

<i>Title:</i> D15 FIU Site Characterization Summary		<i>Date:</i> 01/28/2015
<i>NEON Doc. #:</i> NEON.DOC.011044	<i>Author:</i> E. Ayres, H. Luo, H. Loescher	<i>Revision:</i> C

D15 FIU SITE CHARACTERIZATION SUMMARY

PREPARED BY	ORGANIZATION	DATE
E Ayres / H Luo/ H Loescher	FIU	12/19/2014

APPROVALS	ORGANIZATION	APPROVAL DATE
Dave Tazik	SCI	01/21/2016
Hanne Buur	PSE	01/27/2015

RELEASED BY	ORGANIZATION	RELEASE DATE
Jennifer DeNicholas	CM	01/28/2015

See configuration management system for approval history.

© 2015 NEON Inc. All rights reserved.

The National Ecological Observatory Network is a project solely funded by the National Science Foundation and managed under cooperative agreement by NEON, Inc. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

<i>Title:</i> D15 FIU Site Characterization Summary		<i>Date:</i> 01/28/2015
<i>NEON Doc. #:</i> NEON.DOC.011044	<i>Author:</i> E. Ayres, H.Luo, H. Loescher	<i>Revision:</i> C

Change Record

REVISION	DATE	ECO #	DESCRIPTION OF CHANGE
A	12/10/2010	NEON.FIU.000255.CRE_D15 FIU Site Characterization Reports	INITIAL RELEASE
B	09/23/2011	ECO-00279	Update to new document number's/template throughout document.
C	01/28/2015	ECO-02592	Salt Lake City Urban site replaces Murray site in D15 FIU Site Characterization Report. Murray site was deemed not viable and an alternative location has been identified (Salt Lake City Urban).

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

TABLE OF CONTENTS

1 DESCRIPTION..... 1

 1.1 Purpose 1

 1.2 Scope..... 1

2 RELATED DOCUMENTS AND ACRONYMS..... 2

 2.1 Applicable Documents 2

 2.2 Reference Documents..... 2

 2.3 Acronyms 2

 2.4 Verb Convention 2

3 ONAQUI-AULT ADVANCE TOWER SITE 3

 3.1 Desired ecosystem 3

 3.2 Site Design and Tower Attributes 3

 3.3 Soil Attributes 6

 3.4 Information for ecosystem productivity plots. 7

 3.5 Issues and attentions 7

4 SALT LAKE CITY (SLC) URBAN, RELOCATABLE TOWER 1 8

 4.1 Desired ecosystem 8

 4.2 Site Design and Tower Attributes 8

 4.3 Soil Attributes 11

 4.4 Information for ecosystem productivity plots. 12

 4.5 Issues and attentions 12

5 RED BUTTE CANYON, RELOCATEABLE TOWER 2..... 14

 5.1 Desired ecosystem 14

 5.2 Site Design and Tower Attributes 14

 5.3 Soil Attributes 17

 5.4 Information for ecosystem productivity plots. 18

 5.5 Issues and attentions 19

6 APPENDIX A. FCC SUMMARY TABLES..... 24

LIST OF TABLES

Table 1. Ecosystem at Onaqui-Ault Advanced tower site..... 3

Table 2. Ecosystem and site attributes for Onaqui-Ault Advanced tower site..... 3

Table 3. Site design and tower attributes for Onaqui-Ault Advanced site. 3

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Table 4. Summary of soil array and soil pit information at Onaqui-Ault. 0° represents true north and accounts for declination. 7

Table 5. Ecosystem at SLC urban tower site 8

Table 6. Ecosystem and site attributes for SLC urban Relocatable site 8

Table 7. Site design and tower attributes for SLC Urban Relocatable site 8

Table 8. Summary of soil array and soil pit information at SLC urban. 0° represents true north and accounts for declination. 11

Table 9. Ecosystem at the Red Butte Relocatable site. 14

Table 10. Ecosystem and site attributes for Red Butte Canyon Relocatable site 14

Table 11. Site design and tower attributes for Red Butte Canyon Relocatable site 14

Table 12. Summary of soil array and soil pit information at Red Butte. 0° represents true north and accounts for declination. 18

Table 13. FCC Summary Table for FIU site components at D15 Onaqui-Ault Core 24

Table 14. FCC Summary Table for FIU site components at D15 SLC Urban Relocatable 1 26

Table 15. FCC Summary Table for FIU site components at D15 Red Butte Relocatable 2 29

LIST OF FIGURES

Figure 1 Generic diagram to demonstration the relationship between tower and instrument hut when boom facing south and instrument hut on the north towards the tower 5

Figure 2. Site layout for Onaqui-Ault Advanced tower site 6

Figure 3. Generic diagram to demonstration the relationship between tower and instrument hut when boom facing west and instrument hut on the east towards the tower. 10

Figure 4. Site layout for SLC Urban Relocatable site. 11

Figure 5. Generic diagram to demonstration the relationship between tower and instrument hut when boom facing north and instrument hut on the west towards the tower. 16

Figure 6. Site layout for Red Butte Canyon Relocatable site 17

Figure 7. Generic patterns for the boardwalk configuration 22

Figure 8. Conceptual diagram of Soil Array Patterns 23

<i>Title:</i> D15 FIU Site Characterization Summary		<i>Date:</i> 01/28/2015
<i>NEON Doc. #:</i> NEON.DOC.011044	<i>Author:</i> E. Ayres, H.Luo, H. Loescher	<i>Revision:</i> C

1 DESCRIPTION

1.1 Purpose

The data summarized here is used to inform the site design activities for NEON project Teams, EHS (permitting), FCC, ENG and FSU. This document summarizes the FIU site characterization data collected, analyzed, and described in the FIU D15 Site Characterization: Supporting Data (AD[01]).

1.2 Scope

This document summarizes the FIU site characterization data for three D15 tower locations: Onaqui-Ault site (Advanced), Salt Lake City site (Relocatable 1), and Red Butte site (Relocatable 2). Issues and concerns for each site that need attention are also addressed in this document according to our best knowledge.

Disclaimer: all latitude and longitude points are subject to the tolerances of our measurement system, i.e., GPS

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

2 RELATED DOCUMENTS AND ACRONYMS

2.1 Applicable Documents

AD[01]	NEON.DOC.011043 _ FIU D15 Site Characterization Supporting Data.docx
AD[02]	NEON.DOC.011018 _ WID between FIU and FCC
AD[03]	NEON.DOC.011008 _ FIU Tower Science Requirements
AD[04]	NEON.DOC.011029 _ FIU Precipitation Collector Site Design Requirements

2.2 Reference Documents

RD[01]	NEON.DOC.000008	NEON Acronym List
RD[02]	NEON.DOC.000243	NEON Glossary of Terms
RD[03]		
RD[04]		

2.3 Acronyms

m.a.s.l.	Meters above sea level
m.a.g.l.	Meters above ground level

2.4 Verb Convention

"Shall" is used whenever a specification expresses a provision that is binding. The verbs "should" and "may" express non-mandatory provisions. "Will" is used to express a declaration of purpose on the part of the design activity.

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

3 ONAQUI-AULT ADVANCE TOWER SITE

3.1 Desired ecosystem

Table 1. Ecosystem at Onaqui-Ault Advanced tower site.

Ecosystem Type	Management activity
Sage shrubland	Unknown, nature ecosystem, cattle grazing

The Onaqui-Ault site offers extensive sagebrush steppe transitioning into juniper woodland. The site has open access to the public. The representative ecosystem that NEON design is focused on for this core site is open sage shrubland. Ground cover is ~60%. Canopy height is ~1.2 m around tower site with lowest branches at ground level. Grass understory with height ~ 0.3 m. Canopy area density is estimated to be 0.6 throughout the whole year.

Table 2. Ecosystem and site attributes for Onaqui-Ault Advanced tower site.

Ecosystem attributes	Measure and units
Mean canopy height	1.2 m
Surface roughness ^a	0.2 m
Zero place displacement height ^a	0.8 m
Structural elements	open canopy, uniform
Time zone	Mountain time zone
Magnetic declination	12° 20' E changing by 0° 7' W/year

Note, ^a From field observation.

3.2 Site Design and Tower Attributes

The site layout is summarized in the table below. Assume the projected area of the tower is square. **Anemometer/temperature boom arm direction** is *from* the tower *toward* the prevailing wind direction or designated orientation. **Instrument hut orientation vector** is parallel to the long side of the instrument hut. **Instrument hut distance z** is the distance from the center of tower projection to the center of the instrument hut projection on the ground. The numbering of the **measurement levels** is that the lowest is level one, and each subsequent increase in height is numbered sequentially, in this case, level 4 being the upper most level at this tower site.

Table 3. Site design and tower attributes for Onaqui-Ault Advanced site.

0° is true north with declination accounted for. Color of Instrument hut exterior shall be tan to best match the surrounding environment.

Attribute	lat	long	degree	meters	notes
Airshed area			170° to 260°		Clockwise from 170°
Tower location	40.17759,	-112.45244	--	--	new site
Instrument hut	40.17776,	-112.45239			

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Instrument hut orientation vector	--	--	210° - 30°	
Instrument hut distance z	--	--	--	20
Anemometer/Temperature boom orientation	--	--	180°	--
DFIR	40.17772,	-112.45197		
Height of the measurement levels				
Level 1			0.2	m.a.g.l.
Level 2			2.0	m.a.g.l.
Level 3			4.0	m.a.g.l.
Level 4			6.0	m.a.g.l.
Tower Height ^a			6.0	m.a.g.l.

See AD 03 for technical requirement to determine the boom height for the bottom most measurement level. ^aindicates that the top measurement location is equal to level 4, and the tower top shall be taller based on the sections of tower.

Eddy covariance, sonic wind and air temperature **boom arms** orientation toward the south will be best to capture signals from all r wind directions. **Radiation boom arms** should always be facing south to avoid any shadowing effects from the tower structure.

DFIR (Double Fenced International Reference) will be at 40.17772, -112.45197, which is ~ 40 m away from tower. Closest power line intercept road at 40.17299, -112.42946. **Wet deposition collector** will collocate at the top of the tower. See AD 04 for further information and requirements for bulk precipitation collection and wet deposition collection.

Boardwalks. Ultimately, the decision to use a boardwalk will be, in part, based on owner’s preferences. There are strong science requirements that minimize site disturbance to the surrounding area, which will be difficult to manage over a 30-y period. Traffic control is key to minimizing the site disturbance. Confining foot traffic to boardwalks minimizes site impact; this is particularly true in places where wear caused by foot traffic becomes noticeable and grows. For example, in places with snow part of the year, worn footpaths tend to have low places that collect water, or places where the snow pack becomes uneven causing personnel to walk farther and farther around the sides of the original path, causing the path to grow in width. This is a very common phenomenon. Here, FIU assumes that all conduits will be either buried, or placed inside the boardwalk such that it does not extend beyond the 36” (0.914 m). wide footprint. The boardwalk to access the tower is not on any side that has a boom.

Specific Boardwalks at Onaqui-Ault Advance site:

- Boardwalk is from the access dirt road to instrument hut, pending landowner decision
- Boardwalk from the instrument hut to the tower to intersect on north face of the tower
- Boardwalk required parallel to the soil array.
- No boardwalk from the soil array boardwalk to the individual soil plots
- No boardwalk needed at DFIR site

The relative locations between tower, instrument hut and boardwalk can be found in the Figure below:

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Option 8, anemometer boom facing (generic) South with Instrument Hut towards the North

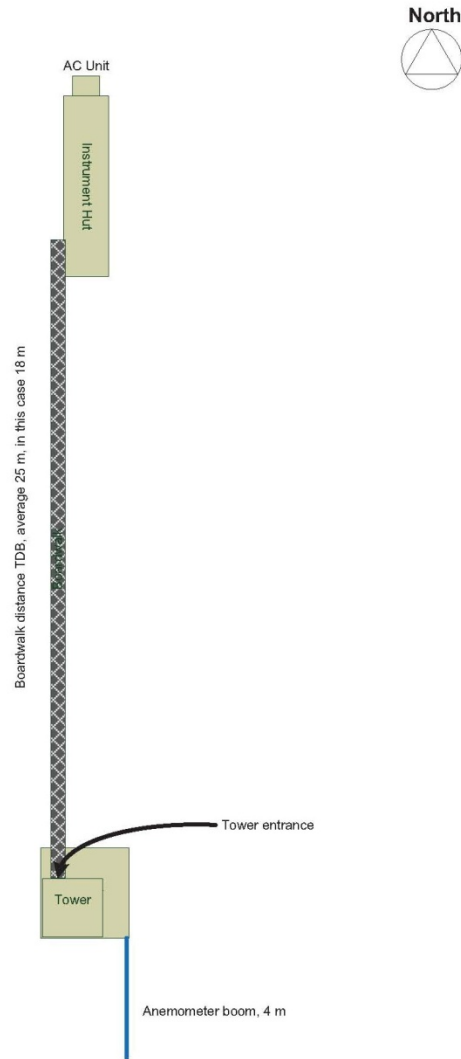


Figure 1 Generic diagram to demonstration the relationship between tower and instrument hut when boom facing south and instrument hut on the north towards the tower.

This is just a generic diagram. The actual layout of boardwalk (or path if no boardwalk required) and instrument hut position will be the joint responsibility of FCC and FIU. At Onaqui-Ault Advanced site, the boom angle will be 180 degrees, instrument hut will be on the north towards the tower, the distance between instrument hut and tower is ~20 m. The instrument hut vector will be SW-NE (210°-30°, longwise).

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

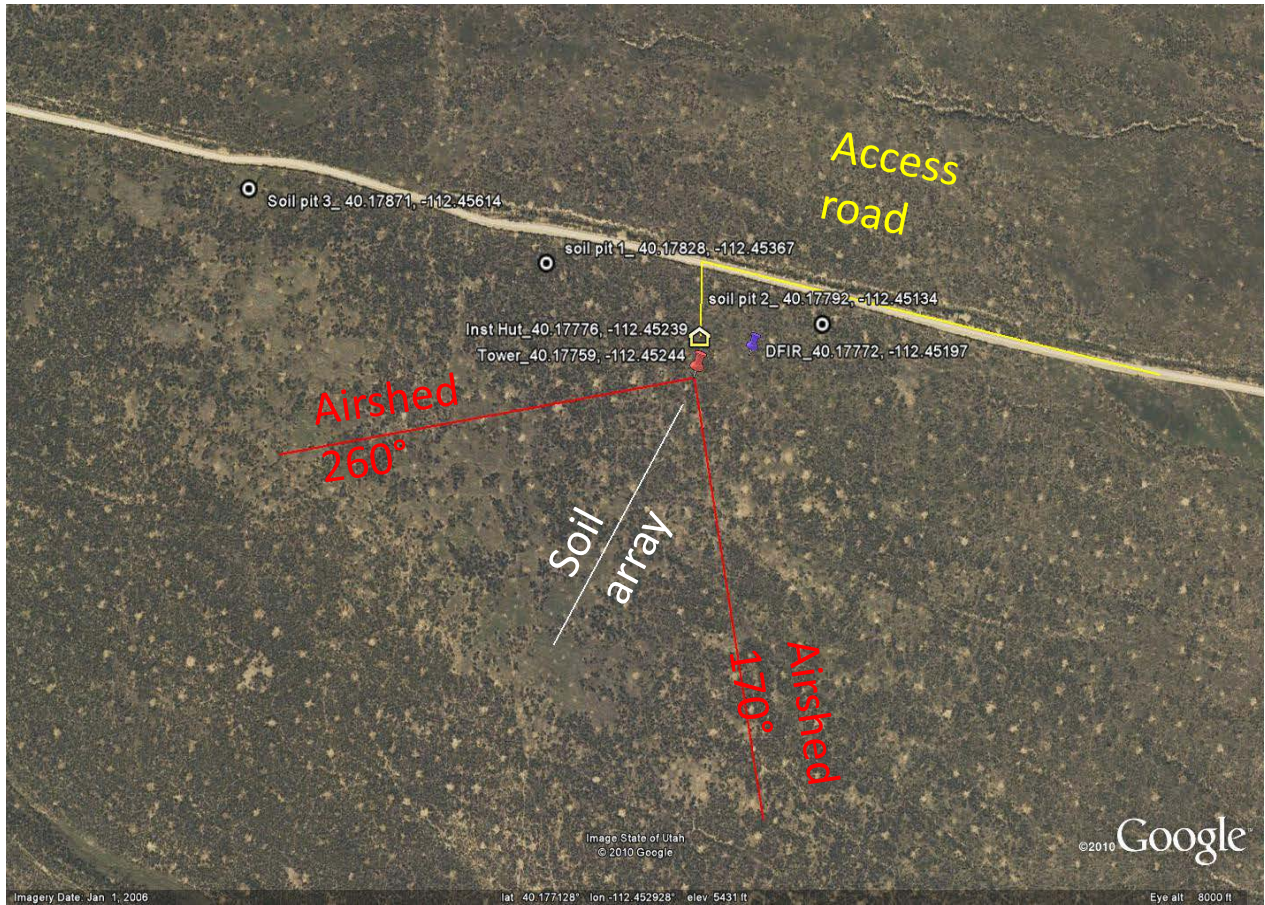


Figure 2. Site layout for Onaqui-Ault Advanced tower site.

Figure 2 above shows the proposed tower location, instrument hut location, DFIR, airshed area and access road.

i) Tower location is presented (red pin), ii) red lines indicate the airshed boundaries. Vectors 170° to 260° (clockwise from 170°) are the airshed area that would have quality wind data without causing flow distortions, respectively. iii) Yellow line is the suggested access road to instrument hut. iv) blue pin is DFIR location

3.3 Soil Attributes

The soil array vector is *from* the soil plot closest to the tower *toward* the farthest soil plot. The exact location of each soil plot will be chosen by an FIU team member during site construction to avoid placing a soil plot at an unrepresentative location (e.g., rock outcrop, drainage channel, large tree, etc).

Dominant soil series at the site: Taylorsflat loam, saline, 0 to 3 percent slopes. The taxonomy of this soil is shown below:

Order: Aridisols

Suborder: Calcids

Great group: Haplocalcids

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Subgroup: Xeric Haplocalcids
Family: Fine-loamy, mixed, superactive, mesic Xeric Haplocalcids
Series: Taylorsflat loam, saline, 0 to 3 percent slopes

Table 4. Summary of soil array and soil pit information at Onaqui-Ault. 0° represents true north and accounts for declination.

Soil plot dimensions	5 m x 5 m
Soil array pattern	B
Distance between soil plots: x	40 m
Distance from tower to closest soil plot: y	19 m
Latitude and longitude of 1 st soil plot OR direction from tower	40.17743°, -112.45253°
Direction of soil array	210°
Latitude and longitude of FIU soil pit 1	40.17828, -112.45367 (primary location)
Latitude and longitude of FIU soil pit 2	40.17792, -112.45134 (alternate 1)
Latitude and longitude of FIU soil pit 3	40.17871, -112.45614 (alternate 2)
Dominant soil type	Taylorsflat loam, saline, 0 to 3 percent slopes
Expected soil depth	>2 m
Depth to water table	>2 m
Expected depth of soil horizons	Expected measurement depths*
0-0.08 m (loam)	0.04 m
0.08-0.23 m (loam)	0.16 m
0.23-1.52 m (loam)	0.88 m
1.52-2 m	1.76 m

*Actual soil measurement depths will be determined based on measured soil horizon depths at the NEON FIU soil pit and may differ substantially from those shown here.

3.4 Information for ecosystem productivity plots.

The tower at Onaqui-Ault Advanced site has been positioned to optimize the collection of the air/wind signals both temporally and spatially over the desired ecosystem (sage shrubland). Major airshed area at this site are from 170° to 260° (clockwise from 170°), and 90% signals for flux measurements are in a distance of 700 m from tower, and 80% within 450 m. We suggest FSU Ecosystem Productivity plots be placed within the boundaries of 170° to 260° (clockwise from 170°) from tower.

3.5 Issues and attentions

Dirt road can be difficult to access after rain and during winter by vehicle. ATV may be the best way to access site during these conditions. This BLM site and adjunction private land is actively used for cattle grazing. Instrument protection will be a concern, just similar to any other grazed grassland.

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

4 SALT LAKE CITY (SLC) URBAN, RELOCATABLE TOWER 1

4.1 Desired ecosystem

Table 5. Ecosystem at SLC urban tower site.

Ecosystem Type	Management activity
Urban grassland, driveway/parking area, buildings	Frequent vehicular and pedestrian traffic in and around the site, in part to access buildings adjacent to the site. Lawn mowing. Possible irrigation and/or fertilization of lawns.

This site is located in Central Salt Lake City and heavily impacted by its urban environment. This site is a very small property. The tallest trees at this site were ~15.2 meters tall. Because of the nature of this small property in the urban area, there were few options for FIU when selecting the locations for the tower, instrument hut, soil plots and guy anchors.

Table 6. Ecosystem and site attributes for SLC urban Relocatable site.

Ecosystem attributes	Measure and units
Mean canopy height	15 m
Surface roughness ^a	5 m
Zero place displacement height ^a	8 m
Structural elements	Parks with lawn and trees, residential buildings
Time zone	Mountain time zone
Magnetic declination	11.77° E ± 0.35° changing by 0.10° W per year

Note, ^a From model output.

4.2 Site Design and Tower Attributes

The site layout is summarized in the table below. Assume the projected area of the tower is square. **Anemometer/temperature boom arm direction** is *from* the tower *toward* the prevailing wind direction or designated orientation. **Instrument hut orientation vector** is parallel to the long side of the instrument hut. **Instrument hut distance z** is the distance from the center of tower projection to the center of the instrument hut projection on the ground. The numbering of the **measurement levels** is that the lowest is level one, and each subsequent increase in height is numbered sequentially, in this case, level 6 being the upper most level at this tower site.

Table 7. Site design and tower attributes for SLC Urban Relocatable site

0° is true north with declination accounted for. Color of Instrument hut exterior shall be tan to best match the surrounding environment.

Attribute	lat	long	degree	meters	notes
-----------	-----	------	--------	--------	-------

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Airshed	130° to 190° and 280° to 10°		Clockwise from first angle
Tower location	40.745890	-111.918070	
Instrument hut	40.745889	-111.917722	
Instrument hut orientation vector	--	--	90°-270° E-W
Instrument hut distance z	--	--	28
Anemometer/Temperature boom orientation	--	--	215°
Height of the measurement levels			
Level 1		0.3	m.a.g.l.
Level 2		2.0	m.a.g.l.
Level 3		8.0	m.a.g.l.
Level 4		14.0	m.a.g.l.
Level 5		20.0	m.a.g.l.
Level 6		35.0	m.a.g.l.
Tower Height		35.0	m.a.g.l.

See AD 03 for technical requirement to determine the boom height for the bottom most measurement level.

Eddy covariance, sonic wind and air temperature **boom arms** orientation toward the southwest will be best to capture signals from all major wind directions. **Radiation boom arms** should always be facing south to avoid any shadowing effects from the tower structure.

Boardwalks. Ultimately, the decision to use a boardwalk will be, in part, based on owner’s preferences. There are strong science requirements that minimize site disturbance to the surrounding area, which will be difficult to manage over a 30-y period. Traffic control is key to minimizing the site disturbance. Confining foot traffic to boardwalks minimizes site impact; this is particularly true in places where wear caused by foot traffic becomes noticeable and grows. For example, in places with snow part of the year, worn footpaths tend to have low places that collect water, or places where the snow pack becomes uneven causing personnel to walk farther and farther around the sides of the original path, causing the path to grow in width. This is a very common phenomenon. Here FIU assumes that all conduits will be either buried, or placed inside the boardwalk such that it does not extend beyond the 36’ wide footprint. While the final design is not yet known, there are some general criteria that can be outlined. We assume that the boardwalk width is 36” (0.914 m). Material is not known, but must be fire proof, and in some locations the site is seasonally flooded and inundated with water. Boardwalks may also provide a scratching structure for grazing animals that in turn, would wear and unduly impact the site. Site by site evaluations must be done.

Specific boardwalks at the SLC Urban Relocatable site

- Boardwalk or improved path is NOT required to access instrument hut since it surrounded by parking area

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H. Luo, H. Loescher	Revision: C

- Boardwalk or improved path is NOT required from the instrument hut to the tower, but suggest marked path
- Soil array boardwalk or improved path is NOT required since all soil plots are next to existing walk way.
- No boardwalk or improved path to the individual soil plots

The relative locations between tower, instrument hut and boardwalk can be found in the diagram below:

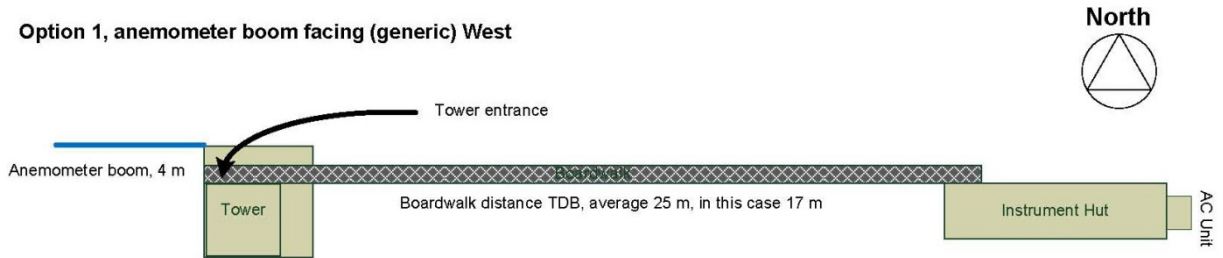


Figure 3. Generic diagram to demonstration the relationship between tower and instrument hut when boom facing west and instrument hut on the east towards the tower.

This is just a generic diagram when boom facing west and instrument hut on the general east towards the tower. The actual design of boardwalk (or path if no boardwalk required) and instrument hut position will be the responsibility of FCC and LAD following FIU’s guidelines. At SLC Urban Relocatable site, the boom angle will be 215 degrees, instrument hut will be on the east towards the tower, the distance between instrument hut and tower is ~28 m. The instrument hut vector will be E-W (90°-270°).

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H. Luo, H. Loescher	Revision: C

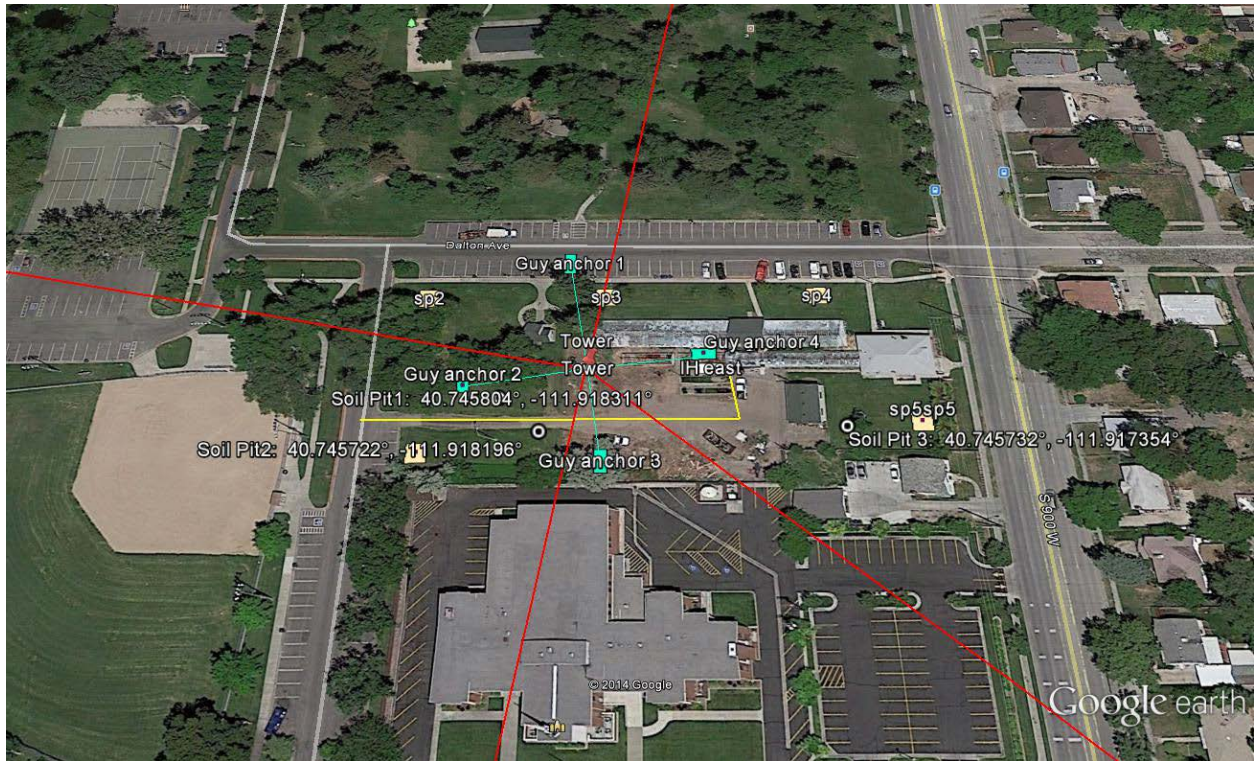


Figure 4. Site layout for SLC Urban Relocatable site.

i) new tower location is presented (red pin), ii) red lines indicate the airshed boundaries. Vectors 130° to 190° (clockwise from 130°) and 280° to 10° (clockwise from 280°) would have quality wind data without causing flow distortions, respectively. iii) Yellow line is the suggested access road to instrument hut.

4.3 Soil Attributes

The exact location of each soil plot will be chosen by an FIU team member during site construction to avoid placing a soil plot at an unrepresentative location (e.g., rock outcrop, drainage channel, large tree, etc).

- Dominant soil series at the site: Urban land. The taxonomy of this soil is shown below:
- Order:** Unknown: Urban land
- Suborder:** Unknown: Urban land
- Great group:** Unknown: Urban land
- Subgroup:** Unknown: Urban land
- Family:** Unknown: Urban land
- Series:** Unknown: Urban land

Table 8. Summary of soil array and soil pit information at SLC urban. 0° represents true north and accounts for declination.

Soil plot dimensions	5 m x 5 m
----------------------	-----------

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Soil array pattern	NA
Distance between soil plots: x	≥40 m
Distance from tower to closest soil plot: y	19 m
Latitude and longitude of 1 st soil plot	40.745690, -111.918530
Latitude and longitude of 2 nd soil plot	40.746076, -111.918541
Latitude and longitude of 3 rd soil plot	40.746077, -111.918019
Latitude and longitude of 4 th soil plot	40.746081, -111.917400
Latitude and longitude of 5 th soil plot	40.745760, -111.917146
Latitude and longitude of FIU soil pit 1	40.745804°, -111.918311° (primary location)
Latitude and longitude of FIU soil pit 2	40.745722°, -111.918196° (alternate 1)
Latitude and longitude of FIU soil pit 3	40.745732°, -111.917354° (alternate 2)
Dominant soil type	Urban land
Expected soil depth	Unknown
Depth to water table	Unknown

Expected depth of soil horizons	Expected measurement depths*
Unknown	Unknown

* Actual soil measurement depths will be determined based on measured soil horizon depths at the NEON FIU soil pit and may differ substantially from those shown here.

4.4 Information for ecosystem productivity plots.

The tower at SLC Urban relocatable site has been positioned to optimize the collection of the air/wind signals both temporally and spatially over the desired ecosystem (urban ecosystem including grassland, trees and residential buildings). Major airshed area at this site are from 130° to 190° (clockwise from 130°) and from 280° to 10° (clockwise from 280°), and 90% signals for flux measurements are in a distance of 700 m to ~3 km from tower, and 80% daytime signals are within 900 m. Due to the nature of this small property, FIU plots are not able to fit in the airshed within this property. Separate locations for FSU plots in the city parks or residential green area should be explored.

4.5 Issues and attentions

In meeting with the city officials during our visit to SLC, they were very much in favor of endorsing NEON's presence at this site. Essentially, the site as laid-out, was approved. They had a number of suggestions related to minor details (e.g. keep soil plots ~8' in from the sidewalk, maintain the curbline and create a vertical "spar" to prevent the guy wire from blocking passageway along the sidewalk, etc.). Most, if not all, of these concerns can be addressed at the 60% site design review. The city would like to begin the permitting process right away so NEON can begin construction at this site as soon as feasibly possible.

There are anticipated power line conflicts with the western guy line and the northern guy line. The northern guy anchor is expected to extend out into the existing parking lot – this is not anticipated to be a challenge. It is also anticipated that an old "light pole" just south of the greenhouse will need to be

<i>Title:</i> D15 FIU Site Characterization Summary		<i>Date:</i> 01/28/2015
<i>NEON Doc. #:</i> NEON.DOC.011044	<i>Author:</i> E. Ayres, H.Luo, H. Loescher	<i>Revision:</i> C

removed to accommodate the position of the instrument hut. Additional “clean-up” and removal of old concrete beds will need to be conducted throughout the site.

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

5 RED BUTTE CANYON, RELOCATEABLE TOWER 2

5.1 Desired ecosystem

Table 9. Ecosystem at the Red Butte Relocatable site.

Ecosystem Type	Management activity
Hardwood (oak-dominated) forest	Unknown, nature ecosystem

The ecosystem is hardwood (oak dominated) forest where NEON tower is located. Canopy height is ~10 m around tower site with lowest branches at 2 m. Shrub and recruit seedling and saplings forms understory with height ~3 m. Grass and many other annuals form understory at ground level with canopy height ~ 0.4 m.

Table 10. Ecosystem and site attributes for Red Butte Canyon Relocatable site.

Ecosystem attributes	Measure and units
Mean canopy height ^a	10 m
Surface roughness ^a	0.7 m
Zero place displacement height ^a	7.5 m
Structural elements	Closed forest, understory presents
Time zone	Mountain time zone
Magnetic declination	12° 13' E changing by 0° 7' W year ⁻¹

Note, ^a From model output.

5.2 Site Design and Tower Attributes

The site layout is summarized in the table below. Assume the projected area of the tower is square. **Anemometer/temperature boom arm direction** is *from* the tower *toward* the prevailing wind direction or designated orientation. **Instrument hut orientation vector** is parallel to the long side of the instrument hut. **Instrument hut distance z** is the distance from the center of tower projection to the center of the instrument hut projection on the ground. The numbering of the **measurement levels** is that the lowest is level one, and each subsequent increase in height is numbered sequentially, in this case, level 5 being the upper most level at this tower site.

Table 11. Site design and tower attributes for Red Butte Canyon Relocatable site

0° is true north with declination accounted for. Color of Instrument hut exterior shall be tan to best match the surrounding environment.

Attribute	lat	long	degree	meters	notes
Airshed			60° to 105° (major) 225° to 315° (secondary)		Clockwise from first angle
Tower location	40.78205,	-111.80394	--	--	new site

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Instrument hut	40.78190,	-111.80396		
Instrument hut orientation vector	--	--	75°-255°	ENE-WSW
Instrument hut distance z	--	--	--	15
Anemometer/Temperature boom orientation	--	--	360°	--
Height of the measurement levels				
Level 1			0.25	m.a.g.l.
Level 2			2.0	m.a.g.l.
Level 3			7.0	m.a.g.l.
Level 4			12.0	m.a.g.l.
Level 5			18.0	m.a.g.l.
Tower Height ^a			18.0	m.a.g.l.

See AD 03 for technical requirement to determine the boom height for the bottom most measurement level. ^aindicates that the top measurement location is equal to level 4, and the tower top shall be taller based on the sections of tower.

Eddy covariance, sonic wind and air temperature **boom arms** orientation toward the north will be best to capture signals from all major wind directions. **Radiation boom arms** should always be facing south to avoid any shadowing effects from the tower structure.

Secondary **precipitation collector** for bulk precipitation collection will be located the top of tower at this site. No **wet deposition collector** will be deployed at this site. See AD 04 for further information and requirements for bulk precipitation collection and wet deposition collection.

Boardwalks: Ultimately, the decision to use a boardwalk will be, in part, based on owner’s preferences. There are strong science requirements that minimize site disturbance to the surrounding area, which will be difficult to manage over a 30-y period. Traffic control is key to minimizing the site disturbance. Confining foot traffic to boardwalks minimizes site impact; this is particularly true in places where wear caused by foot traffic becomes noticeable and grows. For example, in places with snow part of the year, worn footpaths tend to have low places that collect water, or places where the snow pack becomes uneven causing personnel to walk farther and farther around the sides of the original path, causing the path to grow in width. This is a very common phenomenon. Here FIU assumes that all conduits will be either buried, or placed inside the boardwalk such that it does not extend beyond the 36’ wide footprint. While the final design is not yet known, there are some general criteria that can be outlined. We assume that the boardwalk width is 36” (0.914 m). Material is not known, but must be fire proof, and in some locations the site is seasonally flooded and inundated with water. Boardwalks may also provide a scratching structure for grazing animals that in turn, would wear and unduly impact the site. Site by site evaluations must be done.

Specific boardwalks at the Red Butte Canyon Relocatable site

- Boardwalk is from the access dirt road to instrument hut, pending landowner decision
- Boardwalk from the instrument hut to the tower to intersect on north face of the tower
- Boardwalk to soil array, pending landowner decision.

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

- No boardwalk from the soil array boardwalk to the individual soil plots

The relative locations between tower, instrument hut and boardwalk can be found in the diagram below:

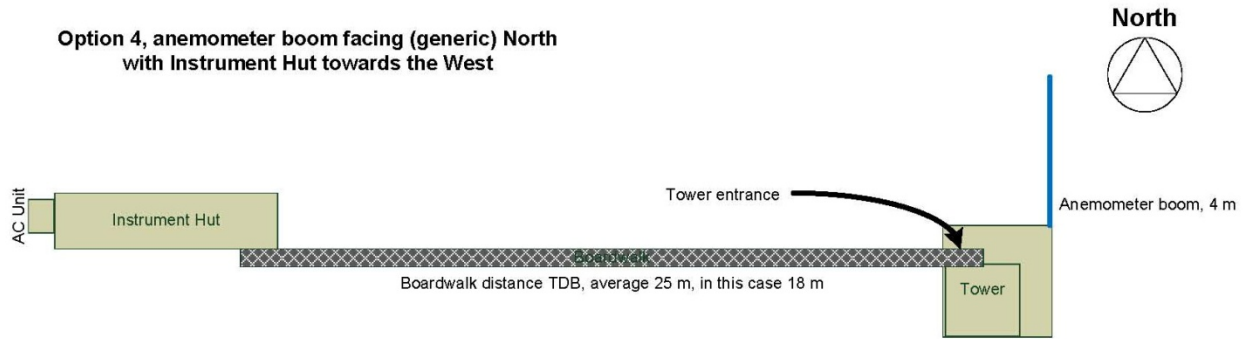


Figure 5. Generic diagram to demonstration the relationship between tower and instrument hut when boom facing north and instrument hut on the west towards the tower. This is just a generic diagram when boom facing north and instrument hut on the general east (includes southwest) towards the tower. The actual design of boardwalk (or path if no boardwalk required) and instrument hut position will be the responsibility of FCC and LAD following FIU’s guidelines. At Red Butte Canyon Relocatable site, the boom angle will be 360 degrees, instrument hut will be on the southwest towards the tower, the distance between instrument hut and tower is ~15 m. The instrument hut vector will be ENE-WSW (75°-255°).

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

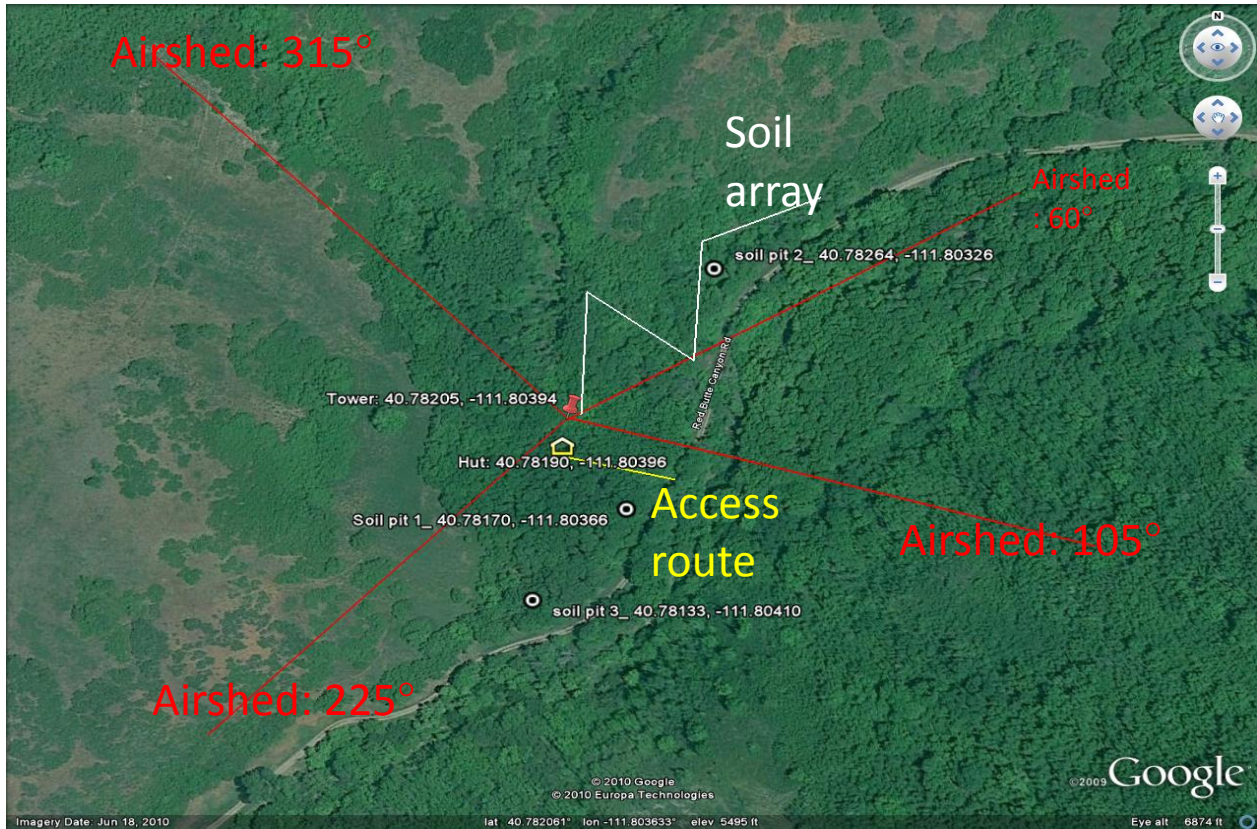


Figure 6. Site layout for Red Butte Canyon Relocatable site.

i) new tower location is presented (red pin), ii) red lines indicate the airshed boundaries. Vectors 60° to 105° (major airshed, clockwise from 60°) and 225° to 315° (secondary airshed, clockwise from 225°) would have quality wind data without causing flow distortions, respectively. iii) Yellow line is the suggested access road to instrument hut.

5.3 Soil Attributes

Due to the small area and width of the forested area at Red Butte none of the exiting soil array patterns could fit into this location. Therefore, a new site specific pattern was developed for Red Butte (see Table 8 for approximate latitude and longitude of each soil plot). The exact location of each soil plot will be chosen by an FIU team member during site construction to avoid placing a soil plot at an unrepresentative location (e.g., rock outcrop, drainage channel, large tree, etc).

Dominant soil series at the site: Harkers-Wallsburg association, steep. The taxonomy of this soil is shown below:

Order: Mollisols

Suborder: Xerolls

Great group: Palexerolls-Argixerolls

Subgroup: Typic Palexerolls-Lithic Argixerolls

Family: Fine, smectitic, frigid Typic Palexerolls-Clayey-skeletal, smectitic, frigid Lithic Argixerolls

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Series: Harkers-Wallsburg association, steep

Table 12. Summary of soil array and soil pit information at Red Butte. 0° represents true north and accounts for declination.

Soil plot dimensions	5 m x 5 m
Soil array pattern	NA
Distance between soil plots: x	40 m
Distance from tower to closest soil plot: y	6 m
Latitude and longitude of 1 st soil plot*	40.782070, -111.803872
Latitude and longitude of 2 nd soil plot*	40.782541, -111.803842
Latitude and longitude of 3 rd soil plot*	40.782281, -111.803355
Latitude and longitude of 4 th soil plot*	40.782738, -111.803323
Latitude and longitude of 5 th soil plot*	40.782916, -111.802774
Direction of soil array	NA
Latitude and longitude of FIU soil pit 1	40.78170, -111.80366 (primary location)
Latitude and longitude of FIU soil pit 2	40.78264, -111.80326 (alternate 1)
Latitude and longitude of FIU soil pit 3	40.78133, -111.80410 (alternate 2)
Dominant soil type	Harkers-Wallsburg association, steep
Expected soil depth	0.30 m to >2 m
Depth to water table	>2 m

Expected depth of soil horizons	Expected measurement depths [†]
0-0.36 m (Loam)	0.18 m
0.36-0.48 m (Gravelly clay loam)	0.42 m
0.48-1.07 (Gravelly clay)	0.78 m
1.07-1.47 m (Very gravelly clay)	1.27 m
1.47-2 m (Very gravelly clay loam)	1.74 m

*Due to the unusual shape of the soil array at Red Butte approximate coordinates are given for each soil plot.

[†]Actual soil measurement depths will be determined based on measured soil horizon depths at the NEON FIU soil pit and may differ substantially from those shown here.

5.4 Information for ecosystem productivity plots.

The tower has been positioned to optimize the collection of the air/wind signals both temporally and spatially over the desired ecosystem (deciduous oak forest). Airshed at this site is from 60° to 105° (clockwise from 60°), with highest frequency wind from 75° throughout the whole year. Secondary airshed is from 225° to 315° (clockwise from 225°). 90% signals for flux measurements are within a distance of 950 m from tower, and 80% within 750 m. Therefore, we suggest FSU Ecosystem Productivity plots are placed within the major tower airshed boundaries of 60° to 105° (clockwise from 60°).

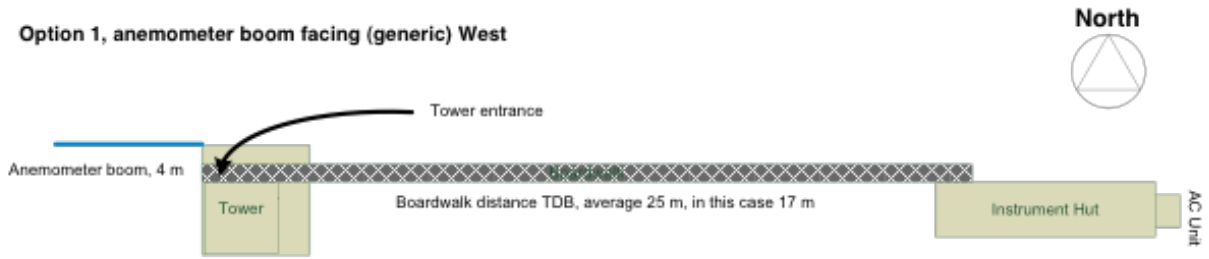
<i>Title:</i> D15 FIU Site Characterization Summary		<i>Date:</i> 01/28/2015
<i>NEON Doc. #:</i> NEON.DOC.011044	<i>Author:</i> E. Ayres, H.Luo, H. Loescher	<i>Revision:</i> C

5.5 Issues and attentions

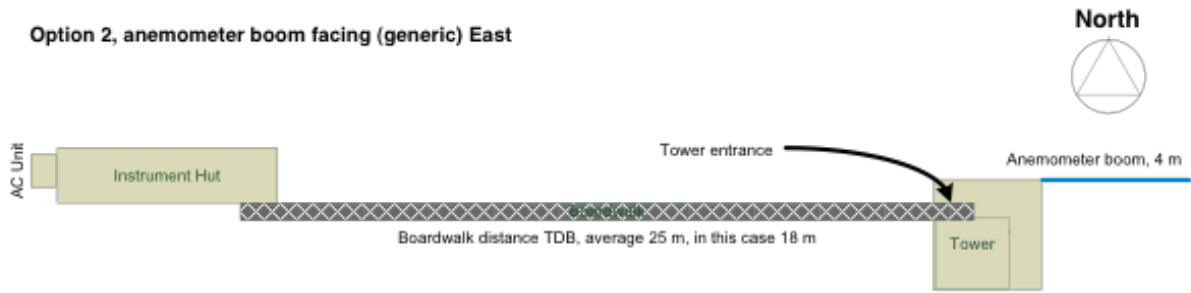
The ecosystems are very patchy surround this site with small pieces of forest stands, meadows, and shrublands. The forest for tower location is a small patch on the northwest side of Red Butte Canyon Road, and difficult to fit in soil array. Flux fetch area is beyond this small patch of forest stand and extends into the forest on the southeast side of Red Butte Canyon Road, which is similar forest type. The tower has been position to best characterize the flux signals over this forest on both sides of road. Red Butte Canyon Road is a small dirt road. We assume its effects on flux measurements are not important. Tower site is at a bottom of valley with large steep slopes on both sides of Red Butte Canyon Road, and in the middle of a large canyon that run NE to SW. Cold air drainage and horizontal advections induced by complex terrain are concerns at this site for flux measruements. It is not adequate to estimate absolute amount of gas exchange and turbulent flux using single point measurements, such as eddy covariance technique, but it is still valid and useful to interpret the long term trend, seasonal variation and inter-annual variation of ecological processes.

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

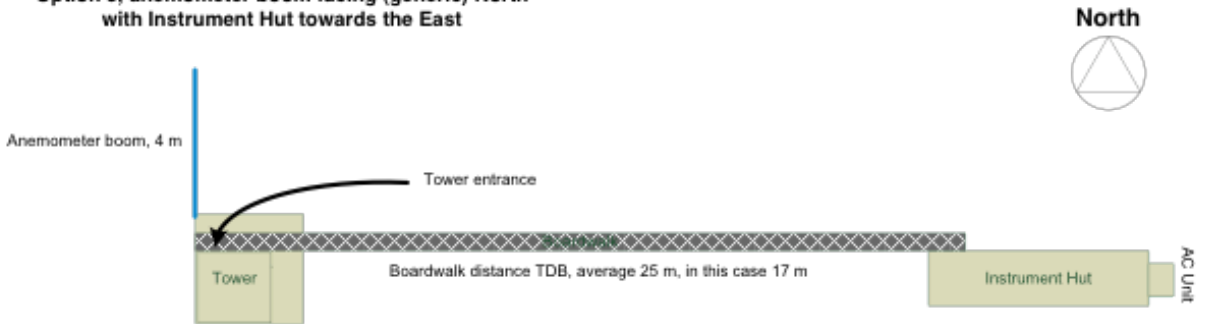
Option 1, anemometer boom facing (generic) West



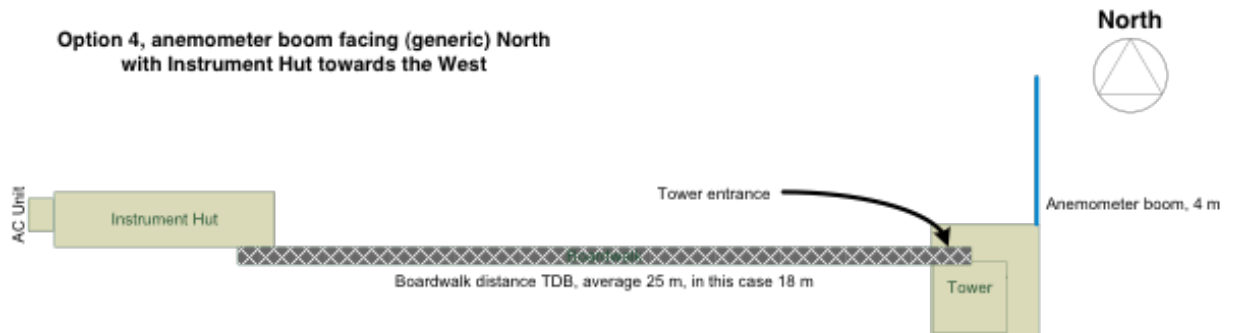
Option 2, anemometer boom facing (generic) East



Option 3, anemometer boom facing (generic) North with Instrument Hut towards the East

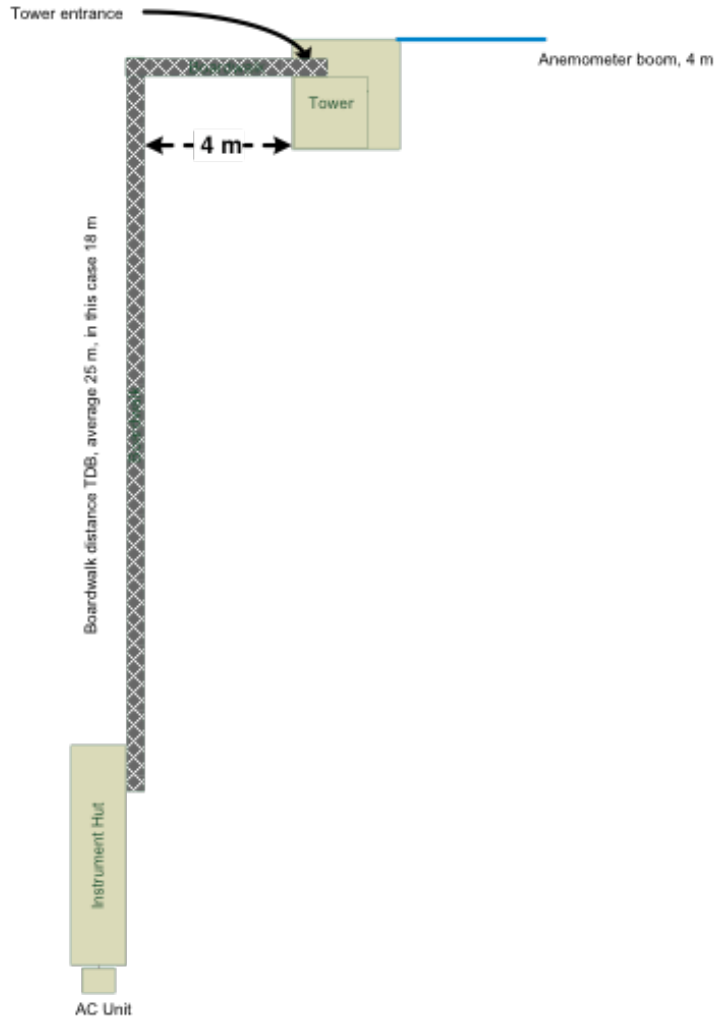


Option 4, anemometer boom facing (generic) North with Instrument Hut towards the West



Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

**Option 5, anemometer boom facing (generic) East
with Instrument Hut towards the South**



Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

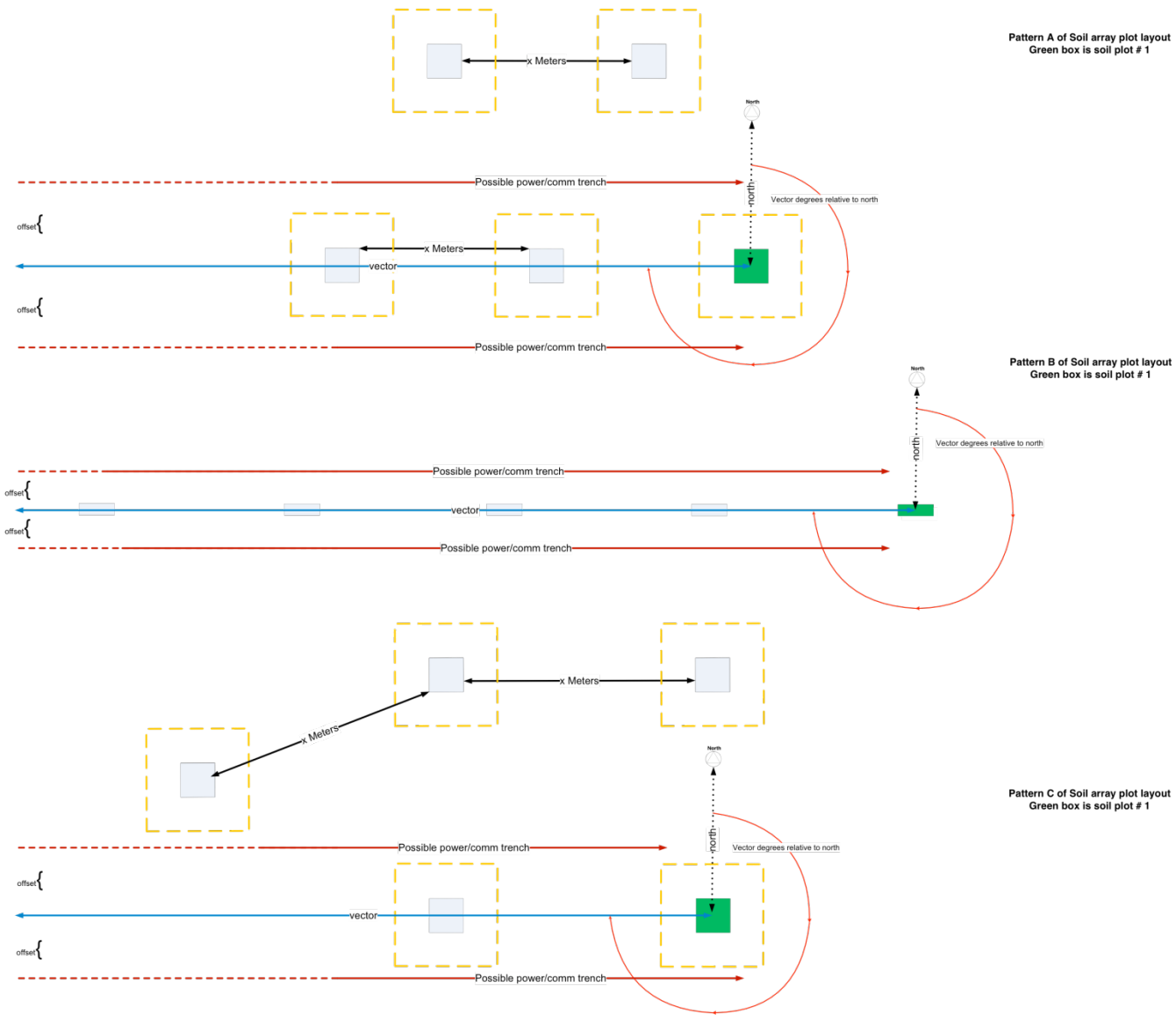


Figure 8. Conceptual diagram of Soil Array Patterns

Outlines the orientation for the soil array and instrument hut from the center point of the tower. The x, y, z distances are i) the distance between soil plots, ii) distance between the tower centerpoint and the closest edge of soil plot, and iii) the distance between the tower centerpoint and the closest edge of the instrument hut, respectively. The yellow outline around each soil plot is the 5 m perimeter keep out zone.

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

6 APPENDIX A. FCC SUMMARY TABLES

Table 13. FCC Summary Table for FIU site components at D15 Onaqui-Ault Core

Site Component				units
Tower location	40.17759,	-112.45244		Lat, Long, in degrees
Tower location	40° 10' 39.324"	-112° 27' 8.7834"		Lat, Long in deg min sec
Tower height ^f	6			meters
Tower guying	None			yes/none, notes
Instrument Hut location	40.17776,	-112.45239		Lat, Long, in degrees
Instrument Hut location	40° 10' 39.9354"	-112° 27' 8.6034"		Lat, Long in deg min sec
IH orientation ^a	210° - 30°			vector
boom orientation ^b	180°			degrees
distance from center of tower to IH center		20	option 8	distance (m), option #
how the Bwalk intersects the tower access	Boardwalk intersects the north-side of the tower from the North.			description
how the Boardwalk intersects the tower access	Straight section of boardwalk from IH to the north side of tower			description
Air shed vector(s) ^c	170° to 260°			Vector, clock wise from first angle
Boardwalk from AP to IH	yes, from dirt road to IH	(see Figure 2)		yes/none, notes
Boardwalk to soil array	yes			yes/none, notes
Boardwalk needed to DFIR	none			yes/none
Power and Communication line	10 m from edge of plot to the centerline of the power/comms line	whichever is easier ^e		offset, notes
DFIR location	40.17772,	-112.45197	No BW	Lat, Long in degrees, notes
DFIR location	40° 10' 39.792"	-112° 27' 7.092"		Lat, Long in deg min sec
DFIR power supply	30 amp AC power from tower			description
Soil plot 1 st location	40.17743°,	-112.45253°		Lat, Long in degrees (center point)
Soil plot 1 st location	40° 10' 38.748"	-112° 27' 9.1074"		Lat, Long in deg min sec
Soil plot distance between plots (x)	40 m			meters

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Soil array pattern and vector ^d	B	210°		A, B, or C, vector
Soil plot dimensions	5 m x 5 m			L x W (meters)
Soil profile pit primary	40.17828,	-112.45367	>2 m	Lat, Long, and expected depth
Soil profile pit primary	40° 10' 41.808"	-112° 27' 13.212"		Lat, Long in deg min sec
Soil profile pit alternative 1	40.17792,	-112.45134	>2 m	Lat, Long, and expected depth
Soil profile pit alternative 1	40° 10' 40.512"	-112° 27' 4.824"		Lat, Long in deg min sec
Soil profile pit alternative 2	40.17871,	-112.45614	>2 m	Lat, Long, and expected depth
Soil profile pit alternative 2	40° 10' 43.356"	-112° 27' 22.104"		Lat, Long in deg min sec
Fencing needs	none	none	none	IH, Soil Arrays, Guy anchors
Presence of large grazing animals	Yes, cattle			description
Site management*	Grazing			description
Any additional site specific information	open sage shrubland, mean canopy height ~2 m			description
Magnetic declination	12° 20' E changing by 0° 7' W/year			At time of site visit

^dindicates that the top measurement location is equal to level 4, and the tower top shall be taller based on the sections of tower.

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Site Component			units
Tower location	40.745890	-111.918070	Lat, Long
Tower location	40°44'45.20"	-111°55'5.05"	Lat, Long in deg min sec
Tower height	35		meters
Tower guying	yes		yes/none, notes
Instrument Hut location	40.745889	-111.917722	Lat, Long,
Instrument Hut location	40°44'45.20"	-111°55'3.80"	Lat, Long in deg min sec
IH orientation ^a	90° - 270°		Long side of IH
boom orientation ^b	215°		degrees
distance from center of tower to IH CPiont		28	Option 1 vector, distance (m), option #
how the Bwalk intersects the tower access	No boardwalk from tower to IH.		description
Air shed vector(s) ^c	130° to 190° and 280° to 10°	Clockwise from first angle	vector, notes
Boardwalk from AP to IH	No		yes/none, notes
Boardwalk to soil array	No	No BW to individual soil plots	yes/none, notes
Boardwalk needed to DFIR	na.		yes/none
DFIR location	na		Lat, Long
DFIR power supply	na		description
Power and Communication line	10 m from edge of plot to the centerline of power/comms line	whichever side is easiest ^e , line below ground	offset, notes
Soil plot 1 st location	40.745690	-111.918530	Lat, Long (center point)
Soil plot 1 st location	40°44'44.48"	-111°55'6.71"	Lat, Long in deg min sec
Soil plot 2 nd location	40.746076	-111.918541	Lat, Long (center point)

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Soil plot 2 nd location	40°44'45.87"	-111°55'6.75"		Lat, Long in deg min sec
Soil plot 3 rd location	40.746077	-111.918019		Lat, Long (center point)
Soil plot 3 rd location	40°44'45.88"	-111°55'4.87"		Lat, Long in deg min sec
Soil plot 4 th location	40.746081	-111.917400		Lat, Long (center point)
Soil plot 4 th location	40°44'45.89"	-111°55'2.64"		Lat, Long in deg min sec
Soil plot 5 th location	40.745760	-111.917146		Lat, Long (center point)
Soil plot 5 th location	40°44'44.74"	-111°55'1.73"		Lat, Long in deg min sec
Soil plot distance between plots (x)	≥40 m		19 m	(meters) x, y
Soil array pattern and vector ^d	Non-standard pattern			A, B, or C, vector
Soil plot dimensions	5 m x 5 m			L x W (meters)
Soil profile pit primary	40.745804°	-111.918311°	0.30 m to >2 m	Lat, Long, and expected depth
Soil profile pit primary	40°44'44.89"	-111°55'5.92"		Lat, Long in deg min sec
Soil profile pit alternative 1	40.745722°	-111.918196°	0.30 m to >2 m	Lat, Long, and expected depth
Soil profile pit alternative 1	40°44'44.60"	-111°55'5.51"		Lat, Long in deg min sec
Soil profile pit alternative 2	40.745732°	-111.917354°	0.30 m to >2 m	Lat, Long, and expected depth
Soil profile pit alternative 2	40°44'44.64"	-111°55'2.47"		Lat, Long in deg min sec
Fencing needs	none			IH, Soil Arrays, Guy anchors
Presence of large grazing animals	none			description
Site management*	Vegetation is managed as city parks, or the residential yards			description
Any additional site specific information				description
Magnetic declination	11.77° E ± 0.35° changing by 0.10° W in Oct, 2014			At time of site visit
Guy Anchor Point 1	40.746171	-111.918128		Lat, Long (center point)
Guy Anchor Point 1	40°44'46.22"	-111°55'5.26"		Lat, Long in deg min sec
Guy Anchor Point 2	40.745670	-111.918030		Lat, Long (center point)
Guy Anchor Point 2	40°44'44.41"	-111°55'4.91"		Lat, Long in deg min sec
Guy Anchor Point 3	40.745926	-111.917740		Lat, Long (center point)
Guy Anchor Point 3	40°44'45.33"	-111°55'3.86"		Lat, Long in deg min sec
Guy Anchor Point 4	40.745850	-111.918420		Lat, Long (center point)
Guy Anchor Point 4	40°44'45.06"	-111°55'6.31"		Lat, Long in deg min sec

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

Table 15. FCC Summary Table for FIU site components at D15 Red Butte Relocatable 2

Site Component				units
Tower location	40.78205	-111.80394		Lat, Long in degrees
Tower location	40° 46' 55.3794"	-111° 48' 14.1834"		Lat, Long in deg min sec
Tower height ^f	18			meters
Tower guying	None	prefer not removing any branches		yes/none, notes
Instrument Hut location	40.78190	-111.80396		Lat, Long in degrees
Instrument Hut location	40° 46' 54.84"	-111° 48' 14.256"		Lat, Long in deg min sec
IH orientation ^a	75°-255°			vector
boom orientation ^b	360°			degrees
distance from center of tower to IH center		15	Option 4	distance (m), option #
how the Bwalk intersects the tower access	Boardwalk intersects the north-side of the tower from the west.			description
how the Bwalk intersects the tower access	Boardwalk to skirt around the west side of tower with 4 m (min) distance away from the tower base			description
Air shed vector(s) ^c	60° to 105° (major), 225° to 315° (secondary)	Clockwise from first angle		vector, notes
Boardwalk from AP to IH	yes	(Fig. 7)		yes/none, notes
Boardwalk to soil array	yes			yes/none, notes
Boardwalk needed to DFIR	no DFIR			yes/none
Power and Communication line	10 m from edge of plot to the centerline of the power/comms line	whichever side is easier ^e , line above ground		offset, notes
DFIR location	none			Lat, Long
DFIR power supply	na.			description
Soil plot 1 st location	40.782070	-111.803872		Lat, Long in degrees (center point)
Soil plot 1 st location	40° 46' 55.4514"	-111° 48' 13.9386"		Lat, Long in deg min sec
Soil plot distance between plots (x)	40 m			meters
Soil array pattern and vector ^d	NA	NA	Special	A, B, or C, vector, notes

Title: D15 FIU Site Characterization Summary		Date: 01/28/2015
NEON Doc. #: NEON.DOC.011044	Author: E. Ayres, H.Luo, H. Loescher	Revision: C

			pattern designed for this site only	
Soil plot dimensions	5 m x 5 m			L x W (meters)
Soil profile pit primary	40.78170	-111.80366	0.3 to >2 m	Lat, Long, and expected depth
Soil profile pit primary	40° 46' 54.12"	-111° 48' 13.1754"		Lat, Long in deg min sec
Soil profile pit alternative 1	40.78264	-111.80326	0.3 to >2 m	Lat, Long, and expected depth
Soil profile pit alternative 1	40° 46' 57.504"	-111° 48' 11.7354"		Lat, Long in deg min sec
Soil profile pit alternative 2	40.78133	-111.80410	0.3 to >2 m	Lat, Long, and expected depth
Soil profile pit alternative 2	40° 46' 52.7874"	-111° 48' 14.76"		Lat, Long in deg min sec
Fencing needs	none	none	none	IH, Soil Arrays, Guy anchors
Presence of large grazing animals	none			description
Site management*	unknown			description
Any additional site specific information	Oak dominant closed forest, mean height ~ 10 m			description
Magnetic declination	12° 13' E changing by 0° 7' W year ⁻¹			At time of site visit

Notes;

^aparallel to the long side of the IH

^bFrom tower point to this direction

^cClockwise from first angle, recommend reviewing FIU site characterization summary report

^dFrom 1st plot toward other plots if pattern B, from 1st plot toward nearest neighbor (see diagram of the patterns)

^esee Appendix A. Options for Soil Array, second figure.

^fTower Height is for FIU requirements; actual tower height will increase toward the next section height, indicates that the top measurement location is equal to level 4, and the tower top shall be taller based on the sections of tower.

IH = instrument hut

AP = auxillary portal

*burn information that may affect boardwalk, IH, or tower infrastructure, or other management activities

<i>Title:</i> D15 FIU Site Characterization Summary		<i>Date:</i> 01/28/2015
<i>NEON Doc. #:</i> NEON.DOC.011044	<i>Author:</i> E. Ayres, H.Luo, H. Loescher	<i>Revision:</i> C