ALASKA GAS PIPELINE

Project, permits and process

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Larry Persily, Federal Coordinator
Alaska Oil & Gas Congress – September 28, 2010

There is progress

- Alaska Pipeline Project (TransCanada/ExxonMobil)
- Denali – The Alaska Gas Pipeline (ConocoPhillips/BP)
- The four have spent almost $500 million since 2000
- 2010 open seasons to judge shippers' interest
- Meanwhile, Alaskans are getting more impatient
- Alaska gubernatorial election Nov. 2 injects politics
- And BP's problems add to uncertainty

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Open seasons

- TransCanada/Exxon open season closed July 30
- TransCanada reported multiple bids, with conditions
  - *No disclosures until precedent agreements*
- Conditions on pipeline bids not unusual
  - *Just like an earnest money offer on a house*
- ConocoPhillips/BP open season closes Oct. 4
- More news could come late 2010, early 2011
- Agreements mean shippers start sharing the risk

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Find the best market

- Pipeline from Alaska to North America would feed into the largest natural gas market in the world
- North America consumes 75 to 80 bcf per day
- Pipeline grid can move Alaska gas from California to New York, and every other state in between
- North America market is three times the size of China, India, Japan, South Korea and Taiwan natural gas markets combined
- In-state delivery is part of the deal for Alaskans

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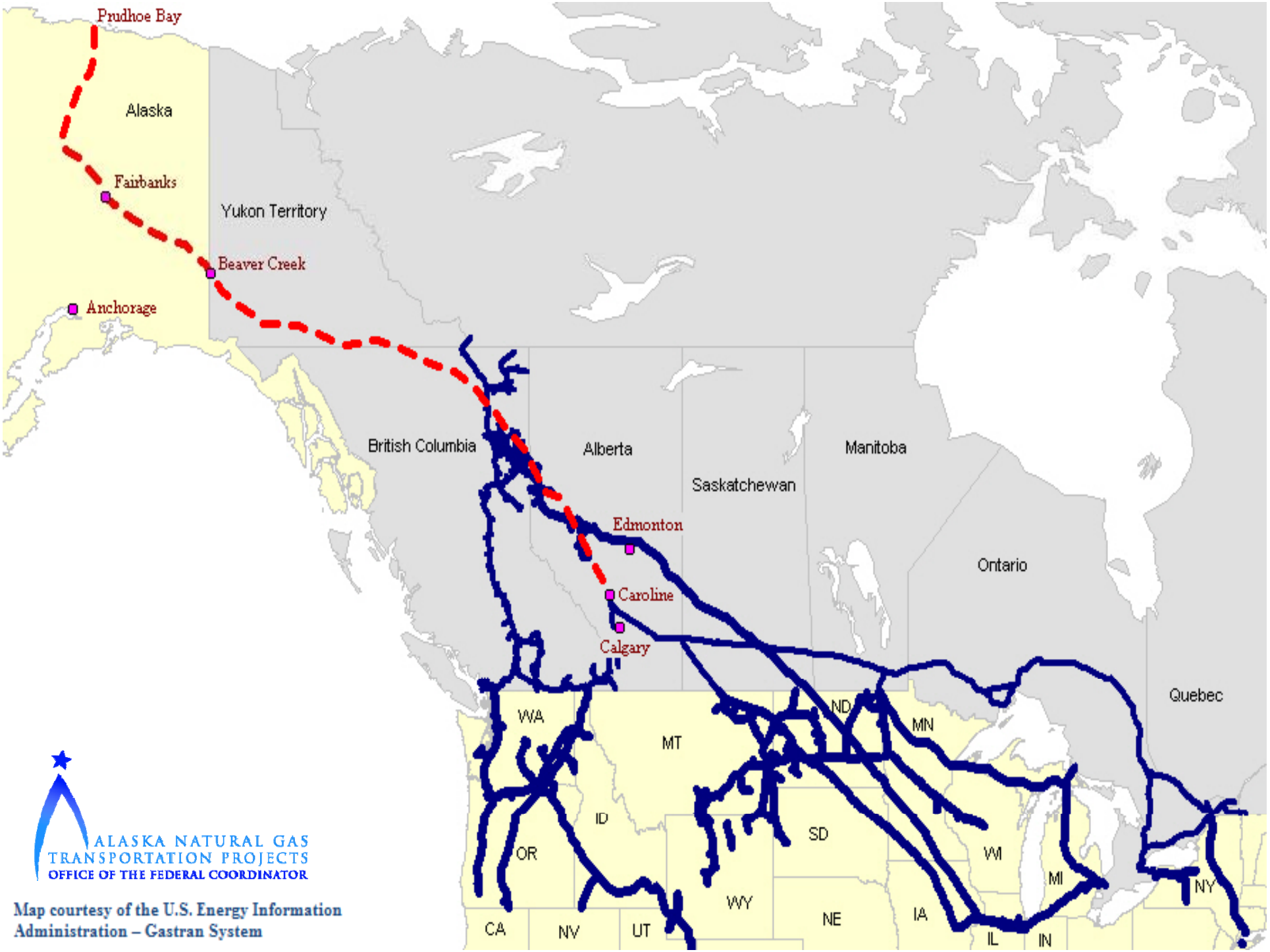
Prudhoe Bay
Alaska
Fairbanks
Yukon Territory
Beaver Creek
Anchorage
British Columbia
Alberta
Saskatchewan
Manitoba
Edmonton
Caroline
Calgary
Ontario
Quebec
WA
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Map courtesy of the U.S. Energy Information
Administration – Gastran System

LNG market is tough

- Australia, Indonesia, Russia, Malaysia, Brunei, Papua New Guinea, Qatar, Oman, Yemen, United Arab Emirates, Egypt, Algeria, Nigeria, Trinidad, Peru and Norway
- All operating or building LNG export projects
- Projects adding 16 bcf/d 2009-2015 in Asia alone
- Floating LNG: Shell's multibillion-dollar order with Samsung to access smaller Australia fields; proposals for Indonesia, Papua New Guinea too

Australia wants to be No. 1

- $50 billion in LNG projects under construction
- $50 billion more in projects will be ready for investment decisions by next year
- Shell, Chevron, ExxonMobil, ConocoPhillips, Hess, Total, Apache, Woodside and others are spending serious money in Australia
- Shell alone looking at $50 billion this decade
- Nothing in Australia needs 800-mile Arctic pipeline

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Tough competition back home

- Shale gas production about 10% of U.S. supply
- Growing rapidly across the U.S. and Canada
- Horizontal drilling efficiency improves each year
- CERA: "Nobody drills a dry hole in a shale play. If they did, they're not very good."
- Close to markets; easy to adjust production
- But the truth is, much of shale goes toward replacing declining production from conventional gas wells

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But shale has its problems

- Fracking becoming about as popular as an oil spill
- EPA review under way; possible federal legislation
- More questions as it moves closer to urban areas
- States not waiting; considering their own laws
- Moratoriums, restrictions, zoning, TV documentaries
- An environmental disaster could change the game
- Shale also needs tens of billions of dollars of new gas pipelines to reach markets

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And more problems

- Hydraulic fracturing for shale gas requires
  3 million to 5 million gallons of water per well
- EPA technical lead on fracking study:
  "Where is that water coming from?"
- Produced water disposal is another issue
- Treatment costs? Disposal costs? Recycling costs?
- American Public Power Association:
  "Environmental costs always go up."

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Surprise, shale is good news

- Shale could help by eliminating price spikes and getting utilities to think gas for the long term
- Worldwatch Institute: "Price volatility remains the Achilles' heel of natural gas."
- No utility can afford repeat of $14 price spikes
- Utility president: "Building a 1,000-megawatt, gas-fired plant doesn't make sense if you can't be sure what your fuel costs will be."
- Shale makes utilities feel more comfortable with gas

Utilities are thinking gas

- Growth in electrical power plant demand essential
- American Public Power Association: Clean Air Act is pushing utilities to decide which plants survive
- The future is natural gas, not coal, for new plants
- TVA, Calpine, Xcel Energy, Constellation Energy, Progress Energy planning new gas-fired plants
- Colorado's Xcel: Gas will cost $1.3 billion, but $225 million less than upgrading coal plants

Demand growth is key

- Electrical demand grew from 14 billion cubic feet per day in 2000 to 19 bcf per day in 2009
- CERA: Electrical utility demand for gas could almost double 2009 - 2030; an additional 16 bcf/day
- Interstate Natural Gas Association of America: Replacing half of oldest, least-efficient coal plants would require 5.5 bcf of gas per day
- It's not taking from coal, but going after new plants and replacement of older, costlier coal plants

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Energy legislation can help

- Anything that helps drive the nation to clean-burning natural gas is good for the Alaska project
- Shale gas producers, coal-fired power plants, LNG regas plants, other pipelines will all have to deal with the same new laws and costs
- There are a lot of options for reasonable legislation
- But an energy bill must be fair to natural gas
- New EPA regulations could help gas demand, too

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It really can help

- Utilities see new laws coming, but don't know when
- They are factoring it into investment decisions now
- Utilities cannot afford to risk new coal-powered investments against unknown future standards
- The Anchorage Assembly resolution:

  "Efforts to reduce pollution and to promote cleaner energy sources will increase demand for natural gas and help create favorable conditions for bringing Alaska's gas to market."

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Expediting the permit process

- Alaska Natural Gas Pipeline Act of 2004
- Established the Office of the Federal Coordinator
- The goal is to ensure that no federal permit imposes excessive conditions that could hurt the project
- Established FERC as the lead agency for National Environmental Policy Act review
- Authorized federal loan guarantee and tax breaks
- Made clear that the pipeline is in national interest

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Federal coordinator's job

- Ensure expeditious permit review and all other related activities by federal agencies
- If an agency imposes a permit condition beyond the law, the coordinator can say "no you can't"
- Regulations are being drafted to carry out that unusual authority; strong debate is expected
- Primary surveillance and monitoring responsibility on federal and private lands along pipeline

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What are we doing?

- Federal interagency memorandum of understanding
- Will present implementation plans twice a year, reviewing project status and permit issues
- Searchable, online permits matrix provides statutes, regulations, agency contacts, summaries — and eventually will track progress of permits
- Prototype GIS for Atigun Pass; may be expanded
- Plan to serve as a research bureau for all things gas

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Federal interagency MOU

- Establishes a project management framework
  - More than 20 participating federal agencies with responsibilities related to the gas pipeline project
- Participating agencies agree to use best efforts to achieve early coordination and compliance with deadlines and review procedures
- Federal Coordinator responsible for tracking consolidated implementation plan for agencies
- Talking in advance is the best way to prevent delay

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Help whenever possible

- Bring the parties together when problems arise between project sponsors and federal agencies
- Set up technical working group meetings
- Resolve inconsistencies between agencies
- Ensure that information flows both ways
- "Translate" if necessary to protect against any possible misunderstandings between project sponsors and permitting agencies

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Benefits of a GIS system

- Establish an authoritative basemap and GIS
  - Provide a common standard and reference system
  - Create a single location to store/integrate historical data
- Provide web-based access to the public, government agencies, stakeholders, applicants
- GIS prototype shows it is possible to build a complex, integrated source of geographic data
- The goal is to cover 800 miles of route in Alaska

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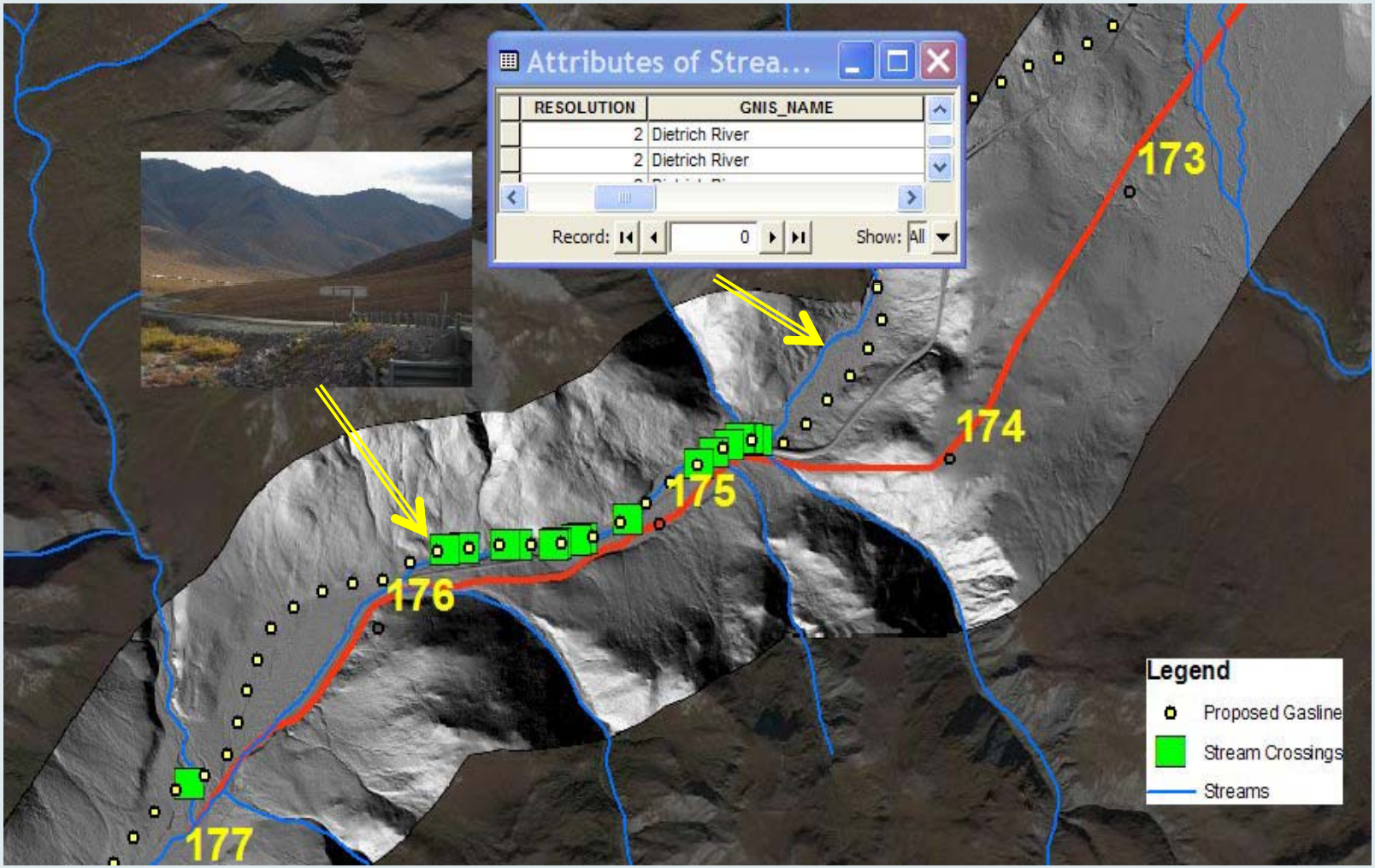
Data access and integration



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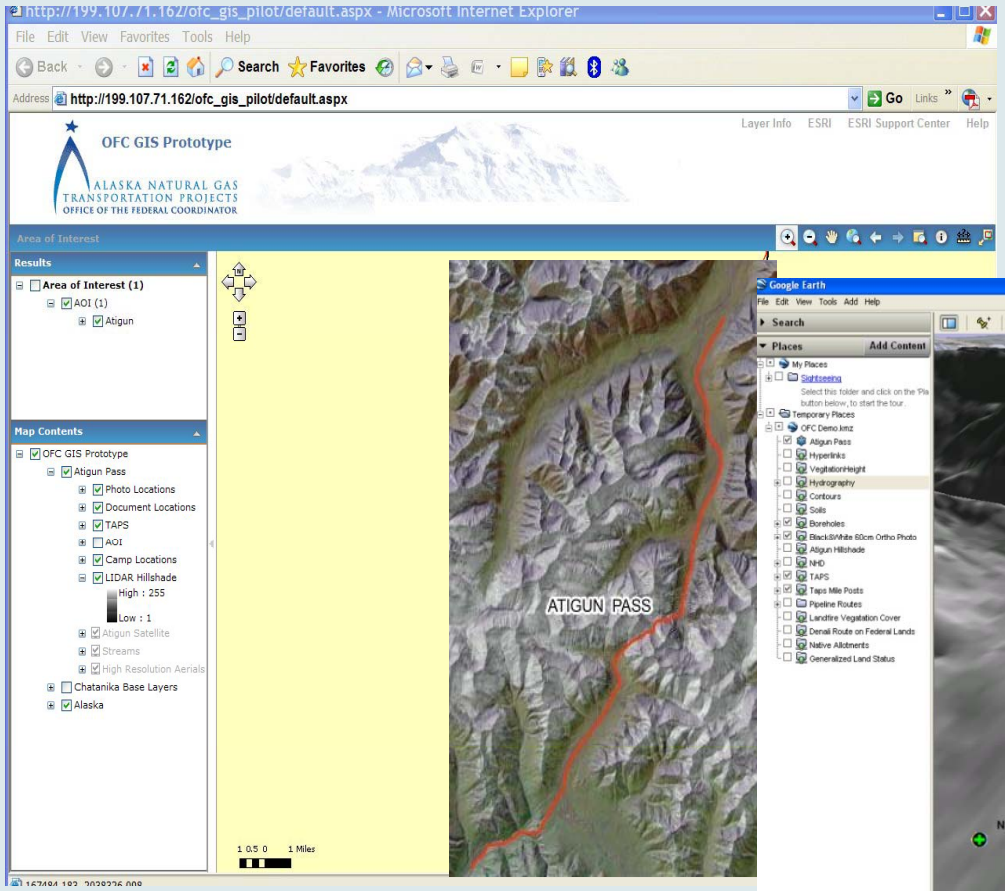
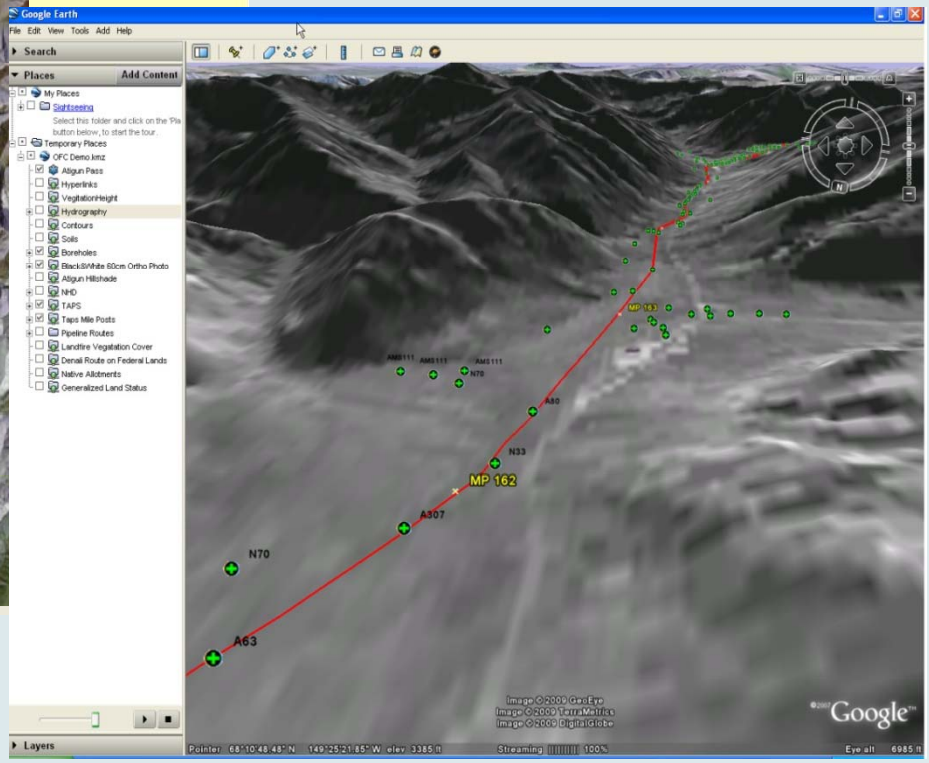
Web access to data





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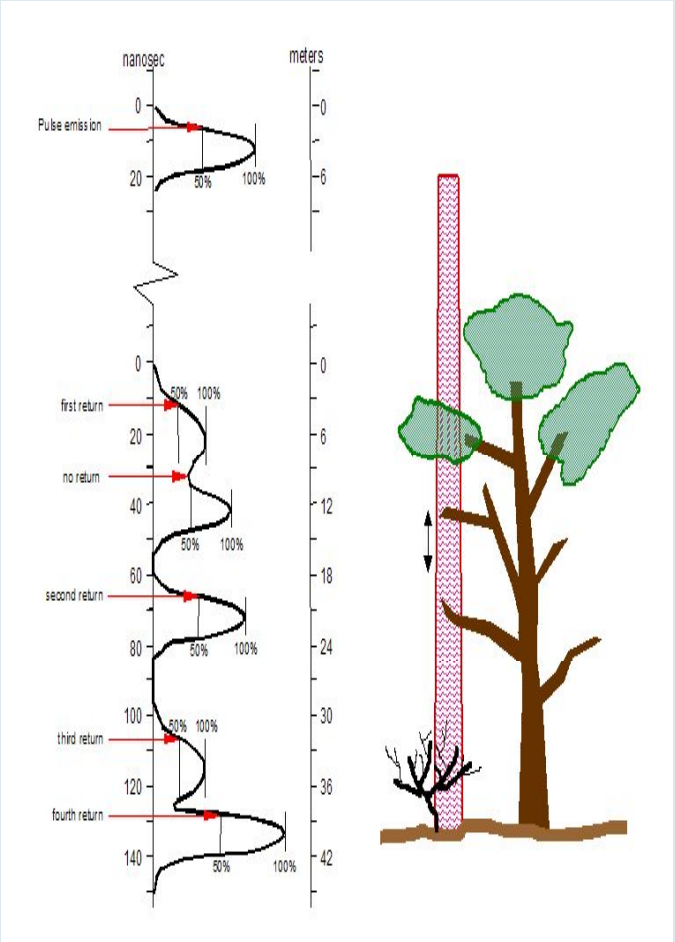
Why LiDAR as a basemap

- Gives users an overview of broad, continuous features that would be otherwise indistinguishable
- LiDAR benefits:
  - Geohazard detection
  - Wetlands
  - Stream mapping
  - Geotechnical and engineering assistance



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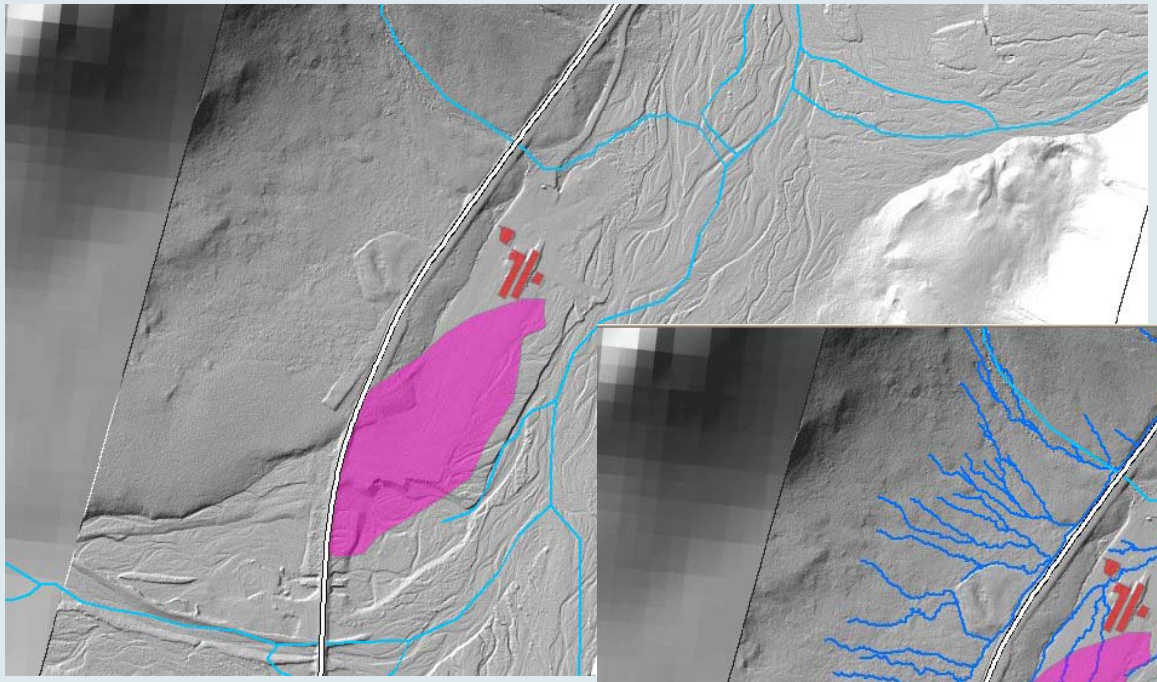
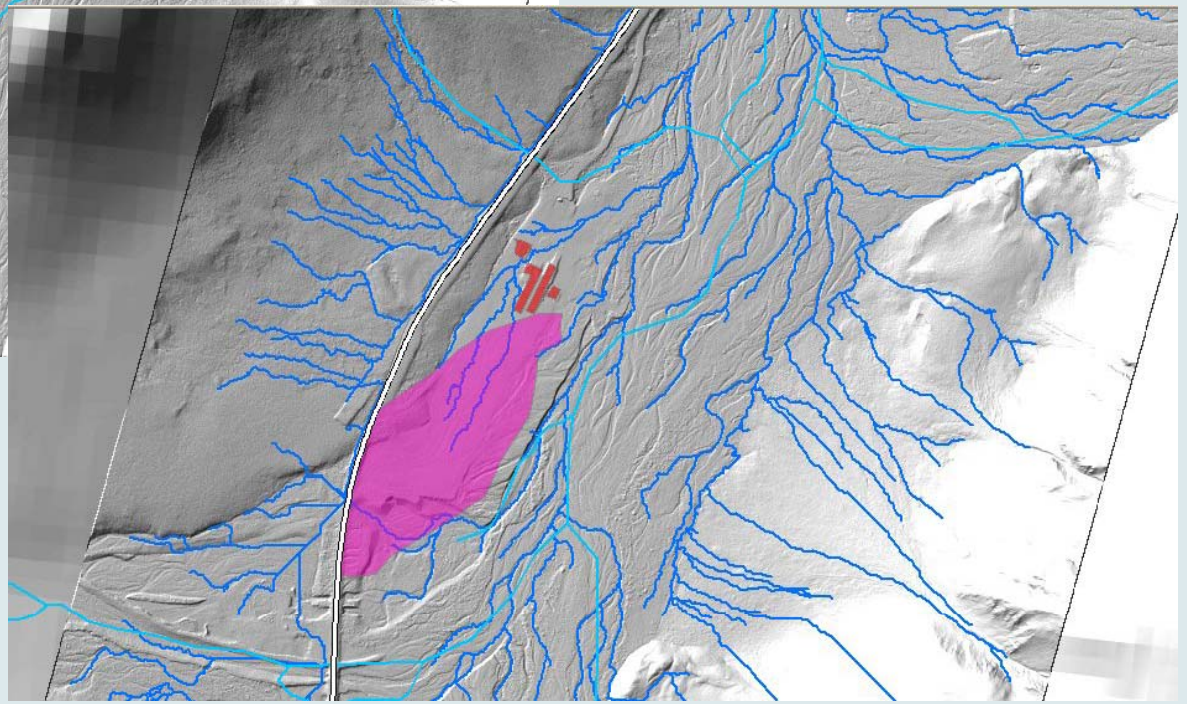
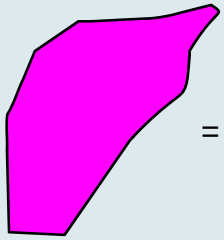
LiDAR improves the quality



Streams
Left: Existing USGS
Below: LiDAR-derived





= EXAMPLE CONTAMINATED ZONE

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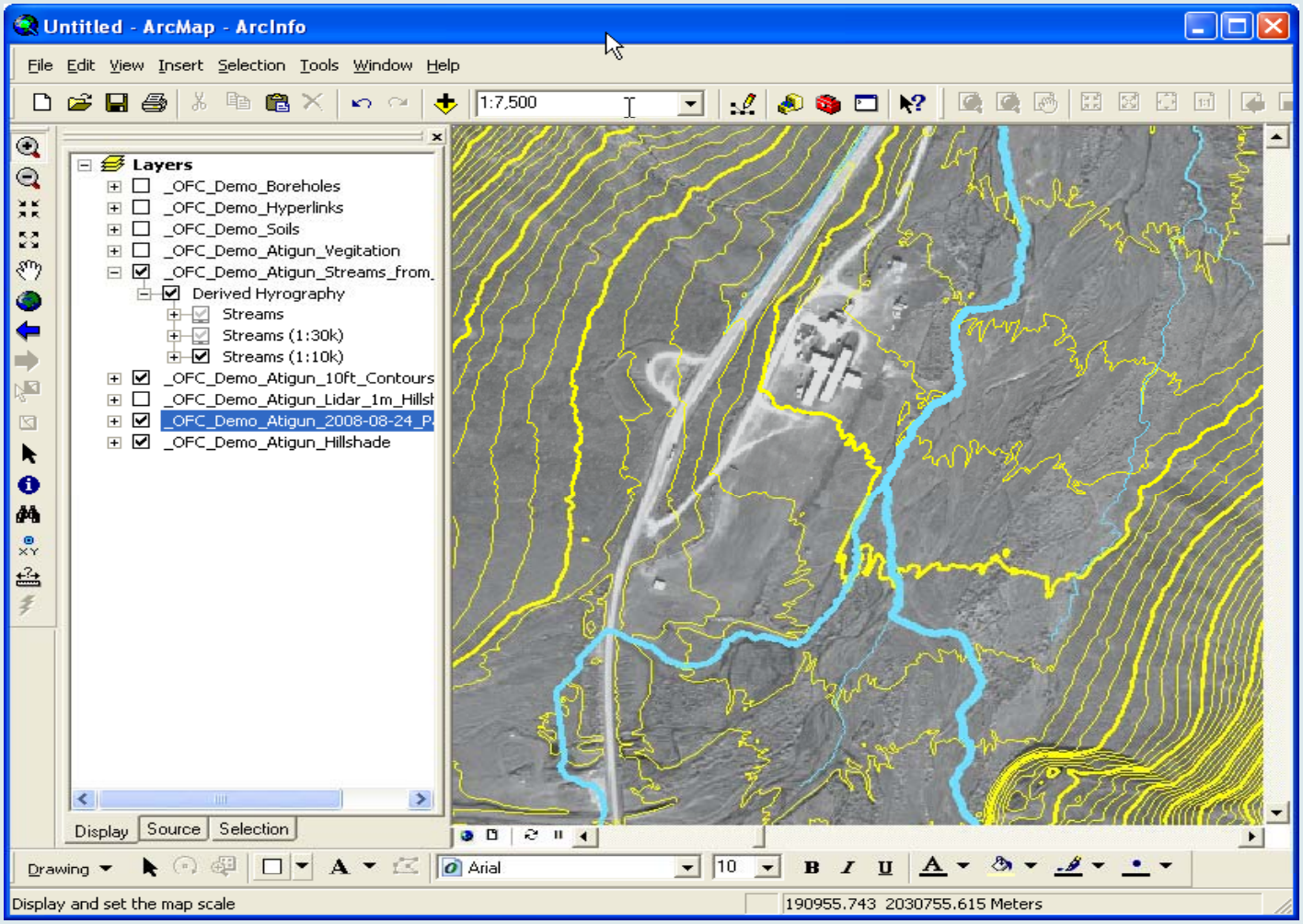
Streams and topography



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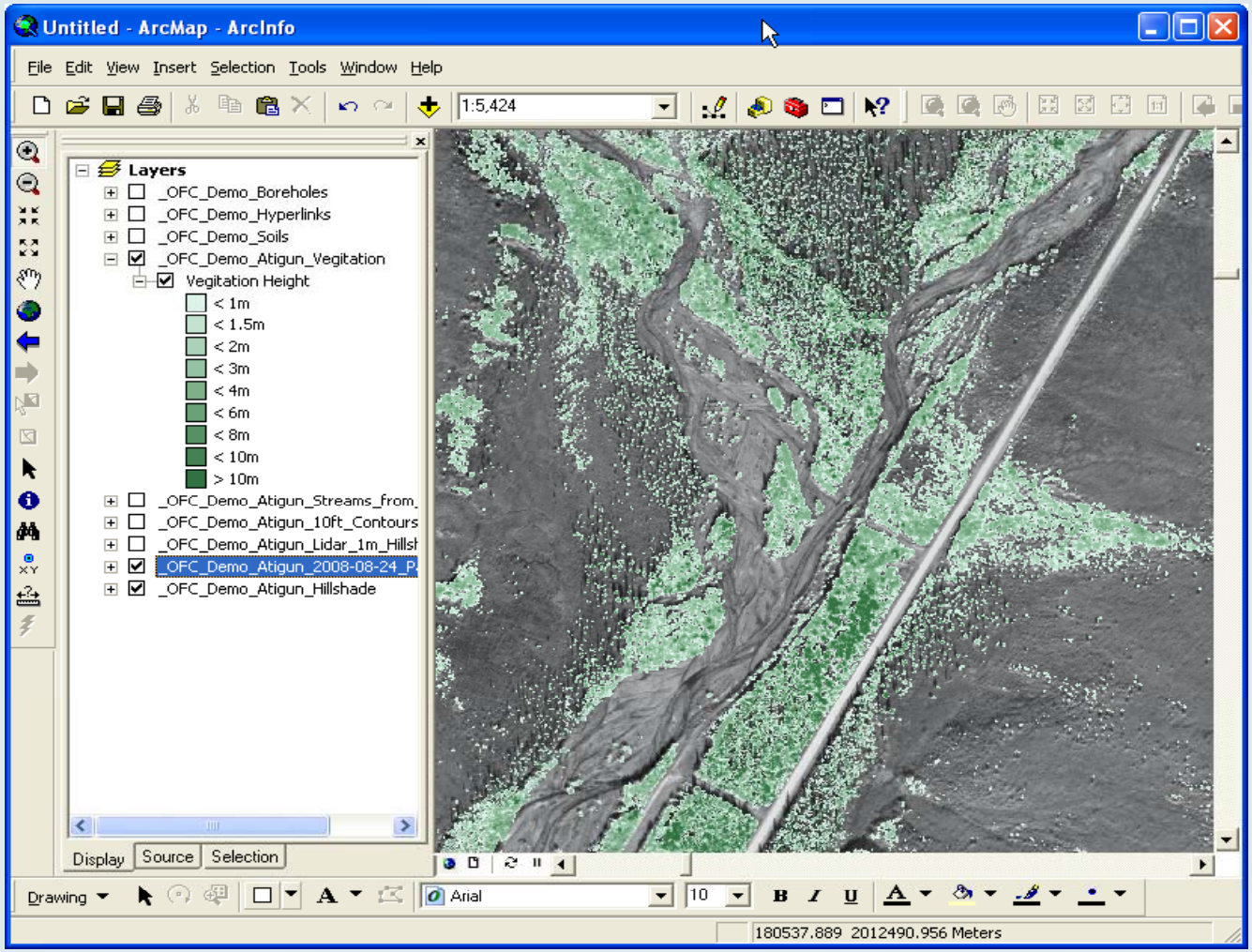
Vegetation



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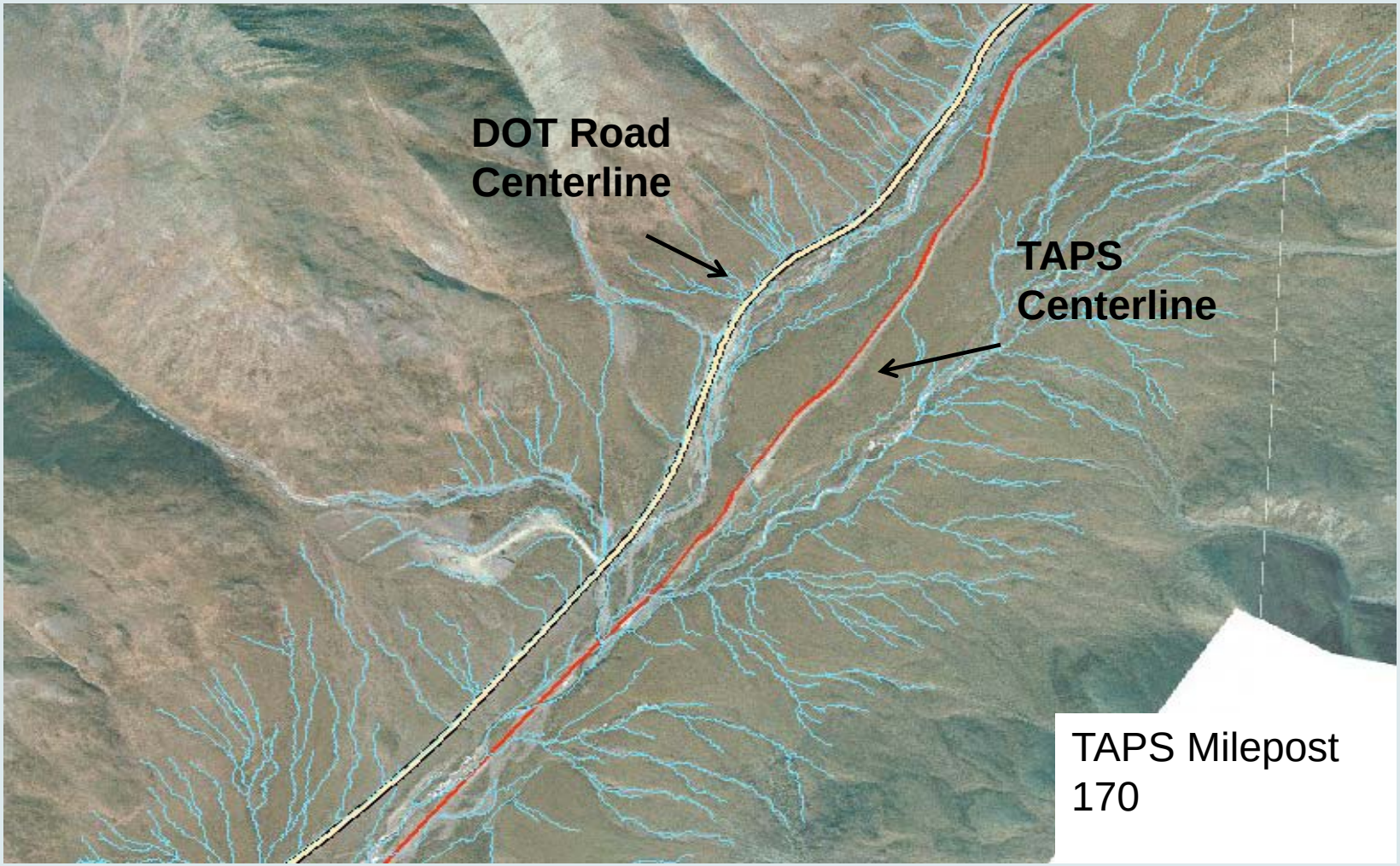
Roads and pipe



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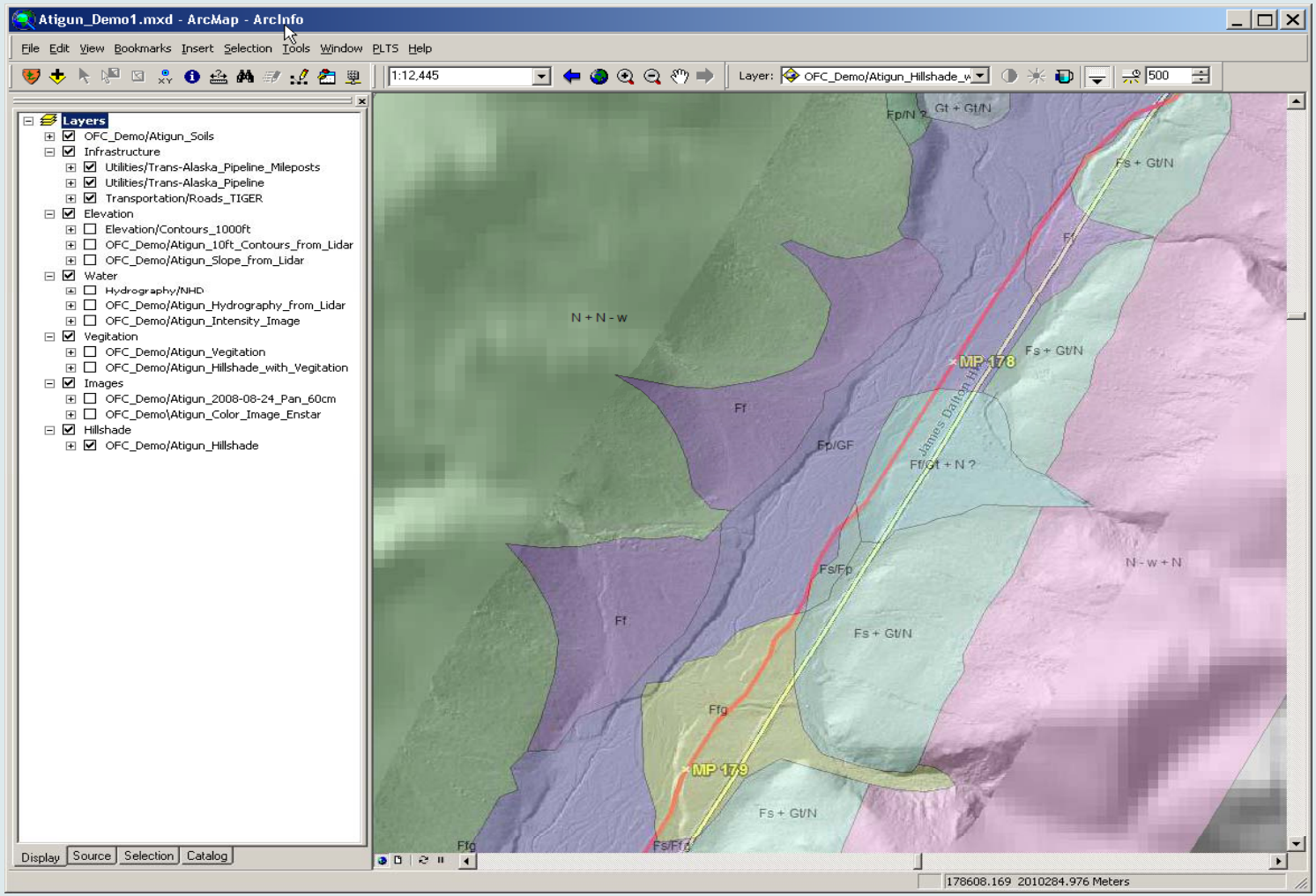
Soil types



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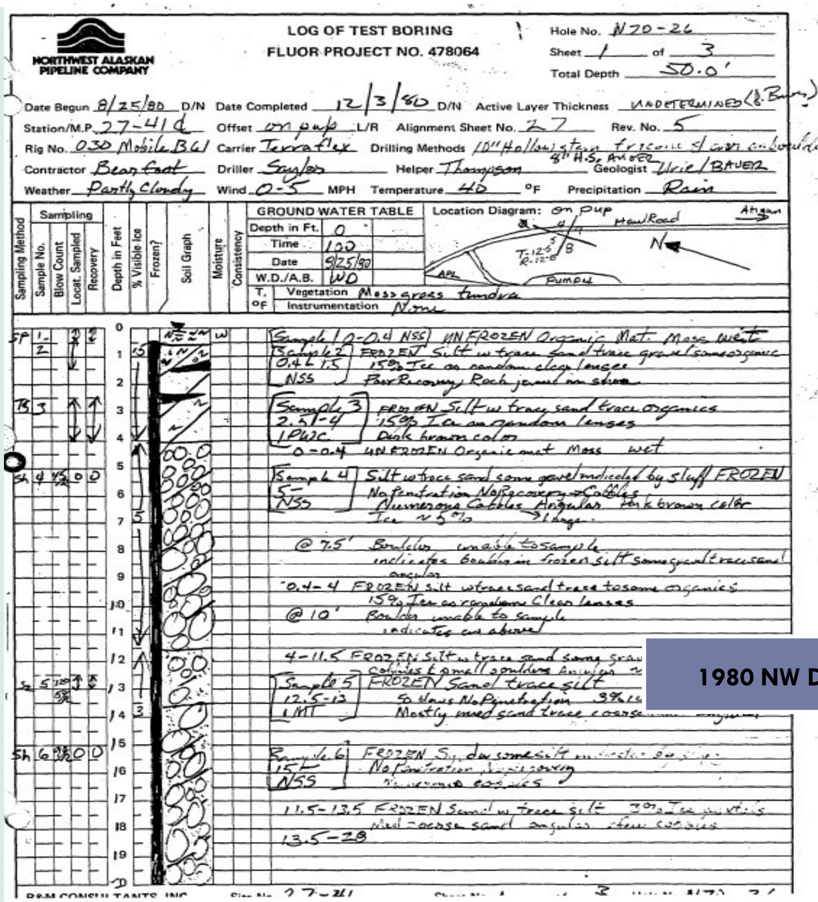
Historical data



LOG OF TEST BORING

FLUOR PROJECT NO. 478064

NORTHWEST ALASKAN PIPELINE COMPANY

Hole No. N70-26 Sheet 1 of 3 Total Depth 50.0'

Date Begun 8/25/80 D/N Date Completed 12/3/80 D/N Active Layer Thickness UNDETERMINED

Station/M.P. 27-41d Offset on pad L/R Alignment Sheet No. 27 Rev. No. 5

Rig No. 030 Mobile B61 Carrier Terraflex Drilling Methods 10" Hollow stem

Contractor Bear Foot Driller Snyder Helper Thompson Geologist Urie / BAUER

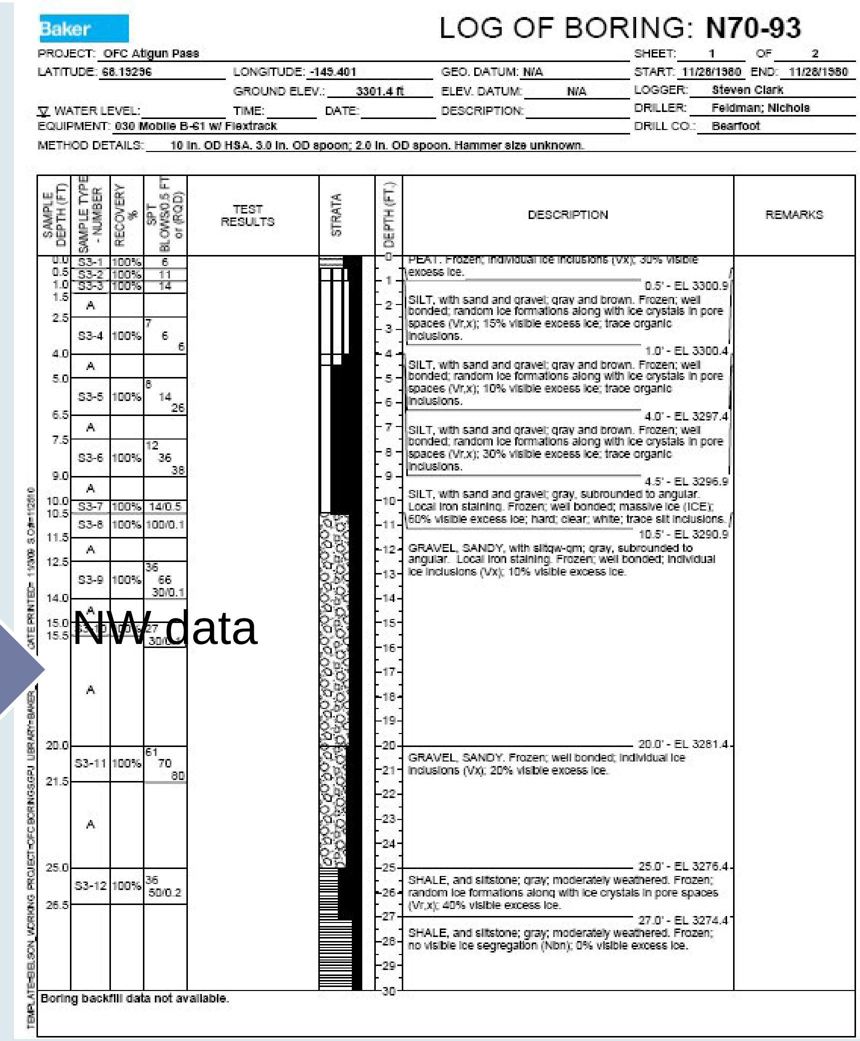
Weather Partly Cloudy Wind 0-5 MPH Temperature 40 °F Precipitation Rain

GROUND WATER TABLE: Depth in Ft. 0; Time 1:00; Date 9/25/80; W.D./A.B. WD

Location Diagram: on pup

Vegetation Moss grass tundra

Instrumentation None



LOG OF BORING: N70-93

PROJECT: OFC Atigun Pass SHEET: 1 OF 2

LATITUDE: 68.13236 LONGITUDE: -149.401 GEO. DATUM: N/A START: 11/28/1980 END: 11/28/1980

GROUND ELEV.: 3301.4 ft ELEV. DATUM: N/A LOGGER: Steven Clark

WATER LEVEL: TIME: DATE: DESCRIPTION: DRILLER: Feldman; Nichols

EQUIPMENT: 030 Mobile B-61 w/ Flextrack DRILL CO.: Bearfoot

METHOD DETAILS: 10 in. OD HSA. 3.0 in. OD spoon; 2.0 in. OD spoon. Hammer size unknown.

SAMPLE DEPTH (FT)	SAMPLE TYPE - NUMBER	RECOVERY %	SPT BLOWS/0.5 FT or (RQD)	DESCRIPTION
0.0–0.5	S3-1	100%	6	PEAT. Frozen; individual ice inclusions (Vx); 30% visible excess ice.
0.5–1.0	S3-2	100%	11	0.5' - EL 3300.9 SILT, with sand and gravel; gray and brown. Frozen; well bonded; random ice formations along with ice crystals in pore spaces (Vr,x); 15% visible excess ice; trace organic inclusions.
1.0–1.5	S3-3	100%	14	1.0' - EL 3300.4 SILT, with sand and gravel; gray and brown. Frozen; well bonded; random ice formations along with ice crystals in pore spaces (Vr,x); 10% visible excess ice; trace organic inclusions.
2.5–4.0	S3-4	100%	7 6 6	4.0' - EL 3297.4 SILT, with sand and gravel; gray and brown. Frozen; well bonded; random ice formations along with ice crystals in pore spaces (Vr,x); 30% visible excess ice; trace organic inclusions.
5.0–6.5	S3-5	100%	8 14 26	4.5' - EL 3296.9 SILT, with sand and gravel; gray, subrounded to angular. Local iron staining. Frozen; well bonded; massive ice (ICE); 60% visible excess ice; hard; clear; white; trace silt inclusions.
7.5–9.0	S3-6	100%	12 36 38	10.5' - EL 3290.9 GRAVEL, SANDY, with siltgw-gm; gray, subrounded to angular. Local iron staining. Frozen; well bonded; individual ice inclusions (Vx); 10% visible excess ice.
10.0–10.5	S3-7	100%	14/0.5	
10.5–11.5	S3-8	100%	100/0.1	
12.5–14.0	S3-9	100%	36 66 30/0.1	
15.0–15.5			27 30/0	
20.0–21.5	S3-11	100%	61 70 80	20.0' - EL 3281.4 GRAVEL, SANDY. Frozen; well bonded; individual ice inclusions (Vx); 20% visible excess ice.
25.0–26.5	S3-12	100%	36 50/0.2	25.0' - EL 3276.4 SHALE, and siltstone; gray; moderately weathered. Frozen; random ice formations along with ice crystals in pore spaces (Vr,x); 40% visible excess ice. 27.0' - EL 3274.4 SHALE, and siltstone; gray; moderately weathered. Frozen; no visible ice segregation (Nbn); 0% visible excess ice.

Boring backfill data not available.

1980 NW Data

NW data

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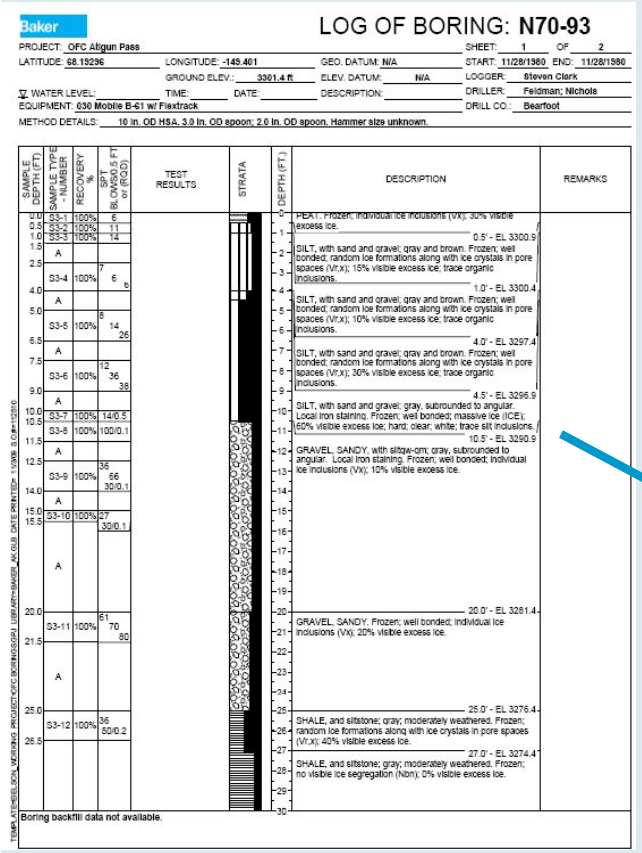
Putting it all together



Baker

LOG OF BORING: N70-93

PROJECT: OFC Atigun Pass
LATITUDE: 68.19296 LONGITUDE: -149.401 GEO. DATUM: N/A SHEET: 1 OF 2
GROUND ELEV.: 3301.4 ft. ELEV. DATUM: N/A START: 11/28/1980 END: 11/28/1980
WATER LEVEL: TIME: DATE: DESCRIPTION: LOGGER: Steven Clark
EQUIPMENT: 630 Mobile B-61 w/ Flextrack DRILLER: Feldman; Nichols
METHOD DETAILS: 10 in. OD HSA, 3.0 in. OD spoon; 2.0 in. OD spoon. Hammer size unknown. DRILL CO.: Bearfoot

SAMPLE DEPTH (FT)	SAMPLE TYPE - NUMBER	RECOVERY %	SPT BLOWS/(0.5 FT or (ROD))	TEST RESULTS	STRATA	DEPTH (FT)	DESCRIPTION	REMARKS
0.0	S3-1	100%	6			0	PEAT; Frozen; individual ice inclusions (Vx); 30% visible excess ice.	
0.5	S3-2	100%	11				0.5' - EL 3300.9	
1.0	S3-3	100%	14			1	SILT, with sand and gravel; gray and brown. Frozen; well bonded; random ice formations along with ice crystals in pore spaces (Vr,x); 15% visible excess ice; trace organic inclusions.	
1.5	A						1.0' - EL 3300.4	
2.5	S3-4	100%	7 6			2	SILT, with sand and gravel; gray and brown. Frozen; well bonded; random ice formations along with ice crystals in pore spaces (Vr,x); 10% visible excess ice; trace organic inclusions.	
4.0	A					4	4.0' - EL 3297.4	
5.0	S3-5	100%	8 14 26			5	SILT, with sand and gravel; gray and brown. Frozen; well bonded; random ice formations along with ice crystals in pore spaces (Vr,x); 30% visible excess ice; trace organic inclusions.	
6.5	A					6	4.5' - EL 3296.9	
7.5	S3-6	100%	12 36 38			7	SILT, with sand and gravel; gray, subrounded to angular. Local iron staining. Frozen; well bonded; massive ice (ICE); 60% visible excess ice; hard; clear; white; trace silt inclusions.	
9.0	A					8	10.5' - EL 3290.9	
10.0	S3-7	100%	14/0.5			9	GRAVEL, SANDY, with siltqw-gm; gray, subrounded to angular. Local iron staining. Frozen; well bonded; individual ice inclusions (Vx); 10% visible excess ice.	
10.5	S3-8	100%	100/0.1			10		
11.5	A					11		
12.5	S3-9	100%	36 66 30/0.1			12		
14.0	A					13		
15.0	S3-10	100%	27 30/0.1			14		
15.5	A					15		
20.0	S3-11	100%	61 70 80			16		
21.5	A					17		
25.0	S3-12	100%	36 50/0.2			18		
26.5						19		
						20	20.0' - EL 3281.4	
						21	GRAVEL, SANDY. Frozen; well bonded; individual ice inclusions (Vx); 20% visible excess ice.	
						22		
						23		
						24		
						25	25.0' - EL 3276.4	
						26	SHALE, and siltstone; gray; moderately weathered. Frozen; random ice formations along with ice crystals in pore spaces (Vr,x); 40% visible excess ice.	
						27	27.0' - EL 3274.4	
						28	SHALE, and siltstone; gray; moderately weathered. Frozen; no visible ice segregation (Nbn); 0% visible excess ice.	
						29		
						30		

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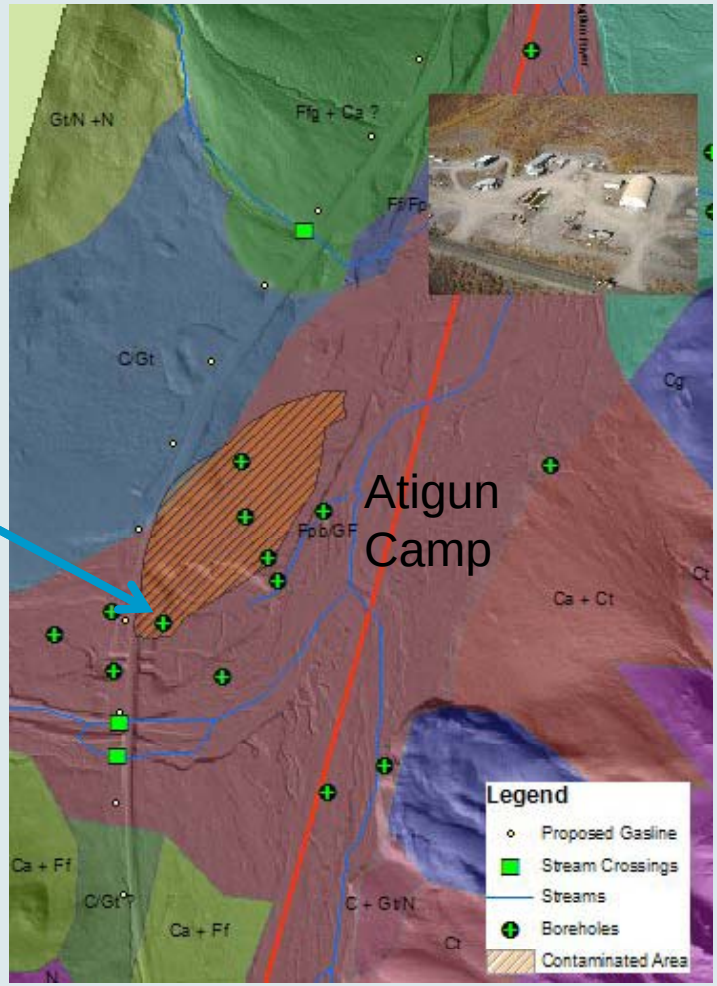

- Soils information
- Borehole logs
- Stream crossings
- Photographs

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It's not easy, but it's possible

- Wood Mackenzie: "Whether the project proceeds … depends on if the producers and the state can reach agreement on the applicable tax terms and, ultimately, what the producers believe to be the long-term value of natural gas in the North American marketplace."
- At some point everyone needs to sit down and talk
- Alaska needs the gas line to help replace declining oil revenues and spur North Slope development

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Thank you

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