

# **APPENDIX H**

## **ENERGY AND POWER REPORTS**

**2022 Power Needs Analysis Report**

2022

# Mission Ridge Expansion



POWER NEEDS ANALYSIS

JANUARY 18, 2022

# MISSION RIDGE EXPANSION

## Executive Summary

Larry Scrivanich/Tamarack Saddle LLC., submitted a revised Master Plan Resort application to Chelan County on January 17, 2020 (MPR 2018-128). The application proposes development within five phases as outlined within the submitted project narrative.

|              | Condominiums,<br>Townhomes and<br>Duplexes (Total<br>Units) | Single<br>Family<br>Detached<br>Units | Hotel/Lodge | Commercial<br>Space/Skier<br>Services | Employee<br>housing |
|--------------|-------------------------------------------------------------|---------------------------------------|-------------|---------------------------------------|---------------------|
| Phase 1      | 172                                                         | 102                                   |             | 60,000                                |                     |
| Phase 2      | 162                                                         | 50                                    | 57          | 20,000                                | 40*                 |
| Phase 3      | 156                                                         | 41                                    |             | 18,500                                |                     |
| Phase 4      | 131                                                         | 41                                    |             | 11,500                                | 40*                 |
| Phase 5      | -                                                           | 31                                    |             |                                       |                     |
| <b>Total</b> | <b>621</b>                                                  | <b>265</b>                            |             | <b>110,000</b>                        | <b>80*</b>          |

In addition to the development outlined above, additional skier amenities will also be provided which include new chair lifts, gondola, platter lift and snow making equipment.

On September 21, 2020, Chelan County Issued the revised Scoping Status Summary document. Within the scoping summary, the following issues were identified seeking additional information on power. These include:

### 5. Energy and Natural Resources

#### a. Source/availability

- i. Analysis of impacts related to extending the Chelan PUD power and telecommunications system to the project site, which will require construction of a new transmission main, substation, and distribution system. Analysis shall be coordinated with Chelan PUD and shall include but not be limited to the Chelan PUD feasibility and application process and include load studies, review of environmental impacts, and land use rights and permitting.

### 8. Public Services

#### d. Electricity

- i. Increased demand for electrical energy for resort operations and heating/lighting.

Mission Ridge retained the services of McKinstry Company to evaluate the planned phased expansion and availability of power from Chelan PUD.

This report provides responsive information to the scoping summary questions and provides proposed mitigation and suggested project conditions.

Electrical infrastructure that provides services to the Mission Ridge Ski area is limited in capacity and will require modifications and additions to support the fully planned expansion. The timing of when modifications are required largely depends on the ability of Chelan PUD to manage load on the existing feeder to the best of its ability and the pace at which Mission Ridge expansion moves forward. The need for added infrastructure to allow for additional load to be served appears to be both a function of organic growth in the area as well as the planned Mission Ridge expansion and other ongoing developments.

Discussions with Chelan PUD indicate a strong desire to serve the load and updates to the current application on file are in process. Chelan PUD has some power availability now (approximately 1mW) and the potential to stretch that to 2-3mW with minor infrastructure upgrades to the Chelan PUD system which would allow phase one construction to begin and potentially complete without any significant infrastructure modifications or additions depending on Chelan PUD ability to shift some load.

We have adjusted anticipated electrical power needs by phase by re-evaluating previously provided power projections as well as making a move to predominately serve the heating, domestic hot water production and cooking fuel source to gas as well as mandating high efficiency building standards for single family, multi-family, hotel and commercial buildings that will further drive down the use of electricity.

Renewables will be a component of the Mission Ridge Expansion which will include at a minimum PV systems either roof mounted or ground mounted as well as potential to couple PV with battery storage systems either at local buildings or at scale to accommodate multiple buildings. The use of battery storage systems can help reduce peak power demands from Chelan PUD.

All parties agree that regular and transparent communication take place to ensure that Chelan PUD has adequate time to accommodate load and that Mission Ridge. This close communication ensures that Mission Ridge can't build at a pace that Chelan PUD can't support as ultimately Chelan PUD controls the process.

Based upon our analysis and work with Chelan PUD power will be available for this project and it is anticipated that a new substation would not be required. If a new substation is required at some later phase in the project due to changing needs of either Mission Ridge or other expansion in the area both Chelan PUD and Mission Ridge have identified potential locations for a new substation. Permit processes through PUD would be required if this is necessary.

## Overview of Power Needs

New loads for the expansion include:

- Single Family Residence
- Multi-Family Residence (Townhome style)

- Condominium Residence
- Hotel
- Commerical Buildings utilized for restaurant/retail/office
- Operations and Maintenance Buildings

We have tabulated estimated loads attached at the end of this document and anticipated phasing for when they may occur. Phasing guidelines subject to change based upon development planning.

Common to all of these loads is the need to utilize highly efficient methods to reduce electrical energy consumption. The most prudent way to stretch the power budget will be to utilize a gas source as a means for heating/cooling, domestic hot water and cooking.

In addition all buildings will utilize high efficiency building methods that include efficient exterior envelopes that exceed energy code standards, premium glazing that exceed energy code standards, heat pump based heating/cooling, heat pump based high-efficiency water heating, incentives to utilize PV and battery storage coupled with PV, occupancy based control systems for both lighting and HVAC systems as well as all LED lighting.

The use of gas systems allows the use of either a high efficiency gas fire heat pump that provides heating water, hot water and at times cooling, a separate gas fired furnace and gas fired water heater or in higher density requirements a micro combined heat and power plant combined with thermal storage. These systems coupled with gas cooking can drive electricity demand down 50% or more.

In higher density occupancies for hotel, condominium and commercial the use of centralized systems in lieu of separate systems approach will also be utilized to make more efficient use of the available power.

## Ski Mountain Loads

New loads for the expansion include:

- Multiple New Lift Lines (6,7,8)
- New Gondola
- New Platter Relay Lift
- Snow Making Equipment

Loads required to support ski operations will be phased with new lift lines 6 and 7 as well as snow making equipment happening in phase one and lift line 8, gondola and platter relay lift happening in later phases.

Loading conditions may warrant an alternate source of power for the lift lines to offset peak loads. This may involve coupling each lift to a generator or battery at each lift equipment site and being tied into a demand response signal from the utility company which would give Chelan PUD the ability to remove these loads from the system at times of peak use. This type of approach will require close coordinate with Chelan PUD for implementation if deemed necessary. It is not anticipated



that this will be a day one requirement but may be something built into the system to allow adding at a later date.

Snow making equipment will also be part of phase one but the use of the snow making equipment does not coincide with the use of the lift lines and these are seen mostly as offsetting loads. If peak loading is a concern to Chelan PUD then this is another load that could be managed in conjunction with Chelan PUD to schedule appropriate times when snow making equipment can operate or if it needs to operate off grid via generator. This is another area where close coordinate with Chelan PUD will be necessary.

## Phased Build

Preliminary load analysis based upon Mission Ridge Expansions plans developed by EcoSign are indicated below. This is a static snapshot and doesn't account for variability in buildings planned. The key coordination is between Mission Ridge and the PUD to stay in close contact as the phases develop to ensure success for both parties.

| Mission Ridge Expansion - Electrical Load Breakdown                                      |                                                                   |          |       |                |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------|-------|----------------|
| Area                                                                                     | Use                                                               | Quantity | Phase | Est. Load (kW) |
| 1                                                                                        | SFR                                                               | 26       | 1     | 169            |
| 2                                                                                        | Day Use Parking                                                   | 1        | 1     | 5              |
| 3P1                                                                                      | Village - (140 hotel units - no cooking or laundry)               | 140      | 1     | 420            |
| 3P1R                                                                                     | Village - Retail 4 Bldgs with ground flr retail/rest <sup>1</sup> | 16       | 1     | 480            |
| 3P2                                                                                      | Village - (140 hotel units - no cooking or laundry)               | 140      | 2     | 420            |
| 3P2R                                                                                     | Village - Retail 4 Bldgs with ground flr retail/rest <sup>1</sup> | 16       | 2     | 480            |
| 3P3                                                                                      | Village - (105 hotel units - no cooking or laundry)               | 105      | 3     | 315            |
| 3P3R                                                                                     | Village - Retail 3 Bldgs with ground flr retail/rest <sup>1</sup> | 12       | 3     | 360            |
| 3P4                                                                                      | Village - (66 hotel units - no cooking or laundry)                | 66       | 4     | 198            |
| 3P4R                                                                                     | Village - Retail 2 bldgs with ground flr retail/rest <sup>1</sup> | 8        | 4     | 240            |
| 4                                                                                        | Multi-Family Townhomes                                            | 20       | 4     | 92             |
| 5                                                                                        | Multi-Family Townhomes                                            | 8        | 3     | 36.8           |
| 6                                                                                        | SFR                                                               | 5        | 4     | 58.5           |
| 7                                                                                        | Multi-Family Townhomes                                            | 40       | 4     | 184            |
| 8P4                                                                                      | SFR                                                               | 36       | 4     | 234            |
| 8P5                                                                                      | SFR                                                               | 14       | 5     | 91             |
| 9                                                                                        | Multi-Family Townhomes                                            | 24       | 3     | 110.4          |
| 10                                                                                       | SFR                                                               | 20       | 5     | 130            |
| 11                                                                                       | SFR                                                               | 3        | 5     | 19.5           |
| 12                                                                                       | Mountain Top Restaurant / Obs Platform                            | 1        | 1     | 75             |
| 13                                                                                       | SFR                                                               | 31       | 3     | 201.5          |
| 14                                                                                       | SFR                                                               | 27       | 2     | 175.5          |
| 15                                                                                       | SFR                                                               | 8        | 3     | 52             |
| 16                                                                                       | Multi-Family Townhomes                                            | 30       | 3     | 138            |
| 17P1                                                                                     | Multi-Family Townhomes                                            | 30       | 1     | 138            |
| 17P2                                                                                     | Multi-Family Townhomes                                            | 51       | 2     | 234.6          |
| 18P1                                                                                     | SFR                                                               | 79       | 1     | 513.5          |
| 18P2                                                                                     | SFR                                                               | 29       | 2     | 188.5          |
| 19                                                                                       | Multi-Family Townhomes                                            | 6        | 1     | 27.6           |
| 20                                                                                       | Multi-Family Townhomes                                            | 16       | 1     | 73.6           |
| 21                                                                                       | SFR                                                               | 6        | 1     | 39             |
| 22                                                                                       | Ski Maintenance / Volunteer Fire                                  | 1        | 1     | 50             |
| 23                                                                                       | Operations Yard                                                   | 1        | 1     | 50             |
| 24                                                                                       | Operations / Civil Infrastructure                                 | 1        | 1     | 50             |
| 25P2                                                                                     | Employee Housing (20 beds)                                        | 40       | 2     | 120            |
| 25P4                                                                                     | Employee Housing (20 beds)                                        | 40       | 4     | 120            |
| NA                                                                                       | Ski Lift 6                                                        | 1        | 1     | 150            |
| NA                                                                                       | Ski Lift 7                                                        | 1        | 1     | 150            |
| NA                                                                                       | Ski Lift 8                                                        | 1        | 2     | 150            |
| NA                                                                                       | Pulse Gondola                                                     | 1        | 2     | 150            |
| NA                                                                                       | Platter Relay                                                     | 1        | 2     | 45             |
| Total Estimated Demand (kW)                                                              |                                                                   |          |       | 6935           |
| Phase 1 Estimate                                                                         |                                                                   |          |       | 2390.7         |
| Phase 2 Estimate                                                                         |                                                                   |          |       | 1963.6         |
| Phase 3 Estimate                                                                         |                                                                   |          |       | 1213.7         |
| Phase 4 Estimate                                                                         |                                                                   |          |       | 1126.5         |
| Phase 5 Estimate                                                                         |                                                                   |          |       | 240.5          |
| Notes                                                                                    |                                                                   |          |       |                |
| 1. Estimated average demand of 30kW for retail/restaurant space, (4) spaces per building |                                                                   |          |       |                |

Current power projections indicate that Mission Ridge could begin Phase I developments as there is sufficient capacity for that activity to start. Minor system upgrades to the existing Chelan PUD



infrastructure would be necessary to get to the end of Phase I. Improvements do not involve new transmission.

Power beyond Phase I could be accomplished in a variety of ways and largely depends on the pace of expansion. One option would be to construct a second distribution feeder up to Cranmer Road which would allow for additional capacity and potential to serve through phase 2. This would provide capacity for a total up to 4-5mW to Mission Ridge.

Power beyond Phase 2 would be to construct an express feeder to switch SW1258 at Forest Ridge. The express feeder would pick up all load above Forest Ridge leaving the existing feeder to carry the lower load. This express feeder is envisioned as being a double circuit on the existing pole line. This option would entail double circuiting for approximately 7 miles from Squilchuck Substation to Forest Ridge Drive.

These two options would provide enough power based upon current projects to build through Phase 5. Neither of these options require building a new substation and utilize existing pathway already established and owned by Chelan PUD for providing additional capacity.

## Proposed Project Conditions

Based upon power study analysis utilizing planned expansion plans and in coordination with Chelan PUD the following suggested conditions of approval and mitigation are proposed for the Mission Ridge Master Planner Resort application:

- a. As part of future preliminary plat applications, proof of power availability shall be provided
- b. Mission Ridge and Chelan PUD will meet on a quarterly basis during phases to align power needs with projected power available and growth from Chelan PUD to ensure that expansion does not outpace availability of power and so that Chelan PUD can keep Mission Ridge abreast of new developments that may affect Mission Ridge planning

# **APPENDIX H ENERGY AND POWER REPORTS**

**2024 Power Needs Analysis Amendment Letter**



April 12, 2024

Mr. Josh Jorgensen  
Mission Ridge Ski & Board Resort  
7500 Mission Ridge Rd  
Wenatchee, WA 98801

Re: Mission Ridge Expansion – Power Needs Analysis Amendment #1

Dear Mr. Jorgensen:

Kimley-Horn and Associates, Inc. has reviewed the lasted Master Planned Resort Development Agreement and accompanying documents to provide the below amendment to the original McKinstry Power Needs Analysis (Appendix I Power) dated Janaury18, 2022. The amendment below provides updated phasing, unit counts, and electrical capacity requirements.

The development phasing plan has been updated to include the construction of all ski area lifts within Phase 1. This includes Chairs 6/7, Chair 8, the platter relay, and pulse gondola. The development plan has also revised the total number of multi-family and hotel units, including the phase when constructed.

In addition, the preliminary estimates of electrical loading were provided by McKinstry 2022. It is recognized that the initial load estimates would need to be refined to reflect actual electrical needs based on permitted building design. Similarly, the phasing plan used by McKinstry has changed, and actual project phasing may continue to change. An updated power needs analysis would be part of the ongoing coordination with Chelan PUD. Updated Phasing Table and Electrical Load Breakdown table are listed below.

Sincerely,  
KIMLEY-HORN AND ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read "Justin Knowles", with a stylized flourish at the end.

By: Justin Knowles  
Associate

### Planned Residential and Commercial Breakdown by Phase

|              | Condominiums,<br>Townhomes and<br>Duplexes (Total<br>Units) | Single<br>Family<br>Detached<br>Units | Hotel/<br>Lodge | Commercial<br>Space/Skier<br>Services | Employee<br>housing |
|--------------|-------------------------------------------------------------|---------------------------------------|-----------------|---------------------------------------|---------------------|
| Phase 1      | 172                                                         | 102                                   |                 | 60,000                                |                     |
| Phase 2      | 162                                                         | 50                                    | 57              | 20,000                                | 40*                 |
| Phase 3      | 156                                                         | 41                                    |                 | 18,500                                |                     |
| Phase 4      | 131                                                         | 41                                    |                 | 11,500                                | 40*                 |
| Phase 5      | -                                                           | 31                                    |                 |                                       |                     |
| <b>Total</b> | <b>621</b>                                                  | <b>265</b>                            |                 | <b>110,000</b>                        | <b>80*</b>          |

\* Employee housing is envisioned as dormitory-style and open-concept bed options for seasonal employees. Some beds may provide more permanent accommodations if needed. Phasing of employee housing could change depending on employment needs.

| Mission Ridge Expansion - Electrical Load Breakdown                                      |                                                                   |          |       |                |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------|-------|----------------|
| Area                                                                                     | Use                                                               | Quantity | Phase | Est. Load (kW) |
| 1                                                                                        | SFR                                                               | 26       | 1     | 169            |
| 2                                                                                        | Day Use Parking                                                   | 1        | 1     | 5              |
| 3P1                                                                                      | Village - (118 Condos)                                            | 118      | 1     | 472            |
| 3P1R                                                                                     | Village - Retail 4 Bldgs with ground flr retail/rest <sup>1</sup> | 16       | 1     | 480            |
| 3P2                                                                                      | Village - (57 hotel units - no cooking or laundry)                | 57       | 2     | 171            |
| 3P2                                                                                      | Village - (111 Condos)                                            | 111      | 2     | 444            |
| 3P2R                                                                                     | Village - Retail 4 Bldgs with ground flr retail/rest <sup>1</sup> | 16       | 2     | 480            |
| 3P3                                                                                      | Village - (94 Condos)                                             | 94       | 3     | 376            |
| 3P3R                                                                                     | Village - Retail 3 Bldgs with ground flr retail/rest <sup>1</sup> | 12       | 3     | 360            |
| 3P4                                                                                      | Village - (71 Condos)                                             | 71       | 4     | 284            |
| 3P4R                                                                                     | Village - Retail 2 Bldgs with ground flr retail/rest <sup>1</sup> | 8        | 4     | 240            |
| 4                                                                                        | Multi-Family Townhomes                                            | 20       | 4     | 92             |
| 5                                                                                        | Multi-Family Townhomes                                            | 8        | 3     | 36.8           |
| 6                                                                                        | SFR                                                               | 5        | 4     | 58.5           |
| 7                                                                                        | Multi-Family Townhomes                                            | 40       | 4     | 184            |
| 8P4                                                                                      | SFR                                                               | 36       | 4     | 234            |
| 8P5                                                                                      | SFR                                                               | 14       | 5     | 91             |
| 9                                                                                        | Multi-Family Townhomes                                            | 24       | 3     | 110.4          |
| 10                                                                                       | SFR                                                               | 10       | 5     | 130            |
| 11                                                                                       | SFR                                                               | 3        | 5     | 19.5           |
| 12                                                                                       | Mountain Top Restaurant / Obs Platform                            | 1        | 1     | 75             |
| 13                                                                                       | SFR                                                               | 31       | 3     | 201.5          |
| 14                                                                                       | SFR                                                               | 27       | 2     | 175.5          |
| 15                                                                                       | SFR                                                               | 8        | 3     | 52             |
| 16                                                                                       | Multi-Family Townhomes                                            | 30       | 3     | 138            |
| 17P1                                                                                     | Multi-Family Townhomes                                            | 30       | 1     | 138            |
| 17P2                                                                                     | Multi-Family Townhomes                                            | 51       | 2     | 234.6          |
| 18P1                                                                                     | SFR                                                               | 70       | 1     | 513.5          |
| 18P2                                                                                     | SFR                                                               | 29       | 2     | 188.5          |
| 19                                                                                       | Multi-Family Townhomes                                            | 8        | 1     | 27.6           |
| 20                                                                                       | Multi-Family Townhomes                                            | 16       | 1     | 73.6           |
| 21                                                                                       | SFR                                                               | 6        | 1     | 39             |
| 22                                                                                       | Ski Maintenance / Volunteer Fire                                  | 1        | 1     | 50             |
| 23                                                                                       | Operations Yard                                                   | 1        | 1     | 50             |
| 24                                                                                       | Operations / Civil Infrastructure                                 | 1        | 1     | 50             |
| 25P2                                                                                     | Employee Housing (20 beds)                                        | 40       | 2     | 120            |
| 25P4                                                                                     | Employee Housing (20 beds)                                        | 40       | 4     | 120            |
| NA                                                                                       | Ski Lift 6                                                        | 1        | 1     | 150            |
| NA                                                                                       | Ski Lift 7                                                        | 1        | 1     | 150            |
| NA                                                                                       | Ski Lift 8                                                        | 1        | 1     | 150            |
| NA                                                                                       | Pulse Gondola                                                     | 1        | 1     | 150            |
| NA                                                                                       | Platter Relay                                                     | 1        | 1     | 45             |
| Total Estimated Demand (kW)                                                              |                                                                   |          |       | 7329           |
| Phase 1 Estimate                                                                         |                                                                   |          |       | 2787.7         |
| Phase 2 Estimate                                                                         |                                                                   |          |       | 1813.6         |
| Phase 3 Estimate                                                                         |                                                                   |          |       | 1274.7         |
| Phase 4 Estimate                                                                         |                                                                   |          |       | 1212.5         |
| Phase 5 Estimate                                                                         |                                                                   |          |       | 240.5          |
| Notes                                                                                    |                                                                   |          |       |                |
| 1. Estimated average demand of 30kW for retail/restaurant space, (4) spaces per building |                                                                   |          |       |                |

# **APPENDIX I**

## **TRAFFIC IMPACT ANALYSIS**

**2018 Traffic Impact Analysis Report**  
**2019 Traffic Impact Analysis Report**  
**2021 Traffic Impact Analysis Report**  
**2023 Traffic Impact Analysis Report**  
**Amendment**  
**2024 Traffic Impact Analysis Report**  
**2025 Traffic Impact Analysis Report**