PLAN OF DEVELOPMENT

FIBER OPTIC CABLE
ADL 232368

Donlin Gold Project

October 2018

4720 Business Park Blvd. Suite G-25
Anchorage, Alaska 99503

Prepared By:

SRK Consulting (U.S.), Inc.
11901 Business Blvd., Suite 110
Eagle River, Alaska 99577

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FIGURES

ACRONYMS

ADNR	Alaska Department of Natural Resources
ADOT	Alaska Department of Transportation
ATV	all-terrain vehicle
BPL	Beluga natural gas pipeline
CCTV	closed-circuit television
CIRI	Cook Inlet Regional Corporation
CP	cathodic protection
DOI	Department of Interior, Bureau of Reclamation
ENSTAR	ENSTAR Natural Gas Company
FOC	fiber optic cable
GCI	General Communications, Inc.
GIS	geographical information system
GPS	global positioning system
HDD	horizontal directional drill
HDPE	high density polyethylene
I/O	input/output
IP	Internet Protocol
LAN	local area network
MLV	mainline block valve
MP	milepost
PCC	pipeline control center
PDC	power distribution center
PLC	programmable logic controller
PoD	Plan of Development
ROW	right-of-way
SCADA	supervisory control and data acquisition
SFSGR	Susitna Flats State Game Refuge
TCP/IP	Transmission Control Protocol
USACE	US Army Corps of Engineers

UNITS OF MEASURE

ft	foot/feet
ha	hectare
km	kilometers
kW	kilowatt
m	meter
mm	millimeters

APPENDIX

Appendix A: Land Status

Appendix B: Donlin Gold Project Gas Line Study- Fiber Optic Cable and Natural Gas Pipeline Proposed Route

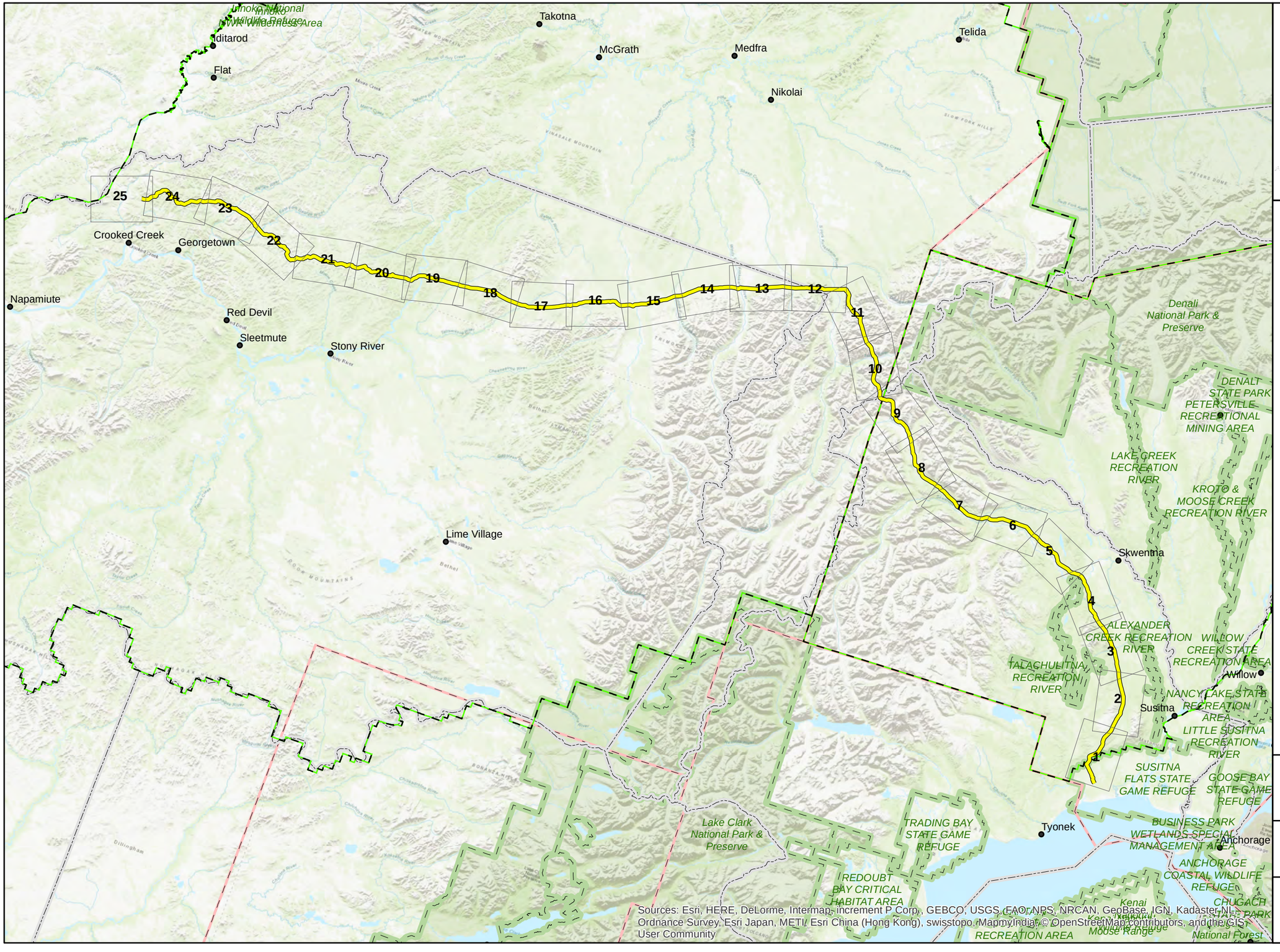
1.0 INTRODUCTION

The proposed Donlin Gold project is approximately 277 miles (446 km) west of Anchorage, 145 miles (233 km) northeast of Bethel, and 10 miles (16 km) north of the village of Crooked Creek. Bethel, 73 river miles (117 km) upstream from the mouth of the Kuskokwim River on the Bering Sea, is the regional center for the Yukon–Kuskokwim region of Alaska.

Currently there is no road or rail access to the site, and all personnel and supplies are transported by air to an existing airstrip. The project is completely isolated from existing power distribution networks and other public utility infrastructure. Donlin Gold proposes to construct a 315-mile-long (507 km) pipeline to deliver natural gas to the Donlin Gold mine project (SRK Consulting, Donlin Gold Project, Natural Gas Pipeline Plan of Development [PoD], Revision 1, December 2013 and Supplemental Information submitted December, 2017) including final alignment and installation of a fiber optic cable (FOC) within the pipeline right-of-way (ROW) as a communications system for pipeline operation and general mine communications. On State of Alaska owned land, which includes approximately 207 miles (333 km) of the route, this proposed FOC project would require separate authorization from the Alaska Department of Natural Resources (ADNR) Division of Mining, Land and Water.

The pipeline would receive natural gas from the existing ENSTAR Natural Gas Company (ENSTAR) 20-inch (508 mm) diameter pipeline (Beluga natural gas pipeline [BPL]) near Beluga, Alaska, and transport the product to the proposed Donlin Gold mine. The gas would be used to generate electricity to power industrial equipment at the mine. The proposed FOC would follow the natural gas pipeline route from its beginning at the BLP, designated as MP 0 (MP) within the Susitna Flats State Game Refuge (SFSGR), to the proposed Donlin Gold mine site. The proposed FOC would be primarily installed underground from the metering station located at MP 0 to the pipeline compressor station at approximately MP 0.4 and then on to the proposed Donlin Gold mine site at approximately MP 315. Donlin Gold is evaluating options for a selected service provider and where the FOC would originate, with the decision to be made during final engineering design.

This PoD for the proposed Donlin Gold's FOC provides information and details regarding the location and description of the proposed FOC installation subject to final engineering design requirements. A map of the proposed FOC and pipeline project route is presented in Figure 1-1 as the GL (gas line) proposed route. Appendix B provides additional detailed information. Route maps also can be found in the Natural Gas Pipeline PoD referenced above.



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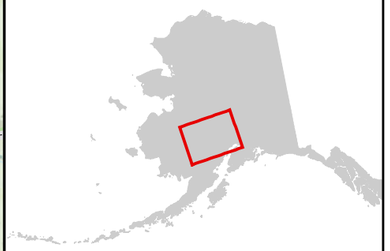


Figure 1-1

DONLIN GOLD GASLINE STUDY OVERVIEW

Alignment current as of 20 Oct 2017

Admin. Land Status Effective as of 20 Jan 2010

Legend

- GL Proposed Route 171020
- GLS_Area_Plans_101123
- Recording_Districts
- Boroughs
- Administrative_Boundaries

1:1,300,000

1 in = 21 miles

6/5/2018

Map and Engineering by RECON LLC
481 W. RECON Cir, Palmer AK 99645
NAD1983 UTM Zone 5N (Meters)
Land Status by Alaska Land Status, Inc.

0 13,000 26,000 39,000 52,000 Meters

0 10 20 30 40 Miles

Gasline_Map Layout_11x17L_Overview_180605

2.0 PROJECT DESCRIPTION

The installation of a fiber optic cable (including a repeater station) within the NGP right-of-way would require a separate authorization on land owned by the State of Alaska. Donlin Gold has applied to the ADNR for an easement in which to install the FOC on state land. This proposed 30 ft (9 m) wide easement would be located within the proposed natural gas pipeline ROW Lease for which Donlin Gold also has applied. Donlin Gold's intent is to complete the FOC installation at the same time the natural gas pipeline is under construction to minimize additional surface disturbance and to optimize use of temporary construction facilities and equipment as well as to implement stabilization, rehabilitation and reclamation actives for both as soon as possible.

The natural gas pipeline PoD and supplemental information provide detailed information to support this FOC PoD, and other appropriate and/or necessary federal, state, or local regulatory processes. The natural gas pipeline provides a detailed description of the route including terrain, fault crossings, construction camps, airstrips, storage locations and access routes as well as a construction schedule. Refer Natural Gas Pipeline PoD, Section 3.10, pgs 3-13 through 3-22 and the supplemental information as well as Appendix B of this PoD.

The proposed FOC would be installed within a proposed 30 ft (9 m) wide easement located within the proposed final 50 ft (15 m) wide NGP right of way. The proposed FOC communications system would be an operational component of pipeline operations and maintenance. The system would connect the Pipeline Control Center (PCC), and the backup Supervisory Control and Data Acquisition (SCADA) Control Center to all other control/monitoring facilities along the pipeline and provide reliable links to carry the operational data, voice services, and closed-circuit television (CCTV) signals associated with the operation of the proposed Donlin Gold natural gas pipeline.

The proposed FOC system would be installed primarily belowground, except in specific areas where above ground installation is deemed necessary (e.g., Denali Fault crossing). Below ground installation within the natural gas pipeline ROW ensures the construction, operation, and maintenance of the FOC would not interfere with the established standards of the proposed Donlin Gold pipeline and facilities while also maximizing the integrity of the FOC system to ensure uninterrupted communications service. Where the FOC system must be installed above ground, specific construction methods and equipment would be used to provide protection from exposure to arctic elements and from other detrimental impacts.

The pipeline communications network would be a high-performance Internet Protocol (IP) network with service provided by an existing telecommunication / internet provider near the BPL tie-in (to be determined during final engineering design). Diversity of the system to ensure uninterrupted service in the case of a damage to the system at a specific point would be determined during final engineering design. The fiber system could be enhanced to provide redundancy either by installation of parallel cables or by use of a wireless data transmission system. Transmission Control Protocol (TCP/IP) would be used over the main network. Each facility on the system would have IP address for the data equipment. Using Ethernet switches and routers, a local area network (LAN) would be generated at all the facilities. Voice-over IP would be implemented for telephone communications. A network email system would also be installed for possible future implementation.

There is the possibility that the FOC system installation as proposed may have sufficient capacity to allow for additional public or private use consideration for communities, or for other entities along or beyond the proposed route. However, such use would be determined based of availability of capacity and on Donlin Gold's own requirements, the community or other need, and technical and fiscal feasibility and may be considered and developed on a case by case basis.

3.0 SPECIAL DESIGN CONSIDERATIONS

The FOC selected for the proposed Donlin Gold pipeline communications system network must possess the physical attributes to operate at full capacity with minimal impact to transmission rate or quality under temperature conditions that are occasionally expected to be –40°F or below and in some areas constantly below freezing. The fibers must be able to provide the necessary transmission rate of the systems being serviced by the cable. The size of the cable (i.e., number of fibers) would be determined based upon the required capacity of the features or systems being serviced by the proposed FOC and the number of facilities to be serviced along the route. The cable would be delivered on 20,000-foot (6096 m) reels, which is the typical industry standard for cable length before signal regeneration is typically required.

3.1 Fire and Wildfires

At the few areas where the proposed FOC system is installed above ground, the system would be designed to prevent the loss of telecommunication service caused by fire and wildfires.

3.2 Frost Action / Permafrost

The proposed FOC system would be designed to accommodate differential movement caused by frost heaving or thaw settlement.

The proposed FOC system would be designed to minimize water infiltration into any conduit or casing where freezing may occur by installing pull boxes on high points or ridges along the alignment and by installation of duct plugs in the ends of all innerducts and casing pipes.

3.3 Slope Stability

The proposed FOC system would be designed to prevent loss of telecommunication service caused by slope instability or other ground movement. Special consideration would be given to the stability of any cuts and fills.

3.4 Rock Fall/Avalanche

The proposed FOC system would be designed to prevent loss of telecommunication services through rock fall or avalanche. All proposed FOC components within the limits of the rock fall/avalanche potential limits would be demonstrated to withstand the increased overburden and/or direct forces caused by the rock fall/avalanche or a mitigative plan would be detailed to eliminate integrity problems during the event.

3.5 Corrosion

The proposed FOC system would be designed to prevent system deterioration due to water or other means. All critical components would address possible sources of corrosion (or other material degradation, e.g., UV) based on the material composition and experience with the hardware. Rates of degradation would be documented for each source of material/component degradation. Each component would be demonstrated to sustain system integrity at the maximum corrosion rate over the design life. Where it cannot be demonstrated degradation

would not affect the integrity of the system, a mitigative plan would be detailed to maintain full system integrity.

3.6 Security

The proposed FOC system would be designed to minimize the possibility of loss of telecommunication service through acts of sabotage. A risk analysis of the proposed FOC system would be completed. The risk analysis would address natural hazards and sabotage, terrorism, vandalism, and accidents. Higher risk areas along the proposed FOC alignment would be identified. A plan would be detailed to maintain system integrity for any identified hazard for higher risk locations.

4.0 LAND STATUS

Of the approximately 315 miles (507 km) proposed FOC route, the State of Alaska owns approximately 207 miles (333 km) of the land that the proposed FOC traverses, with the remaining approximately 108 miles (174 km) owned by Cook Inlet Regional Corporation (CIRI), Calista Corporation and the federal government managed by the Bureau of Land Management (BLM0.

The proposed FOC easement on state land would be 30 ft (9 m) wide and approximately 207 miles (333 km) long for a total of approximately 753 acres (305 ha). See Appendix A for State of Alaska owned and selected land the proposed FOC crosses. The Donlin Gold Project Gas Line Study provided in Appendix B provides addition information including land status and depicts the route of both the FOC and NGP.

5.0 MOBILE EQUIPMENT

Typical list of mobile equipment required for the FOC installation is listed below as well as some of the equipment associated with pipeline construction. The actual equipment type, and quantity could vary during detail engineering design or as deemed necessary by the FOC installation contractor.

- Trenchers
- Cable plows
- Backhoes
- Cable winches
- Directional boring/drilling equipment
- Cable pullers

Typical Construction and Maintenance Mobile Equipment

- Dozers (Type CAT D6, D8, D10)
- Excavators (Type CAT 320, 330, 345, 385)
- Trucks (Type CAT 740)
- Graders (Type CAT 14H)
- Compactors (Type CAT CS563, 815, 825, 563)
- Water Trucks (Type CAT 725)
- Loaders (Type CAT 950, 963, 992, 980, 963, 988H, IT28)
- Generators & Lighting Equipment (Type 6 kW to 1500 kW)
- Light trucks (Type Ford 150, 250, 350)
- Fueling vehicles

6.0 CONSTRUCTION

6.1 Fiber Optic Cable Installation

The proposed FOC system would be installed belowground, except in specific areas where above ground installation is deemed necessary (e.g., Denali Fault crossing). Below ground installation within the ROW ensures the construction, operation, and maintenance of the FOC would not interfere with the established standards of the proposed Donlin Gold pipeline and facilities while also maximizing the integrity of the FOC system to ensure uninterrupted communications service. Where the FOC system must be installed above ground, specific construction methods and equipment would be used to provide protection from exposure to arctic elements and from other detrimental impacts.

6.2 Buried Installation

For most of its length, the FOC would be buried, installed in a protective plastic innerduct sized to allow the cable to be pulled within allowable pulling tolerances. The innerducts would be flexible enough to allow for bends to be formed in the field where possible for changes in both horizontal and vertical alignment. Where the innerduct cannot be bent to the desired curvature, preformed sweeps having a minimum radius of 4 feet (122 cm) would be used. Two or three innerducts are proposed for installation in a common trench, the location of the trench would be determined during final design of the proposed natural gas pipeline. One of the innerducts would be used to house the proposed fiber optic cable, with the other(s) remaining vacant for possible future cable replacement or emergency needs.

6.3 Above Ground Installation

The above ground FOC installation locations are very limited and the method would be determined during final engineering design. Whether the FOC would use the pipeline as its structural support or if the FOC would be lashed to a support cable that has adequate strength to support the FOC over the span between support structures, or another means, would be determined. Most fiber optic cables do not have sufficient strength to allow direct aerial installation, but there are methods to install them above ground as well as special cables that are designed for above ground installation.

6.3 Cable Splicing & Splice Manholes

Reels of cable would be spliced in the Ethernet (Moxa) switches being proposed for use in the FOC, which would be installed in pole-mounted panel enclosures at designated locations along the cable, where the locations of the panel enclosures are near the ends of the cable. Where no panel enclosure is proposed within proximity of the cable end, reels of cable would be spliced in buried Splice Manholes. The manhole would be of sufficient size to allow access to the cable within the manhole and to allow for racking of cable loops and splice enclosures within the manhole. The manhole would be of sufficient composition to provide a permanent enclosure unaffected by exposure to severe arctic elements. A grounding rod would be installed in undisturbed earth near every splice.

6.4 Pull Boxes

Pull boxes would be installed a maximum distance of 3,000 ft (914 m) along the cable alignment to facilitate cable installation. Shorter distances between pull boxes would be required where significant deflections to the horizontal and vertical alignment of the innerducts are necessitated because of topography, geologic conditions, crossings of other buried utilities or other similar obstructions. Pull boxes would also be installed at significant points of intersection in the cable alignment and within the fenced area at mainline block valves (MLV) being serviced by the fiber optic system, launcher/receiver sites, and at the pipeline terminus. The pull boxes would be of sufficient size to permit access and hold coiled cable and installed flush to the existing ground surface. The bottom of the pull box would be open, set on a 6-inch (15 cm) thick layer of aggregate. Twenty feet of slack cable would be coiled and laid in each pull box.

Pull box locations would be adjusted to allow for installation at high points or ridges along the alignment, where possible, to minimize the opportunity for infiltration by ground water or surface water into the pull box.

6.5 Casing Pipe

A 6-inch diameter high density polyethylene (HDPE) pipe would be installed to serve as a casing for the innerducts at all horizontal bores (jack and bores), and horizontal directional drill (HDD) locations.

6.6 Duct Plugs

Duct plugs would be installed in the ends of all casing pipes and innerducts to eliminate or minimize debris or water from accumulating in or passing through the innerducts and conduits. Simplex duct plugs would be installed in the ends of all innerducts housing a fiber optic cable. Triplex duct plugs would be installed in the ends of all casing pipes around the innerduct.

6.7 Grounding Rods

Grounding rods would be installed at all cable splices manholes. A 5/8-inch diameter grounding rod, 8 ft (2.4 m) long, would be driven into undisturbed earth adjacent to the manhole. A number 6 AWG insulated solid copper ground wire would be attached to the rod. The other end of the ground wire would be attached to the splice casing.

6.8 Cable Markers

Marker stakes would be installed at both sides of road crossings, at both ends of horizontal bores and HDD, and at sufficient intervals along the route to ensure visibility in both directions from any marker. The markers would be flat and flexible, approximately 4 inches (10 cm) wide and 66 inches (168 cm) long. Marker Numbers, Splice or Pull Box designations, and Warning signs noting ownership and contact information would be affixed to the markers.

6.9 Fiber Optic Signal Amplification

The distance between the compressor station and the proposed Donlin Gold Mine would require the use of boosting equipment for the fiber optic signal along the way. Current technology limits the distance between boosting points to approximately 75 miles (120 km).

Since automatic line break detection equipment may need to be installed at specific MLV locations, and the Cathodic Protection (CP) system may require rectifiers to be installed at specific locations; coupling the need for automatic line break valves and the CP needs, an industrial fiber booster could be cost effectively installed at these specific locations.

An industrial rated system is very robust and is a proven solution for high demand SCADA needs for real time operations.

The equipment at each location would be powered by a Thermal Electric Generator or Fuel Cell with a UPS system designed for three days of backup. The equipment at the automatic leak detection valves would include an RTU/PLC, pressure transmitters, and a solenoid to trip the valve along with the fiber amplifier/Ethernet switch. The communication and RTU/PLC equipment should be located in a small 6-ft by 6-ft by 8-ft (1.8 m by 1.8 m by 2.4 m) tall walk-in enclosure. The interior and exterior flood lighting should be fiber optic, reducing power requirements. While the walk-in enclosure is much easier to support, a smaller pole mounted weatherized panel 6-ft by 6-ft by 30-inch (1.8 m by 1.8 m by 76 cm) deep could be used to house this equipment.

6.10 Schedule

Donlin Gold estimates that construction of the proposed natural gas pipeline would take an estimated 2 to 3 years within a 3 to 4 year overall project schedule for construction as discussed in the proposed Natural Gas Pipeline PoD, Section 3.3, pg 3-5 and Section 8.2, pgs 8-11 through 8-14. Donlin Gold anticipates that the FOC would be installed at the same time as the natural gas pipeline to maximizm use of equipment and facilities as well as to minimize redundance in stabilization, rehabilitation and reclamation actions.

6.11 Construction Facilities Use

FOC installation activities are dependent on supplies, materials, equipment and personnel being transported to locations for construction and later for operation and maintenance purposes.

Donlin Gold intends that the proposed natural gas pipeline temporary camp facilities including accommodations, shops, storage yards, roads and airstrips would be available to accommodate needs for FOC installation.

During FOC operations and maintenances, depending on location and seasonal conditions most activities would be supported by aircraft or all-terrain vehicles (ATV) unless there is road access.

7.0 AS-BUILT SURVEY

An as-built survey showing the location of the proposed FOC, all associated system components including the repeater station within the easement and the easement boundaries would be completed following FOC installation.

8.0 RECLAMATION AND TERMINATION

8.1 Reclamation

The Stabilization, Rehabilitation, and Reclamation Plan, when completed and approved for the NGP, would include mitigation measures for erosion and sediment control, as well as specifics of stabilization, rehabilitation, and reclamation actions during construction, operations and maintenance, and project termination. The plan would include those actions applicable to the fiber optic cable and easement reclamation stipulation requirements on State owned land. The plan would be developed in accordance with all pertinent regulations and would follow BMPs and would include but not limited to the following:

- Soil removal and replacement
- Cleanup and reclamation
- Stockpiling and use of salvageable growth medium
- Disposal of excess spoil and excavated material
- Erosion and sediment control
- Natural revegetation including site preparation, and seeding as an option when appropriate
- Invasive species prevention and management
- Limiting access to ROW to allow stabilization, rehabilitation, and reclamation actions to be successfully accomplished
- Inspection and maintenance/monitoring schedule and requirements
- Activities occurring during operations and maintenance
- Status of temporary use areas following construction
- Emergency reclamation situations
- Termination and final reclamation
- Estimated cost and unconditional guaranty for performance

8.2 Termination

At mine closure the decision would be made whether the FCO would remain in place available for future use. If during the life of the Donlin Gold project, Donlin Gold allows other use, the closure plan would need to address on-going FOC operational use. Otherwise if it is determined that the FOC is no longer needed post-mine closure, the FOC would be included in the detailed Pipeline Abandonment Plan. The Abandonment Plan and procedures would be based on applicable regulatory requirements at the time and would be designed to minimize impacts to public and private property in coordination with the appropriate agencies and land owners. Unless determined otherwise, all buried fiber optic cable would be abandoned in place. Fiber optic cable would be excavated to a minimum of 12 inches (30 cm) below grade, cut off, and appropriately located and preserved in a manner that would allow future use. Any above grade cable would be removed and salvaged or disposed of at an

appropriate facility. The repeater station would be removed as well as any other above grade components.

A final determination where the proposed FOC would originate would be made during final engineering design and any FOC that is part of the Donlin Gold system and does not service any additional ongoing needs or services would be included in the reclamation and termination requirements.

8.3 Unconditional Guaranty for Duties and Obligations

For the proposed NGP Donlin Gold would provide ADNR an unconditional guaranty including a financial guaranty or surety, or bond as may be required for the performance of all Donlin Gold's duties and obligations in a form approved by ADNR including stabilization, rehabilitation and reclamation during construction, operation, maintenance and termination. Such duties and obligations would be consistent with the approved Stabilization, Rehabilitation and Reclamation Plan, NGP ROW lease and appropriate laws and regulations. Donlin Gold proposes that any unconditional guaranty including a financial guaranty or surety, or bond as may be required for the performance of all Donlin Gold's duties and obligations for work along the NGP route include the FOC.

9.0 GOVERNMENT AGENCY INVOLVEMENT

- Alaska Department of Natural Resources (ADNR)
- Alaska Department of Fish and Game (ADF&G)
- Alaska Department of Environmental Conservation (ADEC)
- Alaska Department of Transportation (ADOT)
- U.S. Army Corps of Engineers (USACE)

10.0 OPERATION AND MAINTENANCE

The proposed FOC easement traverses varied terrain and subsurface soil conditions, including areas of permafrost and intervals of ice-rich soils susceptible to thermal degradation and settlement as well as crossing two active faults. Given these conditions, maintenance and rehabilitation may be necessary throughout the FOC operating life. Appropriate best-management practices would be applied during installation, operations and maintenance of the FOC. Maintenance includes both preventative maintenance to ensure equipment and the system continues to function effectively, and corrective maintenance to fix or replace equipment that is not working or functioning correctly.

Inspection, surveillance and monitoring of the proposed FOC would be included in the natural gas pipeline inspection, surveillance and monitoring program designed to observe surface conditions on and adjacent to the natural gas pipeline ROW for indications of leaks, construction activity, and any other factors affecting safety and operation. This program would include such things as river and stream crossings, areas of known geohazards, above ground fault crossings, areas of known ice-rich permafrost, condition of surface reclamation and any additional specific surveillance and monitoring requirements for the proposed FOC developed during final engineering design.

For operation and maintenance as well as for safety purposes all or a portion of the 50 ft (15 m) wide NGP ROW on state land would be cleared of shrubs at approximately 10-year intervals or as required to preserve pipeline integrity and access. This would include clearing the FOC easement and any specific requirements applicable to the FOC determined during final engineering design.

11.0 REFERENCES

Much of the information used in the preparation of this Plan of Development was derived from Donlin Gold documents from the following sources:

Michael Baker. Donlin Gold LLC, *Natural Gas Pipeline Project Design Basis Memorandum Revision 2*. April 2018

SRK Consulting. Donlin Gold LLC, *Plan of Development, Natural Gas Pipeline Revision 1.* December 2013

Appendix A: State Lands

Donlin Gold proposes to install a Fiber Optic Cable from Cook Inlet to the proposed Donlin Gold mine site located 10 miles (16 km) north of Crooked Creek, Alaska near the Kuskokwim River. The route crosses State of Alaska owned and selected land. Listed below are the areas of the proposed easement land descriptions. The proposed 30 ft (9 m) wide FOC easement would be located within the proposed final 50 ft (15 m) width of the proposed Donlin Gold Natural Gas Pipeline Right-of-Way lease.

Fiber Optic Alignment ADL 232368 (Amended and "expanded" by ADNR to include potential cross-overs and discrepancies).

- **Legal Description:**

  Sections 7, 17, 18, 20, 28 and 29, Township 14 North, Range 9 West, Seward Meridian; Sections 1 and 12, Townships 14 North, Range 10 West, Seward Meridian;
  Sections 4, 5, 8, 17, 20, 29, 30 and 31, Township 15 North, Range 9 West, Seward Meridian;
  Section 36, Township 15 North, Range 10 West, Seward Meridian;
  Sections 3, 10, 15, 21, 22, 28, and 33, Township 16 North, Range 9 West, Seward Meridian; Sections 4, 9, 10, 15, 22, 23, 26 and 35, Township 17 North, Range 9 West, Seward Meridian;
  Sections 7, 18, 19, 20, 29, 32 and 33, Township 18 North, Range 9 West, Seward Meridian; Sections 1, 12, 6, 7, 8, 16, 17, 21, 22, 26, 27, 35 and 36, Township 19 North, Range 10 West, Seward Meridian;
  Sections 1, 5, 8, 9, 16, 21, 22, 26, 27, 35 and 36, Township 20 North, Range 11 West, Seward Meridian;
  Sections 29, 30 and 32, Township 21 North, Range 11 West, Seward Meridian;
  Sections 7, 18, 19, 20, 21, 22, 25, 26 and 27, Township 21 North, Range 12 West, Seward Meridian;
  Sections 2, 3, 4, 11, 12 and 13, Township 21 North, Range 13 West, Seward Meridian;
  Sections 30, 31, 32 and 33, Township 22 North, Range 13 West, Seward Meridian;
  Sections 19, 20, 21, 22, 23, 25 and 26, Township 22 North, Range 14 West, Seward Meridian;
  Sections 19, 21, 22, 23, 24 and 28, Township 22 North, Range 15 West, Seward Meridian; Section 30, Township 22 North, Range 15 West, Seward Meridian;
  Sections 19, 20, 25, 26, 27, 28 and 29, Township 22 North, Range 16 West, Seward Meridian;
  Sections 5, 6, 8, 9, 13, 14, 15, 16, 24, Township 22 North, Range 17 West, Seward Meridian;
  Sections 1, 2, 3, 19, 20, 28, 29, 30, 32, 33, 34 and 35, Township 23 North, Range 18 West, Seward Meridian;
  Sections 2, 11, 12 and 13 and 24, Township 23 North, Range 19 West, Seward Meridian; Section 6, Township 23 North, Range 37 West, Seward Meridian;
  Sections 1, 2, 3, 4, 7, 8, 9, 10, 16, 17 and 18, Township 23 North, Range 38 West, Seward Meridian;
  Sections 13, 14, 15, 16, 17 and 18, Township 23 North, Range 39 West, Seward Meridian; Section 15, Township 23 North, Range 40 West, Seward Meridian;

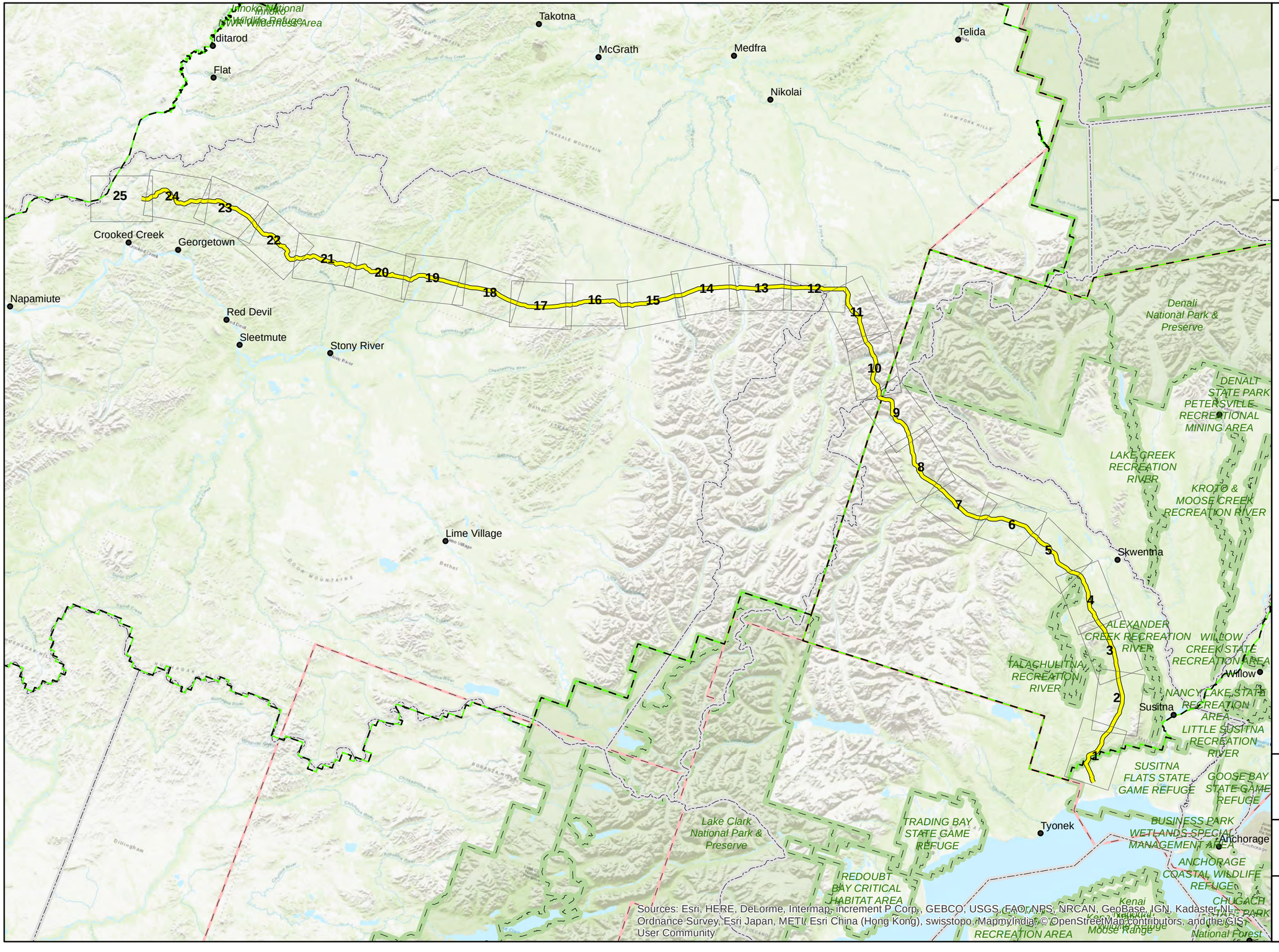
Sections 7, 8, 16, 17, 18, 21, 22, 27, 34 and 35, Township 24 North, Range 19 West, Seward Meridian;
Sections 2, 3, 11 and 12, Township 24 North, Range 20 West, Seward Meridian;
Sections 4, 5, 7, 8, 11, 12, 13, 14, 15, 16, 19, 20 and 21, Township 24 North, Range 33 West, Seward Meridian;
Sections 22, 24, 25, 26, 27, 28, 29 and 30, Township 24 North, Range 34 West, Seward Meridian;
Sections 27, 28 and 29, Township 24 North, Range 35 West, Seward Meridian;
Sections 31, 32 and 33, Township 24 North, Range 37 West, Seward Meridian;
Sections 7, 17, 18, 20, 22, 23, 25, 26, 27, 28, 29, 35 and 36, Township 25 North, 20 West, Seward Meridian;
Sections 1, 2 and 12, Township 25 North, Range 21 West, Seward Meridian;
Sections 4, 5, 6 and 7, Township 25 North, Range 29 West, Seward Meridian;
Sections 4, 5, 9, 10, 14, 15, 23, 26 and 35, Township 26 North, Range 21 West, Seward Meridian;
Sections 1, 2, 3, 9, 10, 16, 17, 19 and 20 of Township 26 North, Range 28 West, Seward Meridian;
Sections 19, 30, 31 and 32 of Township 27 North, Range 21 West, Seward Meridian;
Sections 2, 3, 4, 11, 13, 14, 24 and 25 of Township 27 North, Range 22 West, Seward Meridian;
Sections 11, 12, 14, 15, 16, 17, 18, 19 and 20 of Township 28 North, Range 22 West, Seward Meridian;
Section 18, 19, 30, 31, 32 and 33 of Township 28 North, Range 22 West, Seward Meridian; Sections 13, 14, 15, 16, 17, 19 and 20, Township 28 North, Range 23 West, Seward Meridian.

T. 23N, R. 41W, (State Selected BLM Land)
Sec. 31, NW1/4

T. 23N, R. 42W, (State Selected BLM Land)
Sec. 36, NE1/4;
Sec. 25, S1/2;
Sec. 26, S1/2;
Sec. 35, NW1/4

T. 23N, R. 47W, (State Selected BLM Land)
Sec. 24;
Sec. 23, S1/2;
Sec. 26;
Sec. 27;
Sec. 33, N1/2

Appendix B: Donlin Gold Project Gas Line Study- Fiber Optic Cable and Natural Gas Pipeline Proposed Route



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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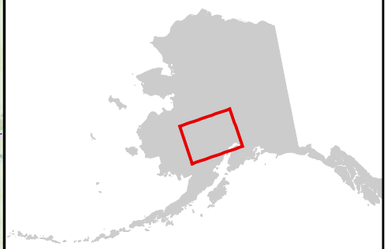


DONLIN GOLD GASLINE STUDY OVERVIEW

Alignment current as of 20 Oct 2017

Admin. Land Status Effective as of 20 Jan 2010

Legend

- GL Proposed Route 171020
- GLS_Area_Plans_101123
- Recording_Districts
- Boroughs
- Administrative_Boundaries

1:1,300,000

1 in = 21 miles

6/5/2018

Map and Engineering by RECON LLC
481 W. RECON Cir, Palmer AK 99645
NAD1983 UTM Zone 5N (Meters)
Land Status by Alaska Land Status, Inc.

0 13,000 26,000 39,000 52,000 Meters

0 10 20 30 40 Miles

Gasline_MapLayout_11x17L_Overview_180605

Mapset Updated:
6/5/2018

DONLIN GOLD PROJECT GASLINE STUDY

ADMINISTRATIVE LAND STATUS EFFECTIVE AS OF 20 JAN 2010 (land status data provided by Alaska Land Status, Inc)
Effective Date of alignment 20 Oct 2017, by RECON LLC

Map and Engineering by RECON LLC
481 W. RECON Cir, Palmer AK 99645
NAD1983 UTM Zone 5N (Meters)
Land Status by Alaska Land Status, Inc.

Lands Legend

Project Boundaries

- Research Boundary
- GLS_Area_Plans_101123
- Recording_Districts
- Boroughs
- State of AK Designates Areas: (Susitna Flats, Talachulitna State Rec River w/in research boundary)

Federal Land

- Bureau of Land Management
- Native Patent or IC
- Native Selected (BLM)
- State Patent or TA
- State Selected (BLM)
- FAA Administered Land [Air Navigation Site (ANS189)]

State Land

- General Grant Selections (State Selected), State Land

Municipal Entitlement Lands

- Kenai Peninsula Borough Municipal Entitlement Selection, Municipal Entitlement Lands
- Matanuska-Susitna Borough Approved Selection or Patented Lands. Surface Estate Only. State-Owned Mineral Estate.

ANCSA Selections and Conveyances

- Cook Inlet Region Inc. (CIRI) Interim Conveyed Surface Including Sand and Gravel, State of Alaska Subsurface Excluding Sand and Gravel

Private Land

- Private, Surface Estate Only (State Land Disposals, includes Contracts for Sale)
- Native Allotments
- Private Land

State of Alaska Oil and Gas Leases

- Hilcorp Alaska, LLC. State of Alaska Oil and Gas Leases or Storage Leases
- Conoco Phillips Alaska, Inc. State and Federal Oil and Gas Leases, State of Alaska and Federal Oil and Gas Leases
- Cook Inlet Energy, LLC, State of Alaska and Federal Oil and Gas Leases
- Cook Inlet Energy, LLC - State Oil & Gas Exploration License, State of Alaska and Federal Oil and Gas Leases

State of Alaska Mining Claims & Leasehold Locations

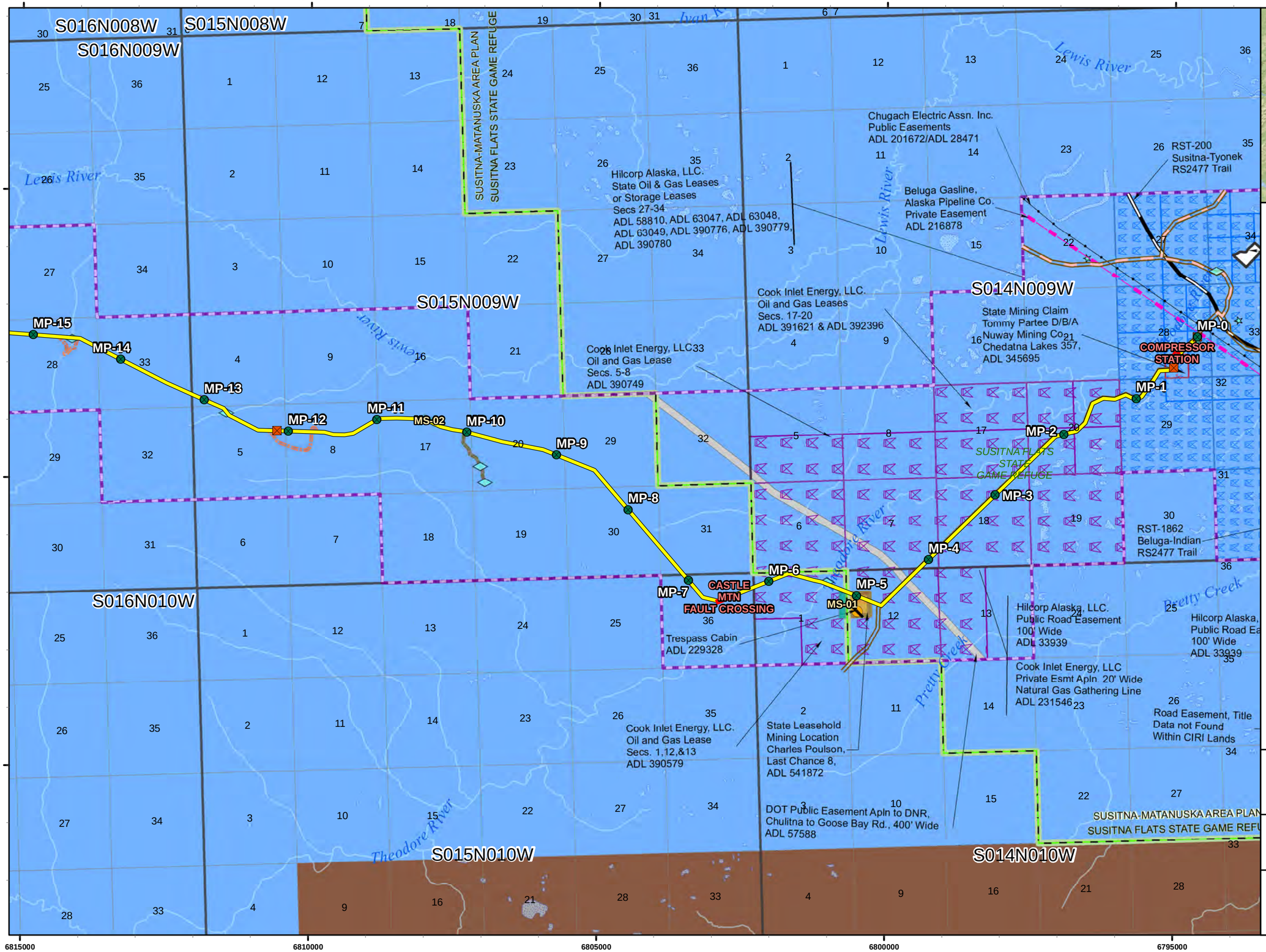
- Charles Poulson, Last Chance 8, State of Alaska Leasehold Location
- Geoinformatics Alaska Exploration, Inc., State of Alaska Mining Claims
- Nuway Mining Company

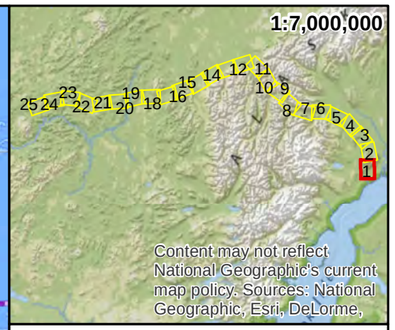
Miscellaneous

- Farewell Airstrip, Miscellaneous
- Happy River Remote Recreational Cabin Staking Area, Miscellaneous
- State Land Subdivision Offering (Shell Hills and Onestone Land)
- Porcupine Butte Remote Recreational Cabing Staking Area

Easements

- DOT Public Easement 400' Wide, Easements
- Iditarod Historic Trail, 400' Wide, Easements
- State Public Access Easement For Iditarod Trail, 400' Wide, Easements
- Farewell Airstrip Trail
- Talachulitna River Scenic Easement, 200' Upland from Each Bank
- Private Easement Application 20', Cook Inlet Energy, LLC
- Private Access Easement 20', Hilcorp Alaska, LLC
- Iditarod Historical Trail Over State-Owned Navigable Water
- Public Easement 100', Hilcorp Alaska, LLC
- Shell Hills Trail
- ANCSA Sec. 17(b) Public Easements
- Beluga Gasline Alaska Pipeline Company
- Chugach Electric Association
- State Identified RS 2477 Public Rights-of-Way
- Commercial Guide Camp
- Oil and Gas Well Sites, Both Producing and Non-Producing
- Personal Use Cabin
- Recording Station
- Trespass Cabin





DONLIN GOLD
GL Project Study

See 'Lands Legend' sheet
for land status descriptions

Legend: Route & Infrastructure

- GL Proposed Route 171020
- Water Extraction Sites
- WES Cut/Fill
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- Const Access Centerline
- Const Access Cut/Fill
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- HDD Alignments

1:63,360
1 in = 1 miles

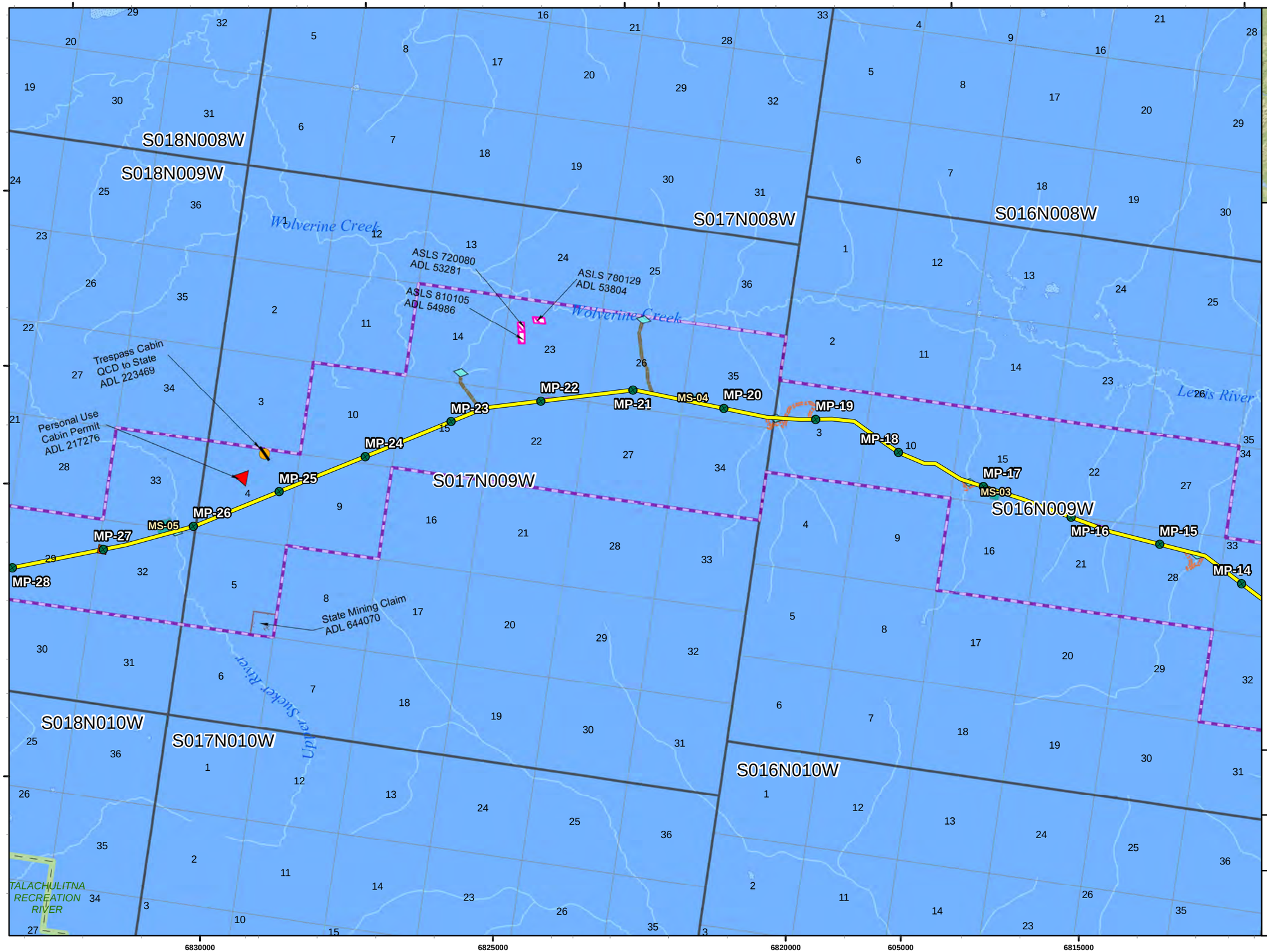
6/5/2018

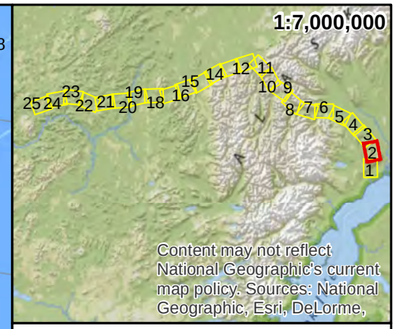
Map and Engineering by RECON LLC
481 W. RECON Cir, Palmer AK 99645
NAD1983 UTM Zone 5N (Meters)
Land Status by Alaska Land Status, Inc.

0 660 1,320 1,980 2,640 **Meters**

0 0.5 1 1.5 2 **Miles**

Gasline_MapLayout_11x17L_BkR_180605





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GL Project Study

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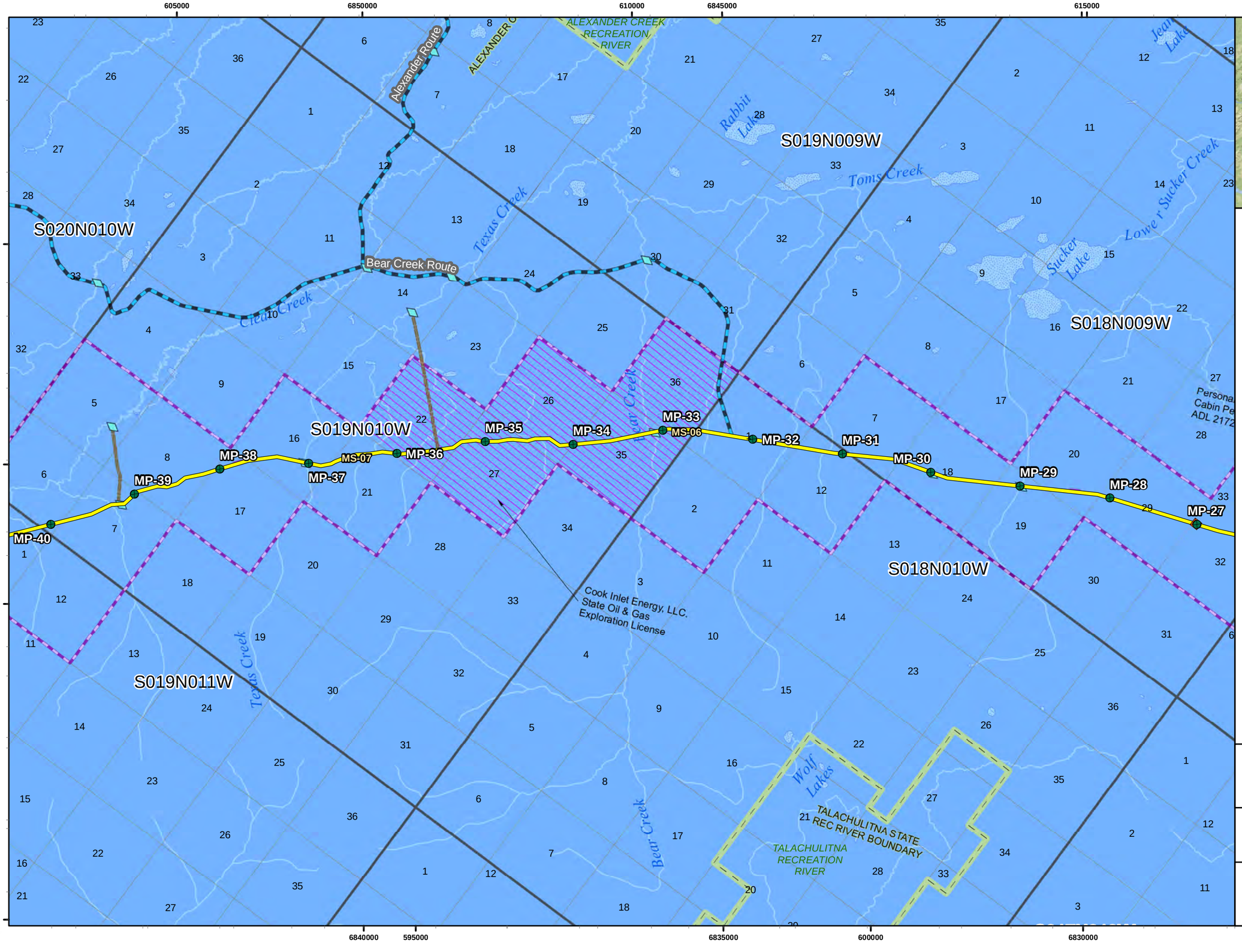

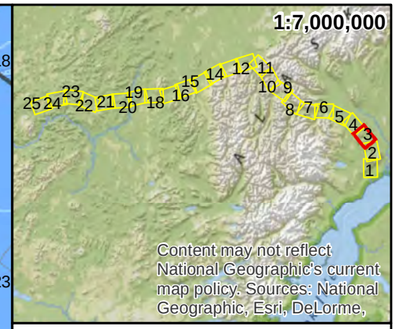

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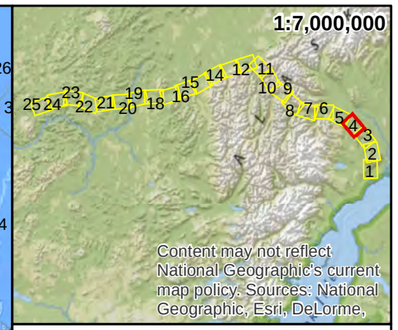
585000 580000 6860000

580000 6855000 585000 6845000 590000



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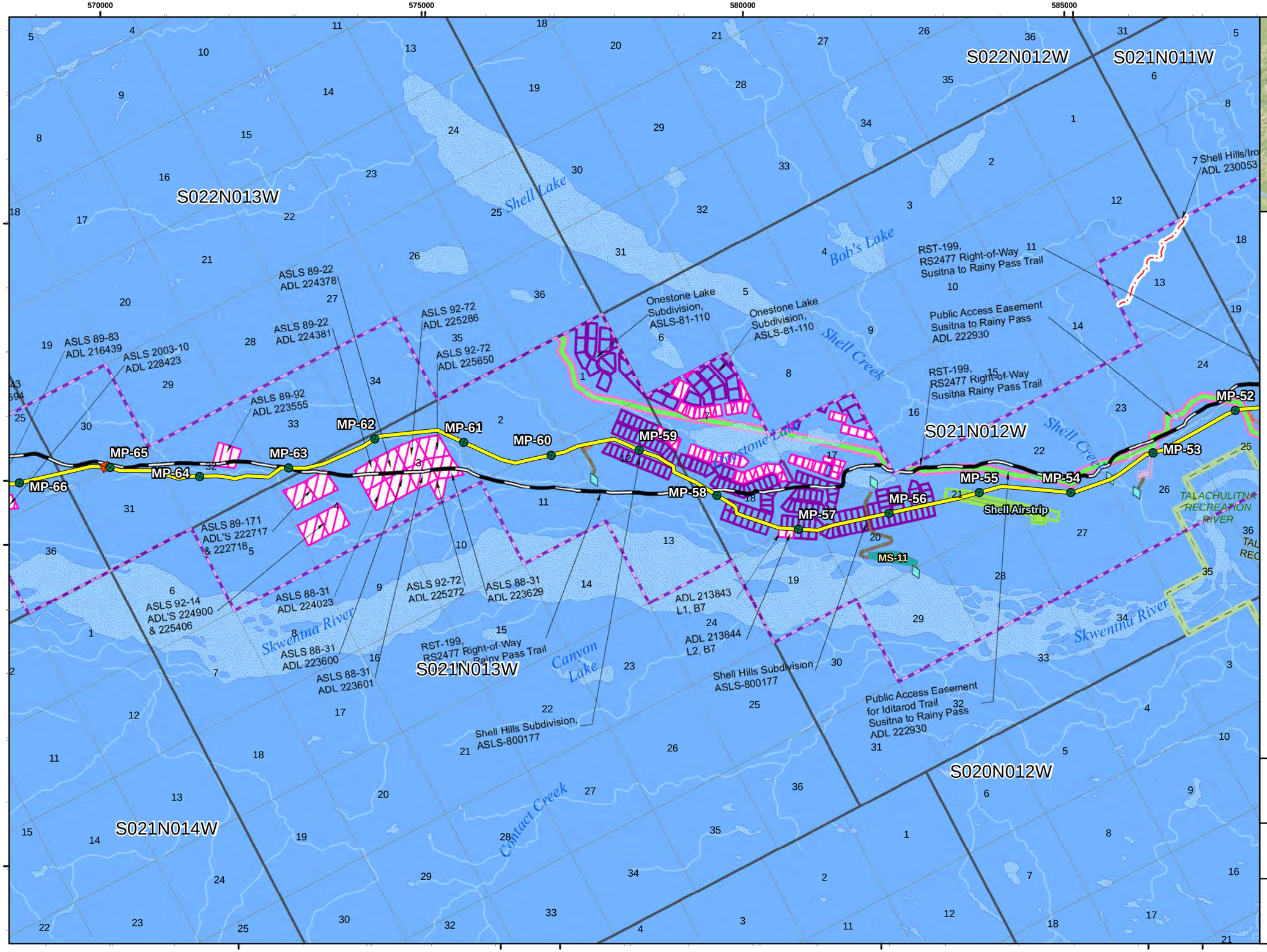

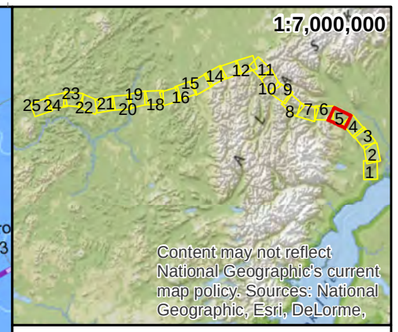

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GL Project Study

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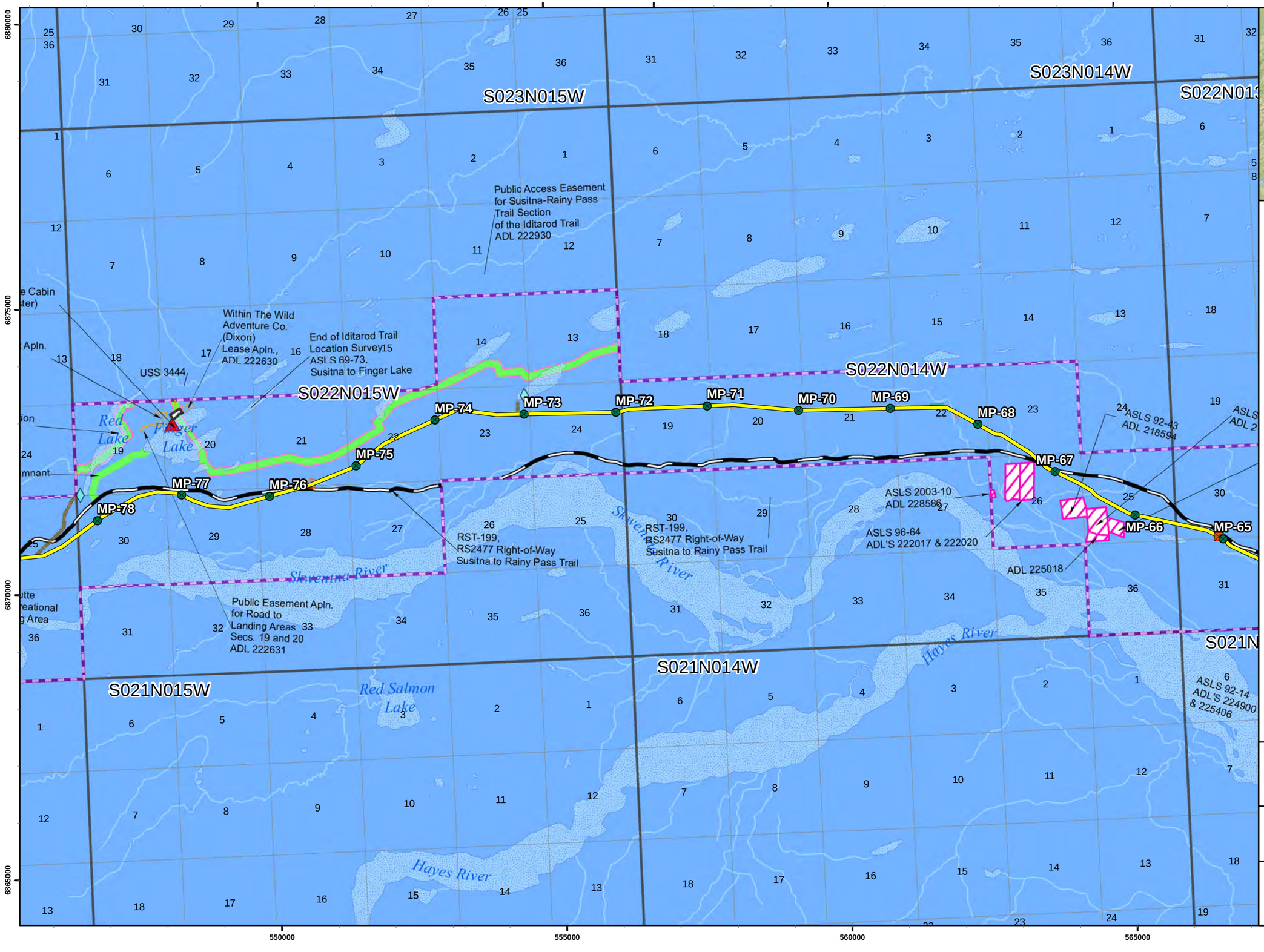

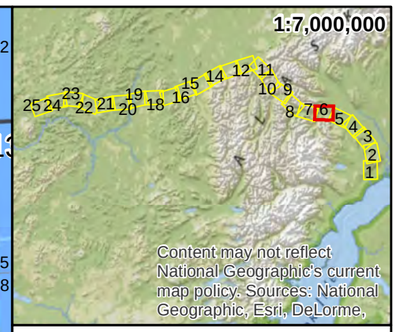

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GL Project Study

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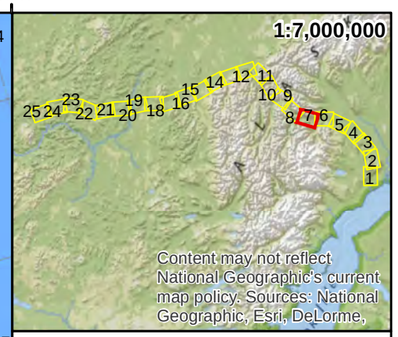

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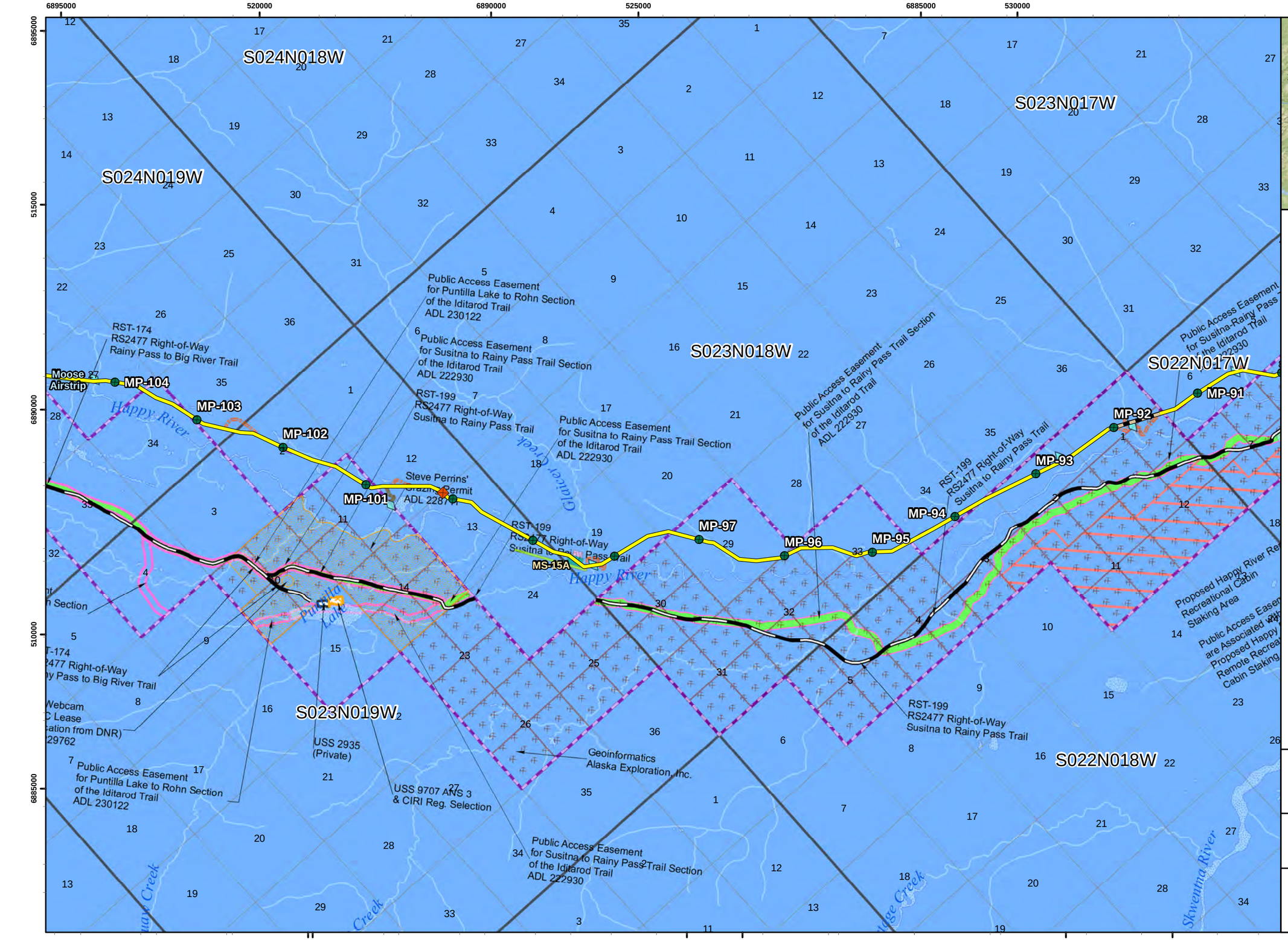

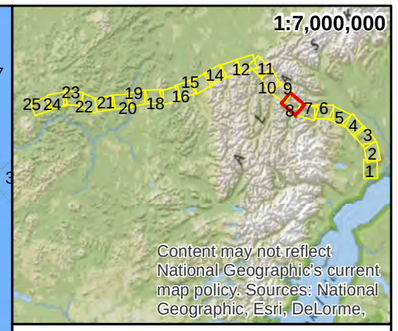

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GL Project Study

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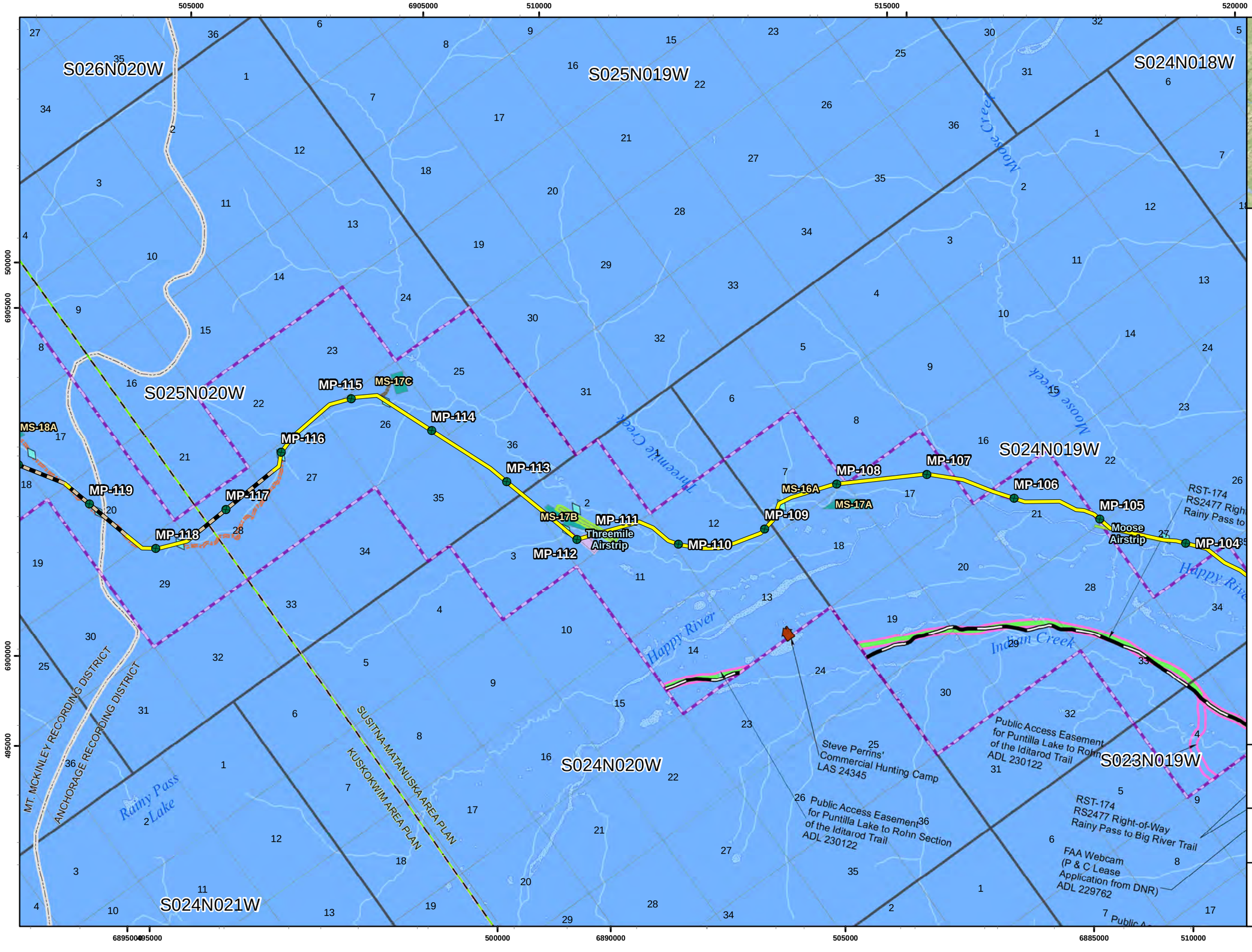

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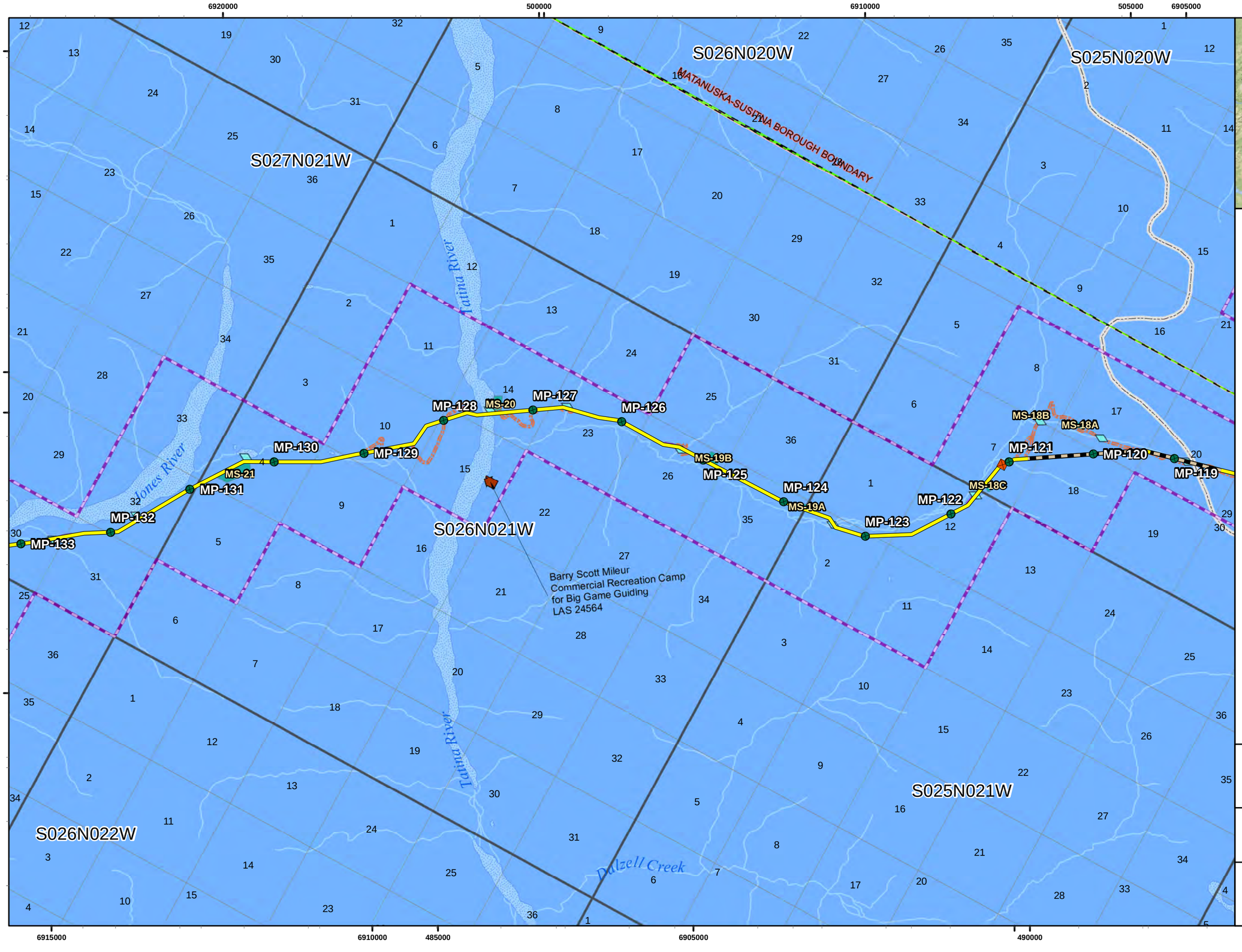

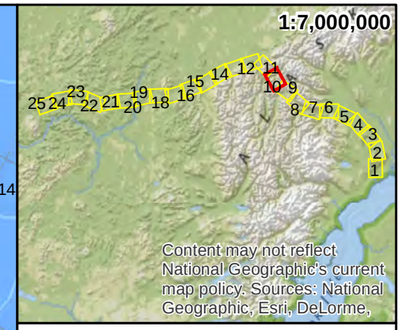

DONLIN GOLD
GL Project Study

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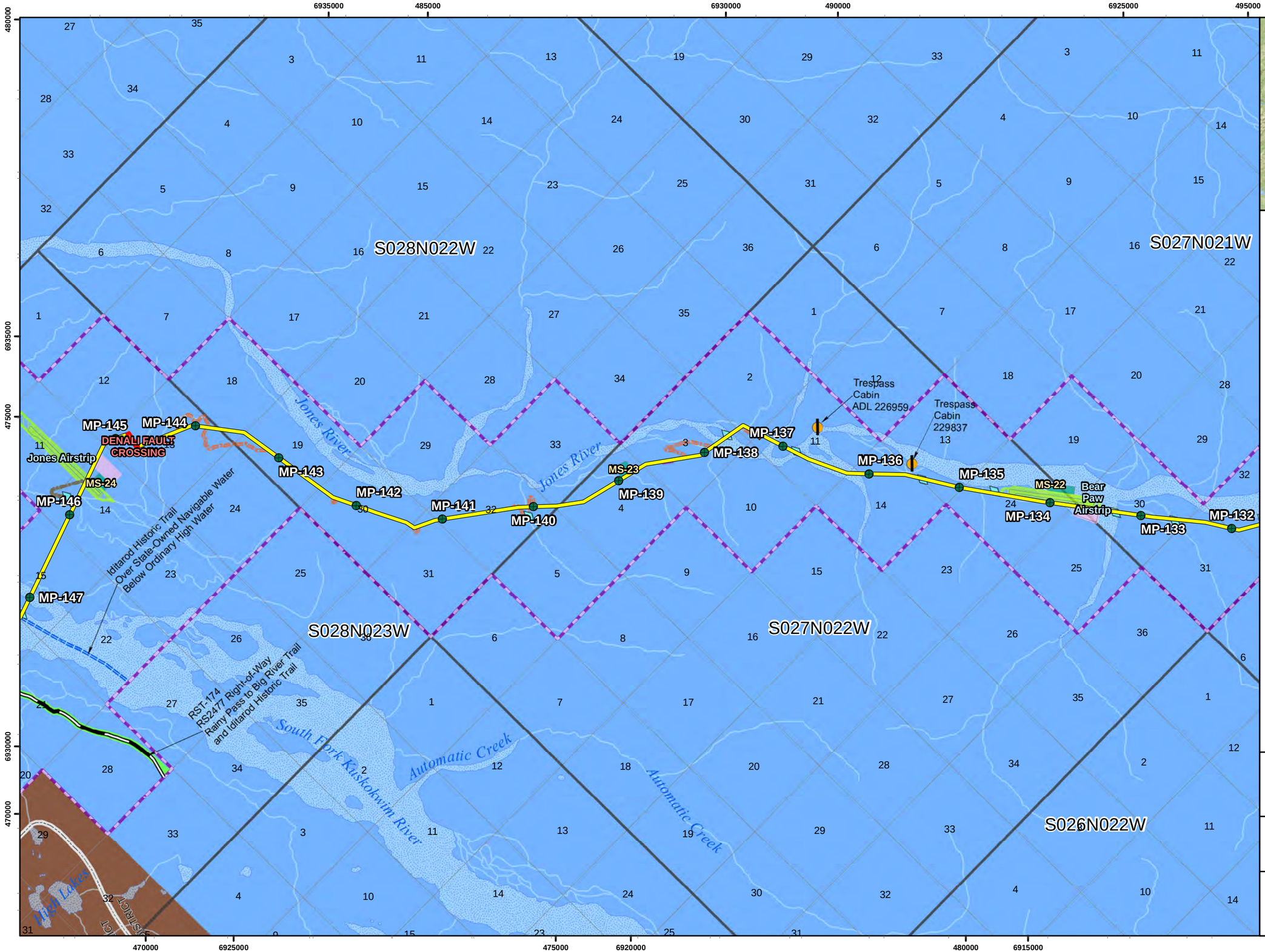

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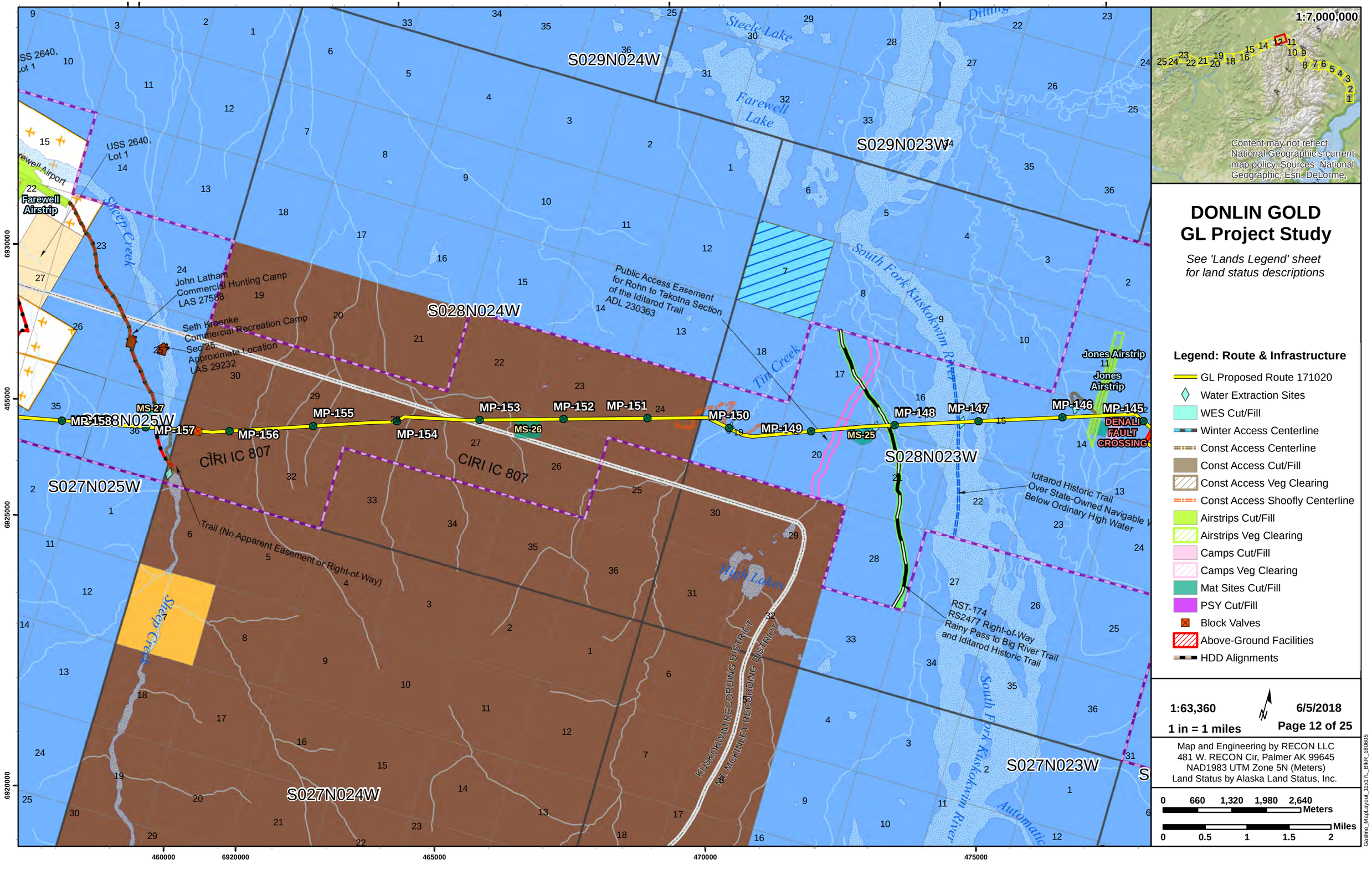

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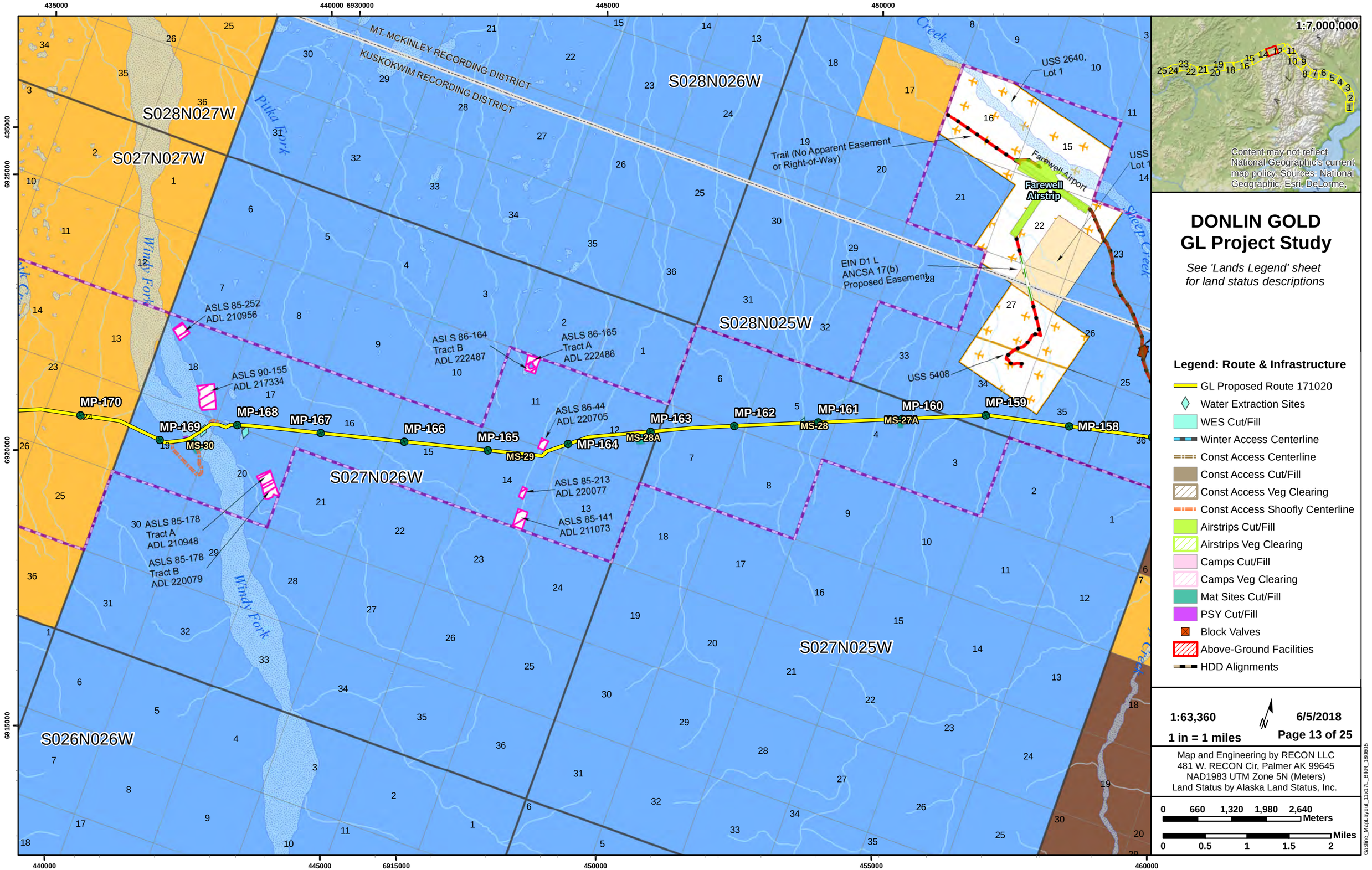

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6915000 420000 6910000

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S028N027W
S026N029W
S027N027W
S026N028W
S027N026W
S026N027W
S025N028W
S026N026W

MP-182 MP-181 MP-180 MS-34 MP-179 MP-178 MS-33 MP-177 MP-176 MS-32 MP-175 MP-174 MP-173 MP-172 MS-31 MP-171 MP-170

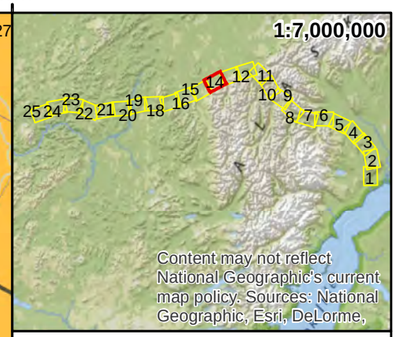
Middle Fork

Khuchaynik Creek

Doyon, Ltd. 14(h) (1) Historical Site Apln. AA-12321 "Huchaynik #2"

Philip Esai & John Runkle 4 Recreational Use Permit Hunting Guide d/b/a Silvertip Guide Service AA 070130

Doyon, Ltd. Apln.14(h) (1) Historical Site Apln. AA-12320 "Huchaynik #1"



DONLIN GOLD
GL Project Study

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- Camps Veg Clearing
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- PSY Cut/Fill
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- HDD Alignments

1:63,360
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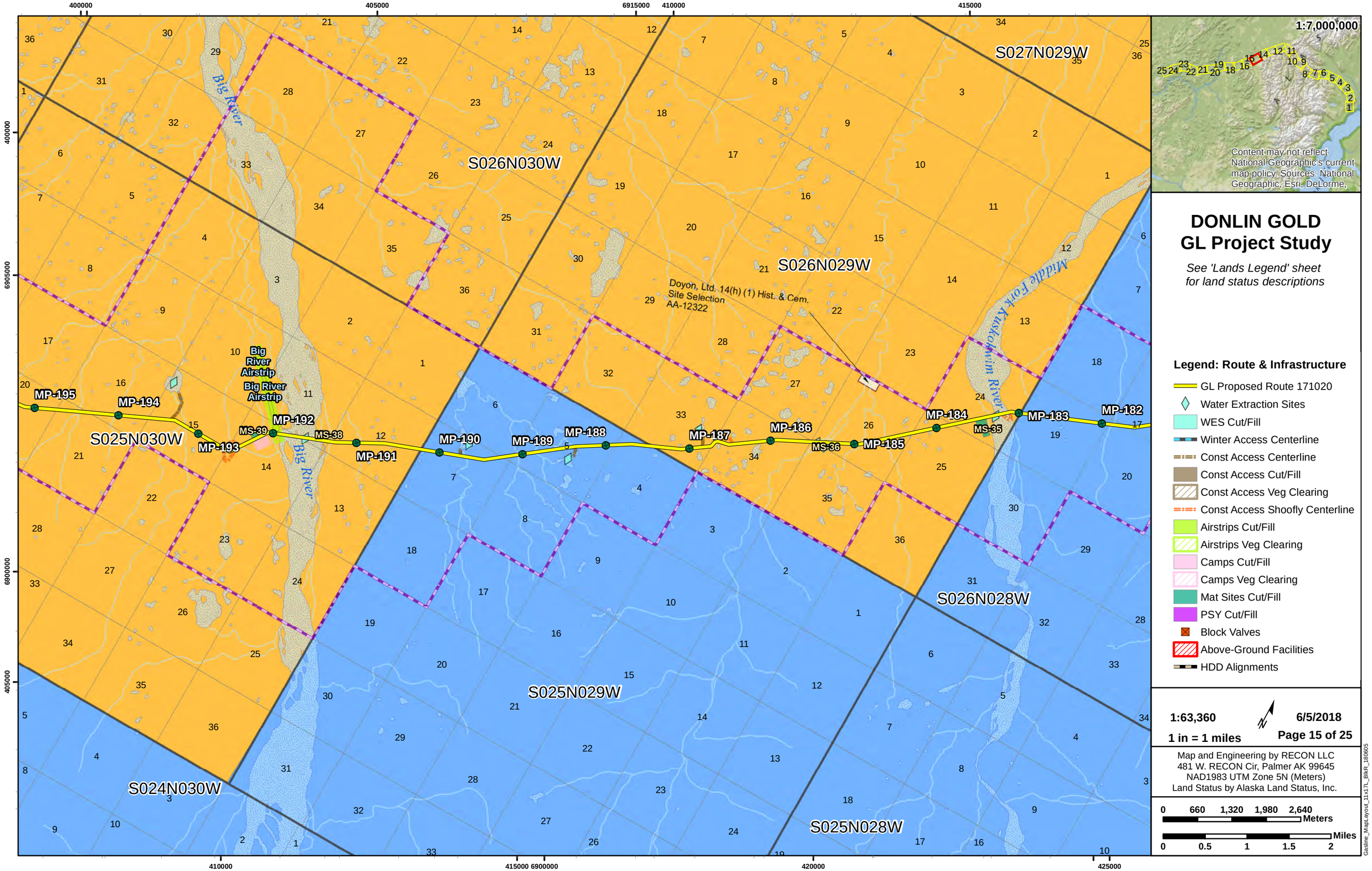
6/5/2018
Page 14 of 25

Map and Engineering by RECON LLC
481 W. RECON Cir, Palmer AK 99645
NAD1983 UTM Zone 5N (Meters)
Land Status by Alaska Land Status, Inc.

0 660 1,320 1,980 2,640 Meters

0 0.5 1 1.5 2 Miles

Gasline_MapLayout_11x17L_BkR_180605



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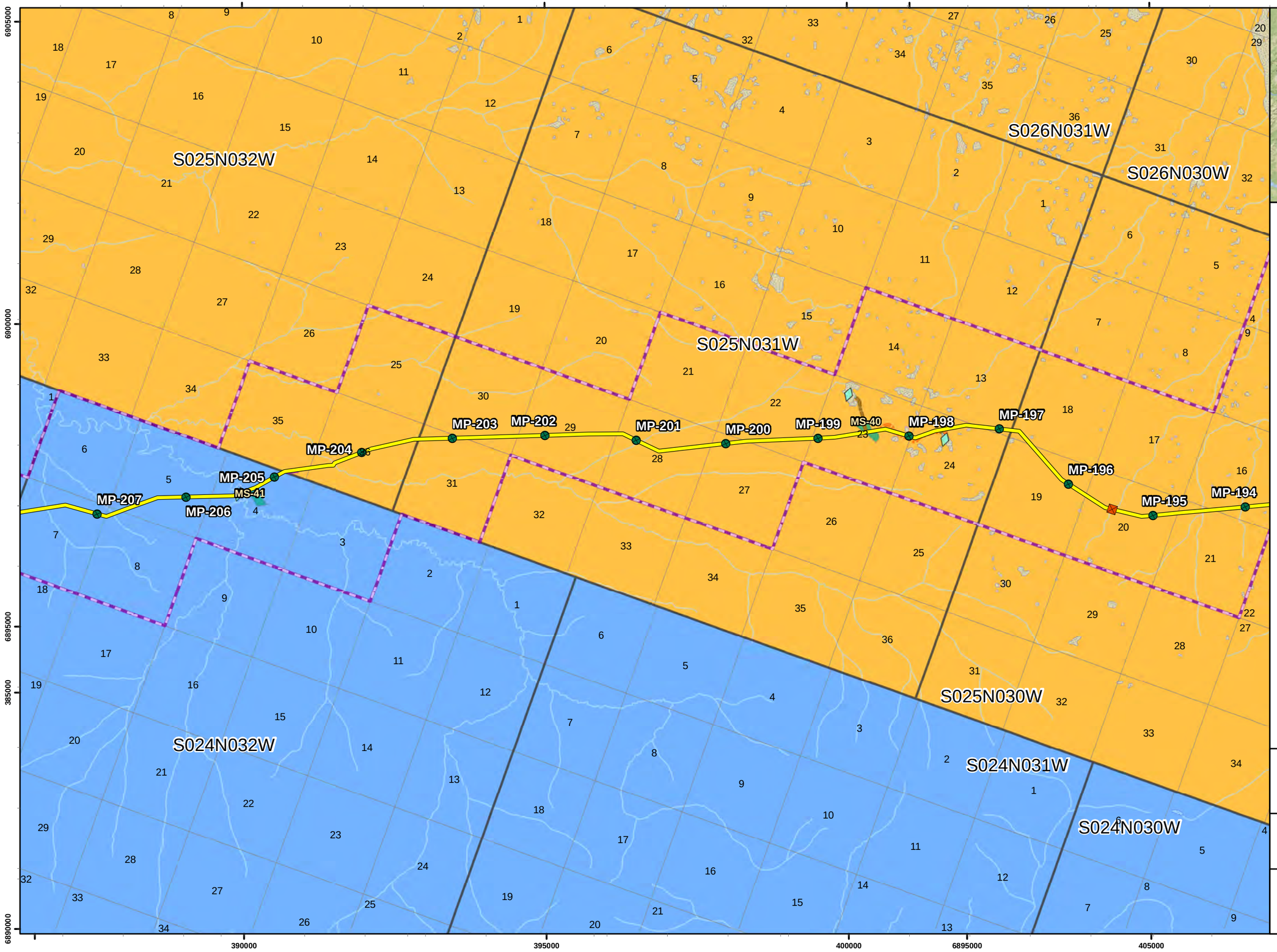

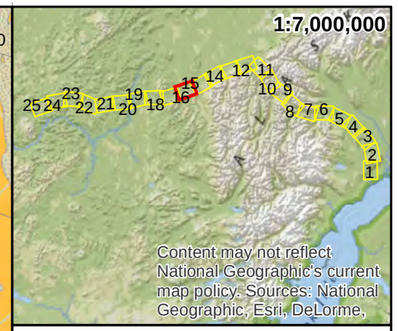

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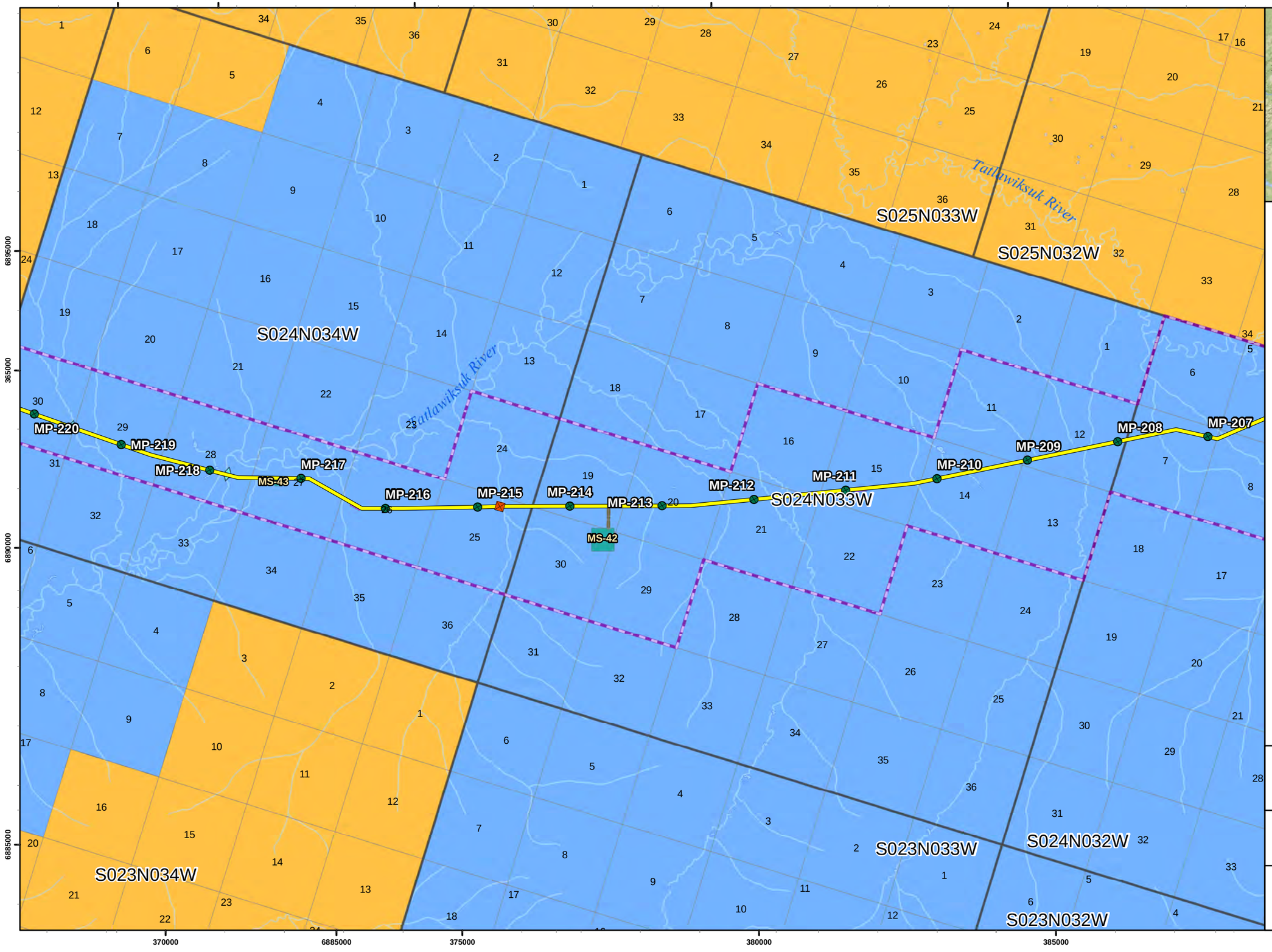

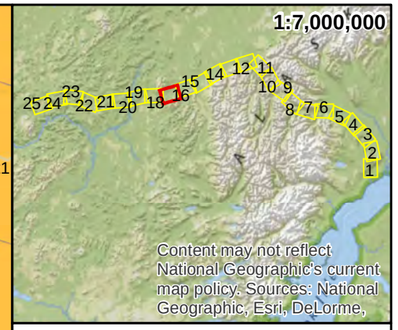

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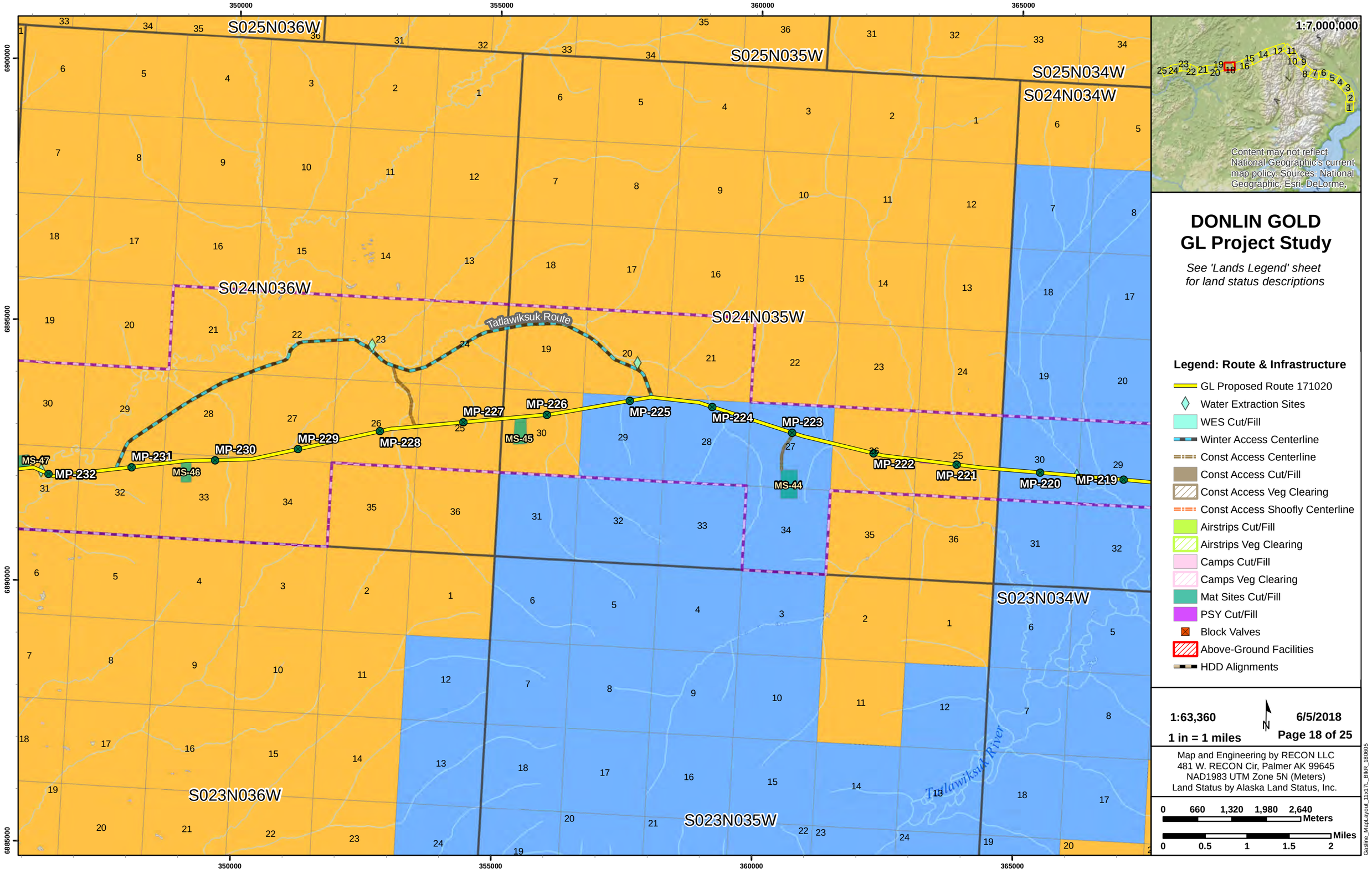
350000
355000
360000
365000
6900000
6895000
6890000
6885000
S025N036W
S025N035W
S025N034W
S024N034W
S024N036W
S024N035W
S023N034W
S023N036W
S023N035W
Tatlawiksuk Route
Tatlawiksuk River
MP-232
MP-231
MP-230
MP-229
MP-228
MP-227
MP-226
MP-225
MP-224
MP-223
MP-222
MP-221
MP-220
MP-219
MS-47
MS-46
MS-45
MS-44
1:7,000,000
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme,
DONLIN GOLD
GL Project Study
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Meters
0 0.5 1 1.5 2
Miles
Gasline_MapLayout_11x17L_BlkR_180605

330000 335000 3400006900000 345000

6895000 6890000 6885000

S024N038W S024N037W S024N036W S023N038W S023N037W S023N036W S022N038W

MP-245 MP-244 MP-243 MP-242 MP-241 MP-240 MP-239 MP-238 MP-237 MP-236 MP-235 MP-234 MP-233 MP-232 MP-231

MS-53 MS-52 MS-50 MS-48 MS-47

Tatlawiksuk Route

Kuskokwim East Airstrip

Kuskokwim East Airstrip

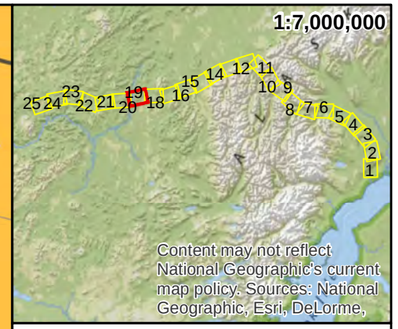
USS 8074 Native Allotment Nick Bobby 50-99-0309

State-Selected Calista 14(h)(1) Cemetery and Historical Site Selection (AA10413) Excluded from TA to State. 14(h)(1) Apln Later Closed, but Doughnut -Hole not Conveyed to State. Remains Federally-owned and State Selected.

USS 12428 Native Allotment Multiple Heirs of Nicholi Wasky 50-2000-0060

State-Selected Calista 14(h)(1) Cemetery and Historical Site Selection (AA10413) Excluded from TA to State. 14(h)(1) Apln Later Closed, but Doughnut -Hole not Conveyed to State. Remains Federally-owned and State Selected.

Kuskokwim River



DONLIN GOLD GL Project Study

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0 0.5 1 1.5 2 Miles

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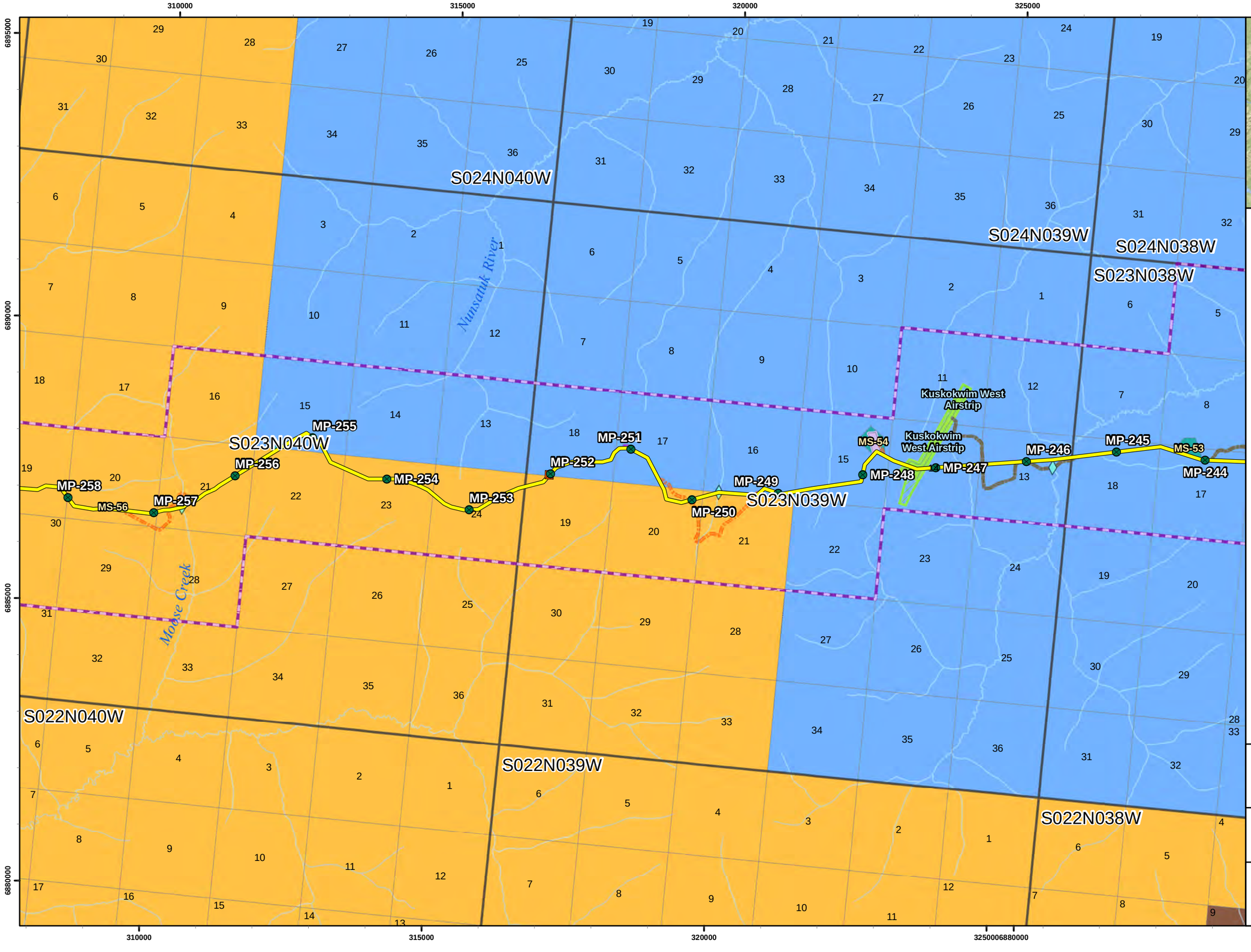

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0 0.5 1 1.5 2 **Miles**

Gasline_MapLayout_11x17L_BlkR_180605

290000 295000 300000 305000

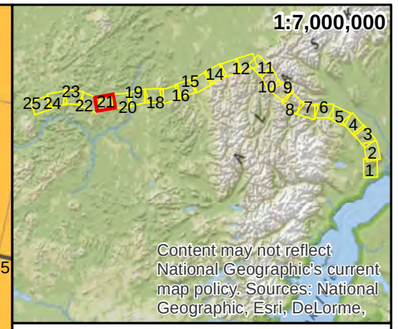
6890000 6885000 6880000

S024N041W
S023N042W
S023N041W
S023N040W
S022N042W
S022N041W
S022N040W

MP-269 MP-268 MP-267 MP-266 MS-57 MP-265 MP-264 MP-263 MP-262 MP-261 MP-260 MP-259 MP-258 MS-56
MP-270 MS-58 MP-271 MP-272

Moose Creek

290000 295000 300000 305000 310000



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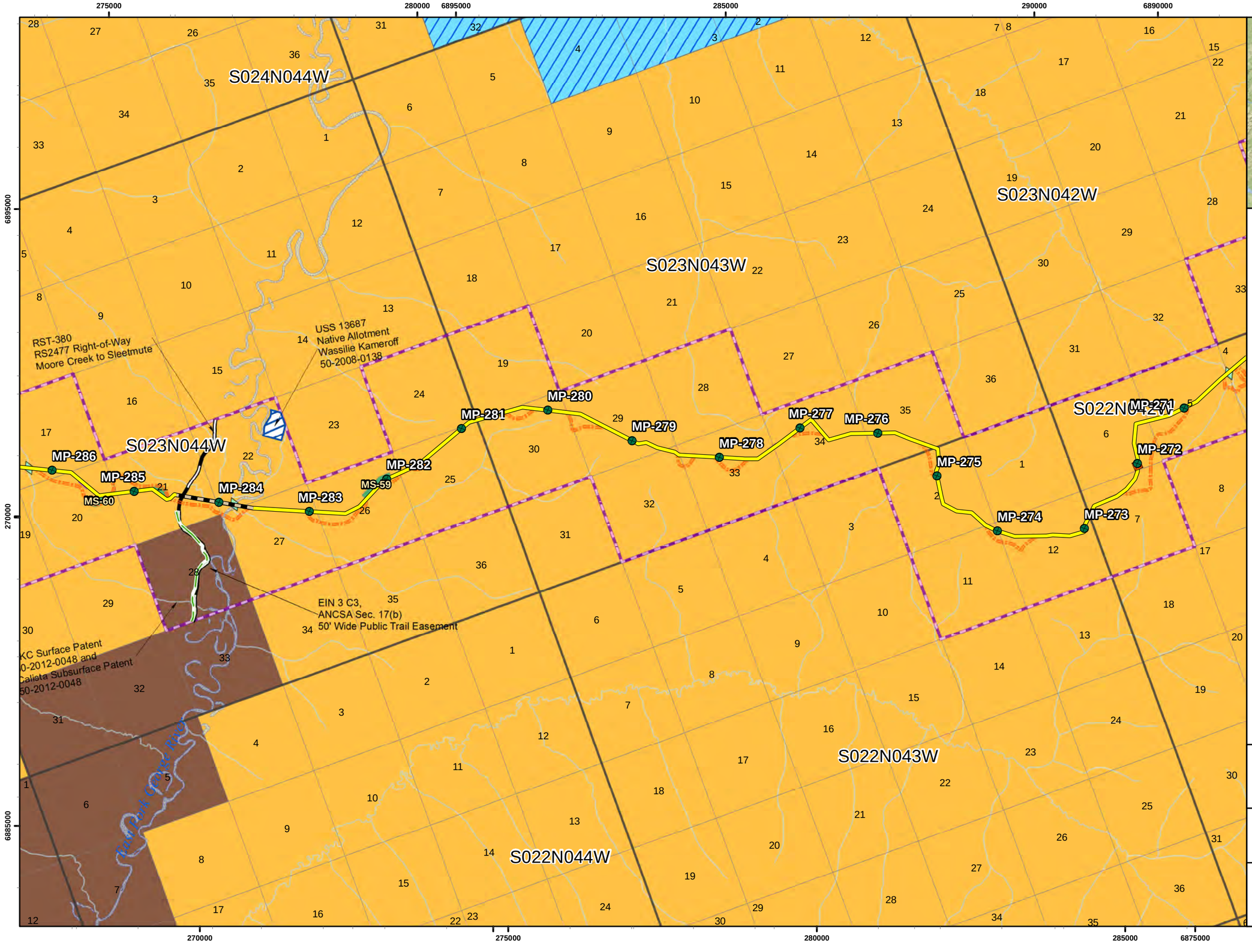

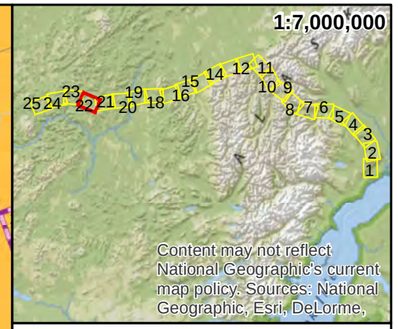

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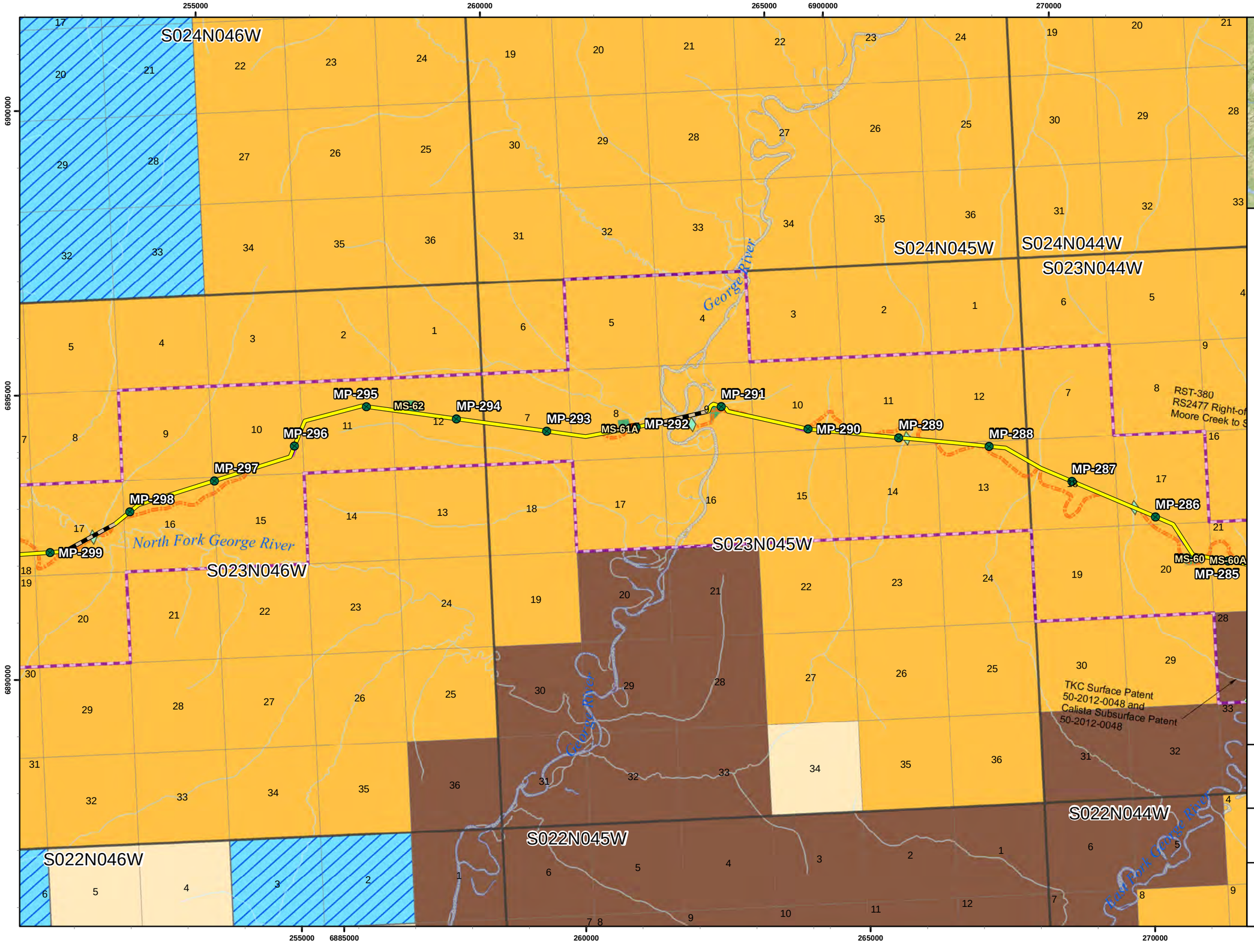

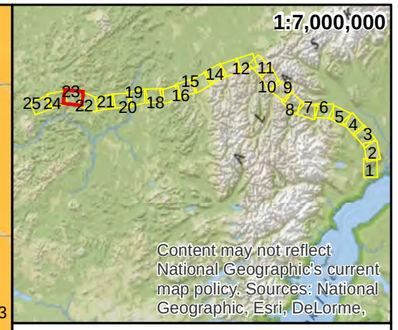

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235000 240000 245000 250000

6895000 6890000

Note.Discrepancy Between Calista Patent 50-2007-0148 and BLM Iditarod A-5 17(b) Easement Map. EIN 9 D1 and EIN 11 D1 Terminate Upon Entering Public Land in Section 23 at Section Line Common to Section 22 (Calista land) and Section 23 (BLM public land) per 50-2007-0148. However, BLM Iditarod A-5 Easement Map Depicts EIN 9 D1 and EIN 11 D1 Continuing for Approx. ¼ mile into Public Land Section 23

S024N047W

S024N046W

S023N048W

S023N047W

S023N046W

S022N048W

S022N047W

S022N046W

RST-76
RS2477 Right-of-Way
Flat to Georgetown

EIN 11 D1
ANCSA Sec. 17 (b)
50' Wide Public Easement
for Existing Trail

EIN 9 D1
ANCSA Sec. 17 (b)
50' Wide Public Easement
for Existing Trail

CALISTA PATENT
50-2007-0148

Bell Creek Trail

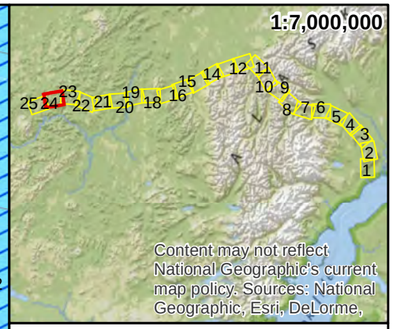
EIN 10 D1
ANCSA Sec. 17(b)
50' Wide Public Easement
for Existing Trail

RST-548
RS2477 Right-of-Way
Dome Creek-Anaconda-Bell Creek Trail

RST-549
RS2477 Right-of-Way
Dome Creek-Bell Creek-Ridgetop Trail

MP-298
MP-299
MS-63
MP-300
MP-301
MP-302
MP-303
MP-304
MP-305
MP-306
MP-307
MP-308
MP-309
MP-310
MP-311
MP-312
MP-313
MP-314

Ophir Creek
Dome Creek
North Fork George River
Steamboat Creek



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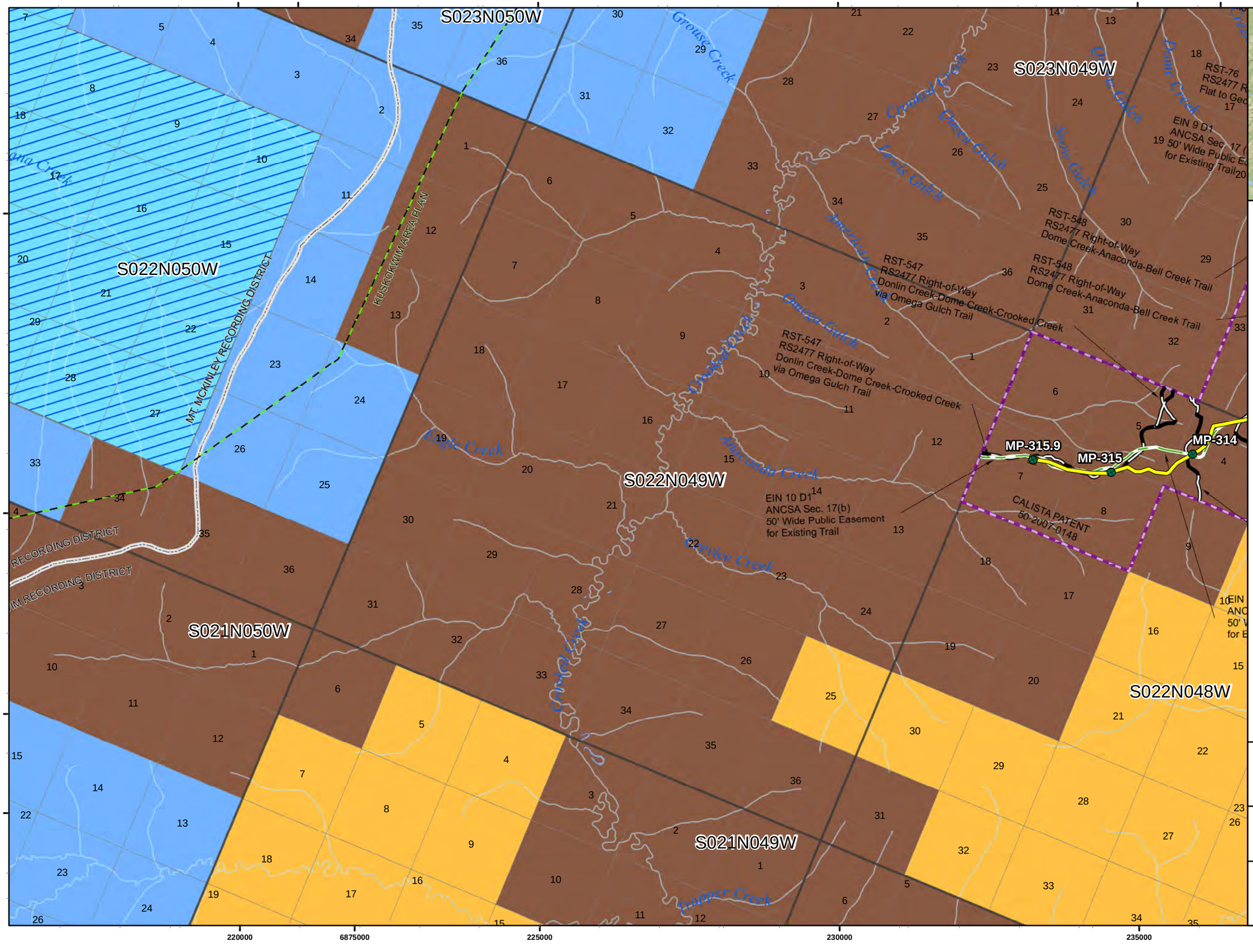

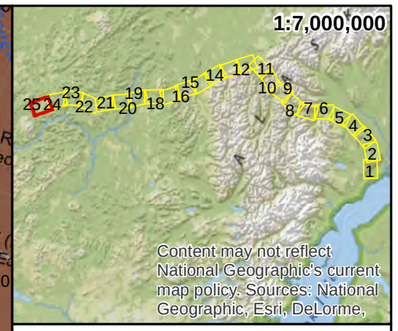

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