



Assessing Aquatic Organism Passage Potential in Three Clearfield County Watersheds for Native Brook Trout Populations



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1. Introduction and Background

Western Pennsylvania Conservancy (WPC) staff approached the Coldwater Heritage Partnership (CHP) about the potential to complete a project that would evaluate aquatic organism passage (AOP) in watersheds found in Clearfield County, Pennsylvania that previously had coldwater conservation plans completed. WPC proposed completing AOP surveys utilizing the North Atlantic Aquatic Connectivity Collaborative (NAACC) protocol for evaluating road-stream intersections as a way to inform stakeholders about locations that had conservation plans written as to the most beneficial locations for AOP replacements for increased aquatic organism passage potential as well as increased flood resiliency for local communities. An additional benefit from this project would include increased recreational opportunities for anglers due to native and wild trout species being able to access more habitat allowing for more robust populations higher in each respective watershed which equates to more miles of streams to fish.

2. Project Area Description

The original proposal that was submitted to CHP was to survey at least 70 road-stream intersections using the NAACC protocol in three Clearfield County watersheds including Lick Run, Upper Moshannon, and Lower Clearfield Creeks. WPC staff began our NAACC surveys in November 2020 and initial assessments showed that our focal watersheds had less than optimal water quality which would inhibit native or wild trout populations from existing or the surveys were completed by another conservation partner before we received our CHP funding (i.e. Lick Run watershed). In an attempt to make sure that CHP funds were expended in watersheds that actually had a higher potential for documenting restoration projects that could possibly benefit native and wild reproducing salmonid populations, WPC staff expanded our survey areas by utilizing GIS planning. After reviewing PFBC fisheries data for Clearfield County, we continued surveys with a new focus on Class A and Naturally Reproducing trout streams which resulted in NAACC surveys being completed in six additional watersheds (Figure 1). As a result of our expanded project scope several potential AOP projects were identified as a result of our survey efforts.

3. Detailed Maps

WPC staff completed mapping that will aid in the visualization of restoration projects as well as demonstrating locations that were surveyed across Clearfield County (Figs. 1-3). All watersheds surveyed per this contract are identified in Figure 1 with the original proposed watersheds in gray while the added watersheds are tan.

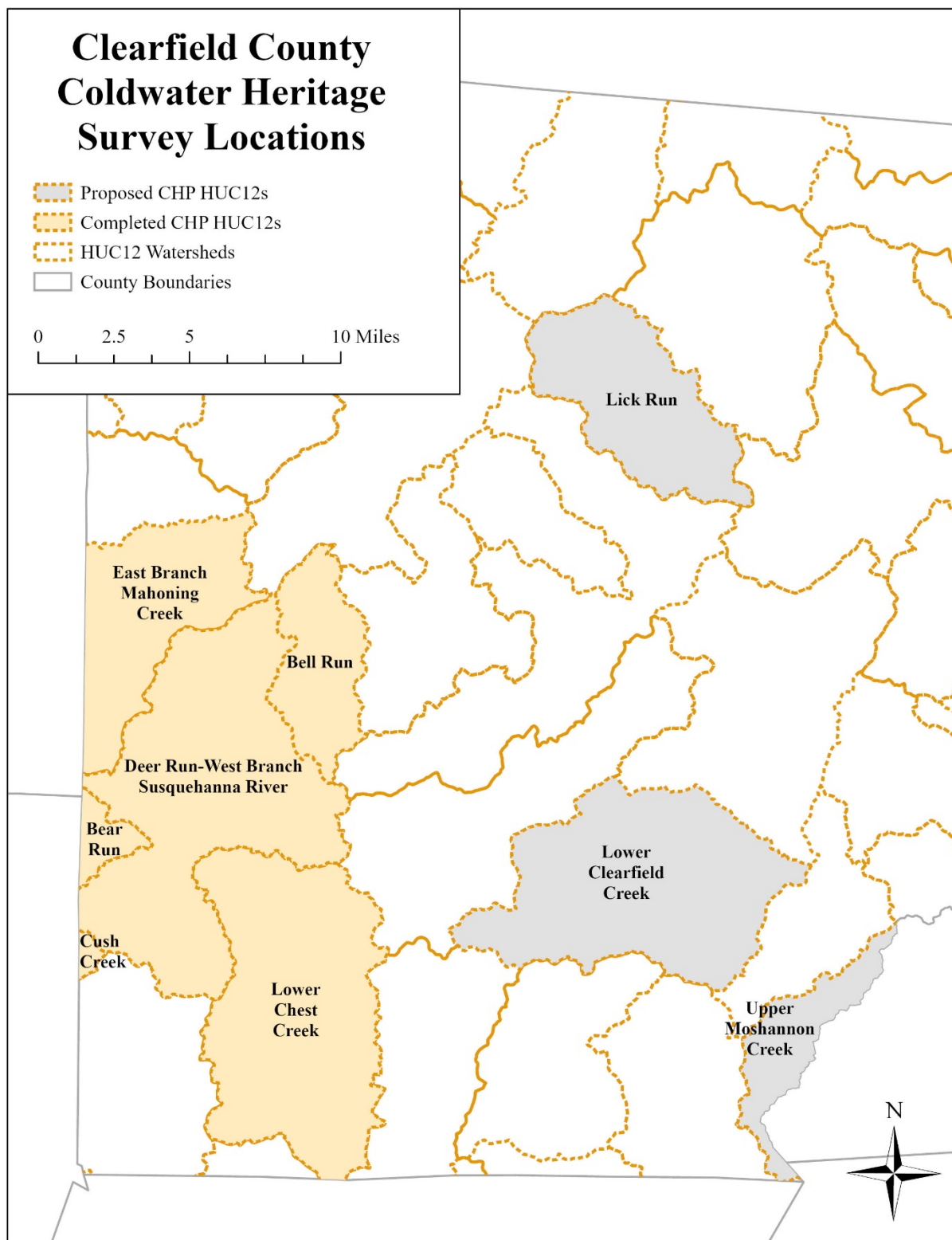


Figure 1. Watersheds where road-stream intersections were surveyed in Clearfield County, Pennsylvania.

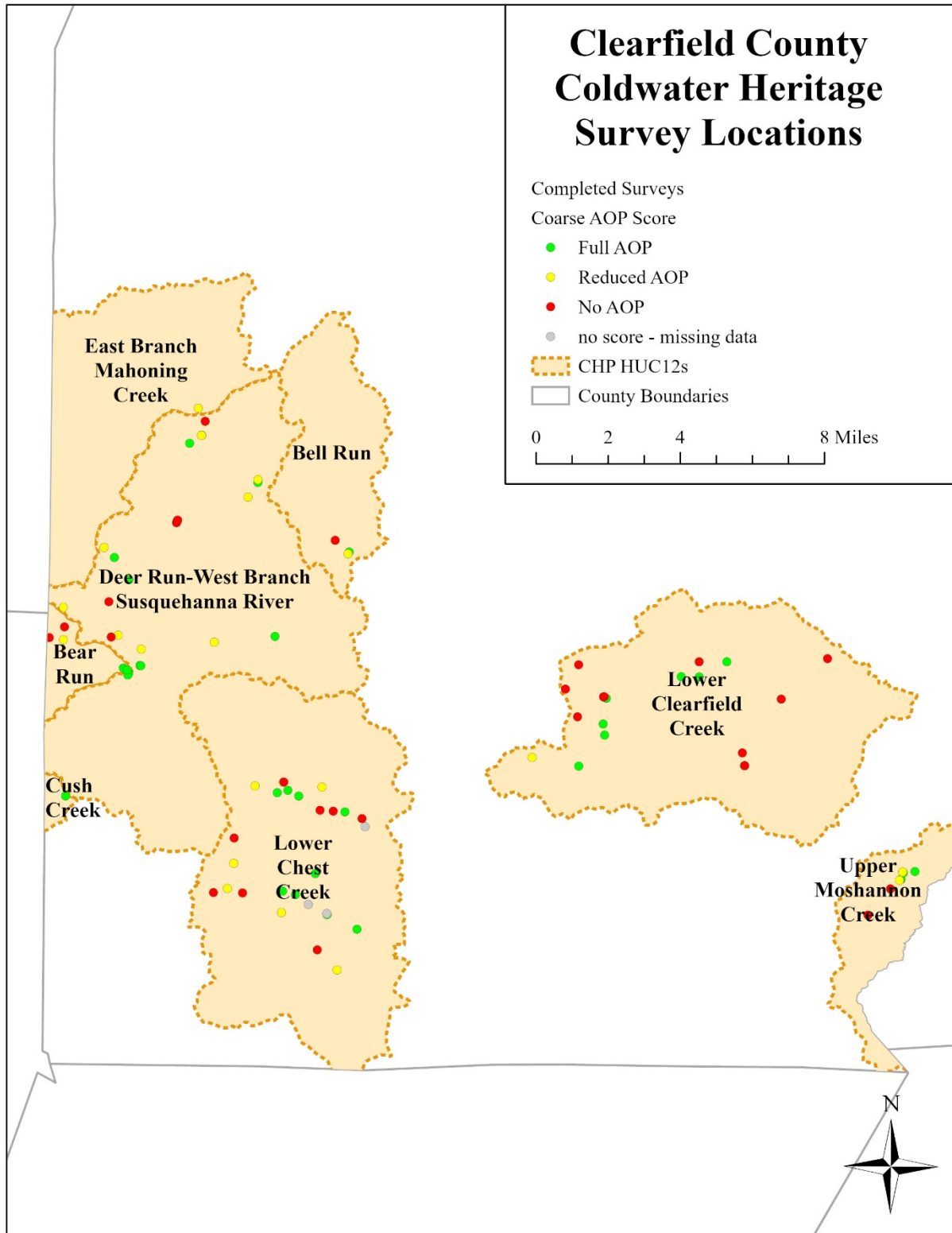


Figure 2. Road-stream intersection scorings for all 87 surveyed crossings. Green locations have full AOP, yellow sites have reduced AOP, while red dots have no AOP, and gray dots are sites that are missing data due to being inaccessible normally from livestock fencing.

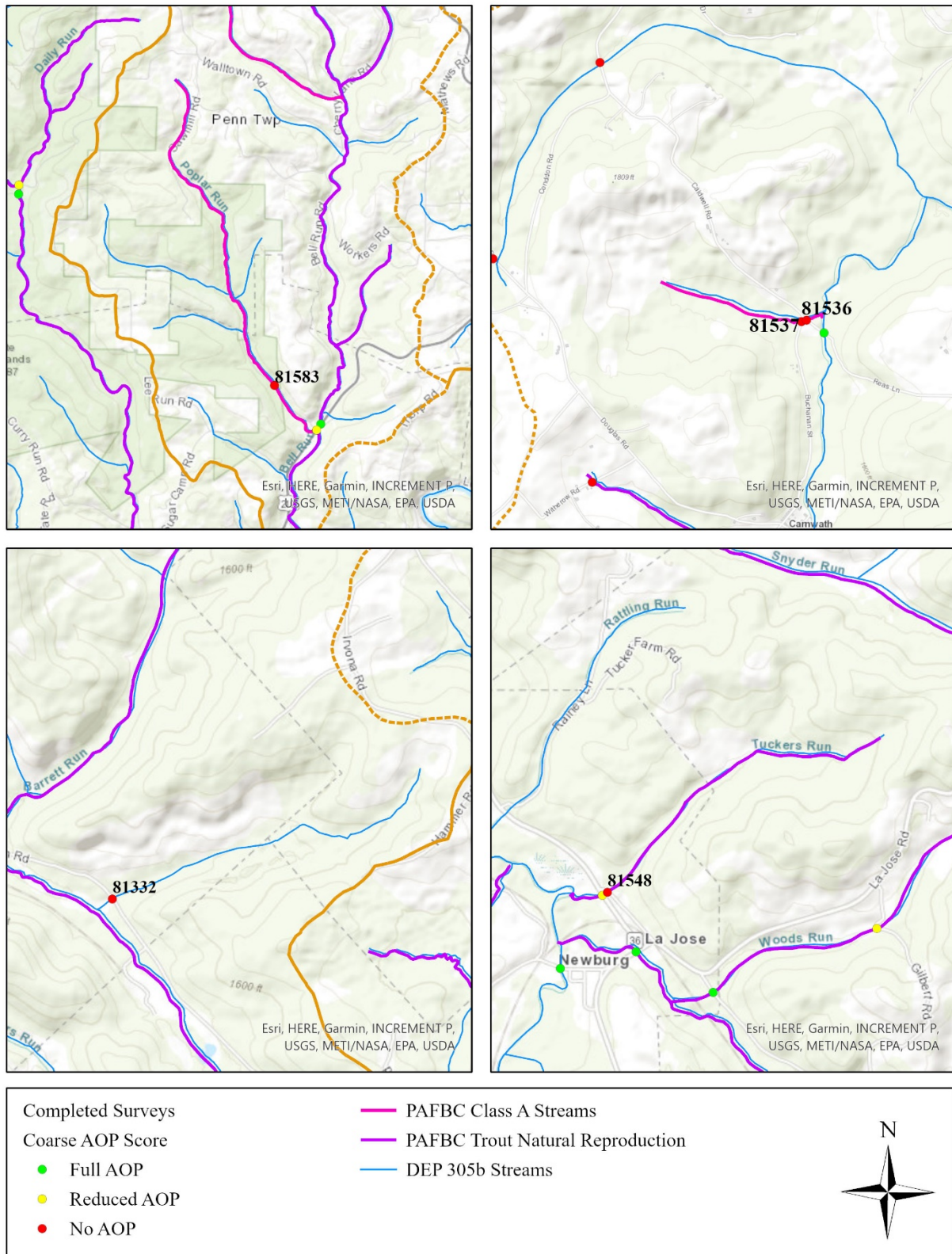


Figure 3. Four potential AOP projects that would greatly benefit native and wild salmonid resources as well as increase flood resiliency.

4. Previously Existing Information and Current Data Analysis

Before this CHP, no CHP planning project has solely focused on AOP surveys utilizing the NAACC protocol. WPC chose to embark upon this project because there were several watersheds in Clearfield County that already had CHP plans written which would allow for implementation projects to be easily leveraged. Unfortunately, those watersheds didn't have excellent water quality or AOP crossings that allowed for a significant improvement in fish passage, so WPC staff discussed other project locations with Rachel Kester and she agreed that we should broaden our survey focus. By increasing our focal area to allow for a greater potential of finding restoration projects that could increase native and wild reproducing trout species distributions in western Pennsylvania. WPC staff completed a total of 87 AOP crossings as part of this contract (Figure 2).

Examining the results generated from the NAACC scoring has resulted in 33 sites that were considered not to be a barrier for aquatic organisms resulting in full aquatic organism passage potential being met; twenty-one sites were considered to be reduced AOP for aquatic organisms; while thirty of the 87 sites, or just over 34% of the crossings examined were found to be complete barriers to aquatic organisms in the surveyed watersheds. Three of the locations examined resulted in no score/missing data rankings because one aspect of the survey could not be completed, in our case it was usually due to an inaccessible outlet or inlet because of livestock fencing prohibiting us access to properly score one aspect of the survey (Figure 4).



Figure 4. Inaccessible outlet due to livestock fencing in Westover, PA. NAACC Site ID 81334.

5. Areas of Concern and Opportunities

The goal of this AOP assessment was to identify road-stream intersections that are in poor condition in Clearfield County that harbor native or wild trout populations. WPC staff utilized GIS to compare surveyed crossings to streams that were either listed as Natural Reproduction or Class A by the Pennsylvania Fish and Boat Commission. We have identified several projects that would result in increased fish passage as well as improved flood resiliency for local communities (Table 1). All of the proposed crossings are failing structures that are negatively impacting aquatic communities by not allowing for adequate fish passage chiefly due to perched and undersized structures. All structure evaluations can be found on the www.naacc.org website that shows field images as well as crossing dimensions.

Table 1. Potential aquatic organism passage restoration projects identified in Clearfield County, Pennsylvania.

Stream Name	NAACC Crossing ID	PFBC Classification	Miles of Potential Reconnected Habitat
Tuckers Run	81548	Natural Reproduction	1.37
Woods Run	81326	Natural Reproduction	0.58
UNT 26821 to Wilson Run	81332	Unassessed Stream*	1.4
UNT to Potts Run (RM 5.47)	81537	Class A	0.1
UNT to Potts Run (RM 5.47)	81536	Class A	0.4
Poplar Run	81583	Class A	6.1
	Total Miles Improved		9.95

* = Wilson Run, the receiving water, it is a natural reproduction stream according to PFBC.

6. Recommendations

WPC staff have completed 87 NAACC crossing evaluations as part of this CHP planning grant. We have identified six potential restoration projects in Clearfield County (Table 1) that could aid in the reconnection of important salmonid resources in Pennsylvania. The most important crossing to complete a restoration project on in Clearfield County is NAACC ID 81583 (Cover Photo). This crossing is a complete barrier to aquatic organisms and is found on a Class A native Brook trout stream, the highest biomass designation from PFBC. By restoring aquatic connectivity at this site,

over 6 miles of aquatic habitat will be reconnected resulting in an improved fishery. WPC staff are currently working with the PGC on addressing this crossing since it is on a PGC access road to state game land (SGL) 87. There are still numerous crossings to be surveyed in the county but they should be prioritized before future survey work begins to determine if the surveys are being completed solely for flood resiliency or for the reconnection of high-quality stream habitat for native and wild trout. There are serious water quality issues associated with several watersheds as a result of acid mine drainage which is pervasive in Clearfield County which render many streams in the region completely lifeless.

7. Future Funding Opportunities and/or Potential Partners

WPC believes there are many potential project partners in Clearfield County that could help to support this work including the Clearfield County Conservation District, numerous townships and boroughs, as well as Trout Unlimited, and Pennsylvania Fish and Boat Commission. WPC has been actively working with the Pennsylvania Game Commission (PGC) to prioritize failing crossings on PGC lands that will offer the greatest benefit to coldwater species of conservation significance.

8. Summary and Conclusions

Being able to adapt a project during its initial phases has allowed for WPC staff to discover numerous locations that could benefit aquatic species in Clearfield County. If the original project scope wasn't modified to include additional less anthropogenically impacted waters these valuable locations wouldn't have been identified as restoration priorities. In addition, precious planning funds would have been spent surveying locations that would offer limited benefit to aquatic resources resulting in less conservation benefit to coldwater species in Pennsylvania.

Survey Id	Crossing Code	Alignment	Aqua Pass Score	AOP	Approved	Coordinator	Crossing Condition	Crossing Span	Crossing Type	Data Checked Coordinator	Date Data Checked	Date First Entered	Date Last Updated	Date Observed	Evaluation
80775	xy4080059178353831	Flow-Aligned	0.787995	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	Minor barrier
80776	xy4080097378353008	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	12/3/2020	11/12/2020	12/3/2020	11/5/2020	No barrier
80777	xy4079711778358638	Flow-Aligned	0.55821	No AOP	TRUE	Long, Eli	Poor	Unknown	Culvert	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	Moderate barrier
80778	xy4078659178370438	Flow-Aligned	0.59746	No AOP	TRUE	Long, Eli	Poor	Severe	Culvert	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	Moderate barrier
80780	xy4080416678345735	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	No barrier
80781	xy4080392178352170	Flow-Aligned	0.864638	Reduced AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	1/22/2021	11/12/2020	11/12/2020	11/5/2020	Insignificant barrier
80782	xy4080362278351813	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	11/12/2020	11/12/2020	11/5/2020	No barrier
80783	xy4084630778436102	Flow-Aligned	0.534635	No AOP	TRUE	Long, Eli	OK	Moderate	Multiple Culvert	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	Moderate barrier
80783	xy4084630778436102	Flow-Aligned	0.534635	No AOP	TRUE	Long, Eli	OK	Moderate	Multiple Culvert	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	Moderate barrier
80784	xy4085142078437268	Flow-Aligned	0.597571	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	1/22/2021	11/12/2020	11/12/2020	11/5/2020	Moderate barrier
80785	xy4087309678416811	Skewed (>45°)	0.320351	No AOP	TRUE	Long, Eli	Poor	Severe	Culvert	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	Significant barrier
80786	xy4088945678392469	Flow-Aligned	0.599682	No AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	12/3/2020	11/12/2020	11/12/2020	11/5/2020	Moderate barrier
81326	xy4083666078659727	Flow-Aligned	0.438994	Reduced AOP	TRUE	Long, Eli	Poor	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Moderate barrier
81327	xy4082087178636741	Flow-Aligned	-1	no score - missing data	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	no score - missing data
81328	xy4088175978762532	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81329	xy4082733978660621	Flow-Aligned	0.722826	No AOP	TRUE	Long, Eli	Poor	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Minor barrier
81330	xy4082703478653630	Flow-Aligned	0.078947	No AOP	TRUE	Long, Eli	Poor	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Severe barrier
81331	xy4082677478647463	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81332	xy4082414978638411	Flow-Aligned	0.444034	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Moderate barrier
81333	xy4078548978656482	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81334	xy4078592778656613	Flow-Aligned	-1	no score - missing data	TRUE	Long, Eli	Poor	Moderate	Partially Inaccessible	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	no score - missing data
81335	xy4077968678640618	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81336	xy4079342178673310	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81337	xy4088104178762999	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81338	xy4079476578680140	Flow-Aligned	0.831804	Full AOP	TRUE	Long, Eli	OK	Bankfull/Acti	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Insignificant barrier
81339	xy4079568178709345	Flow-Aligned	0.869267	Reduced AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Insignificant barrier
81340	xy4079400778716615	Skewed (>45°)	0.40678	No AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Moderate barrier
81341	xy4079394078701276	Skewed (>45°)	0.093072	No AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Severe barrier
81342	xy4078618078680535	Skewed (>45°)	0.402946	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Moderate barrier
81343	xy4088377778765372	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81344	xy4088301578763432	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81345	xy4089574978804722	Skewed (>45°)	0.618993	No AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Minor barrier
81346	xy4089495678797203	Flow-Aligned	0.703278	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Minor barrier
81347	xy4090011078796718	Flow-Aligned	0.41421	No AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	Moderate barrier
81348	xy4083425978683326	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81349	xy4083297078671902	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	1/22/2021	1/22/2021	1/22/2021	1/21/2021	No barrier
81528	xy4077129278661491	Skewed (>45°)	0.155365	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/26/2021	3/17/2021	Severe barrier
81529	xy4081594378705881	Skewed (>45°)	0.318491	No AOP	TRUE	Long, Eli	Poor	Moderate	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/16/2021	Significant barrier
81530	xy4080580078706124	Skewed (>45°)	0.720186	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/16/2021	Minor barrier
81531	xy4084915378548541	Skewed (>45°)	0.745364	Reduced AOP	TRUE	Long, Eli	Poor	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Minor barrier
81532	xy4086556978524588	Flow-Aligned	0.431349	No AOP	TRUE	Long, Eli	Poor	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Moderate barrier
81533	xy4084577178523834	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	No barrier
81534	xy4085829478510309	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	No barrier
81535	xy4086274178511043	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	No barrier
81536	xy4087361778510929	Flow-Aligned	0.349357	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Significant barrier
81537	xy4087314178509640	Flow-Aligned	0.130435	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Severe barrier
81538	xy4087369578510561	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	No barrier
81539	xy4076328378650995	Skewed (>45°)	0.603297	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Minor barrier
81540	xy4088190578469902	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	No barrier
81541	xy4088792378460479	Skewed (>45°)	0.330846	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Significant barrier

81542	xy4088799478445740	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	No barrier
81543	xy4088645378524251	Flow-Aligned	0.155365	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Severe barrier
81544	xy4087665178531197	Flow-Aligned	0.40678	No AOP	TRUE	Long, Eli	Poor	Moderate	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	Moderate barrier
81545	xy4078952378666490	Flow-Aligned	-1	no score - missing data	TRUE	Long, Eli	OK	No data	Partially Inaccessible	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	no score - missing data
81546	xy4080188978662884	Skewed (>45°)	0.769994	Full AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/16/2021	Minor barrier
81547	xy4083523478677681	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/16/2021	No barrier
81548	xy4083858778679850	Flow-Aligned	0.109991	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/16/2021	Severe barrier
81549	xy4083841078680220	Flow-Aligned	0.907912	Reduced AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/16/2021	Insignificant barrier
81550	xy4083689978695066	Flow-Aligned	0.483755	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/16/2021	Moderate barrier
81551	xy4088184078460312	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/18/2021	3/18/2021	3/18/2021	3/17/2021	No barrier
81577	xy4088488178756582	Flow-Aligned	0.932427	Full AOP	TRUE	Long, Eli	New	Bankfull/Acti	Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Insignificant barrier
81578	xy4097746878724929	Flow-Aligned	0.884005	Reduced AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Insignificant barrier
81579	xy4098834778726834	Flow-Aligned	0.741363	Reduced AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Minor barrier
81580	xy4098309378723120	Skewed (>45°)	0.636321	No AOP	TRUE	Long, Eli	Poor	Moderate	Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Minor barrier
81581	xy4097750278724883	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/26/2021	3/25/2021	3/26/2021	3/24/2021	No barrier
81582	xy4088476778756090	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	No barrier
81583	xy4093575878653612	Flow-Aligned	0.093072	No AOP	TRUE	Long, Eli	Poor	Severe	Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Severe barrier
81584	xy4095984678694853	Flow-Aligned	0.707442	Reduced AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Minor barrier
81585	xy4095875578694865	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	No barrier
81586	xy4094230178737833	Flow-Aligned	0.5	No AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Moderate barrier
81587	xy4094331978737318	Skewed (>45°)	0.427402	No AOP	TRUE	Long, Eli	Poor	Severe	Multiple Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Moderate barrier
81587	xy4094331978737318	Skewed (>45°)	0.427402	No AOP	TRUE	Long, Eli	Poor	Severe	Multiple Culvert	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	Moderate barrier
81588	xy4097427178731262	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	3/26/2021	3/25/2021	3/25/2021	3/24/2021	No barrier
81630	xy4095285578700079	Flow-Aligned	0.458036	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	3/29/2021	3/29/2021	3/29/2021	3/24/2021	Moderate barrier
81664	xy4093110478646158	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	4/12/2021	4/8/2021	4/8/2021	3/31/2021	No barrier
81665	xy4092812378770564	Flow-Aligned	0.914732	Full AOP	TRUE	Long, Eli	OK	Bankfull/Acti	Culvert	Long, Eli	4/12/2021	4/9/2021	4/12/2021	3/31/2021	Insignificant barrier
81666	xy4091038878773306	Flow-Aligned	0.048338	No AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	4/12/2021	4/9/2021	4/12/2021	3/31/2021	Severe barrier
81667	xy4090795078797340	Flow-Aligned	0.306994	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	5/6/2021	4/9/2021	4/9/2021	3/31/2021	Significant barrier
81668	xy4091933678762790	Flow-Aligned	0.8773	Full AOP	TRUE	Long, Eli	OK	Bankfull/Acti	Culvert	Long, Eli	4/12/2021	4/9/2021	4/9/2021	3/31/2021	Insignificant barrier
81669	xy4089140478755963	Flow-Aligned	0.441152	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	4/12/2021	4/9/2021	4/9/2021	3/31/2021	Moderate barrier
81670	xy4093038878646814	Skewed (>45°)	0.838619	Reduced AOP	TRUE	Long, Eli	New	Bankfull/Acti	Culvert	Long, Eli	4/12/2021	4/9/2021	4/9/2021	3/31/2021	Insignificant barrier
81671	xy4089703178685126	No data	1	Full AOP	TRUE	Long, Eli	No data	No data	Bridge Adequate	Long, Eli	4/12/2021	4/9/2021	4/9/2021	3/3/2021	No barrier
81672	xy4089446078717289	Flow-Aligned	0.838088	Reduced AOP	TRUE	Long, Eli	New	Bankfull/Acti	Culvert	Long, Eli	4/12/2021	4/9/2021	4/9/2021	3/31/2021	Insignificant barrier
81674	xy4089698378768248	Flow-Aligned	0.7446	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	4/12/2021	4/9/2021	4/12/2021	3/31/2021	Minor barrier
81675	xy4089620678771880	Skewed (>45°)	0	No AOP	TRUE	Long, Eli	Poor	Moderate	Culvert	Long, Eli	4/12/2021	4/9/2021	4/9/2021	3/31/2021	Severe barrier
81676	xy4093211478776132	Flow-Aligned	0.73773	Reduced AOP	TRUE	Long, Eli	OK	Severe	Culvert	Long, Eli	4/12/2021	4/9/2021	4/9/2021	3/31/2021	Minor barrier
81777	xy4083224478795370	Skewed (>45°)	0.749694	Full AOP	TRUE	Long, Eli	OK	Moderate	Culvert	Long, Eli	4/26/2021	4/22/2021	4/26/2021	4/15/2021	Minor barrier

Flow Condition	GIS Latitude	GIS Longitude	GPS X Coordinate	GPS Y Coordinate	GPS Distance	Inlet Type	Location Description	Number Of Culverts	Observer	Road	Road Fill Height	Road Type	Scour Pool
Typical low-flow	40.800591	-78.353831	-78.353831	40.800591	0	Projecting	Just off of 153	1	Chapman, Eric	Eureka St	2.8	Paved	Large
No data	40.800973	-78.353008	-78.353008	40.800973	0		153 Bridge	-1	Chapman, Eric	PA 153	-1	Paved	No data
No Flow	40.797117	-78.358638	-78.358638	40.797117	0	Projecting	By Power Station	1	Chapman, Eric	Birch Rd	0.5	Paved	Large
Typical low-flow	40.786591	-78.370438	-78.370438	40.786591	0	Headwall and Wingwalls	Alder	1	Chapman, Eric	Alder Rd	1.5	Unpaved	Large
No data	40.804166	-78.345735	-78.345735	40.804166	0			-1	Chapman, Eric	Kirk St	-1	Paved	No data
Typical low-flow	40.803921	-78.35217	-78.35217	40.803921	0	Projecting	Int with 153	1	Chapman, Eric	Eureka St	0.5	Paved	Small
No data	40.803622	-78.351813	-78.351813	40.803622	0			-1	Chapman, Eric	PA 153	-1	Paved	No data
Typical low-flow	40.846307	-78.436102	-78.436102	40.846307	0	Projecting	At bendpadt small houss	2	Chapman, Eric	Spruce St	3.4	Paved	Large
Typical low-flow	40.846307	-78.436102	-78.436102	40.846307	0	Projecting	At bendpadt small houss	2	Chapman, Eric	Spruce St	3.4	Paved	Large
No Flow	40.85142	-78.437268	-78.437268	40.85142	0	Wingwalls	By rv	1	Chapman, Eric	Spruce St	1.7	Paved	None
Typical low-flow	40.873096	-78.416811	-78.416811	40.873096	0	Headwall and Wingwalls	Bottom of rough road	1	Chapman, Eric	Meade Rd	0.8	Unpaved	Large
Typical low-flow	40.889456	-78.392469	-78.392469	40.889456	0	Headwall and Wingwalls	By old farm	1	Chapman, Eric	Grange Ave	2.8	Paved	Large
Moderate	40.83666	-78.659727	-78.65936	40.83652	34.6	Wingwalls	bottom of steep hill off La Jose Rd	1	Chapman, Eric	Gilbert Rd	3	Unpaved	Large
Moderate	40.820871	-78.636741	-78.637	40.82074	26.2	Headwall	By trout nursery	1	Chapman, Eric	Holes Rd	3.2	Paved	Large
No data	40.881759	-78.762532	-78.76255	40.88166	11.1		Near 36-219 Int	-1	Chapman, Eric	PA 219 36	-1	Paved	No data
Typical low-flow	40.827339	-78.660621	-78.6606	40.82768	38	Projecting	near Gilford Rd Int	1	Chapman, Eric	Thompsontown Rd	2.2	Paved	None
Typical low-flow	40.827034	-78.65363	-78.65393	40.82761	69	Headwall	before sharp bend	1	Chapman, Eric	Thompsontown Rd	6.8	Paved	Small
No data	40.826774	-78.647463	-78.64787	40.82721	59.4		150 sign	-1	Chapman, Eric	Thompsontown Rd	-1	Paved	No data
Moderate	40.824149	-78.638411	-78.63861	40.82416	16.8	Headwall	Big dip in road	1	Chapman, Eric	Thompsontown Rd	1.5	Paved	Large
No data	40.785489	-78.656482	-78.65657	40.78584	39.8		At bend	-1	Chapman, Eric	North Camp Road	-1	Paved	No data
Moderate	40.785927	-78.656613	-78.65657	40.78583	11.4	Headwall	Small trib before curve	1	Chapman, Eric	N Camp Rd	3.4	Paved	Large
No data	40.779686	-78.640618	-78.64048	40.77952	21.8		At bend pulloff	-1	Chapman, Eric	N Camp Rd	-1	Paved	No data
No data	40.793421	-78.67331	-78.67427	40.79364	84.5		Open Grate Bridge	-1	Chapman, Eric	Five Points Rd	-1	Paved	No data
No data	40.881041	-78.762999	-78.76299	40.88104	0.8			-1	Chapman, Eric	Railroad	-1	Railroad	No data
Moderate	40.794765	-78.68014	-78.67997	40.79473	14.8	Headwall and Wingwalls	By Hugill Sanitation plant	1	Chapman, Eric	Five Points Rd	0	Paved	None
Moderate	40.795681	-78.709345	-78.70946	40.79613	50.9	Projecting	By tan garage	1	Chapman, Eric	Glenn Rd	2.4	Paved	None
Moderate	40.794007	-78.716615	-78.71727	40.79432	65.3	Wingwalls	at Int with Breth Ln	1	Chapman, Eric	Five Points Rd	3	Paved	Large
Moderate	40.79394	-78.701276	-78.70113	40.79426	37.7	Headwall and Wingwalls	By driveway	1	Chapman, Eric	Five Points Rd	0	Paved	Large
Moderate	40.78618	-78.680535	-78.68136	40.78569	88.4	Projecting	At curve	1	Chapman, Eric	Spring Run Rd	4.9	Unpaved	Large
No data	40.883777	-78.765372	-78.76504	40.88357	36.2			-1	Chapman, Eric	PA 36	-1	Paved	No data
No data	40.883015	-78.763432	-78.76343	40.88301	0.6			-1	Chapman, Eric	Railroad	-1	Railroad	No data
Moderate	40.895749	-78.804722	-78.80512	40.8958	34	Projecting	Just off 36	1	Chapman, Eric	Harkleroad Road	2.3	Paved	Large
Typical low-flow	40.894956	-78.797203	-78.79679	40.89532	53.4	Mitered to Slope	By tan building	1	Chapman, Eric	Bouch Rd	3.3	Unpaved	None
Typical low-flow	40.90011	-78.796718	-78.79667	40.90028	19.4	Projecting	Half mile from Bouch Rd	1	Chapman, Eric	Davidson Rd	4	Unpaved	Large
No data	40.834259	-78.683326	-78.6845	40.83468	109.4		By park	-1	Chapman, Eric	Town Rd	-1	Paved	No data
No data	40.83297	-78.671902	-78.6717	40.83274	30.7		Below int with La Jose Rd	-1	Chapman, Eric	Thompsontown Rd	-1	Paved	No data
Moderate	40.771292	-78.661491	-78.66155	40.77107	25.2	Headwall	Pine Road	1	Chapman, Eric	Pine Run Road	2	Unpaved	Large
Moderate	40.815943	-78.705881	-78.70587	40.81604	10.8	Headwall	By private lane	1	Chapman, Eric	Glenn Rd	2.2	Unpaved	Large
Moderate	40.8058	-78.706124	-78.70607	40.80566	16.2	Projecting	Just past Marshall Rd	1	Chapman, Eric	Glen Rd	1.6	Unpaved	Large
Moderate	40.849153	-78.548541	-78.54857	40.84921	6.8	Projecting	below wetland pond	1	Chapman, Eric	Lawyers Rd	1	Unpaved	None
Moderate	40.865569	-78.524588	-78.52428	40.86562	26.5	Other	By red garage	1	Chapman, Eric	Witherow Rd	5.7	Paved	None
No data	40.845771	-78.523834	-78.523884	40.84587	11.8		By abandoned RV	-1	Chapman, Eric	Brinks Rd	-1	Unpaved	No data
No data	40.858294	-78.510309	-78.51	40.85844	30.7			-1	Chapman, Eric	Fruit Hill Rd	-1	Unpaved	No data
No data	40.862741	-78.511043	-78.5111	40.86275	4.9			-1	Chapman, Eric	Douglas Rd	-1	Paved	No data
Moderate	40.873617	-78.510929	-78.51095	40.87359	3.5	Projecting	Near int with Reas Lane	1	Chapman, Eric	Buchanan Lane	3.7	Paved	Large
Moderate	40.873141	-78.50964	-78.50987	40.87324	22.3	Projecting	Between Buchanan and Bridge	1	Chapman, Eric	Read Lane	1.9	Paved	None
No data	40.873695	-78.510561	-78.50987	40.87324	77.1		Timber Deck Bridge	-1	Chapman, Eric	Read Lane	-1	Paved	No data
Moderate	40.763283	-78.650995	-78.6508	40.76323	17.5	Headwall and Wingwalls	At bend	1	Chapman, Eric	Pine Run Rd	0.7	Unpaved	Large
No data	40.881905	-78.469902	-78.46921	40.88133	86.5		Bottom of big dip	-1	Chapman, Eric	Clark Rd	-1	Paved	No data
Moderate	40.887923	-78.460479	-78.46079	40.88814	35.6	Headwall and Wingwalls	At bend before church	1	Chapman, Eric	PA 453	7	Paved	Large

No data	40.887994	-78.44574	-78.4453	40.88877	94		Old Bridge	-1	Chapman, Eric	Kellytown Rd	-1	Unpaved	No data
Moderate	40.886453	-78.524251	-78.52415	40.88632	17.1	Projecting	Just past Conndon Rd	1	Chapman, Eric	Caldwell Rd	6.4	Paved	Large
Moderate	40.876651	-78.531197	-78.53099	40.87629	43.8	Projecting	Just past greenhousepuse	1	Chapman, Eric	Douglas Road	3	Paved	Small
Moderate	40.789523	-78.66649	-78.66613	40.78961	31.8		at fence	1	Chapman, Eric	Camp Run Road	4	Paved	Large
Moderate	40.801889	-78.662884	-78.66268	40.80188	17.2	Projecting	At pull off	1	Chapman, Eric	Horseshoe Rd	7.7	Unpaved	Small
No data	40.835234	-78.677681	-78.67744	40.835312	22.1		By flea market	-1	Chapman, Eric	PA 36	-1	Paved	No data
Moderate	40.838587	-78.67985	-78.67977	40.83873	17.3	Headwall and Wingwalls	At Road Int	1	Chapman, Eric	Railroad St	9.3	Paved	Large
Moderate	40.83841	-78.68022	-78.67977	40.83873	52	Headwall and Wingwalls	Between road and hwy	1	Chapman, Eric	PA 36	7.3	Paved	None
Moderate	40.836899	-78.695066	-78.69746	40.8384	261.9	Projecting	At bend by RR	1	Chapman, Eric	Lee Hollow Rd	4.5	Unpaved	Large
No data	40.88184	-78.460312	-78.46031	40.88184	0.2			-1	Chapman, Eric	PA 453	-1	Paved	No data
Moderate	40.884881	-78.756582	-78.75655	40.88447	45.8	Wingwalls	by old school	1	Chapman, Eric	PA 219	1.7	Paved	None
Moderate	40.977468	-78.724929	-78.725311	40.978439	112.8	Headwall and Wingwalls	At T	1	Chapman, Eric	SGL Access Rd	2.4	Unpaved	Small
Moderate	40.988347	-78.726834	-78.726534	40.988477	29.1	Headwall and Wingwalls	at stream gate	1	Chapman, Eric	SGL Access Rd	2	Unpaved	Large
Moderate	40.983093	-78.72312	-78.722691	40.983158	36.8	Projecting	past y split	1	Chapman, Eric	SGL access road	4.3	Unpaved	Small
No data	40.977502	-78.724883	-78.724626	40.97747	21.9		gabion bridge	-1	Chapman, Eric	SGL access road	-1	Unpaved	No data
No data	40.884767	-78.75609	-78.756618	40.884806	44.6			-1	Chapman, Eric	Railroad	-1	Railroad	No data
Moderate	40.935758	-78.653612	-78.65388	40.93582	23.6	Projecting	at first bend after houses - private lane	1	Chapman, Eric	Popular Run Lane	0.6	Unpaved	Large
Moderate	40.959846	-78.694853	-78.694309	40.958847	120.2	Headwall and Wingwalls	Just before bigger stream	1	Chapman, Eric	Splash Dam Rd	1.2	Unpaved	Small
No data	40.958755	-78.694865	-78.694865	40.958626	14.4			-1	Chapman, Eric	Splash Dam Rd	-1	Unpaved	No data
Moderate	40.942301	-78.737833	-78.740065	40.942272	187.7	Projecting	By gaswell	1	Chapman, Eric	SGL access road	3.9	Unpaved	None
Moderate	40.943319	-78.737318	-78.73734	40.943793	52.8	Projecting	bottom of dip	2	Chapman, Eric	SGL Access Road	3.4	Unpaved	Small
Moderate	40.943319	-78.737318	-78.73734	40.943793	52.8	Projecting	bottom of dip	2	Chapman, Eric	SGL Access Road	3.4	Unpaved	Small
No data	40.974271	-78.731262	-78.730916	40.97308	135.7			-1	Chapman, Eric	SGL Access Road	-1	Unpaved	No data
Moderate	40.952855	-78.700079	-78.700149	40.95289	7.1	Other	first dip	1	Chapman, Eric	SGL Access Rd	5	Unpaved	Large
No data	40.931104	-78.646158	-78.64607	40.931095	7.5			-1	Chapman, Eric	PA 219	-1	Paved	No data
Moderate	40.928123	-78.770564	-78.770568	40.928172	5.5	Headwall and Wingwalls	By church	1	Chapman, Eric	Clover Run Rd	0.5	Paved	None
Moderate	40.910388	-78.773306	-78.773177	40.910303	14.4	Projecting	pst old farm headed west	1	Chapman, Eric	Weber Lane	3.8	Unpaved	Large
Moderate	40.90795	-78.79734	-78.797192	40.907884	14.5	Projecting	After gaswell access lane on left	1	Chapman, Eric	Weber Lane	5	Unpaved	Large
Moderate	40.919336	-78.76279	-78.762832	40.9191	26.5	Headwall and Wingwalls	by auto repair	1	Chapman, Eric	Clover Run Road	2	Paved	Small
Moderate	40.891404	-78.755963	-78.755793	40.891309	17.8	Projecting	middle of houses	1	Chapman, Eric	Clover Run Rd	2.8	Paved	Large
Moderate	40.930388	-78.646814	-78.646778	40.930373	3.5	Headwall and Wingwalls	By White House	1	Chapman, Eric	PA 219	1.2	Paved	None
No data	40.897031	-78.685126	-78.685054	40.897077	7.9			-1	Chapman, Eric	PA 219	-1	Paved	No data
Moderate	40.89446	-78.717289	-78.717317	40.894346	12.9	Headwall and Wingwalls	By church camp	1	Chapman, Eric	PA 219	3	Paved	None
Moderate	40.896983	-78.768248	-78.768324	40.896965	6.7	Headwall and Wingwalls	At big dip past Clear6	1	Chapman, Eric	Whiskey Run Rd	3	Unpaved	Large
Moderate	40.896206	-78.77188	-78.771989	40.89616	10.5	Wingwalls	Past Clear7	1	Chapman, Eric	Whiskey Run Rd	5.7	Unpaved	Small
Moderate	40.932114	-78.776132	-78.775888	40.932059	21.4	Headwall and Wingwalls	3430 Clover Run Rd	1	Chapman, Eric	Clover Run Rd	5.4	Paved	Small
Moderate	40.832244	-78.79537	-78.795325	40.832164	9.7	Headwall	By old barn	1	Chapman, Eric	PA 286	4.5	Paved	Large

State	Stream Name	Town	Armoring	Barrier_Name	Barrier Severity	Crossing Structure Length	Dry Passage	Inlet Grade	Inlet Height	Inlet Openness	Inlet Structure Type	Inlet Substrate Water Width
PA	Whiteside Run	Woodward (Clearfield)	None	None	None	31	No	At Stream Grade	5.2	0.477	Round Culvert	5.8
PA	Whiteside Run	Woodward (Clearfield)		No culvert								
PA	Whiteside Run	Woodward (Clearfield)	Extensive	Deformation	Severe	34.5	No	At Stream Grade	4	0.36	Round Culvert	1.8
PA	Whiteside Run	Woodward (Clearfield)	Not Extensive	None	None	22	No	At Stream Grade	3.8	0.733	Round Culvert	2.2
PA	Whiteside Run	Woodward (Clearfield)		No culvert								
PA	UNT to Whiteside Run	Woodward (Clearfield)	Not Extensive	None	None	30	No	At Stream Grade	4.2	0.381	Round Culvert	2
PA	UNT to Whiteside Run	Woodward (Clearfield)		No culvert								
PA	UNT to ClearfieldCreek	Bigler	Not Extensive	None	None	40	No	At Stream Grade	3.9	0.297	Round Culvert	0.8
PA	UNT to ClearfieldCreek	Bigler	Not Extensive	None	None	40	No	Inlet Drop	3.9	0.298	Round Culvert	0.6
PA	UNT to Clearfield Creek	Bigler	Extensive	Deformation	Moderate	40	No	At Stream Grade	2	0.079	Arch/Elliptical Cul	0
PA	North Branch Upper Morgan Run	Woodward (Clearfield)	None	Deformation	Severe	33	No	Perched	6.3	0.855	Round Culvert	2
PA	UNT to Wolf Run	Woodward (Clearfield)	Extensive	None	None	30	No	At Stream Grade	2	0.103	Round Culvert	0.9
PA	Woods Run	Curwensville	Not Extensive	Deformation	Moderate	64.5	No	At Stream Grade	3	0.107	Round Culvert	1.3
PA	Wilson Run	Curwensville	Not Extensive	Deformation	Moderate	31	No	At Stream Grade	5.2	0	Round Culvert	6.4
PA	Bear Run	Mahaffey		No culvert								
PA	UNT to Wilson Run	Ferguson (Clearfield)	None	Deformation,Free Fall	Severe	31	No	At Stream Grade	2.6	0.181	Round Culvert	2.5
PA	UNT to Wilson Run	Ferguson (Clearfield)	Extensive	Deformation,Free Fall	Severe	45	No	Inlet Drop	3	0.129	Round Culvert	2
PA	Barrett Run	Ferguson (Clearfield)		No culvert								
PA	UNT 26821 to Wilson Run	Curwensville	None	Debris/Sediment/Rock,Deformation,Free Fall	Severe	34.5	No	At Stream Grade	3	0.189	Round Culvert	2
PA	North Camp Run	Westover		No culvert								
PA	UNT 26832	Westover	None	Deformation	Minor	41	No	Inlet Drop	3	-1	Round Culvert	1.6
PA	UNT 26833 to North Camp Run	Westover		No culvert								
PA	Chest Creek	New Washington		No culvert								
PA	Bear Run	Mahaffey		No culvert								
PA	Snyder Run	New Washington	Extensive	None	None	30	No	At Stream Grade	5.4	1.88	Box Culvert	7.5
PA	UNT 26829 to Snyder Run	New Washington	Not Extensive	None	None	40	No	At Stream Grade	5.6	0.844	Round Culvert	3.3
PA	UNT 26829 to Snyder Run	New Washington	Not Extensive	Deformation	Minor	41	No	At Stream Grade	4	0.305	Round Culvert	1.7
PA	UNT 26829 to Snyder Run	Burnside (Clearfield 2TWP)	Extensive	None	None	33	No	At Stream Grade	2.9	0.568	Box Culvert	6.7
PA	Spring Run	New Washington	Extensive	None	None	38	No	Inlet Drop	4.7	0.452	Round Culvert	2.5
PA	Bear Run	Mahaffey		No culvert								
PA	Bear Run	Mahaffey		No culvert								
PA	UNT 27307 to Bear Run	Mahaffey	None	None	None	39	No	At Stream Grade	4	0.312	Round Culvert	2
PA	UNT 27033	Mahaffey	None	None	None	42	No	At Stream Grade	2	0.072	Round Culvert	1
PA	UNT 27033	Mahaffey	None	None	Minor	41	No	At Stream Grade	1.2	0.027	Round Culvert	0.6
PA	Chest Creek	Newburg (Clearfield)		No culvert								
PA	Woods Run	Newburg (Clearfield)		No culvert								
PA	UNT to Pine Run	Chest (Clearfield)	Extensive	None	None	46	No	At Stream Grade	2	0.058	Round Culvert	1.5
PA	UNT to Chest Creek	New Washington	None	Deformation	Severe	29	No	Inlet Drop	3	0.24	Round Culvert	1.4
PA	UNT to Chest Creek	New Washington	None	None	None	39.5	No	At Stream Grade	2	0.098	Arch/Elliptical Cul	3
PA	Potts Run	Jordan (Clearfield)	Not Extensive	None	None	30	No	Inlet Drop	4	0.135	Arch/Elliptical Cul	2
PA	UNT to Potts Run	Knox (Clearfield)	Extensive	Debris/Sediment/Rock,Deformation	Severe	32	No	Inlet Drop	1.2	0	Round Culvert	1
PA	Potts Run	Glen Hope		No culvert								
PA	Potts Run	Glen Hope		No culvert								
PA	Potts Run	Glen Hope		No culvert								
PA	UNT to Potts Run	Knox (Clearfield)	None	Deformation	Severe	40	No	At Stream Grade	3	0.131	Round Culvert	3
PA	UNT to Potts Run	Knox (Clearfield)	Extensive	None	None	40	No	At Stream Grade	2	0.058	Round Culvert	2
PA	Potts Run	Knox (Clearfield)		No culvert								
PA	Pine Run	Westover	Not Extensive	None	None	36	No	At Stream Grade	6.5	0.68	Round Culvert	6
PA	Potts Run	Knox (Clearfield)		No culvert								
PA	Little Potts Run	Knox (Clearfield)	Extensive	None	None	58	No	Inlet Drop	5.1	0.325	Round Culvert	2.8

PA	Potts Run	Knox (Clearfield)		No culvert								
PA	UNT to Potts Rin	Knox (Clearfield)	Extensive	Deformation	Minor	46	No	At Stream Grade	2	0.061	Round Culvert	1.4
PA	UNT to Potts Run	Knox (Clearfield)	Extensive	Deformation	Severe	41	No	At Stream Grade	4.2	0.307	Round Culvert	0.8
PA	UNT to North Camp Run	New Washington	Extensive	None	None	42	No		-1	-1		-1
PA	UNT to Chest Creek	New Washington	Extensive	None	None	62	No	At Stream Grade	2	0.029	Round Culvert	2
PA	Wilson Run	New Washington		No culvert								
PA	Tuckers Run	Newburg (Clearfield)	Extensive	Deformation	Minor	42	No	Inlet Drop	4	0.27	Round Culvert	2.9
PA	Tuckers Run	Newburg (Clearfield)	Not Extensive	None	None	59	No	At Stream Grade	7.3	0.442	Arch/Elliptical Cul	7
PA	UNT to Chest Creek	New Washington	None	Deformation	Minor	40	No	At Stream Grade	4.5	0.349	Round Culvert	3.3
PA	Potts Run	Knox (Clearfield)		No culvert								
PA	Whisky Run	Mahaffey	Not Extensive	None	None	50.4	No	At Stream Grade	7	3.378	Box Culvert	19.2
PA	UNT to Curry Run	Bell (Clearfield)	None	None	None	25	No	At Stream Grade	3.5	0.255	Arch/Elliptical Cul	3.5
PA	Beech Run	Bell (Clearfield)	None	None	None	26	No	Inlet Drop	5	0.732	Round Culvert	2.7
PA	UNT to Curry Run	Troutville	None	Deformation	Severe	40	No	At Stream Grade	2.7	0.136	Round Culvert	1.7
PA	Curry Run	Troutville		No culvert								
PA	Whisky Run	Bell (Clearfield)		No culvert								
PA	Poplar Run	Greenwood (Clearfield)	Extensive	Deformation	Severe	23	No	Inlet Drop	5.3	0.868	Round Culvert	3.6
PA	Daily Run	Grampian	None	None	None	25	No	At Stream Grade	4	0.445	Round Culvert	3
PA	Curry Run	Grampian		No culvert								
PA	UNT to Haslett Run	Mahaffey	None	Debris/Sediment/Rock,Deformation	Minor	40	No	At Stream Grade	2	0.075	Round Culvert	1
PA	Haslett Run	Mahaffey	None	Deformation	Severe	40	No	Perched	3	0.167	Round Culvert	1.6
PA	Haslett Run	Mahaffey	Not Extensive	Deformation	Severe	40	No	At Stream Grade	3	0.16	Round Culvert	2.4
PA	Curry Run	Troutville		No culvert								
PA	UNT to Curry Run	Bell (Clearfield)	None	None	None	23	No	Inlet Drop	1.6	0.079	Round Culvert	1.2
PA	Bell Run	Greenwood (Clearfield)		No culvert								
PA	UNT to Whiskey Run	Mahaffey	None	None	None	34	No	At Stream Grade	4	0.96	Box Culvert	10.2
PA	UNT to Whiskey Run	Bell (Clearfield)	Extensive	None	None	41	No	At Stream Grade	3	0.16	Arch/Elliptical Cul	4
PA	UNT to Whiskey Run	Bell (Clearfield)	Not Extensive	Deformation	Moderate	41	No	Inlet Drop	3	0.144	Round Culvert	2.8
PA	Whiskey Run	Bell (Clearfield)	Not Extensive	None	None	31	No	At Stream Grade	12.3	3.495	ottom Arch Bridge	13.4
PA	UNT to West Branch	Bell (Clearfield)	Not Extensive	Deformation	Minor	38	No	At Stream Grade	3	0.15	Round Culvert	2.2
PA	Poplar Run	Grampian	None	None	None	64	No	At Stream Grade	6.5	1.732	Box Culvert	12.4
PA	Haslett Run	Mahaffey		No culvert								
PA	Laurel Run	Mahaffey	None	None	None	45	No	At Stream Grade	6.6	2.222	Box Culvert	20
PA	Whiskey Run	Bell (Clearfield)	Extensive	None	None	17	No	At Stream Grade	11	6.924	ottom Arch Bridge	15
PA	UNT to Whiskey Run	Bell (Clearfield)	Extensive	Deformation	Severe	82	No	At Stream Grade	5	0.214	Round Culvert	2.9
PA	UNT to Whiskey Run	Bell (Clearfield)	None	Deformation	Minor	43	No	At Stream Grade	3	0.119	Round Culvert	2.9
PA	UNT to Cush Creek	Burnside (Clearfield 2TWP)	None	None	None	59	No	At Stream Grade	3.8	0.295	Arch/Elliptical Cul	6.4

Inlet Type1	Inlet Water Depth	Inlet Width	Internal Structure	Material	NHD_HUC8_Watershed	Outlet Drop To Stream Bottom	Outlet Drop To Water Surface	Outlet Grade	Outlet Height	Outlet Openness	Outlet Structure Type	Outlet Substrate Water Width
Projecting	3.4	6.2	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	5.1	0.412	Round Culvert	5.9
Headwall and Wingwalls	Projecting	0.1	None	Concrete	Upper West Branch Susquehanna	0	0	Free Fall Onto Cascade	4.2	0.364	Round Culvert	0
	0.1	4.7	Baffles/Weirs	Plastic	Upper West Branch Susquehanna	0.5	0.3	Free Fall Onto Cascade	3.8	0.594	Round Culvert	0.6
	Projecting	0.2	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	3.9	0.394	Round Culvert	2.6
Headwall and Wingwalls	Projecting	0.1	None	Plastic	Upper West Branch Susquehanna	0.6	0.5	Free Fall Onto Cascade	3.7	0.056	Pipe Arch/Elliptical Culvert	1.2
	Projecting	0.1	None	Plastic	Upper West Branch Susquehanna	0.5	0.1	Free Fall	3.7	0.028	Pipe Arch/Elliptical Culvert	0.6
	Wingwalls	0	None	Plastic	Upper West Branch Susquehanna	0	0	Free Fall Onto Cascade	2	0.079	Round Culvert	0
Headwall and Wingwalls	0.3	6	None	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	6.5	0.85	Round Culvert	2.3
Headwall and Wingwalls	0.1	2	None	Plastic	Upper West Branch Susquehanna	0.4	0.3	Free Fall	2.1	0.095	Round Culvert	0.6
Wingwalls	0.2	3	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	2.9	0.104	Round Culvert	1.7
Headwall	2.2	6.4	Supports	Metal	Upper West Branch Susquehanna	-1	-1	Clogged/Collapsed/Submerged	-1	0	Unknown	-1
Headwall	Projecting	0.2	None	Metal	Upper West Branch Susquehanna	1	0.1	Free Fall	2.9	0.186	Round Culvert	0.8
	0.4	2.8	None	Metal	Upper West Branch Susquehanna	2.1	1.5	Free Fall	2.8	0.138	Round Culvert	1.8
	Headwall	0.4	None	Combination	Upper West Branch Susquehanna	0	0	At Stream Grade	3.1	0.235	Box Culvert	3
Headwall and Wingwalls	Headwall	0.2	None	Concrete	Upper West Branch Susquehanna	-1	-1		-1	-1		-1
					Upper West Branch Susquehanna							
					Upper West Branch Susquehanna							
Headwall and Wingwalls	0.7	12	Baffles/Weirs	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	5.6	1.88	Box Culvert	9.2
Projecting	0.2	6.8	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	5.7	0.762	Round Culvert	4.8
Wingwalls	0	4	None	Metal	Upper West Branch Susquehanna	1	0.6	Free Fall Onto Cascade	4	0.277	Round Culvert	1.2
Headwall and Wingwalls	0.1	6.7	None	Concrete	Upper West Branch Susquehanna	2	1.4	Free Fall Onto Cascade	3	0.615	Box Culvert	7
Projecting	0.5	4.8	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	4.7	0.492	Round Culvert	2.6
Mitered to Slope	Projecting	0.3	None	Metal	Upper West Branch Susquehanna	0.4	0.2	Free Fall	4	0.317	Round Culvert	1.6
	0.2	2	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	2.4	0.045	Round Culvert	2
	Projecting	0.1	None	Plastic	Upper West Branch Susquehanna	0.7	0.4	Free Fall	1.2	0.027	Round Culvert	0.5
Headwall	Headwall	0.5	None	Plastic	Upper West Branch Susquehanna	1.6	1.1	Free Fall Onto Cascade	2	0.067	Round Culvert	1
	0.1	3	None	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	3	0.224	Round Culvert	1.4
	Projecting	0.6	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	2.4	0.137	Pipe Arch/Elliptical Culvert	3.3
Projecting	0.4	6.4	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	4.8	0.567	Pipe Arch/Elliptical Culvert	6
Other	0.2	1.2	None	Metal	Upper West Branch Susquehanna	0	0	Clogged/Collapsed/Submerged	1.3	0	Round Culvert	0
Projecting	Projecting	1.2	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	3.1	0.126	Round Culvert	2.8
	0.7	2.1	None	Plastic	Upper West Branch Susquehanna	2.2	1.2	Free Fall Onto Cascade	2	0.071	Round Culvert	1.4
	Headwall and Wingwalls	2	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	6.4	0.647	Round Culvert	5.6
Headwall and Wingwalls	0.5	5	None	Concrete	Upper West Branch Susquehanna	0.9	0.4	Free Fall	4.9	0.309	Round Culvert	2.1

					Upper West Branch Susquehanna							
Projecting	0.4	2	None	Plastic	Upper West Branch Susquehanna	2.2	1.1	Free Fall	2	0.067	Round Culvert	1
Projecting	0.1	4	None	Metal	Upper West Branch Susquehanna	0.8	0.6	Free Fall	3.7	0.302	Round Culvert	0.9
	-1	-1	None	Metal	Upper West Branch Susquehanna	0.6	0.1	Free Fall	2.8	-1	Round Culvert	1.5
Projecting	0.8	2	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	1.5	0.027	Round Culvert	1.8
					Upper West Branch Susquehanna							
Headwall and Wingwalls	0.6	4	None	Concrete	Upper West Branch Susquehanna	2.8	1.3	Free Fall Onto Cascade	4	0.287	Round Culvert	2
Headwall and Wingwalls	0.4	8.3	None	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	4.6	0.36	Pipe Arch/Elliptical Culvert	8.2
Projecting	0.9	4.5	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	3.9	0.289	Round Culvert	2.6
					Upper West Branch Susquehanna							
Wingwalls	1.4	30.4	Baffles/Weirs	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	5.7	3.076	Box Culvert	24.4
Headwall and Wingwalls	0.5	4.5	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	2.3	0.247	Pipe Arch/Elliptical Culvert	4.6
Headwall and Wingwalls	0.3	5	None	Metal	Middle Allegheny-Redbank	0	0	At Stream Grade	5	0.622	Round Culvert	3.7
Projecting	0.2	2.7	None	Metal	Upper West Branch Susquehanna	0.7	0.2	Free Fall Onto Cascade	2.8	0.147	Round Culvert	1.8
					Upper West Branch Susquehanna							
Projecting	0.9	5.3	None	Metal	Upper West Branch Susquehanna	2.2	1.4	Free Fall Onto Cascade	5.2	0.781	Round Culvert	4.5
Headwall and Wingwalls	0.7	4	None	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	4	0.471	Round Culvert	2.4
					Upper West Branch Susquehanna							
Projecting	0.2	2	None	Plastic	Upper West Branch Susquehanna	0.7	0.5	Free Fall	2	0.077	Round Culvert	0.8
Projecting	0.4	3	None	Metal	Upper West Branch Susquehanna	0.6	0.4	Free Fall	3	0.174	Round Culvert	1.4
Projecting	0.3	3	None	Metal	Upper West Branch Susquehanna	1.7	0.5	Free Fall	3	0.17	Round Culvert	1.7
					Upper West Branch Susquehanna							
Other	0.2	1.6	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	1.6	0.063	Round Culvert	1.5
					Upper West Branch Susquehanna							
Headwall and Wingwalls	0.8	10.2	None	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	3.7	0.951	Box Culvert	9.8
Projecting	0.8	4.8	None	Metal	Upper West Branch Susquehanna	1.8	1.8	Free Fall Onto Cascade	3.5	0.116	Pipe Arch/Elliptical Culvert	2.7
Projecting	0.4	3	None	Plastic	Upper West Branch Susquehanna	0	0	At Stream Grade	2.8	0.12	Round Culvert	3
Headwall and Wingwalls	2	13.4	None	Combination	Upper West Branch Susquehanna	0	0	At Stream Grade	13	3.191	en Bottom Arch Bridge/Culv	12.6
Projecting	0.4	2.8	None	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	3	0.179	Round Culvert	1.7
Headwall and Wingwalls	1.9	24.1	Baffles/Weirs	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	5	1.695	Box Culvert	17.3
					Upper West Branch Susquehanna							
Headwall and Wingwalls	1.6	20	Baffles/Weirs	Concrete	Upper West Branch Susquehanna	0	0	At Stream Grade	9.3	3.067	Box Culvert	11
Headwall and Wingwalls	1.2	15.3	None	Rock/Stone	Upper West Branch Susquehanna	0	0	At Stream Grade	10.6	6.857	en Bottom Arch Bridge/Culv	15
Wingwalls	0.4	4.8	None	Metal	Upper West Branch Susquehanna	6.5	4.9	Free Fall Onto Cascade	5.2	0.205	Round Culvert	1.8
Headwall and Wingwalls	0.8	3	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	1.5	0.084	Pipe Arch/Elliptical Culvert	3.3
Headwall	1.7	6.4	None	Metal	Upper West Branch Susquehanna	0	0	At Stream Grade	3.2	0.213	Pipe Arch/Elliptical Culvert	5.4

Outlet Water Depth	Outlet Width	Structure Comment	Structure Substrate Matches Stream	Substrate Continuous	Substrate Type	Water Depth Matches Stream	Water Velocity
3.8	6.2	No data	Comparable	50%	Silt	Yes	Yes
0	4	No data	None	None	None	Dry	Dry
0.1	4.1	No data	None	None	None	Yes	Yes
0.3	4	No data	Comparable	50%	Cobble	Yes	Yes
0.1	4.1	No data	None	None	None	No-Shallower	No-Faster
0.1	4.1	No data	None	None	None	Yes	No-Slower
0	2	No data	None	None	None	Dry	Dry
0.6	6	No data	None	None	None	No-Shallower	No-Faster
0.1	1.9	No data	None	None	None	Yes	Yes
0.2	3	No data	None	None	None	No-Shallower	No-Faster
-1	-1	No data	Unknown	Unknown	Unknown	No-Deeper	No-Slower
0.1	2.7	No data	Comparable	50%	Cobble	Yes	Yes
0.2	2.9	No data	None	50%	Cobble	Yes	No-Faster
0.4	3	No data	Comparable	25%	Gravel	No-Shallower	No-Faster
-1	-1	No data	None	None	None	No-Shallower	No-Faster
0.9	12	No data	Comparable	100%	Cobble	No-Deeper	No-Slower
0.6	6.7	No data	Contrasting	25%	Sand	Yes	Yes
0.1	3.8	No data	None	None	None	No-Shallower	No-Faster
0.1	7	No data	None	None	None	No-Shallower	No-Slower
0.3	5	No data	None	None	None	No-Shallower	No-Faster
0.2	4	No data	None	None	None	Yes	No-Faster
1.1	2	No data	None	None	None	Yes	Yes
0.1	1.2	No data	None	None	None	No-Shallower	No-Faster
0.1	2	No data	None	None	None	No-Shallower	No-Faster
0.2	2.9	No data	None	None	None	No-Shallower	No-Faster
0.9	3.3	No data	Comparable	25%	Sand	Yes	Yes
0.9	6	No data	Comparable	100%	Cobble	Yes	Yes
0	1.3	No data	None	None	None	Dry	Dry
1.1	3	No data	None	None	None	No-Shallower	No-Faster
0.3	2	No data	None	None	None	No-Shallower	No-Faster
1.3	6	No data	None	None	None	No-Deeper	No-Slower
0.2	4.8	No data	None	None	None	No-Shallower	No-Faster

0.1	2	No data	None	None	None	No-Shallower	No-Faster
0.1	4	No data	None	None	None	Yes	Yes
0.2	2.8	No data	None	None	None	No-Shallower	No-Faster
0.9	2	No data	Comparable	100%	Cobble	Yes	Yes
0.4	4	No data	None	None	None	No-Shallower	No-Faster
0.6	8.2	No data	Comparable	100%	Cobble	Yes	Yes
0.5	4	No data	None	None	None	No-Shallower	No-Faster
0.6	30.4	No data	Comparable	100%	Cobble	Yes	Yes
0.4	4.6	No data	Comparable	100%	Sand	Yes	Yes
0.9	4.8	No data	Comparable	25%	Sand	Yes	Yes
0.2	2.8	No data	Comparable	100%	Cobble	Yes	No-Faster
1.2	5.3	No data	None	None	None	No-Shallower	No-Faster
0.5	4	No data	None	None	None	Yes	No-Faster
0.1	2	No data	None	None	None	Yes	No-Faster
0.1	3	No data	Comparable	25%	Cobble	No-Shallower	Yes
0.2	3	No data	None	None	None	Yes	No-Faster
0.5	1.6	No data	None	None	None	Yes	No-Faster
0.5	10.1	No data	Contrasting	100%	Gravel	Yes	No-Slower
0.2	4.5	No data	None	None	None	No-Shallower	No-Faster
0.9	3.1	No data	None	None	None	No-Shallower	No-Faster
3	12.6	No data	Comparable	100%	Gravel	No-Deeper	No-Slower
0.2	3	No data	None	None	None	No-Shallower	No-Faster
0.5	24.1	No data	Comparable	50%	Cobble	No-Deeper	No-Slower
2.4	20	No data	Contrasting	75%	Sand	No-Deeper	No-Slower
0.7	15	No data	Contrasting	25%	Gravel	Yes	Yes
1	4.7	No data	None	None	None	No-Shallower	No-Faster
0.7	3.3	No data	Contrasting	50%	Sand	Yes	Yes
1.5	5.4	No data	Comparable	100%	Silt	No-Deeper	No-Slower