

# *Overview of the USGS Albuquerque Seismological Laboratory (ASL)*



# *ASL History*

- 1960 – Sited by Jim Devine
- 1961 – Opened under the US Coast and Geodetic Survey
- 1962 – Tasked with the World-Wide Standardized Seismographic Network (WWSSN)
- 1972 – Transferred to the USGS (along with NEIC)



# *The ASL Today*

## Facilities

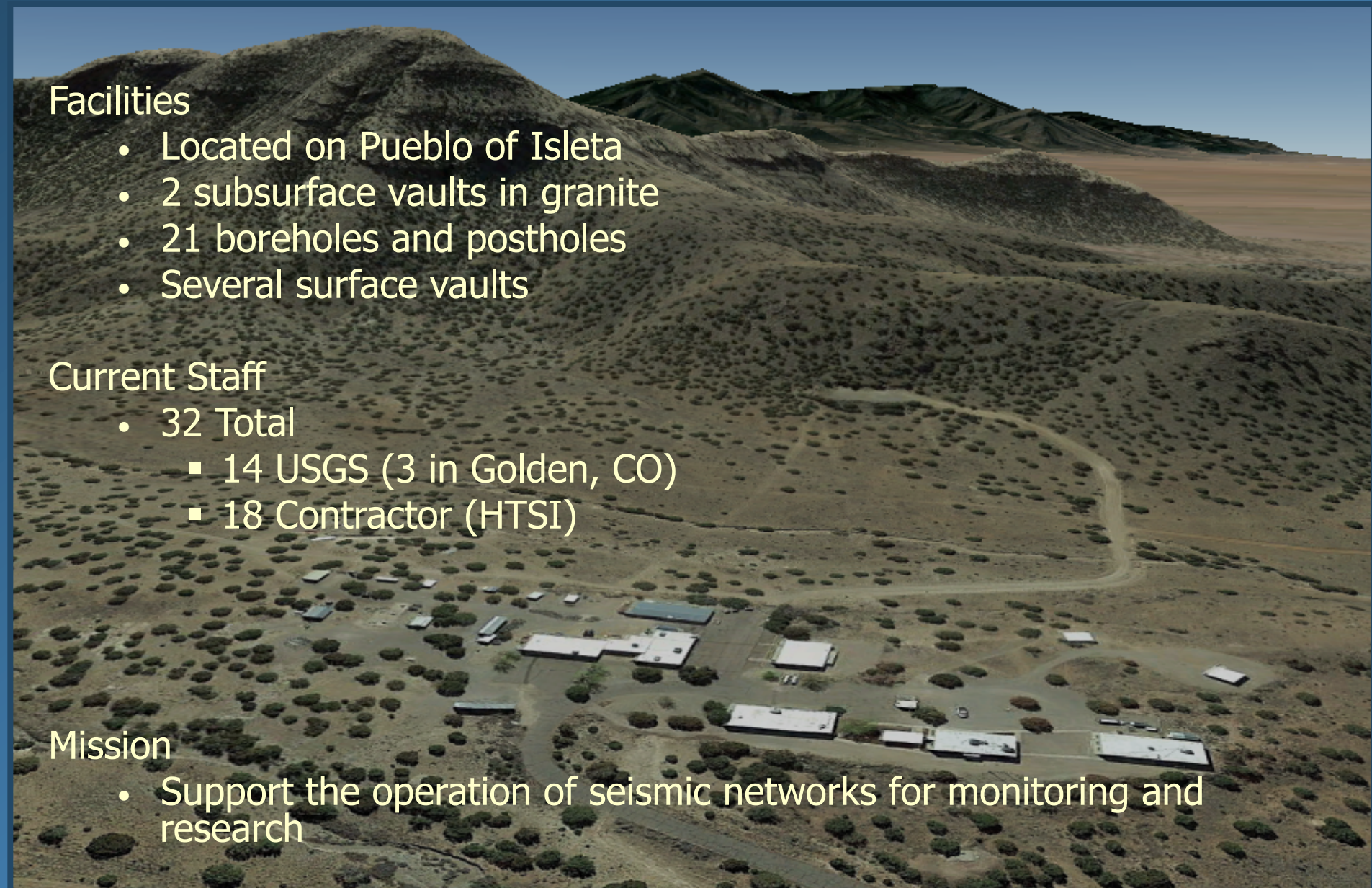
- Located on Pueblo of Isleta
- 2 subsurface vaults in granite
- 21 boreholes and postholes
- Several surface vaults

## Current Staff

- 32 Total
  - 14 USGS (3 in Golden, CO)
  - 18 Contractor (HTSI)

## Mission

- Support the operation of seismic networks for monitoring and research



# *ASL Seismic Network Operations*

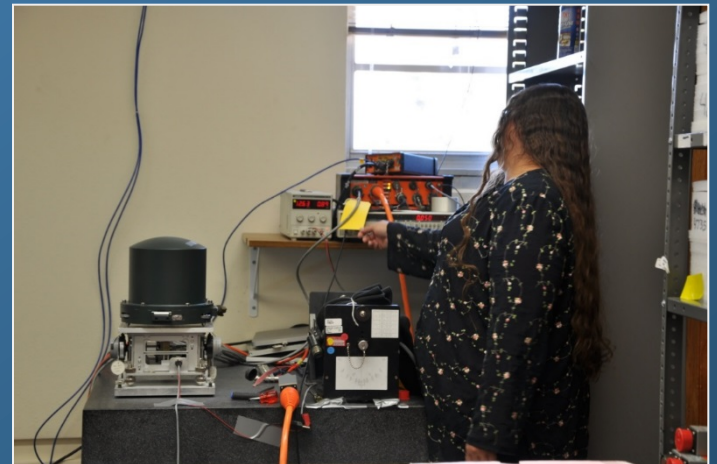
- Global Seismographic Network (GSN) Program
  - 100 stations including the IU, IC, and CU networks.
- Advanced National Seismic System (ANSS)
  - National “Backbone” Network
  - Regional Networks (Teton & New England)
  - Regional Equipment Depot
- Maintain pool of 32 aftershock systems



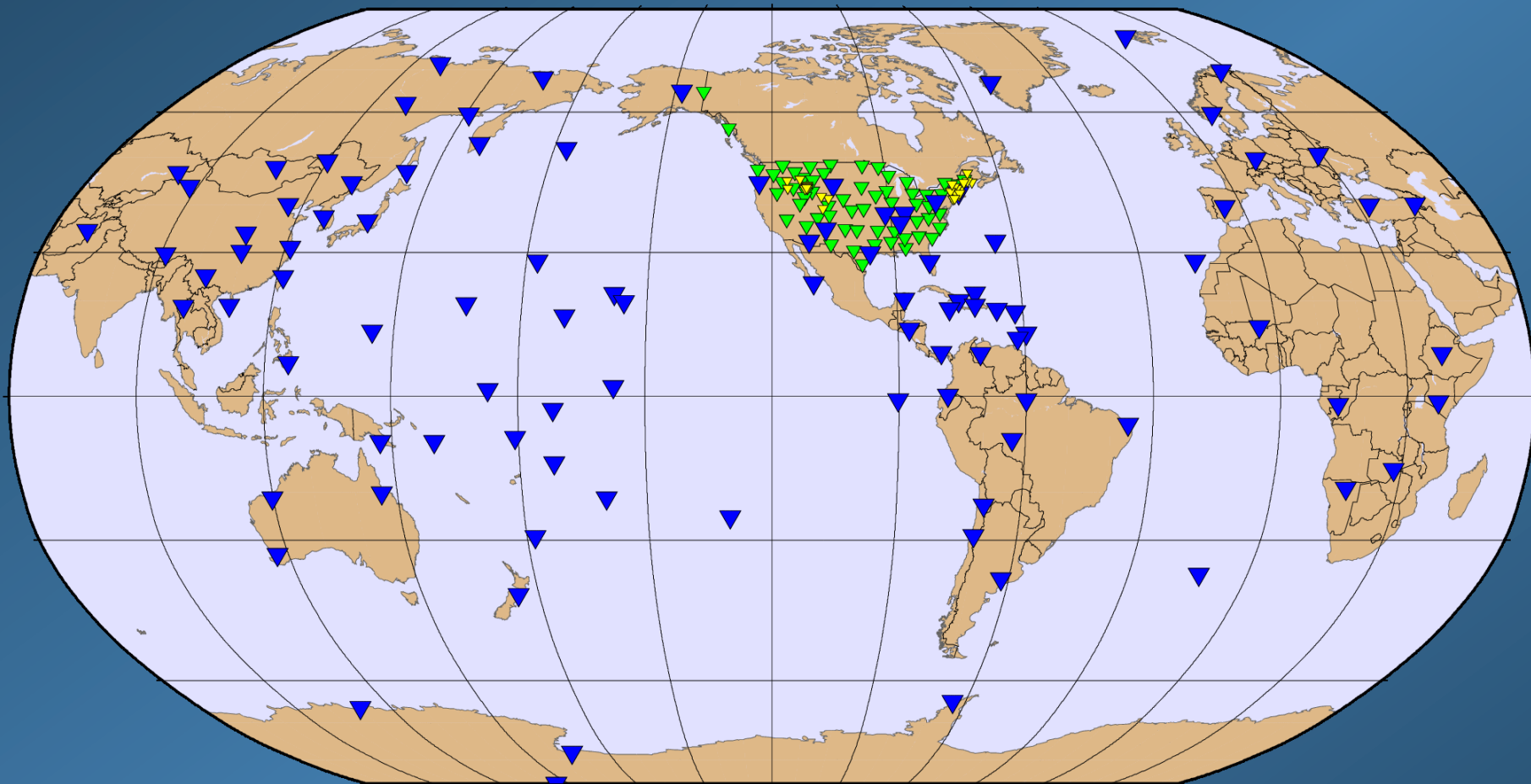
# *ASL Seismic Network Operations*

ASL network operations include:

- Station operations
- Data (and metadata) Quality Control
- Instrument testing



## *Stations operated by ASL*



GSN



U.S. backbone network



Regional networks

USGS-ASL has MOU's and agreements with 54 different countries.

# *Sensors Currently Installed*

## IU primary broadband (81)

- 43 STS-1's
- 17 KS-54000 borehole
- 2 KS-36000 borehole
- 16 STS-2
- 3 Trillium-120 post hole

## IU secondary broadband (72)

- 48 STS-2
- 14 Trillium 240
- 9 CMG3-T
- 1 Trillium-120 post hole

## IC primary broadband (10)

- 10 STS-1's

## IC secondary broadband (10)

- 10 STS-2

## CU primary broadband (9)

- 9 STS-2

All upgraded sites (97/100)  
have Episensor strong  
motion accelerometers

# On to the tour!

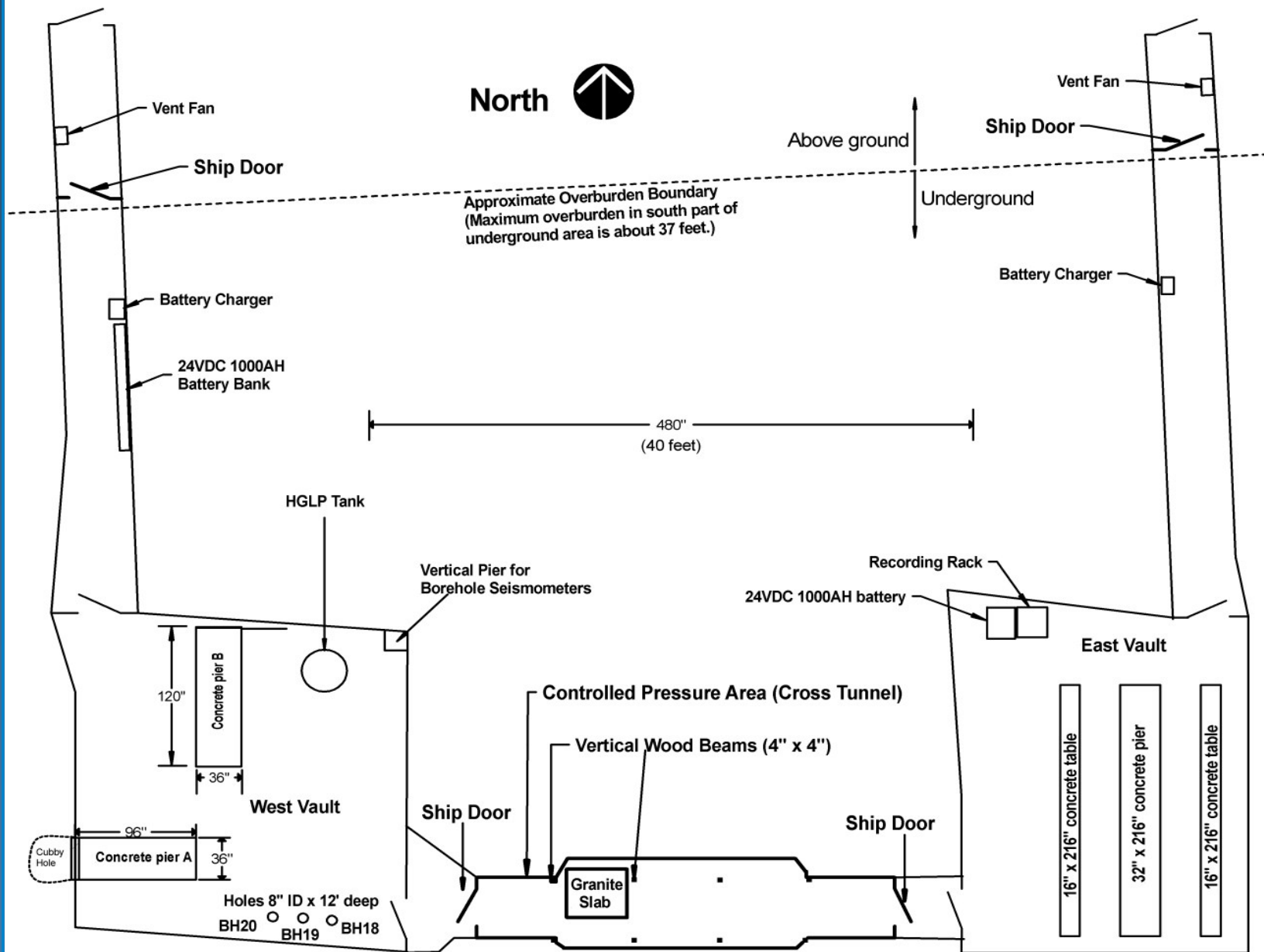
Kirtland AFB

ASL

Isleta Pueblo

Underground  
Test Vaults





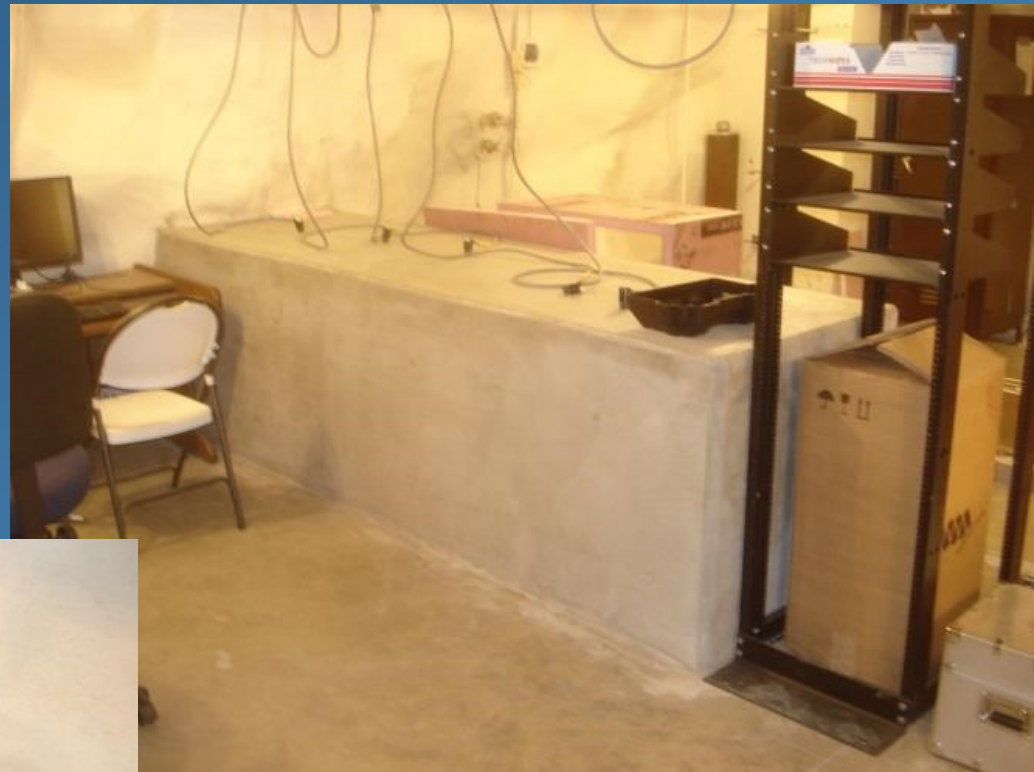
ASL Underground Vault Area

CRH  
2 January 2014

# ASL underground vaults



# ASL Underground Vault (West Side)

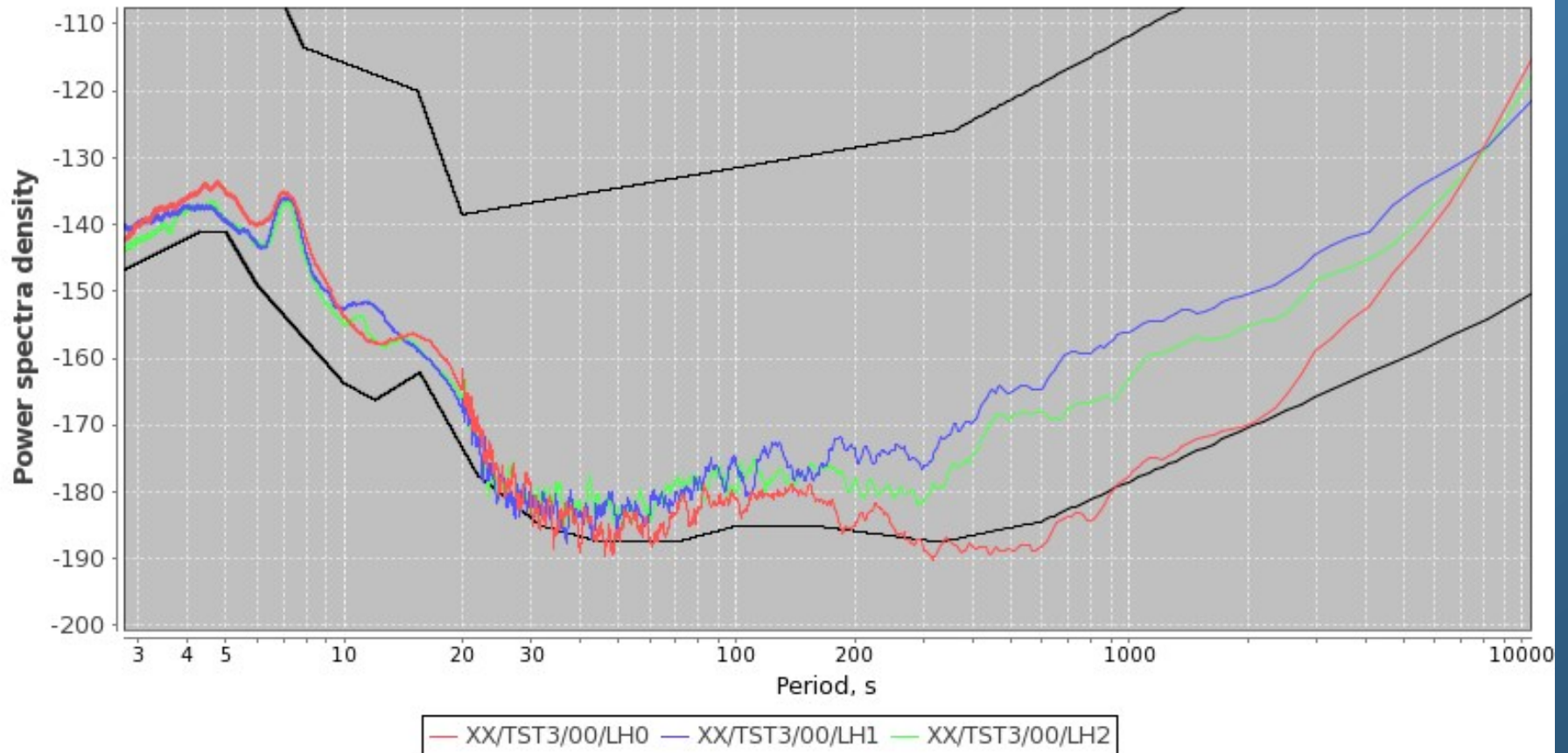


# ASL Cross-Tunnel



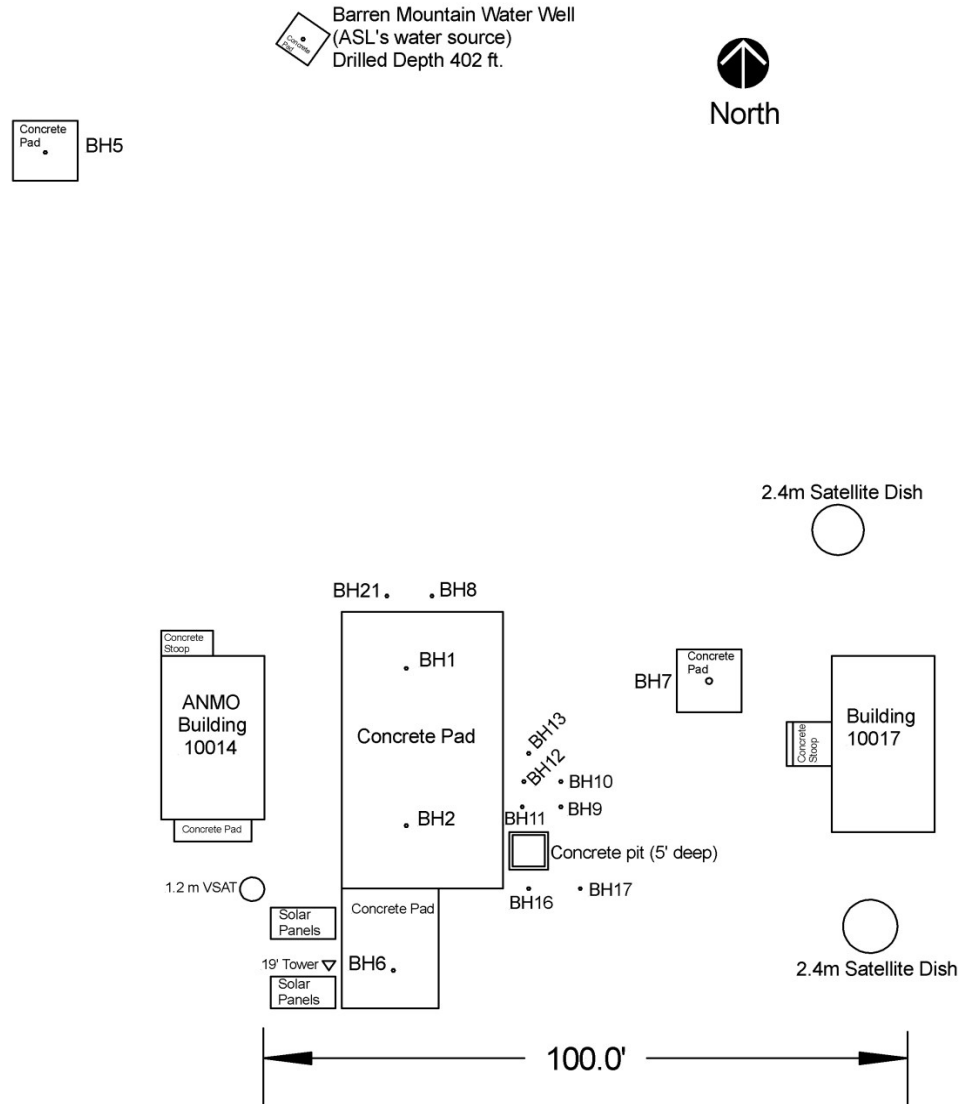
# ASL Cross-Tunnel Noise Levels

Start time: 2013,133,00:41:58.152, Duration: +9.102 h



Typical long-period noise levels from STS-1 reference seismometers in cross tunnel during quiet conditions (little or no wind). Red = Z, Blue = NS, Green = EW. Upper and lower black lines are Peterson's (1993) New High Noise Model (NHNM) and New Low Noise Model (NLNM), respectively.

# ASL Boreholes



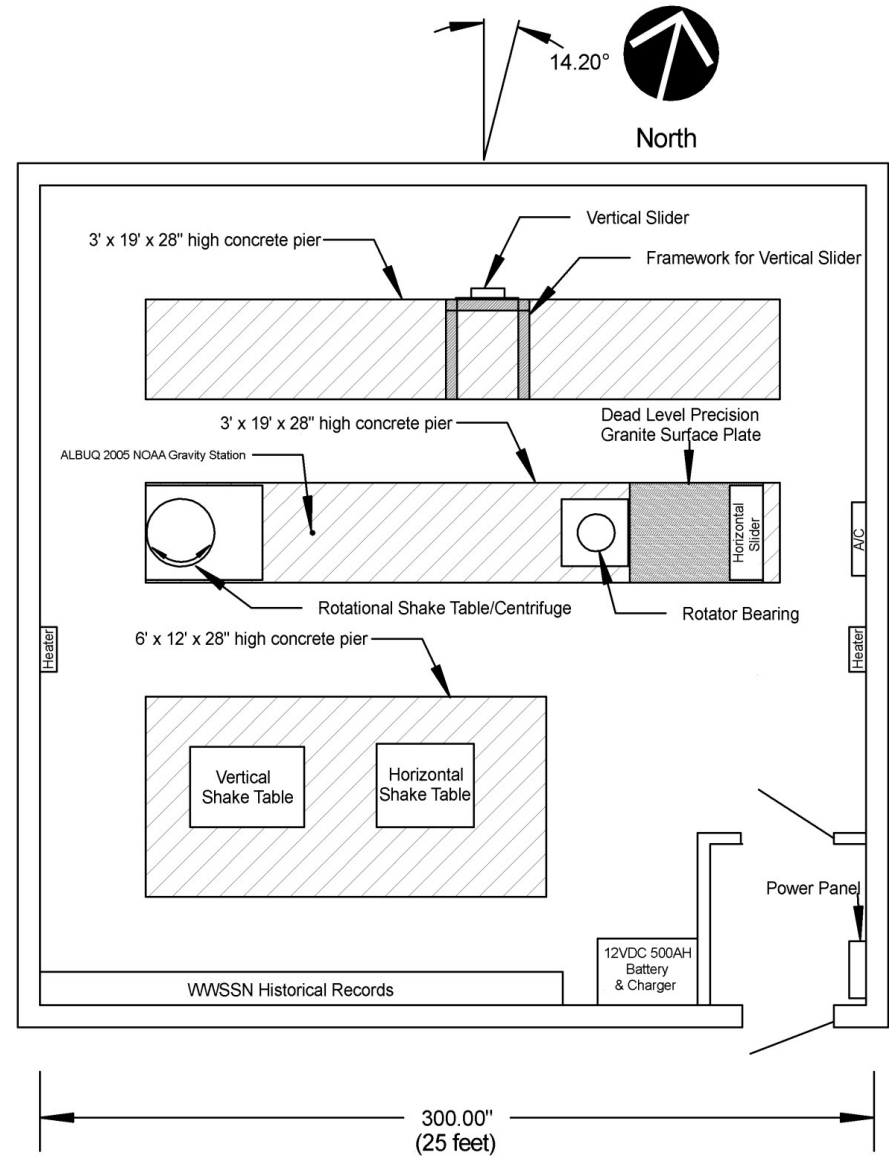
ASL Borehole Test Area and ANMO Operational Boreholes

CRH  
23 August 2013

# ASL Boreholes

Well Name	Where	Depth	ID or OD	Casing	Date Drilled	Comment
ASL BH1	ANMO Area	498.8' (152.0m)	7.0" ID	Steel	01 Aug 1973	~33' soil, then granite. ANMO KS5400 at 476' (145m).
ASL BH2	ANMO Area	701' (213.7m)	6.5" ID	Steel	01 Jul 1973	~33' soil, then granite. ANMO CMG-3TB at 57m (187'). Severe tilt below about 200' (up to 11° at bottom).
ASL BH3	Snake Pit Area	31' (9.4m)	6.5" ID	Steel	1973(?)	~6' soil, then granite North hole.
ASL BH4	Snake Pit Area	29' (8.8m)	6.5" ID	Steel	1973(?)	~6' soil, then granite South hole.
ASL BH5	ANMO Area	617.5' (188.2m)	6.5" ID	Steel	16 Apr 1974	~33' soil, then granite. North test hole.
ASL BH6	ANMO Area	492.6' (150.1m)	6.5" ID	Steel	06 Nov 1984	~33' soil, then granite. South test hole.
ASL BH7	ANMO Area	350' (106.7m)	12 5/8" ID	Steel	27 Aug 1990	~33' soil, then granite. Russian test hole.
ASL BH8	ANMO Area	10' (3.0m)	6.5" ID	Steel	Aug 1973(?)	In soil, not cemented.
ASL BH9	ANMO Area	9' (2.7m)	8.0" ID	PVC	April 2012	In soil, not cemented. Drilled by Earthscope TA project.
ASL BH10	ANMO Area	14' (4.3m)	6.0" ID	PVC	April 2012	In soil, not cemented. Drilled by Earthscope TA project.
ASL BH11	ANMO Area	25' (7.6m)	6.0" ID	PVC	April 2012	In soil, not cemented. Drilled by Earthscope TA project.
ASL BH12	ANMO Area	15' (4.6m)	6.0" ID	PVC	April 2012	In soil, not cemented. Drilled by Earthscope TA project.
ASL BH13	ANMO Area	9' (2.7m)	6.0" ID	PVC	April 2012	In soil, not cemented. Drilled by Earthscope TA project.
ASL BH14	Snake Pit Area	5' (1.5m)	8.0" ID	None	April 2012	Cored into granite, no casing. Hole closest to snake pit. Drilled by Earthscope TA project.
ASL BH15	Snake Pit Area	4.5' (1.4m)	6.0" ID	None	April 2012	Cored into granite, no casing. Drilled by Earthscope TA project.
ASL BH16	ANMO Area	95' (29.0m)	6.5" ID	Steel	18 Sep to 15 Oct 2012	~33' soil, then granite.
ASL BH17	ANMO Area	192' (58.5m)	6.5" ID	Steel	18 Sep to 15 Oct 2012	~33' soil, then granite.
ASL BH18	West Underground Vault	12' (3.7m)	8.0" ID	None	Nov 2012	Cored through vault floor into granite, no casing. East hole.
ASL BH19	West Underground Vault	12' (3.7m)	8.0" ID	None	Nov 2012	Cored through vault floor into granite, no casing. Center hole.
ASL BH20	West Underground Vault	12' (3.7m)	8.0" ID	None	Nov 2012	Cored through vault floor into granite, no casing. West hole.
ASL BH21	ANMO Area	10' (3.0m)	6.5" ID	Steel	25 Jun 2013	In soil, cemented. Casing is tilted 5° off vertical.
ASL PD	ANMO Area	401.6' (122.4m)	6.5" OD	PVC	11 Jan 1990	Water well with 4" ID PVC inside outer PVC casing. Bottom part from 337' to 401.6' is screen PVC.

# ASL Shake Table Facility



ASL Building 10006  
Shake Table Facility  
Drawing by CRH  
7 January 2014

# ASL Vault Farm



*Thank You!*

