STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

Division of Mining, Land and Water

Northern Region Land Office, Fairbanks	Southcentral Region Land Office, Anchorage	Southeast Region Land Office, Juneau
(907) 451-2740	(907) 269-8503	(907) 465-3400

The Department of Natural Resources, Division of Mining, Land and Water's (DMLW) regional land offices are responsible for managing state land and resources. Certain activities on state land require a land use permit, while other activities are considered "generally allowed" or require other authorizations. Commercial recreation facilities that remain no longer than 14 days in any one site may obtain a commercial recreation permit rather than a land use permit. Additional information and forms are available online or at any Division of Mining, Land and Water regional land office and the Public Information Centers in Anchorage and Fairbanks. The following text describes information that is required to be filled out by applicants for your application to be considered complete.

Land Use Permits:

- Authorize the temporary use of state land or resources;
- can be issued for up to five years;
- do not convey any interest in state land;
- are revocable with or without cause;
- are not transferable; and
- do not constitute waiver of any other state, federal, or local laws.

Complete Land Use Permit Application Packages include the following documents:

- A Land Use Permit application form completed and signed by the applicant;
- A completed Supplemental Questionnaire for Use of State-Owned Uplands if the use or activity includes use of state-owned uplands - **including a Site Development Diagram**;
- A completed Supplemental Questionnaire for Off-Road Travel if the use or activity includes travel by or with means that exceed those that are generally allowed; and/or
- A completed Supplemental Questionnaire for Use of State-Owned Waters (Shorelands, Tidelands, and Submerged Lands) if the use or activity includes uses on tide and submerged lands below the mean high tide line in marine environments or uses on state-owned shorelands below the ordinary high-water line in freshwater environments - **including a Site Development Diagram**.
- A Site Development Diagram showing each item labeled so that it corresponds with your description in the Questionnaire. The Site Development Diagram must include:
  - **Location** - Section, Township, and Range lines; North arrow; scale; title; and include a legend (these items may be attached if necessary).
  - **Boundaries** – Boundaries and dimensions of proposed area of use and their relation to geographic features, including water bodies, and existing trails or rights-of-way.
  - **Structures and Storage** - Location and dimensions of buildings, tent platforms, out-buildings and other improvements, and of equipment parking and storage areas, including snow storage areas.
  - **Hazardous substances** – Location and dimensions of storage facilities for hazardous substances, including but not limited to oil, lubricants, fuel oil, gasoline, solvents, and diesel fuel. Include method and dimensions of storage (tank, drum, etc.).

Other items that must accompany the application package include:

- **Map** - a topographic map or aerial photo of sufficient scale to show the location of the proposed activity.
- **Filing Fees** - A non-refundable filing fee required by regulation (11 AAC 05.010(5)(B)). See the current Director's Fee Order for applicable fees. Make checks payable to the "State of Alaska".
- **Other Miscellaneous Items**: Items specifically identified and required in any of the supplemental questionnaires.

Completed Land Use Permit Applications must be submitted electronically to an email address below or mailed to one of the following offices closest to the proposed use or activity on state lands:

Northern Region Land Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2740
nro.lands@alaska.gov

Southcentral Region Land Office
550 West 7th Ave, Suite 900C
Anchorage, AK 99501-3577
(907) 269-8503
dnr.scro.permitting@alaska.gov

Southeast Region Land Office
P. O. Box 111020
Juneau, AK 99811-1020
(907) 465-3400
sero@alaska.gov

Statewide TTY – 771 for Alaska Relay or 1-800-770-8973

Prior to issuance of a permit, an applicant is required to submit one or more of the following:

- **Use Fees** - The use fee depends on the type of activity, length of use and the acreage authorized for use. See the current Director's Fee Order or contact your regional office for applicable fees.
- **Performance Guaranty (Bond)** - A performance guaranty is held by the state to incentivize performance and to pay for corrective action if the use of state land fails to comply with the requirements of the permit. Acceptable types of performance guaranties include:
  - cash or check made out to the State of Alaska;
  - a Certificate of Deposit (CD) in the state's name; or
  - a corporate surety bond.
- **Insurance** – Proof of insurance to protect you and the state from liabilities incurred through the use of state land.
- **Survey and Location** - Surveys are generally not required for land use permits. Many authorizations require a Global Positioning System (GPS) to determine the location of the project. If we determine a survey is required, we will contact you.

ONLY COMPLETE APPLICATIONS WILL BE ACCEPTED

STATE OF ALASKA DEPARTMENT OF NATURAL RESOURCES
Division of Mining, Land and Water

LAND USE PERMIT APPLICATION
AS 38.05.850

Applicants must complete all sections of this application. In addition, applicants proposing:

- the use of the uplands must also complete the Supplemental Questionnaire for Use of State-Owned Uplands accompanying this application;
- off-road travel must also complete the Supplemental Questionnaire for Off-Road Travel accompanying this application; and/or
- the use of shorelands, tidelands, and submerged lands must also complete the Supplemental Questionnaire for Use of State-Owned Waters accompanying this application.

Other items that must accompany the completed application are:

- a (non-refundable) application fee; see current Director's Fee Order or contact your regional office for applicable fees;
- a topographic map or aerial photo showing the location of the proposed activity;
- additional items identified and required in any supplemental questionnaire(s) to this application; and
- additional pages if more space is necessary to answer the questions completely.

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3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2740
nro.lands@alaska.gov

Southcentral Region Land Office
550 West 7th Ave, Suite 900C
Anchorage, AK 99501-3577
(907) 269-8503
dnr.scro.permitting@alaska.gov

Southeast Region Land Office
P. O. Box 111020
Juneau, AK 99811-1020
(907) 465-3400
sero@alaska.gov

Statewide TTY – 771 for Alaska Relay or 1-800-770-8973

LAS # 34647
(Applicant please provide if known)

Applicant Information:

Name: Shovel Creek Wind LLC
Doing Business As: Shovel Creek Wind LLC
Mailing Address: 125 High Street
17th Floor High Street Tower
Suite 1705
Boston, MA 02110
Email Address: [redacted]

Date of Birth: N/A
Business License #: 2158831
EIN: [redacted]
Contact Person: Chad Allen
Home Phone:
Work Phone:
Cell Phone: [redacted]
Fax:

If you are applying for a corporation, give the following information:

Name, address and place of incorporation:

Shovel Creek Wind LLC is a limited liability company, not a corporation. Shovel Creek Wind LLC was organized in the State of Alaska effective August 9, 2021

Is the corporation qualified to do business in Alaska? Yes ☒ No ☐

If yes, provide name, address and phone number of the resident agent:

Faith Tyson
3300 Arctic Blvd
Suite 201 #1451
Anchorage, AK 99503
[redacted]

Type of User (Select One): ☐ Private non-commercial (personal use) ☐ Commercial Recreation or Tourism

☐ Public Non-profit including Federal, State, Municipal Government Agency ☒ Other commercial or industrial

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Duration of Project: The proposed activity will require the use of state land for: **(Check one)**

☐ A single term of less than one year. **Beginning month:** _____ **Ending month:** _____

☒ A multi year term for up to 5 years. **Beginning year:** 2024 **Ending year:** 2028

If multi year and seasonal, mark months of use in each year.

☐ Jan, ☐ Feb, ☐ Mar, ☐ Apr, ☐ May, ☐ Jun, ☐ Jul, ☐ Aug, ☐ Sept, ☐ Oct, ☐ Nov, ☐ Dec

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Project Location:

Latitude/Longitude or UTM: See attached. or

Section: _____ **Township:** _____ **Range:** _____ **Meridian:** _____

Section: _____ **Township:** _____ **Range:** _____ **Meridian:** _____

Proposed project will require the use of up to 65 acres.

(Please add additional sheets for this section as necessary)

Project Description: Describe in detail your intended use of state land. (State land also includes all tide and submerged lands beneath coastal waters and all shorelands beneath other navigable waterbodies of the state.) Discuss development and activities. (Attach additional pages as necessary.)

See attached.

Should a portion of the permitted area be closed to the general public? **Yes** ☐ **No** ☒ .

If yes, explain which portion and provide justification for exclusive use.

N/A

Site Description: Briefly describe the current condition of the proposed site of use, noting any trash, garbage, debris or signs of possible site contamination. (If significant, we recommend you provide pictures to establish initial conditions.)

Sites will be described for the current conditions prior to development action taking place. Currently, some sites are located in the vicinity of existing gravel roads or ATV trails. Other sites need access trails to be cleared, or may be accessed by helicopter.

There is no known trash, garbage, debris, or signs of possible site contamination. Any signs will be noted prior to development.

Existing ATV trails have pre-existing known degradation from historical use. Sections of these trails are deeply rutted and at times muddy. These trail conditions are evident based on historical aerial imagery features of Google Earth. Additional discussion with DNR is requested on the best way to document and manage these features.

Are there improvements or materials on the site now? **Yes** ☒ **No** ☐ **If yes**, briefly describe the improvements, their approximate value, and who owns them. (We recommend you provide pictures of improvements.)

There are currently 4 meteorological towers, one lidar, and associated power supply units on the proposed site. One is owned by Shovel Creek Wind, the other three towers and the Lidar unit are owned and operated by Golden Valley Electric Association. We are proposing to expand the meteorological campaign through this request.

Describe the natural vegetation – ground cover, trees, shrubs – and any proposed changes. Describe the location of any estuarine, riparian, or wetlands and any noticeable animal use of area.

Natural vegetation exists in all of the locations - the only current disturbances are the roads, ATV trails, and similar improvements at each site.

Vegetation varies. North of Murphy Dome Extension Road was burned in a historic wildfire, and is experiencing regrowth of the deciduous forest. This has a variety of trees, shrubs, with near continuous emergent vegetation. Along the ridgeline on either side of Murphy Dome Extension Road is predominantly white and black spruce forest, with occasional tall shrub alpine habitat and occasional deciduous forest. The area south of Murphy Dome Extension Road is white spruce and black spruce forest. More detailed information on existing natural vegetation is available on request - some preliminary habitat mapping reports have been completed for the project.

There are no known estuarine or riparian habitats in the vicinity. These ridgelines are noteable for their lack of these habitats.

There are wetlands scattered throughout the project. Field delineations and flagging are planned prior to development activities to help understand and permit (if required) potential impacts to these wetlands.

Site Access: Describe how you plan to access the site, and your mode of transportation.

Access will be obtained using highway vehicles on the Murphy Dome Extension Road, and off-road vehicles above the Generally Allowed Use weight limit. Access will also include a tracked forestry mulcher and a mini-excavator (or similar). Some access is also planned by helicopter. See attached for additional information

If your access is by aircraft, specify the type and size of aircraft:

Helicopter - Four- or six- person capacity. For example, an R-44 or an AStar.

To access the site, the aircraft is equipped with **floats** ☐ **wheels** ☐ **skis** ☐ .

Number of people:

1. Indicate the number of employees and supervisors who will be working on the site. up to 12
2. Indicate the number of customers who will be using the site per year or season. 0
3. Indicate the number of days the site will be used per year or season. 365

Environmental Risk / Hazardous Substances: In the course of your proposed activity will you generate, use, store, transport, dispose of, or otherwise come in contact with toxic and/or hazardous materials, and/or hydrocarbons?

Yes ☒ **No** ☐ . **If yes**, please describe:

Fuel and typical equipment liquids (i.e. lubricant) will be required for vehicle or helicopter use.

Towers may be powered by a propane fuel cell (or similar). No gasoline or diesel generators will be used for the tower, LiDAR, or SoDAR operations.

The types and volumes of fuel or other hazardous substances present or proposed:

Vehicles and off-road vehicles will be filled with gasoline or diesel, as applicable; helicopters will be fueled with aviation gasoline or other appropriate fuel. Fuel volume will not exceed that which is required to move vehicles to and from the site and to operate them while on-site.

The specific storage location(s):

Any fuel in addition to that which is contained within vehicle fuel tanks will be kept within secondary containment structures.

The spill plan and prevention methods:

Fuel stored will be limited to small tanks during operation of equipment. The fuel storage will be in secondary containment structures. Spill kits will be included on-site. Fuel will not be left on-site in the long-term after installation is complete.

If you plan to use either above or below ground storage containers (like tanks, drums, or other containers) for hazardous material storage, answer the following questions for each container:

Where will the container be located?

Additional fuel will be located on vehicles, as applicable, or in secondary containment structures, such as duck ponds or similar, on-site

What will be stored in the container?

Diesel or gasoline, as applicable, for OHVs and other required equipment.

What will be the container's size in gallons? 5-55 gallons

Give a description of any secondary containment structure, including volume in gallons, the type of lining material, and configuration:

Duck ponds or similar secondary containment structures will be used to contain gas cans or drums, as applicable while on-site. Only secondary containment structures designed for the containment of petroleum products/fuels will be used. No fuel will be stored on-site in the long-term after installation.

Will the container be tested for leaks? **Yes** ☒ **No** ☐ .

Will the container be equipped with leak detection devices? **Yes** ☐ **No** ☒ . **If no**, describe:

Do you have any reason to suspect, or do you know if the site may have been previously contaminated?

Yes ☐ **No** ☒ . **If yes**, please explain:

The Alaska Department of Environmental Conservation does not list any contaminated sites in the immediate vicinity of these two locations. At this time, there is no reason to suspect contamination at the sites.
The Alaska DEC has had discussions about areas used for target practice, and the potential for contamination in these types of areas. There has been no sampling in these areas, and no knowledge if there is contamination or not. This project does not propose using materials that (if spilled) would contributed to contamination of the type that might be found at a target practice area (i.e. lead). This project does not propose ground disturbing activity at the site DEC has identified as a target practice area.

Michael U. Alvarez		Chief Operating Officer	7/18/2024
Signature of Applicant or Authorized Representative		Title	Date

This form must be filled out completely and submitted with the applicable fees. Failure to do so will result in a delay in processing your permit. AS 38.05.035(a) authorizes the director to decide what information is needed to process an application for the sale or use of state land and resources. This information is made a part of the state public land records and becomes public information under AS 40.25.110 and 40.25.120 (unless the information qualifies for confidentiality under AS 38.05.035(a)(8) and confidentiality is requested, AS 43.05.230, or AS 45.48). Public information is open to inspection by you or any member of the public. A person who is the subject of the information may challenge its accuracy or completeness under AS 44.99.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit are punishable under AS 11.56.210.

In submitting this form, the applicant certifies that he or she has not changed the original text of the form or any attached documents provided by the Division. In submitting this form, the applicant agrees with the Department to use "electronic" means to conduct "transactions" (as those terms are used in the Uniform Electronic Transactions Act, AS 09.80.010 – AS 09.80.195) that relate to this form and that the Department need not retain the original paper form of this record: the department may retain this record as an electronic record and destroy the original.

For Department Use Only
Application received date stamp

Receipt Type: ☐ **7A** ☐ **RR** ☐ **FF**

LAS #: 34647

LAND USE PERMIT APPLICATION SUPPLEMENTAL QUESTIONNAIRE FOR:
Off Road Travel

Answer the following questions if your proposed activity includes off-road travel:

Terrain: Check the following terrain type(s) that best describes your route of travel:

- ☒ Wetlands
- ☒ Open, non-tundra or wetland areas
- ☐ Rivers or other waterbodies
- ☒ Wooded areas with trees of 6" or greater diameter (at breast height)
- ☒ Tundra areas

Vehicles and Weight: List the number and kinds of vehicles to be used for motorized travel, the weight of each vehicle and the weight of each trailer or sled (including loaded weight) to be carried by that vehicle:

Specific vehicles are listed in the supplement.

There will be no waterbody crossings.

Mileage:

- State the average total miles traveled in one round trip: 7
- State the number of trips proposed: 100

Season: Proposed date(s) of travel will be: **From:** July 2024 **To:** October 2029

Stream and Waterbody Crossings: Note who you contacted in the ADF&G, Division of Habitat:

Date: N/A Person: N/A

Fuel and Hazardous Substance Factor: The volume of fuel and hazardous substances to be used is the total volume in gallons to be carried on one vehicle and any trailers or sleds that vehicle is towing.

- Maximum volume of fuel (in gallons) that is being transported by one vehicle and any trailers or sleds it is towing: 55 gallons.
- Hazardous substances other than fuel:

  Substance: _____

  Substance: _____

- Do you have an Oil Discharge Prevention and Contingency Plan approved by the Alaska Department of Environmental Conservation? **Yes** ☐ **No** ☒
- Do you have either a trained spill response team or a contract with a spill response company? **Yes** ☐ **No** ☒

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LAND USE PERMIT APPLICATION SUPPLEMENTAL QUESTIONNAIRE FOR:
Use of State-Owned Uplands

To be completed to provide more detailed information about projects or activities requiring the use of state-owned uplands. All site development details identified in this section must be represented graphically in the scaled drawings on Page 6 of the supplement.

Temporary Structures

1) Describe all temporary improvements (including buildings, tent platforms, out-buildings, docks, floats, and floating facilities), including dimensions and building materials. **2)** Label improvements to be maintained on a year round basis as year round. **Note:** Seasonal improvements must be completely dismantled and removed or stored on or before the end of authorized terms of use.

Meterological Towers. See attached.

Distance structures including pit privies will be located from the ordinary highwater mark of the nearest freshwater body (lake, stream, river, etc.), or the mean high water mark of a saltwater body: _____

Harvest of Non-Timber Related Forest Products

Please list the type and quantity of each non-timber related forest product (berries, ferns, willow, mushrooms, birch bark, etc.) to be harvested for commercial use:

N/A

Contact the DNR Division of Forestry to obtain authorizations for the harvest of small trees.

Motorized Equipment

List mechanized/motorized equipment to be used, including type, size, purpose, and number of each.

See the attached equipment list.

For stream and waterbody crossings, note who you contacted in the ADF&G, Division of Habitat:

Date: _____ Person: _____

Storage and Parking

If you plan to store items or park boats, vehicles and/or heavy equipment on the site, complete the following:

Describe and give dimensions of long term and short-term parking and or storage areas:

No items will be stored on-site permanently. The towers, LiDAR units with power supply trailers, once installed, will remain on-site until sampling is completed, and then they will be removed.

Is parking and storage planned to take place on filled tidelands? **Yes** ☐ **No** ☒

Does storage involve structures or materials floating in a waterbody? **Yes** ☐ **No** ☒

If yes, please complete the Supplemental Questionnaire for the Use of State-Owned Waters (Shorelands, Tidelands & Submerged Lands).

Number of disassembled tent frames N/A Number of tent platforms N/A

List and describe items that are large and difficult to transport. Include dimensions:

Sections of the meteorological tower will be brought in by trailer.

The LIDAR/SoDAR unit is a trailer, that will be towed in.

Will barrel(s) or an equivalent type of container be used? **Yes** ☐ **No** ☒

If using something other than barrels for storage containers, describe the alternative container.

N/A

Describe any measures you plan to take to minimize drips or spills from leaking vehicles or equipment.

Spill kits will be provided with vehicles and equipment.

Water / Wastewater

Water Supply: Describe the water supply and proposed use.

N/A

Wastewater: Describe the wastewater type and quantity and proposed method of wastewater disposal: (for the marine environment, also describe the proposed gray and black water systems or out fall pipeline.

N/A

Waste: Describe the types of waste that will be generated on-site, including solid waste, the source of the waste, and the method of waste disposal, i.e. pit privy, or self-contained system, or outfall line; indicate distance from the nearest waterbody.

Any waste will be removed and disposed of at a licensed facility.

Animal Use

Will there be any use of animals (horses, llamas, dogs, etc.)? **Yes** ☐ **No** ☒

Will there be commercial use of the animals (horseback rides, packing, dog sled rides, etc.)? **Yes** ☐ **No** ☐

If yes, please explain:

Dismantle, Removal, Restoration Plan

Provide a plan for dismantling and removing temporary structures. Include method and timeline for total site restoration:

Once the data is collected, the towers and LIDAR/SoDAR will be dismantled, and entirely removed from the project. The only remaining equipment will be the ground anchors, which will be cut to be flush with the ground.

Short Term (Portable) Commercial Recreation Camps

Identify commercial recreation activity/activities for which short term (portable) camps **will be** established to accommodate employees and clients, and provide a general description of the location(s) (e.g. guide use area, game management sub-unit, river, stream, lake, etc.) where the recreational activity/activities and short term (portable) camp use will occur.

☐ **Big Game Guiding (List up to 3 Guide Use Areas).**

☐ **Sportfishing (List river corridors, lakes, etc.).**

☐ **Boating/Rafting/Kayaking (List river corridors, lakes, etc.).**

☐ **Other Recreation (Type and general geographic description).**

Identify any State of Alaska Refuge, Sanctuary and/or Critical Habitat Area where short term (portable) camps will be used.

Will activities include "day use" of state land managed under the Haines State Forest Management Plan? **Yes** ☐ **No** ☐

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Site Development Diagram

VICINITY MAP

Date Prepared:	Applicant's Name:
Alaska Department of Natural Resources Division of Mining, Land & Water Land Use Permit	
Site Development Diagram	
Sec(s) _____ T _____ R _____ M _____	
Sheet of	LAS # 34647

Supplemental Information – Project Description

The intended use of state land is for the installation, operation, and removal of meteorological equipment at four sites west of Murphy Dome, near Fairbanks, Alaska. The second component of the program is a geotechnical sampling effort in the same area.

Meteorological Towers

Four meteorological towers are proposed for installation. The most suitable site for each meteorological tower has not yet been selected, and so meteorological towers 08, and 09 have two alternative sites under consideration. Site SCMET05B is an alternative to a previously permitted site. A pre-development field visit will occur during Summer 2024 to select a final location for each meteorological tower.

This permit application seeks approval for land use at all possible locations so that the final location will be in compliance with DNR permitting requirements regardless of which alternative is chosen. Geographic coordinates of the proposed locations for each tower are included in Table 1, below.

Table 1: Locations of Proposed Meteorological Towers and Alternates

Location Name	Met Tower	Alternative	Latitude (WGS 1984)	Longitude (WGS 1984)
SCMET08B	08	Alternative 2	64.91649201	-148.5239596
SCMET08A	08	Alternative 1	64.94073605	-148.5226845
SCMET09B	09	Alternative 2	64.90440448	-148.5637741
SCMET09A	09	Alternative 1	64.90514988	-148.5617507
SCMET05B	05	Only Alternative	64.83416221	-148.663562

A LiDAR or SoDAR unit will potentially be co-located at some of the towers. The location of the LiDAR or SoDAR unit has not yet been determined. Consequently, this permit seeks approval for the possible co-location of the LiDAR/SoDAR units at all proposed tower location alternatives. The LiDAR/SoDAR unit is associated with a 16’ enclosed cargo trailer that serves as the unit’s remote power supply with the LiDAR/SoDAR installed adjacent to the trailer. If fencing is installed around the units, it will consist of T-posts and wire mesh.

Each meteorological tower may be up to 60 meters in height. Tower bases will consist of a base plate that rests on the ground surface. Towers are a tilt-up 10-inch diameter monopole design supported by up to twenty (20) guy lines to buried flat plate anchors or similar. Each anchor will require the excavation and refill of a 3-foot (ft) x 4-ft x 8-ft (width x length x depth) hole or smaller/shallower, with a utility rod eye end extending six inches above ground level. Vegetation will be cleared within a 60-meter radius of each tower using a tracked forestry mulcher.

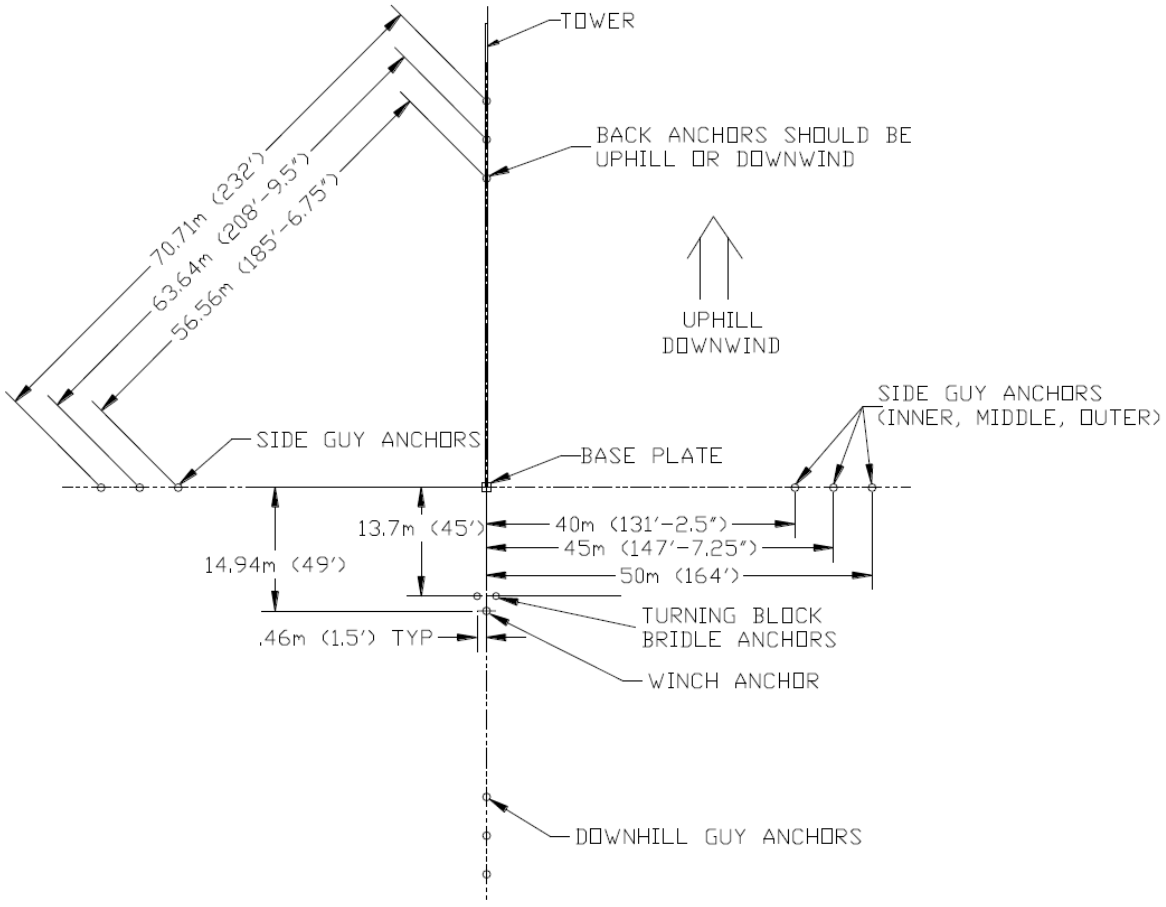
Where applicable, the LiDAR/SoDAR unit will be located at a distance of 70 m from the base of the meteorological tower. Vegetation will also be cleared within a 60-meter radius around the LiDAR unit. To be conservative, the attached figures depict a 130-meter radii (70m + 60m) around each meteorological tower, to account for the potential LiDAR/SoDAR units.

Access to the site will be obtained through the use of existing gravel roads, existing OHV trails, and creation of new overland haul routes through the removal of vegetation using the tracked

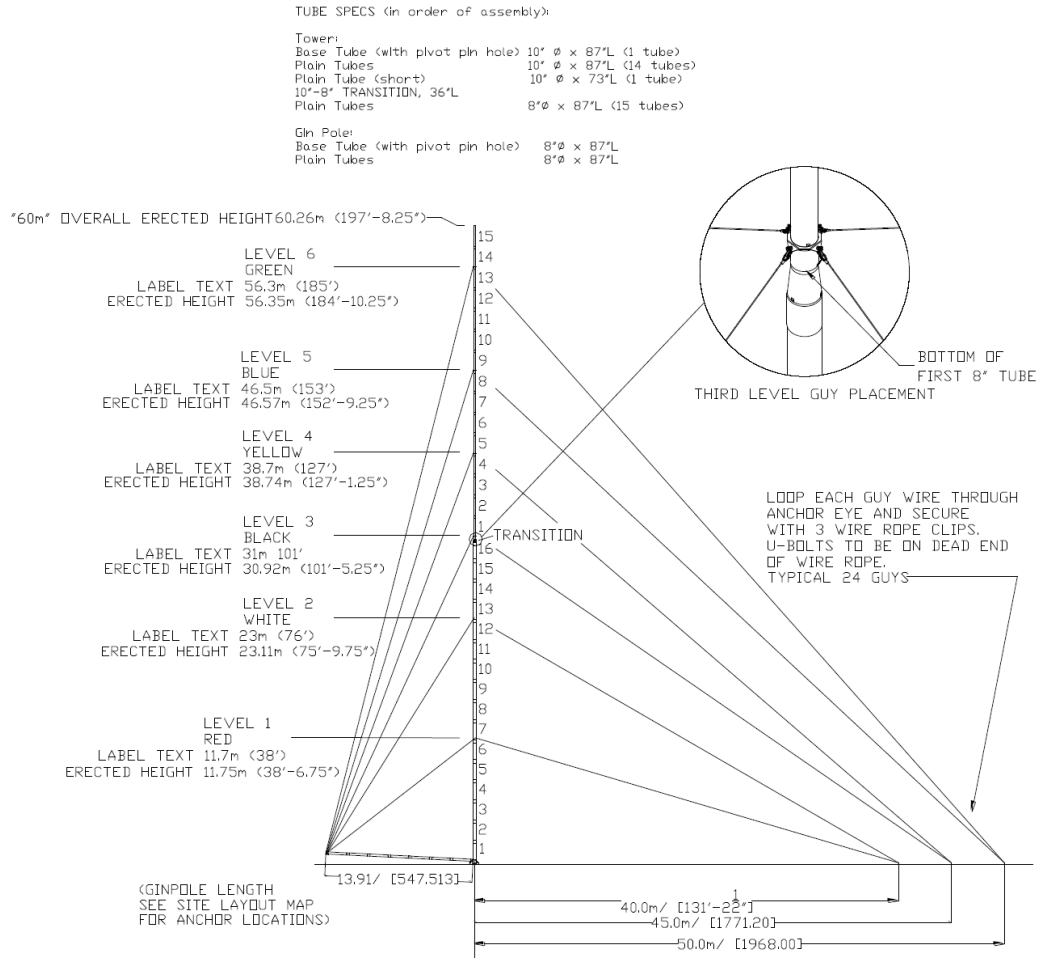
forestry mulcher. The new overland haul routes will be determined during a site visit in July 2024. The trails will be used by OHVs and mini-excavators and similar equipment to access the site. Care will be taken to avoid degradation of the habitat.

Meteorological towers and LiDAR will remain on-site year-round. The structures will be removed once sampling is complete.

Example of an existing meteorological tower currently installed on the project site.



Standard plan view of the meteorological tower base and anchor layout.



Meteorological tower schematic

Example of the power supply trailer with Lidar unit mounted on the right.

Geotechnical Sampling

Geotechnical investigations will include geotechnical borings (3-4” air rotary, solid-stem auger, and hollow stem auger drilling), standard penetration tests (SPT), undisturbed thin-walled tube sampling, bulk soil sampling, a review of the proposed wind turbine locations, general soil laboratory testing, and test-pit excavations. This will involve up to 30-40 borings and 10-15 test pits; the remaining testing will be done on foot with no impact.

Track-mounted drill rigs will be used to conduct the borings using solid stem auger, hollow stem auger, and air rotary drilling techniques as necessary. A tracked crawler or helicopter will be used to transport water for drilling purposes. A tracked excavator (approximately 2.5-3.5 tons) will be used for test pit excavations. Soil and rock sampling and classification will be performed at regular intervals through the full depth of the boring. Borings will be backfilled with auger/rotary hammer cuttings and/or Bentonite, resulting in minimal disturbance. Test pits will be approximately 10 feet long, 3 feet wide, and up to 10 feet deep, and will be backfilled with the excavated material to match the existing grade. Test pits will be opened and closed the same day.

Access to all sampling locations will be via tracked equipment, and routes will avoid sensitive environmental areas as much as possible. The locations of borings and test pits will be as close as feasible to the proposed turbine locations but may be adjusted up to 50 feet during the investigation to minimize near-term vegetation impacts and clearing efforts. Tree cutting may be required to access locations, and this will be done by hand, leaving stumps with a maximum protrusion of 6 inches to allow appropriate access.

Bulk samples of representative material from the site will be collected for laboratory testing. A total of twelve (12) to twenty-four (24) bulk soil samples (5-gallon buckets) are expected to be collected across the project site to support further off-site material property testing and analysis.

The entire geotechnical studies should not exceed two weeks, based on weather conditions.

Environmental Permitting and Monitoring

Prior to the work being completed, the site will be visited by the construction contractors in collaboration a team of wetland and cultural resources subject matter experts. Together, the team will identify the proposed work locations, and how to avoid potential protected resources.

As necessary, proposed disturbance will then be surveyed by the wetlands and cultural resources technical teams. This will provide the baseline information to use for permitting (if required).

Section Township Range

F001N004W05, F001N004W06, F001N004W07, F001N005W02, F001N005W03, F001N005W10, F001N005W11, F001N005W12, F001N005W14, F001N005W15, F001N005W16, F001N005W20, F001N005W21, F001N005W22, F001N005W23, F001N005W28, F001N005W29, F001N005W31, F001N005W32, F001N005W33, F001S005W05, F001S005W06, F001S005W18, F001S006W01, F001S006W12, F001S006W13, F002N004W30, F002N004W31, F002N004W32, F002N005W12, F002N005W13, F002N005W24, F002N005W25, F002N005W35.

Existing Site Conditions

Existing ATV trails have pre-existing known degradation from historical use. These are deeply rutted, muddy sections of the ATV trail running north from the Murphy Dome Extension Road. These trail conditions are evident based on historical aerial imagery features of Google Earth.

Equipment List for Geotech at SC for LUP Permit

List mechanized/motorized equipment to be used, including type, size (or equivelent), purpose, an

Equipment	Type
Geoprobe 7822DT	Track-mounted drilling rig, Length = 133 inches, Width = 70 inches
CME-850	Track-mounted drilling rig, Length = 24 feet, Width = 8 feet
185 CFM Air Compressor	Wheel-mounted air compressor, Length = 137 inches, Width = 57 inches
CAT 313 Excavator	Track mounted excavator, Length = 12.3 feet, Width = 8.1 feet
Prinoth Panther T12	Tracked crawler

Equipment List for Trail Clearing at SC for LUP Per

List mechanized/motorized equipment to be used, including type, size (or equivelent), purpose, an

Equipment	Type
Prime Tech PT300	Tracked foresty mulcher
CAT 299D	Tracked skid steer with attachments
CAT D5M LGP Dozer	
Polaris 800 Sportsman 6x6	
Polaris 500 Sportsman 4 wheeler	

Equipment List for Met Campaign at SC for LUP Pe

List mechanized/motorized equipment to be used, including type, size (or equivelent), purpose, an

Equipment	Type
Can-am Defender 6x6	Side by side
Can-am Defender Max	side by side
Can-am Outlander 6x6	ATV
Mini Excavator	Small Excavator
Excavator	Excavator
Tractor	Tractor

d numbers of each

Purpose

Drilling locations where overland access is possible over short distances and moderate terrain
Drilling locations where overland access is possible over long distances and rough terrain

Support rock drilling
Conducting test pits at proposed turbine locations
Hauling water to geotech sites

rmit

d numbers of each

Purpose

Mulch brush

This would be a contingency machine brought in only if there is an issue
Transportation
Transportation

rmit

d numbers of each

Purpose

Transportation of equipment and personnel
Transportation of equipment and personnel
Transportation of equipment and personnel
Installing anchors

This would be a contingency machine only if there is an
Transportation of equipment

Weight	Quantity
10,500 pounds, ground pressure ~ 6 pounds per square inch	1
30,000 pounds, ground pressure ~ 3 pounds per square inch	1
1,500 pounds	1
30,000 pounds, ground pressure ~ 8 pounds per square inch	1
30,500 pounds, ground pressure ~ 2.94 psi (empty), 5.91 psi (l	1

Weight	Quantity
37,500 lbs. ~ 4.2 psi ground pressure	1
12,500 lbs. ~ 4.9 psi ground pressure	1
36,000 lbs. ~ 5 psi ground pressure	1
1050 lbs	1
750 lbs	1

Weight	Quantity
2,000 lbs	1
2,200 lbs	2
1,100 lbs	2
13,000 lbs	1
20,000 lbs	1
4,000 lbs	1