	2.35	10.72	3.82	0.50	0.04	7:1	6.12	18	0.11	12
565+45	569+37	112,589	100	0.20	HSG D	0.300	5.91	487	0.11	2.30	3.53	9.43	4.01	0.50	0.08	8:1	5.18	12	0.14	8
612+03	613+16	206,666	100	0.13	HSG D	0.300	6.53	484	0.12	2.30	3.51	10.04	3.92	0.37	0.07	20:1	6.88	12	0.08	12
612+17	618+53	186,442	100	0.09	HSG D	0.300	7.12	271	0.23	1.25	3.61	10.73	3.82	0.30	0.02	7:1	4.91	18	0.14	8
618+55	620+09	35,136	100	0.07	HSG D	0.400	8.63	288	0.22	1.20	4.00	12.63	3.58	0.20	0.03	6:1	0.58	12	0.16	6
624+31	625+28	86,230	100	0.16	HSG D	0.300	6.22	711	0.17	1.00	11.85	18.07	3.02	0.20	0.11	9:1	1.20	12	0.08	6
634+54	637+94	144,160	100	0.16	HSG D	0.400	7.12	744	0.21	1.10	11.27	18.39	3.00	0.20	0.03	5:1	1.98	12	0.05	8
637+94	641+37	187,511	100	0.17	HSG D	0.400	7.02	690	0.21	1.10	10.45	17.47	3.07	0.20	0.04	7:1	2.65	12	0.14	8
646+09	648+34	51,330	100	0.46	HSG D	0.400	5.56	264	0.17	1.00	4.40	9.96	3.93	0.20	0.05	6:1	0.93	12	0.14	6
648+38	653+40	50,206	100	0.30	HSG D	0.400	6.15	11	0.30	1.40	0.13	6.28	4.55	0.20	0.02	7:1	1.05	12	0.02	8
678+18	679+88	69,197	100	0.12	HSG D	0.400	7.61	306	0.11	1.50	3.40	11.01	3.78	0.31	0.02	8:1	1.86	12	0.10	6
679+90	681+86	43,713	100	0.14	HSG D	0.300	6.42	323	0.11	1.50	3.59	10.01	3.92	0.31	0.03	7:1	1.22	12	0.15	6
683+63	683+95	5,647	100	0.11	HSG D	0.300	6.79	207	0.17	1.70	2.03	8.82	4.11	0.31	0.10	5:1	0.16	12	N/A	N/A
696+41	698+18	52,074	100	0.10	HSG D	0.400	7.94	365	0.15	0.90	6.76	14.70	3.34	0.20	0.02	8:1	0.80	12	0.08	6
698+19	699+97	43,195	100	0.07	HSG D	0.400	8.63	485	0.13	0.80	10.10	18.74	2.97	0.20	0.03	7:1	0.59	12	0.12	6
700+00	701+69	46,277	100	0.06	HSG D	0.400	8.95	268	0.16	1.00	4.47	13.42	3.48	0.20	0.05	7:1	0.74	12	0.12	6
701+75	703+02	25,535	100	0.06	HSG D	0.400	8.95	222	0.17	1.10	3.36	12.31	3.62	0.20	0.06	4:1	0.42	12	0.15	6
703+05	705+43	29,413	100	0.08	HSG D	0.400	8.37	145	0.14	0.80	3.02	11.39	3.73	0.20	0.06	5:1	0.50	12	0.20	6
708+92	709+36	2,067,185	100	0.14	HSG D	0.300	6.42	1379	0.10	0.75	30.64	37.06	1.96	0.25	0.10	16:1	23.26	18	0.05	3 x 12
709+35	709+39	15,604	100	0.18	HSG D	0.300	6.05	562	0.18	1.40	6.69	12.74	3.56	0.25	0.06	10:1	0.32	12	N/A	N/A
716+59	716+98	2,773	100	0.12	HSG D	0.300	6.65	62	0.17	1.70	0.61	7.26	4.37	0.31	0.04	6:1	0.09	12	0.27	6
717+02	718+00	16,631	100	0.05	HSG D	0.300	8.17	131	0.20	3.00	0.73	8.89	4.09	0.31	0.05	6:1	0.48	12	0.20	6
721+35	722+35	99,777	100	0.10	HSG D	0.300	6.94	563	0.16	2.75	3.41	10.36	3.87	0.31	0.05	6:1	2.75	12	0.11	8
723+05	724+96	50,937	100	0.10	HSG D	0.300	6.94	373	0.17	2.75	2.26	9.20	4.05	0.31	0.11	4:1	1.47	12	N/A	N/A
724+97	726+86	69,100	100	0.02	HSG D	0.300	10.11	129	0.25	3.50	0.61	10.73	3.82	0.31	0.09	3:1	1.88	12	0.23	6
762+78	763+55	212,373	100	0.08	HSG D	0.300	7.32	661	0.22	1.25	8.81	16.13	3.20	0.20	0.06	6:1	3.12	12	N/A	N/A
795+60	796+67	493,263	100	0.04	HSG D	0.300	8.60	1019	0.15	0.90	18.87	27.47	2.38	0.20	0.04	10:1	5.40	12	0.08	12

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity* (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
985+45	987+35	13,520	100	0.19	Type D	0.300	5.98	55	0.27	1.30	0.71	6.68	4.48	0.20	0.15	4:1	0.28	12	0.30	6
865+90	868+95	65,263	100	0.13	Type D	0.800	10.33	1845	0.05	0.55	55.91	66.24	1.70	0.29						
		52,855											6.24	0.20	0.01	9.5:1	2.25	12	0.13	8
877+90	879+15	29,957	100	0.11	Type D	0.300	6.79	155	0.08	2.00	1.29	8.08	4.23	0.35						
		27,488						155	0.05	0.55	4.70		6.24	0.16						
								200	0.11	2.20	1.52		6.24	0.35	0.02	7:1	1.65	12	0.14	8
914+15	916+40	80,171	100	0.11	Type D	0.400	7.77	340	0.14	1.70	3.33	11.10	3.77	0.31	0.04	7.5:1	2.15	12	0.02	12
916+40	918+00	54,046	100	0.10	Type D	0.400	7.94	385	0.11	1.50	4.28	12.22	3.63	0.31	0.01	7.5:1	1.40	12	0.02	12

* Intensity calculated as 2-year return period with TC as duration OR 5-year/1-hr storm, whichever is greater

Allegheny County

**Allegheny County
Temporary Diversion Berm Calculations**

STATION	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Left Side Slope (ft/ft (H:V))	Right Side Slope (ft/ft (H:V))	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Flow Type
1042+59 to 1045+14 CHN	0.025	0.06	0.31	0.1	8	1.53	0.39	2.82	0.14	2.52	0.39	0.0183	3.91	0.24	0.55	1.75	Supercritical
1079+50 to 1080+75 CHN	0.023	0.03	0.3	0.1	8	1.06	0.36	2.71	0.13	2.42	0.34	0.0163	2.93	0.13	0.43	1.33	Supercritical
1399+90 - 1400+75	0.025	0.01	0.78	0.1	5	4.4	1.56	4.77	0.33	3.99	0.71	0.0163	2.82	0.12	0.91	0.79	Subcritical
1401+70 - 1403+96	0.025	0.06	0.41	0.1	3.5	1.3	0.3	1.91	0.16	1.48	0.5	0.0203	4.28	0.28	0.7	1.66	Supercritical
1404+00 - 1407+40	0.025	0.06	0.49	0.1	4	2.41	0.49	2.51	0.2	2.01	0.61	0.0182	4.91	0.37	0.86	1.75	Supercritical
1411+55 - 1413+96	0.025	0.02	0.39	0.1	5	1	0.4	2.41	0.16	2.01	0.39	0.0199	2.53	0.1	0.49	1	Supercritical
1479+45 - 1480+90	0.025	0.01	0.34	0.1	4	0.36	0.23	1.72	0.13	1.38	0.29	0.0235	1.56	0.04	0.37	0.67	Subcritical

**Allegheny County
Temporary Slope Pipe Calculations**

STATION	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Diameter (ft)	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Percent Full (%)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Maximum Discharge (ft ³ /s)	Discharge Full (ft ³ /s)	Slope Full (ft/ft)	Flow Type
1042+59 to 1045+14 PIPE	0.024	0.17	0.36	0.67	1.53	0.19	1.1	0.17	0.67	0.58	53.5	0.0492	7.97	0.99	1.35	2.62	2.94	2.73	0.05321	SuperCritical
1079+50 to 1080+75 PIPE	0.024	0.17	0.36	0.67	1.53	0.19	1.1	0.17	0.67	0.58	53.5	0.0492	7.97	0.99	1.35	2.62	2.94	2.73	0.05321	SuperCritical
1399+90 - 1400+75	0.023	0.21	0.49	1	4.4	0.38	1.54	0.25	1	0.88	48.6	0.043	11.61	2.1	2.58	3.33	9.93	9.23	0.04775	SuperCritical
1401+70 - 1403+96	0.023	0.22	0.36	0.5	1.3	0.15	1.02	0.15	0.45	0.49	72.4	0.1503	8.55	1.13	1.5	2.58	1.6	1.49	0.16804	SuperCritical
1404+00 - 1407+40	0.023	0.21	0.44	0.67	2.41	0.24	1.26	0.19	0.64	0.65	65.2	0.1065	9.9	1.52	1.96	2.82	3.41	3.17	0.12125	SuperCritical
1411+55 - 1413+96	0.023	0.22	0.3	0.5	1	0.12	0.89	0.14	0.49	0.47	60	0.086	8.12	1.03	1.33	2.86	1.6	1.49	0.09943	SuperCritical
1479+45 - 1480+90	0.023	0.24	0.16	0.5	0.36	0.06	0.61	0.09	0.47	0.3	32.7	0.0272	6.44	0.65	0.81	3.29	1.67	1.55	0.01289	SuperCritical

Allegheny County
Temporary Diversion Berm
Erosion Control Blanket Calculations

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
1042+59 to 1045+14 CHN	0.06	0.31	1.53	3.91	V	8.00	2.00	1.16	SC150
1079+50 to 1080+75 CHN	0.03	0.3	1.06	2.93	V	8.00	2.00	0.56	SC150
1399+90 - 1400+75	0.01	0.78	4.4	2.82	V	8.00	2.00	0.49	SC150
1401+70 - 1403+96	0.06	0.41	1.3	4.28	V	8.00	2.00	1.54	SC150
1404+00 - 1407+40	0.06	0.49	2.41	4.91	V	8.00	2.00	1.83	SC150
1411+55 - 1413+96	0.02	0.39	1	2.53	V	8.00	2.00	0.49	SC150
1479+45 - 1480+90	0.01	0.34	0.36	1.56	V	8.00	2.00	0.21	SC150

Allegheny County
Temporary Perforated Pipe Level Spreader Calculations

STATION	Diversion Discharge (ft ³ /s)	Available Static Head (ft)	Level Spreader Pipe Diameter (in.)	Perforation Diameter (in.)	Number of Perforations per Row	Orifice Area per Foot (in ² /ft)	Row Spacing (in.)	Orifice Coefficient (Cd)	Level Spreader Capacity per foot of length (ft ³ /s per ft)	Required Length (ft)	Nominal Length (ft)	Overall Level Spreader Capacity(ft ³ /s)
1042+59 to 1045+14 PIPE	1.53	11	12	0.375	6	4.10	1.94	0.61	0.462	3.31	5	2.31
1079+50 to 1080+75 PIPE	1.53	10	12	0.375	6	4.10	1.94	0.61	0.441	3.47	5	2.20
1399+90 - 1400+75	4.4	16	12	0.375	6	4.10	1.94	0.61	0.558	7.89	10	5.58
1401+70 - 1403+96	1.3	12	12	0.375	6	4.10	1.94	0.61	0.483	2.69	5	2.41
1404+00 - 1407+40	2.41	18	12	0.375	6	4.10	1.94	0.61	0.591	4.08	5	2.96
1411+55 - 1413+96	1	16	12	0.375	6	4.10	1.94	0.61	0.558	1.79	5	2.79
1479+45 - 1480+90	0.36	14	12	0.375	6	4.10	1.94	0.61	0.522	0.69	5	2.61

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
234+15	234+90	12,404	100	0.21	Type D	0.300	5.84	145	0.28	1.40	1.73	7.57	4.32	0.20	0.03	5:1	0.25	12	0.32	6
228+10	229+30	18,785	95	0.49	Type D	0.300	4.67	0				5.00	4.82	0.20	0.15	3.5:1	0.42	12	0.44	6
229+30	231+75	11,101	85	0.52	Type D	0.300	4.38	0				5.00	4.82	0.20	0.04	2:1	0.25	12	0.37	6
225+35	227+50	15,929	85	0.39	Type D	0.300	4.69	0				5.00	4.82	0.20	0.01	8:1	0.35	12	0.44	6
225+35	228+05	4,356	70	0.47	Type D	0.300	4.09	0				5.00	4.82	0.20	0.01	7.5:1	0.10	12	0.47	6
170+75	171+90	3,620	100	1.13	Type D	0.300	3.94	0				5.00	4.82	0.20	0.04	3.5:1	0.08	12	0.23	6
171+90	172+65	20,699	100	0.30	Type D	0.300	5.37	315	0.43	1.70	3.09	8.46	4.16	0.20	0.07	7.5:1	0.40	12	0.01	8
147+00	147+35	5,432	100	0.26	Type D	0.300	5.55	170	0.21	1.20	2.36	7.92	4.25	0.20	0.20	3.5:1	0.11	12	0.13	6
148+15	150+25	67,071	100	0.17	Type D	0.300	6.13	445	0.23	1.20	6.18	12.32	3.62	0.20	0.01	6:1	1.11	12	0.21	6
150+25	152+50	65,332	100	0.19	Type D	0.300	5.98	510	0.22	1.20	7.08	13.06	3.53	0.20	0.07	4:1	1.06	12	0.16	6
152+50	153+80	217,884	100	0.17	Type D	0.300	6.13	605	0.22	1.20	8.40	14.54	3.36	0.20	0.10	8.5:1	3.36	12	0.22	6
153+80	156+75	134,029	100	0.18	Type D	0.300	6.05	370	0.23	1.20	5.14	11.19	3.76	0.20	0.11	4:1	2.31	12	0.25	6
156+90	159+55	69,275	100	0.16	Type D	0.300	6.22	300	0.22	1.20	4.17	10.39	3.87	0.20	0.04	4:1	1.23	12	0.18	6
159+55	164+80	215,939	100	0.18	Type D	0.300	6.05	320	0.21	1.20	4.44	10.50	3.85	0.20	0.04	4:1	3.82	18	0.19	12
164+90	167+50	60,280	100	0.12	Type D	0.300	6.65	230	0.20	1.20	3.19	9.85	3.95	0.20	0.03	4.5:1	1.09	12	0.16	8
127+05	128+05	637,955	100	0.10	Type D	0.800	10.98	1285	0.12	0.85	25.20	36.18	1.99	0.35						
		392,503			Type D								6.24	0.20						
		143,718			Type D								6.24	0.31	0.01	13:1	27.83	24	0.06	6 - 12"
119+25	122+10	42,573	100	0.17	Type D	0.300	6.13	185	0.18	3.00	1.03	7.16	4.39	0.35						
		39,826			Type D								6.24	0.20	0.02	5:1	2.64	18	0.18	8
114+25	115+00	10,110	100	0.17	Type D	0.300	6.13	80	0.36	1.50	0.89	7.02	4.41	0.20	0.03	4:1	0.20	12	0.54	6
115+00	116+95	27,270	100	0.14	Type D	0.300	6.42	80	0.35	1.50	0.89	7.31	4.36	0.20	0.01	3.5:1	0.55	12	0.22	6
109+70	110+40	34,328	100	0.19	Type D	0.300	5.98	275	0.24	1.30	3.53	9.50	4.00	0.20	0.01	5.5:1	0.63	12	0.24	6
110+40	111+65	58,939	100	0.19	Type D	0.300	5.98	285	0.23	1.20	3.96	9.94	3.94	0.20	0.02	6.5:1	1.06	12	0.19	8
75+15	76+05	19,165	100	0.15	Type D	0.300	6.32	295	0.13	0.85	5.78	12.10	3.64	0.20	0.04	7:1	0.32	12	0.15	6
67+40	72+50	151,165	100	0.08	Type D	0.300	7.32	450	0.14	0.90	8.33	15.65	3.25	0.20						
		10,807			Type D								6.24	0.35						
		2,825			Type D								6.24	0.87	0.06	3.5:1	3.15	18	0.19	8
49+75	50+55	18,225	100	0.23	Type D	0.300	5.72	260	0.16	0.95	4.56	10.28	3.89	0.20	0.01	10.5:1	0.33	12	0.22	6
33+80	35+35	19,606	100	0.23	Type D	0.300	5.72	195	0.18	1.20	2.71	8.42	4.17	0.20	0.04	4:1	0.38	12	0.13	6
35+35	40+05	214,183	100	0.22	Type D	0.400	6.61	550	0.18	1.20	7.64	14.25	3.39	0.20	0.02	6:1	3.34	18	0.15	12
32+85	33+05	132,634	100	0.13	Type D	0.300	6.53	90	0.14	0.90	1.67	8.20	4.21	0.20	0.10	4.5:1	2.56	12	0.50	8
31+20	31+25	8,757	100	0.23	Type D	0.300	5.72	205	0.21	1.20	2.85	8.56	4.15	0.20	0.05	4.5:1	0.17	12	0.24	6
27+70	29+75	3,021	100	0.14	Type D	0.300	6.42	730	0.26	1.30	9.36	15.78	3.23	0.20	0.01	6:1	0.04	12	0.16	6
14+85	15+40	7,114	100	0.18	Type D	0.300	6.05	150	0.24	1.20	2.08	8.14	4.22	0.20	0.04	5:1	0.14	12	0.27	6
15+40	15+95	8,498	100	0.23	Type D	0.300	5.72	160	0.26	1.30	2.05	7.77	4.28	0.20	0.07	3.5:1	0.17	12	0.30	6
17+30	18+70	13,996	100	0.10	Type D	0.500	8.82	320	0.26	1.30	4.10	12.92	3.54	0.35						
		19,316											6.24	0.20	0.03	4:1	0.95	12	0.13	6
18+70	20+00	4,937	100	0.12	Type D	0.500	8.45	195	0.33	1.40	2.32	10.77	3.82	0.20						
		10,268													0.02	2.5:1	0.09	12	0.11	6

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
264+30	265+85	55,396	100	0.06	Type D	0.300	7.82	540	0.18	1.00	9.00	16.82	3.13	0.20	0.05	4:1	0.80	12	0.23	6
265+85	266+30	9,970	100	0.15	Type D	0.300	6.32	460	0.17	0.95	8.07	14.39	3.38	0.20	0.05	5:1	0.15	12	0.22	6
270+20	271+25	21,518	100	0.11	Type D	0.400	7.77	201	0.17	1.80	1.86	9.63	3.98	0.40	0.01	5:1	0.79	12	0.13	6
271+25	272+20	21,136	100	0.33	Type D	0.400	6.01	196	0.18	1.90	1.72	7.73	4.29	0.40	0.03	5:1	0.83	12	0.17	6
297+40	301+30	124,917	100	0.08	Type D	0.400	8.37	559	0.21	2.00	4.66	13.03	3.53	0.40	0.05	5:1	4.05	18	0.18	12
301+30	304+00	108,636	100	0.03	Type D	0.400	10.52	450	0.21	2.00	3.75	14.27	3.39	0.40	0.06	5:1	3.38	18	0.27	8
304+00	305+80	91,221	100	0.05	Type D	0.400	9.34	462	0.17	1.80	4.28	13.62	3.46	0.40	0.10	4:1	2.90	12	0.30	8
305+80	309+25	70,318	100	0.03	Type D	0.300	9.20	349	0.15	0.85	6.84	16.04	3.21	0.20	0.06	4.5:1	1.04	12	0.34	6
337+65	341+60	181,711	100	0.14	Type D	0.300	6.42	290	0.19	1.05	4.60	11.02	3.78	0.20	0.05	4:1	3.16	18	0.21	12
341+60	342+70	31,944	100	0.12	Type D	0.300	6.65	223	0.17	0.95	3.91	10.57	3.85	0.20	0.03	3:1	0.56	12	0.22	6
342+70	343+35	19,983	100	0.10	Type D	0.300	6.94	220	0.18	1.00	3.67	10.61	3.84	0.20	0.03	3:1	0.35	12	0.26	6
350+65	354+30	105,894	100	0.14	Type D	0.300	6.42	310	0.20	1.95	2.65	9.07	4.07	0.60	0.04	4.5:1	5.93	18	0.27	12
368+05	373+20	134,882	100	0.17	Type D	0.400	7.02	219	0.18	1.90	1.92	8.94	4.09	0.40	0.03	5:1	5.06	18	0.16	12
373+20	375+45	88,254	100	0.17	Type D	0.400	7.02	229	0.18	1.90	2.01	9.03	4.07	0.40	0.06	6:1	3.30	12	0.15	12
375+45	380+25	189,085	100	0.22	Type D	0.400	6.61	370	0.18	1.90	3.25	9.85	3.95	0.40	0.03	6:1	6.85	18	0.20	12
396+00	396+75	46,572	100	0.17	Type D	0.400	7.02	567	0.21	2.00	4.73	11.74	3.69	0.40	0.03	5:1	1.58	12	0.12	8
396+75	398+45	63,967	100	0.17	Type D	0.400	7.02	581	0.21	2.00	4.84	11.86	3.67	0.40	0.02	5:1	2.16	18	0.11	8
398+45	399+05	22,045	100	0.17	Type D	0.400	7.02	638	0.18	1.90	5.60	12.61	3.58	0.40	0.02	5:1	0.72	12	0.14	6
399+05	400+10	23,814	100	0.18	Type D	0.400	6.92	466	0.17	1.80	4.31	11.24	3.75	0.40	0.05	5:1	0.82	12	0.17	6
476+15	480+60	147,225	100	0.09	Type D	0.400	8.14	406	0.20	1.95	3.47	11.61	3.70	0.40	0.06	6:1	5.01	18	0.09	12
480+60	481+85	141,248	100	0.07	Type D	0.400	8.63	658	0.14	1.70	6.45	15.08	3.30	0.40	0.02	8:1	4.29	18	0.06	12
484+35	485+05	27,509	100	0.09	Type D	0.400	8.14	133	0.19	1.90	1.17	9.31	4.03	0.40	0.11	20:1	1.02	12	0.13	6
515+95	521+15	194,218	100	0.08	Type D	0.400	8.37	397	0.15	1.75	3.78	12.15	3.64	0.40	0.04	4:1	6.49	18	0.16	12
521+15	523+50	57,955	100	0.05	Type D	0.400	9.34	195	0.18	1.90	1.71	11.05	3.78	0.40	0.03	4:1	2.01	18	0.22	8

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
540+10	540+83	28,778	100	0.05	HSG D	0.400	9.34	215	0.13	0.80	4.48	13.82	3.44	0.20	0.01	8:1	0.45	12	0.11	6
558+33	558+91	5,470	100	0.14	HSG D	0.300	6.42	185	0.14	0.85	3.63	10.05	3.92	0.20	0.10	5:1	0.10	12	0.06	6
558+91	560+22	115,912	100	0.07	HSG D	0.300	7.55	500	0.13	2.30	3.62	11.17	3.76	0.20	0.10	9:1	2.00	12	0.09	8
560+74	565+10	139,552	100	0.08	HSG D	0.400	8.37	353	0.14	2.50	2.35	10.72	3.82	0.50	0.04	7:1	6.12	18	0.11	12
565+45	569+37	112,589	100	0.20	HSG D	0.300	5.91	487	0.11	2.30	3.53	9.43	4.01	0.50	0.08	8:1	5.18	12	0.14	8
612+03	613+16	206,666	100	0.13	HSG D	0.300	6.53	484	0.12	2.30	3.51	10.04	3.92	0.37	0.07	20:1	6.88	12	0.08	12
612+17	618+53	186,442	100	0.09	HSG D	0.300	7.12	271	0.23	1.25	3.61	10.73	3.82	0.30	0.02	7:1	4.91	18	0.14	8
618+55	620+09	35,136	100	0.07	HSG D	0.400	8.63	288	0.22	1.20	4.00	12.63	3.58	0.20	0.03	6:1	0.58	12	0.16	6
624+31	625+28	86,230	100	0.16	HSG D	0.300	6.22	711	0.17	1.00	11.85	18.07	3.02	0.20	0.11	9:1	1.20	12	0.08	6
634+54	637+94	144,160	100	0.16	HSG D	0.400	7.12	744	0.21	1.10	11.27	18.39	3.00	0.20	0.03	5:1	1.98	12	0.05	8
637+94	641+37	187,511	100	0.17	HSG D	0.400	7.02	690	0.21	1.10	10.45	17.47	3.07	0.20	0.04	7:1	2.65	12	0.14	8
646+09	648+34	51,330	100	0.46	HSG D	0.400	5.56	264	0.17	1.00	4.40	9.96	3.93	0.20	0.05	6:1	0.93	12	0.14	6
648+38	653+40	50,206	100	0.30	HSG D	0.400	6.15	11	0.30	1.40	0.13	6.28	4.55	0.20	0.02	7:1	1.05	12	0.02	8
678+18	679+88	69,197	100	0.12	HSG D	0.400	7.61	306	0.11	1.50	3.40	11.01	3.78	0.31	0.02	8:1	1.86	12	0.10	6
679+90	681+86	43,713	100	0.14	HSG D	0.300	6.42	323	0.11	1.50	3.59	10.01	3.92	0.31	0.03	7:1	1.22	12	0.15	6
683+63	683+95	5,647	100	0.11	HSG D	0.300	6.79	207	0.17	1.70	2.03	8.82	4.11	0.31	0.10	5:1	0.16	12	N/A	N/A
696+41	698+18	52,074	100	0.10	HSG D	0.400	7.94	365	0.15	0.90	6.76	14.70	3.34	0.20	0.02	8:1	0.80	12	0.08	6
698+19	699+97	43,195	100	0.07	HSG D	0.400	8.63	485	0.13	0.80	10.10	18.74	2.97	0.20	0.03	7:1	0.59	12	0.12	6
700+00	701+69	46,277	100	0.06	HSG D	0.400	8.95	268	0.16	1.00	4.47	13.42	3.48	0.20	0.05	7:1	0.74	12	0.12	6
701+75	703+02	25,535	100	0.06	HSG D	0.400	8.95	222	0.17	1.10	3.36	12.31	3.62	0.20	0.06	4:1	0.42	12	0.15	6
703+05	705+43	29,413	100	0.08	HSG D	0.400	8.37	145	0.14	0.80	3.02	11.39	3.73	0.20	0.06	5:1	0.50	12	0.20	6
708+92	709+36	2,067,185	100	0.14	HSG D	0.300	6.42	1379	0.10	0.75	30.64	37.06	1.96	0.25	0.10	16:1	23.26	18	0.05	3 x 12
709+35	709+39	15,604	100	0.18	HSG D	0.300	6.05	562	0.18	1.40	6.69	12.74	3.56	0.25	0.06	10:1	0.32	12	N/A	N/A
716+59	716+98	2,773	100	0.12	HSG D	0.300	6.65	62	0.17	1.70	0.61	7.26	4.37	0.31	0.04	6:1	0.09	12	0.27	6
717+02	718+00	16,631	100	0.05	HSG D	0.300	8.17	131	0.20	3.00	0.73	8.89	4.09	0.31	0.05	6:1	0.48	12	0.20	6
721+35	722+35	99,777	100	0.10	HSG D	0.300	6.94	563	0.16	2.75	3.41	10.36	3.87	0.31	0.05	6:1	2.75	12	0.11	8
723+05	724+96	50,937	100	0.10	HSG D	0.300	6.94	373	0.17	2.75	2.26	9.20	4.05	0.31	0.11	4:1	1.47	12	N/A	N/A
724+97	726+86	69,100	100	0.02	HSG D	0.300	10.11	129	0.25	3.50	0.61	10.73	3.82	0.31	0.09	3:1	1.88	12	0.23	6
762+78	763+55	212,373	100	0.08	HSG D	0.300	7.32	661	0.22	1.25	8.81	16.13	3.20	0.20	0.06	6:1	3.12	12	N/A	N/A
795+60	796+67	493,263	100	0.04	HSG D	0.300	8.60	1019	0.15	0.90	18.87	27.47	2.38	0.20	0.04	10:1	5.40	12	0.08	12

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
985+45	987+35	13,520	100	0.19	Type D	0.300	5.98	55	0.27	1.30	0.71	6.68	4.48	0.20	0.15	4:1	0.28	12	0.30	6
865+90	868+95	65,263	100	0.13	Type D	0.800	10.33	1845	0.05	0.55	55.91	66.24	1.27	0.29						
		52,855											6.24	0.20	0.01	9.5:1	2.07	12	0.13	8
877+90	879+15	29,957	100	0.11	Type D	0.300	6.79	155	0.08	2.00	1.29	8.08	4.23	0.35						
		27,488						155	0.05	0.55	4.70		6.24	0.16						
								200	0.11	2.20	1.52		6.24	0.35	0.02	7:1	1.65	12	0.14	8
914+15	916+40	80,171	100	0.11	Type D	0.400	7.77	340	0.14	1.70	3.33	11.10	3.77	0.31	0.04	7.5:1	2.15	12	0.02	12
916+40	918+00	54,046	100	0.10	Type D	0.400	7.94	385	0.11	1.50	4.28	12.22	3.63	0.31	0.01	7.5:1	1.40	12	0.02	12

Westmoreland County

**Westmoreland County
Temporary Diversion Berm Calculations**

STATION	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Left Side Slope (ft/ft (H:V))	Right Side Slope (ft/ft (H:V))	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Flow Type
3122+15 to 3123+20 CHN	0.025	0.02	0.29	0.1	6	0.52	0.25	2.03	0.12	1.75	0.28	0.0214	2.08	0.07	0.35	0.97	Subcritical
3193+25 to 3193+60 CHN	0.025	0.09	0.23	0.1	7	0.74	0.19	1.87	0.1	1.64	0.31	0.0202	3.89	0.24	0.47	2.02	Supercritical
3199+85 to 3200+90 CHN	0.025	0.99	0.22	0.1	4.5	1.25	0.11	1.21	0.09	0.99	0.45	0.0195	11.72	2.13	2.35	6.29	Supercritical
3200+90 to 3201+85 CHN	0.025	1.09	0.35	0.1	4.5	4.72	0.28	1.95	0.14	1.6	0.76	0.0164	16.96	4.47	4.82	7.17	Supercritical
3215+75 to 3216+45 CHN	0.025	0.11	0.54	0.1	5.5	5.94	0.81	3.54	0.23	3.01	0.78	0.0155	7.36	0.84	1.38	2.5	Supercritical
3216+45 to 3216+85 CHN	0.025	0.03	0.49	0.1	5.5	2.42	0.67	3.23	0.21	2.74	0.54	0.0175	3.61	0.2	0.69	1.29	Supercritical
3218+35 to 3219+45 CHN	0.025	0.05	0.15	0.1	8	0.21	0.09	1.39	0.07	1.24	0.18	0.0238	2.22	0.08	0.23	1.42	Supercritical
3247+80 to 3251+00 CHN	0.025	0.06	0.32	0.1	4.5	0.88	0.23	1.79	0.13	1.47	0.39	0.0205	3.75	0.22	0.54	1.66	Supercritical
3251+00 to 3252+20 CHN	0.025	0.04	0.55	0.1	5	3.5	0.78	3.38	0.23	2.82	0.65	0.0168	4.48	0.31	0.87	1.5	Supercritical
3259+20 to 3259+70 CHN	0.025	0.06	0.5	0.1	6	4.01	0.77	3.55	0.22	3.06	0.64	0.0163	5.24	0.43	0.93	1.84	Supercritical
3259+70 to 3262+40 CHN	0.025	0.004	0.81	0.1	5.5	3.36	1.83	5.33	0.34	4.52	0.62	0.0168	1.84	0.05	0.86	0.51	Subcritical
3269+95 to 3270+90 CHN	0.025	0.01	0.22	0.1	4	0.11	0.09	1.1	0.09	0.88	0.18	0.0275	1.16	0.02	0.24	0.62	Subcritical
3270+90 to 3271+45 CHN	0.025	0.24	0.12	0.1	6	0.16	0.04	0.82	0.05	0.71	0.18	0.025	3.93	0.24	0.36	2.88	Supercritical
3274+90 to 3276+25 CHN	0.025	0.07	0.16	0.1	5	0.18	0.07	1	0.07	0.84	0.2	0.025	2.63	0.11	0.27	1.62	Supercritical
3292+65 to 3293+50 CHN	0.025	0.06	0.44	0.1	5	2.3	0.49	2.68	0.18	2.24	0.55	0.0178	4.7	0.34	0.78	1.77	Supercritical
3292+65 to 3299+65 CHN	0.025	0.02	0.73	0.1	3.5	3.5	0.96	3.4	0.28	2.64	0.75	0.0178	3.63	0.2	0.94	1.06	Supercritical
3293+50 to 3295+00 CHN	0.025	0.01	0.49	0.1	5.5	1.43	0.68	3.25	0.21	2.76	0.44	0.0188	2.1	0.07	0.56	0.74	Subcritical
3300+00 to 3300+75 CHN	0.025	0.2	0.13	0.1	1.5	0.04	0.01	0.37	0.04	0.21	0.17	0.0436	2.95	0.14	0.27	2.04	Supercritical
3305+40 to 3307+30 CHN	0.025	0.15	0.13	0.1	16	0.44	0.13	2.13	0.06	2.02	0.18	0.0219	3.48	0.19	0.31	2.45	Supercritical
3307+30 to 3307+55 CHN	0.025	1.32	0.34	0.1	2.5	2.43	0.15	1.25	0.12	0.88	0.74	0.0203	16.47	4.22	4.55	7.08	Supercritical
3335+75 to 3338+65 CHN	0.025	0.05	0.07	0.1	10.5	0.03	0.02	0.76	0.03	0.7	0.07	0.0309	1.3	0.03	0.09	1.26	Supercritical
3377+80 to 3384+90 CHN	0.025	0.02	0.65	0.1	3	2.13	0.65	2.71	0.24	2.01	0.65	0.0196	3.26	0.17	0.81	1.01	Supercritical
3384+90 to 3386+95 CHN	0.025	0.06	0.43	0.1	3	1.24	0.29	1.8	0.16	1.34	0.52	0.0211	4.3	0.29	0.72	1.63	Supercritical
3387+45 to 3389+70 CHN	0.025	0.06	0.37	0.1	6	1.77	0.41	2.61	0.16	2.25	0.46	0.0181	4.27	0.28	0.65	1.75	Supercritical
3394+45 to 3396+10 CHN	0.025	0.18	0.32	0.1	10	3.5	0.5	3.49	0.14	3.19	0.5	0.0164	6.94	0.75	1.06	3.08	Supercritical
3433+23 to 3437+15 CHN	0.025	0.03	0.35	0.1	15	2.89	0.93	5.63	0.17	5.3	0.39	0.017	3.1	0.15	0.5	1.31	Supercritical
3437+30 to 3438+20 CHN	0.025	0.02	0.16	0.1	16	0.33	0.22	2.79	0.08	2.64	0.16	0.0228	1.53	0.04	0.2	0.94	Subcritical
3438+20 to 3438+60 CHN	0.025	0.05	0.15	0.1	16	0.41	0.18	2.55	0.07	2.41	0.17	0.0222	2.28	0.08	0.23	1.47	Supercritical
3438+60 to 3439+08 CHN	0.025	0.02	0.25	0.1	14	0.91	0.45	3.8	0.12	3.56	0.25	0.0198	2.02	0.06	0.32	1	Supercritical
3439+85 to 3442+35 CHN	0.025	0.017	0.49	0.1	8	2.67	0.95	4.4	0.22	3.93	0.49	0.017	2.8	0.12	0.61	1	Supercritical
3442+35 to 3444+30 CHN	0.025	0.021	0.34	0.1	9	1.27	0.52	3.39	0.15	3.07	0.34	0.0187	2.46	0.09	0.43	1.06	Supercritical
3445+40 to 3448+10 CHN	0.025	0.008	0.44	0.1	12	2.2	1.19	5.78	0.21	5.36	0.38	0.0175	1.85	0.05	0.5	0.69	Subcritical
3448+10 to 3449+25 CHN	0.025	0.011	0.27	0.1	15	0.84	0.54	4.28	0.13	4.03	0.24	0.0201	1.56	0.04	0.3	0.75	Subcritical
3449+25 to 3450+10 CHN	0.025	0.045	0.41	0.1	8	2.84	0.69	3.75	0.18	3.35	0.5	0.0168	4.09	0.26	0.67	1.59	Supercritical
3450+10 to 3450+40 CHN	0.025	0.043	0.15	0.1	15	0.39	0.18	2.49	0.07	2.34	0.18	0.0222	2.15	0.07	0.23	1.36	Supercritical
3450+40 to 3451+50 CHN	0.025	0.01	0.32	0.1	5	0.41	0.26	1.96	0.13	1.64	0.28	0.0224	1.56	0.04	0.36	0.69	Subcritical
3451+50 to 3454+15 CHN	0.025	0.039	0.4	0.1	8	2.42	0.65	3.63	0.18	3.24	0.47	0.0172	3.73	0.22	0.62	1.47	Supercritical
3454+15 to 3456+45 CHN	0.025	0.026	0.3	0.1	10	1.12	0.44	3.28	0.14	2.99	0.31	0.019	2.53	0.1	0.4	1.16	Supercritical
3457+75 to 3460+60 CHN	0.025	0.028	0.37	0.1	9	1.87	0.62	3.71	0.17	3.36	0.4	0.0178	3.02	0.14	0.51	1.24	Supercritical
3460+60 to 3464+40 CHN	0.025	0.037	0.36	0.1	11	2.55	0.73	4.38	0.17	4.04	0.42	0.0171	3.47	0.19	0.55	1.44	Supercritical

Westmoreland County
Temporary Slope Pipe Calculations

3450+10 to 3450+40 PIPE	0.023	0.048	0.27	0.5	0.39	0.11	0.82	0.13	0.5	0.32	53.6	0.0282	3.64	0.21	0.47	1.39	0.75	0.69	0.01512	SuperCritical
3450+40 to 3451+50 PIPE	0.023	0.063	0.25	0.5	0.41	0.1	0.79	0.13	0.5	0.33	50.9	0.029	4.08	0.26	0.51	1.61	0.86	0.8	0.01671	SuperCritical
3451+50 to 3454+15 PIPE	0.023	0.063	0.49	1	2.42	0.38	1.55	0.25	1	0.67	48.7	0.0235	6.37	0.63	1.12	1.82	5.44	5.05	0.01444	SuperCritical
3454+15 to 3456+45 PIPE	0.023	0.095	0.34	0.67	1.12	0.18	1.07	0.17	0.67	0.5	51.5	0.0316	6.12	0.58	0.93	2.07	2.29	2.13	0.02619	SuperCritical
3457+75 to 3460+60 PIPE	0.023	0.086	0.51	0.67	1.87	0.29	1.41	0.2	0.58	0.62	75.6	0.0633	6.54	0.66	1.17	1.63	2.18	2.03	0.073	SuperCritical
3460+60 to 3464+40 PIPE	0.023	0.043	0.56	1	2.55	0.46	1.7	0.27	0.99	0.68	56.4	0.0243	5.58	0.48	1.05	1.45	4.49	4.18	0.01604	SuperCritical

**Westmoreland County
Temporary Diversion Berm
Erosion Control Blanket Calculations**

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
1505+92 - 1507+25	0.02	0.36	0.81	2.4	V	8.00	2.00	0.45	SC150
1509+75 - 1510+65	0.06	0.3	1.84	3.88	V	8.00	2.00	1.12	SC150
1552+40 - 1557+70	0.01	0.38	2.25	1.9	V	8.00	2.00	0.24	SC150
1566+35 - 1567+80	0.03	0.36	2.31	3.13	V	8.00	2.00	0.67	SC150
1566+35 - 1568+80	0.01	0.35	1.8	1.8	V	8.00	2.00	0.22	SC150
1572+76 - 1574+25	0.02	0.21	0.28	1.73	V	8.00	2.00	0.26	SC150
1574+35 - 1576+13	0.01	0.26	0.28	1.37	V	8.00	2.00	0.16	SC150
1620+30 North 1 CHN	0.12	0.32	1.37	5.35	S	9.50	3.00	2.40	SC250
1620+30 North 2 CHN	0.08	0.5	2.97	5.76	V	9.50	3.00	2.50	SC250
1620+30 North 3 CHN	0.05	0.45	5.22	4.65	V	8.00	2.00	1.40	SC150
1620+30 North 4 CHN	0.03	0.32	1.82	2.9	V	8.00	2.00	0.60	SC150
1620+30 North South 1 CHN	0.03	0.29	0.56	2.54	V	8.00	2.00	0.54	SC150
1620+30 North South 2 CHN	0.06	0.39	1.36	4.25	V	8.00	2.00	1.46	SC150
1635+82 to 1641+21 CHN	0.01	0.39	8.95	1.97	V	8.00	2.00	0.24	SC150
1659+18 to 1664+18 CHN	0.01	0.88	7.4	3.12	V	8.00	2.00	0.55	SC150
1669+06 to 1669+93 CHN	0.01	0.46	1.06	1.98	V	8.00	2.00	0.29	SC150
1705+00 to 1709+50 CHN	0.04	0.52	5.7	4.55	V	8.00	2.00	1.30	SC150
1717+86 to 1719+77 CHN	0.03	0.35	0.86	2.83	V	8.00	2.00	0.66	SC150
1719+77 to 1720+52 CHN	0.04	0.2	0.29	2.33	V	8.00	2.00	0.50	SC150
1746+56 to 1748+30 CHN	0.06	0.29	1.91	3.81	V	8.00	2.00	1.09	SC150
1748+30 to 1749+10 CHN	0.04	0.19	0.43	2.34	V	8.00	2.00	0.47	SC150
1786+83 to 1787+29 CHN	0.04	0.09	0.07	1.41	V	8.00	2.00	0.22	SC150
1787+29 to 1788+03 CHN	0.03	0.26	0.31	2.27	V	8.00	2.00	0.49	SC150
1813+27 to 1817+00 CHN	0.06	0.43	2.62	4.71	V	8.00	2.00	1.61	SC150
1817+00 to 1818+37 CHN	0.04	0.22	0.6	2.54	V	8.00	2.00	0.55	SC150
1825+37 to 1825+82 CHN	0.05	0.16	0.31	2.34	V	8.00	2.00	0.50	SC150
1856+70 to 1859+19 CHN	0.04	0.5	4.32	4.35	V	8.00	2.00	1.25	SC150
1884+35 - 1885+04	0.01	0.24	0.79	1.39	V	8.00	2.00	0.15	SC150
1886+18 - 1888+33	0.01	0.78	8.28	2.97	V	8.00	2.00	0.49	SC150
1888+33 - 1890+59	0.01	0.66	4	2.6	V	8.00	2.00	0.41	SC150
1890+59 - 1892+57	0.05	0.57	2.82	4.85	V	8.00	2.00	1.78	SC150
1903+15 - 1904+76	0.05	0.36	1.47	3.8	V	8.00	2.00	1.12	SC150
1904+77 - 1910+14	0.05	0.51	3.15	4.74	V	8.00	2.00	1.59	SC150
1953+81 - 1955+63	0.03	0.32	1.5	2.87	V	8.00	2.00	0.60	SC150
1972+40 - 1974+33	0.15	0.69	20.11	10.48	S	12.50	12.00	6.46	P550
1985+25 - 1987+30	0.05	0.64	19.4	5.96	V	8.00	2.00	2.00	SC150
1987+37 - 1988+49	0.01	0.31	0.63	1.6	V	8.00	2.00	0.19	SC150
1995+22 - 1999+69	0.03	0.43	8.03	3.6	V	8.00	2.00	0.80	SC150
2007+27 - 2008+28	0.02	0.3	0.81	2.21	V	8.00	2.00	0.37	SC150
2008+28 - 2113+82	0.03	0.71	15.04	4.91	V	8.00	2.00	1.33	SC150

Westmoreland County
Temporary Diversion Berm
Erosion Control Blanket Calculations

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
2015+53 - 2018+33	0.03	0.58	4.96	4.14	V	8.00	2.00	1.09	SC150
2018+33 - 2020+42	0.06	0.55	6.04	5.65	V	9.50	3.00	2.06	SC250
2020+69 - 2024+65	0.05	0.46	3.94	4.62	V	8.00	2.00	1.44	SC150
2041+54 - 2045+81	0.06	0.4	1.37	4.26	V	8.00	2.00	1.50	SC150
2050+72 - 2053+75	0.02	0.36	1.71	2.55	V	8.00	2.00	0.45	SC150
2100+82 - 2104+74	0.02	0.3	1.16	2.26	V	8.00	2.00	0.37	SC150
2108+90 - 2111+32	0.05	0.33	1.58	3.68	V	8.00	2.00	1.03	SC150
2111+83 - 2114+33	0.03	0.52	4.72	3.9	V	8.00	2.00	0.97	SC150
2114+33 - 2116+46	0.04	0.41	2.61	3.83	V	8.00	2.00	1.02	SC150
2116+46 - 2117+90	0.1	0.39	5.83	5.99	S	9.50	3.00	2.43	SC250
2117+90 - 2118+62	0.11	0.58	12.46	8.09	S	12.50	4.00	3.98	P550
2122+11 - 2124+60	0.07	0.21	1.32	3.41	V	8.00	2.00	0.92	SC150
2123+86 - 2124+27	0.09	0.12	0.23	2.56	V	8.00	2.00	0.67	SC150
2170+77 - 2170+77	0.01	0.19	0.13	1.14	V	8.00	2.00	0.12	SC150
2178+25 - 2178+25	0.06	0.3	0.63	3.51	V	8.00	2.00	1.12	SC150
2178+55 - 2178+55	0.02	0.23	1.1	1.91	V	8.00	2.00	0.29	SC150
2193+45 - 2196+62	0.02	0.38	1.51	2.58	V	8.00	2.00	0.47	SC150
2195+83 - 2196+62	0.05	0.37	1.79	3.94	V	8.00	2.00	1.15	SC150
2196+62 - 2197+25	0.09	0.39	2.53	5.43	V	9.50	3.00	2.19	SC250
2339+35 to 2340+95 CHN	0.05	0.31	1.04	3.49	V	8.00	2.00	0.97	SC150
2340+95 to 2342+35 CHN	0.021	0.19	0.46	1.72	V	8.00	2.00	0.25	SC150
2374+55 to 2376+35 CHN	0.05	0.32	0.71	3.38	V	8.00	2.00	1.00	SC150
2409+95 to 2410+60 CHN	0.03	0.21	0.51	2.15	V	8.00	2.00	0.39	SC150
2411+75 to 2412+75 CHN	0.03	0.21	0.51	2.15	V	8.00	2.00	0.39	SC150
2693+60 to 2694+55 CHN	0.04	0.38	1.57	3.56	V	8.00	2.00	0.95	SC150
2690+60 to 2691+40 CHN	0.06	0.21	0.71	3.05	V	8.00	2.00	0.79	SC150
2691+40 to 2693+30 CHN	0.01	0.5	0.59	1.85	V	8.00	2.00	0.31	SC150
2655+70 to 2657+75 CHN	0.01	0.34	1.26	1.74	V	8.00	2.00	0.21	SC150
2648+50 to 2650+05 CHN	0.04	0.51	17.93	4.7	V	8.00	2.00	1.27	SC150
2626+15 to 2626+55 CHN	0.05	0.62	10.06	5.71	V	8.00	2.00	1.93	SC150
2626+55 to 2633+75 CHN	0.03	0.69	5.51	4.5	V	8.00	2.00	1.29	SC150
2590+60 to 2595+35 CHN	0.07	0.43	2.85	5.09	V	8.00	2.00	1.88	SC150
2549+50 to 2550+35 CHN	0.01	1.05	24.46	3.68	V	8.00	2.00	0.66	SC150
2530+10 to 2533+00 CHN	0.01	0.66	3.11	2.55	V	8.00	2.00	0.41	SC150
2520+55 to 2522+90 CHN	0.06	0.49	1.44	4.53	V	8.00	2.00	1.83	SC150
2522+90 to 2528+05 CHN	0.03	0.75	3.15	4.25	V	8.00	2.00	1.40	SC150
1512+30 to 2512+90 CHN	0.02	0.47	3.02	3	V	8.00	2.00	0.59	SC150
2513+25 to 2514+30 CHN	0.02	0.28	0.76	2.12	V	8.00	2.00	0.35	SC150
2482+50 to 2484+45 CHN	0.02	0.42	2.22	2.77	V	8.00	2.00	0.52	SC150
2484+45 to 2485+45 CHN	0.01	0.48	2.22	2.14	V	8.00	2.00	0.30	SC150

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STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
2695+00 to 2698+95 CHN	0.03	0.46	2.43	3.51	V	8.00	2.00	0.86	SC150
2716+60 to 2717+80 CHN	0.12	0.13	0.31	3.16	S	8.00	2.00	0.97	SC150
2727+75 to 2729+65 CHN	0.04	0.42	1.29	3.61	V	8.00	2.00	1.05	SC150
2731+10 to 2732+85 CHN	0.01	0.85	4.9	2.94	V	8.00	2.00	0.53	SC150
2732+85 to 2734+10 CHN	0.02	0.55	1.88	3.06	V	8.00	2.00	0.69	SC150
2734+90 to 2738+60 CHN	0.01	0.8	2.09	2.54	V	8.00	2.00	0.50	SC150
2734+90 to 2738+60 CHN	0.04	0.53	2.09	4.14	V	8.00	2.00	1.32	SC150
2742+15 to 2744+05 CHN	0.01	0.49	1.27	2.07	V	8.00	2.00	0.31	SC150
2749+25 to 2749+75 CHN	0.18	0.32	1.16	6.28	S	12.50	4.00	3.59	P550
2786+05 to 2788+15 CHN	0.03	0.41	0.89	3	V	8.00	2.00	0.77	SC150
2788+15 to 2791+00 CHN	0.04	0.46	2.08	3.93	V	8.00	2.00	1.15	SC150
2791+00 to 2792+95 CHN	0.02	0.62	1.86	3.15	V	8.00	2.00	0.77	SC150
2792+95 to 2795+45 CHN	0.04	0.39	2	3.68	V	8.00	2.00	0.97	SC150
2822+30 to 2824+00 CHN	0.12	0.26	0.88	4.72	S	8.00	2.00	1.95	SC150
2824+00 to 2825+75 CHN	0.16	0.15	0.14	3.54	S	8.00	2.00	1.50	SC150
2831+25 to 2931+70 CHN	0.02	0.38	2.27	2.63	V	8.00	2.00	0.47	SC150
2841+70 to 2842+15 CHN	0.04	0.13	0.11	1.78	V	8.00	2.00	0.32	SC150
2844+30 to 2846+20 CHN	0.01	0.54	1.64	2.2	V	8.00	2.00	0.34	SC150
2847+50 to 2850+15 CHN	0.01	0.56	1.96	2.27	V	8.00	2.00	0.35	SC150
2850+15 to 2852+85 CHN	0.01	0.56	2	2.28	V	8.00	2.00	0.35	SC150
2852+95 to 2857+15 CHN	0.03	0.47	2.68	3.6	V	8.00	2.00	0.88	SC150
2857+15 to 2858+35 CHN	0.003	0.36	0.4	0.94	V	8.00	2.00	0.07	SC150
2883+90 to 2885+00 CHN	0.01	0.18	0.29	1.17	V	8.00	2.00	0.11	SC150
2885+00 to 2888+35 CHN	0.01	0.49	1.71	2.13	V	8.00	2.00	0.31	SC150
2908+80 to 2910+60 CHN	0.05	0.16	0.12	2.13	V	8.00	2.00	0.50	SC150
2908+80 to 2910+60 CHN	0.15	0.13	0.12	3.2	S	8.00	2.00	1.22	SC150
2910+55 to 2911+60 CHN	0.12	0.33	1.18	5.33	S	9.50	3.00	2.47	SC250
2910+55 to 2911+60 CHN	0.08	0.35	1.18	4.57	V	8.00	2.00	1.75	SC150
2912+85 to 2914+10 CHN	0.11	0.43	1.66	5.81	S	9.50	3.00	2.95	SC250
2914+10 to 2915+00 CHN	0.04	0.21	0.4	2.46	V	8.00	2.00	0.52	SC150
2916+65 to 2918+20 CHN	0.02	0.67	3.18	3.48	V	8.00	2.00	0.84	SC150
2921+00 to 2921+45 CHN	0.06	0.21	0.19	2.69	V	8.00	2.00	0.79	SC150
2929+35 to 2931+25 CHN	0.03	0.54	4.79	4.01	V	8.00	2.00	1.01	SC150
2929+35 to 2931+25 CHN	0.02	0.52	4.79	3.23	V	8.00	2.00	0.65	SC150
2931+70 to 2932+00 CHN	0.03	0.46	3.66	3.62	V	8.00	2.00	0.86	SC150
2932+00 to 2933+80 CHN	0.03	0.44	3.18	3.53	V	8.00	2.00	0.82	SC150
2945+85 to 2947+70 CHN	0.01	0.6	5.79	2.54	V	8.00	2.00	0.37	SC150
2952+00 to 2953+95 CHN	0.04	0.63	3.3	4.64	V	8.00	2.00	1.57	SC150
2953+95 to 2955+85 CHN	0.04	0.38	0.85	3.3	V	8.00	2.00	0.95	SC150
2961+10 to 2961+85 CHN	0.02	0.28	0.35	1.98	V	8.00	2.00	0.35	SC150

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STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
2962+95 to 2964+85 CHN	0.07	0.43	3.35	5.16	V	8.00	2.00	1.88	SC150
2966+90 to 2967+15 CHN	0.08	0.16	0.11	2.61	V	8.00	2.00	0.80	SC150
3031+60 to 3036+05 CHN	0.01	0.57	4.94	2.44	V	8.00	2.00	0.36	SC150
3036+05 to 3038+55 CHN	0.01	0.37	1.57	1.85	V	8.00	2.00	0.23	SC150
3038+75 to 3040+60 CHN	0.02	0.18	0.45	1.62	V	8.00	2.00	0.22	SC150
3042+80 to 3044+00 CHN	0.15	0.18	0.74	4.34	S	8.00	2.00	1.68	SC150
3044+00 to 3044+50 CHN	0.03	0.29	1.28	2.7	V	8.00	2.00	0.54	SC150
3044+50 to 3045+75 CHN	0.02	0.22	0.55	1.83	V	8.00	2.00	0.27	SC150
3053+00 to 3054+50 CHN	0.15	0.21	1.1	4.85	S	8.00	2.00	1.97	SC150
3062+50 to 3064+95 CHN	0.06	0.38	3	4.52	V	8.00	2.00	1.42	SC150
3062+95 to 3065+85 CHN	0.21	0.21	0.48	5.24	S	9.50	3.00	2.75	SC250
3109+50 to 3111+50 CHN	0.04	0.22	0.54	2.53	V	8.00	2.00	0.55	SC150
3111+50 to 3113+20 CHN	0.02	0.46	1.63	2.81	V	8.00	2.00	0.57	SC150
3113+20 to 3115+85 CHN	0.01	0.56	1.99	2.28	V	8.00	2.00	0.35	SC150
3115+85 to 3117+30 CHN	0.03	0.46	1.44	3.33	V	8.00	2.00	0.86	SC150
3117+30 to 3119+65 CHN	0.04	0.57	2.98	4.44	V	8.00	2.00	1.42	SC150
3119+65 to 3121+80 CHN	0.02	0.43	1.44	2.72	V	8.00	2.00	0.54	SC150
3121+80 to 3122+15 CHN	0.03	0.15	0.09	1.64	V	8.00	2.00	0.28	SC150
3122+15 to 3123+20 CHN	0.02	0.29	0.52	2.08	V	8.00	2.00	0.36	SC150
3193+25 to 3193+60 CHN	0.09	0.23	0.74	3.89	V	8.00	2.00	1.29	SC150
3199+85 to 3200+90 CHN	0.03	0.41	1.25	3.16	V	8.00	2.00	0.77	SC150
3200+90 to 3201+85 CHN	0.03	0.68	4.72	4.4	V	8.00	2.00	1.27	SC150
3215+75 to 3216+45 CHN	0.11	0.54	5.94	7.36	S	12.50	4.00	3.71	P550
3216+45 to 3216+85 CHN	0.03	0.49	2.42	3.61	V	8.00	2.00	0.92	SC150
3218+35 to 3219+45 CHN	0.05	0.15	0.21	2.22	V	8.00	2.00	0.47	SC150
3247+80 to 3251+00 CHN	0.06	0.32	0.88	3.75	V	8.00	2.00	1.20	SC150
3251+00 to 3252+20 CHN	0.04	0.55	3.5	4.48	V	8.00	2.00	1.37	SC150
3259+20 to 3259+70 CHN	0.06	0.5	4.01	5.24	V	8.00	2.00	1.87	SC150
3259+70 to 3262+40 CHN	0.004	0.81	3.36	1.84	V	8.00	2.00	0.20	SC150
3269+95 to 3270+90 CHN	0.01	0.22	0.11	1.16	V	8.00	2.00	0.14	SC150
3270+90 to 3271+45 CHN	0.24	0.12	0.16	3.93	S	8.00	2.00	1.80	SC150
3274+90 to 3276+25 CHN	0.07	0.16	0.18	2.63	V	8.00	2.00	0.70	SC150
3292+65 to 3293+50 CHN	0.06	0.44	2.3	4.7	V	8.00	2.00	1.65	SC150
3292+65 to 3299+65 CHN	0.02	0.73	3.5	3.63	V	8.00	2.00	0.91	SC150
3293+50 to 3295+00 CHN	0.01	0.49	1.43	2.1	V	8.00	2.00	0.31	SC150
3300+00 to 3300+75 CHN	0.2	0.13	0.04	2.95	S	8.00	2.00	1.62	SC150
3305+40 to 3307+30 CHN	0.15	0.13	0.44	3.48	S	8.00	2.00	1.22	SC150
3307+30 to 3307+55 CHN	0.17	0.49	2.43	7.63	S	12.50	12.00	5.20	P550
3335+75 to 3338+65 CHN	0.05	0.07	0.03	1.3	V	8.00	2.00	0.22	SC150
3377+80 to 3384+90 CHN	0.02	0.65	2.13	3.26	V	8.00	2.00	0.81	SC150

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3384+90 to 3386+95 CHN	0.06	0.43	1.24	4.3	V	8.00	2.00	1.61	SC150
3387+45 to 3389+70 CHN	0.06	0.37	1.77	4.27	V	8.00	2.00	1.39	SC150
3394+45 to 3396+10 CHN	0.18	0.32	3.5	6.94	S	12.50	4.00	3.59	P550
3433+23 to 3437+15 CHN	0.03	0.35	2.89	3.1	V	8.00	2.00	0.66	SC150
3437+30 to 3438+20 CHN	0.02	0.16	0.33	1.53	V	8.00	2.00	0.20	SC150
3438+20 to 3438+60 CHN	0.05	0.15	0.41	2.28	V	8.00	2.00	0.47	SC150
3438+60 to 3439+08 CHN	0.02	0.25	0.91	2.02	V	8.00	2.00	0.31	SC150
3439+85 to 3442+35 CHN	0.017	0.49	2.67	2.8	V	8.00	2.00	0.52	SC150
3442+35 to 3444+30 CHN	0.021	0.34	1.27	2.46	V	8.00	2.00	0.45	SC150
3445+40 to 3448+10 CHN	0.008	0.44	2.2	1.85	V	8.00	2.00	0.22	SC150
3448+10 to 3449+25 CHN	0.011	0.27	0.84	1.56	V	8.00	2.00	0.19	SC150
3449+25 to 3450+10 CHN	0.045	0.41	2.84	4.09	V	8.00	2.00	1.15	SC150
3450+10 to 3450+40 CHN	0.043	0.15	0.39	2.15	V	8.00	2.00	0.40	SC150
3450+40 to 3451+50 CHN	0.01	0.32	0.41	1.56	V	8.00	2.00	0.20	SC150
3451+50 to 3454+15 CHN	0.039	0.4	2.42	3.73	V	8.00	2.00	0.97	SC150
3454+15 to 3456+45 CHN	0.026	0.3	1.12	2.53	V	8.00	2.00	0.49	SC150
3457+75 to 3460+60 CHN	0.028	0.37	1.87	3.02	V	8.00	2.00	0.65	SC150
3460+60 to 3464+40 CHN	0.037	0.36	2.55	3.47	V	8.00	2.00	0.83	SC150

Westmoreland County
Temporary Perforated Pipe Level Spreader Calculations

STATION	Diversion Discharge (ft ³ /s)	Available Static Head (ft)	Level Spreader Pipe Diameter (in.)	Perforation Diameter (in.)	Number of Perforations per Row	Orifice Area per Foot (in ² /ft)	Row Spacing (in.)	Orifice Coefficient (Cd)	Level Spreader Capacity per foot of length (ft ³ /s per ft)	Required Length (ft)	Nominal Length (ft)	Overall Level Spreader Capacity (ft ³ /s)
1505+92 - 1507+25	0.81	14	12	0.375	6	4.10	1.94	0.61	0.522	1.55	5	2.61
1509+75 - 1510+65	1.84	4	12	0.375	6	4.10	1.94	0.61	0.279	6.60	10	2.79
1552+40 - 1557+70	2.25	2	12	0.375	6	4.10	1.94	0.61	0.197	11.41	15	2.96
1566+35 - 1567+80	2.31	7	12	0.375	6	4.10	1.94	0.61	0.369	6.26	10	3.69
1572+76 - 1576+25	0.28	6	12	0.375	6	4.10	1.94	0.61	0.341	0.82	5	1.71
1574+35 - 1576+13	0.28	6	12	0.375	6	4.10	1.94	0.61	0.341	0.82	5	1.71
1620+30 North 1 PIPE	1.37	4	12	0.375	6	4.10	1.94	0.61	0.279	4.91	5	1.39
1620+30 North 2 PIPE	2.97	5	12	0.375	6	4.10	1.94	0.61	0.312	9.53	10	3.12
1620+30 North 3 PIPE	5.22	5	12	0.375	6	4.10	1.94	0.61	0.312	16.75	20	6.23
1620+30 North 4 PIPE	1.82	5	12	0.375	6	4.10	1.94	0.61	0.312	5.84	10	3.12
1620+30 South 1 PIPE	0.56	6	12	0.375	6	4.10	1.94	0.61	0.341	1.64	5	1.71
1620+30 South 2 PIPE	1.36	12	12	0.375	6	4.10	1.94	0.61	0.483	2.82	5	2.41
1635+82 to 1641+21 CAP	5.46	1	12	0.375	6	4.10	1.94	0.61	0.139	39.17	40	5.58
1635+82 to 1641+21 PIPE	4.48	1	12	0.375	6	4.10	1.94	0.61	0.139	32.14	35	4.88
1659+18 to 1664+18 PIPE	7.4	14	12	0.375	6	4.10	1.94	0.61	0.522	14.19	15	7.82
1669+06 to 1669+93 PIPE	1.06	8	12	0.375	6	4.10	1.94	0.61	0.394	2.69	5	1.97
1705+00 to 1709+50 PIPE	5.7	5	12	0.375	6	4.10	1.94	0.61	0.312	18.29	20	6.23
1717+86 to 1719+77 PIPE	0.86	13	12	0.375	6	4.10	1.94	0.61	0.503	1.71	5	2.51
1719+77 to 1720+52 PIPE	0.29	6	12	0.375	6	4.10	1.94	0.61	0.341	0.85	5	1.71
1746+56 to 1748+30 PIPE	1.91	8	12	0.375	6	4.10	1.94	0.61	0.394	4.85	5	1.97
1748+30 to 1749+10 PIPE	0.43	9	12	0.375	6	4.10	1.94	0.61	0.418	1.03	5	2.09
1786+83 to 1787+29 PIPE	0.07	6	12	0.375	6	4.10	1.94	0.61	0.341	0.21	5	1.71
1787+29 to 1788+03 PIPE	0.31	9	12	0.375	6	4.10	1.94	0.61	0.418	0.74	5	2.09
1813+27 to 1817+00 PIPE	2.62	12	12	0.375	6	4.10	1.94	0.61	0.483	5.43	10	4.83
1817+00 to 1818+37 PIPE	0.6	7	12	0.375	6	4.10	1.94	0.61	0.369	1.63	5	1.84
1825+37 to 1825+82 PIPE	0.31	8	12	0.375	6	4.10	1.94	0.61	0.394	0.79	5	1.97
1856+70 to 1859+19 PIPE	4.32	7	12	0.375	6	4.10	1.94	0.61	0.369	11.71	15	5.53
1884+35 - 1885+04	0.79	0.55	12	0.375	6	4.10	1.94	0.61	0.103	7.64	10	1.03
1886+18 - 1888+33	2.76	1	12	0.375	6	4.10	1.94	0.61	0.139	19.80	20	2.79
1888+33 - 1890+59	2	1.3	12	0.375	6	4.10	1.94	0.61	0.159	12.59	15	2.38
1890+59 - 1892+57	1.41	1	12	0.375	6	4.10	1.94	0.61	0.139	10.12	15	2.09
1903+15 - 1904+76	1.47	7	12	0.375	6	4.10	1.94	0.61	0.369	3.99	5	1.84
1904+77 - 1910+14	3.15	7	12	0.375	6	4.10	1.94	0.61	0.369	8.54	10	3.69
1953+81 - 1955+63	1.5	11	12	0.375	6	4.10	1.94	0.61	0.462	3.24	5	2.31
1972+40 -1974+33	5.03	3.5	12	0.375	6	4.10	1.94	0.61	0.261	19.29	20	5.22
1985+25 - 1987+30	4.85	3.5	12	0.375	6	4.10	1.94	0.61	0.261	18.60	20	5.22
1987+37 - 1988+49	0.63	10	12	0.375	6	4.10	1.94	0.61	0.441	1.43	5	2.20
1995+22 - 1999+69	4.02	1.8	12	0.375	6	4.10	1.94	0.61	0.187	21.50	25	4.67
2007+27 - 2008+28	0.81	7	12	0.375	6	4.10	1.94	0.61	0.369	2.20	5	1.84
2008+28 - 2113+82	3.42	6	12	0.375	6	4.10	1.94	0.61	0.341	10.02	15	5.12
2015+53 - 2018+33	4.96	8	12	0.375	6	4.10	1.94	0.61	0.394	12.58	15	5.91
2018+33 - 2020+42	3.02	6	12	0.375	6	4.10	1.94	0.61	0.341	8.85	10	3.41
2020+69 - 2024+65	3.94	13	12	0.375	6	4.10	1.94	0.61	0.503	7.84	10	5.03
2041+54 - 2045+81	1.37	10	12	0.375	6	4.10	1.94	0.61	0.441	3.11	5	2.20

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Temporary Perforated Pipe Level Spreader Calculations

2050+72 - 2053+75	1.71	14	12	0.375	6	4.10	1.94	0.61	0.522	3.28	5	2.61
2100+82 - 2104+74	1.16	4	12	0.375	6	4.10	1.94	0.61	0.279	4.16	5	1.39
2108+90 - 2111+32	1.58	8	12	0.375	6	4.10	1.94	0.61	0.394	4.01	5	1.97
2111+83 - 2114+33	4.72	8	12	0.375	6	4.10	1.94	0.61	0.394	11.97	15	5.91
2114+33 - 2116+46	2.61	7	12	0.375	6	4.10	1.94	0.61	0.369	7.08	10	3.69
2116+46 - 2117+90	5.83	7	12	0.375	6	4.10	1.94	0.61	0.369	15.81	20	7.38
2117+90 - 2118+62	4.15	6	12	0.375	6	4.10	1.94	0.61	0.341	12.16	15	5.12
2122+11 - 2124+60	1.32	7	12	0.375	6	4.10	1.94	0.61	0.369	3.58	5	1.84
2123+86 - 2124+27	0.23	8	12	0.375	6	4.10	1.94	0.61	0.394	0.58	5	1.97
2178+25 - 2178+25	0.63	4	12	0.375	6	4.10	1.94	0.61	0.279	2.26	5	1.39
2178+55 - 2178+55	2.6	4	12	0.375	6	4.10	1.94	0.61	0.279	9.33	10	2.79
2193+45 - 2196+62	1.51	10	12	0.375	6	4.10	1.94	0.61	0.441	3.43	5	2.20
2195+83 - 2196+62	1.79	11	12	0.375	6	4.10	1.94	0.61	0.462	3.87	5	2.31
2196+62 - 2197+25	2.53	11	12	0.375	6	4.10	1.94	0.61	0.462	5.47	10	4.62
2339+35 to 2340+95 PIPE	1.04	6	12	0.375	6	4.10	1.94	0.61	0.341	3.05	5	1.71
2340+95 to 2342+35 PIPE	0.46	7	12	0.375	6	4.10	1.94	0.61	0.369	1.25	5	1.84
2374+55 to 2376+35 PIPE	0.71	8	12	0.375	6	4.10	1.94	0.61	0.394	1.80	5	1.97
2409+95 to 2410+60 PIPE	0.51	2.8	12	0.375	6	4.10	1.94	0.61	0.233	2.19	5	1.17
2411+75 to 2412+75 PIPE	0.6	3.2	12	0.375	6	4.10	1.94	0.61	0.249	2.41	5	1.25
2482+50 to 2484+45 PIPE	2.22	8	12	0.375	6	4.10	1.94	0.61	0.394	5.63	10	3.94
2484+45 to 2485+45 PIPE	1.45	7	12	0.375	6	4.10	1.94	0.61	0.369	3.93	5	1.84
2512+30 to 2512+90 PIPE	3.02	11	12	0.375	6	4.10	1.94	0.61	0.462	6.53	10	4.62
2513+25 to 2514+30 PIPE	0.76	11	12	0.375	6	4.10	1.94	0.61	0.462	1.64	5	2.31
2520+55 to 2522+90 PIPE	1.44	2	12	0.375	6	4.10	1.94	0.61	0.197	7.31	10	1.97
2522+90 to 2528+05 PIPE	3.15	10	12	0.375	6	4.10	1.94	0.61	0.441	7.15	10	4.41
2530+10 to 2533+00 PIPE	0.33	24	12	0.375	6	4.10	1.94	0.61	0.683	0.48	5	3.41
2549+50 to 2550+35 PIPE	6.12	0.5	12	0.375	6	4.10	1.94	0.61	0.099	62.10	65	6.41
2590+60 to 2595+35 PIPE	2.85	9	12	0.375	6	4.10	1.94	0.61	0.418	6.82	10	4.18
2626+15 to 2626+55 PIPE	5.03	6	12	0.375	6	4.10	1.94	0.61	0.341	14.73	15	5.12
2626+55 to 2633+75 PIPE	5.51	4	12	0.375	6	4.10	1.94	0.61	0.279	19.77	20	5.58
2648+50 to 2650+05 PIPE	3.59	1	12	0.375	6	4.10	1.94	0.61	0.139	25.76	30	4.18
2655+70 to 2657+75 PIPE	1.26	8	12	0.375	6	4.10	1.94	0.61	0.394	3.20	5	1.97
2690+60 to 2691+40 PIPE	0.71	8	12	0.375	6	4.10	1.94	0.61	0.394	1.80	5	1.97
2691+40 to 2693+30 PIPE	0.59	11	12	0.375	6	4.10	1.94	0.61	0.462	1.28	5	2.31
2693+60 to 2694+55 PIPE	1.57	14	12	0.375	6	4.10	1.94	0.61	0.522	3.01	5	2.61
2695+00 to 2698+95 PIPE	2.43	9	12	0.375	6	4.10	1.94	0.61	0.418	5.81	10	4.18
2727+75 to 2729+65 PIPE	1.29	22	12	0.375	6	4.10	1.94	0.61	0.654	1.97	5	3.27
2731+10 to 2732+85 PIPE	4.91	14	12	0.375	6	4.10	1.94	0.61	0.522	9.42	10	5.22
2732+85 to 2734+10 PIPE	1.88	16	12	0.375	6	4.10	1.94	0.61	0.558	3.37	5	2.79
2734+90 to 2738+60 PIPE	2.09	26	12	0.375	6	4.10	1.94	0.61	0.711	2.94	5	3.55
2734+90 to 2738+60 PIPE	2.09	20	12	0.375	6	4.10	1.94	0.61	0.623	3.35	5	3.12
2742+15 to 2744+05 PIPE	1.27	18	12	0.375	6	4.10	1.94	0.61	0.591	2.15	5	2.96
2786+05 to 2788+15 PIPE	0.89	20	12	0.375	6	4.10	1.94	0.61	0.623	1.43	5	3.12
2788+15 to 2791+00 PIPE	2.08	17	12	0.375	6	4.10	1.94	0.61	0.575	3.62	5	2.87
2791+00 to 2792+95 PIPE	1.86	16	12	0.375	6	4.10	1.94	0.61	0.558	3.34	5	2.79
2792+95 to 2795+45 PIPE	2	12	12	0.375	6	4.10	1.94	0.61	0.483	4.14	5	2.41
2822+30 to 2824+00 PIPE	0.88	12	12	0.375	6	4.10	1.94	0.61	0.483	1.82	5	2.41
2824+00 to 2825+75 PIPE	0.14	16	12	0.375	6	4.10	1.94	0.61	0.558	0.25	5	2.79
2841+70 to 2842+15 PIPE	0.11	12	12	0.375	6	4.10	1.94	0.61	0.483	0.23	5	2.41
2844+30 to 2846+20 PIPE	1.64	11	12	0.375	6	4.10	1.94	0.61	0.462	3.55	5	2.31
2847+50 to 2850+15 PIPE	1.96	12	12	0.375	6	4.10	1.94	0.61	0.483	4.06	5	2.41
2850+15 to 2852+85 PIPE	2	15	12	0.375	6	4.10	1.94	0.61	0.540	3.71	5	2.70

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2852+95 to 2857+15 PIPE	2.68	12	12	0.375	6	4.10	1.94	0.61	0.483	5.55	10	4.83
2857+15 to 2858+35 PIPE	0.4	16	12	0.375	6	4.10	1.94	0.61	0.558	0.72	5	2.79
2883+90 to 2885+00 PIPE	0.29	2	12	0.375	6	4.10	1.94	0.61	0.197	1.47	5	0.99
2885+00 to 2888+35 PIPE	1.71	5	12	0.375	6	4.10	1.94	0.61	0.312	5.49	10	3.12
2908+80 to 2910+60 PIPE	0.12	21	12	0.375	6	4.10	1.94	0.61	0.639	0.19	5	3.19
2910+55 to 2911+60 PIPE	1.18	20	12	0.375	6	4.10	1.94	0.61	0.623	1.89	5	3.12
2912+85 to 2914+10 PIPE	1.66	20	12	0.375	6	4.10	1.94	0.61	0.623	2.66	5	3.12
2914+10 to 2915+00 PIPE	0.12	18	12	0.375	6	4.10	1.94	0.61	0.591	0.20	5	2.96
2916+65 to 2918+20 PIPE	3.18	16	12	0.375	6	4.10	1.94	0.61	0.558	5.70	10	5.58
2929+35 to 2931+25 PIPE	4.79	8	12	0.375	6	4.10	1.94	0.61	0.394	12.15	15	5.91
2929+35 to 2931+25 PIPE	4.79	7	12	0.375	6	4.10	1.94	0.61	0.369	12.99	15	5.53
2931+25 to 2931+70 PIPE	2.27	6	12	0.375	6	4.10	1.94	0.61	0.341	6.65	10	3.41
2931+70 to 2932+00 PIPE	3.66	6	12	0.375	6	4.10	1.94	0.61	0.341	10.72	15	5.12
2932+00 to 2933+80 PIPE	3.18	6	12	0.375	6	4.10	1.94	0.61	0.341	9.31	10	3.41
2945+85 to 2947+70 PIPE	2.9	5	12	0.375	6	4.10	1.94	0.61	0.312	9.31	10	3.12
2952+00 to 2953+95 PIPE	3.3	20	12	0.375	6	4.10	1.94	0.61	0.623	5.29	10	6.23
2953+95 to 2955+85 PIPE	0.85	16	12	0.375	6	4.10	1.94	0.61	0.558	1.52	5	2.79
2961+10 to 2961+85 PIPE	0.35	8	12	0.375	6	4.10	1.94	0.61	0.394	0.89	5	1.97
2962+95 to 2964+85 PIPE	3.35	16	12	0.375	6	4.10	1.94	0.61	0.558	6.01	10	5.58
2966+90 to 2967+15 PIPE	0.11	6	12	0.375	6	4.10	1.94	0.61	0.341	0.32	5	1.71
3031+60 to 3036+05 PIPE	4.94	8	12	0.375	6	4.10	1.94	0.61	0.394	12.53	15	5.91
3036+05 to 3038+55 PIPE	1.57	9	12	0.375	6	4.10	1.94	0.61	0.418	3.75	5	2.09
3038+75 to 3040+60 PIPE	0.45	5	12	0.375	6	4.10	1.94	0.61	0.312	1.44	5	1.56
3042+80 to 3044+00 PIPE	0.74	4	12	0.375	6	4.10	1.94	0.61	0.279	2.65	5	1.39
3042+80 to 3044+50 PIPE	1.28	7	12	0.375	6	4.10	1.94	0.61	0.369	3.47	5	1.84
3044+50 to 3045+75 PIPE	0.55	8	12	0.375	6	4.10	1.94	0.61	0.394	1.40	5	1.97
3062+50 to 3064+95 PIPE	3	11	12	0.375	6	4.10	1.94	0.61	0.462	6.49	10	4.62
3109+50 to 3111+50 PIPE	0.54	14	12	0.375	6	4.10	1.94	0.61	0.522	1.04	5	2.61
3111+50 to 3113+20 PIPE	1.63	12	12	0.375	6	4.10	1.94	0.61	0.483	3.38	5	2.41
3113+20 to 3115+85 PIPE	1.99	12	12	0.375	6	4.10	1.94	0.61	0.483	4.12	5	2.41
3115+85 to 3117+30 PIPE	1.44	14	12	0.375	6	4.10	1.94	0.61	0.522	2.76	5	2.61
3117+30 to 3119+65 PIPE	2.98	16	12	0.375	6	4.10	1.94	0.61	0.558	5.35	10	5.58
3119+65 to 3121+80 PIPE	1.44	11	12	0.375	6	4.10	1.94	0.61	0.462	3.12	5	2.31
3121+80 to 3122+15 PIPE	0.09	7	12	0.375	6	4.10	1.94	0.61	0.369	0.24	5	1.84
3122+15 to 3123+20 PIPE	0.52	10	12	0.375	6	4.10	1.94	0.61	0.441	1.18	5	2.20
3199+85 to 3200+90 PIPE	4.72	10	12	0.375	6	4.10	1.94	0.61	0.441	10.71	15	6.61
3215+75 to 3216+45 PIPE	5.94	11	12	0.375	6	4.10	1.94	0.61	0.462	12.85	15	6.93
3215+75 to 3216+45 PIPE	2.42	11	12	0.375	6	4.10	1.94	0.61	0.462	5.24	10	4.62
3216+45 to 3216+85 PIPE	1.25	12	12	0.375	6	4.10	1.94	0.61	0.483	2.59	5	2.41
3218+35 to 3219+45 PIPE	0.21	10	12	0.375	6	4.10	1.94	0.61	0.441	0.48	5	2.20
3247+80 to 3251+00 PIPE	0.88	12	12	0.375	6	4.10	1.94	0.61	0.483	1.82	5	2.41
3251+00 to 3252+20 PIPE	3.5	10	12	0.375	6	4.10	1.94	0.61	0.441	7.94	10	4.41
3259+20 to 3259+70 PIPE	4.01	18	12	0.375	6	4.10	1.94	0.61	0.591	6.78	10	5.91
3259+70 to 3262+40 PIPE	3.36	36	12	0.375	6	4.10	1.94	0.61	0.836	4.02	5	4.18
3269+95 to 3270+90 PIPE	0.11	26	12	0.375	6	4.10	1.94	0.61	0.711	0.15	5	3.55
3274+90 to 3276+25 PIPE	0.18	1	12	0.375	6	4.10	1.94	0.61	0.139	1.29	5	0.70
3292+65 to 3293+50 PIPE	2.3	17	12	0.375	6	4.10	1.94	0.61	0.575	4.00	5	2.87
3292+65 to 3299+65 PIPE	2.43	7	12	0.375	6	4.10	1.94	0.61	0.369	6.59	10	3.69
3293+50 to 3295+00 PIPE	1.43	15	12	0.375	6	4.10	1.94	0.61	0.540	2.65	5	2.70
3335+75 to 3338+65 PIPE	0.03	24	12	0.375	6	4.10	1.94	0.61	0.683	0.04	5	3.41
3377+80 to 3384+90 PIPE	2.13	25	12	0.375	6	4.10	1.94	0.61	0.697	3.06	5	3.48
3384+90 to 3386+95 PIPE	1.24	26	12	0.375	6	4.10	1.94	0.61	0.711	1.74	5	3.55

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3387+45 to 3389+70 PIPE	1.77	15	12	0.375	6	4.10	1.94	0.61	0.540	3.28	5	2.70
3433+23 to 3437+15 PIPE	2.89	3	12	0.375	6	4.10	1.94	0.61	0.241	11.97	15	3.62
3437+30 to 3438+20 PIPE	0.33	11	12	0.375	6	4.10	1.94	0.61	0.462	0.71	5	2.31
3438+20 to 3438+60 PIPE	0.41	10	12	0.375	6	4.10	1.94	0.61	0.441	0.93	5	2.20
3438+60 to 3439+08 PIPE	0.91	5	12	0.375	6	4.10	1.94	0.61	0.312	2.92	5	1.56
3439+85 to 3442+35 PIPE	2.67	6	12	0.375	6	4.10	1.94	0.61	0.341	7.82	10	3.41
3442+35 to 3444+30 PIPE	1.27	4	12	0.375	6	4.10	1.94	0.61	0.279	4.56	5	1.39
3445+40 to 3448+10 PIPE	2.2	5	12	0.375	6	4.10	1.94	0.61	0.312	7.06	10	3.12
3448+10 to 3449+25 PIPE	0.84	3	12	0.375	6	4.10	1.94	0.61	0.241	3.48	5	1.21
3449+25 to 3450+10 PIPE	2.84	4	12	0.375	6	4.10	1.94	0.61	0.279	10.19	15	4.18
3450+10 to 3450+40 PIPE	0.39	4	12	0.375	6	4.10	1.94	0.61	0.279	1.40	5	1.39
3450+40 to 3451+50 PIPE	0.41	3	12	0.375	6	4.10	1.94	0.61	0.241	1.70	5	1.21
3451+50 to 3454+15 PIPE	2.42	3.5	12	0.375	6	4.10	1.94	0.61	0.261	9.28	10	2.61
3454+15 to 3456+45 PIPE	1.12	5	12	0.375	6	4.10	1.94	0.61	0.312	3.59	5	1.56
3457+75 to 3460+60 PIPE	1.87	7	12	0.375	6	4.10	1.94	0.61	0.369	5.07	10	3.69
3460+60 to 3464+40 PIPE	2.55	4	12	0.375	6	4.10	1.94	0.61	0.279	9.15	10	2.79

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
1620+30	North 1	90,303	100	0.05	HSG D	0.400	9.34	479	0.34	1.40	5.70	15.04	3.31	0.20	0.12	5:1	1.37	12	0.04	8
1620+30	North 2	179,082	100	0.11	HSG D	0.300	6.79	498	0.36	1.50	5.53	12.32	3.61	0.20	0.08	4:1	2.97	12	0.12	8
1620+30	North 3	271,534	100	0.09	HSG D	0.400	8.14	622	0.24	1.60	6.48	14.62	3.35	0.25	0.05	11:1	5.22	12	0.10	12
1620+30	North 4	85,438	100	0.21	HSG D	0.400	6.68	583	0.30	2.00	4.86	11.54	3.71	0.25	0.03	12:1	1.82	12	0.07	8
1620+30	South 1	31,034	100	0.25	HSG D	0.300	5.61	420	0.43	1.60	4.38	9.98	3.93	0.20	0.03	5:1	0.56	12	0.10	6
1620+30	South 2	75,647	100	0.15	HSG D	0.300	6.32	351	0.44	1.60	3.66	9.97	3.93	0.20	0.06	4:1	1.36	12	0.13	6
1635+82*	1641+21*	440,380	100	0.02	HSG D	0.400	11.57	334	0.02	0.65	8.56	20.13	2.85	0.31	0.01	60:1	8.95	12	0.02	2 x 12
1659+18	1664+18	296,884	100	0.10	HSG D	0.400	7.94	509	0.13	1.60	5.30	13.25	3.50	0.31	0.01	6:1	7.40	18	0.12	12
1669+06	1669+93	36,778	100	0.04	HSG D	0.800	13.60	414	0.11	2.25	3.07	16.67	3.15	0.40	0.01	5:1	1.06	12	0.07	6
1705+00	1709+50	229,014	100	0.06	HSG D	0.400	8.95	394	0.11	1.50	4.38	13.33	3.50	0.31	0.04	9:1	5.70	18	0.11	12
1717+86	1719+77	33,154	100	0.06	HSG D	0.400	8.95	279	0.10	1.50	3.10	12.05	3.65	0.31	0.03	5:1	0.86	12	0.19	6
1719+77	1720+52	11,046	100	0.06	HSG D	0.400	8.95	256	0.11	1.50	2.84	11.79	3.68	0.31	0.04	6:1	0.29	12	0.19	6
1746+56	1748+30	91,660	100	0.04	HSG D	0.800	13.60	573	0.15	1.70	5.62	19.22	2.93	0.31	0.06	12:1	1.91	12	0.10	6
1748+30	1749+10	16,610	100	0.16	HSG D	0.400	7.12	429	0.11	1.50	4.77	11.88	3.67	0.31	0.04	10:1	0.43	12	0.13	6
1786+83	1787+29	3,836	100	0.18	HSG D	0.300	6.05	118	0.12	0.75	2.62	8.68	4.13	0.20	0.04	13:1	0.07	12	0.09	6
1787+29	1788+03	17,371	100	0.05	HSG D	0.400	9.34	575	0.14	1.25	7.67	17.01	3.12	0.25	0.03	4:1	0.31	12	0.10	6
1813+27	1817+00	108,226	100	0.05	HSG D	0.400	9.34	408	0.09	1.40	4.86	14.20	3.40	0.31	0.06	6:1	2.62	12	0.09	8
1817+00	1818+37	25,538	100	0.04	HSG D	0.400	9.84	431	0.08	1.35	5.32	15.16	3.30	0.31	0.04	10:1	0.60	12	0.11	6
1825+37	1825+82	11,647	100	0.15	HSG D	0.800	9.99	533	0.15	0.95	9.35	19.34	2.92	0.40	0.05	10:1	0.31	12	0.11	6
1856+70	1859+19	181,222	100	0.06	HSG D	0.400	8.95	513	0.11	1.50	5.70	14.65	3.35	0.31	0.04	8:1	4.32	12	0.14	8

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
1884+35	1885+04	36,408	100	0.13	Type D	0.800	10.27	703	0.12	1.60	7.32	17.59	3.06	0.31	0.01	20.00	0.79	12	0.02	8
1886+18	1888+33	299,045	100	0.10	Type D	0.400	7.94	1071	0.15	1.75	10.20	18.14	3.02	0.40	0.01	9.00	8.28	18	0.02	3x12
1888+33	1890+59	175,134	100	0.11	Type D	0.400	7.85	1012	0.17	0.95	17.75	25.61	2.49	0.40	0.01	7.00	4.00	18	0.01	2x12
1890+59	1892+57	134,245	100	0.11	Type D	0.400	7.77	1166	0.16	0.90	21.59	29.36	2.29	0.40	0.05	3.50	2.82	18	0.01	2x12
1903+15	1904+76	55,437	100	0.02	Type D	0.800	16.00	501	0.11	2.30	3.63	19.63	2.89	0.40	0.05	6.00	1.47	12	0.18	8
1904+77	1910+14	203,013	100	0.10	Type D	0.300	6.94	873	0.06	1.20	12.13	19.07	2.94	0.23	0.05	5.00	3.15	18	0.14	12
1953+81	1955+63	43,668	100	0.09	Type D	0.020	2.01	320	0.10	2.20	2.42	5.00	4.82	0.31	0.03	10.00	1.50	12	0.16	8
1972+40	1974+33	837,726	100	0.16	Type D	0.400	7.12	1091	0.12	1.60	11.36	18.48	2.99	0.35	0.15	8.00	20.11	18	0.06	4x12
1985+25	1987+30	1,002,669	100	0.10	Type D	0.400	7.94	1433	0.13	1.70	14.05	21.99	2.72	0.31	0.05	16.00	19.40	18	0.06	4x12
1987+37	1988+49	23,540	100	0.22	Type D	0.400	6.61	407	0.10	1.50	4.52	11.13	3.77	0.31	0.01	8.00	0.63	12	0.06	6
1995+22	1999+69	499,657	100	0.10	Type D	0.400	7.94	1585	0.07	1.20	22.01	29.96	2.26	0.31	0.03	24.00	8.03	12	0.04	2x12
2007+27	2008+28	25,594	100	0.10	Type D	0.800	10.98	362	0.09	2.30	2.62	13.61	3.46	0.40	0.02	8.00	0.81	12	0.10	6
2008+28	2113+82	587,074	100	0.07	Type D	0.800	11.94	1251	0.09	2.30	9.07	21.00	2.79	0.40	0.03	12.00	15.04	18	0.09	3x12
2015+53	2018+33	161,123	100	0.07	Type D	0.400	8.63	794	0.08	2.20	6.02	14.65	3.35	0.40	0.03	7.00	4.96	18	0.12	12
2018+33	2020+42	208,038	100	0.08	Type D	0.400	8.37	1098	0.10	2.25	8.13	16.50	3.16	0.40	0.06	7.00	6.04	18	0.08	2x12
2020+69	2024+65	133,263	100	0.12	Type D	0.800	10.52	725	0.10	2.25	5.37	15.89	3.22	0.40	0.05	8.00	3.94	12	0.13	12
2041+54	2045+81	102,120	100	0.03	Type D	0.300	9.20	543	0.13	0.90	10.06	19.26	2.92	0.20	0.06	4.00	1.37	12	0.13	8
2050+72	2053+75	105,309	100	0.09	Type D	0.300	7.12	301	0.12	0.85	5.90	13.02	3.53	0.20	0.06	10.00	1.71	12	0.19	8
2100+82	2104+74	83,201	100	0.13	Type D	0.300	6.53	655	0.15	0.95	11.49	18.02	3.03	0.20	0.02	11.00	1.16	12	0.05	8
2108+90	2111+32	46,279	100	0.15	Type D	0.800	9.99	209	0.10	2.20	1.58	11.57	3.71	0.40	0.05	8.00	1.58	12	0.10	8
2111+83	2114+33	140,916	100	0.14	Type D	0.400	7.34	776	0.16	2.75	4.70	12.05	3.65	0.40	0.03	9.00	4.72	18	0.10	12
2114+33	2116+46	76,183	100	0.14	Type D	0.400	7.34	693	0.18	2.85	4.05	11.40	3.73	0.40	0.04	8.00	2.61	12	0.12	12
2116+46	2117+90	178,536	100	0.09	Type D	0.400	8.14	802	0.18	2.85	4.69	12.83	3.55	0.40	0.10	13.00	5.83	12	0.10	12
2117+90	2118+62	387,082	100	0.08	Type D	0.400	8.37	820	0.17	2.80	4.88	13.25	3.50	0.40	0.11	9.00	12.46	18	0.07	3x12
2122+11	2124+60	37,743	100	0.09	Type D	0.300	7.12	306	0.10	3.20	1.59	8.71	4.12	0.37	0.07	17.00	1.32	12	0.15	8
2123+86	2124+27	5,436	100	0.27	Type D	0.300	5.51	28	0.10	3.20	0.15	5.65	4.68	0.40	0.09	13.00	0.23	12	0.12	6

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Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
2339+35	2340+95	54,692	100	0.14	Type D	0.300	6.42	524	0.10	0.70	12.48	18.90	2.95	0.28	0.05	6:1	1.04	12	0.19	8
2340+95	2342+35	21,973	100	0.10	Type D	0.300	6.94	321	0.08	0.60	8.92	15.86	3.23	0.28	0.02	15:1	0.46	12	0.12	6
2374+55	2376+35	31,407	100	0.06	Type D	0.300	7.82	318	0.17	1.00	5.30	13.12	3.52	0.28	0.05	4:1	0.71	12	0.16	6
2409+95	2410+60	29,285	100	0.07	Type D	0.300	7.55	523	0.07	0.60	14.53	22.08	2.71	0.28	0.03	11:1	0.51	12	0.05	6
2411+75	2412+75	32,174	100	0.08	Type D	0.300	7.32	431	0.07	0.60	11.97	19.29	2.92	0.28	0.03	15:1	0.60	12	0.04	6

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
2693+60	2694+55	55,115	100	0.26	Type D	0.300	5.55	220	0.15	2.70	1.36	6.91	4.43	0.28	0.04	6:1	1.57	12	0.19	8
2690+60	2691+40	24,244	100	0.25	Type D	0.300	5.61	77	0.13	1.70	0.75	6.36	4.54	0.28	0.06	10.5:1	0.71	12	0.10	6
2691+40	2693+30	19,545	100	0.37	Type D	0.300	5.12	29	0.14	1.70	0.28	5.40	4.73	0.28	0.01	2.5:1	0.59	12	0.12	6
2655+70	2657+75	49,275	100	0.07	Type D	0.300	7.55	240	0.08	2.00	2.00	9.55	3.99	0.28	0.01	12.5:1	1.26	12	0.06	8
2648+50	2650+05	2,492,509	100	0.05	Type D	0.300	8.17	1785	0.07	0.70	42.50	50.67	1.57	0.20						
		1,511,648												0.31	0.04	29:1	17.93	18	0.03	5 - 12"
2626+15	2626+55	5,902	100	0.02	Type D	0.300	10.11	445	0.01	0.70	10.60	20.71	2.81	0.28						
		10,165			Type D			185	0.12	0.80	3.85	5.00	4.82	0.20	0.05	9:1	10.06	18	0.07	2 - 12"
2626+55	2633+75	104,940	100	0.06	Type D	0.300	7.82	115	0.17	2.70	0.71	8.53	4.15	0.28						
		112,860			Type D			220	0.12	0.80	4.58	5.00	4.82	0.20	0.03	5:1	5.51	18	0.07	12
2590+60	2595+35	116,132	100	0.03	Type D	0.300	9.20	310	0.23	3.30	1.57	10.77	3.82	0.28	0.07	6:1	2.85	12	0.22	8
2549+50	2550+35	625,690	100	0.14	Type D	0.300	6.42	645	0.09	2.00	5.38	11.79	3.68	0.28						
		672,960						1019	0.09	0.80	21.23	21.23	2.77	0.20						
		46,717						300	0.02	1.00	5.00	5.00	4.82	0.21	0.01	12:1	24.46	24	0.01	4 - 18"
2530+10	2533+00	115,410	100	0.15	Type D	0.300	6.32	300	0.13	2.50	2.00	8.32	4.19	0.28	0.01	5.5:1	3.11	18	0.33	6
2520+55	2522+90	55,214	100	0.07	Type D	0.300	7.55	285	0.18	3.00	1.58	9.13	4.06	0.28	0.06	2.5:1	1.44	12	0.66	6
2522+90	2528+05	122,977	100	0.05	Type D	0.300	8.17	300	0.23	3.40	1.47	9.64	3.98	0.28						
		32,875			Type D									0.78	0.03	2.5:1	3.15	18	0.07	12
2512+30	2512+90	139,999	100	0.09	Type D	0.800	11.26	495	0.13	2.50	3.30	14.56	3.36	0.28	0.02	9:1	3.02	12	0.05	12
2513+25	2514+30	35,502	100	0.09	Type D	0.800	11.26	510	0.13	2.50	3.40	14.66	3.35	0.28						
		14,706			Type D									0.87	0.02	9:1	0.76	12	0.05	6
2482+50	2484+45	88,477	100	0.08	Type D	0.300	7.32	410	0.12	2.40	2.85	10.16	3.90	0.28	0.02	9:1	2.22	12	0.15	8
2484+45	2485+45	57,365	100	0.10	Type D	0.300	6.94	420	0.11	2.30	3.04	9.99	3.93	0.28	0.01	8.5:1	1.45	12	0.05	8

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2966+90	2967+15	5,562	100	0.10	Type D	0.400	7.94	140	0.10	1.50	1.56	9.50	4.00	0.31						
		4,935						135	0.27	1.30	1.73	5.00	4.82	0.20	0.08	3:1	0.11	12	0.11	6
2962+95	2964+85	76,983	100	0.26	Type D	0.400	6.35	580	0.15	1.80	5.37	11.72	3.69	0.31						
		59,860						300	0.22	1.20	4.17	5.00	4.82	0.20	0.07	7:1	3.35	12	0.12	12
2961+10	2961+85	3,423	100	0.15	Type D	0.400	7.23	130	0.13	1.70	1.27	8.50	4.16	0.31						
		11,191						285	0.19	1.00	4.75	5.00	4.82	0.20	0.02	4.5:1	0.35	12	0.16	6
2953+95	2955+85	13,845	70	0.11	Type D	0.400	6.52													
		24,360	30	0.23	Type D	0.300	3.25	105	0.31	1.40	1.25	5.00	4.82	0.20	0.04	3.5:1	0.85	12	0.28	6
2952+00	2953+95	8,456	100	0.05	Type D	0.300	8.17	55	0.07	0.65	1.41	9.58	3.99	0.20						
		78,056						335	0.10	1.50	3.72	5.00	4.82	0.31						
		21,310						75	0.29	1.30	0.96	5.00	4.82	0.20	0.04	3.5:1	3.30	18	0.28	8
2929+35	2931+25	214,424	100	0.06	Type D	0.400	8.95	800	0.14	1.70	7.84	16.79	3.14	0.31	0.03	8:1	#REF!	18	0.10	12
															0.02	11:1	4.79	18	0.11	12
2931+25	2931+70	102,040	100	0.02	Type D	0.400	11.57	645	0.18	2.00	5.38	16.94	3.12	0.31	0.02	12:1	2.27	12	0.09	12
2931+70	2932+00	172,833	100	0.06	Type D	0.400	8.95	985	0.13	1.70	9.66	18.61	2.98	0.31	0.03	9.5:1	3.66	12	0.10	12
2945+85	2947+70	49,990	100	0.18	Type D	0.800	9.57	200	0.15	2.70	1.23	10.81	3.81	0.35						
		53,895						490	0.09	0.75	10.89	10.89	3.80	0.20						
		85,795						150	0.07	1.80	1.39	5.00	4.82	0.35	0.01	12.5:1	5.79	18	0.07	2 - 12"
2932+00	2933+80	152,470	100	0.04	Type D	0.400	9.84	950	0.13	1.70	9.31	19.15	2.93	0.31	0.03	9:1	3.18	12	0.10	12
2921+00	2921+45	10,057	100	0.24	Type D	0.300	5.66	285	0.27	1.30	3.65	9.31	4.03	0.20	0.06	3:1	0.19	12		NO PIPE
2916+65	2918+20	101,755	100	0.14	Type D	0.300	6.42	800	0.16	1.00	13.33	19.75	2.88	0.20	0.02	4:1	3.18	18	0.18	12
2912+85	2914+10	101,502	50	0.16	Type D	0.300	4.50	500	0.17	1.00	8.33	12.83	3.55	0.20	0.11	3:1	1.66	12	0.22	8
2914+10	2915+00	23,880	100	0.09	Type D	0.300	7.12	345	0.21	1.20	4.79	11.91	3.67	0.20	0.04	7:1	0.40	12	0.21	6
2908+80	2910+60	10,600	100	0.04	Type D	0.300	8.60	790	0.10	0.75	17.56	26.16	2.46	0.20	0.05	4.5:1	0.12	12	0.22	6
															0.15	4.5:1	0.12	12	0.22	6
2910+55	2911+60	126,261	100	0.09	Type D	0.300	7.12	1255	0.09	0.75	27.89	35.01	2.04	0.20	0.12	4:1	1.18	12	0.24	6
															0.08	4:1	1.18	12	0.24	6
2883+90	2885+00	16,028	100	0.24	Type D	0.300	5.66	255	0.15	0.95	4.47	10.13	3.91	0.20	0.01	14.5:1	0.29	12	0.07	6
2885+00	2888+35	103,824	100	0.13	Type D	0.300	6.53	470	0.25	1.30	6.03	12.56	3.59	0.20	0.01	6.5:1	1.71	12	0.03	12
2857+15	2858+35	21,577	100	0.21	Type D	0.300	5.84	240	0.23	1.20	3.33	9.17	4.05	0.20	0.0250	6.5:1	0.40	12	0.15	6
2852+95	2857+15	192,388	100	0.16	Type D	0.300	6.22	665	0.16	0.95	11.67	17.89	3.04	0.20	0.03	6.5:1	2.68	12	0.15	8
2847+50	2850+15	121,748	100	0.07	Type D	0.300	7.55	445	0.26	1.30	5.71	13.25	3.50	0.20	0.01	5.5:1	1.96	18	0.17	8
2850+15	2852+85	127,308	100	0.11	Type D	0.300	6.79	520	0.21	1.20	7.22	14.01	3.42	0.20	0.01	5.5:1	2.00	18	0.17	8
2844+30	2846+20	103,952	100	0.08	Type D	0.300	7.32	475	0.21	1.20	6.60	13.91	3.43	0.20	0.01	5:1	1.64	18	0.13	8
2841+70	2842+15	5,639	100	0.21	Type D	0.300	5.84	105	0.20	1.20	1.46	7.30	4.36	0.20	0.04	7:1	0.11	12	0.14	6
2822+30	2824+00	61,181	100	0.06	Type D	0.300	7.82	410	0.11	0.75	9.11	16.94	3.12	0.20	0.12	5.5:1	0.88	12	0.17	6
2824+00	2825+75	6,497	60	0.57	Type D	0.300	3.65	0	0.00	0.00	0.00	5.00	4.82	0.20	0.16	3.5:1	0.14	12	0.21	6
2792+95	2795+45	162,974	100	0.04	Type D	0.300	8.60	1010	0.21	1.20	14.03	22.63	2.67	0.20	0.04	7:1	2.00	12	0.19	8
2786+05	2788+15	52,307	100	0.16	Type D	0.300	6.22	380	0.20	1.20	5.28	11.50	3.72	0.20	0.03	3.5:1	0.89	12	0.25	6
2788+15	2791+00	155,371	100	0.04	Type D	0.300	8.60	840	0.24	1.30	10.77	19.37	2.91	0.20	0.04	5:1	2.08	12	0.27	8
2791+00	2792+95	160,197	100	0.11	Type D	0.300	6.79	1035	0.17	0.95	18.16	24.95	2.53	0.20	0.02	3:1	1.86	18	0.26	8
2749+25	2749+75	22,767	100	0.12	Type D	0.800	10.52	150	0.22	3.20	0.78	11.31	3.74	0.35						
		21,767						375	0.23	1.20	5.21	5.21	4.77	0.20	0.18	3.5:1	1.16	12		NO PIPE
2742+15	2744+05	18,317	100	0.07	Type D	0.800	11.94	205	0.16	2.80	1.22	13.16	3.51	0.35						
		26,518												0.20	0.01	5:1	1.27	12	0.22	6
2734+90	2738+60	26,087	100	0.05	Type D	0.800	12.91	120	0.10	2.20	0.91	13.82	3.44	0.35						
		61,898						235	0.25	1.30	3.01	5.00	4.82	0.20	0.01	2.5:1	2.09	18	0.32	8
															0.04	3.5:1	2.09	18	0.32	8
2731+10	2732+85	143,278	100	0.11	Type D	0.800	10.74	160	0.19	2.70	0.99	11.73	3.69	0.35						
		30,320						310	0.16	0.95	5.44	5.44	4.72	0.20	0.01	4.5:1	4.91	18	0.21	12
2732+85	2734+10	53,026	100	0.04	Type D	0.800	13.60	410	0.03	1.20	5.69	19.30	2.92	0.29						
		38,603						215	0.27	1.30	2.76	5.00	4.82	0.20	0.02	4:1	1.88	18	0.16	8
2727+75	2729+65	44,961	100	0.11	Type D	0.800	10.74	310	0.14	2.70	1.91	12.65	3.57	0.35	0.04	4:1	1.29	12	0.15	6
2716+60	2717+80	10,930	100	0.13	Type D	0.400	7.47	225	0.15	1.80	2.08	9.55	3.99	0.31	0.12	11.5:1	0.31	12		NO PIPE
2695+00	2698+95	152,350	100	0.11	Type D	0.300	6.79	365	0.17	0.90	6.76	13.55	3.47	0.20	0.03	6.5:1	2.43	12	0.07	12

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
3218+35	3219+45	26,194	100	0.15	Type D	0.800	9.99	1210	0.02	1.00	20.17	30.16	2.25	0.29						
		9,390						110	0.13	0.85	2.16	5.00	4.82	0.20	0.05	8:1	0.21	12	0.13	6
3215+75	3216+45	112,166	100	0.04	Type D	0.300	8.60	145	0.08	0.70	3.45	12.05	3.65	0.20						
		76,445						450	0.30	3.80	1.97	5.00	4.82	0.35						
3216+45	3216+85	46,542	100	0.09	Type D	0.800	11.26	40	0.10	2.20	0.30	11.56	3.71	0.35		5.5:1	5.94	18	0.18	12
		48,362						310	0.17	0.90	5.74	5.74	4.66	0.20	0.03	5.5:1	2.42	12	0.18	8
3199+85	3200+90	45,265	100	0.06	Type D	0.300	7.82	405	0.41	2.80	2.41	10.24	3.89	0.31	0.99	4.5:1	1.25	12	0.15	6
3200+90	3201+85	212,016	100	0.05	Type D	0.300	8.17	1050	0.18	2.00	8.75	16.92	3.13	0.31	1.09	4.5:1	4.72	12	0.15	12
3193+25	3193+60	32,141	100	0.04	Type D	0.400	9.84	640	0.15	1.80	5.93	15.77	3.24	0.31	0.09	7:1	0.74	12	NO PIPE	
3109+50	3111+50	12,808	100	0.14	Type D	0.300	6.42	320	0.22	1.20	4.44	10.86	3.80	0.20						
		18,165																0.04	9:1	0.54
3111+50	3113+20	48,004	100	0.16	Type D	0.300	6.22	260	0.27	1.30	3.33	9.56	3.99	0.20						
		41,002																0.02	5.5:1	1.63
3113+20	3115+85	139,549	100	0.12	Type D	0.300	6.65	625	0.17	1.00	10.42	17.07	3.11	0.20	0.01	5.5:1	1.99	18	0.18	6
3115+85	3117+30	94,401	100	0.32	Type D	0.300	5.29	695	0.20	1.20	9.65	14.94	3.32	0.20	0.03	6:1	1.44	12	0.18	6
3117+30	3119+65	205,973	100	0.14	Type D	0.300	6.42	735	0.21	1.20	10.21	16.63	3.15	0.20	0.04	4:1	2.98	18	0.27	8
3119+65	3121+80	124,725	100	0.13	Type D	0.300	6.53	730	0.22	1.20	10.14	16.67	3.15	0.20	0.02	5.5:1	1.44	12	0.16	8
3121+80	3122+15	4,511	50	0.42	Type D	0.300	3.59	225	0.26	1.30	2.88	6.48	4.52	0.20	0.03	4.5:1	0.09	12	0.16	6
3122+15	3123+20	33,792	100	0.31	Type D	0.300	5.33	665	0.20	1.20	9.24	14.57	3.36	0.20	0.02	6:1	0.52	12	0.21	6
3062+95	3065+85	28,107	100	0.06	Type D	0.300	7.82	195	0.14	0.95	3.42	11.25	3.75	0.20	0.21	4:1	0.48	12	NO PIPE	
3062+50	3064+95	57,922	100	0.05	Type D	0.300	8.17	640	0.08	1.30	8.21	16.37	3.18	0.31						
		74,953																	0.06	9:1
3038+75	3040+60	14,721	100	0.13	Type D	0.300	6.53	90	0.06	1.20	1.25	7.78	4.28	0.31	0.02	17.5:1	0.45	12	0.06	6
3036+05	3038+55	22,440	100	0.33	Type D	0.300	5.25	130	0.17	0.90	2.41	7.66	4.30	0.20						
		32,890						75	0.24	2.20	0.57	5.00	4.82	0.31	0.01	12:1	1.57	12	0.07	6
3031+60	3036+05	114,994	100	0.11	Type D	0.400	7.77	265	0.18	1.10	4.02	11.78	3.68	0.20						
		87,382						125	0.13	1.70	1.23	5.00	4.82	0.31	0.01	12.5:1	4.94	18	0.08	12
3042+80	3044+00	46,304	100	0.17	Type D	0.300	6.13	365	0.12	0.85	7.16	13.29	3.50	0.20						
		2,676																	0.15	10.5:1
3044+00	3044+50	142,050	100	0.03	Type D	0.300	9.20	515	0.04	0.50	17.17	26.37	2.44	0.16						
		73,855																	0.03	11:1
3044+50	3045+75	34,796	100	0.05	Type D	0.400	9.34	200	0.09	0.75	4.44	13.78	3.44	0.20	0.02	12.5:1	0.55	12	0.11	6
3053+00	3054+50	41,948	100	0.15	Type D	0.400	7.23	430	0.14	1.55	4.62	11.85	3.67	0.31	0.15	10:1	1.10	12	N/A	N/A

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
3394+45	3396+10	105,562	100	0.12	Type D	0.400	7.61	245	0.25	2.30	1.78	9.39	4.02	0.31					NO PIPE	
		22,004						270	0.13	0.90	5.00	5.00	4.82	0.20	0.18	10:1	3.50	12		
3387+45	3389+70	108,677	100	0.14	Type D	0.300	6.42	460	0.20	1.20	6.39	12.81	3.56	0.20	0.06	6:1	1.77	12	0.15	8
3377+80	3384+90	132,565	100	0.13	Type D	0.300	6.53	485	0.21	1.20	6.74	13.27	3.50	0.20	0.02	3:1	2.13	18	0.19	8
3384+90	3386+95	75,174	100	0.13	Type D	0.300	6.53	425	0.19	1.20	5.90	12.43	3.60	0.20	0.06	3:1	1.24	12	0.06	8
3335+75	3338+65	1,329	100	0.05	Type D	0.800	12.91	430	0.07	1.80	3.98	16.89	3.13	0.31						
		71,850													0.05	10.5:1	0.03	12	0.17	6
3292+65	3293+50	207,509	100	0.03	Type D	0.300	9.20	960	0.13	0.90	17.78	26.98	2.41	0.20	0.06	5:1	2.30	12	0.23	8
3293+50	3295+00	121,863	100	0.02	Type D	0.300	10.11	820	0.16	0.95	14.39	24.50	2.55	0.20	0.01	5.5:1	1.43	12	0.23	6
3292+65	3299+65	202,302	100	0.02	Type D	0.300	10.11	765	0.17	0.95	13.42	23.54	2.62	0.20	0.02	3.5:1	2.43	18	0.08	12
3305+40	3307+30	3,863	100	0.11	Type D	0.300	6.79	110	0.15	1.80	1.02	7.81	4.27	0.31						
		14,684						125	0.17	0.95	2.19	5.00	4.82	0.20	0.15	16:1	0.44	12	NO PIPE	
3307+30	3307+55	77,532	100	0.14	Type D	0.400	7.34	155	0.17	1.80	1.44	8.78	4.11	0.31						
		7,279						45	0.09	0.80	0.94	5.00	4.82	0.20						
								140	0.14	1.80	1.30	5.00	4.82	0.31						
								185	0.22	1.20	2.57	5.00	4.82	0.20	1.32	2.5:1	2.43	12	NO PIPE	
3300+00	3300+75	1,115	50	0.20	Type D	0.300	4.27	0	0.00	0.00	0.00	5.00	4.82	0.31	0.20	1.5:1	0.04	12	NO PIPE	
3274+90	3276+25	8,552	100	0.31	Type D	0.300	5.33	60	0.25	1.30	0.77	6.10	4.59	0.20						
		4,878													0.07	5:1	0.18	12	0.03	6
3270+90	3271+45	7,629	100	0.36	Type D	0.300	5.15	140	0.31	1.40	1.67	6.81	4.45	0.20	0.24	6:1	0.16	12	NO PIPE	
3269+95	3270+90	5,268	100	0.36	Type D	0.300	5.15	145	0.32	1.40	1.73	6.87	4.44	0.20	0.01	4:1	0.11	12	0.18	6
3259+20	3259+70	187,820	100	0.05	Type D	0.400	9.34	810	0.11	1.50	9.00	18.34	3.00	0.31	0.06	6:1	4.01	12	0.12	12
3259+70	3262+40	145,030	100	0.07	Type D	0.400	8.63	620	0.11	1.50	6.89	15.52	3.26	0.31	0.004	5.5:1	3.36	18	0.10	12
3247+80	3251+00	35,497	100	0.07	Type D	0.400	8.63	510	0.14	1.80	4.72	13.36	3.49	0.31	0.06	4.5:1	0.88	12	0.14	6
3251+00	3252+20	141,480	100	0.10	Type D	0.400	7.94	500	0.11	1.50	5.56	13.50	3.48	0.31	0.04	5:1	3.50	18	0.16	12

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
3433+23	3437+15	153,356	100	0.19	Type D	0.300	5.98	383	0.11	2.25	2.84	8.81	4.11	0.20	0.030	15:1	2.89	12	0.054	12
3437+30	3438+20	16,811	100	0.19	Type D	0.300	5.98	264	0.11	2.25	1.96	7.93	4.25	0.20	0.020	16:1	0.33	12	0.080	6
3438+20	3438+60	21,098	100	0.19	Type D	0.300	5.98	264	0.11	2.25	1.96	7.93	4.25	0.20	0.050	16:1	0.41	12	0.070	6
3438+60	3439+08	47,801	100	0.18	Type D	0.300	6.05	324	0.11	2.25	2.40	8.45	4.16	0.20	0.020	14:1	0.91	12	0.090	6
3439+85	3442+35	192,027	100	0.25	Type D	0.300	5.61	557	0.10	0.75	12.38	17.98	3.03	0.20	0.017	8:1	2.67	18	0.057	12
3442+35	3444+30	87,273	100	0.14	Type D	0.400	7.34	517	0.15	0.95	9.07	16.41	3.17	0.20	0.021	9:1	1.27	12	0.042	8
3445+40	3448+10	121,305	100	0.04	Type D	0.400	9.84	602	0.15	0.95	0.00	9.84	3.95	0.20	0.008	12:1	2.20	12	0.055	12
3448+10	3449+25	52,892	100	0.10	Type D	0.400	7.94	396	0.19	1.15	5.74	13.68	3.45	0.20	0.011	15:1	0.84	12	0.065	6
3449+25	3450+10	301,575	100	0.09	Type D	0.400	8.14	1276	0.11	0.80	26.58	34.72	2.05	0.20	0.045	8:1	2.84	18	0.041	12
3450+10	3450+40	38,916	100	0.09	Type D	0.400	8.14	1170	0.12	0.85	22.94	31.08	2.20	0.20	0.043	15:1	0.39	12	0.048	6
3450+40	3451+50	24,233	100	0.25	Type D	0.400	6.41	265	0.12	0.85	5.20	11.61	3.71	0.20	0.010	5:1	0.41	12	0.063	6
3451+50	3454+15	207,029	100	0.08	Type D	0.400	8.37	930	0.15	0.95	16.32	24.68	2.54	0.20	0.039	8:1	2.42	18	0.063	12
3454+15	3456+45	91,912	100	0.07	Type D	0.400	8.63	866	0.16	1.00	14.43	23.07	2.65	0.20	0.026	10:1	1.12	12	0.095	8
3457+75	3460+60	133,883	100	0.10	Type D	0.400	7.94	711	0.20	1.20	9.88	17.82	3.04	0.20	0.028	9:1	1.87	12	0.086	8
3460+60	3464+40	193,906	100	0.10	Type D	0.400	7.94	833	0.19	1.15	12.07	20.02	2.86	0.20	0.037	11:1	2.55	18	0.043	12

Indiana County

Indiana County
Temporary Diversion Berm Calculations

STATION	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Left Side Slope (ft/ft (H:V))	Right Side Slope (ft/ft (H:V))	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Flow Type
3571+40 to 3571+55 CHN	0.025	0.03	0.37	0.1	10	2.15	0.69	4.07	0.17	3.72	0.41	0.0175	3.14	0.15	0.52	1.29	Supercritical
3571+55 to 3571+70 CHN	0.025	0.03	0.38	0.1	8.25	1.87	0.59	3.51	0.17	3.15	0.42	0.0178	3.15	0.15	0.53	1.28	Supercritical
3571+70 to 3572+45 CHN	0.025	0.03	0.36	0.1	8.25	1.71	0.56	3.4	0.16	3.05	0.4	0.018	3.08	0.15	0.51	1.27	Supercritical
3583+55 to 3585+35 CHN	0.025	0.04	0.45	0.1	2.25	0.8	0.24	1.55	0.15	1.05	0.49	0.0244	3.39	0.18	0.63	1.26	Supercritical
3587+90 to 3589+40 CHN	0.025	0.02	0.29	0.1	4.5	0.38	0.19	1.61	0.12	1.32	0.28	0.0229	2.02	0.06	0.35	0.94	Subcritical
3589+40 to 3571+40 CHN	0.025	0.03	0.36	0.1	5.25	1.04	0.35	2.31	0.15	1.94	0.39	0.0197	2.95	0.13	0.5	1.22	Supercritical
3589+70 to 3863+15 CHN	0.025	0.03	0.77	0.1	1.25	1.4	0.4	2	0.2	1.04	0.77	0.0301	3.51	0.19	0.96	1	Subcritical
3673+45 to 3674+75 CHN	0.025	0.01	0.37	0.1	5.75	0.71	0.41	2.55	0.16	2.18	0.33	0.0206	1.75	0.05	0.42	0.71	Subcritical
3675+00 to 3675+75 CHN	0.025	0.03	0.38	0.1	2.5	0.52	0.19	1.42	0.14	1	0.4	0.025	2.71	0.11	0.5	1.09	Supercritical
3677+15 to 3679+40 CHN	0.025	0.07	0.37	0.1	5.5	1.72	0.38	2.42	0.16	2.06	0.47	0.0183	4.56	0.32	0.69	1.87	Supercritical
3677+15 to 3679+40 CHN	0.025	0.06	0.14	0.1	6.5	0.15	0.07	1.07	0.06	0.93	0.17	0.0251	2.27	0.08	0.22	1.51	Supercritical
3863+30 to 3863+75 CHN	0.025	0.09	0.46	0.1	3	1.84	0.33	1.93	0.17	1.44	0.61	0.02	5.52	0.47	0.94	2.02	Supercritical
3863+75 to 3864+40 CHN	0.025	0.03	0.57	0.1	3	1.85	0.5	2.38	0.21	1.77	0.62	0.02	3.66	0.21	0.78	1.21	Subcritical
3864+40 to 3867+20 CHN	0.025	0.01	0.74	0.1	3	2.14	0.85	3.09	0.28	2.3	0.65	0.0196	2.52	0.1	0.84	0.73	Subcritical
3867+20 to 3868+15 CHN	0.025	0.04	0.29	0.1	3	0.34	0.13	1.19	0.11	0.89	0.31	0.0251	2.67	0.11	0.4	1.25	Supercritical
3868+15 to 3869+95 CHN	0.025	0.06	0.29	0.1	5	0.75	0.21	1.76	0.12	1.47	0.35	0.0207	3.55	0.2	0.48	1.65	Supercritical
3878+63 to 3879+13 CHN	0.025	0.5	0.17	0.1	1.5	0.12	0.02	0.46	0.05	0.26	0.27	0.0377	5.48	0.47	0.63	3.36	Supercritical
3898+25 to 3898+95 CHN	0.025	0.03	0.1	0.1	9.5	0.07	0.05	1.1	0.05	1	0.11	0.0276	1.35	0.03	0.13	1.04	Supercritical
3898+95 to 3900+66 CHN	0.025	0.01	0.25	0.1	9.5	0.44	0.31	2.69	0.12	2.45	0.22	0.0216	1.41	0.03	0.29	0.7	Subcritical
3935+95 to 3938+45 CHN	0.025	0.2	0.22	0.1	10	1.43	0.25	2.45	0.1	2.24	0.35	0.0184	5.77	0.52	0.74	3.06	Supercritical
3938+45 to 3939+85 CHN	0.025	0.02	0.54	0.1	10	4.92	1.48	5.99	0.25	5.48	0.57	0.0156	3.31	0.17	0.71	1.12	Supercritical
3939+85 to 3942+00 CHN	0.025	0.01	0.4	0.1	8.5	1.29	0.68	3.81	0.18	3.43	0.35	0.0187	1.89	0.06	0.45	0.75	Subcritical
3980+40 to 3985+45 CHN	0.025	0.03	0.27	0.1	10.5	1.02	0.4	3.16	0.13	2.9	0.3	0.0193	2.58	0.1	0.38	1.23	Supercritical
4056+75 to 4059+65 CHN	0.025	0.07	0.37	0.1	4.5	1.37	0.31	2.06	0.15	1.68	0.47	0.0193	4.44	0.31	0.67	1.83	Supercritical
4059+65 to 4061+05 CHN	0.025	0.02	0.16	0.1	14	0.29	0.19	2.47	0.08	2.32	0.16	0.023	1.52	0.04	0.2	0.94	Subcritical
4061+05 to 4061+80 CHN	0.025	0.01	0.24	0.1	8.5	0.32	0.24	2.26	0.11	2.03	0.2	0.0225	1.33	0.03	0.26	0.68	Subcritical
4063+25 to 4064+20 CHN	0.025	0.06	0.27	0.1	4	0.51	0.15	1.4	0.11	1.12	0.33	0.0224	3.33	0.17	0.45	1.59	Supercritical
4064+20 to 4065+85 CHN	0.025	0.04	0.36	0.1	4	0.89	0.27	1.86	0.15	1.49	0.41	0.0208	3.29	0.17	0.53	1.36	Supercritical
4068+50 to 4070+95 CHN	0.025	0.05	0.29	0.1	7.5	1.09	0.32	2.49	0.13	2.21	0.35	0.0192	3.39	0.18	0.47	1.57	Supercritical
4109+50 to 4110+90 CHN	0.025	0.09	0.2	0.1	6.5	0.48	0.14	1.54	0.09	1.34	0.27	0.0215	3.53	0.19	0.4	1.96	Supercritical
4110+90 to 4113+40 CHN	0.025	0.02	0.17	0.1	6.5	0.14	0.09	1.28	0.07	1.12	0.16	0.0253	1.48	0.03	0.2	0.89	Subcritical
4168+15 to 4169+35 CHN	0.025	0.03	0.26	0.1	14.5	1.25	0.49	4.04	0.12	3.8	0.28	0.019	2.53	0.1	0.36	1.24	Supercritical
4169+35 to 4170+30 CHN	0.025	0.01	0.4	0.1	11.5	1.81	0.94	5.04	0.19	4.66	0.36	0.0179	1.94	0.06	0.46	0.76	Subcritical
4172+70 to 4174+25 CHN	0.025	0.01	0.29	0.1	14.5	0.97	0.62	4.51	0.14	4.24	0.26	0.0196	1.58	0.04	0.33	0.73	Subcritical
4174+25 to 4175+25 CHN	0.025	0.01	0.42	0.1	17	3.1	1.52	7.61	0.2	7.22	0.38	0.017	2.03	0.06	0.49	0.78	Subcritical
4175+25 to 4176+70 CHN	0.025	0.01	0.43	0.1	22.5	4.42	2.12	10.19	0.21	9.78	0.39	0.0165	2.09	0.07	0.5	0.79	Subcritical
4176+70 to 4179+70 CHN	0.025	0.003	0.75	0.1	9	4.09	2.58	7.57	0.34	6.85	0.55	0.016	1.59	0.04	0.79	0.46	Subcritical
4217+85 to 4219+30 CHN	0.025	0.06	0.39	0.1	2	0.6	0.16	1.28	0.13	0.83	0.46	0.0265	3.69	0.21	0.61	1.47	Supercritical
4219+30 to 4220+05 CHN	0.025	0.05	0.33	0.1	2	0.33	0.11	1.05	0.11	0.68	0.36	0.0287	2.97	0.14	0.46	1.3	Supercritical
4291+05 to 4294+65 CHN	0.025	0.02	0.33	0.1	2	0.22	0.12	1.08	0.11	0.7	0.31	0.0303	1.9	0.06	0.39	0.82	Subcritical
4294+65 to 4295+60 CHN	0.025	0.06	0.39	0.1	2	0.6	0.16	1.28	0.13	0.83	0.46	0.0265	3.69	0.21	0.61	1.47	Supercritical
4298+15 to 4299+35 CHN	0.025	0.13	0.32	0.1	2	0.51	0.11	1.04	0.1	0.67	0.43	0.0271	4.73	0.35	0.67	2.08	Supercritical
4299+35 to 4300+55 CHN	0.025	0.06	0.61	0.1	3.5	3.7	0.67	2.83	0.24	2.19	0.77	0.0176	5.55	0.48	1.09	1.78	Supercritical
4308+25 to 4309+35 CHN	0.025	0.16	0.24	0.1	2	0.27	0.06	0.79	0.08	0.51	0.33	0.0295	4.36	0.3	0.54	2.21	Supercritical
4345+50 to 4346+75 CHN	0.025	0.01	0.42	0.1	2.5	0.38	0.23	1.55	0.15	1.09	0.35	0.026	1.66	0.04	0.46	0.64	Subcritical
4393+30 to 4396+80 CHN	0.025	0.01	0.32	0.1	17.5	1.48	0.88	5.86	0.15	5.57	0.28	0.0188	1.68	0.04	0.36	0.74	Subcritical
4393+30 to 4396+80 CHN	0.025	0.02	0.34	0.1	5	0.7	0.3	2.1	0.14	1.76	0.34	0.0209	2.31	0.08	0.43	0.98	Subcritical
4476+15 to 4478+30 CHN	0.025	0.02	0.43	0.1	15.5	4.25	1.46	7.15	0.2	6.75	0.45	0.0162	2.91	0.13	0.56	1.1	Supercritical
4478+30 to 4479+00 CHN	0.025	0.01	0.45	0.1	18	3.89	1.83	8.56	0.21	8.14	0.41	0.0165	2.13	0.07	0.52	0.79	Subcritical
4479+00 to 4480+55 CHN	0.025	0.03	0.3	0.1	18	2.38	0.84	5.79	0.14	5.51	0.34	0.0177	2.84	0.13	0.43	1.28	Supercritical

**Indiana County
Temporary Slope Pipe Calculations**

STATION	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Diameter (ft)	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Percent Full (%)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Maximum Discharge (ft ³ /s)	Discharge Full (ft ³ /s)	Slope Full (ft/ft)	Flow Type
3569+40 to 3571+40 PIPE	0.023	0.02	0.6	0.67	1.04	0.33	1.66	0.2	0.41	0.48	89.4	0.0298	3.13	0.15	0.75	0.61	1.05	0.98	0.02258	SubCritical
3571+40 to 3571+55 PIPE	0.023	0.02	0.65	1	2.15	0.54	1.87	0.29	0.95	0.63	64.9	0.0222	3.98	0.25	0.9	0.93	3.06	2.85	0.0114	SubCritical
3571+55 to 3571+70 PIPE	0.023	0.04	0.48	1	1.87	0.37	1.53	0.24	1	0.58	47.9	0.0209	5.03	0.39	0.87	1.46	4.33	4.03	0.00862	SuperCritical
3571+70 to 3572+45 PIPE	0.023	0.04	0.45	1	1.71	0.35	1.48	0.23	1	0.56	45.5	0.0203	4.92	0.38	0.83	1.47	4.33	4.03	0.00721	SuperCritical
3583+55 to 3585+35 PIPE	0.023	0.16	0.29	0.5	0.8	0.12	0.86	0.14	0.49	0.44	57.6	0.0567	6.83	0.73	1.01	2.47	1.36	1.27	0.06364	SuperCritical
3587+90 to 3589+40 PIPE	0.023	0.14	0.19	0.5	0.38	0.07	0.67	0.1	0.49	0.31	38.9	0.0279	5.38	0.45	0.64	2.49	1.28	1.19	0.01436	SuperCritical
3589+70 to 3863+15 PIPE	0.023	0.26	0.36	0.5	1.4	0.15	1.01	0.15	0.45	0.49	71.9	0.1766	9.26	1.33	1.69	2.82	1.74	1.62	0.19489	SuperCritical
3673+45 to 3674+75 PIPE	0.023	0.13	0.29	0.5	0.71	0.12	0.86	0.14	0.5	0.42	57	0.0473	6.14	0.58	0.87	2.24	1.23	1.14	0.05012	SuperCritical
3675+00 to 3675+75 PIPE	0.023	0.18	0.22	0.5	0.52	0.08	0.72	0.11	0.5	0.37	43.1	0.0338	6.42	0.64	0.86	2.8	1.45	1.35	0.02689	SuperCritical
3677+15 to 3679+40 PIPE	0.023	0.12	0.42	0.67	1.72	0.23	1.22	0.19	0.65	0.6	62.7	0.0544	7.39	0.85	1.27	2.18	2.58	2.4	0.06176	SuperCritical
3677+15 to 3679+40 PIPE	0.023	0.12	0.12	0.5	0.15	0.04	0.52	0.07	0.43	0.19	25	0.0226	3.91	0.24	0.36	2.32	1.18	1.1	0.00224	SuperCritical
3863+30 to 3863+75 PIPE	0.023	0.32	0.42	0.5	1.84	0.18	1.17	0.15	0.36	0.5	84.5	0.3165	10.39	1.68	2.1	2.62	1.93	1.79	0.33664	SuperCritical
3863+75 to 3864+40 PIPE	0.023	0.26	0.34	0.67	1.85	0.18	1.07	0.17	0.67	0.62	51.4	0.0621	10.13	1.59	1.94	3.42	3.8	3.53	0.07145	SuperCritical
3864+40 to 3867+20 PIPE	0.023	0.29	0.36	0.67	2.14	0.2	1.11	0.18	0.67	0.64	54.3	0.0828	10.94	1.86	2.22	3.56	4.01	3.73	0.0956	SuperCritical
3867+20 to 3869+15 PIPE	0.023	0.32	0.15	0.5	0.34	0.05	0.57	0.08	0.46	0.3	29.5	0.0267	7.01	0.76	0.91	3.79	1.93	1.79	0.01149	SuperCritical
3868+15 to 3869+95 PIPE	0.023	0.19	0.26	0.5	0.75	0.1	0.81	0.13	0.5	0.43	52.5	0.0512	7.18	0.8	1.06	2.77	1.49	1.38	0.05593	SuperCritical
3898+25 to 3898+95 PIPE	0.023	0.05	0.11	0.5	0.07	0.03	0.48	0.06	0.41	0.13	21.2	0.0222	2.3	0.08	0.19	1.49	0.76	0.71	0.00049	SuperCritical
3898+95 to 3900+66 PIPE	0.023	0.05	0.29	0.5	0.44	0.12	0.86	0.14	0.5	0.34	57	0.0301	3.8	0.22	0.51	1.39	0.76	0.71	0.01925	SuperCritical
3935+95 to 3938+45 PIPE	0.023	0.06	0.47	0.67	1.43	0.27	1.33	0.2	0.61	0.56	70.4	0.0411	5.39	0.45	0.92	1.44	1.82	1.7	0.04269	SuperCritical
3938+45 to 3939+85 PIPE	0.023	0.06	0.82	1	4.92	0.69	2.26	0.3	0.77	0.91	81.7	0.052	7.16	0.8	1.61	1.34	5.31	4.93	0.0597	SuperCritical
3939+85 to 3942+00 PIPE	0.023	0.12	0.35	0.67	1.29	0.19	1.08	0.17	0.67	0.54	52.2	0.0363	6.93	0.75	1.1	2.31	2.58	2.4	0.03474	SuperCritical
3980+40 to 3985+45 PIPE	0.023	0.09	0.46	0.5	1.02	0.19	1.28	0.15	0.28	0.47	91.6	0.0896	5.41	0.46	0.91	1.16	1.02	0.95	0.10345	SuperCritical
4056+75 to 4059+65 PIPE	0.023	0.21	0.39	0.5	1.37	0.16	1.07	0.15	0.42	0.49	77.2	0.1682	8.42	1.1	1.49	2.38	1.56	1.45	0.18662	SuperCritical
4059+65 to 4061+05 PIPE	0.023	0.16	0.16	0.5	0.29	0.06	0.61	0.09	0.47	0.27	32.5	0.0252	5.24	0.43	0.59	2.69	1.36	1.27	0.00836	SuperCritical
4061+05 to 4061+80 PIPE	0.023	0.13	0.18	0.5	0.32	0.06	0.64	0.1	0.48	0.29	36.1	0.0261	5	0.39	0.57	2.42	1.23	1.14	0.01018	SuperCritical
4063+25 to 4064+20 PIPE	0.023	0.12	0.24	0.5	0.51	0.09	0.76	0.12	0.5	0.36	47.9	0.0333	5.49	0.47	0.71	2.25	1.18	1.1	0.02586	SuperCritical
4064+20 to 4065+85 PIPE	0.023	0.12	0.34	0.5	0.89	0.14	0.97	0.15	0.47	0.46	68.3	0.0684	6.23	0.6	0.94	1.98	1.18	1.1	0.07876	SuperCritical
4068+50 to 4070+95 PIPE	0.023	0.14	0.38	0.5	1.09	0.16	1.05	0.15	0.43	0.48	75.5	0.1029	6.85	0.73	1.11	1.99	1.28	1.19	0.11814	SuperCritical
4109+50 to 4110+90 PIPE	0.023	0.12	0.25	0.5	0.7	0.1	0.78	0.12	0.5	0.42	49.6	0.0464	7.2	0.81	1.05	2.88	1.53	1.42	0.04872	SuperCritical
4110+90 to 4113+40 PIPE	0.023	0.14	0.28	0.5	0.7	0.11	0.84	0.13	0.5	0.42	55.2	0.0464	6.29	0.62	0.89	2.35	1.28	1.19	0.04872	SuperCritical
4168+15 to 4169+35 PIPE	0.023	0.06	0.43	0.67	1.25	0.24	1.24	0.19	0.64	0.53	63.9	0.0351	5.26	0.43	0.86	1.53	1.82	1.7	0.03262	SuperCritical
4169+35 to 4170+30 PIPE	0.023	0.02	0.58	1	1.81	0.47	1.73	0.27	0.99	0.57	57.9	0.0207	3.84	0.23	0.81	0.98	3.06	2.85	0.00808	SubCritical
4172+70 to 4174+25 PIPE	0.023	0.06	0.36	0.67	0.97	0.2	1.11	0.18	0.67	0.47	54.2	0.0284	4.97	0.38	0.75	1.62	1.82	1.7	0.01964	SuperCritical
4174+25 to 4175+25 PIPE	0.023	0.06	0.57	1	3.1	0.47	1.72	0.27	0.99	0.75	57.5	0.0281	6.63	0.68	1.26	1.7	5.31	4.93	0.02037	SuperCritical
4175+25 to 4176+70 PIPE	0.023	0.04	0.53	1	2.21	0.42	1.63	0.26	1	0.64	52.8	0.0224	5.25	0.43	0.96	1.42	4.33	4.03	0.01205	SuperCritical
4176+70 to 4179+70 PIPE	0.023	0.04	0.83	1	4.09	0.7	2.3	0.3	0.74	0.86	83.4	0.0385	5.84	0.53	1.36	1.06	4.33	4.03	0.04126	SuperCritical
4217+85 to 4219+30 PIPE	0.023	0.36	0.19	0.5	0.6	0.07	0.67	0.1	0.49	0.39	38.6	0.0386	8.6	1.15	1.34	4	2.05	1.9	0.0358	SuperCritical
4219+30 to 4220+05 PIPE	0.023	0.31	0.15	0.5	0.33	0.05	0.57	0.08	0.46	0.29	29.3	0.0263	6.87	0.73	0.88	3.73	1.9	1.77	0.01083	SuperCritical
4291+05 to 4294+65 PIPE	0.023	0.2	0.45	1	3.7	0.34	1.46	0.23	0.99	0.82	44.7	0.0337	10.9	1.85	2.29	3.29	9.69	9.01	0.03376	SuperCritical
4294+65 to 4295+60 PIPE	0.023	0.48	0.11	0.5	0.22	0.03	0.48	0.06	0.41	0.24	21.4	0.0236	7.16	0.8	0.9	4.61	2.36	2.2	0.00481	SuperCritical
4298+15 to 4299+25 PIPE	0.023	0.32	0.13	0.5	0.27	0.04	0.54	0.08	0.44	0.26	26.2	0.0247	6.57	0.67	0.8	3.79	1.93	1.79	0.00725	SuperCritical
4299+35 to 4300+55 PIPE	0.023	0.3	0.19	0.5	0.51	0.07	0.65	0.1	0.48	0.36	37.1	0.0333	7.69	0.92	1.11	3.66	1.87	1.74	0.02586	SuperCritical
4308+25 to 4309+35 PIPE	0.023	0.19	0.18	0.5	0.38	0.06	0.64	0.1	0.48	0.31	35.8	0.0279	6.02	0.56	0.74	2.92	1.49	1.38	0.01436	SuperCritical
4345+50 to 4346+75 PIPE	0.023	0.7	0.1	0.5	0.22	0.03	0.46	0.06	0.4	0.24	19.5	0.0236	8.16	1.03	1.13	5.51	2.85	2.65	0.00481	SuperCritical
4393+30 to 4396+80 PIPE	0.023	0.07	0.46	0.67	1.48	0.26	1.3	0.2	0.62	0.57	68.2	0.0431	5.78	0.52	0.98	1.59	1.97	1.83	0.04573	SuperCritical
4476+15 to 4478+30 PIPE	0.023	0.06	0.72	1	4.25	0.6	2.02	0.3	0.9	0.87	71.6	0.0407	7.07	0.78	1.49	1.53	5.31	4.93	0.04455	SuperCritical
4478+30 to 4479+00 PIPE	0.023	0.05	0.72	1	3.89	0.6	2.02	0.3	0.9	0.84	71.7	0.036	6.45	0.65	1.36	1.39	4.84	4.5	0.03732	SuperCritical
4479+00 to 4480+55 PIPE	0.023	0.05	0.52	1	2.38	0.41	1.6	0.26	1	0.66	51.7	0.0233	5.81	0.53	1.04	1.6	4.84	4.5	0.01397	SuperCritical

Indiana County
Temporary Diversion Berm
Erosion Control Blanket Calculations

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
3571+40 to 3571+55 CHN	0.03	0.37	2.15	3.14	V	8.0	2.00	0.69	SC150
3571+55 to 3571+70 CHN	0.03	0.38	1.87	3.15	V	8.0	2.00	0.71	SC150
3571+70 to 3572+45 CHN	0.03	0.36	1.71	3.08	V	8.0	2.00	0.67	SC150
3583+55 to 3585+35 CHN	0.04	0.45	0.8	3.39	V	8.0	2.00	1.12	SC150
3587+90 to 3589+40 CHN	0.02	0.29	0.38	2.02	V	8.0	2.00	0.36	SC150
3589+40 to 3571+40 CHN	0.03	0.36	1.04	2.95	V	8.0	2.00	0.67	SC150
3589+70 to 3863+15 CHN	0.03	0.77	1.4	3.51	V	8.0	2.00	1.44	SC150
3673+45 to 3674+75 CHN	0.01	0.37	0.71	1.75	V	8.0	2.00	0.23	SC150
3675+00 to 3675+75 CHN	0.03	0.38	0.52	2.71	V	8.0	2.00	0.71	SC150
3677+15 to 3679+40 CHN	0.07	0.37	1.72	4.56	V	8.0	2.00	1.62	SC150
3677+15 to 3679+40 CHN	0.06	0.14	0.15	2.27	V	8.0	2.00	0.52	SC150
3863+30 to 3863+75 CHN	0.09	0.46	1.84	5.52	V	8.0	2.00	2.58	SC150
3863+75 to 3864+40 CHN	0.03	0.57	1.85	3.66	V	8.0	2.00	1.07	SC150
3864+40 to 3867+20 CHN	0.01	0.74	2.14	2.52	V	8.0	2.00	0.46	SC150
3867+20 to 3868+15 CHN	0.04	0.29	0.34	2.67	V	8.0	2.00	0.72	SC150
3868+15 to 3869+95 CHN	0.06	0.29	0.75	3.55	V	8.0	2.00	1.09	SC150
3878+63 to 3879+13 CHN	0.5	0.17	0.12	5.48	S	12.5	12.00	5.30	P550
3898+25 to 3898+95 CHN	0.03	0.1	0.07	1.35	V	8.0	2.00	0.19	SC150
3898+95 to 3900+66 CHN	0.01	0.25	0.44	1.41	V	8.0	2.00	0.16	SC150
3935+95 to 3938+45 CHN	0.2	0.22	1.43	5.77	S	8.0	3.00	2.75	SC250
3938+45 to 3939+85 CHN	0.02	0.54	4.92	3.31	V	8.0	2.00	0.67	SC150
3939+85 to 3942+00 CHN	0.01	0.4	1.29	1.89	V	8.0	2.00	0.25	SC150
3980+40 to 3985+45 CHN	0.03	0.27	1.02	2.58	V	8.0	2.00	0.51	SC150
4056+75 to 4059+65 CHN	0.07	0.37	1.37	4.44	V	8.0	2.00	1.62	SC150
4059+65 to 4061+05 CHN	0.02	0.16	0.29	1.52	V	8.0	2.00	0.20	SC150
4061+05 to 4061+80 CHN	0.01	0.24	0.32	1.33	V	8.0	2.00	0.15	SC150
4063+25 to 4064+20 CHN	0.06	0.27	0.51	3.33	V	8.0	2.00	1.01	SC150
4064+20 to 4065+85 CHN	0.04	0.36	0.89	3.29	V	8.0	2.00	0.90	SC150
4068+50 to 4070+95 CHN	0.05	0.29	1.09	3.39	V	8.0	2.00	0.90	SC150
4109+50 to 4110+90 CHN	0.09	0.2	0.48	3.53	V	8.0	2.00	1.12	SC150
4110+90 to 4113+40 CHN	0.02	0.17	0.14	1.48	V	8.0	2.00	0.21	SC150
4168+15 to 4169+35 CHN	0.03	0.26	1.25	2.53	V	8.0	2.00	0.49	SC150
4169+35 to 4170+30 CHN	0.01	0.4	1.81	1.94	V	8.0	2.00	0.25	SC150
4172+70 to 4174+25 CHN	0.01	0.29	0.97	1.58	V	8.0	2.00	0.18	SC150
4174+25 to 4175+25 CHN	0.01	0.42	3.1	2.03	V	8.0	2.00	0.26	SC150
4175+25 to 4176+70 CHN	0.01	0.43	4.42	2.09	V	8.0	2.00	0.27	SC150
4176+70 to 4179+70 CHN	0.003	0.75	4.09	1.59	V	8.0	2.00	0.14	SC150
4217+85 to 4219+30 CHN	0.06	0.39	0.6	3.69	V	8.0	2.00	1.46	SC150
4219+30 to 4220+05 CHN	0.05	0.33	0.33	2.97	V	8.0	2.00	1.03	SC150

Indiana County
Temporary Diversion Berm
Erosion Control Blanket Calculations

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
4291+05 to 4294+65 CHN	0.02	0.33	0.22	1.9	V	8.0	2.00	0.41	SC150
4294+65 to 4295+60 CHN	0.06	0.39	0.6	3.69	V	8.0	2.00	1.46	SC150
4298+15 to 4299+35 CHN	0.13	0.32	0.51	4.73	S	8.0	3.00	2.60	SC250
4299+35 to 4300+55 CHN	0.06	0.61	3.7	5.55	V	8.0	3.00	2.28	SC250
4308+25 to 4309+35 CHN	0.16	0.24	0.27	4.36	S	8.0	3.00	2.40	SC250
4345+50 to 4346+75 CHN	0.01	0.42	0.38	1.66	V	8.0	2.00	0.26	SC150
4393+30 to 4396+80 CHN	0.01	0.32	1.48	1.68	V	8.0	2.00	0.20	SC150
4393+30 to 4396+80 CHN	0.02	0.34	0.7	2.31	V	8.0	2.00	0.42	SC150
4476+15 to 4478+30 CHN	0.02	0.43	4.25	2.91	V	8.0	2.00	0.54	SC150
4478+30 to 4479+00 CHN	0.01	0.45	3.89	2.13	V	8.0	2.00	0.28	SC150
4479+00 to 4480+55 CHN	0.03	0.3	2.38	2.84	V	8.0	2.00	0.56	SC150

Indiana County
Temporary Perforated Pipe Level Spreader Calculations

STATION	Diversion Discharge (ft ³ /s)	Available Static Head (ft)	Level Spreader Pipe Diameter (in.)	Perforation Diameter (in.)	Number of Perforations per Row	Orifice Area per Foot (in ² /ft)	Row Spacing (in.)	Orifice Coefficient (Cd)	Level Spreader Capacity per foot of length (ft ³ /s per ft)	Required Length (ft)	Nominal Length (ft)	Overall Level Spreader Capacity (ft ³ /s)
3569+40 to 3571+40 PIPE	1.04	2	12	0.375	6	4.10	1.94	0.61	0.197	5.28	10	1.97
3571+40 to 3571+55 PIPE	2.15	2	12	0.375	6	4.10	1.94	0.61	0.197	10.91	15	2.96
3571+55 to 3571+70 PIPE	1.87	2	12	0.375	6	4.10	1.94	0.61	0.197	9.49	10	1.97
3571+70 to 3572+45 PIPE	1.71	2	12	0.375	6	4.10	1.94	0.61	0.197	8.68	10	1.97
3583+55 to 3585+35 PIPE	0.8	7	12	0.375	6	4.10	1.94	0.61	0.369	2.17	5	1.84
3587+90 to 3589+40 PIPE	0.38	10	12	0.375	6	4.10	1.94	0.61	0.441	0.86	5	2.20
3589+70 to 3863+15 PIPE	1.4		12	0.375	6	4.10	1.94	0.61	0.000	#####	#####	#DIV/0!
3673+45 to 3674+75 PIPE	0.71	8	12	0.375	6	4.10	1.94	0.61	0.394	1.80	5	1.97
3675+00 to 3675+75 PIPE	0.52	12	12	0.375	6	4.10	1.94	0.61	0.483	1.08	5	2.41
3677+15 to 3679+40 PIPE	1.72	9	12	0.375	6	4.10	1.94	0.61	0.418	4.11	5	2.09
3677+15 to 3679+40 PIPE	0.15	9	12	0.375	6	4.10	1.94	0.61	0.418	0.36	5	2.09
3863+30 to 3863+75 PIPE	1.84	22	12	0.375	6	4.10	1.94	0.61	0.654	2.81	5	3.27
3863+75 to 3864+40 PIPE	1.85	26	12	0.375	6	4.10	1.94	0.61	0.711	2.60	5	3.55
3864+40 to 3867+20 PIPE	2.14	26	12	0.375	6	4.10	1.94	0.61	0.711	3.01	5	3.55
3867+20 to 3869+15 PIPE	0.34	28	12	0.375	6	4.10	1.94	0.61	0.738	0.46	5	3.69
3868+15 to 3869+95 PIPE	0.75	28	12	0.375	6	4.10	1.94	0.61	0.738	1.02	5	3.69
3898+25 to 3898+95 PIPE	0.07	4	12	0.375	6	4.10	1.94	0.61	0.279	0.25	5	1.39
3898+95 to 3900+66 PIPE	0.44	4	12	0.375	6	4.10	1.94	0.61	0.279	1.58	5	1.39
3935+95 to 3938+45 PIPE	1.43	5	12	0.375	6	4.10	1.94	0.61	0.312	4.59	5	1.56
3938+45 to 3939+85 PIPE	4.92	5	12	0.375	6	4.10	1.94	0.61	0.312	15.79	20	6.23
3939+85 to 3942+00 PIPE	1.29	10	12	0.375	6	4.10	1.94	0.61	0.441	2.93	5	2.20
3980+40 to 3985+45 PIPE	1.02	9	12	0.375	6	4.10	1.94	0.61	0.418	2.44	5	2.09
4056+75 to 4059+65 PIPE	1.37	19	12	0.375	6	4.10	1.94	0.61	0.608	2.26	5	3.04
4059+65 to 4061+05 PIPE	0.29	19	12	0.375	6	4.10	1.94	0.61	0.608	0.48	5	3.04
4061+05 to 4061+80 PIPE	0.32	11	12	0.375	6	4.10	1.94	0.61	0.462	0.69	5	2.31
4063+25 to 4064+20 PIPE	0.51	10	12	0.375	6	4.10	1.94	0.61	0.441	1.16	5	2.20
4064+20 to 4065+85 PIPE	0.89	10	12	0.375	6	4.10	1.94	0.61	0.441	2.02	5	2.20
4068+50 to 4070+95 PIPE	1.09	13	12	0.375	6	4.10	1.94	0.61	0.503	2.17	5	2.51
4109+50 to 4110+90 PIPE	0.7	12	12	0.375	6	4.10	1.94	0.61	0.483	1.45	5	2.41
4110+90 to 4113+40 PIPE	0.7	13	12	0.375	6	4.10	1.94	0.61	0.503	1.39	5	2.51
4168+15 to 4169+35 PIPE	1.25	2	12	0.375	6	4.10	1.94	0.61	0.197	6.34	10	1.97
4169+35 to 4170+30 PIPE	1.81	2	12	0.375	6	4.10	1.94	0.61	0.197	9.18	10	1.97
4172+70 to 4174+25 PIPE	0.97	5	12	0.375	6	4.10	1.94	0.61	0.312	3.11	5	1.56
4174+25 to 4175+25 PIPE	3.1	5	12	0.375	6	4.10	1.94	0.61	0.312	9.95	10	3.12
4175+25 to 4176+70 PIPE	2.21	4	12	0.375	6	4.10	1.94	0.61	0.279	7.93	10	2.79
4176+70 to 4179+70 PIPE	4.09	4	12	0.375	6	4.10	1.94	0.61	0.279	14.67	15	4.18
4217+85 to 4219+30 PIPE	0.6	26	12	0.375	6	4.10	1.94	0.61	0.711	0.84	5	3.55
4219+30 to 4220+05 PIPE	0.33	22	12	0.375	6	4.10	1.94	0.61	0.654	0.50	5	3.27
4291+05 to 4294+65 PIPE	3.7	17	12	0.375	6	4.10	1.94	0.61	0.575	6.44	10	5.75
4294+65 to 4295+60 PIPE	0.22	17	12	0.375	6	4.10	1.94	0.61	0.575	0.38	5	2.87
4298+15 to 4299+25 PIPE	0.27	30	12	0.375	6	4.10	1.94	0.61	0.763	0.35	5	3.82
4299+35 to 4300+55 PIPE	0.51	27	12	0.375	6	4.10	1.94	0.61	0.724	0.70	5	3.62

Indiana County
Temporary Perforated Pipe Level Spreader Calculations

4308+25 to 4309+35 PIPE	0.38	18	12	0.375	6	4.10	1.94	0.61	0.591	0.64	5	2.96
4345+50 to 4346+75 PIPE	0.22	19	12	0.375	6	4.10	1.94	0.61	0.608	0.36	5	3.04
4393+30 to 4396+80 PIPE	1.48	4	12	0.375	6	4.10	1.94	0.61	0.279	5.31	10	2.79
4476+15 to 4478+30 PIPE	4.25	4	12	0.375	6	4.10	1.94	0.61	0.279	15.25	20	5.58
4478+30 to 4479+00 PIPE	3.89	4	12	0.375	6	4.10	1.94	0.61	0.279	13.95	15	4.18
4479+00 to 4480+55 PIPE	2.38	4	12	0.375	6	4.10	1.94	0.61	0.279	8.54	10	2.79

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Table with 20 columns: Start Sta., End Sta., Area of Drainage (sq ft), Length of Sheet Flow (ft), Slope of Ground during Sheet Flow (ft/ft), Soil Type, Roughness Coefficient (n), Time of Concentration in Sheet Flow (min), Length of Shallow Concentrated Flow (ft), Slope of Ground during Shallow Concentrated Flow (ft/ft), Shallow Concentrated Flow Velocity (ft/sec), Time of Concentration in Shallow Concentrated Flow (min), Total Time of Concentration (min), 2-Year Storm Rainfall Intensity (in/hr), Runoff Coefficients for the Rational Equation, Channel Longitudinal Slope (ft/ft), Channel Side Slope (H:V) (ft/ft), Peak Runoff Rate (CFS), Size of Diversion Sock (in), Pipe Slope (ft/ft), Size of Slope Pipe (in). The table contains data for 41 pipe segments, with the last one (3878+63) marked as N/A.

Cambria County

Cambria County
Temporary Slope Pipe Calculations

STATION	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Diameter (ft)	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Percent Full (%)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Maximum Discharge (ft ³ /s)	Discharge Full (ft ³ /s)	Slope Full (ft/ft)	Flow Type
4545+60 to 4546+65 PIPE	0.023	1	0.17	0.5	0.81	0.06	0.63	0.1	0.48	0.45	34.4	0.0579	13.53	2.85	3.02	6.72	3.41	3.17	0.06524	SuperCritical
4546+65 to 4547+55 PIPE	0.023	1	0.14	0.5	0.57	0.05	0.57	0.08	0.45	0.38	28.7	0.0367	12.25	2.33	2.48	6.73	3.41	3.17	0.03231	SuperCritical
4585+20 to 4586+70 PIPE	0.023	0.14	0.32	0.5	0.87	0.13	0.92	0.14	0.48	0.46	63.6	0.0656	6.6	0.68	1	2.22	1.28	1.19	0.07526	SuperCritical
4586+70 to 4588+00 PIPE	0.023	0.12	0.36	0.5	1.88	0.15	1.01	0.15	0.45	0.44	72.1	0.0544	5.15	0.41	0.77	1.56	0.96	0.9	0.06049	SuperCritical
4588+00 to 4589+50 PIPE	0.023	0.12	0.38	0.5	1.02	0.16	1.06	0.15	0.43	0.47	76.2	0.0896	6.36	0.63	1.01	1.83	1.18	1.1	0.10345	SuperCritical
4589+50 to 4590+00 PIPE	0.023	0.14	0.31	0.5	0.85	0.13	0.91	0.14	0.48	0.45	62.6	0.0629	6.57	0.67	0.98	2.24	1.28	1.19	0.07184	SuperCritical
4590+00 to 4590+50 PIPE	0.023	0.13	0.48	0.67	2.14	0.27	1.35	0.2	0.61	0.64	71.3	0.0828	7.95	0.98	1.46	2.1	2.68	2.5	0.0956	SuperCritical
4590+50 to 4591+55 PIPE	0.023	0.18	0.36	0.5	1.15	0.15	1	0.15	0.45	0.48	71.2	0.1153	7.7	0.92	1.28	2.36	1.45	1.35	0.1315	SuperCritical
4603+45 to 4605+05 PIPE	0.023	0.28	0.16	0.5	0.37	0.05	0.6	0.09	0.47	0.31	31.9	0.0276	6.87	0.73	0.89	3.56	1.81	1.68	0.01361	SuperCritical
4605+05 to 4606+00 PIPE	0.023	0.28	0.18	0.5	0.45	0.06	0.64	0.1	0.48	0.34	35.4	0.0306	7.23	0.81	0.99	3.53	1.81	1.68	0.02013	SuperCritical
4667+25 to 4668+25 PIPE	0.023	0.28	0.16	0.5	0.37	0.05	0.6	0.09	0.47	0.31	31.9	0.0276	6.87	0.73	0.89	3.56	1.81	1.68	0.01361	SuperCritical
4764+25 to 4765+65 PIPE	0.023	0.24	0.2	0.5	0.54	0.07	0.69	0.11	0.49	0.37	40.6	0.035	7.21	0.81	1.01	3.25	1.67	1.55	0.02899	SuperCritical
4900+45 to 4904+75 PIPE	0.023	0.03	0.58	1	2.22	0.47	1.73	0.27	0.99	0.64	58	0.0225	4.7	0.34	0.92	1.2	3.75	3.49	0.01215	SuperCritical
4903+00 to 4804+75 PIPE	0.023	0.13	0.42	0.5	1.16	0.17	1.15	0.15	0.37	0.48	83.3	0.1176	6.63	0.68	1.1	1.71	1.23	1.14	0.1338	SuperCritical
4905+65 - 4908+75	0.024	0.094	0.54	0.67	2.01	0.31	1.5	0.2	0.53	0.63	80.9	0.0794	6.58	0.67	1.21	1.52	2.19	2.03	0.09183	SuperCritical
4909+15 - 4910+35	0.024	0.159	0.31	0.5	0.87	0.13	0.91	0.14	0.48	0.46	62.7	0.0714	6.71	0.7	1.01	2.29	1.3	1.21	0.08195	SuperCritical
5033+45 - 5036+30	0.024	0.158	0.37	0.5	1.1	0.16	1.05	0.15	0.43	0.48	74.9	0.1142	6.97	0.76	1.13	2.04	1.3	1.21	0.131	SuperCritical
5063+55 - 5065+00	0.024	0.135	0.25	0.5	0.57	0.1	0.79	0.13	0.5	0.38	50.6	0.04	5.72	0.51	0.76	2.26	1.2	1.12	0.03518	SuperCritical
5065+00 - 5069+85	0.024	0.099	0.43	0.67	1.57	0.24	1.25	0.19	0.64	0.58	64.8	0.0511	6.5	0.66	1.09	1.86	2.24	2.09	0.05603	SuperCritical
5098+65 - 5105+30	0.024	0.08	0.55	1	3.18	0.44	1.67	0.26	1	0.76	54.8	0.0313	7.21	0.81	1.36	1.91	5.87	5.46	0.02716	SuperCritical
5105+35 - 5109+20	0.024	0.085	0.71	1	4.8	0.6	2	0.3	0.91	0.91	71	0.0542	8.05	1.01	1.72	1.75	6.05	5.63	0.06187	SuperCritical
5176+65 - 5180+00	0.024	0.183	0.39	0.67	1.8	0.21	1.16	0.18	0.66	0.61	57.8	0.0643	8.52	1.13	1.52	2.66	3.05	2.84	0.07365	SuperCritical
5180+00 - 5182+30	0.024	0.179	0.43	0.5	1.33	0.18	1.18	0.15	0.35	0.49	85.4	0.1719	7.44	0.86	1.29	1.84	1.38	1.29	0.19151	SuperCritical
5229+15 - 5234+10	0.024	0.093	0.49	1	2.84	0.38	1.55	0.25	1	0.72	49	0.0285	7.43	0.86	1.35	2.12	6.33	5.88	0.02166	SuperCritical
5234+10 - 5236+55	0.024	0.197	0.39	0.67	1.89	0.21	1.16	0.18	0.66	0.62	58.3	0.0704	8.86	1.22	1.61	2.75	3.17	2.94	0.08119	SuperCritical
5237+35 - 5240+00	0.024	0.354	0.35	0.5	1.53	0.15	1	0.15	0.46	0.49	70.6	0.2328	10.33	1.66	2.01	3.19	1.95	1.81	0.25344	SuperCritical
5240+00 - 5246+10	0.024	0.233	0.49	0.67	2.83	0.28	1.37	0.2	0.59	0.66	73	0.1641	10.26	1.63	2.12	2.65	3.44	3.2	0.18204	SuperCritical
5256+20 - 5257+21	0.024	0.405	0.06	0.5	0.05	0.01	0.34	0.03	0.31	0.11	11.1	0.0245	4.21	0.28	0.33	3.82	2.08	1.93	0.00027	SuperCritical
5287+30 - 5288+55	0.024	0.221	0.22	0.5	0.56	0.08	0.72	0.11	0.5	0.38	43.5	0.0393	6.84	0.73	0.94	2.97	1.54	1.43	0.03395	SuperCritical
5288+60 - 5289+95	0.024	0.142	0.28	0.5	0.7	0.11	0.85	0.13	0.5	0.42	56.5	0.0505	6.12	0.58	0.86	2.25	1.23	1.15	0.05305	SuperCritical
5313+76 - 5316+40	0.024	0.065	0.33	0.5	0.59	0.14	0.94	0.14	0.48	0.39	65.3	0.0413	4.34	0.29	0.62	1.43	0.83	0.77	0.03769	SuperCritical
5348+30 - 5350+85	0.024	0.124	0.41	0.67	1.62	0.23	1.2	0.19	0.65	0.59	61.3	0.0537	7.15	0.8	1.21	2.14	2.51	2.34	0.05965	SuperCritical
5350+85 - 5353+50	0.024	0.209	0.5	1	4.34	0.39	1.56	0.25	1	0.88	49.5	0.0458	11.19	1.95	2.44	3.17	9.49	8.82	0.05058	SuperCritical
5401+15 - 5402+30	0.024	0.186	0.41	0.5	1.31	0.17	1.13	0.15	0.38	0.49	81.9	0.1664	7.61	0.9	1.31	2.01	1.41	1.31	0.1858	SuperCritical
5424+75 to 5427+50 PIPE	0.023	0.22	0.57	0.67	5.85	0.46	1.71	0.27	0.99	0.95	57	0.0731	12.66	2.49	3.06	3.27	10.16	9.44	0.0844	SuperCritical
5427+50 to 5429+00 PIPE	0.023	0.22	0.36	0.5	1.28	0.15	1.01	0.15	0.45	0.49	71.5	0.1455	8.51	1.13	1.48	2.6	1.6	1.49	0.16291	SuperCritical
5496+00 to 5501+00 PIPE	0.023	0.08	0.45	1	2.37	0.34	1.47	0.23	0.99	0.66	45	0.0233	6.91	0.74	1.19	2.08	6.13	5.7	0.01385	SuperCritical
5501+00 to 5504+00 PIPE	0.023	0.05	0.43	1	1.76	0.33	1.44	0.23	0.99	0.56	43.4	0.0205	5.38	0.45	0.88	1.65	4.84	4.5	0.00764	SuperCritical
5504+00 to 5507+30 PIPE	0.023	0.07	0.48	0.67	1.6	0.27	1.36	0.2	0.6	0.59	72.4	0.0483	5.86	0.53	1.02	1.53	1.97	1.83	0.05344	SuperCritical
5542+00 to 5544+25 PIPE	0.023	0.08	0.36	0.5	0.78	0.15	1.01	0.15	0.45	0.44	72.1	0.0544	5.15	0.41	0.77	1.56	0.96	0.9	0.06049	SuperCritical
5587+00 to 5588+00 PIPE	0.023	0.15	0.38	0.67	1.62	0.2	1.13	0.18	0.67	0.59	56.1	0.0493	7.96	0.98	1.36	2.54	2.88	2.68	0.05479	SuperCritical
5589+10 to 5591+50 PIPE	0.023	0.11	0.48	1	3.07	0.37	1.52	0.24	1	0.75	47.6	0.0279	8.33	1.08	1.55	2.42	7.18	6.68	0.02324	SuperCritical
5609+50 to 5611+30 PIPE	0.023	0.06	0.62	1	3.47	0.51	1.81	0.28	0.97	0.8	61.9	0.0314	6.8	0.72	1.34	1.65	5.31	4.93	0.0297	SuperCritical
5611+30 to 5611+80 PIPE	0.023	0.08	0.58	1	3.66	0.48	1.74	0.27	0.99	0.82	58.3	0.0333	7.7	0.92	1.5	1.95	6.13	5.7	0.03304	SuperCritical
5611+80 to 5613+00 PIPE	0.023	0.09	0.41	0.67	1.43	0.23	1.2	0.19	0.65	0.56	61	0.0411	6.35	0.63	1.04	1.91	2.23	2.08	0.04269	SuperCritical
5613+00 to 5615+80 PIPE	0.023	0.06	0.66	1	3.78	0.55	1.89	0.29	0.95	0.83	65.6	0.0347	6.92	0.74	1.4	1.61	5.31	4.93	0.03524	SuperCritical

Cambria County
Temporary Diversion Berm
Erosion Control Blanket Calculations

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft ³ /s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft ²)	Shear Stress (lb/ft ²)	Blanket Specification
4545+60 to 4546+65 CHN	0.02	0.34	0.81	2.33	V	8.0	2.00	0.42	SC150
4546+65 to 4547+55 CHN	0.01	0.34	0.57	1.64	V	8.0	2.00	0.21	SC150
4585+20 to 4586+70 CHN	0.06	0.32	0.87	3.74	V	8.0	2.00	1.20	SC150
4586+70 to 4588+00 CHN	0.01	0.53	1.88	2.21	V	8.0	2.00	0.33	SC150
4588+00 to 4589+50 CHN	0.01	0.42	1.02	1.9	V	8.0	2.00	0.26	SC150
4589+50 to 4590+00 CHN	0.02	0.37	0.85	2.42	V	8.0	2.00	0.46	SC150
4590+00 to 4590+50 CHN	0.02	0.5	2.14	3.01	V	8.0	2.00	0.62	SC150
4590+50 to 4591+55 CHN	0.01	0.52	1.15	2.08	V	8.0	2.00	0.32	SC150
4603+45 to 4605+05 CHN	0.01	0.28	0.37	1.45	V	8.0	2.00	0.17	SC150
4605+05 to 4606+00 CHN	0.02	0.26	0.45	1.98	V	8.0	2.00	0.32	SC150
4667+25 to 4668+25 CHN	0.01	0.21	0.17	1.2	V	8.0	2.00	0.13	SC150
4764+25 to 4765+65 CHN	0.03	0.3	0.54	2.56	V	8.0	2.00	0.56	SC150
4900+45 to 4903+00 CHN	0.03	0.3	2.22	2.8	V	8.0	2.00	0.56	SC150
4903+00 to 4804+75 CHN	0.03	0.33	1.16	2.85	V	8.0	2.00	0.62	SC150
4905+65 - 4908+75	0.0224	0.54	2.03	3.23	V	8.0	2.00	0.75	SC150
4909+15 - 4910+35	0.00083	0.72	0.88	0.76	V	8.0	2.00	0.04	SC150
5033+45 - 5036+30	0.014	0.3	1.1	1.9	V	8.0	2.00	0.26	SC150
5063+55 - 5065+00	0.004	0.29	0.57	1	V	8.0	2.00	0.07	SC150
5065+00 - 5069+85	0.023	0.29	1.57	2.41	V	8.0	2.00	0.42	SC150
5098+65 - 5105+30	0.018	0.5	6.36	3.05	V	8.0	2.00	0.56	SC150
5105+35 - 5109+20	0.018	0.48	4.8	2.94	V	8.0	2.00	0.54	SC150
5169+95 - 5170+40	0.32	0.22	0.3	5.81	S	12.5	12.00	4.39	P550
5176+65 - 5180+00	0.022	0.51	1.8	3.1	V	8.0	2.00	0.70	SC150
5180+00 - 5182+30	0.034	0.39	1.33	3.28	V	8.0	2.00	0.83	SC150
5229+15 - 5234+10	0.024	0.59	2.84	3.56	V	8.0	2.00	0.88	SC150
5234+10 - 5236+55	0.041	0.46	1.89	3.96	V	8.0	2.00	1.18	SC150
5237+35 - 5240+00	0.019	0.51	1.53	2.85	V	8.0	2.00	0.60	SC150
5240+00 - 5246+10	0.056	0.51	2.38	4.82	V	8.0	2.00	1.78	SC150
5256+20 - 5257+21	0.04	0.13	0.05	1.63	V	8.0	2.00	0.32	SC150
5287+30 - 5288+55	0.057	0.24	0.56	3.12	V	8.0	2.00	0.85	SC150
5288+60 - 5289+95	0.027	0.28	0.7	2.43	V	8.0	2.00	0.47	SC150
5313+76 - 5316+40	0.038	0.25	0.59	2.68	V	8.0	2.00	0.59	SC150
5348+30 - 5350+85	0.048	0.29	1.62	3.41	V	8.0	2.00	0.87	SC150
5350+85 - 5353+50	0.019	0.52	4.34	3.15	V	8.0	2.00	0.62	SC150
5401+15 - 5402+30	0.035	0.38	1.31	3.28	V	8.0	2.00	0.83	SC150
5424+75 to 5427+50 CHN	0.02	0.8	5.85	3.99	V	8.0	2.00	1.00	SC150
5427+50 to 5429+00 CHN	0.02	0.3	1.28	2.26	V	8.0	2.00	0.37	SC150
5496+00 to 5501+00 CHN	0.01	0.5	2.37	2.2	V	8.0	2.00	0.31	SC150
5501+00 to 5504+00 CHN	0.02	0.24	1.76	2	V	8.0	2.00	0.30	SC150

Cambria County
Temporary Diversion Berm
Erosion Control Blanket Calculations

STATION	Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft³/s)	Velocity (ft/s)	Shear or Velocity Method (S or V)	Max. Allowable Velocity (ft/s)	Max. Allowable Shear Stress (lb/ft²)	Shear Stress (lb/ft²)	Blanket Specification
5504+00 to 5507+30 CHN	0.03	0.27	1.6	2.64	V	8.0	2.00	0.51	SC150
5542+00 to 5544+25 CHN	0.1	0.17	0.78	3.51	S	8.0	2.00	1.06	SC150
5587+00 to 5588+60 CHN	0.02	0.33	1.62	2.4	V	8.0	2.00	0.41	SC150
5589+10 to 5591+50 CHN	0.04	0.47	3.07	4.15	V	8.0	2.00	1.17	SC150
5609+50 to 5611+30 CHN	0.03	0.45	3.47	3.57	V	8.0	2.00	0.84	SC150
5611+30 to 5611+80 CHN	0.02	0.41	3.66	2.83	V	8.0	2.00	0.51	SC150
5611+80 to 5613+00 CHN	0.02	0.27	1.43	2.13	V	8.0	2.00	0.34	SC150
5613+00 to 5615+80 CHN	0.03	0.43	3.78	3.51	V	8.0	2.00	0.80	SC150

Cambria County
Temporary Perforated Pipe Level Spreader Calculations

STATION	Diversion Discharge (ft ³ /s)	Available Static Head (ft)	Level Spreader Pipe Diameter (in.)	Perforation Diameter (in.)	Number of Perforations per Row	Orifice Area per Foot (in ² /ft)	Row Spacing (in.)	Orifice Coefficient (Cd)	Level Spreader Capacity per foot of length (ft ³ /s per ft)	Required Length (ft)	Nominal Length (ft)	Overall Level Spreader Capacity(ft ³ /s)
4545+60 to 4546+65 PIPE	0.81	10	12	0.375	6	4.10	1.94	0.61	0.441	1.84	5	2.20
4546+65 to 4547+55 PIPE	0.57	10	12	0.375	6	4.10	1.94	0.61	0.441	1.29	5	2.20
4585+20 to 4586+70 PIPE	0.87	10	12	0.375	6	4.10	1.94	0.61	0.441	1.97	5	2.20
4586+70 to 4588+00 PIPE	1.88	10	12	0.375	6	4.10	1.94	0.61	0.441	4.27	5	2.20
4588+00 to 4589+50 PIPE	1.02	8	12	0.375	6	4.10	1.94	0.61	0.394	2.59	5	1.97
4589+50 to 4590+00 PIPE	0.85	8	12	0.375	6	4.10	1.94	0.61	0.394	2.16	5	1.97
4590+00 to 4590+50 PIPE	2.14	9	12	0.375	6	4.10	1.94	0.61	0.418	5.12	10	4.18
4590+50 to 4591+55 PIPE	1.15	8	12	0.375	6	4.10	1.94	0.61	0.394	2.92	5	1.97
4603+45 to 4605+05 PIPE	0.37	20	12	0.375	6	4.10	1.94	0.61	0.623	0.59	5	3.12
4605+05 to 4606+00 PIPE	0.45	15	12	0.375	6	4.10	1.94	0.61	0.540	0.83	5	2.70
4667+25 to 4668+25 PIPE	0.37	8	12	0.375	6	4.10	1.94	0.61	0.394	0.94	5	1.97
4764+25 to 4765+65 PIPE	0.54	30	12	0.375	6	4.10	1.94	0.61	0.763	0.71	5	3.82
4900+45 to 4904+75 PIPE	2.22	3	12	0.375	6	4.10	1.94	0.61	0.241	9.20	10	2.41
4903+00 to 4804+75 PIPE	1.16	8	12	0.375	6	4.10	1.94	0.61	0.394	2.94	5	1.97
4905+65 - 4908+75	2.01	7	12	0.375	6	4.10	1.94	0.61	0.369	5.45	10	3.69
4909+15 - 4910+35	0.87	8	12	0.375	6	4.10	1.94	0.61	0.394	2.21	5	1.97
5033+45 - 5036+30	1.1	11	12	0.375	6	4.10	1.94	0.61	0.462	2.38	5	2.31
5063+55 - 5065+00	0.57	9	12	0.375	6	4.10	1.94	0.61	0.418	1.36	5	2.09
5065+00 - 5069+85	1.57	7	12	0.375	6	4.10	1.94	0.61	0.369	4.26	5	1.84
5098+65 - 5105+30	3.18	5	12	0.375	6	4.10	1.94	0.61	0.312	10.20	15	4.67
5105+35 - 5109+20	4.8	6	12	0.375	6	4.10	1.94	0.61	0.341	14.06	15	5.12
5176+65 - 5180+00	1.8	13	12	0.375	6	4.10	1.94	0.61	0.503	3.58	5	2.51
5180+00 - 5182+30	1.33	13	12	0.375	6	4.10	1.94	0.61	0.503	2.65	5	2.51
5229+15 - 5234+10	2.84	8	12	0.375	6	4.10	1.94	0.61	0.394	7.20	10	3.94
5234+10 - 5236+55	1.89	26	12	0.375	6	4.10	1.94	0.61	0.711	2.66	5	3.55
5237+35 - 5240+00	1.53	26	12	0.375	6	4.10	1.94	0.61	0.711	2.15	5	3.55
5240+00 - 5246+10	2.83	18	12	0.375	6	4.10	1.94	0.61	0.591	4.79	5	2.96
5256+20 - 5257+21	0.05	30	12	0.375	6	4.10	1.94	0.61	0.763	0.07	5	3.82
5287+30 - 5288+55	0.56	13	12	0.375	6	4.10	1.94	0.61	0.503	1.11	5	2.51
5288+60 - 5289+95	0.7	6	12	0.375	6	4.10	1.94	0.61	0.341	2.05	5	1.71
5313+76 - 5316+40	0.59	5	12	0.375	6	4.10	1.94	0.61	0.312	1.89	5	1.56
5348+30 - 5350+85	1.62	10	12	0.375	6	4.10	1.94	0.61	0.441	3.68	5	2.20
5350+85 - 5353+50	4.34	13	12	0.375	6	4.10	1.94	0.61	0.503	8.64	10	5.03
5401+15 - 5402+30	1.31	11	12	0.375	6	4.10	1.94	0.61	0.462	2.83	5	2.31
5424+75 to 5427+50 PIPE	5.85	15	12	0.375	6	4.10	1.94	0.61	0.540	10.84	15	8.10
5427+50 to 5429+00 PIPE	1.28	20	12	0.375	6	4.10	1.94	0.61	0.623	2.05	5	3.12
5496+00 to 5501+00 PIPE	2.37	6	12	0.375	6	4.10	1.94	0.61	0.341	6.94	10	3.41
5501+00 to 5504+00 PIPE	1.76	3	12	0.375	6	4.10	1.94	0.61	0.241	7.29	10	2.41
5504+00 to 5507+30 PIPE	1.6	4	12	0.375	6	4.10	1.94	0.61	0.279	5.74	10	2.79
5542+00 to 5544+25 PIPE	0.78	3	12	0.375	6	4.10	1.94	0.61	0.241	3.23	5	1.21
5587+00 to 5588+00 PIPE	1.62	4	12	0.375	6	4.10	1.94	0.61	0.279	5.81	10	2.79
5589+10 to 5591+50 PIPE	3.07	5	12	0.375	6	4.10	1.94	0.61	0.312	9.85	10	3.12
5609+50 to 5611+30 PIPE	3.47	5	12	0.375	6	4.10	1.94	0.61	0.312	11.13	15	4.67

Cambria County
Temporary Perforated Pipe Level Spreader Calculations

5611+30 to 5611+80 PIPE	3.66	4	12	0.375	6	4.10	1.94	0.61	0.279	13.13	15	4.18
5611+80 to 5613+00 PIPE	1.43	5	12	0.375	6	4.10	1.94	0.61	0.312	4.59	5	1.56
5613+00 to 5615+80 PIPE	3.78	2	12	0.375	6	4.10	1.94	0.61	0.197	19.18	20	3.94

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity* (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
4545+60	4546+65	45,371	100	0.13	Type D	0.300	6.53	365	0.46	1.70	3.58	10.11	3.91	0.20	0.02	12:1	0.81	12	1.00	6
4546+65	4547+55	31,340	100	0.12	Type D	0.300	6.65	310	0.54	1.70	3.04	9.69	3.97	0.20	0.01	12:1	0.57	12	1.00	6
4585+20	4586+70	76,134	100	0.34	Type D	0.300	5.22	485	0.26	0.40	20.21	25.43	2.50	0.20	0.06	9:1	0.87	12	0.14	6
4586+70	4588+00	178,177	100	0.15	Type D	0.300	6.32	1640	0.20	1.20	22.78	29.09	2.30	0.20	0.01	12:1	1.88	12	0.12	6
4588+00	4589+50	217,532	100	0.12	Type D	0.300	6.65	1680	0.01	0.25	112.00	118.65	1.70	0.12	0.01	12:1	1.02	12	0.12	6
4589+50	4590+00	180,712	100	0.10	Type D	0.300	6.94	1860	0.01	0.25	124.00	130.94	1.70	0.12	0.02	10:1	0.85	12	0.14	6
4590+00	4590+50	205,441	100	0.14	Type D	0.300	6.42	1685	0.20	1.20	23.40	29.82	2.26	0.20	0.02	11:1	2.14	12	0.13	8
4590+50	4591+55	102,796	100	0.21	Type D	0.300	5.84	1475	0.20	1.20	20.49	26.33	2.45	0.20	0.01	8:1	1.15	12	0.18	6
4603+45	4605+05	30,249	100	0.13	Type D	0.300	6.53	305	0.16	0.31	16.40	22.93	2.65	0.20	0.01	13:1	0.37	12	0.28	6
4605+05	4606+00	43,206	100	0.08	Type D	0.300	7.32	430	0.17	0.32	22.40	29.71	2.27	0.20	0.02	13:1	0.45	12	0.28	6
4667+25	4668+25	11,899	100	0.08	Type D	0.300	7.32	130	0.08	0.23	9.42	16.74	3.14	0.20	0.01	13:1	0.17	12	0.19	6
4764+25	4765+65	31,596	100	0.07	Type D	0.300	7.55	260	0.19	1.10	3.94	11.49	3.72	0.20	0.03	9:1	0.54	12	0.24	6
4900+45	4903+00	175,190	100	0.05	Type D	0.300	8.17	965	0.21	1.21	13.29	21.46	2.76	0.20	0.03	35:1	2.22	12	0.06	12
4903+00	4904+75	86,953	100	0.05	Type D	0.300	8.17	845	0.23	1.23	11.45	19.61	2.89	0.20	0.03	9:1	1.16	12	0.13	6

*Intensity calculated with 2-year return period with tc as duration or the 5-year/1-hour storm, whichever is greater.

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Class	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Peak Runoff Rate (CFS)	Size of Diversion Berm (in)	CWD Pipe Slope (ft/ft)	CWD Pipe Size (in)
4905+65	4908+75	161,657	100	0.09	D	0.80	11.26	783	0.24	1.20	10.88	22.13	2.71	0.20	2.01	18	0.094	8
4909+15	4910+35	71,796	100	0.06	D	0.80	12.37	770	0.23	1.20	10.69	23.07	2.65	0.20	0.87	18	0.159	6
5033+45	5036+30	86,265	100	0.10	D	0.80	10.98	433	0.08	0.70	10.31	21.29	2.77	0.20	1.10	12	0.158	6
5063+55	5065+00	48,676	100	0.06	D	0.80	12.37	491	0.07	0.68	12.03	24.41	2.56	0.20	0.57	12	0.135	6
5065+00	5069+85	125,000	100	0.06	D	0.80	12.37	408	0.09	0.72	9.44	21.82	2.73	0.20	1.57	12	0.099	8
5098+65	5105+30	201,507	100	0.02	D	0.80	16.00	584	0.06	1.75	5.56	21.56	2.75	0.50	6.36	12	0.080	12 (2)
5105+35	5109+20	145,908	100	0.02	D	0.80	16.00	452	0.07	1.90	3.96	19.96	2.87	0.50	4.80	12	0.085	12
5169+95	5170+40	11,730	100	0.36	D	0.80	8.14	325	0.46	1.60	3.39	11.53	3.72	0.30	0.30	12	n/a	n/a
5176+65	5180+00	152,368	100	0.10	D	0.80	10.98	952	0.23	1.20	13.22	24.20	2.57	0.20	1.80	18	0.183	8
5180+00	5182+30	134,110	100	0.13	D	0.80	10.33	1434	0.19	1.10	21.73	32.06	2.16	0.20	1.33	12	0.179	6
5229+15	5234+10	211,968	100	0.23	D	0.80	9.04	742	0.22	1.20	10.31	19.35	2.92	0.20	2.84	18	0.093	12
5234+10	5236+55	154,556	100	0.18	D	0.80	9.57	954	0.23	1.20	13.25	22.82	2.66	0.20	1.89	12	0.197	8
5237+35	5240+00	118,458	100	0.20	D	0.80	9.34	853	0.25	1.25	11.37	20.71	2.81	0.20	1.53	18	0.354	6
5240+00	5246+10	215,626	100	0.22	D	0.80	9.13	824	0.27	1.25	10.99	20.12	2.86	0.20	2.83	18	0.233	8
5256+20	5257+21	2,699	100	0.31	D	0.80	8.43	30	0.30	1.35	0.37	8.80	4.11	0.20	0.05	12	0.405	6
5287+30	5288+55	45,866	100	0.14	D	0.80	10.15	721	0.16	0.97	12.39	22.54	2.68	0.20	0.56	12	0.221	6
5288+60	5289+95	63,267	100	0.14	D	0.80	10.15	922	0.14	0.90	17.07	27.23	2.40	0.20	0.70	12	0.142	6
5313+76	5316+40	46,851	100	0.03	D	0.80	14.55	396	0.15	0.95	6.95	21.50	2.75	0.20	0.59	12	0.065	6
5348+30	5350+85	46,418	100	0.06	D	0.40	8.95	689	0.09	1.30	8.83	17.78	3.05	0.50	1.62	12	0.124	8
5350+85	5353+50	123,508	100	0.03	D	0.40	10.52	599	0.10	1.40	7.13	17.65	3.06	0.50	4.34	18	0.209	12
5401+15	5402+30	46,022	100	0.07	D	0.30	7.55	346	0.18	2.90	1.99	9.54	3.99	0.31	1.31	12	0.186	6

TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSION

Start Sta.	End Sta.	Area of Drainage (sq ft)	Length of Sheet Flow (ft)	Slope of Ground during Sheet Flow (ft/ft)	Soil Type	Roughness Coefficient (n)	Time of Concentration in Sheet Flow (min)	Length of Shallow Concentrated Flow (ft)	Slope of Ground during Shallow Concentrated Flow (ft/ft)	Shallow Concentrated Flow Velocity (ft/sec)	Time of Concentration in Shallow Concentrated Flow (min)	Total Time of Concentration (min)	2-Year Storm Rainfall Intensity (in/hr)	Runoff Coefficients for the Rational Equation	Channel Longitudinal Slope (ft/ft)	Channel Side Slope (H:V) (ft/ft)	Peak Runoff Rate (CFS)	Size of Diversion Sock (in)	Pipe Slope (ft/ft)	Size of Slope Pipe (in)
5609+50	5611+30	123,303	100	0.04	Type D	0.300	8.60	976	0.05	0.55	29.58	38.18	1.92	0.16						
		75,828			Type D			385	0.10	1.45	4.43	5.00	4.82	0.31	0.09	19:1	3.47	12	0.06	12
5611+30	5611+80	140,764	100	0.08	Type D	0.300	7.32	878	0.08	0.70	20.90	28.22	2.34	0.20						
		62,475			Type D			335	0.08	1.30	4.29	5.00	4.82	0.31	0.02	25:1	3.66	12	0.08	12
5611+80	5613+00	51,408	100	0.05	Type D	0.300	8.17	903	0.06	0.60	25.08	33.25	2.11	0.16						
		29,998			Type D			310	0.09	1.35	3.83	5.00	4.82	0.31	0.02	37:1	1.43	12	0.09	8
5613+00	5615+80	117,624	100	0.08	Type D	0.300	7.32	918	0.08	0.70	21.86	29.17	2.30	0.20						
		74,063			Type D			295	0.10	1.45	3.39	5.00	4.82	0.31	0.03	23:1	3.78	12	0.06	12
5589+10	5591+50	35,661	100	0.22	Type D	0.300	5.78	337	0.34	1.40	4.01	9.79	3.96	0.20						
		37,723			Type D			320	0.36	2.70	1.98	5.00	4.82	0.40						
		34,218			Type D			133	0.20	1.20	1.85	5.00	4.82	0.20	0.04	13:1	3.07	12	0.11	12
5587+00	5588+60	1,263	55	0.11	Type D	0.300	5.15	333	0.11	1.50	3.70	8.85	4.10	0.20						
		48,466	45	0.07	Type D	0.800	8.31	217	0.13	0.85	4.25	12.57	3.58	0.40						
		22,320			Type D									0.20	0.02	25:1	1.62	12	0.15	8
5542+00	5544+25	56,726	100	0.13	Type D	0.300	6.53	455	0.07	0.65	11.67	18.20	3.01	0.20	0.01	30:1	0.78	12	0.08	6
5496+00	5501+00	211,049	100	0.02	Type D	0.300	10.11	685	0.08	0.70	16.31	26.42	2.44	0.20	0.01	17:1	2.37	12	0.08	12
5501+00	5504+00	181,211	100	0.06	Type D	0.300	7.82	910	0.06	0.60	25.28	33.10	2.12	0.20	0.02	61:1	1.76	12	0.05	12
5504+00	5507+30	183,710	100	0.05	Type D	0.300	8.17	1100	0.06	0.60	30.56	38.72	1.90	0.20	0.03	32:1	1.60	12	0.07	8
5424+75	5427+50	11,996	100	0.09	Type D	0.300	7.12	100	0.08	0.70	2.38	9.50	4.00	0.20						
		110,419			Type D			660	0.13	1.60	6.88	6.88	4.44	0.50	0.02	9:1	5.85	18	0.20	8
5427+50	5429+00	23,921	100	0.11	Type D	0.025	2.13	370	0.14	1.70	3.63	5.75	4.66	0.50	0.04	13:1	1.28	12	0.22	6