City of Millwood, Washington

Shoreline Restoration Plan

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1.0 Introduction

1.1 Introduction

This report supports the City of Millwood's Shoreline Master Program (SMP) update. The SMP, also known as Title 18.12 of the Millwood Municipal Code (MMC), is being updated to comply with revisions to the Washington State Shoreline Management Act (Act) requirements (Chapter 90.58 RCW) and the State's SMP guidelines (Chapter 173-26 WAC, Part III), which were adopted in 2003.

The SMP update process specifies that local governments must include within their master plans a "real and meaningful" strategy to address shoreline restoration. The guidelines require that the regulatory policies in the master plan promote mitigation of functional losses caused by development. Restoration of natural shoreline functionality is a hedge against impairments from development by providing positive progress toward increasingly natural functionality while helping to guarantee that there will be no net loss of ecological function over time.

Based on a detailed inventory and characterization of the shoreline ecosystem within a local jurisdiction, governments are encouraged to promote restoration efforts by planning for, and fostering, restoration through the SMP and other regulatory and non-regulatory programs.

1.2 Purpose and Scope of Restoration Planning

This document has been prepared to comply with the State of Washington's SMP guidelines for restoration planning (WAC 173-26-201(2)(f)). These guidelines recommend that restoration plans:

- Identify degraded areas, impaired ecological functions, and sites with potential for restoration;
- Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;
- Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future), which are designed to contribute to local restoration goals;

- Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies, including identify prospective funding sources for those projects and programs;

- Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and

- Provide mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.

The guidelines acknowledge that the approach to restoration planning may vary among local jurisdictions, depending on:

- The size of the jurisdiction;

- The extent and condition of shorelines in the jurisdiction;

- The availability of grants, volunteer programs, or other tools for restoration; and,

- The nature of the ecological functions to be addressed by restoration planning.

The jurisdiction for the City of Millwood includes 1.41 miles of shoreline along the Spokane River, a river of statewide significance. Many of the restoration opportunities mentioned in this report will require further investigation and analysis to assess feasibility and determine actual benefits and costs. Considerable additional study will be required before detailed implementation plans, budgets, schedules, and monitoring programs can be developed for any individual project.

1.3 No Net Loss and Restoration

The concept of no net loss of shoreline ecological functions is rooted in the Act and in the goals, policies, and governing principles of the State's shoreline guidelines. The Act states: "permitted uses in the shoreline shall be designed and conducted in a manner that minimizes insofar as practical, any resultant damage to the ecology and environment of the shoreline area." (RCW 90.58.020)

According to the governing principles of the guidelines as found in WAC 173-26-186, protection of shoreline ecological functions are accomplished through the following:

- Local government is guided in its review and amendment of local master programs so that it uses a process that identifies, inventories, and ensures

meaningful understanding of current and potential ecological functions provided by affected shorelines.

- Local master programs shall include policies and regulations designed to achieve no net loss of those ecological functions.

- For counties and cities containing any shorelines with impaired functions, master programs shall include goals and policies that provide for restoration of such impaired ecological functions. These master program provisions shall identify existing policies and programs that contribute to planned restoration goals and identify any additional policies and programs that local government will implement to achieve its goals. These master program elements regarding restoration should make real and meaningful use of established or funded nonregulatory policies and programs that contribute to restoration of ecological functions, and should appropriately consider the direct or indirect effects of other regulatory or nonregulatory programs under other local, state, and federal laws, as well as any restoration effects that may flow indirectly from shoreline development regulations and mitigation standards.

- Local master programs shall evaluate and consider cumulative impacts of reasonably foreseeable future development on shoreline ecological functions and other shoreline functions fostered by the policy goals of the act. To ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts among development opportunities.

- The guidelines are not intended to limit the use of regulatory incentives, voluntary modification of development proposal, and voluntary mitigation measures that are designed to restore as well as protect shoreline ecological functions.

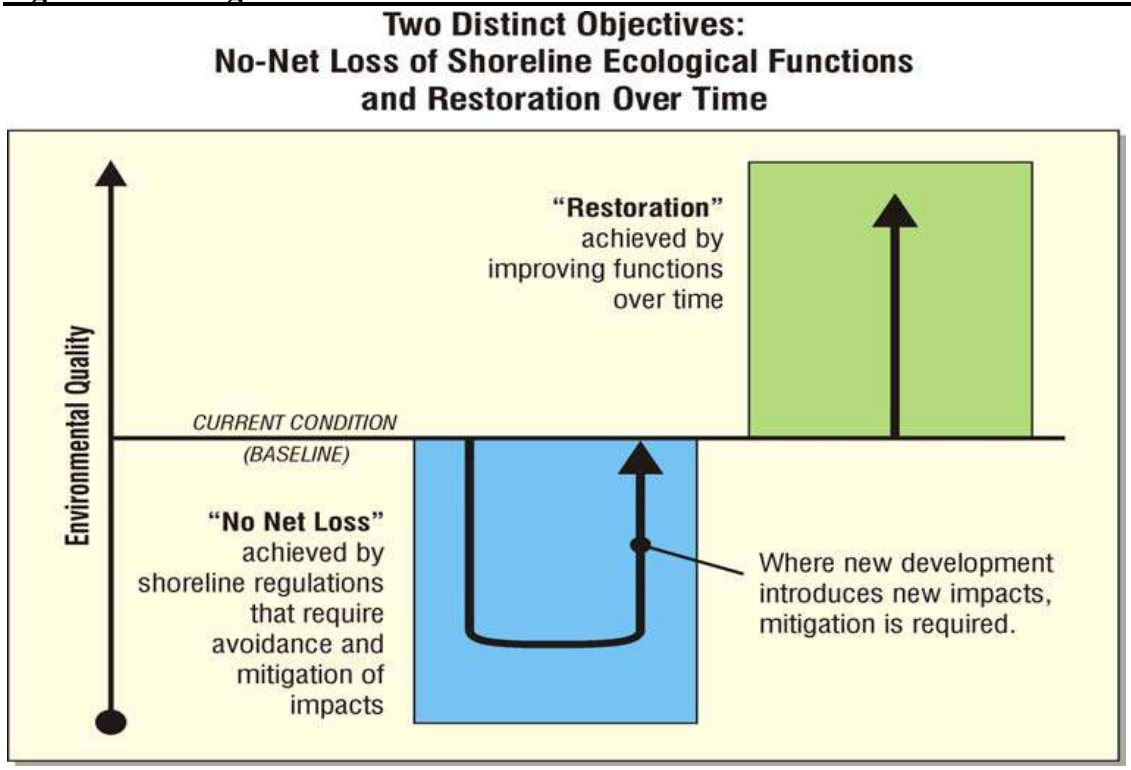
These principles suggest that no net loss is achieved primarily through regulatory approaches and that restoration occurs mainly via goals, policies, and voluntary or incentive-based mechanisms. It is also important to note that more than simply preventing further loss of ecological functions, master program provisions must also "…achieve overall improvements in shoreline ecological functions over time when compared to the status upon adoption of the master program." (WAC 173-26-201) The current status of the shoreline in Millwood's jurisdiction is contained in the Shoreline Cumulative Impacts Analysis report.

The mandate to improve functions over time provides the basis for restoration planning and creates a distinction between mitigation and restoration in the context of the Act. Under the Act, applicants for shoreline permits must fully mitigate new impacts caused by their proposed development. However, applicants are not required to restore past ecosystem damages as a condition of permit approval. Permit applicants will not be required to implement the restoration measures identified in this plan as mitigation for project impacts, but they may elect to implement elements of this plan as mitigation for shoreline development if appropriate.

It is important to note that the majority of restoration activities identified in an SMP Restoration Plan are primarily voluntary, not regulatory, and funding and partnering mechanisms will need to be developed. Therefore, the City's primary role will focus on fostering, coordinating, and stimulating restoration partnerships. Upon forming these partnerships, the City and its restoration partners will work together on securing restoration funding via grant applications.

Figure 1.1, shows the distinction between mitigation and restoration as these terms are applied through the SMP process. The regulations in the SMP are designed to maintain the baseline condition that is described in the Cumulative Impacts Analysis. Unfortunately, impacts too small to be considered development still occur, requiring active restoration projects to balance the slow degradation of the shoreline environment.

Figure 1.1: Mitigation Versus Restoration



Source: Washington State Department of Ecology

The City realizes and accepts the importance of implementing this plan and intends to attain the timelines and benchmarks described below, as funding allows.

2.0 Existing and Ongoing Assessments and Restoration Efforts

The following plans discuss existing restoration activities that will provide a positive influence for the shoreline area within the City of Millwood.

2.1 Spokane County Shoreline Protection and Restoration Plan (July 2008)

Chapter 173-26 WAC requires the *Spokane County Shoreline Protection and Restoration Plan* to include "real and meaningful" strategies to address restoration of shorelines. The goals, policies, and restoration recommendations included in this plan are intended to protect shoreline ecological functions and promote restoration of impaired shoreline functions necessary to sustain ecological integrity. The goals and recommendations included in this report are as follows:

GOALS:

- Restore those shorelines where ecological functions have been degraded;
- Ensure that no net loss of ecological functions will result from the development and use of the shorelines; and,
- Encourage appropriate public agencies, owner associations, businesses, property owners and other shoreland user groups to understand and promote good stewardship of the shorelands.

RECOMMENDATIONS:

- Develop and implement programs to restore the ecological functions of degraded shorelines;
- Encourage the collaboration and participation of public and private entities and interested citizens;
- Establish rehabilitation priorities, benchmarks, and a post-restoration monitoring and maintenance program;
- Emphasize actions and programs addressing riparian habitat fragmentation, which is a major reason for shoreline degradation;

- Develop regulations and mitigation standards necessary to ensure implementation of the no-net loss policy;

- Enforce no-net-loss regulations through permit conditions and post-permit project monitoring; and,

- Emphasize prevention of continued degradation of ecological functions of the shoreline by preserving priority habitat.

2.2 Spokane County PFC Stream Inventory & Assessment

The *Spokane County Proper Functioning Condition (PFC) Stream Inventory & Assessment* was developed in 2005. The project was the result of a shared effort, incorporating input from concerned citizens, local governments, and resource agency representatives from the Washington Department of Ecology, Washington Department of Fish and Wildlife, City of Spokane, Spokane County, Spokane Conservation District, and the Washington Environmental Council. The central objective of the inventory and assessment effort was to generate a product that would be useful to local decision-makers, especially within the framework of the existing City of Spokane and Spokane County Shoreline Master Programs and Critical Areas Ordinances. The PFC Stream Inventory and Assessment uses a rapid assessment protocol to evaluate the physical functioning of riparian-wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. Overall, 105 reaches were identified, assessed, and rated in this report, including segments of the Spokane River and Hangman (Latah) Creek. The goals of the plan include the following:

GOALS:

- Complete a study of riparian and riparian-dependent habitat based on a reconnaissance level inventory and analysis of the ecological and physical characteristics of stream and streamside lands and watershed processes in Spokane County; and

- Ensure that the final product is used as a tool to designate and protect critical areas and shorelines in Spokane County.

PFC is based on the physical ability of a given reach to withstand a 25-30 year hydrological event. Properly functioning reaches have characteristics such as well-established riparian vegetation, an active floodplain, and stable channels. However, there were many sites considered to be in PFC on a physical basis that did not provide

other important ecological or biological values and functions. The Spokane River, as a whole, was found to have ninety-five percent (95%) of its shorelines in PFC. Within Millwood, only sixty-five percent (65%) or our shoreline is considered to be in PFC. This percentage includes all of the shoreline east of the Argonne Road Bridge.

Residential and urban development, shoreline modifications, deficient riparian communities, road encroachment, and moderate to severe stream bank erosion were often typical in the reaches that did not reach PFC status.

2.3 Spokane Regional Stormwater Manual

The *Spokane Regional Stormwater Manual* establishes standards for stormwater design and management to protect water quality, natural drainage systems, and down-gradient properties, as urban development occurs. The Manual meets or exceeds applicable criteria from the Washington State Department of Ecology's *Stormwater Management Manual for Eastern Washington* (SWMMEW), for both underground injection and discharge to surface waters.

The purpose of the manual is to help communities in the Spokane region protect water quality, prevent adverse impacts from flooding, and control stormwater runoff to levels equivalent to those that occurred prior to development. Acceptable stormwater management should be achieved when the criteria and standards presented in this manual are met.

2.4 City of Millwood Comprehensive Plan

Millwood's Comprehensive Plan includes goals and policy statements that provide support for public and private efforts to protect the environment, both inside and outside the shoreline environment.

Specific goals include:

LAND USE ELEMENT

6.4.1 Critical Areas – Aquifer Recharge Area

- The entire City is situated over the Spokane Valley Rathdrum Prairie Aquifer. The Aquifer is located approximately 50-75 feet below ground and is the sole source of drinking water for Millwood and the greater Spokane area. The water in the Aquifer is vulnerable to contamination from a variety of sources. These sources of contamination can be the unlawful discharge of chemicals and

fertilizers to the ground or via flow to storm water drywells. If rainwater reaches the Aquifer during the infiltration process without adequate filtration, contaminants that are not removed enter the Aquifer. Each parcel should have sufficient area available for storm water to properly filter and drain; this means restricting the impervious surface coverage of a parcel. By strictly regulating uses, including in some cases restricting the use and storage of hazardous chemicals on site, and by requiring storm water management on site, the necessary measures will be in place to ensure the continued safety of the City's drinking water supply.

6.4.1 Critical Areas – Shorelines

- The northern boundary of the City is the southern shoreline of the Spokane River. Because the Spokane River has been determined to have a Shoreline of Statewide Significance, all development within 200 feet of the Ordinary High Water Mark (OHWM) is regulated. Federal, State, and local laws must all be consulted prior to development in this shoreline area. Limiting vegetation removal and restricting the use and development of hard structures such as bulkheads and buildings will be necessary to preserve this shoreline.

6.4.1 Critical Areas – Fish and Wildlife Habitat Conservation Areas

- There are sections of land within the City and surrounding areas that perform valuable functions as fish and wildlife habitat. Some of the land along the river's shore still has native vegetation or has adequate vegetation to provide a habitat for animals and birds as well as shade for the trout, walleye, and other fish that inhabit the river. The immediate shoreline area should be a Fish and Wildlife Habitat Conservation Area.

UTILITIES ELEMENT

- The City shall take all measures necessary to protect the Spokane Rathdrum Prairie Aquifer from polluted groundwater infiltration and the City has adopted a wellhead protection plan.

2.5 City of Millwood Critical Areas Ordinance

The City of Millwood's Critical Areas Ordinance (CAO), chapter 18.08 MMC, identifies the first 50 feet inland of the OHWM of the Spokane River as a Critical Fish and Wildlife Habitat area buffer and presents goals for the protection of habitat within this area. This same area is identified within the SMP, as the Minimum Native Conservation Area.

The following goals are included in the CAO:

- Conserve fish and wildlife habitat areas for the management and maintenance of fish and wildlife resources as the City recognizes the role these areas play in the local ecosystem.

- Conserve fish and wildlife habitat areas for public health, safety and well-being and the aesthetic value they bring to the community.

- Ensure that priority fish and wildlife species, as identified by the Washington Department of Fish and Wildlife, and species of local importance, do not become increasingly imperiled due to land use changes, habitat alteration, and other human activities.

3.0 Restoration Goals and Policies

The following restoration goal and policies direct the course of the City's shoreline restoration efforts:

Goal:

Restore or rehabilitate impaired or degraded conditions along the shoreline of the Spokane River to an ecologically functioning condition.

Restoration plan policy 1:

Summarize degraded shoreline functions as documented by previous assessments.

Existing assessments have documented impairments to the City's shoreline areas and have provided recommendations for improvement. The assessments are detailed in Chapter 2, above. The affected shoreline functions are detailed in Chapter 4.

Restoration plan policy 2:

Identify restoration opportunities that can be implemented immediately as well as restoration projects that can be interleaved into existing capital planning efforts.

This plan, along with the Cumulative Impacts Analysis, presents the City's findings and recommends targeted restoration strategies. This plan addresses the causes of ecological degradation, rather than focusing on the degraded areas themselves.

Restoration plan policy 3:

Work with public and private partners to encourage restoration of the City's shoreline.

As funding allows, the City will work with public and private individuals and groups to pursue projects that restore degraded shoreline ecological functionality.

Restoration plan policy 4:

Establish an implementation strategy.

To facilitate a workable implementation strategy, this plan identifies potential restoration partners, potential funding mechanisms, timelines and benchmarks.

Restoration plan policy 5:

Monitor the success of restoration activities and adopt strategies based upon results.

Establish monitoring procedures to evaluate the effectiveness of City efforts. Monitoring data will be used to identify successful project designs that will serve as models for future restoration projects. In addition, monitoring will identify failed project designs that will provide equally important lessons for the future.

4.0 Areas with Potential for Ecological Restoration

4.1 Framework

Without a well designed restoration plan, the City of Millwood probably cannot meet the "no net loss" standard required by the SMP guidelines simply through project-related mitigation. Therefore, a Restoration Plan is needed to offset the expected loss of function that will occur from site-specific mitigation and other incremental impacts.

The Restoration Plan is a framework for local restoration efforts, based on the findings from the Shoreline Inventory and Characterization report as well as the Shoreline Cumulative Impacts Analysis. The plan includes a list of ongoing local and external restoration efforts that can be employed to offset negative ecological trends and effects and provides a list of potential restoration projects designed to restore impaired ecological functionality.

Determination of which areas have the potential for restoration, identification of the processes that are impaired, and crafting projects with the potential for restoration is a multiple step process:

1. At a local scale, the data collected for the Shoreline Characterization and Analysis report and expanded in the Shoreline Cumulative Impacts Analysis report, shall be used to identify the ecological functions that have been impacted over time.

2. A determination is made of how the baseline ecological function has been impaired, so that plans can be constructed to remove or alleviate the process that is causing the problem. The physical extent of the process in question can expand proposed solutions beyond the Shoreline Management Area.

3. Impaired functions and their causes are mapped to provide easy visual representations. These maps are then used when determining possible solutions.

4. Alternative solutions are identified and evaluated for effectiveness, equity, and cost. In many cases, longer-range solutions will require efforts that are not anticipated by the City budget, may require grant funding to complete.

5. Monitoring programs are initiated to provide tracking for projects that can be implemented with current resources. Projects that are beyond current resource limits are added to capital plans.

This Shoreline Restoration Plan is designed to address the steps listed above. Step 1 will be addressed below, in section 4.2. Steps 2 and 3 are addressed in Chapter 5 of this report while step 4 will be addressed in Chapter 6. Step 5 is addressed in Chapter 7.

4.2 Impacted Functionality

The following ecological functions have been impacted by development along the shoreline within the jurisdiction of the City:

- Movement of surface water.

  Human activities alter surface water movement by changing the physical characteristics of the landscape, therefore affecting the water movement process. For example, the addition of pervious surfaces increases the amount and changes the direction of water flowing across the landscape. As the percentage of pervious surfaces rises, additional stormwater is introduced into the environment, usually in funneled streams from guttered roofs. Refer to Tables 3.4, 3.5 and 3.6 from the Cumulative Impacts Analysis report for current percentages of pervious surfaces within each environmental designation.

  Once the water reaches the ground, the relative positioning and length of travel over lawns and density of native plantings affect the flow patterns of stormwater and the amount of sediment movement that can be expected. Lawns actually perform a useful purpose in residential areas, by slowing and allowing stormwater to sheet evenly prior to entry into more natural areas.

- Nutrient absorption and release.

  Water dispersal over planted areas carries and concentrates nutrients such as phosphorus and nitrogen, which then enter the groundwater and is released directly into the aquifer or the river.

- Toxins absorption and release.

  Water dispersal over planted areas also carries toxic substances such as herbicides and insecticides, which then enter the groundwater and is released directly into the aquifer or the river.

- Lack of large woody debris.

In the Shoreline Industrial Environment, a relatively unbroken, mature band of natural vegetation has led to usable large woody debris along the OHWM and in many cases, actually protruding into the water. This debris offers cover for fish and other wildlife along the shore as well as provides buffering from wave action. In the Shoreline Residential Environment, years of pruning and landscaping routines have reduced the supply of large plants along the bank. If woody debris were to fall into the water in the urban environment, sections of vertical concrete bulkheads force the debris to enter deeper, faster water and they are carried downstream.

- Erosion due to wave action.

  Powered watercraft, when used at speeds great enough to create wakes, produce wave energy that can erode shorelines. This wave energy can be dissipated by uneven shorelines, as in the case of a natural shoreline that consists of vegetation, or by man-made armoring that utilizes substances other than a vertical cement wall.

5.0 Mapping of Impaired Functionality to Local Jurisdiction

5.1 Surface Water Movement

The general ground slope in Millwood is from the south to the north, especially through the two hundred foot (200') Shoreline Management Area (SMA). Surface water, including stormwater, rain water, and water used for irrigation, flows toward the river. Below the surface, the Spokane Rathdrum Prairie Aquifer lies directly under our City. Since Millwood lies in a gaining reach of the aquifer, the aquifer is at groundwater level, pushing water into the Spokane River as it flows through the City. Please see Appendix B for a map of Millwood, showing its placement over the aquifer. Contour lines for every two feet of elevation are added to indicate degree of slope down the bank to the river.

Appendix C shows a more narrow view of the same data as Appendix B. Here, the City's Environmental Designations (ED's) are included on the map, along with contour lines to indicate slopes just outside of, and within, the ED's.

To be successful in modifying surface water movement, projects will have to address one or more of the following factors;

- Water moving into the SMA from upslope;
- Water coming off of impervious surfaces within the SMA;
- The desired action of the water within the SMA, including sheeting and channelization; and
- A proper planting technique within the riparian zone to slow and capture the water before it carries sediments, nutrients, and toxins into the river.

5.2 Nutrient Absorption and Release

Projects that address the absorption and release of nutrients into the Spokane River must start with the same causality as mentioned above for surface and sub-surface water movement. Additional analysis is required to identify targeted nutrients and the possible methods of application. Provision must then be made for their reduction or elimination.

Successful mitigation projects will have to address the same factors as above, with the following additions.

- A listing of nutrients identified as harmful to the ecology of the Spokane River, both locally and downstream; and

- Best Management Practices (BMP's) for reducing or eliminating the sources of contamination.

5.3 Toxins Absorption and Release

Projects that address the absorption and release of toxic substances into the Spokane River must start with the same causality as mentioned above for surface and sub-surface water movement. Additional analysis through is required to identify targeted toxic substances and the possible sources of contamination. Provision must be made for their elimination.

Successful mitigation projects will have to address the same factors as above, with the following additions:

- A listing of toxic substances identified as harmful to the ecology of the Spokane River; and

- Best Management Practices (BMPs) for reducing or eliminating the sources of contamination.

5.4 Lack of Large Woody Debris (LWD)

In the Shoreline Industrial Environment, a relatively unbroken, mature band of natural vegetation has led to usable LWD (logs with a minimum diameter of four (4) inches and minimum length of six (6) feet) deposited onto the shoreline and into the water. In the Shoreline Residential Environment, years of pruning and landscaping routines have reduced the supply of large plants along the bank. According to Durst,

> "The chief role of LWD may well be in shaping stream morphology, adding hydraulic roughness, providing bank armoring, contributing to the formation of river bars and islands, and blocking side channels. Because of its size, LWD in large rivers can be more stable than the relatively mobile bed load sediments, and can function as substrate for aquatic invertebrates used by fishes as food. It has also been hypothesized that LWD could play an important, but short-term, role during migration by providing eddies where upstream movement is easier and where fish can rest."

To be successful in modifying surface water movement, projects will have to address one or more of the following factors;

- Prevention of LWD from being cleared as soon as it is created, either naturally, or by human design;
- Expansion of and proper maintenance of intact riparian areas within the Native Conservation Area; and
- Programs for reduction of hard bulkheads and replacement with softer materials that absorb instead of concentrate hydrologic flow.

5.5 Erosion at OHWM from Wave Action

Spokane River Reaches six, seven and eight, (6, 7, & 8) (see the Cumulative Impacts Analysis report for descriptions and maps) are confined to a low sinuosity riverbed backwatered from Upriver Dam, in the City of Spokane. This makes for almost five (5) miles of navigable water between the dam and shallow water just east of Coyote Rock, in the City of Spokane Valley. The City of Millwood is in the center of this span.

Just within Millwood, there are twenty-seven (27) residential shoreline parcels. Many more surround the area in unincorporated Spokane County and Spokane Valley. A significant number of these parcels support powered watercraft. If existing speed rules on the river are not followed, the resulting boat wakes become erosive.

To be successful in calming wave movement, projects will have to address one or more of the following factors;

- Public education of existing boat speed regulations.
- Public education on planting techniques and shoreline armoring techniques that will better absorb wave energy.
- Programs for reduction of hard bulkheads and replacement with softer materials that absorb instead of concentrate hydrologic flows.

6.0 Alternative Solutions to Repairing Impacted Functionality

6.1 Selection of Alternatives

The process of selecting and ranking alternative solutions begins with a definition of the problem(s) to be solved, which leads to the goals and objectives that focus the City's efforts, and then provides analysis of alternative solutions. Chapter 4 introduced the impaired ecological functions affecting the shoreline.

With the problems identified, we can begin to evaluate alternative responses. The evaluation process consists of several steps:

1. Discovering alternative responses;

2. Evaluating each alternative; and

3. Ranking the alternatives.

This report will provide a non-exhaustive list of alternatives that address the problems that have been defined. As the City gets closer to implementing solutions, further analysis to find possible additional alternatives is warranted.

This report will not evaluate and rank the alternatives presented below. That process should involve both staff and elected officials as budgetary impacts will occur.

6.2 Possible Alternatives

Since the identified alternative solutions span a geographical area that is larger than the SMA, potential solutions have been grouped into two lists: projects that impact development within the SMA, and projects that extend beyond.

Possible alternatives with impacts localized to the shoreline area:

A. Surface Water Movement:

- Add stormwater flow control techniques to development within the Shoreline Management Area that will slow runoff and then direct runoff into man-made or natural absorption areas. For example, gutters, rain barrels, and swales.

- Provide, or subsidize, water storage mechanisms, such as rain barrels, to homeowners within the Shoreline Management Area.

- Provide incentives for shoreline homeowners to voluntarily add native plantings within the Native Conservation Areas first and the Shoreline Management Area second.

B. Nutrient Absorption:

- Provide incentives for shoreline homeowners to make changes to their stormwater and irrigation water techniques, including:

    - Addition of native plantings to the Native Conservation Areas;
    - Inclusion of natural processes that sheet and slow the flow of water; and
    - Use of lawn products that are low in phosphorus or other controlled nutrients.

- Adopt Spokane Regional Stormwater Manual design standards.

C. Toxics Absorption:

- Provide incentives for shoreline homeowners to make changes to their stormwater and irrigation techniques, including:

    - Addition of native plantings to the Native Conservation Areas;
    - Inclusion of natural processes that sheet and slow the flow of water; and
    - Use of lawn products that control weeds or insects with less toxic substances.

D. Lack of Hard Woody Debris:

- Plant native trees within the Native Conservation Zone to absorb rainwater and runoff as well as provide habitat.

- Reduce hard armoring practices in the Shoreline Residential Environmental Designation and replace existing bulkheads and create any new bulkheads using softer solutions. Softer erosion control methods retain the original contour of the shoreline while absorbing the energy from the water flow instead of focusing flow damage to downstream areas. Alternatives to hard structural stabilization measures include, from soft to hard:

    - Vegetation enhancement;
    - Upland drainage control;
    - Anchor trees;

- Gravel placement; and
- Rock revetments.

E. Wave Action:

- Select softer armoring practices in the Shoreline Residential Environmental Designation and the Public Reserve ED that will protect shoreline sediments while absorbing wave energy. Softer erosion control methods will retain the original contour of the shoreline while absorbing the energy from the wave action instead of focusing flow damage to downstream areas. Alternatives to hard structural stabilization measures include, from soft to hard:

  - Vegetation enhancement;
  - Upland drainage control;
  - Anchor trees;
  - Gravel placement; and
  - Rock revetments.

- Provide public outreach to shoreline homeowners in Spokane River Reaches 6-8, within the City, and outside the City, on the need for protecting shorelines from excessive wave action.

F: Multiple Impairments:

- Provide public education to shoreline homeowners on the need for, and best management practices for the control of;

  - Stormwater;
  - Noxious weeds;
  - Native plants and proper planting techniques;
  - Use of products containing nutrients that affect water quality; and
  - Use of products containing toxins that affect water quality.

Potential alternatives that extend landward from the SMA:

A. Surface Water Movement:

- Adopt City-wide stormwater regulations that address water flow on streets that terminate at or allow water to flow into the SMA. This could include:

- Curbing to direct flow;
- Crown management;
- Catch basins; and
- Swales.

B. Nutrient Absorption:

- Provide incentives for homeowners to make changes to their stormwater and irrigation water techniques, including:

  - Inclusion of processes that sheet and slow the flow of water; and
  - Use of lawn products that are low in phosphorus or other controlled nutrients.

C. Toxics Absorption:

- Provide incentives for homeowners to make changes to their stormwater and irrigation techniques, including:

  - Inclusion of processes that sheet and slow the flow of water; and
  - Use of lawn products that control weeds or insects with less toxic substances.

D. Multiple Impairments:

- Provide public education to all homeowners on the need for, and BMPs for the control of;

  - Stormwater;
  - Noxious weeds;
  - Native plants and proper planting techniques;
  - Use of products containing nutrients that affect water quality; and
  - Use of products containing toxins that affect water quality.

7.0 Restoration Project Implementation

7.1 Project Timelines

Funding, or the lack thereof, will dictate the timelines surrounding some of the projects listed above.

There are short-term projects, such as providing public education that can be started immediately upon adoption of the plan. These projects will require planning staff time, but little other cost over publishing and distribution fees. No outside funding should be required.

In the medium-term, projects like local stormwater control will need to be researched for best practices. Decisions on implementation will have to be made. For quick successes, the City can offer incentives for the retrofit of existing pervious surfaces while adding conditions based upon best practices to new development projects that specify stormwater mitigation practices. This will ensure that small but steady progress is made. Depending on the incentives offered, no outside funding should be required.

There are two long term projects;

a. Stormwater controls that provide mitigation for water management from outside the SMA will require outside funding and will have to be incorporated into the Capital Improvements list.

b. Replacement or removal of hard armoring along the shoreline will happen over time as bulkheads fail due to scouring of sediments below and behind. As development projects arise to repair or replace them, alternative solutions will be proposed by the permitting bodies.

7.2 Potential Funding Sources

Potential funding sources for capital projects, including stormwater control and shoreline armoring removal/replacement include:

U.S. Fish & Wildlife Service:

Habitat Conservation - Partners for Fish and Wildlife Program

This program provides expert technical assistance and cost-share incentives to private landowners to restore fish and wildlife habitats. Any privately owned land is potentially

eligible. After signing a cooperative agreement with a minimum duration of 10 years, the landowner works one-on-one with a local Service biologist to develop a project plan addressing the goals and objectives of the landowner and the Service to benefit fish and wildlife species on his/her land. The landowner is reimbursed after project completion, based on the cost-sharing formula in the agreement. For further information contact Juliet Barenti, Eastern Washington Coordinator, 11103 East Montgomery #2, Spokane, WA 99206 (509) 893-8005. Juliet_Barenti@fws.gov.

Upper Columbia Fish and Wildlife Office Recovery Program

Recovery grants are available to fund restoration, recovery, assessment, or research projects with an emphasis on well-planned "on-the-ground" projects that restore or enhance fish and wildlife and/or their habitats, benefit federally listed/candidate species and their habitats, or improve listed species numbers. Nonprofits and private landowners are eligible. There is no match requirement; however, projects with some cost share or in-kind support may be prioritized. Proposals are accepted near the beginning of each fiscal year for restoration or recovery projects to be funded during that fiscal year. For further information contact Suzanne Audet at (509) 893-8002, Juliet Barenti at (509) 893-8005, or Greg Van Stralen at (509) 665-3508, extension 20, or by email at: suzanne_audet@fws.gov , juliet_barenti@fws.gov , or greg_vanstralen@fws.gov

Washington State Department of Ecology:

Centennial Clean Water Fund

Provides funding for activities to reduce nonpoint pollution, comprehensive planning (sewer, storm water, watershed), and/or construction point source facilities. Available to local governments, tribes, and special purpose districts such as sewer, health, or conservation districts. The funding is capped at $250,000 for up to four years and requires a 25 percent match except for construction projects, which require a 50 percent match. Funding is awarded annually. Notice and workshops occurs in December and January. Applications are due late February. For further information contact Tim Hilliard at Ecology: (360) 407-429 thil461@ecy.wa.gov , http://www.ecy.wa.gov/fap.html

Flood Control Assistance Account Program

This statewide financial assistance program funds proposals that can demonstrate a propensity for preservation, restoration, or enhancement of ESA listed fishery resources through planning or flood damage reduction projects. Any public entity that belongs to

the National Flood Insurance Program (NFIP), including towns, cities, counties, and eligible Native American tribes throughout the state, are eligible. Funding is capped at $500,000 per county per biennium and requires a 25-50 percent match, depending on the project. Applications are due in May, with funds available in September. For further information contact Ted Olson at Ecology, (509) 329-3413, tols461@ecy.wa.gov.

Non-point Source Implementation Grant (319) Program

This fund provides grants to local governments, Native American tribes, state agencies, and nonprofit organizations to address identified non-point source pollution and to improve and protect water quality. Grant funds available for each state are determined by an EPA-developed allocation formula. Grants are awarded annually. For further information contact Helen Bresler at Ecology, (360) 407-6180, hbre461@ecy.wa.gov.

WA Coastal Protection Fund - Terry Husseman WQ Account

This account is used to fund environmental, recreational and aesthetic restoration and enhancement projects. Funding is available to local governments, tribes, watershed planning units, nonprofits, and state agencies. Priority is given to projects that involve partnerships with local resources/ volunteers. Successful applications require the Department of Ecology to be a partner. Total available funding is $200,000 for all projects. A match is not required but given points. Applications are accepted year-round. For further information contact Melissa Gildersleeve, Watershed Coordinator, P.O. Box 47600, Olympia, WA 98504 (360)407-6548 mgil461@ecy.wa.gov

Washington State Recreation and Conservation Office:

Aquatic Lands Enhancement Account

This grant supports the purchase, improvement, or protection of aquatic lands for public purposes, including improved accessibility. The grant is available to local governments, state agencies, and tribes. Applicants must provide at least 50 percent in matching resources. Projects must be consistent with the local shoreline master program and must be located on lands adjoining a water body that meets the definition of "navigable." For further information contact Kim Sellers, Outdoor Grant Manager, (360) 902-3082, kims@rco.wa.gov.

Local Non Profit Organizations:

Spokane Parks Foundation

The foundation provides grant funding for projects that improve parks as places of beauty, rest and recreation. The Foundation reviews grants once a year in March. After a review and recommendation by the grants committee a full board votes on the requests. Applicants are notified within five business days regarding their request. For further information contact the foundation at (509) 326-5233.

7.3 Project Monitoring

The following procedure is designed to produce and document progress toward implementation of the above-mentioned restoration projects. Proposed monitoring activities are tied to benchmarks listed below. Future SMP updates will benefit from data collected by the monitoring activities. Monitoring will highlight where the City's restoration efforts are most successful and where they may need improvement prior to the next round of SMP updates.

The US Army Corps of Engineers Ecosystem Management and Restoration Research Program provide the following process for implementing monitoring for riparian restoration projects:

The general process for implementing riparian restoration and monitoring is outlined in five basic steps. These include:

1. Setting goals and objectives;

Goals and objectives for shoreline restoration are listed in chapter 3.

2. Developing a monitoring protocol;

This process will be followed for monitoring shoreline projects described by this plan.

Benchmark 1: Allocate staff resources and create funding plan in 2013:

A. Monitoring Method:

1. Review and evaluate City budget funds that can be allocated to restoration projects to determine if existing funding is sufficient to support any of the mid-term and long-term projects.

2. Obtain preliminary cost estimate for each restoration project.

B. Contingency:

If the City cannot allocate internal financing for complete implementation of a restoration program, the City should begin allocating funds to be used as matching funds for grant based financing.

Benchmark 2: Determine proper grantor(s) for projects that will require outside funding.

A. Monitoring Method:

1. Document the requirements of each grantor whose programs support the restoration project in question. There may be more than one source available for each project. Document the percentage of funding that the city will need to supply based upon grant rules. Document whether in-kind contributions are acceptable and what percentage of City supplied funding these can represent.

Benchmark 3: Apply for funding by 2014.

A. Monitoring Method:

Identify and order the projects that will be completed. Apply for restoration funding. In addition, for projects that no application is entered for, document why no action was made and how to ensure future action (e.g. lack of partners, staff unavailable, grantor's acceptance schedule, etc.).

Benchmark 4: Monitor and summarize success of restoration efforts by 2015.

A. Contingency: Document cause of any noncompliance with SMP/failure to implement. City will revise strategy based on current experience.

3. Designing and implementing data collection;

It is important to monitor the success of individual restoration activities so that subsequent restoration projects can be modified based on the particular successes and failures of each completed project. When applying for restoration project funding, the City may include funding for follow up monitoring in the funding application. Monitoring

data can be used to direct maintenance activities and demonstrate that the City is following through on the grant-funded projects. In addition, it can ensure grantors that future grant funded restoration projects will have the benefit of lessons learned from past projects.

4. Given that specific projects are not currently identified for implementation, but are merely suggested due to lack of funding, all restoration activities that are undertaken under this plan will be monitored and evaluated both for restoration achieved and for any future restoration needs as part of the next SMP update, due by June 2021~~Analyzing and interpreting monitoring data~~; and

5. Assessing results of restoration efforts.

8.0 Conclusions

This plan provides multiple programmatic and site-specific opportunities for restoring the City's shoreline ecological functionality, such that a net benefit in conditions is achieved. Site-specific restoration opportunities have been listed that target projects with the greatest ecological benefit and ease of implementation.

Ecological benefits that would be realized by implementing this plan include: slope stability/erosion control; wildlife corridor connectivity; additional roosting, nesting, and foraging habitat for avian species; additional production of healthy organic materials; displacement of noxious vegetation; and increase in woody debris.

Some of the major factors that result in ecological impairment to the City's waterways are beyond the scope of this plan. Addressing low dissolved oxygen is the focus of a different plan, and thus not addressed in detail here.

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Appendix A:

City of Millwood, Citizens Advisory Committee

Permanent members:

Jay Molitor	Millwood Resident, resides on shoreline
Shannon Stravens	Millwood Resident, does not reside on shoreline
Andy Van Hees	Millwood Resident, does not reside on shoreline
Doug Krapas	Employee of Inland Empire Paper Company

Alternate Members:

Cheryl Gotzian	Millwood Resident, resides on shoreline
Shirene Young	Employee of Inland Empire Paper Company

Appendix B:

Shoreline Map with Aquifer and Coutour Lines

Appendix C:

Shoreline Residential ED (Green hash) and Public Reserve ED (Buff hash), with 2' contour lines (Red). Horizontal lines are shoreline, 50' line and 200' line. Moving east from City limit to Argonne River Bridge.

Parcels 45064.0061 – 45064.0105

Source: City of Millwood

Parcels 45061-0105 – 45064.0071

Source: City of Millwood

Parcels 45064.0071 – 45064.0703

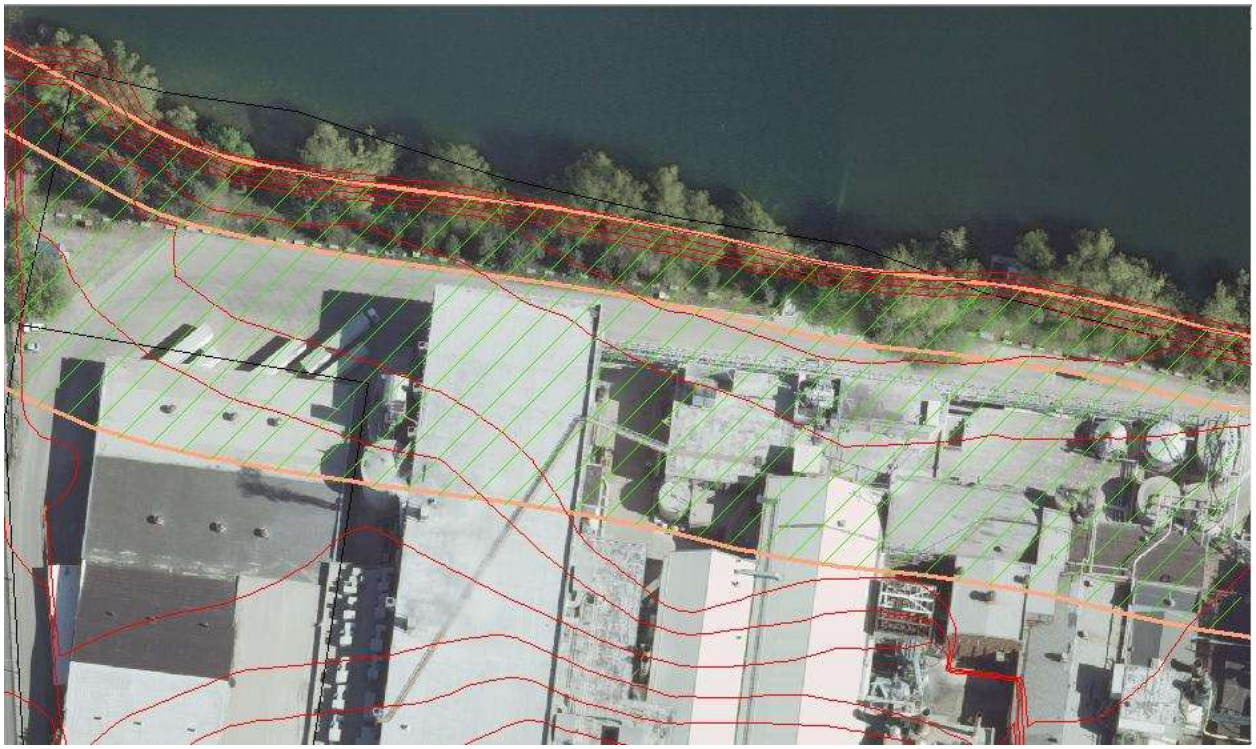
Source: City of Millwood

Parcels: 45064.0704 – 45064.0701

Source: City of Millwood

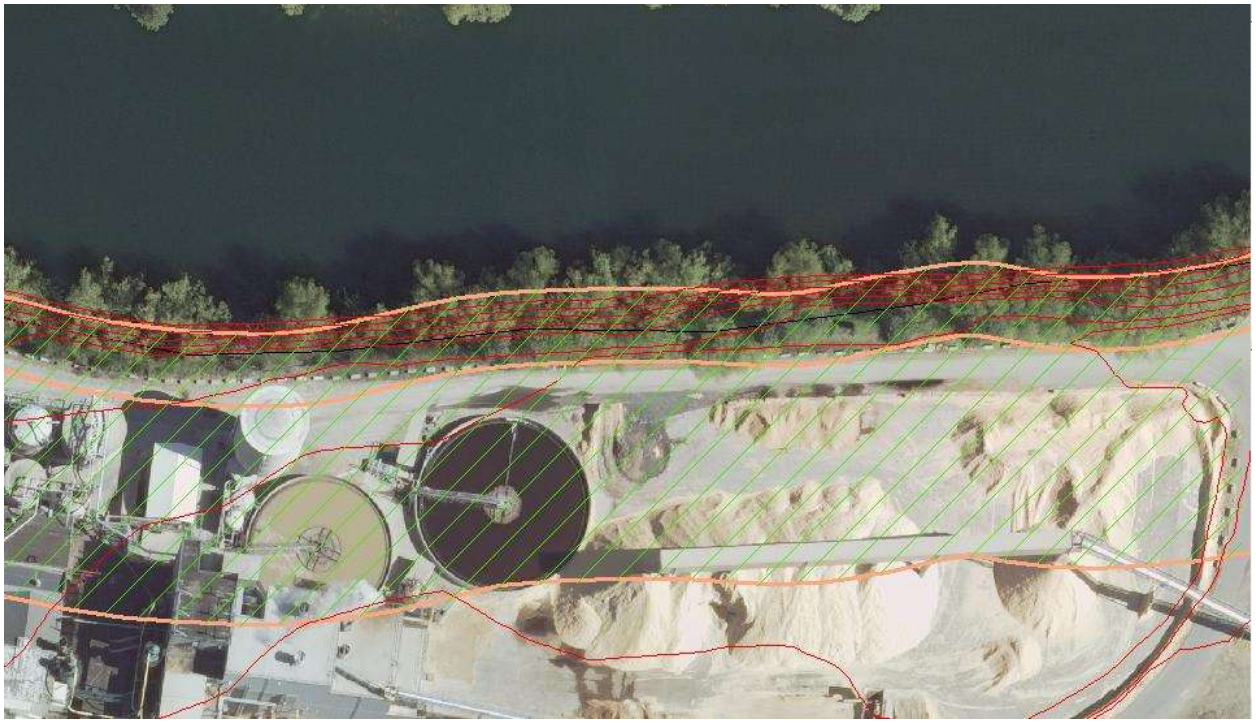
Shoreline Industrial ED (Green hash) with 2’ contour lines. Moving east from Argonne River Bridge to eastern City limit.

Parcel: 45053.0001 (partial)



Source: City of Millwood

Parcel: 45053.0001 (partial)

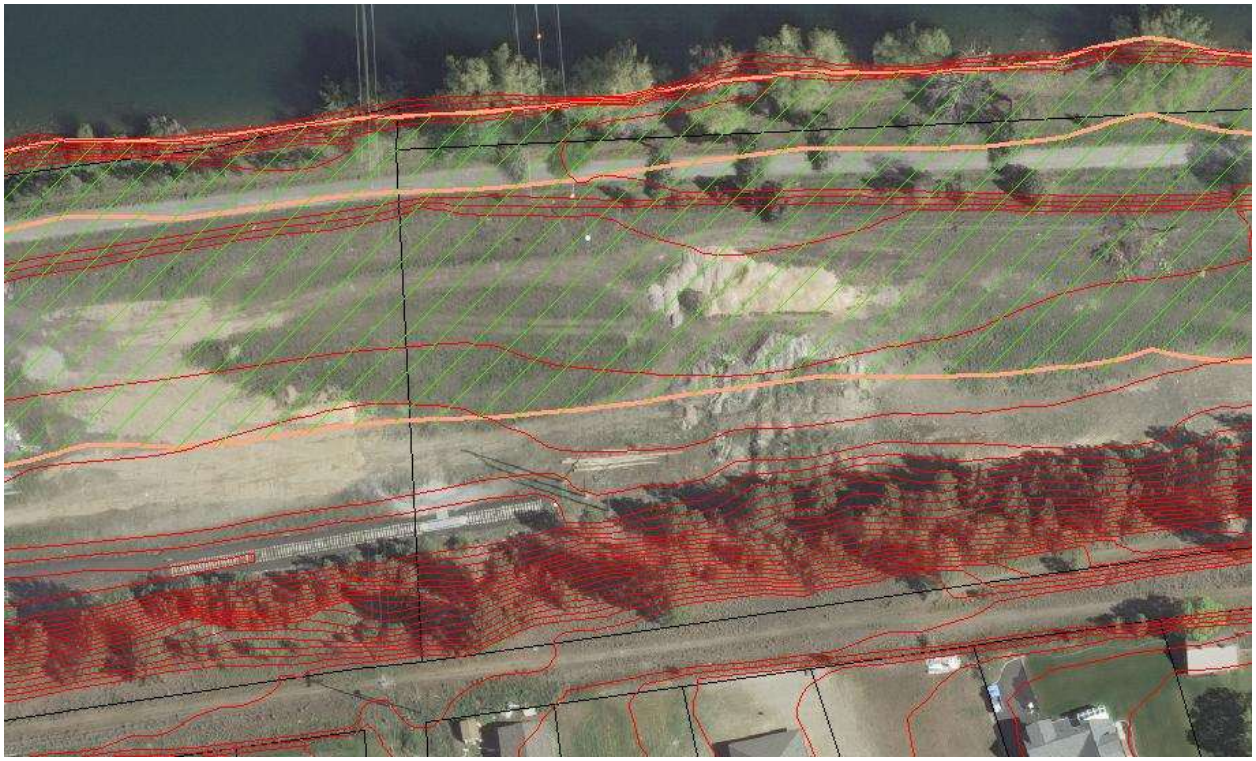


Source: City of Millwood

Parcel: 45053.0001 (partial)

Source: City of Millwood

Parcels: 45053.0001 – 45054.0201 (partials)



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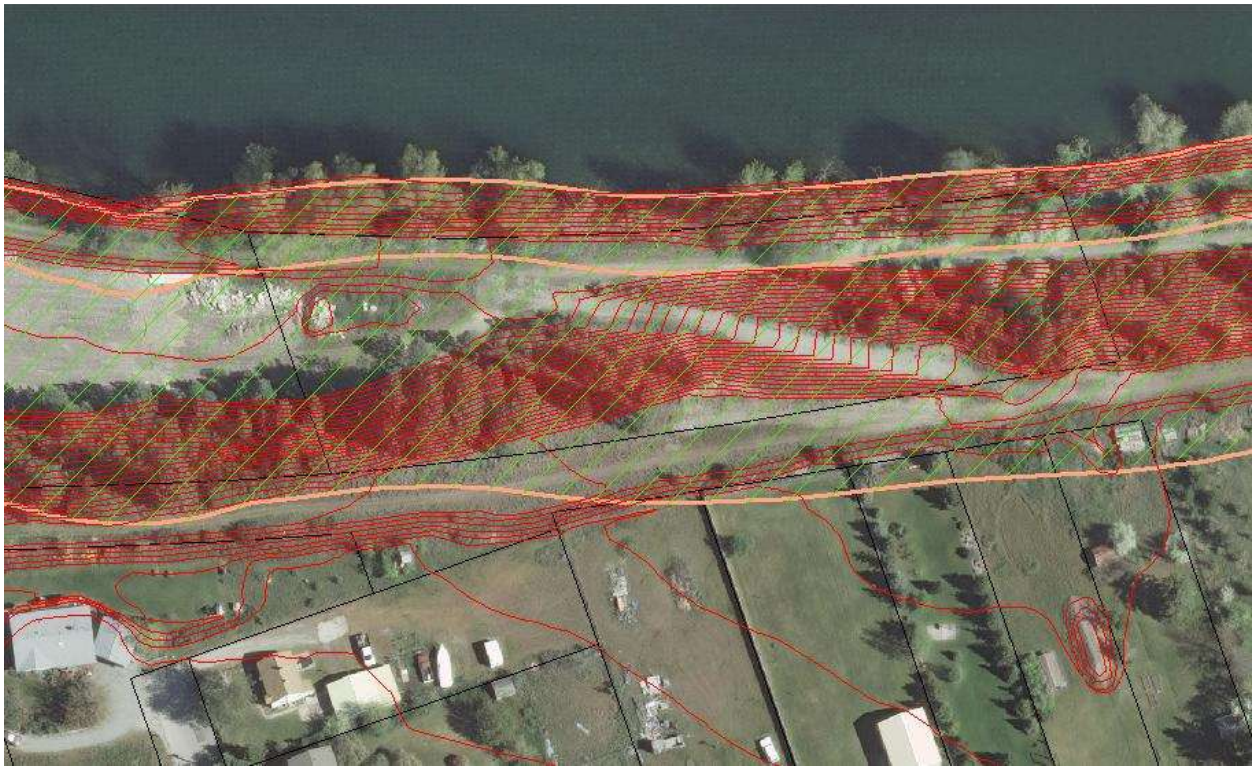
Parcels: 45054.0201 – 45054.0210 (partials)

Source: City of Millwood

Parcels: 45054.0210 – 45054.0306



Source: City of Millwood