

WATER RESOURCE INVENTORY FOR WILDFIRE SUPPRESSION

RED MOUNTAIN ROAD AND
ENTERPRISE CREEK
2025/2026

Dan Caverly/Quinntex Entertainment Photo



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Community Partner

This project has been completed in partnership between Living Lakes Canada and the Red Mountain Road and Enterprise Creek Emergency Preparedness Society (REEPS). REEPS is a non-profit society started by residents brought together by the 2024 Slocan Lake Complex wildfires, aiming to support and strengthen community safety through prevention, preparedness, response, and recovery.

Contributors

- BC Wildfire Service
- Community Champion, Nicky Blackshaw
- Community Participants
- Regional District of Central Kootenay
- Rik Valentine (Argenta Safety and Preparedness Society)
- Saso Consulting
- Slocan Integral Forestry Cooperative

Funders

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Land Acknowledgement

We respectfully acknowledge that this project was carried out on lands that have been stewarded by the Ktunaxa, Secwépemc, Sinixt and Syilx peoples. We recognize the relationships that Indigenous Peoples have with their territories and the waters that flow through them.

Disclaimer and Limitations

This report and the associated maps have been prepared using information provided in good faith by residents, for the sole purpose of supporting emergency response activities. The authors and their organizations do not monitor or control third-party use of this information. Any use beyond the intended purpose of supporting emergency response is outside the scope of this project and is undertaken entirely at the responsibility and risk of the user.

Any use of this information by third parties, whether related to emergency response or otherwise, is at the liability of such third parties. The authors and their organizations accept no responsibility or liability for any damages, losses, or consequences arising from such uses. The information reflects the authors' best judgment based on the data available at the time of preparation. A record copy of this report and data is on file with Living Lakes Canada, which takes precedence over any other copy or reproduction.

This project does not represent an exhaustive inventory of usable water resources or other features relevant to fire suppression within the Area of Interest (AOI) for several reasons. Factors such as crew safety, weather conditions, permission to access private land, limitations of landowner consent, condition of access routes, and time constraints precluded a thorough assessment of all lands and waters within the AOI. Some data provided through this project has been accessed or provided by third parties. Living Lakes Canada and REEPS cannot guarantee the accuracy of that information.

Version Control

Version	Date	Notes
1.0	2026-02-25	Initial Release of report and data products

Please refer to the [Columbia Basin Water Hub](#) for the most current version of these products.

Introduction

British Columbia is experiencing longer, more intense, and more destructive wildfire seasons, with fires increasingly threatening communities, infrastructure, and ecosystems. While wildfires occur naturally and have an important ecological role, and Indigenous cultural burning has maintained landscapes over centuries, high-intensity fires within wildland-urban interface areas (WUI) can pose significant risks to human safety and watershed security (Casselmann, 2025).

In recent years, wildfires across the province have destroyed entire neighbourhoods, displaced thousands of residents, and placed unprecedented strain on emergency response capacity. As climate change, drought, and fuel accumulation continue to increase wildfire risk, it is clear that proactive, locally informed preparedness measures are essential. Improving the speed, safety, and effectiveness of wildfire response is a pressing priority, particularly in the WUI.

This report summarizes the 2025 Water Resource Inventory for Wildfire Suppression project delivered in the Red Mountain Road and Enterprise Creek area on the east side of Slocan Lake. The project focused on the systematic identification, verification, and mapping of water sources and related infrastructure to support wildfire suppression operations. The primary output of this project is a suite of maps and geospatial data layers designed to empower firefighters with knowledge of the endangered community during wildfire response. Maps include locations and information about private standpipes, potential stream-based pump deployment sites, water storage features, stream networks, access routes, and helicopter landing sites. The maps include 33 standpipes, 26 potential pump deployment sites, and 17 helicopter landing sites among other features.

By consolidating this information in advance and combining technical data with local, on-the-ground knowledge, the inventory is intended to improve the efficiency and effectiveness of wildfire response by reducing time spent on field reconnaissance, improving situational awareness, and enabling faster, safer decision making by the BC Wildfire Service (BCWS) and other emergency responders.

A core objective of this work is to empower both firefighters and local communities by transforming community-held knowledge into shared, actionable information. Residents often possess detailed understanding of local water sources, seasonal access constraints, and site-specific conditions that are not captured in existing datasets (Figure 1). This project provides a structured mechanism for responsibly sharing that knowledge, strengthening coordination between responders and communities, and ensuring that



Figure 1. Community meeting participants shared information about water resources within the AOI. LLC Photo

local insights directly contribute to the protection of homes, infrastructure, and lives during wildfire events.

The methodology and structure of this inventory build on a successful pilot project completed in Argenta, BC, in 2023 (Living Lakes Canada, 2024). That pilot integrated hydrometric and spatial data from Living Lakes Canada's Columbia Basin Water Monitoring Framework with local knowledge provided by the Argenta Safety and Preparedness Society (ASAP). The resulting maps were used operationally by ASAP and BCWS in the response to the 2024 Argenta Creek wildfire and demonstrated measurable reductions in field reconnaissance time, contributing directly to more efficient suppression efforts and improved protection of communities. This success led to the approach being adopted as a template for implementation in additional communities across the Columbia Basin.

Project Scope

The scope of this project was limited to developing mapping resources to inform the Community Partner (REEPS) and emergency responders of water resources and other physical features within the AOI to aid in wildfire response. While this project supports local wildfire preparedness, it is only one element of broader rural community preparedness. Effective wildfire resilience requires coordinated action at the household, neighbourhood, and community levels. Communities and residents are encouraged to take other measures to support wildfire resilience, including participation in the RDCK [FireSmart](#) and [Neighbourhood Emergency Preparedness Program](#).

Area of Interest

The Area of Interest (AOI) is located on the east side of Slocan Lake, within Area H of the Regional District of Central Kootenay (RDCK). This area was selected due to strong interest expressed by the community, paired with the complexity of water access and navigation, and confirmation from wildfire professionals that the methodology would be beneficial in this region.

The north-south extent of the AOI runs from Silverton Creek to Memphis Creek. Its eastern boundary is defined by the Wildland Urban Interface (BCWS, 2020). The 5127 hectare area includes 144 private land parcels (DataBC, 2025). The area encompasses 5127 hectares.

The landscape is characterized by dense forests and steep mountainous terrain, which borders Slocan Lake. The forests in the region consist mainly of Cedar-Hemlock and Engelmann Spruce, as well as Sub-alpine Fir based on the BC biogeoclimatic zones (Government of British Columbia, 2021). The highest elevation point within the AOI is 1,934 m and the lowest at the lake is 536 m, with some areas having up to 35 degree slopes. Many residences are located within densely forested areas on steep slopes, with limited access routes, which may present complexities to emergency responders. Silverton Creek and Enterprise Creek are the two largest streams within the AOI.

Fire protection coverage varies across the AOI. Portions of the northern section fall within RDCK's New Denver / Silverton Fire Protection Area, while portions of the southern section are covered by the Slocan Fire Protection Area. Other areas lie outside of established fire protection areas (Figure 2).

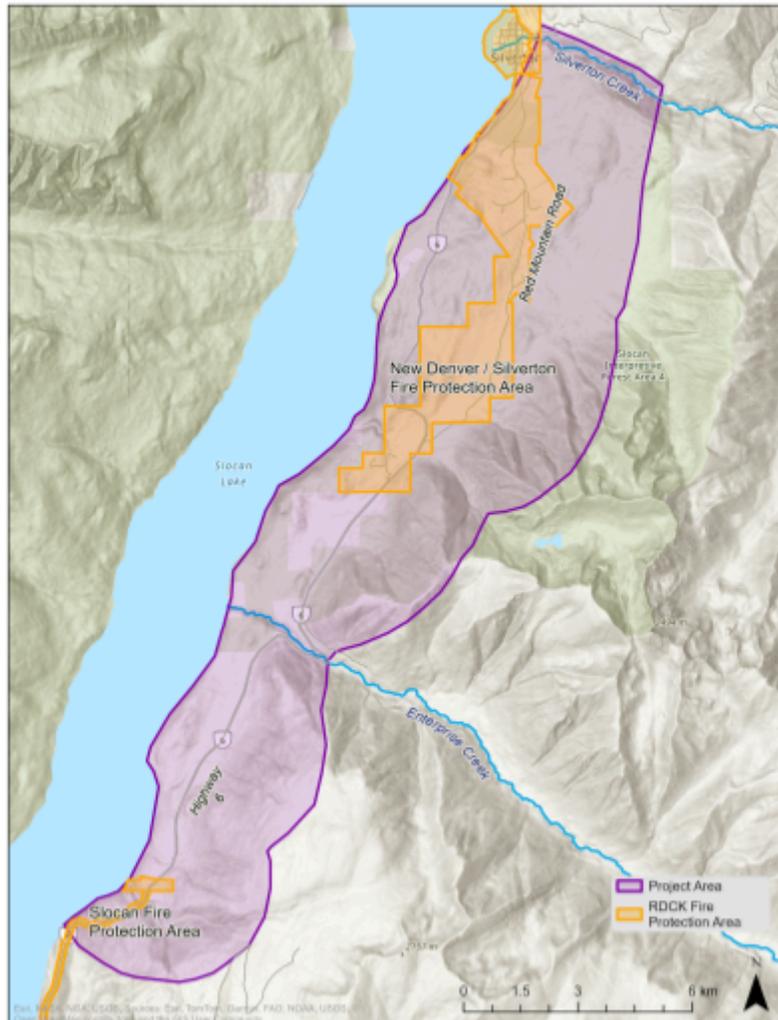


Figure 2. Map of the AOI in relation to RDCK Fire Protection Areas. The eastern boundary is defined by the Wildland Urban Interface. GIS Data: RDCK, 2024; DataBC, 2025; BCWS, 2020.

Community Engagement

In spring 2025, a community engagement campaign was launched to inform residents of the project, respond to questions, and invite the sharing of local knowledge. Community engagement was supported by Nicky Blackshaw, a REEPS board member who acted as the Community Champion for this project. A press release was circulated to local media outlets, a web page was developed for the project, posters were displayed in visible areas throughout the community, and a public meeting was held in Silverton on June 10th with 24 attendees (Figures 1 and 3). REEPS members followed up directly with each household within the AOI, resulting in the participation of 36 households.

Participation in the project was voluntary. Residents were invited to share information at the public meeting, through an online survey, or directly with the project team. The following types of information were requested: stream or natural water sources, potential pump locations, irrigation standpipes, high-pressure garden hoses, access routes, and other relevant features. Suggested locations were subsequently visited and verified by project field crews.

Participating landowners were required to sign a Participation Agreement, providing consent for crews to access their property, collect data, and share it with emergency responders. Information gathered on private properties was limited to that which was permitted by the landowner; some features have been omitted or obscured by landowner request.

REEPS Outreach

To manage outreach to the households within the project area, REEPS used several digital tools. They created an online mapping tool that allowed team members to add contact details to mapped land parcels to organize outreach efforts (Figure 4 and 5). This custom tool (available to other organizations upon request) helped increase local participation by supporting direct outreach through phone calls and in-person conversations.

REEPS also used Google Forms to collect information from community members. These easy, free tools helped REEPS connect with more households efficiently. For residents without online access, information was collected on paper and later added to the digital forms.



Figure 3. Community Champion Nicky Blackshaw shows Living Lakes Project Coordinator Claire Pollock-Hall the location of a stream near Enterprise Creek. LLC Photo

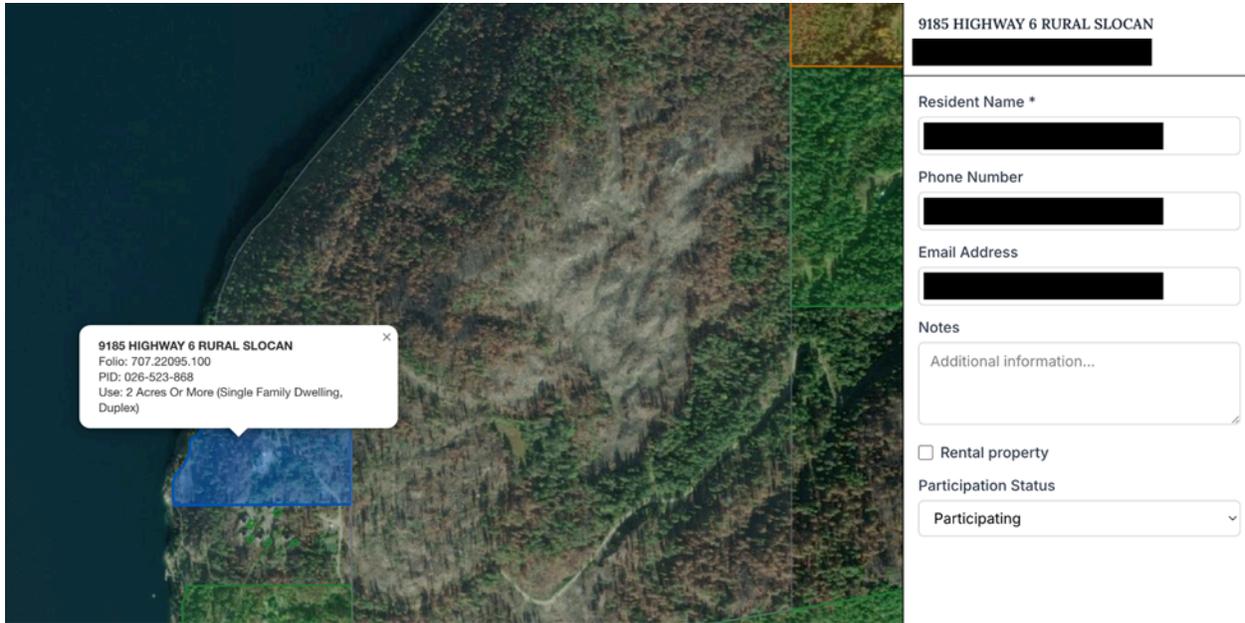


Figure 4. The custom online mapping tool used by REEPS to record household contact information, participation status, and feedback during the community outreach.

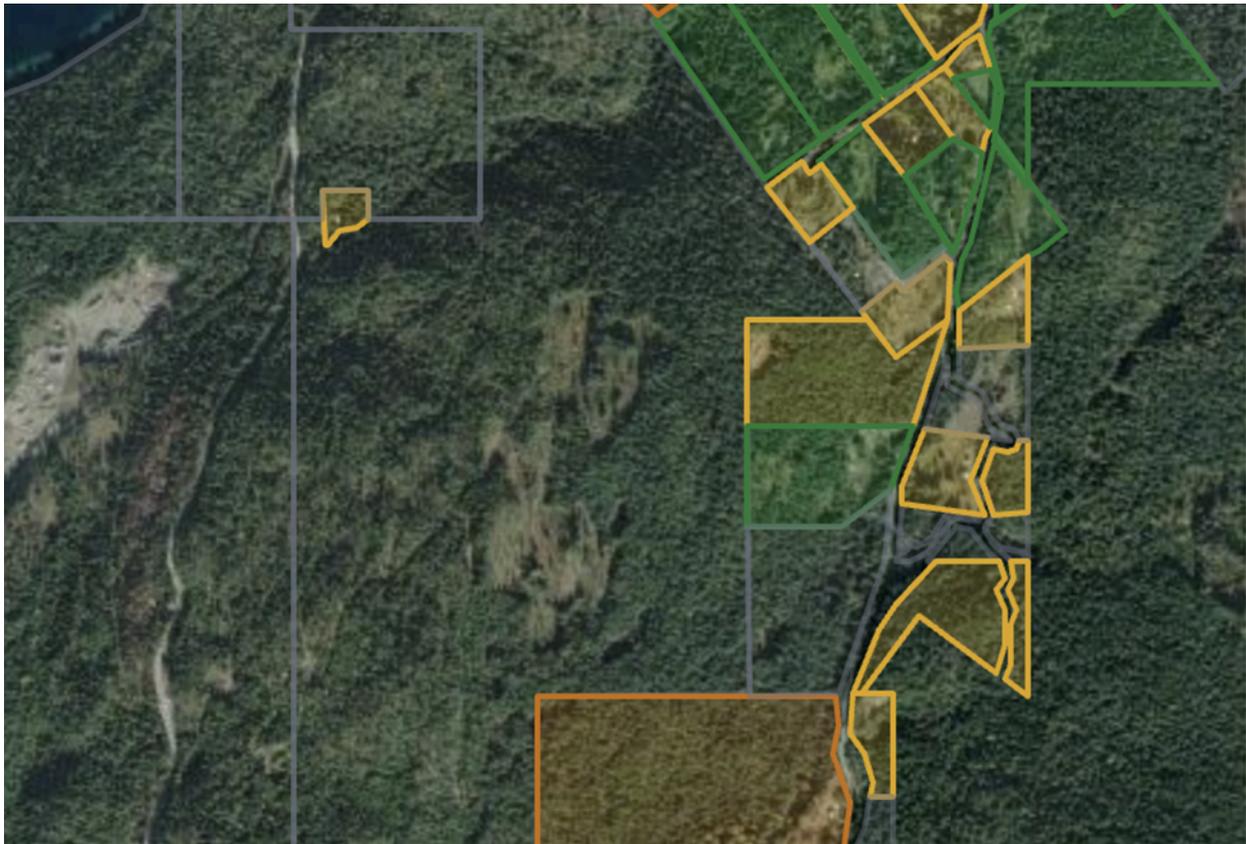


Figure 5. The mapping tool's colour-coded parcels indicating which households had been contacted within the AOI.

Methods for Data Collection and GIS Transformations

Field reconnaissance and measurements were completed by Living Lakes and REEPS, with support from community members and the West Kootenay Youth Climate Corps. Site visits were carried out in July, August, and early September of 2025. Since the summer of 2025 was a relatively low flow year for many streams in this region, these measurements should be representative of low flow conditions that could be expected in dryer years when wildfire risk is higher. All site coordinates were taken using smartphone-based GPS apps or a Garmin inReach device, both of which have a typical accuracy of 5-10 metres.

Standpipes and Garden Hoses

Standpipes and garden hoses can provide firefighters with an invaluable resource especially when defending structures against an incoming forest fire. In many cases, these features can be difficult or impossible to find for an incoming fire crew, and their operability and reliability is typically unknown. Having detailed knowledge of the location, pressure, and flow rate of these resources vastly improves the fire crews ability to save threatened homes and properties.

Standpipes volunteered by landowners were visited by field crews who took flow rate and static pressure measurements and gathered relevant metadata. For garden hoses under 12 gallons per minute (GPM) a RESTMO brand flow meter was used. Above 12 GPM, a timed volume test was conducted, using a 222 litre (58.6462 gallon) bucket (for systems with low water supply, a 100 litre bucket was used). Tests were conducted using a 1.5" firehose or ¾" garden hose, depending on the system. Static water pressure was measured using liquid-filled pressure gauges (Figure 6). Metadata recorded included geographic coordinates, photos of the resource, source streams, size of intake pipes, connectivity with neighbouring water systems, access information, and landowner contact details.

Pump Sites in Streams

Advance knowledge of the locations and flows in local creeks can save fire crews days when arriving on site. In many communities, the hydrological landscape can be quite complex and confusing, with small streams disappearing into the ground and reappearing, and seeps and springs providing pools in locations that may not be found using pre-existing mapping resources. Photos provide additional insight into site conditions and enable crews to arrive on site with the required equipment.

Potential pump deployment sites were first identified through local knowledge paired with a review of the BC Freshwater Atlas (GeoBC, 2025). Site visits were carried out to evaluate access routes and staging

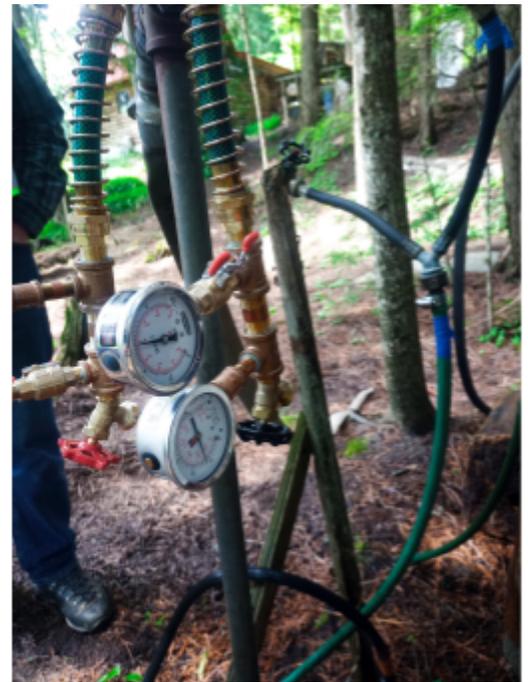


Figure 6. Measuring water pressure on an irrigation standpipe. LLC Photo

sites, identify and measure pools, quantify stream flows, and photograph the site (Figure 7). Optimal pump sites were characterized by a pool depth of at least 30 cm, with coarse substrates, and easy accessibility. Due to limited water resources in some parts of the AOI, sites which do not fully meet the criteria have still been included, and could potentially be modified for usability.

Where existing hydrometric data was not available, stream flow measurements were obtained using the stream velocity rod or salt dilution method. These field measurements represent instantaneous estimates of stream discharge and do not reflect long-term or seasonal averages. To display a comparison of typical conditions, modelled average flows were compiled for each measured stream discharge.

Water Survey Canada real-time and historical datasets were used as the primary preferred source for long-term hydrometric data (Environment and Climate Change Canada, 2025). Additional streamflow records were obtained from datasets within Living Lakes Canada's Columbia Basin Water Hub, and modelled data was accessed using the BC Water Tool to supplement measured discharge values (Living Lakes Canada, 2025; BC Water Tool, 2025).

10th and 90th percentile discharges were developed for each stream using the sources mentioned above, and presented as a range of potential monthly high and low flow conditions for a given stream in July, August, and September. This provides wildfire crews with a clearer understanding of the potential range of conditions they may encounter at each recommended stream site.

Within the spatial data resources, pump sites are symbolized based on an overall average of summer streamflows, scaled from white (lower flows) to dark purple (higher flows).

Stream Mapping

Another challenge faced by fire crews is inaccurate mapping of streams on other available maps, which can lead them in the wrong direction and waste valuable time. Additionally, some streams which flow during wet seasons exhibit little to no flow during fire season. This project provides corrected and seasonally-relevant stream mapping generated from local knowledge and on-the-ground verification, empowering fire crews with accurate locations of water sources.

Existing stream mapping layers were obtained from the BC Freshwater Atlas (GeoBC, 2025), as well as an internal data layer provided by the Slocan Integral Forestry Cooperative (SIFCo, 2025). Although there is some variance between these maps, both layers were included to provide the most complete



Figure 7. Example of a potential pump site. LLC Photo

representation of potential streams in the area. Where accessible, stream locations were verified on-the-ground and updated within the provided maps, resulting in the development of the LLC Stream Layer. Symbology within the LLC Stream Layer has been scaled to depict expected stream flows based on field observations. Note that not all stream segments were able to be verified in-person due to access limitations and time constraints.

Within the LLC Stream Layer, streams with flows high enough to identify potential pump sites were classified as Significant Flow. Streams that were investigated and had running water but were likely not suitable for pump placement were classified as Flowing. Streams that could not be located or that exhibited little to no water during field reconnaissance are indicated on the Inactive Streams layer (Figure 8). While conditions may vary over time, these streams are considered unlikely to be usable for wildfire suppression purposes.

Stream lines within these layers have been extended slightly beyond the bounds verified through field reconnaissance where conditions are inferred to be similar upstream and downstream of the location visited. However, due to the variable hydrology of this region, conditions may not be consistent along an entire stream channel.



Figure 8. Dry creek bed in project area. LLC Photo

Helicopter Landing Sites

Helicopter access is essential to fire crews needing to access the site quickly, and for staging equipment and crews. Field teams documented sites which could be used for a potential helicopter landing (Figure 9). Sites were characterized by dimensions and geographic coordinates.



Figure 9. Helicopter Landing Site HEL_301. LLC Photo

Roads and Access

Road access shown in this project is primarily based on the BC Road Atlas and a road layer provided by SIFCo. These road datasets did not undergo full field verification as part of this work. However, points of interest encountered during field activities, such as road blockages, water bars, additional access routes

not previously mapped, or special access considerations (4WD) were noted where observed.

Water Storage Containers

Water storage containers supplied by residents can provide fire crews with a reliable, known quantity of water. Containers can also be refilled using water trucks as needed to provide a continued supply at a location. This project documents these resources as volunteered by residents.

Resource dimensions and the locations were recorded. These vessels could include pools, water intake reservoirs, ponds, or water storage tanks. In some instances, landowners requested that such features be documented to indicate that they should *not* be used as pump sites or otherwise, as this would have adverse impacts on downstream water supply or pressure.

Building Footprints

Structural protection is often the most important aspect of wildland firefighting. In rural, densely vegetated communities, where residences are not mapped on a grid, it is difficult for fire crews to know where the structures they need to protect are located. Building footprint data was derived from satellite imagery from Esri basemap (2024). A QGIS Plugin called Mapflow uses the imagery to outline buildings within the area of interest (AOI). Buildings which were built later than 2024 would not be included in this layer. In addition, because the building footprints are generated through automated interpretation of satellite imagery, the dataset cannot be considered fully complete. Some structures may be missed or inaccurately represented due to factors such as image resolution, shadowing, vegetation cover, or other conditions that limit the visibility of buildings in the source imagery.

Data Products

The map and data resources are available in two versions: Professional and Public. The Public version of the map is provided in Appendix 1 of this report and is available on the Columbia Basin Water Hub (Living Lakes Canada and Red Mountain Road and Enterprise Creek Emergency Preparedness Society, 2026).

The Public version has been developed for broader public access. It excludes confidential information, including access routes, pump sites, and standpipes on private land, to protect the privacy of landowners and participants. Mapped stream channels, whether flowing or dry, are included in the Public version.

The Professional version contains the complete dataset and is restricted to emergency response agencies only to protect the privacy of private landowners and participants. These files have been shared with the BCWS (Southeast Fire Centre), RDCK Fire and Emergency Services Department, and the Red Mountain Road and Enterprise Creek Emergency Preparedness Society (REEPS). Incoming wildfire crews should be supplied with these resources when dispatched to the area. **Other emergency response professionals seeking access to the Professional resources can contact REEPS at info@reeps.ca.**

Map products delivered through this project include printable PDF maps of the study area, a georeferenced basemap for use in Avenza Maps, CSV files of all identified features, and KML files (for use in Avenza and Google Earth) containing the data layers described below. All spatial layers produced through this work are also provided in a file geodatabase for use in external mapping applications such as ArcGIS and QGIS.

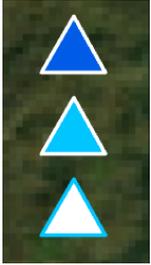
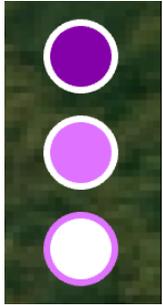
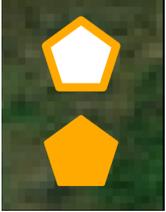
Basemap Display Layers

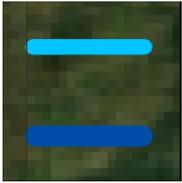
Within the mapping resources, the following spatial data layers are included on the basemap for reference purposes:

Layer Name	Layer Symbology	Symbology Description	Layer Description
Satellite Imagery		Satellite imagery basemap	Satellite imagery sourced from Vantor and ESRI Canada, 2024 imagery.
Streams		Light blue line	Existing mapped streams, sourced from the Freshwater Atlas and SIFCo datasets.
Roads and Access		Highway: orange line with red outline Railway: grey line with grey vertical bars Roads: white line with green outline Trails: yellow dotted line LLC Access Routes: red line with black outline	Road information, including highways, roads, railways and trails, was extracted from the BC Road Atlas in conjunction with SIFCo's road dataset and routes identified through Living Lakes field reconnaissance.
BC Cadastral		Black outline	ParcelMap BC cadastral polygons.

Interactive Data Layers

Within the Professional versions of the mapping resources, the following spatial data layers are available:

Layer Name	Layer Symbology	Symbology Description	Layer Description
Pump Sites		Pump Site Utility (Average Flows) Dark blue: 1400 - 35500 GPM Light blue: 500 - 1400 GPM White: 100 - 500 GPM	Pump sites are locations that wildfire crews can use to draw water. Sites are along creeks where water pools and creates a depth of at least 30 cm deep.
Standpipes		Standpipe Pressure Dark purple: 80-113 PSI Purple: 30-80 PSI White: <30 PSI	Standpipes can be garden standpipes, irrigation, or garden hoses.
Water Storage		Empty orange pentagon: Water storage that landowner has requested not to use Filled orange pentagon: Water storage vessel	Water storage can be a pond, pool, or any vessel containing a significant amount of water to use for wildfire suppression.
Helicopter Landing Sites		Red outlined circle with "H" represent helicopter landing sites	Locations within the project area where a helicopter can land.
Road Impasse		Road impasses are represented by red bars	Blocked roads, water bars, or features which would require 4WD.
Building Footprints		Building footprints are yellow polygons	Building footprints were derived from aerial imagery as described above.

Layer Name	Layer Symbology	Symbology Description	Layer Description
LLC Streams		Medium weight blue line: Flowing Stream Heavy dark blue line: Significant Flow	Verified locations of flowing streams, based on field observation by Living Lakes in Summer 2025.
LLC Inactive Streams		Light red line: Inactive Stream	Locations where streams shown on other available maps were verified to be dry, nearly dry, subsurface, or non-existent based on field observations by Living Lakes in Summer 2025.
SIFCo Fuel Treatment		Transparent light green polygon: Fuel treatment area	Locations where SIFCo has performed wildfire mitigation fuel treatments (SIFCo, 2026).

Future Actions

Living Lakes and REEPS recognize that conditions within the mapped areas will change over time, and that the data products will be most useful if they are kept up-to-date. Ideally, annual or bi-annual desktop-based maintenance would be carried out, with field measurements updated at five year intervals. Further funding would be required to enable Living Lakes and REEPS to undertake this maintenance. Living Lakes hopes to continue to work alongside BCWS, community groups, and local governments to support the maintenance of these products and provide regular updates to emergency responders in advance of wildfires.

Numerous other rural communities have approached Living Lakes with interest in applying this methodology within their own communities, with several new projects to be completed in 2026. With further funding, the model could be scaled to support additional rural communities.

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Slocan Integral Forestry Cooperative (2025). Water Features Layer. Personal Communication.

Slocan Integral Forestry Cooperative (2025). Road Vector Layer. Personal Communication.

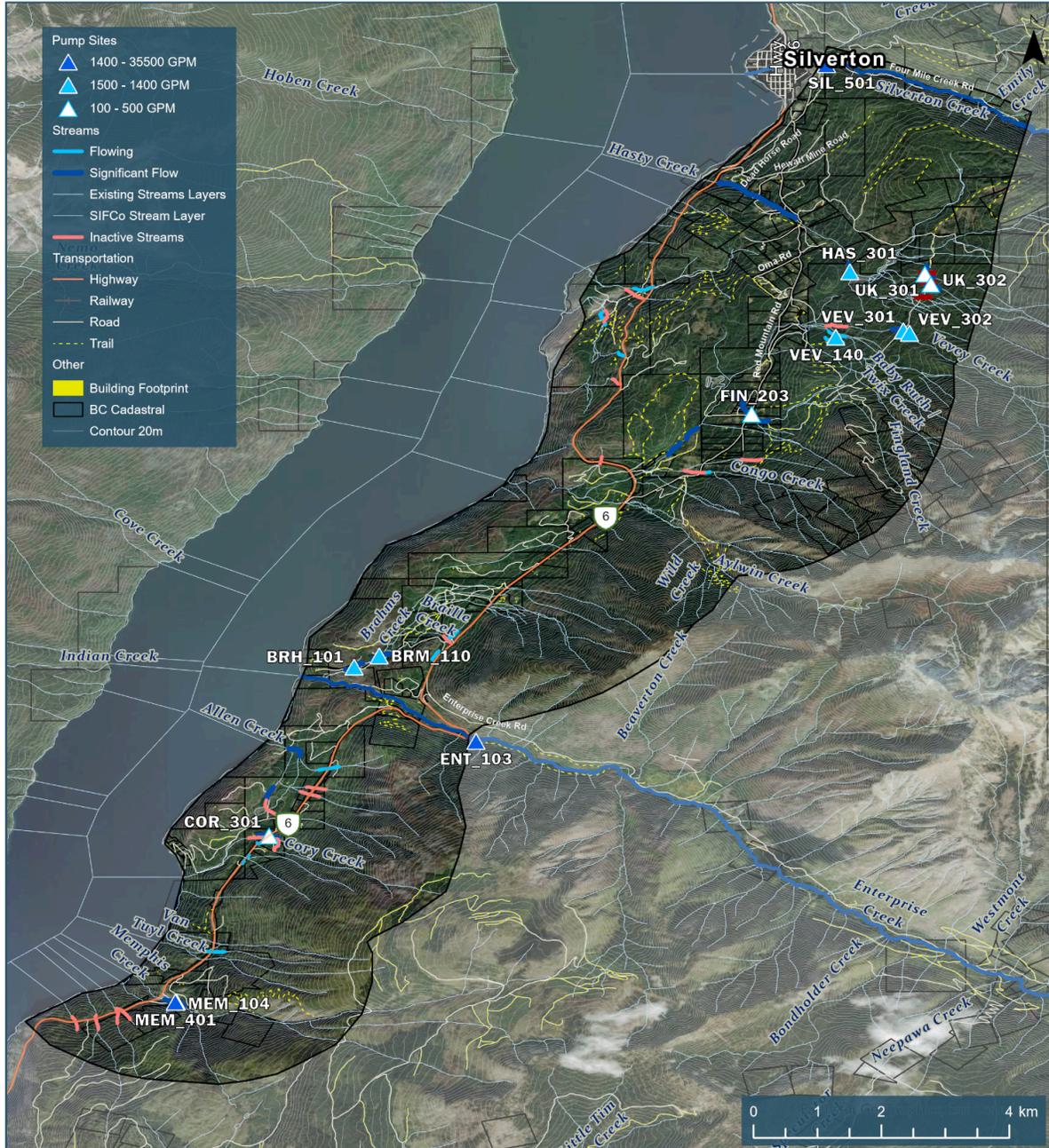
Slocan Integral Forestry Cooperative (2026). Fuel Treatment Layer. Personal Communication.

Appendix 1

Water Resource Inventory for Wildfire Suppression

Red Mountain Road and Enterprise Creek 2025/2026

Public Version - Confidential Details Excluded



The complete Professional files have been shared with the BCWS (Southeast Fire Centre), RDC Fire and Emergency Services Department, and the Red Mountain Road and Enterprise Creek Emergency Preparedness Society (REEPS). Incoming wildfire crews should be supplied with these resources when dispatched to the area. Other emergency response professionals seeking access to the Professional resources can contact REEPS: info@reeps.ca. Please refer to the Columbia Basin Water Hub for the most current version of these products: <https://data.cbwaterhub.ca/organization/reeps>

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Version 1.0

