

Navajo Nation

Navajo-Hopi Land Commission



Feasibility Study for 4,000 MW of  
Renewable Power at the  
Paragon-Bisti Ranch

DOE TEP Review, Golden, CO

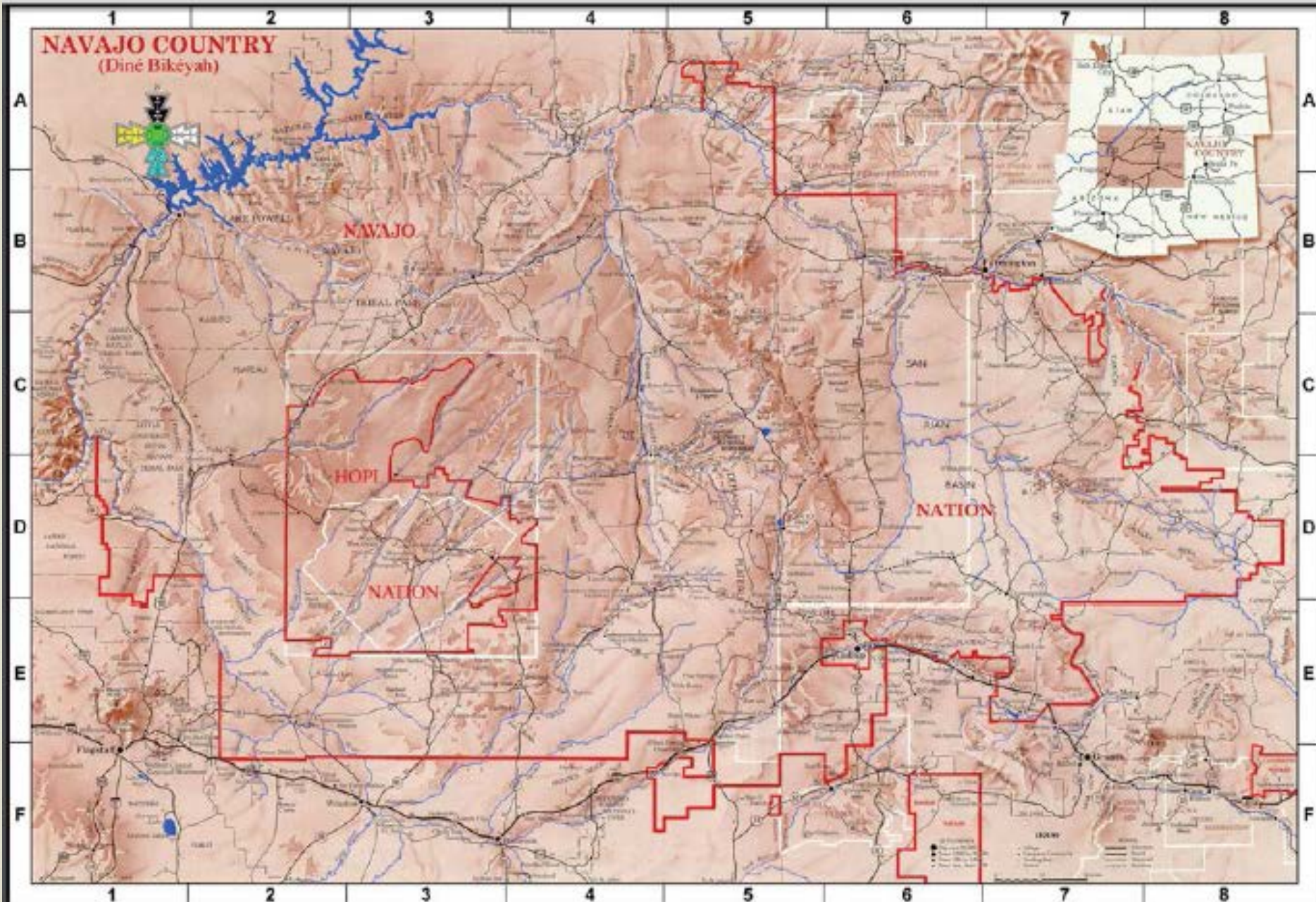
March 25, 2014

# HISTORY



- ❖ THE NAVAJO-HOPI LAND SETTLEMENT ACT
  - Navajo-Hopi Land Settlement Act passed 1974.
  - Required relocation of Navajo and Hopi families  
living on land partitioned to other tribe.
  - Set aside certain lands for the benefit of relocatees.

# HISTORY



# HISTORY

- Paragon-Bisti Ranch is one of the selected lands :
  - Located in northwestern New Mexico.
  - 22,000 acres of land
  - Benefits Navajo families residing on the HPL per P.L. 93-305.



Utah Colorado  
Arizona New Mexico



# 5-phase Program for Renewable Energy Development @ Paragon-Bisti

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- Phase I – preliminary critical issues analysis (*COMPLETED*)
  - Four goals to implement
- Phase II – Feasibility Study (*IN PROCESS*, today's talk).
- Phase III – Preconstruction
- Phase IV – Construction
- Phase V – long-term Operations and Maintenance

# Four Goals from Phase I

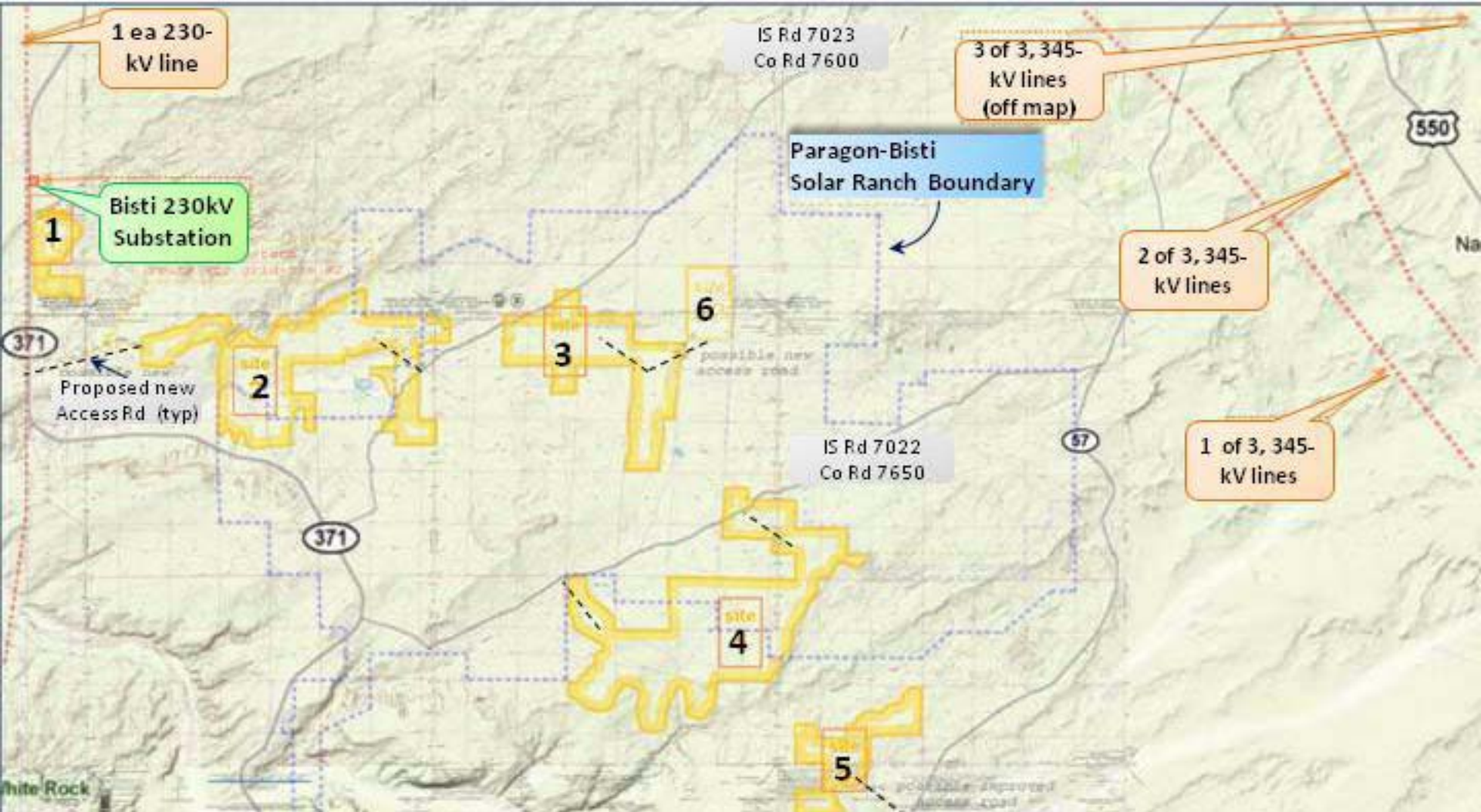


- Initiate development of large-scale (multi-gigawatt based on initial solar estimate) green power on PBR & environs
- Conduct education, outreach, and coordinate activities with Navajo & non-Navajo stakeholders
- Develop institutional capacity for Navajo Nation to conduct large-scale renewable development
- Develop Navajo Nation capacity to be a renewable energy development innovator.

# 1. Initiate development of large-scale renewable energy project.

- Maintain active communication w/solar & wind development firms.
- Develop and conduct site investigation plan (*i.e.* *PHASE II*).
- Identify and establish management strategies for essential infrastructure rights.
- Develop and distribute initial master plan for Bisti-Paragon site.

# initial master plan (2010-2014)





Site	Township and Section	Acres	Potential Power (MW)	Land Status	Miles to Road	Miles to 230 kV Bisti sub.	Miles to 230 kV Line BI	Miles to 345 kV Line FW
1	Sec 31, T24N R13W; Sec 6, T23N R13W	640	160	ALL Selected and Conveyed – surf and min	0	2	0	16
2	Sec 9-14, 23, 24, T23N R13W; Sec 6-9, 17, 20, 21, T23N R12W	4,000	1,030	ALL Selected and Conveyed – surf and min	0-3	6-9	3-7	11-14
3	Sec 2, 10-12, 14, T23N, R12W Sec 7, 18, 19, T23N, R11W	3,330	830	BOTH Tribal (1280) <i>and</i> Selected and Conveyed – surf & min (2050)	0-3	13-15	10-13	10-11
4	Sec 27, 28, 33-35, T23N, R11W Sec 3-5, 8-10, T22N, R11W Sec 1, 12,13, T22N, R12W	6,560	1,640	BOTH Tribal (4960) <i>and</i> Selected and Conveyed – surf and min (1600)	0-1	18-22	15	12-14
5	Sec 13-15, 22, 23, 26, 27, T22N, R11W	1,960	490	ALL Tribal	1	25	17	12
6	Sec 5, 8, T23N, R11W	870	220	ALL Tribal but landlocked	2	16	14	8
<b>Totals</b>		<b>17,360</b>	<b>4,370</b>					

## 2. Conduct education, outreach, and coordinate activities with stakeholders.

- Identified and establish working relationship with Navajo Stakeholders.
- Identified and established working relationship with non-Navajo Nation Stakeholders (Federal, State of New Mexico, Local Government, Non-Governmental Organizations).
- Prepared presentations to support education and outreach efforts (*MENTION "COSMOS" AGX DEMO*)

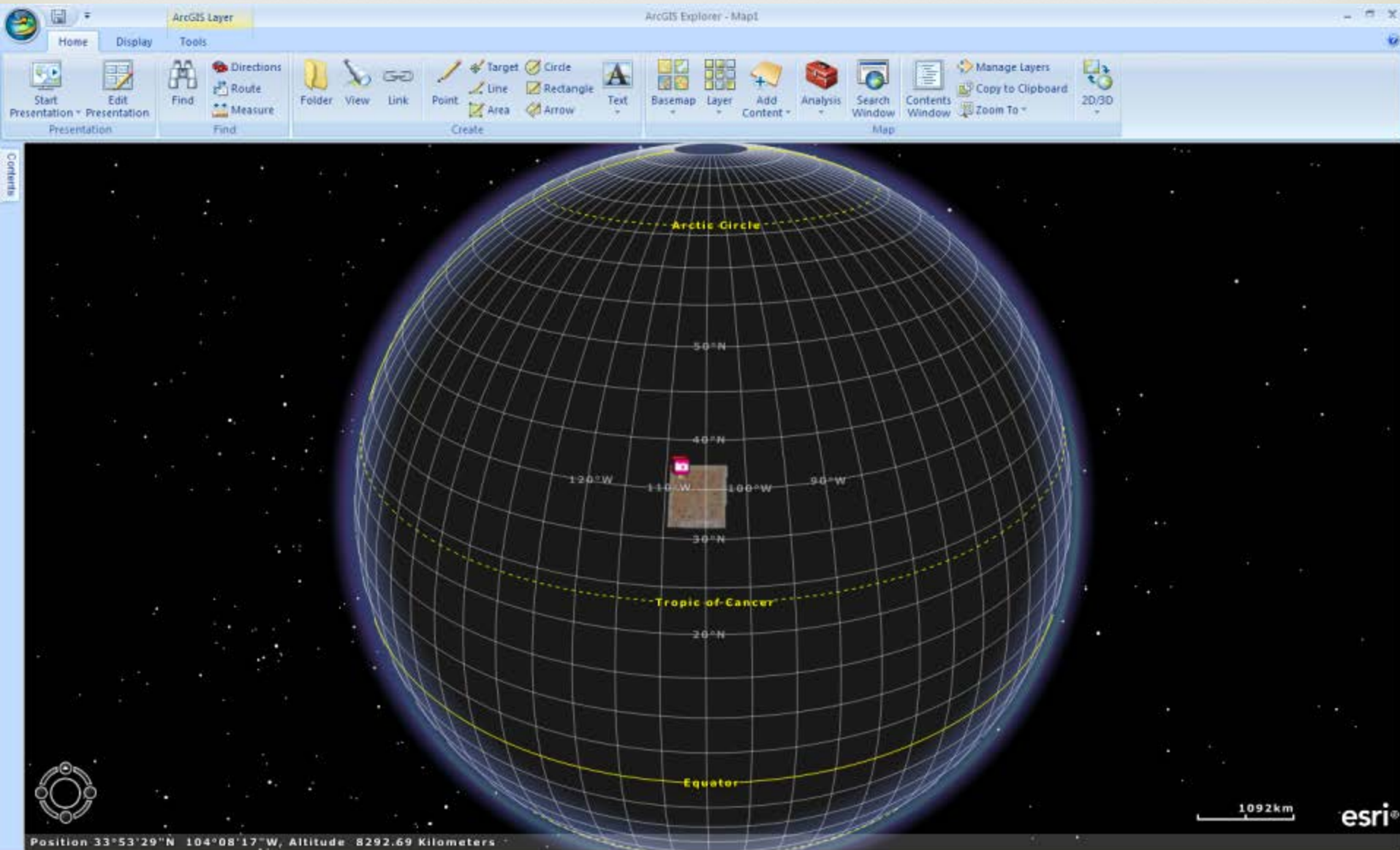
3. Develop institutional capacity for Navajo Nation to conduct large-scale renewable energy development
4. Develop Navajo Nation's capacity to be a renewable energy development innovator

# Department of Energy / TEP-funded Grant for Phase II FS



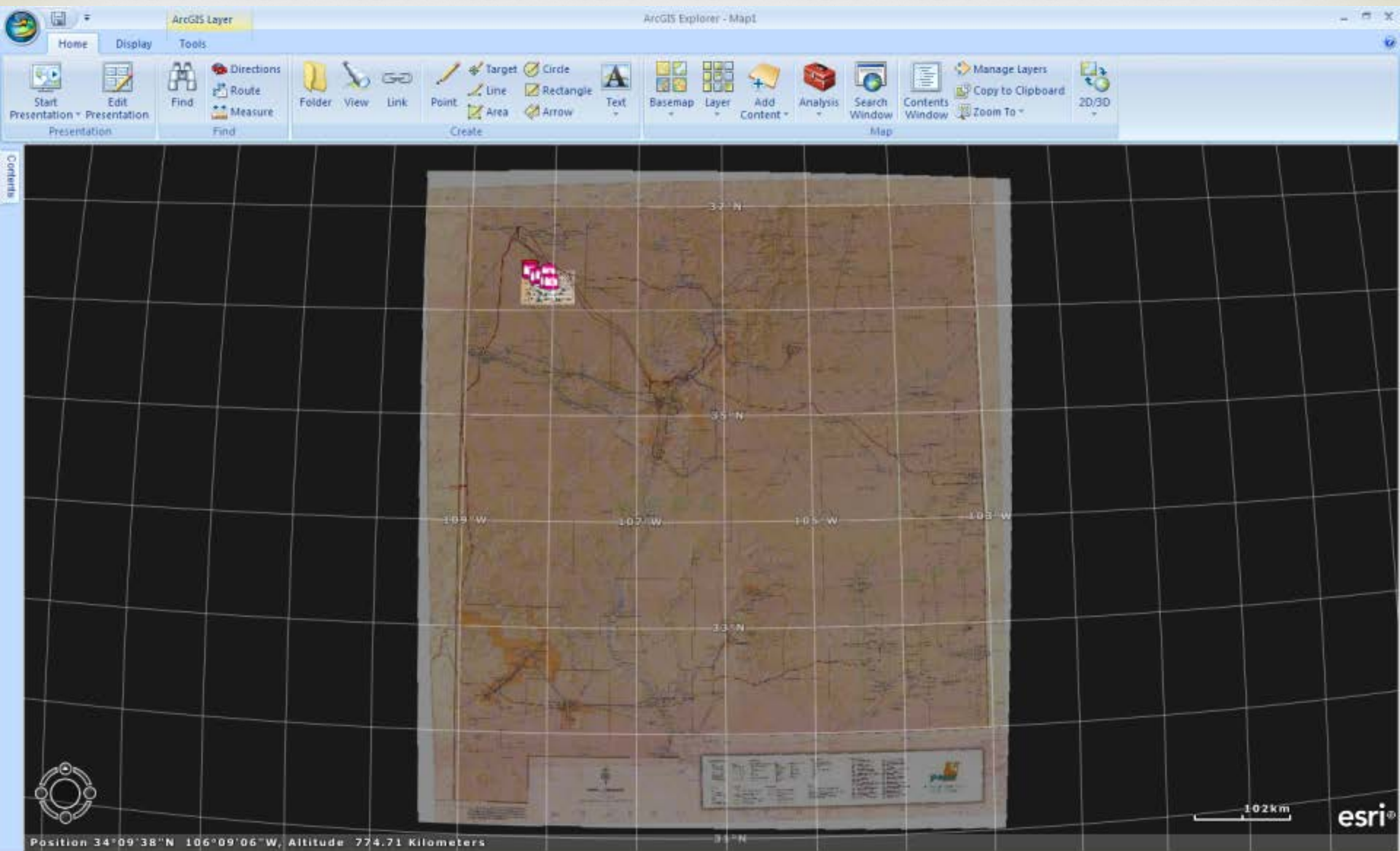
- *IN PROCESS NOW*: technical/economic evaluation of the all four major forms of RE (solar, wind, geothermal, biomass) at PBR, identification of funders/investors, power market and transmission studies.
- Conduct environmental site survey and subdivide 22,000 acre site into about five solar ranches.
  - **RUN “Cosmos” AGX demo**
- Explore vocational-technical opportunities, socioeconomic development, and spinoffs for tribal members.
- Develop lifecycle cost model and analyze cost-benefits ratio, draft feasibility study for the tribe and present FS.

# “Cosmos” view of AGX via separate laptop



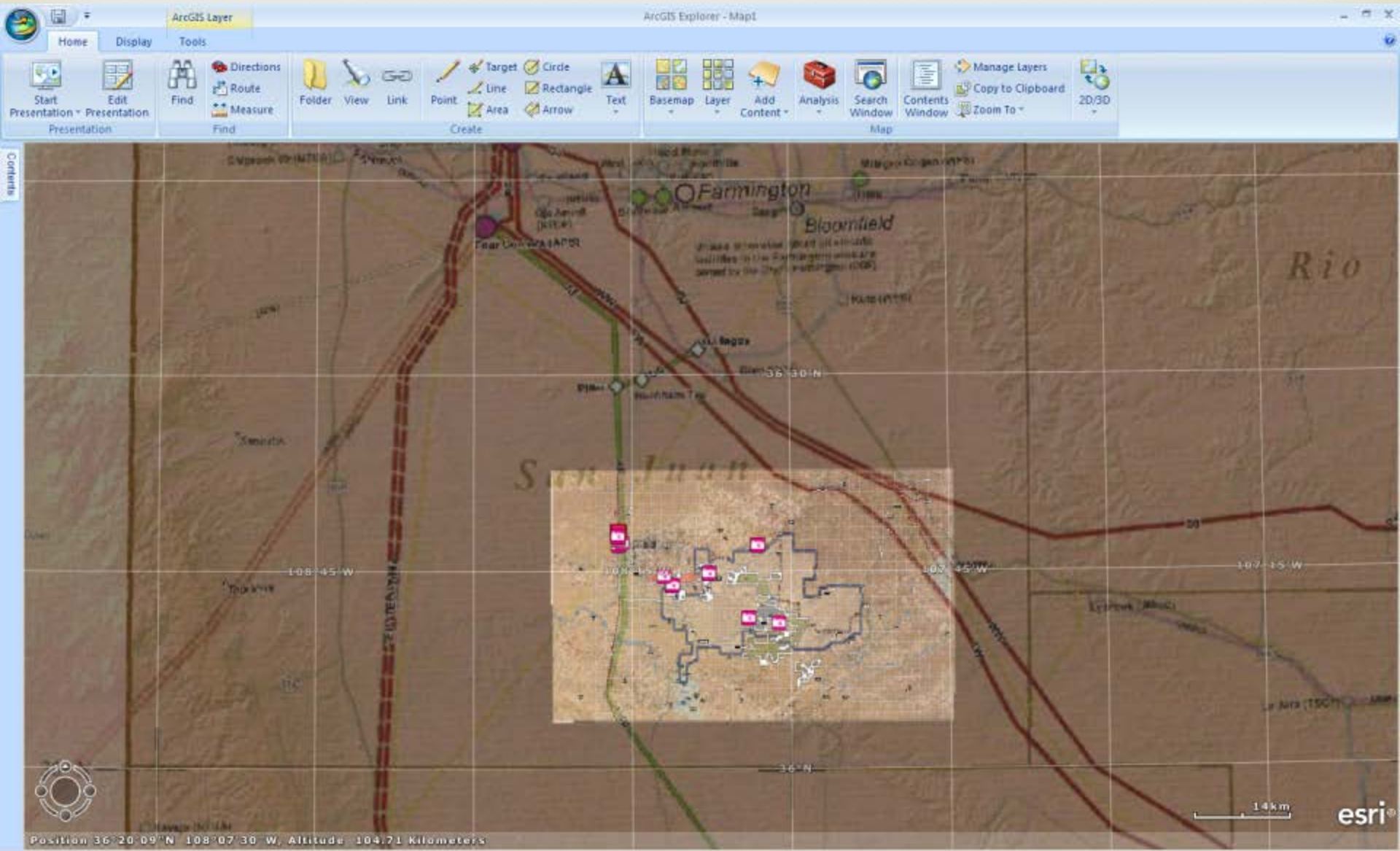
forced perspective New Mexico grid & study area wrt Earth

# screencap of AGX via separate laptop



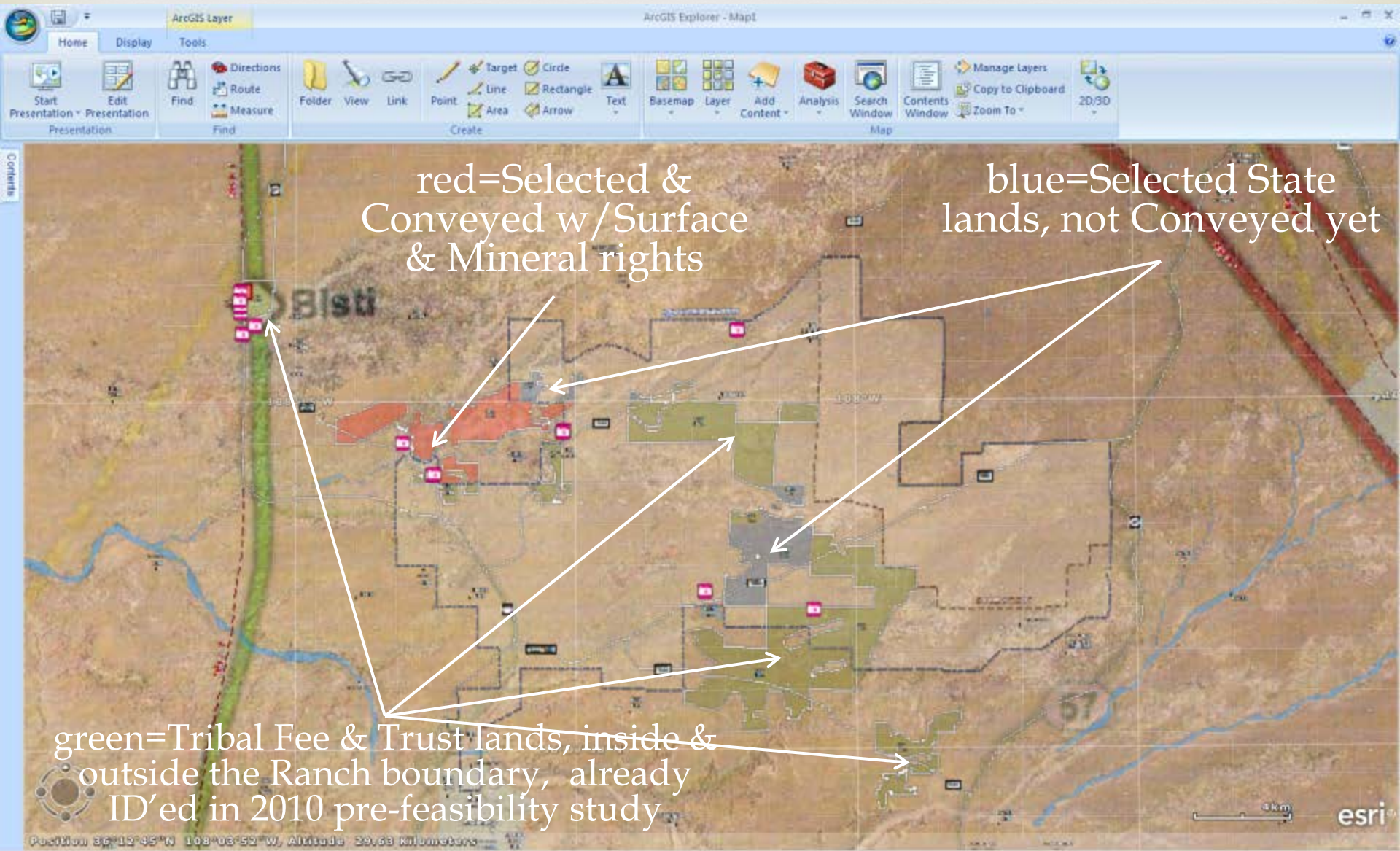
zooming in on PNM grid & study area

# screencap of AGX via separate laptop



zooming in on NW New Mexico grid, study area & Paragon Ranch

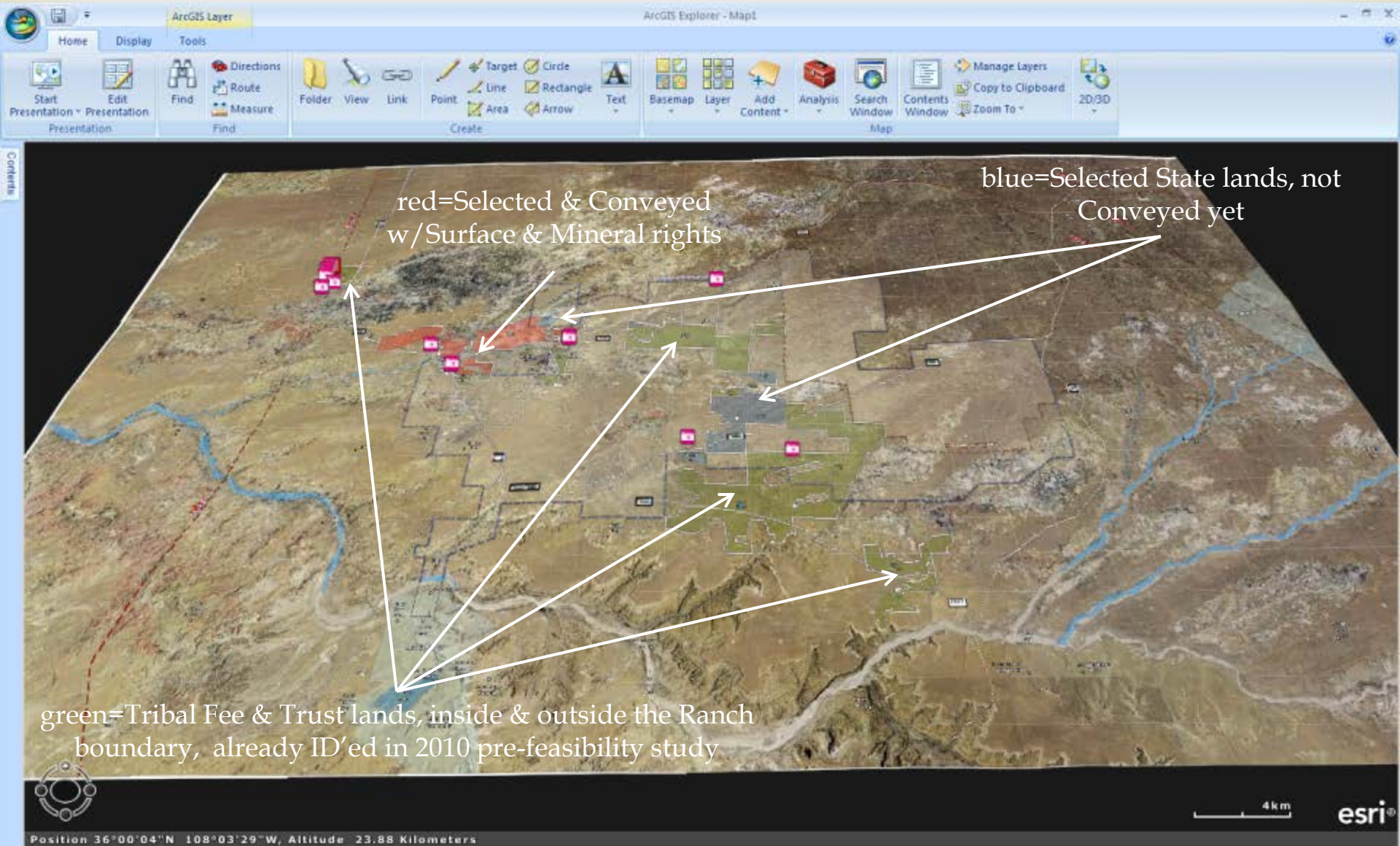
# screencap of AGX via separate laptop



zooming in on Paragon-Bisti Ranch

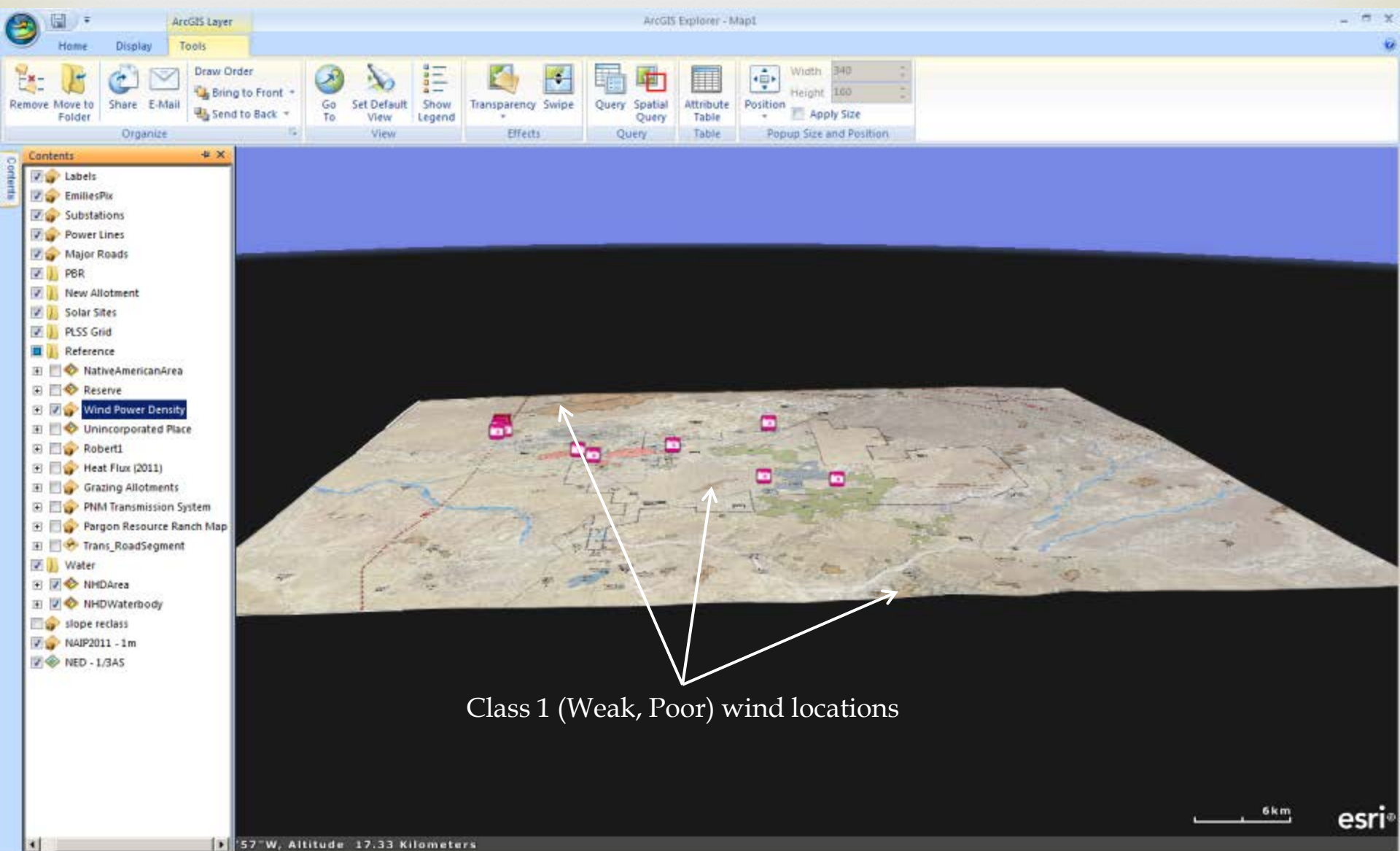


# screencap of AGX via separate laptop



## swooping down to Chaco Canyon

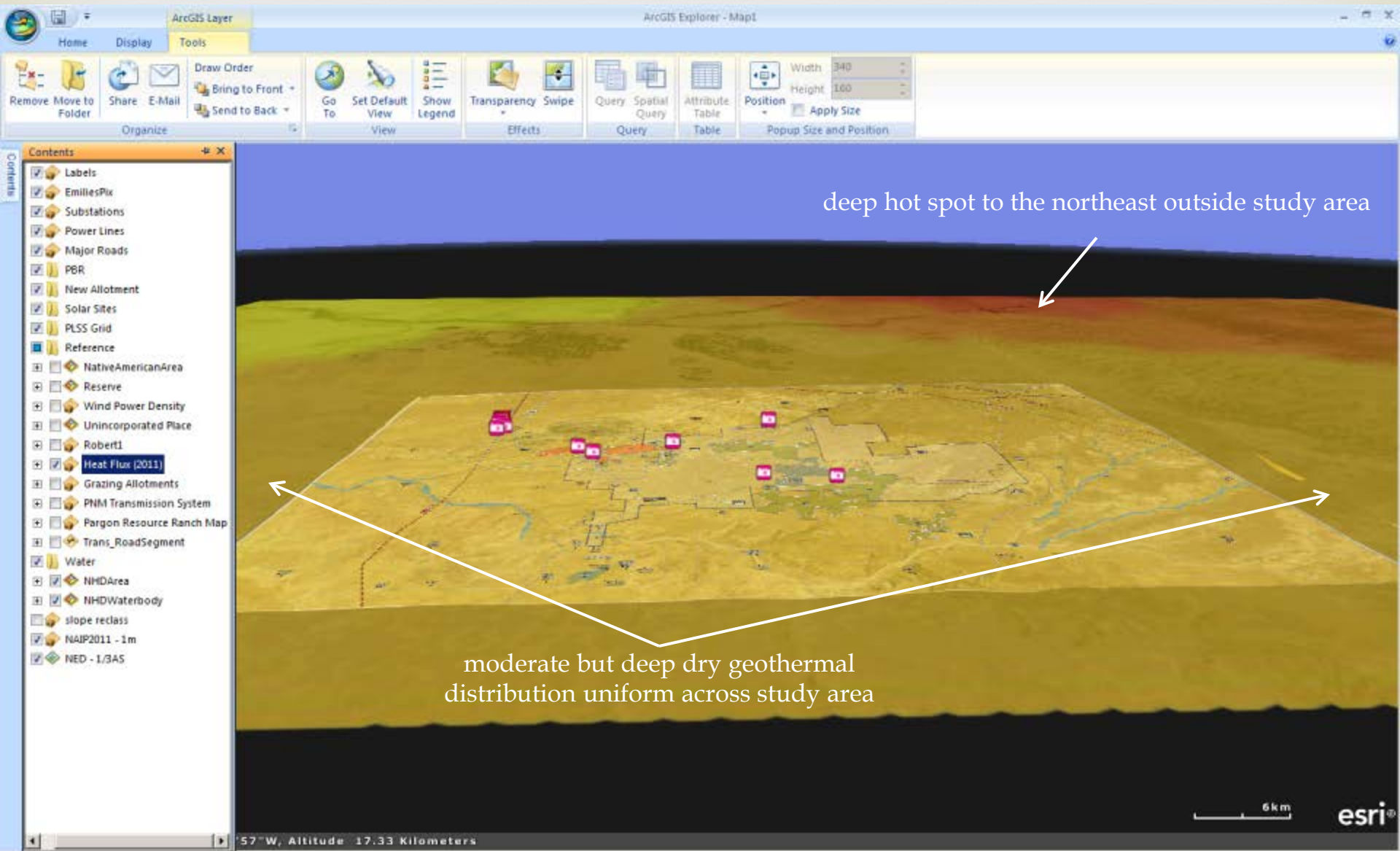
# screen cap of AGX via separate laptop



Class 1 (Weak, Poor) wind locations

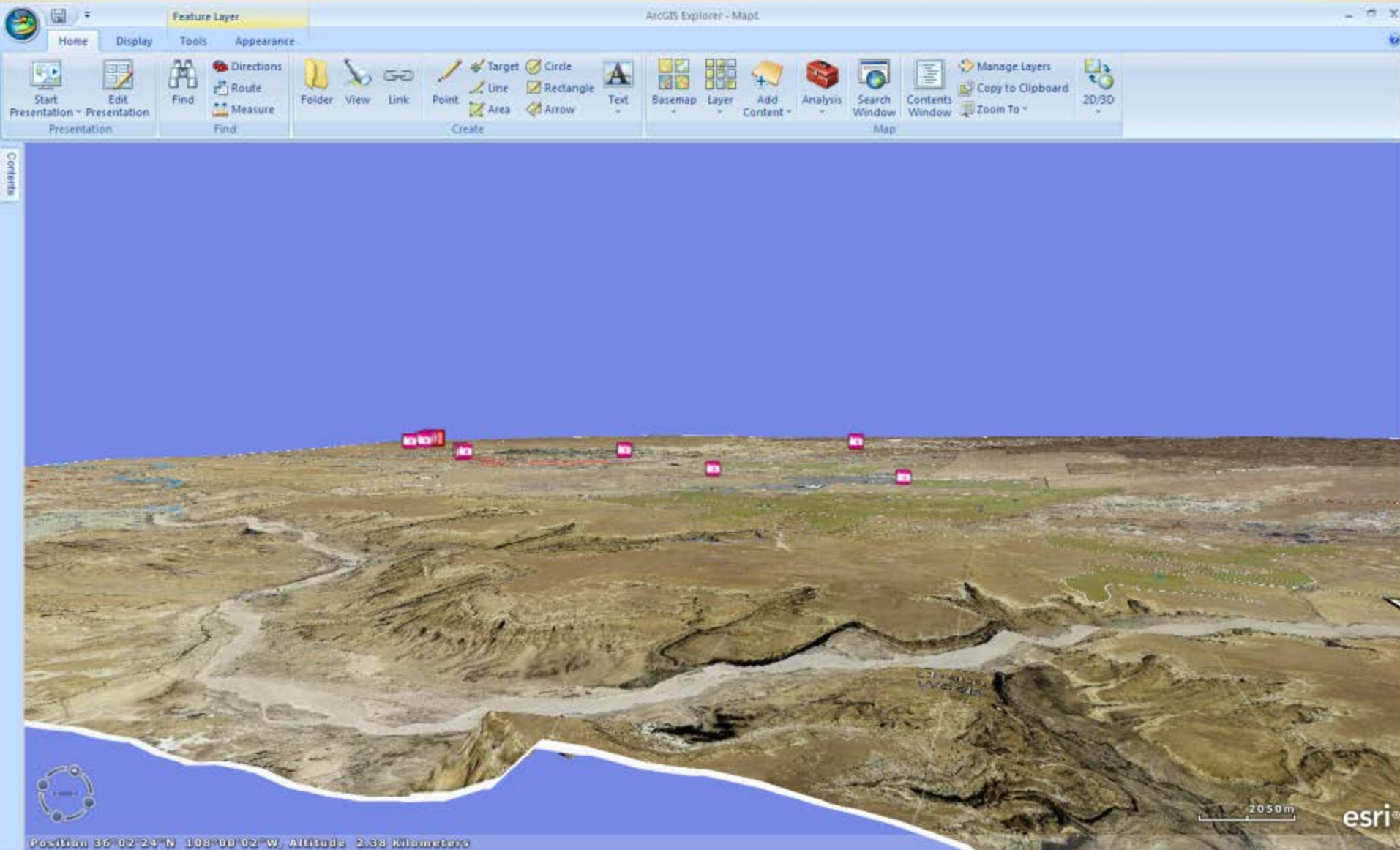
wind resource layer visible

# screencap of AGX via separate laptop



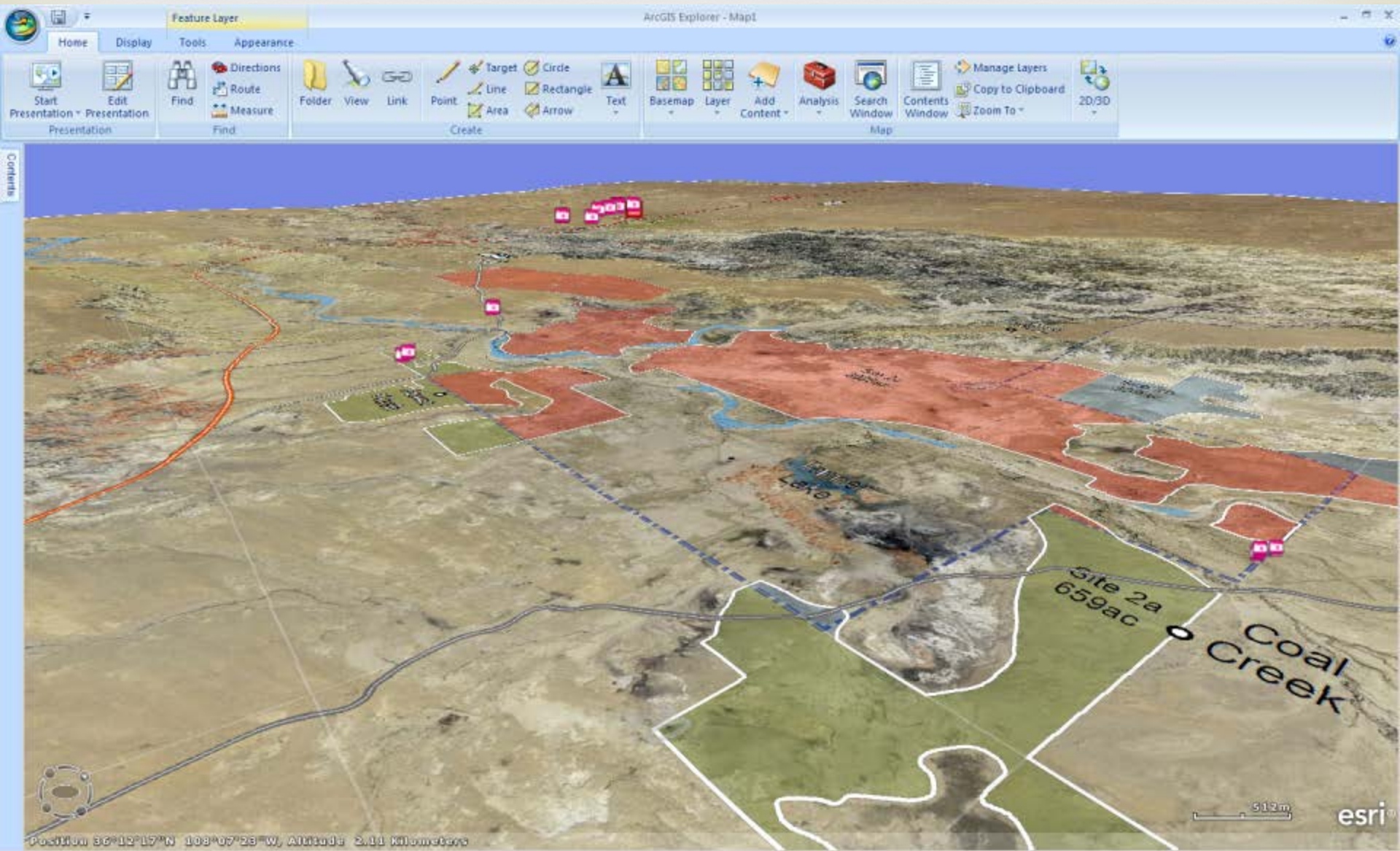
geothermal resource layer turned on

# screencap of AGX via separate laptop



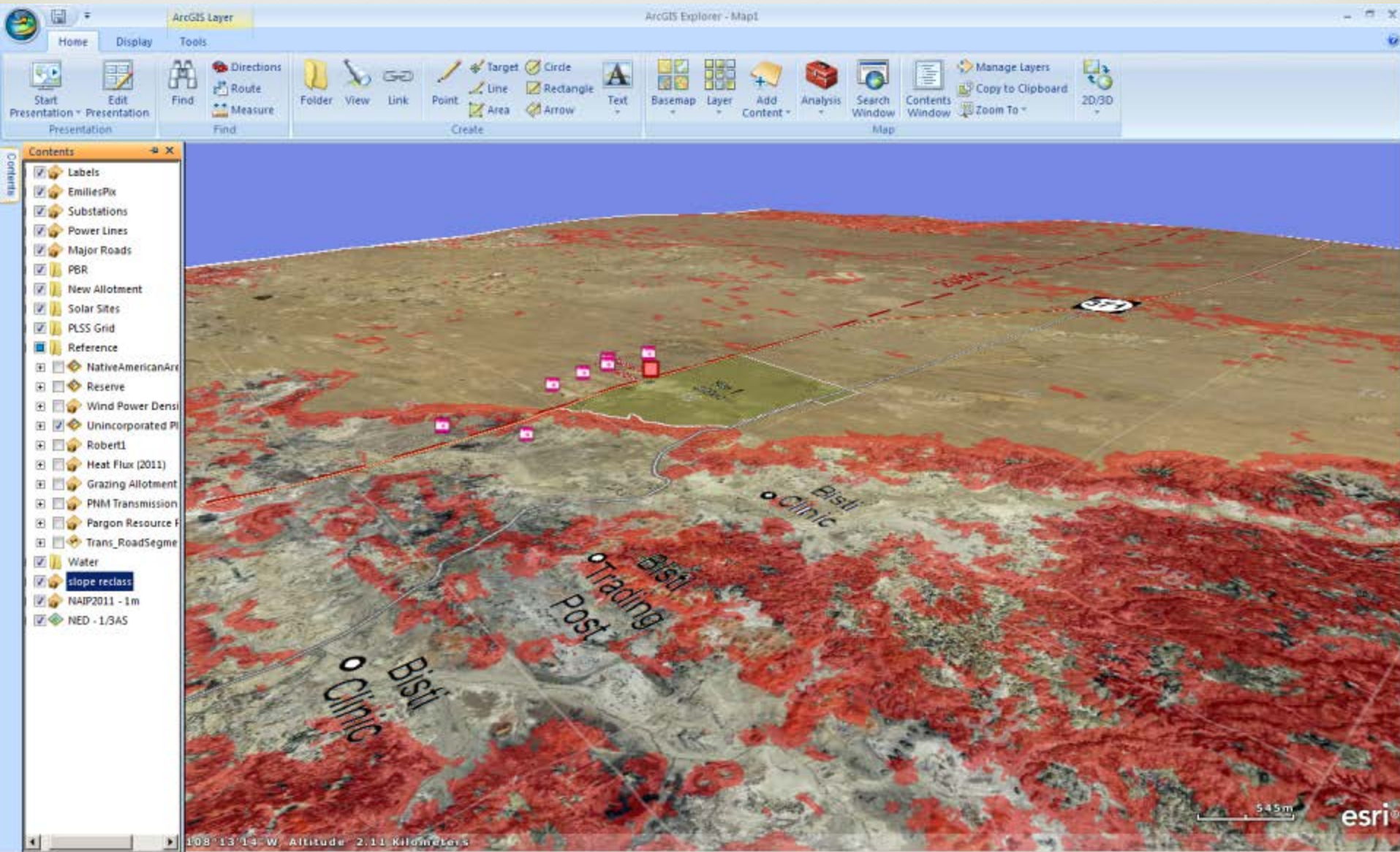
start flyover to Bisti substation up Chaco Canyon

# screencap of AGX via separate laptop



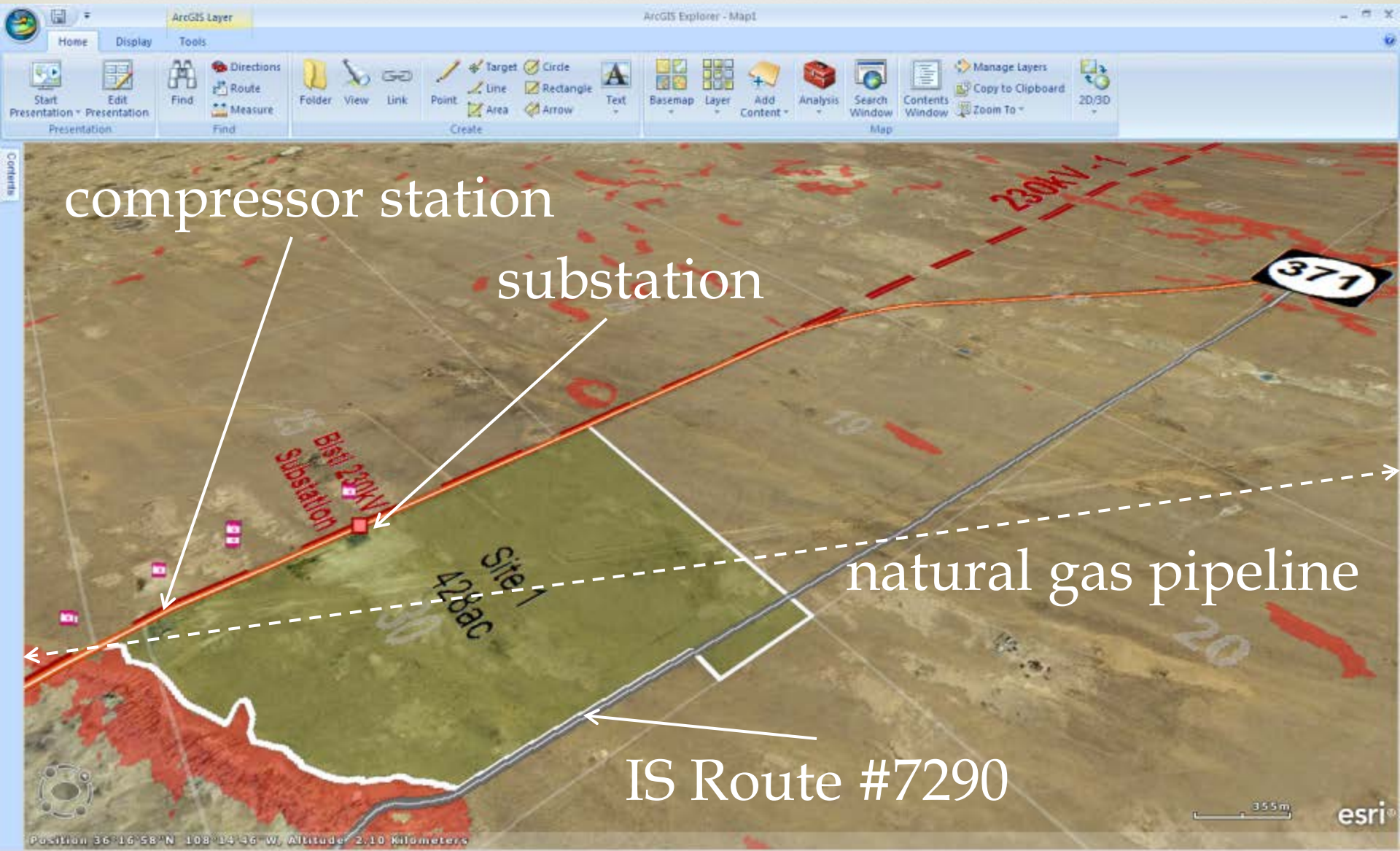
fly over Tanner Lake & Coal Creek to De-Na-Zin Wash...

# screencap of AGX via separate laptop



...to keystone Site #1: Bisti Substation, 230-kV line & Hwy 371  
(data directory visible, slope layer turned on, >3% shown in red)

# screencap of AGX via separate laptop



~150-MW keystone Site #1: Bisti Substation, 230-kV line & Hwy 371  
(data directory hidden, slope layer still on)

# What's Next:

## Preconstruction – Phase III

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- Conduct all planning
- Define boundaries
- Basic infrastructure
- Environmental studies and permitting
- Draft and issue Requests for Information “RFI/Sources Sought”
- Draft and issue Request for Qualifications (RFQ)
- Develop financial model & lease agreement
- Independent capital cost estimate & an engineering economic analysis/investment-grade financial proforma
- Review qualifications
- Draft and issue Request for Proposal (RFP)
- Review bids and proposals and select best-value developer(s).



# Construction – Phase IV



- Sign lease and partnering agreement.
- Partnering meetings between NHLCO, Navajo Nation, Developer and other Stakeholders
- Construction preparation
- Engineering designs
- Submission of plans
- Obtain environmental permits
- Transmission line studies
- Negotiation of PPA
- Mobilization
- Site preparation
- Infrastructure, improvements, construction and grid-tie

# Long-term O&M - Phase V



# Thank you. Questions?



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