APPENDIX T. 2012 MIDDLE SUSITNA RIVER SEGMENT GEOMORPHIC FEATURES ON THE 2013 AERIALS

Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Geomorphology Study (6.5)

Mapping of Geomorphic Features and Turnover within the Middle and Lower Susitna River Segments from 1950s, 1980s, and Current Aerials Technical Memorandum

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO
Clean, reliable energy for the next 100 years.

Prepared by

Tetra Tech Inc.

September 2014

150°W
149°30'W
149°W
148°30'W
62°40'N
62°30'N
62°20'N

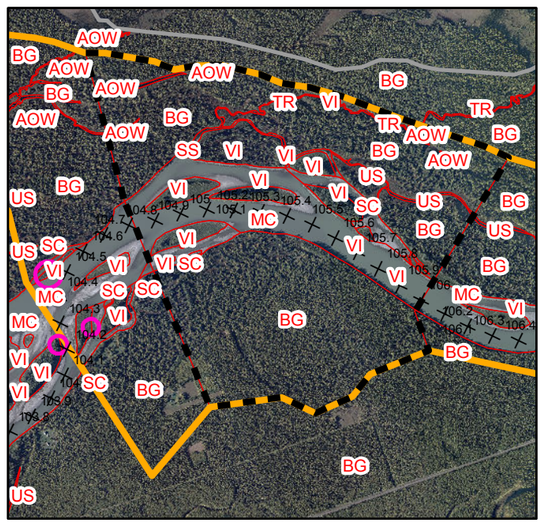
Indian River
Portage Creek
Devil Creek
Tsusena Creek
Susitna River
Chulitna River
Talkeetna River

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Legend For Individual Mapbook Pages

- Project River Mile
- Geomorphic Reach Breaks
- Geomorphic Assessment Area Extents
- Focus Area Extents
- Analysis Extent Boundary
- Middle River Erosion in Water Year 2012
- 2012 Geomorphic Features

Example Mapbook Page Data



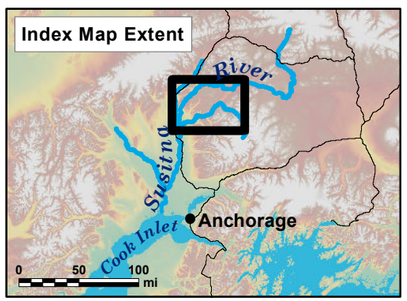
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MIDDLE SUSITNA RIVER SEGMENT 2012 GEOMORPHIC FEATURES 2013 AERIAL

Legend

- Proposed Watana Dam Site
- Sheet Extents
- Roads
- Railroads
- Rivers and Streams
- Waterbodies

Data Sources: See Map References



0 5 10 mi

Projection: NAD83 State Plane Alaska 4 FIPS 5004 (ft)
Date Created: 9/3/2014
Map Author: Tetra Tech
File: GeomFeat_2012_on_2013erials_MR_20140724_Cover.mxd



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See index page for legend and additional data information.

1 inch = 1,000 feet

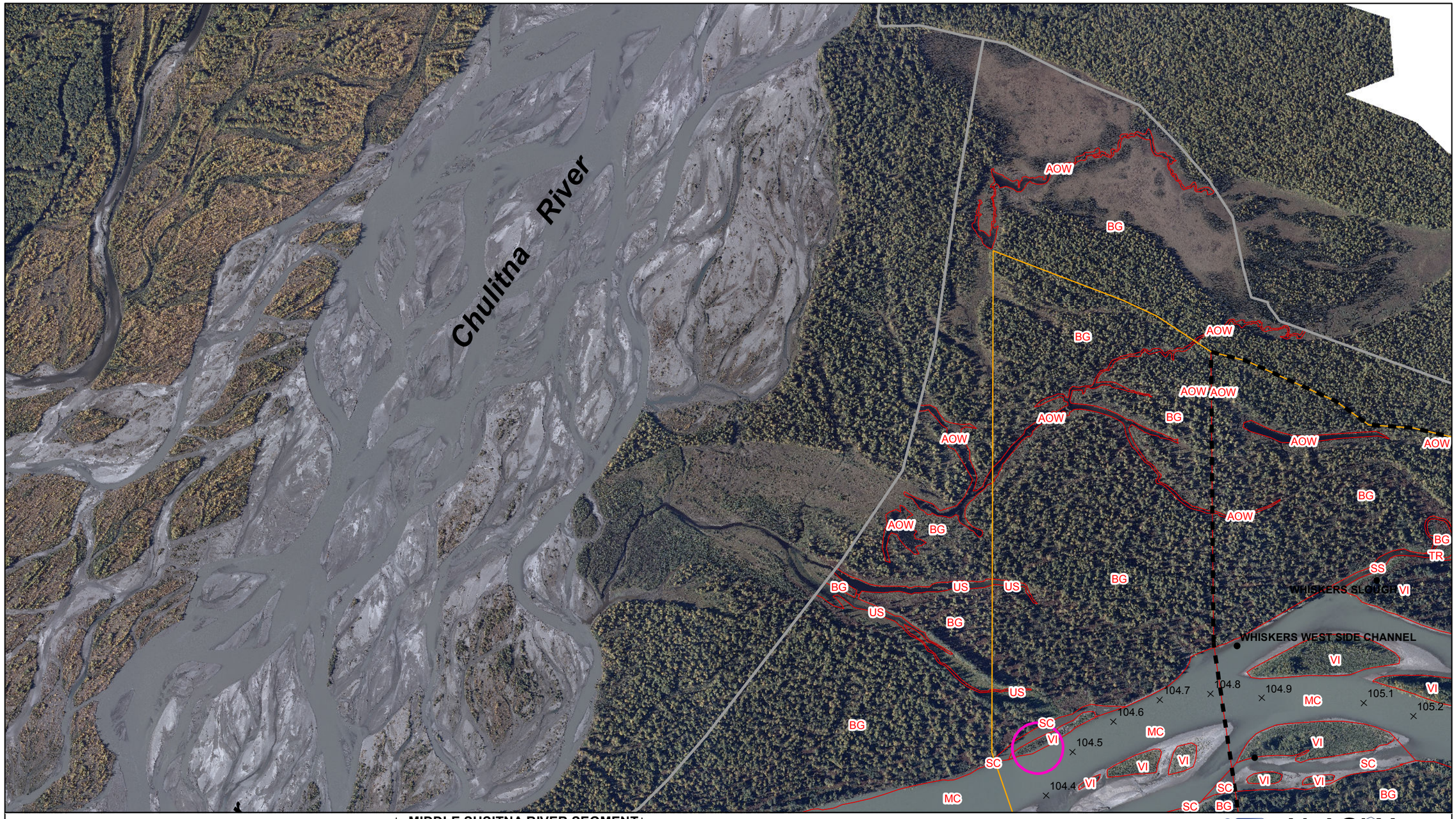
Sheet 1 of 34

MIDDLE SUSITNA RIVER SEGMENT 2012 GEOMORPHIC FEATURES on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 149 - 183	11/06/2013	6,200 cfs
PRM 183 - 187	09/16/2013	19,200 cfs

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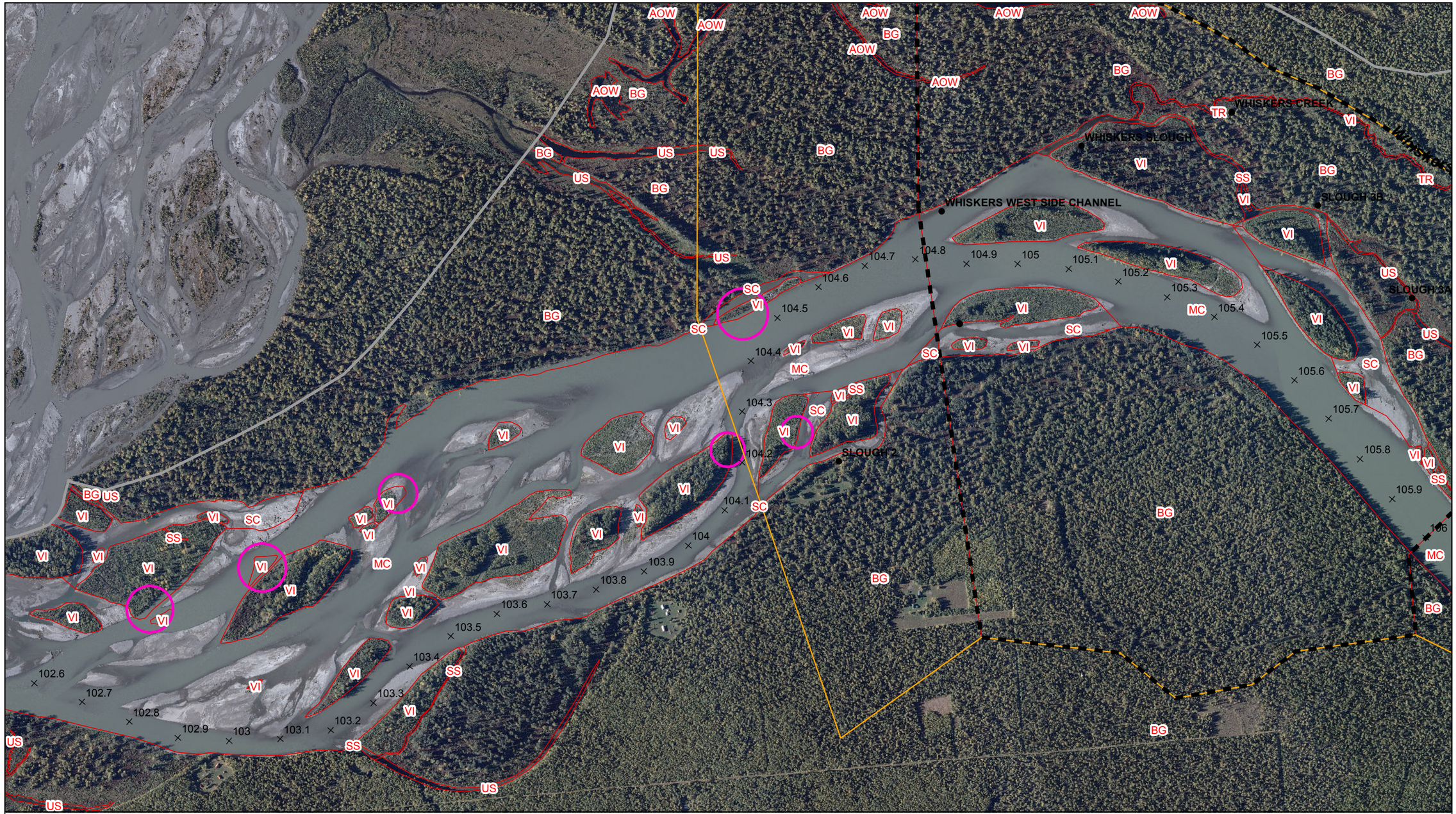
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MIDDLE SUSITNA RIVER SEGMENT 2012 GEOMORPHIC FEATURES on 2013 Aerials

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ALASKA ENERGY AUTHORITY



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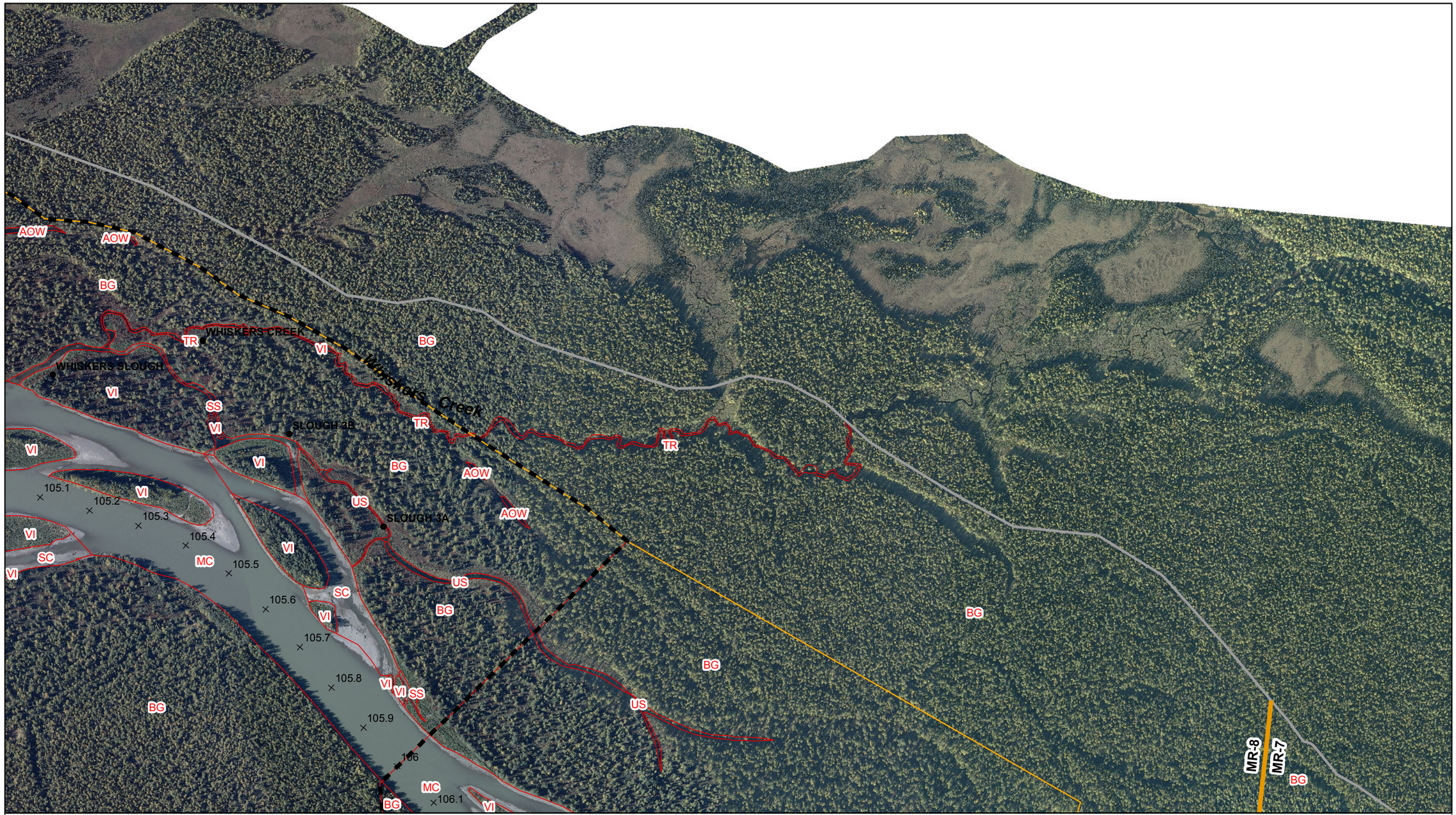
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MIDDLE SUSITNA RIVER SEGMENT 2012 GEOMORPHIC FEATURES on 2013 Aerials

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ALASKA ENERGY AUTHORITY



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Sheet 4 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
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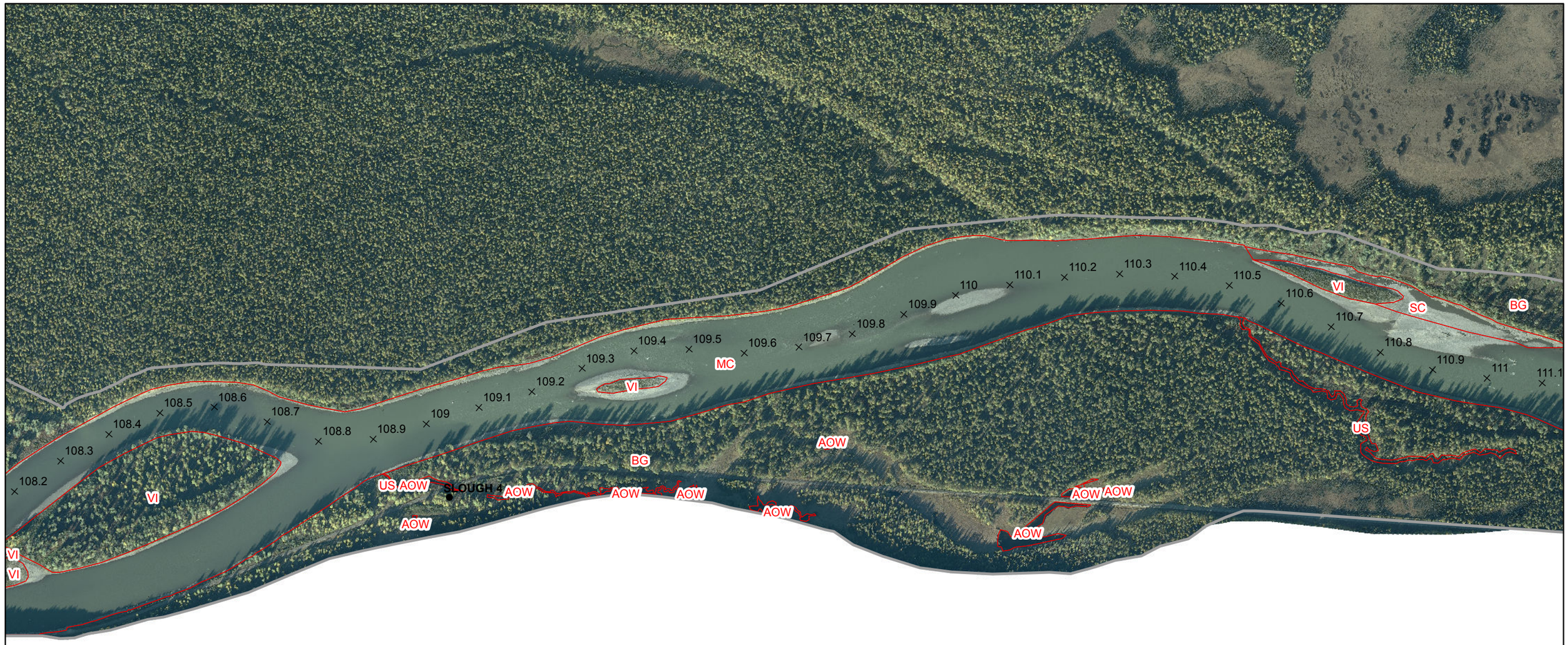
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MIDDLE SUSITNA RIVER SEGMENT
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Sheet 6 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
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ALASKA ENERGY AUTHORITY



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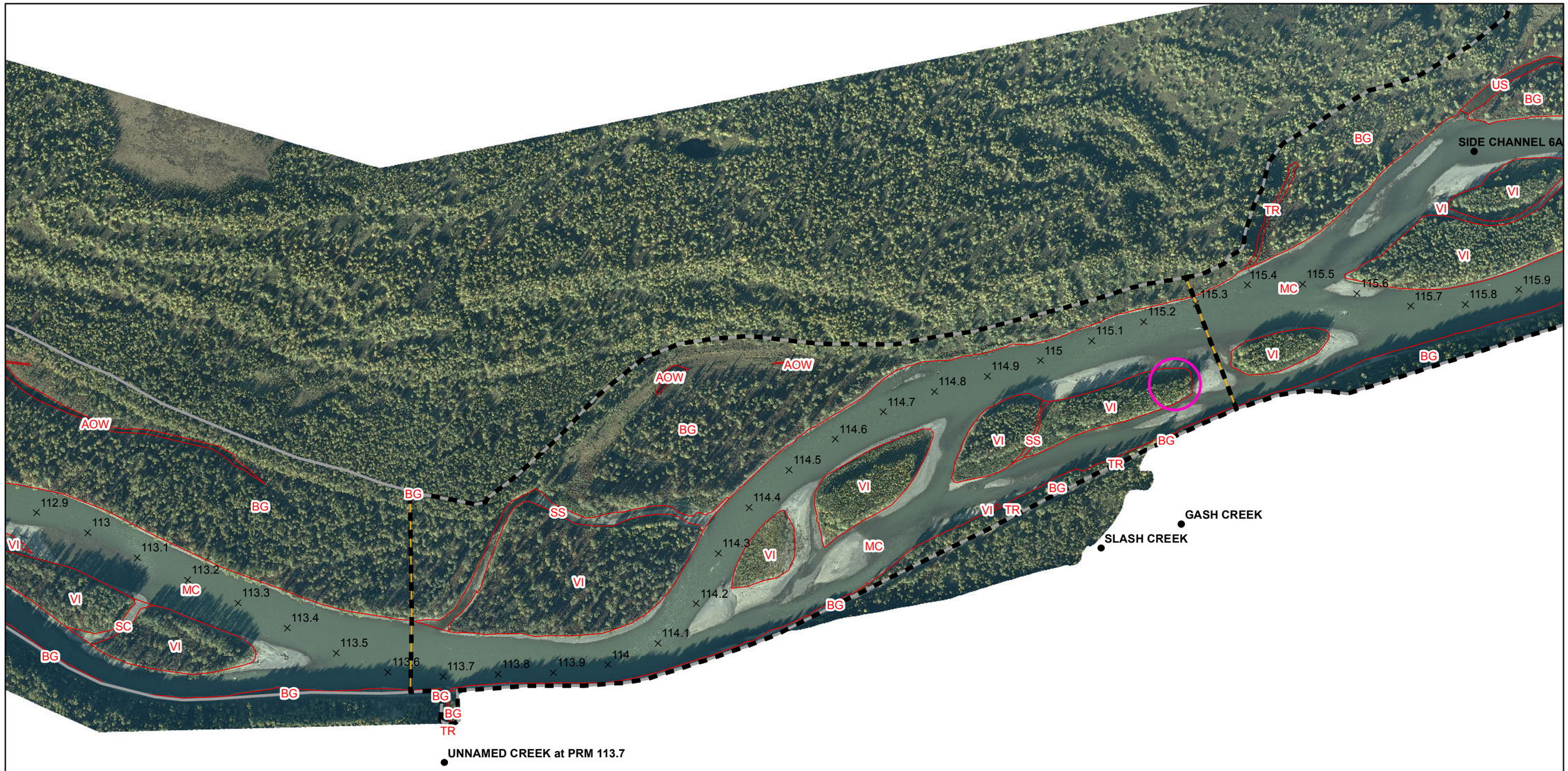
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MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
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ALASKA ENERGY AUTHORITY



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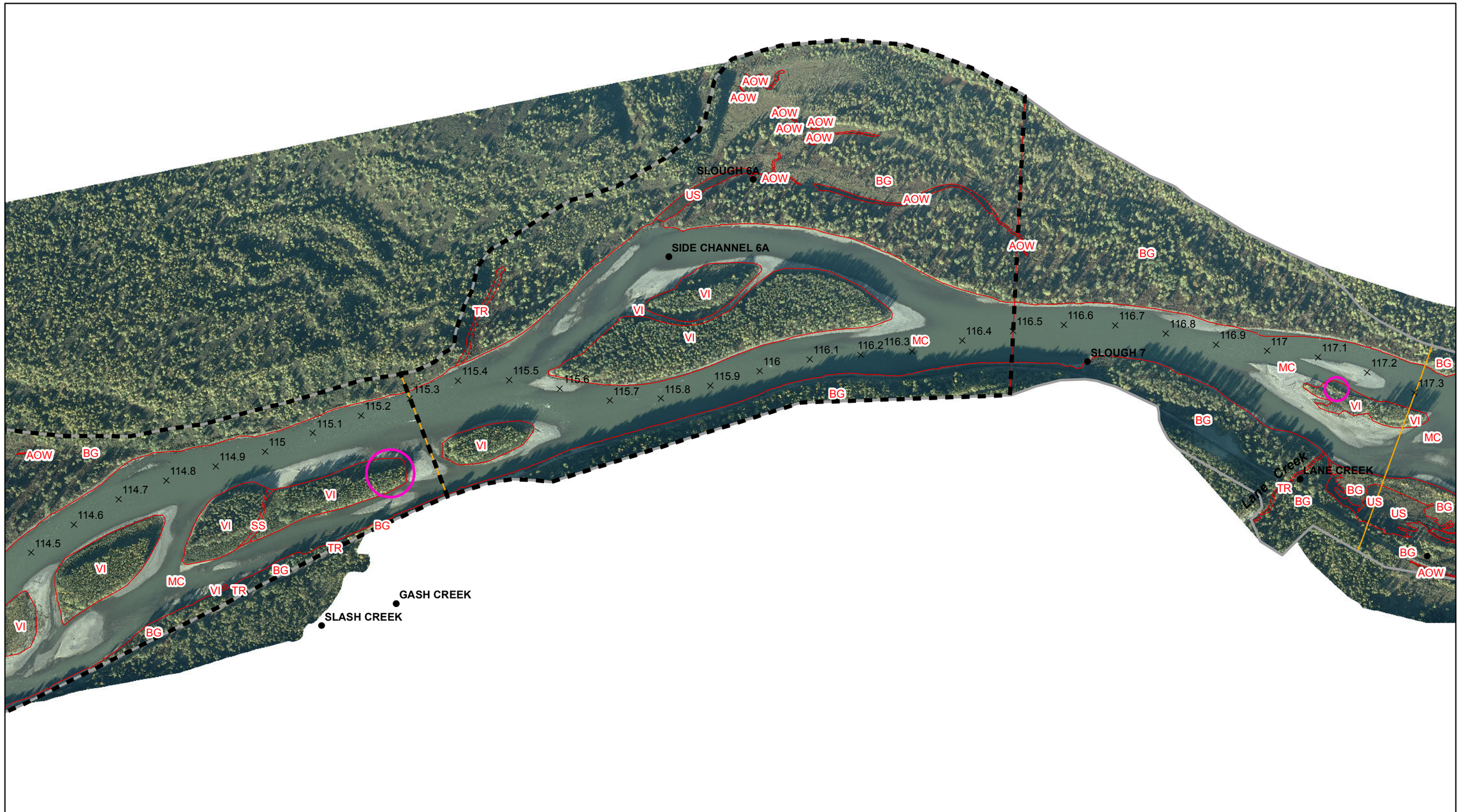
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MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
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ALASKA ENERGY AUTHORITY



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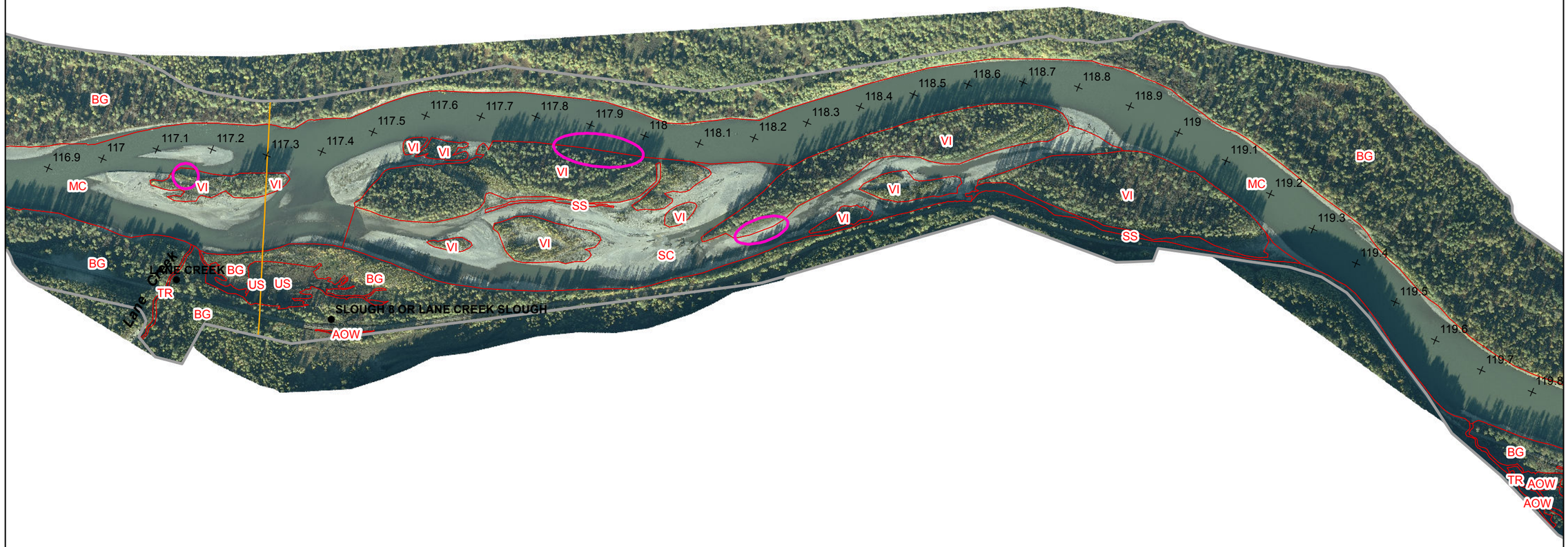
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MIDDLE SUSITNA RIVER SEGMENT 2012 GEOMORPHIC FEATURES on 2013 Aerials

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Location:	Imagery Date,	Discharge (Gold Creek)
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Sheet 10 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)	Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs	**PRM 149 - 183**	11/06/2013	6,200 cfs
			PRM 183 - 187	09/16/2013	19,200 cfs

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Sheet 11 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
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Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

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ALASKA ENERGY AUTHORITY



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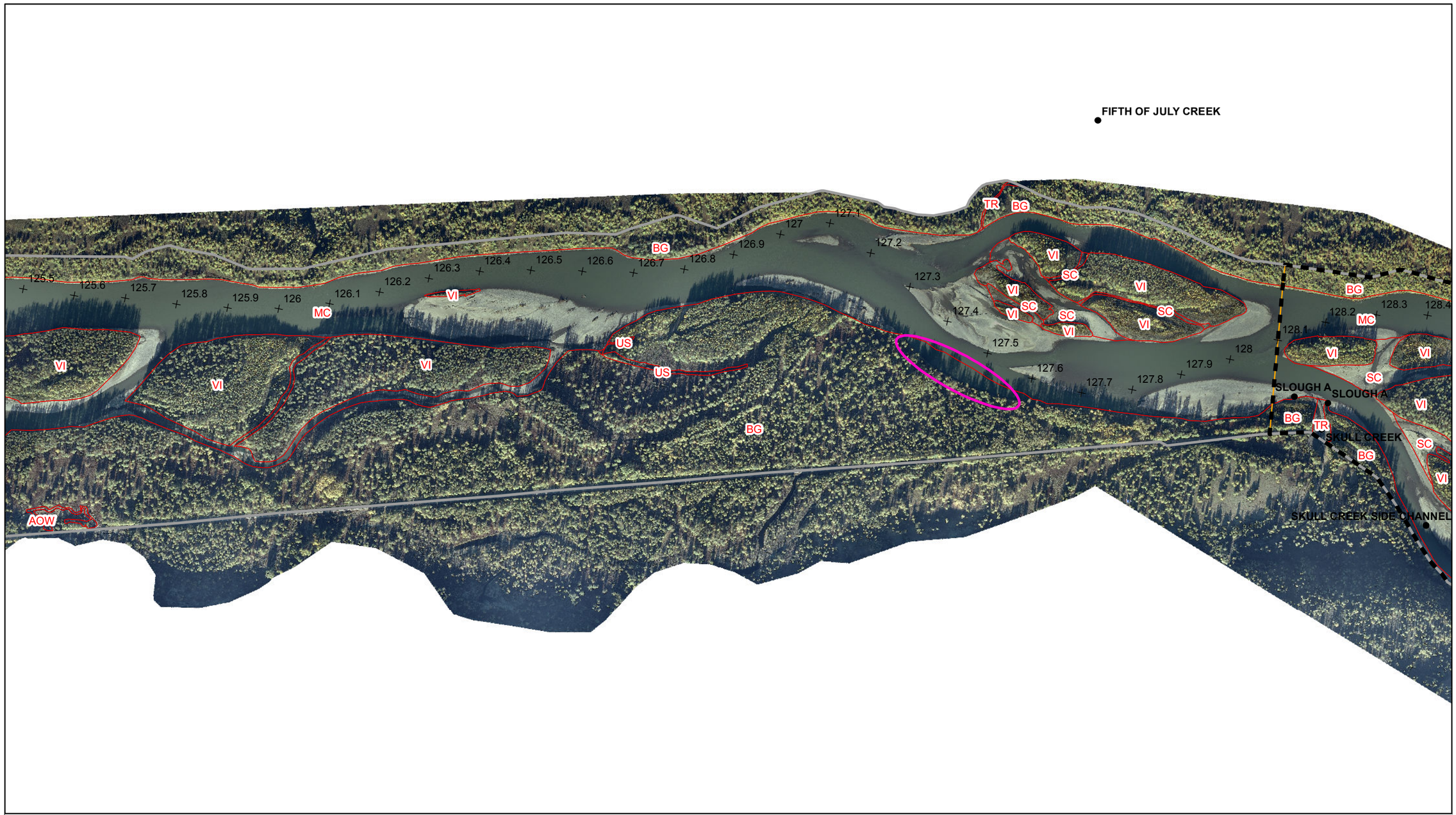
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MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
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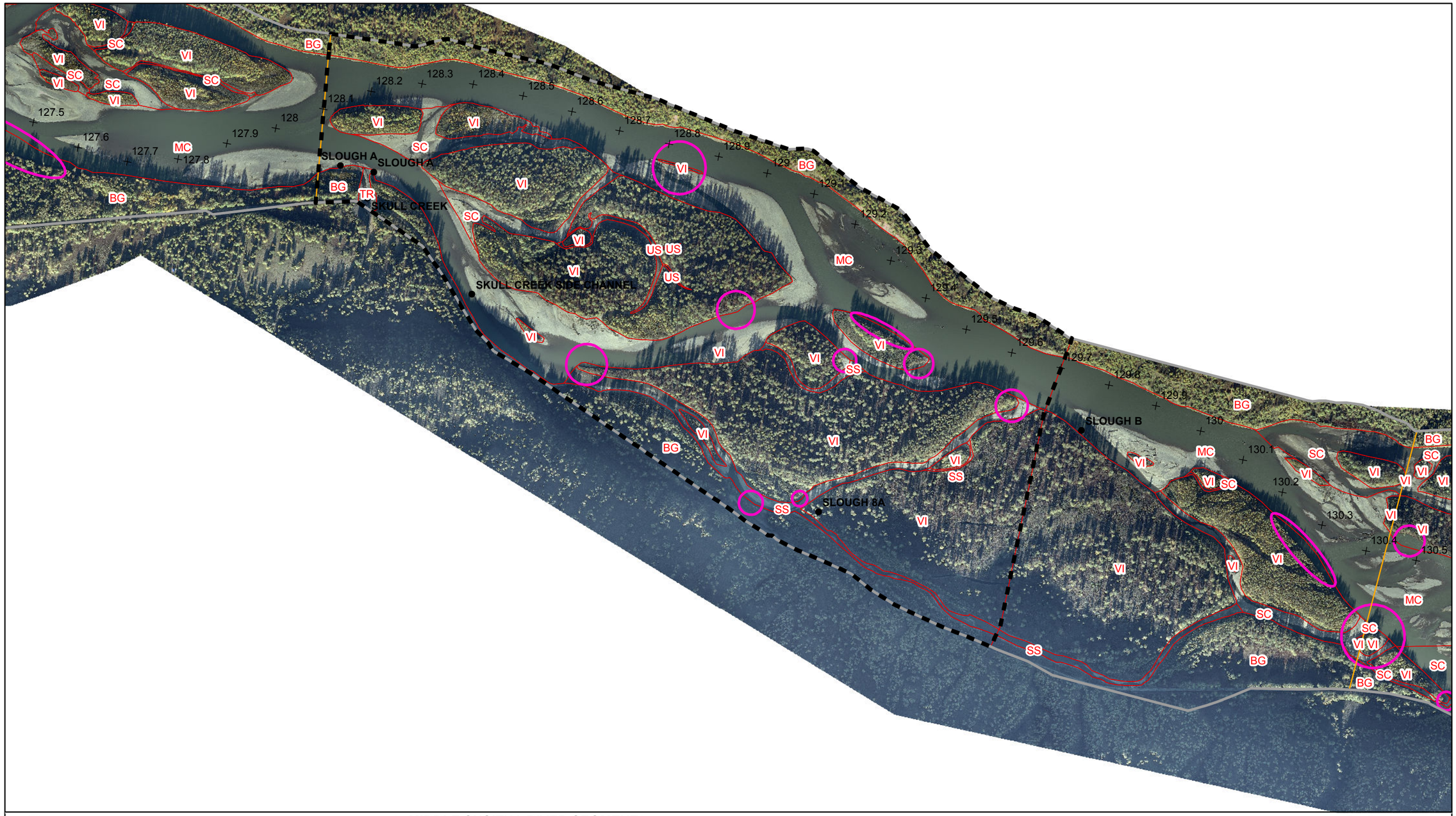
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MIDDLE SUSITNA RIVER SEGMENT
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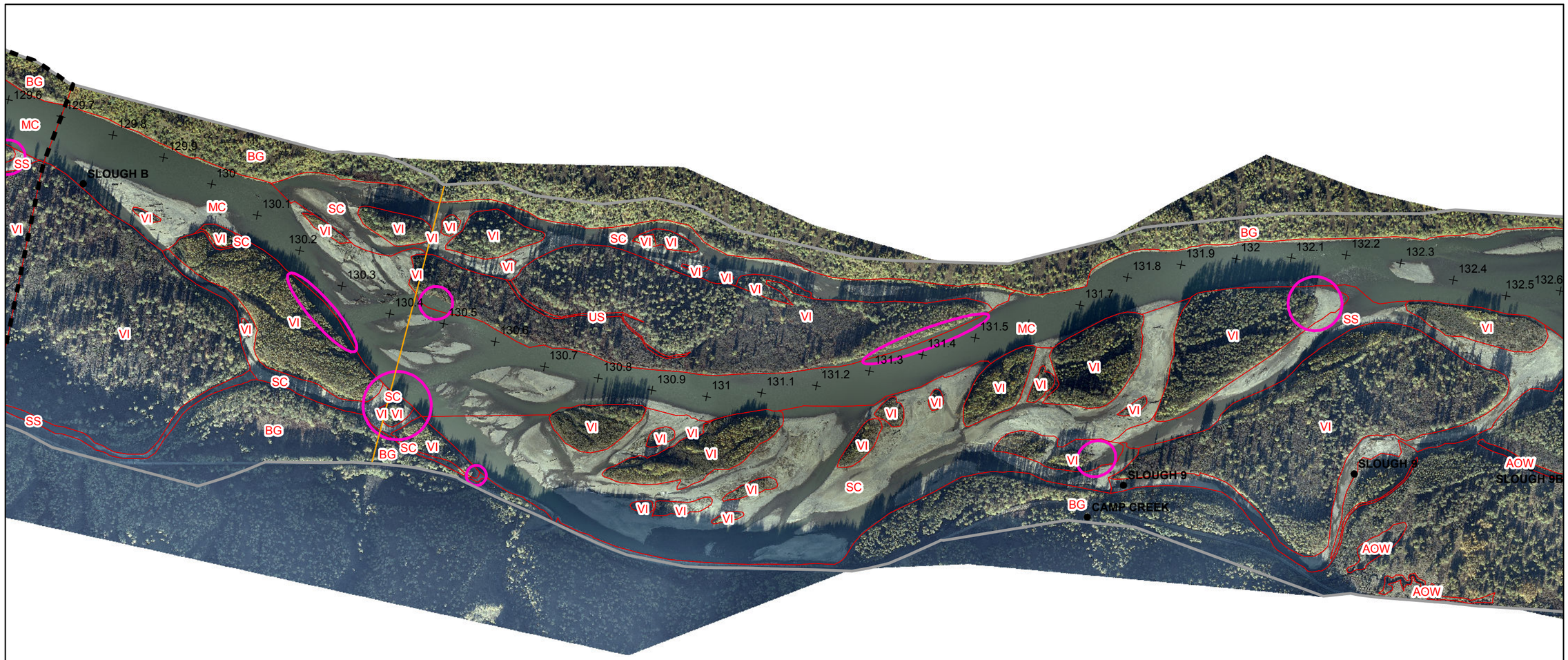
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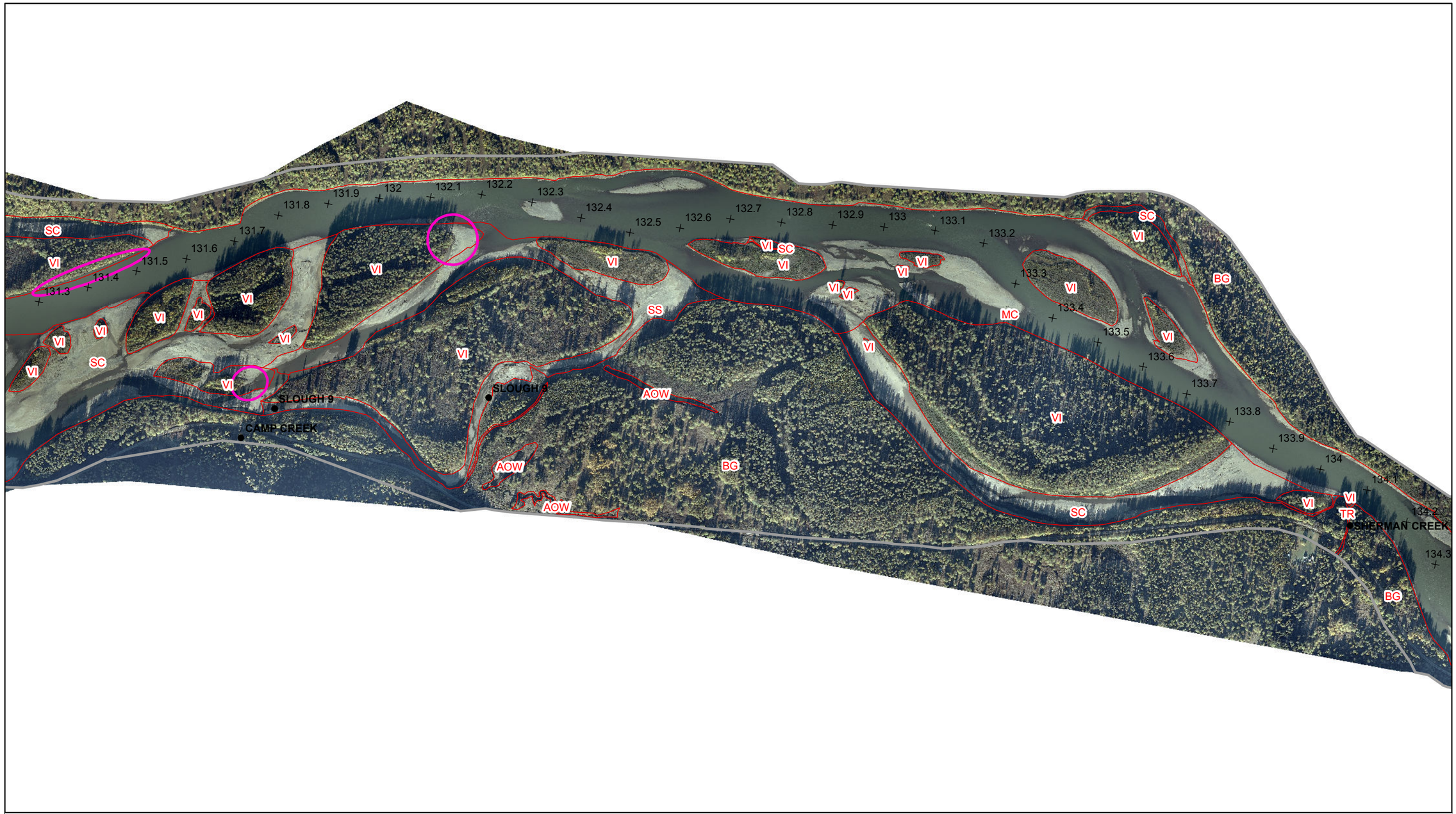
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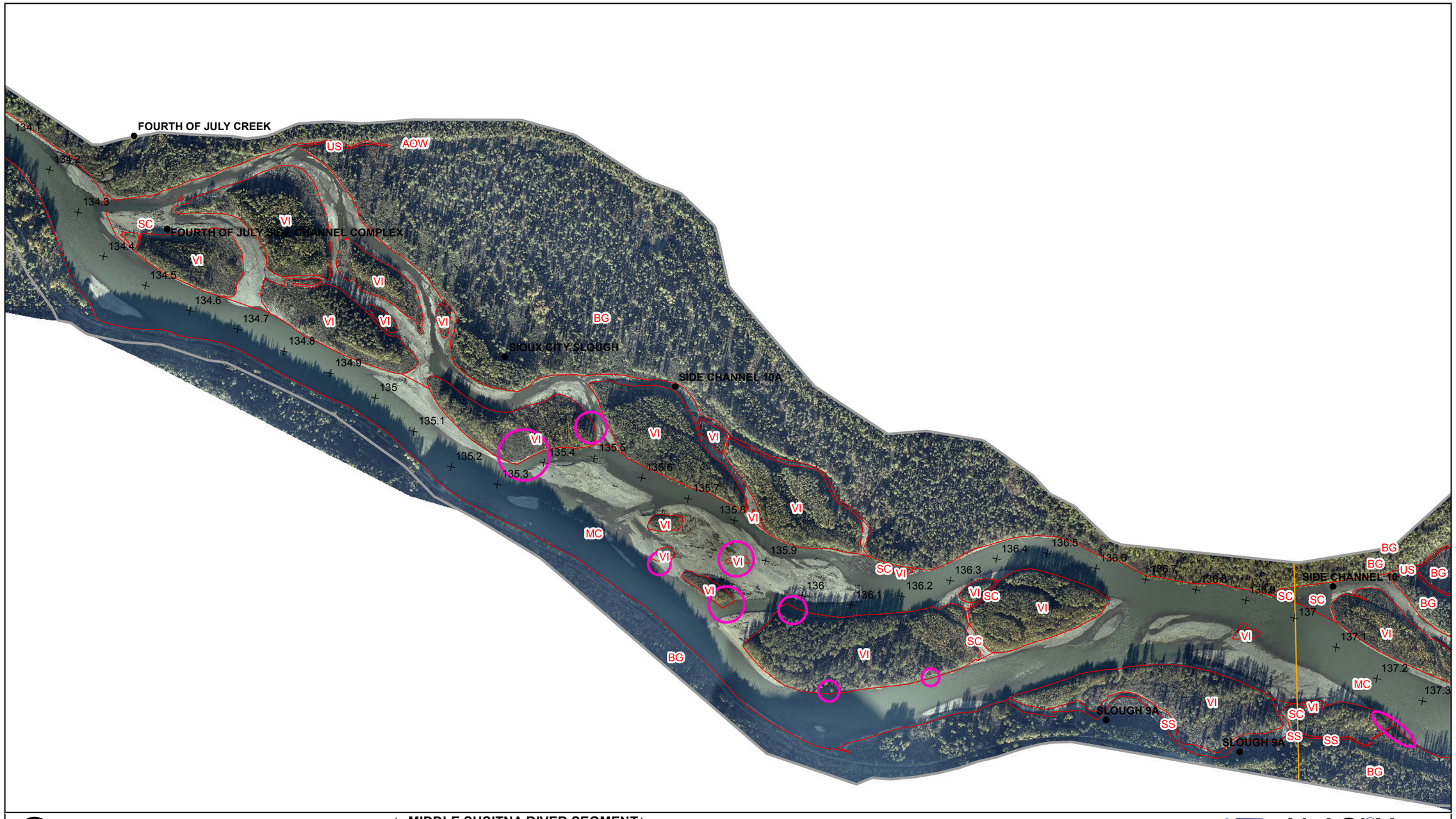
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MIDDLE SUSITNA RIVER SEGMENT 2012 GEOMORPHIC FEATURES on 2013 Aerials

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ALASKA ENERGY AUTHORITY



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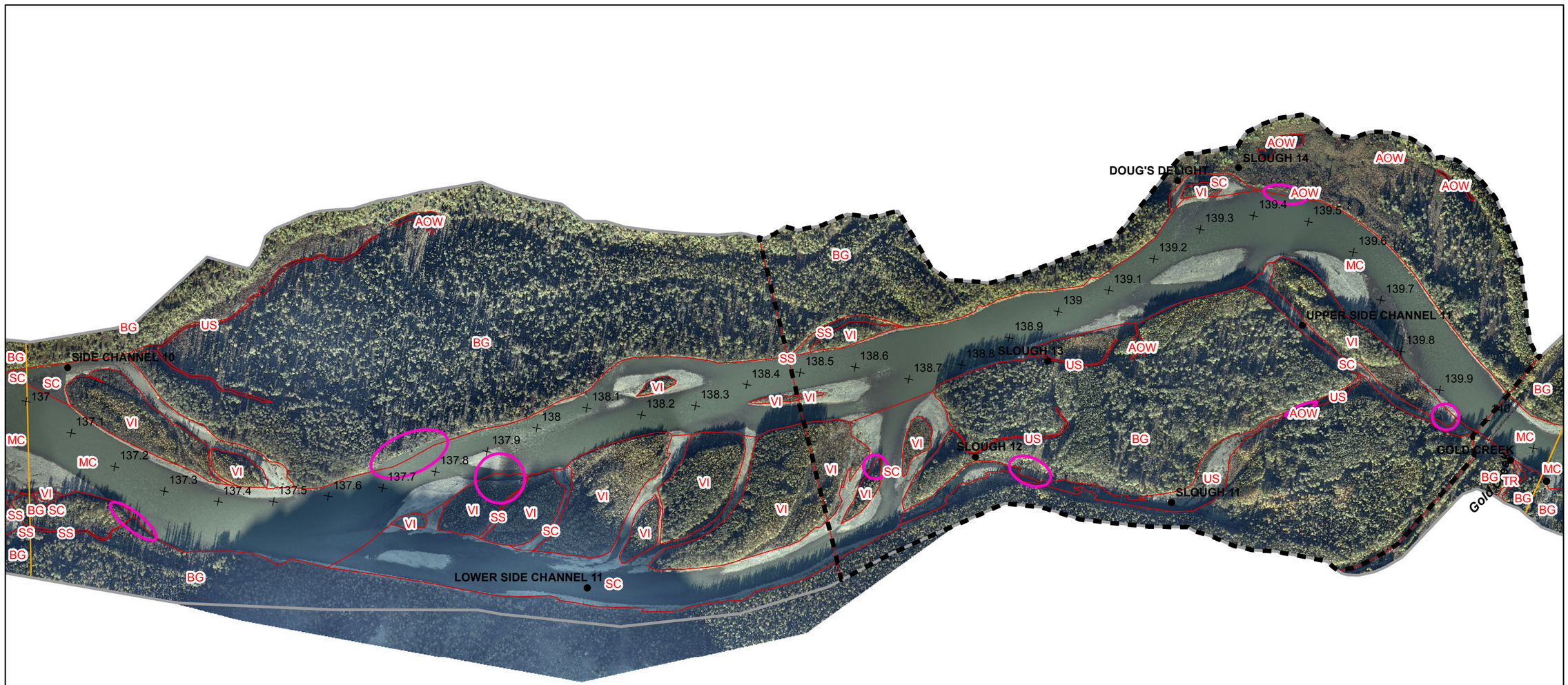
Sheet 17 of 34

MIDDLE SUSITNA RIVER SEGMENT 2012 GEOMORPHIC FEATURES on 2013 Aerials

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ALASKA ENERGY AUTHORITY



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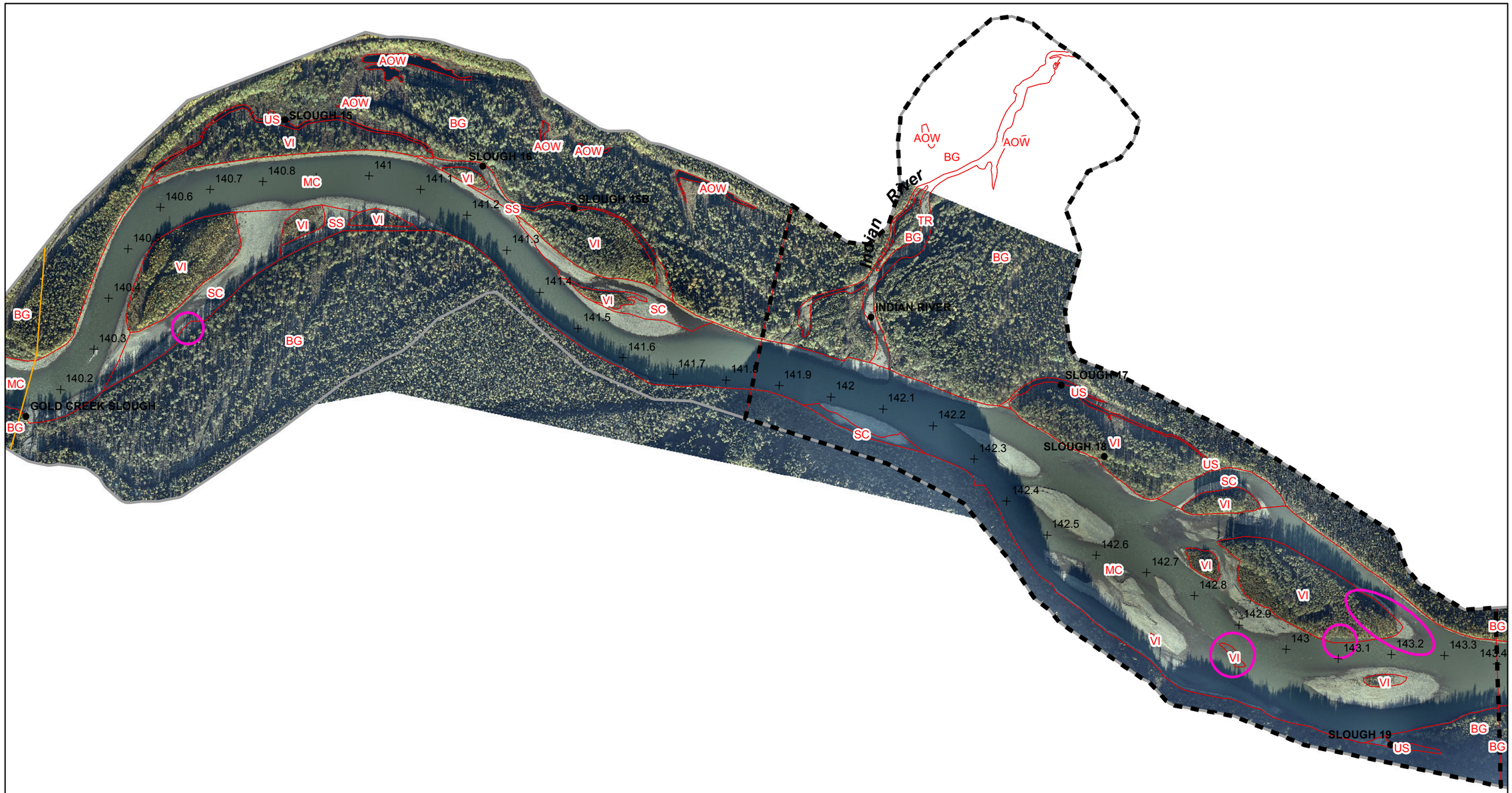
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MIDDLE SUSITNA RIVER SEGMENT
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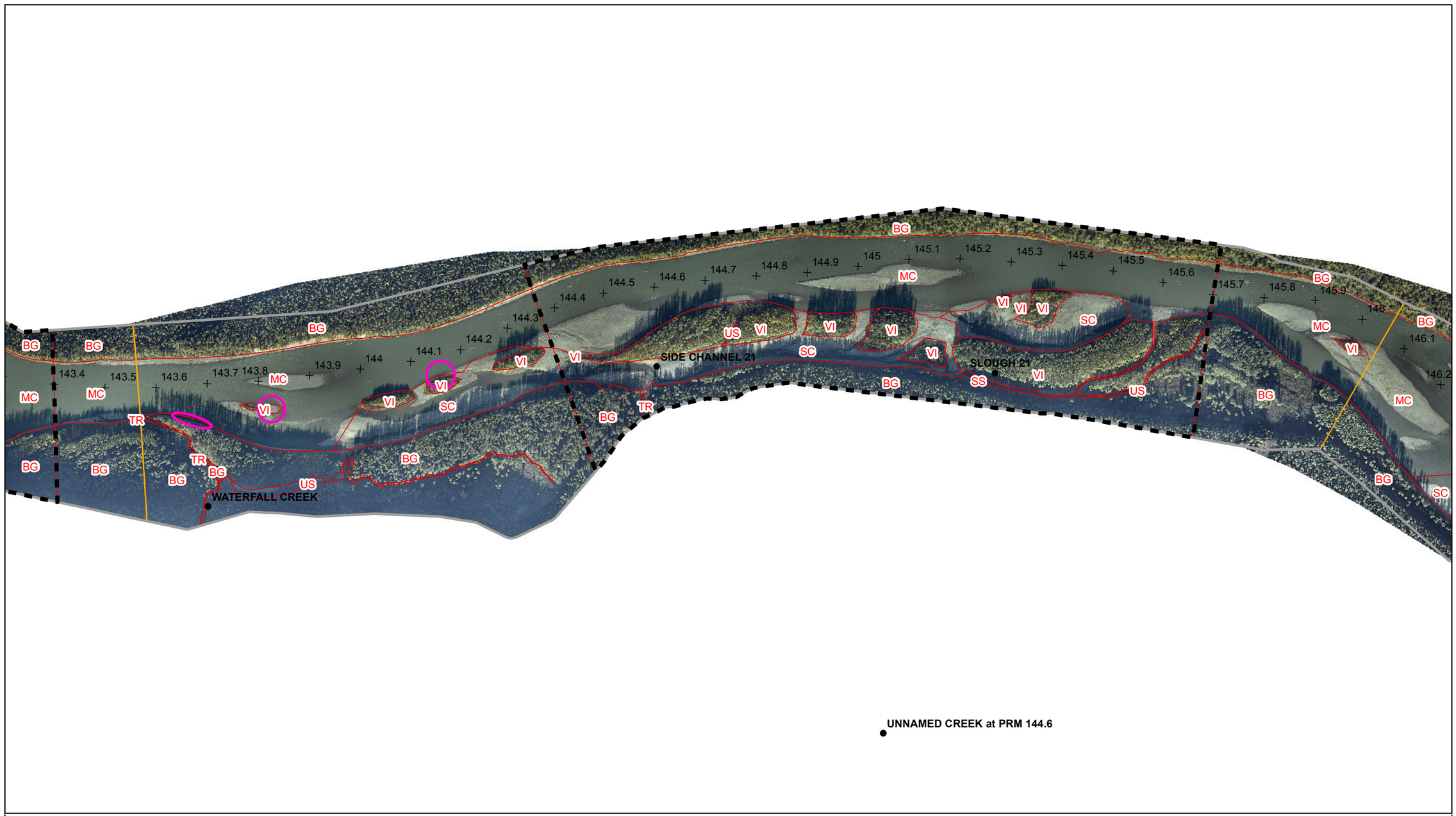
Sheet 19 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
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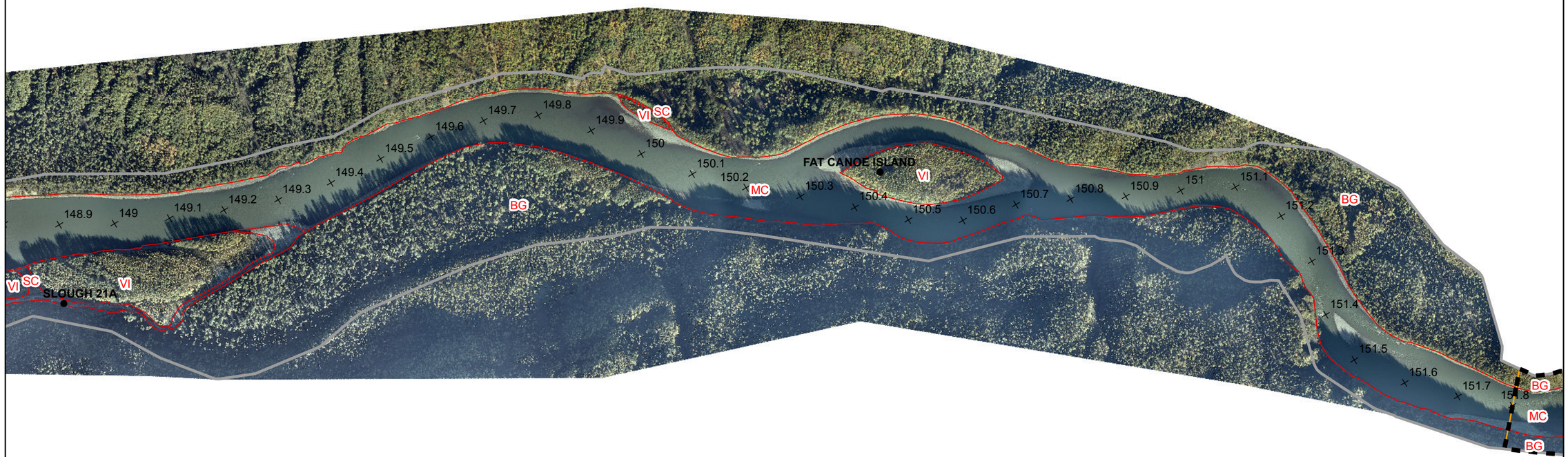
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Sheet 22 of 34

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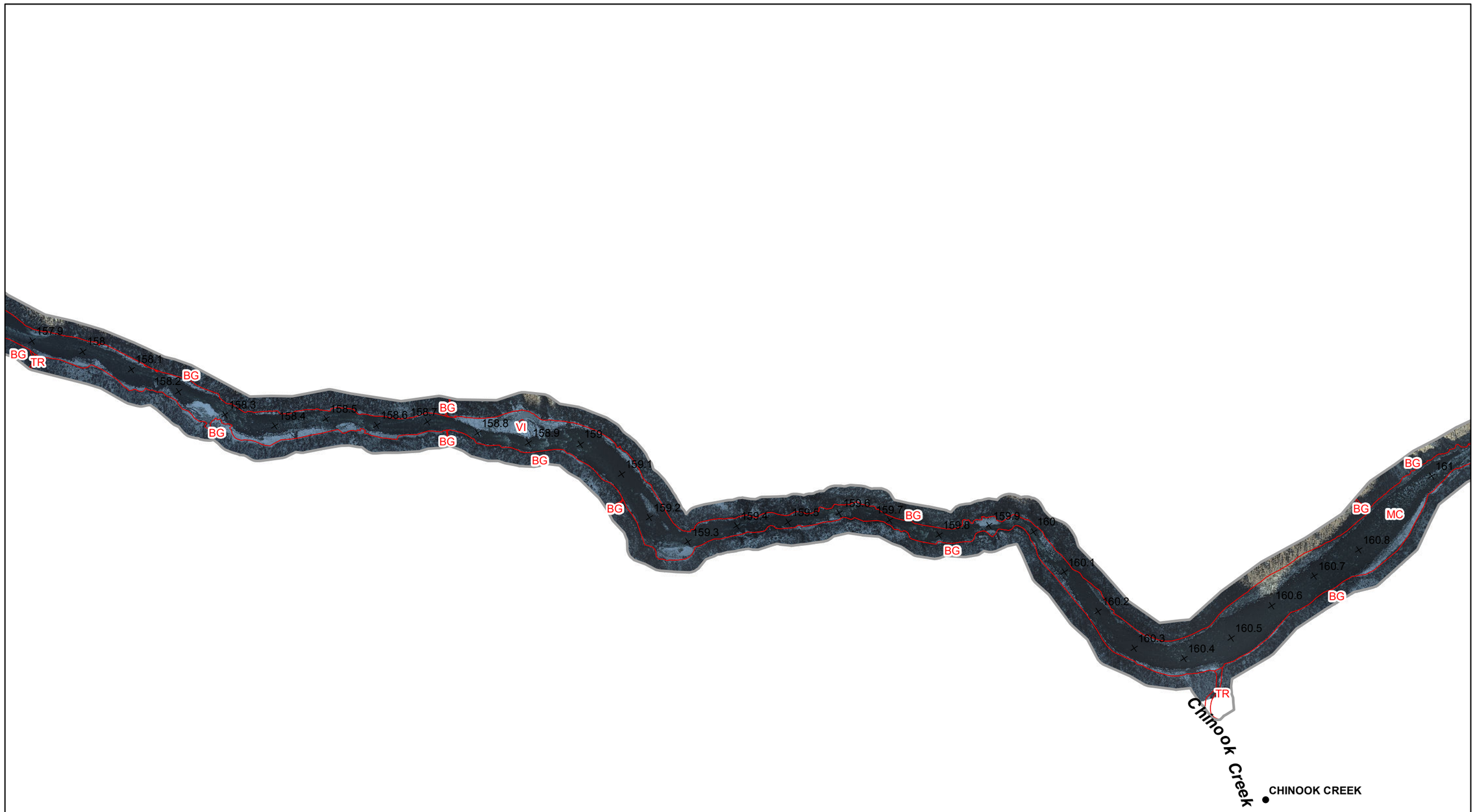
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MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
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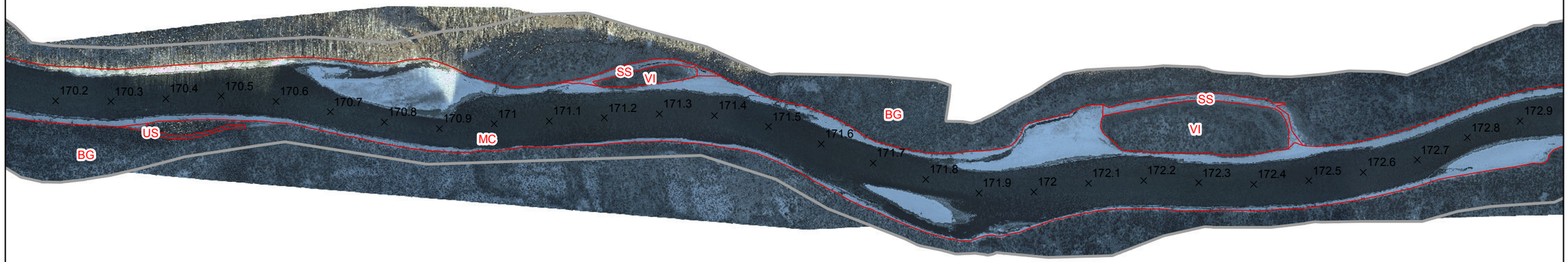
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MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 149 - 183	11/06/2013	6,200 cfs
PRM 183 - 187	09/16/2013	19,200 cfs

ALASKA ENERGY AUTHORITY



0 1,000 2,000 Feet

1 inch = 1,000 feet

See index page for legend and additional data information.

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MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 149 - 183	11/06/2013	6,200 cfs
PRM 183 - 187	09/16/2013	19,200 cfs

ALASKA ENERGY AUTHORITY

UNNAMED CREEK at PRM 173.8

BG
MC
BG
TR
SC
VI
VI
VI
VI
VI
VI
VI
SS
BG
AOW
BG
BG
MC
MC
MC
172.9
173
173.1
173.2
173.3
173.4
173.5
173.6
173.7
173.8
173.9
174
174.1
174.2
174.3
174.4
174.5
174.6
174.7
174.8
174.9
175
175.1
175.2
175.3
175.4
175.5
175.6

UNNAMED CREEK at PRM 174.3

VI
SS
BG
US
BG
BG
US
US
BG
BG

0 1,000 2,000 Feet

See index page for legend and additional data information.

1 inch = 1,000 feet

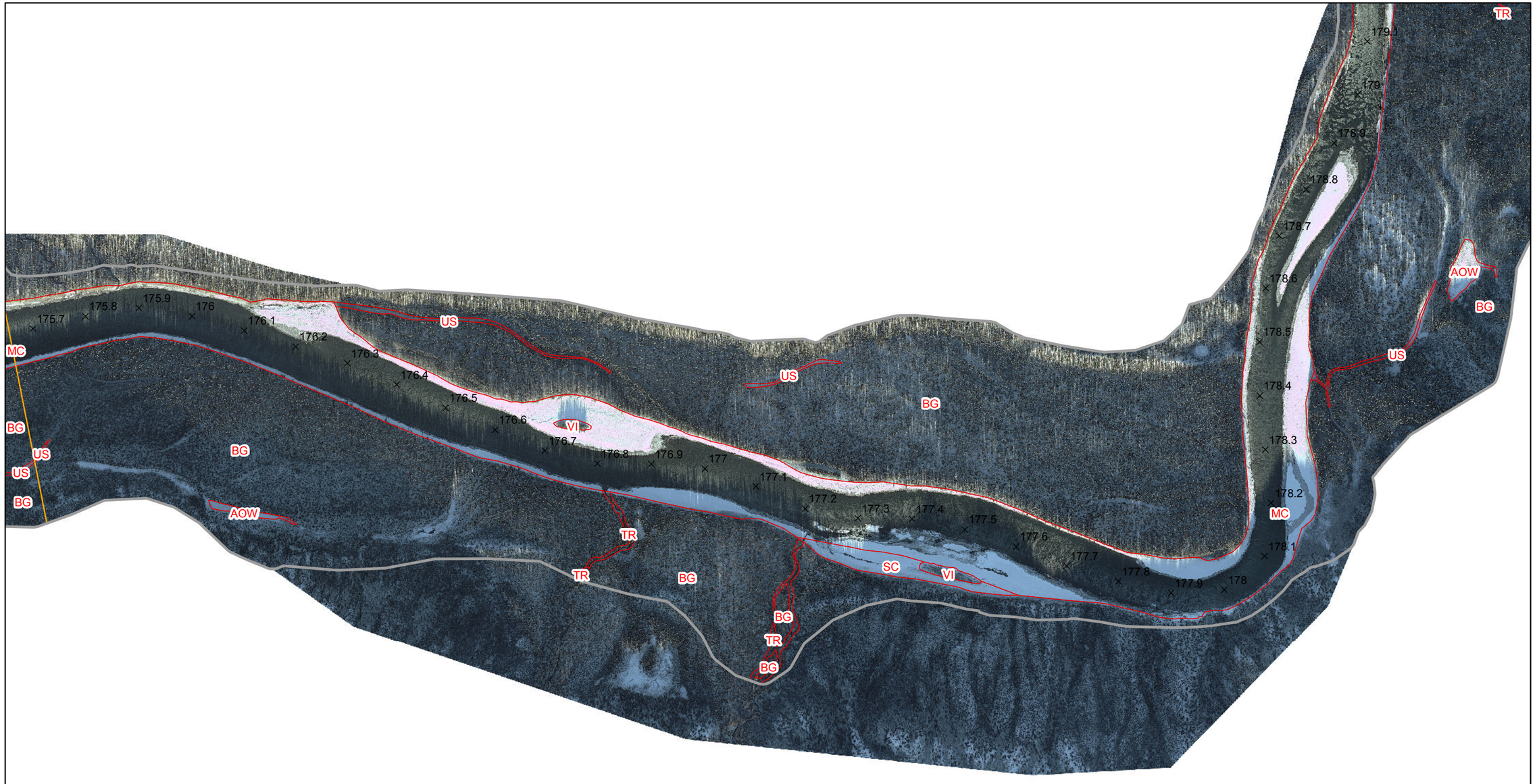
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MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 149 - 183	11/06/2013	6,200 cfs
PRM 183 - 187	09/16/2013	19,200 cfs

ALASKA ENERGY AUTHORITY



0 1,000 2,000 Feet

See index page for legend and additional data information.

1 inch = 1,000 feet

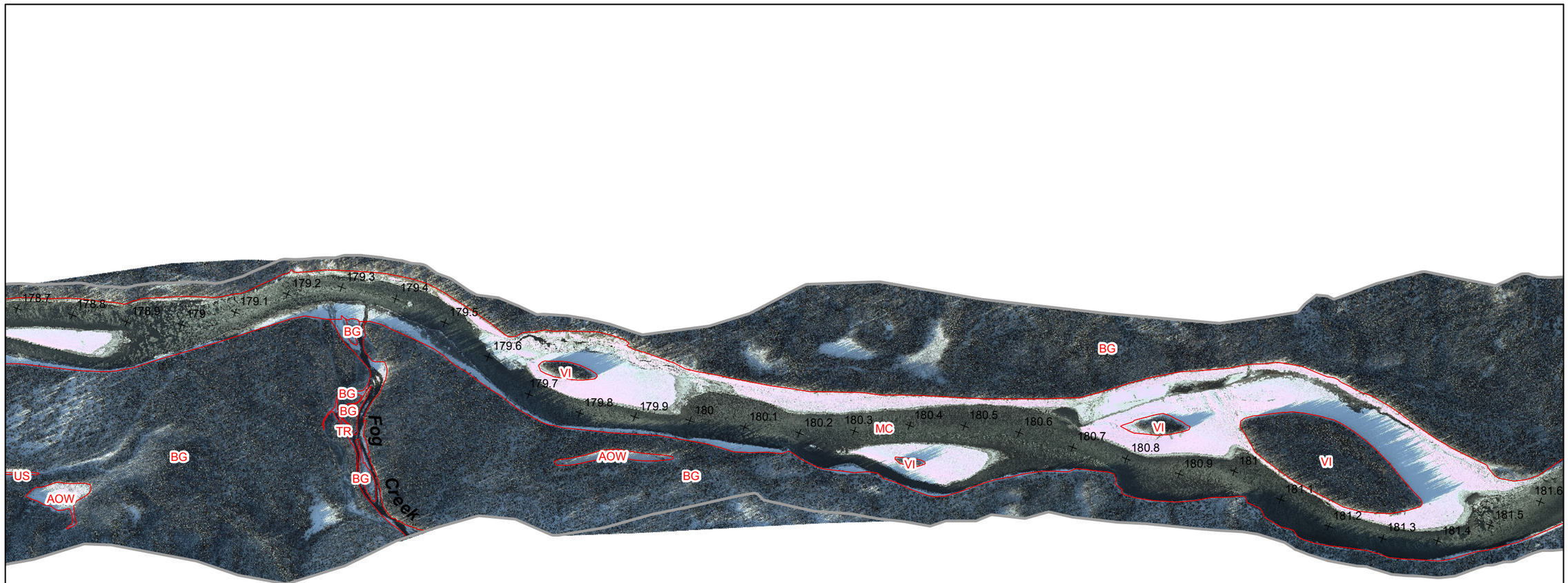
Sheet 31 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 149 - 183	11/06/2013	6,200 cfs
PRM 183 - 187	09/16/2013	19,200 cfs

ALASKA ENERGY AUTHORITY



FOG CREEK

0 1,000 2,000 Feet

See index page for legend and additional data information.

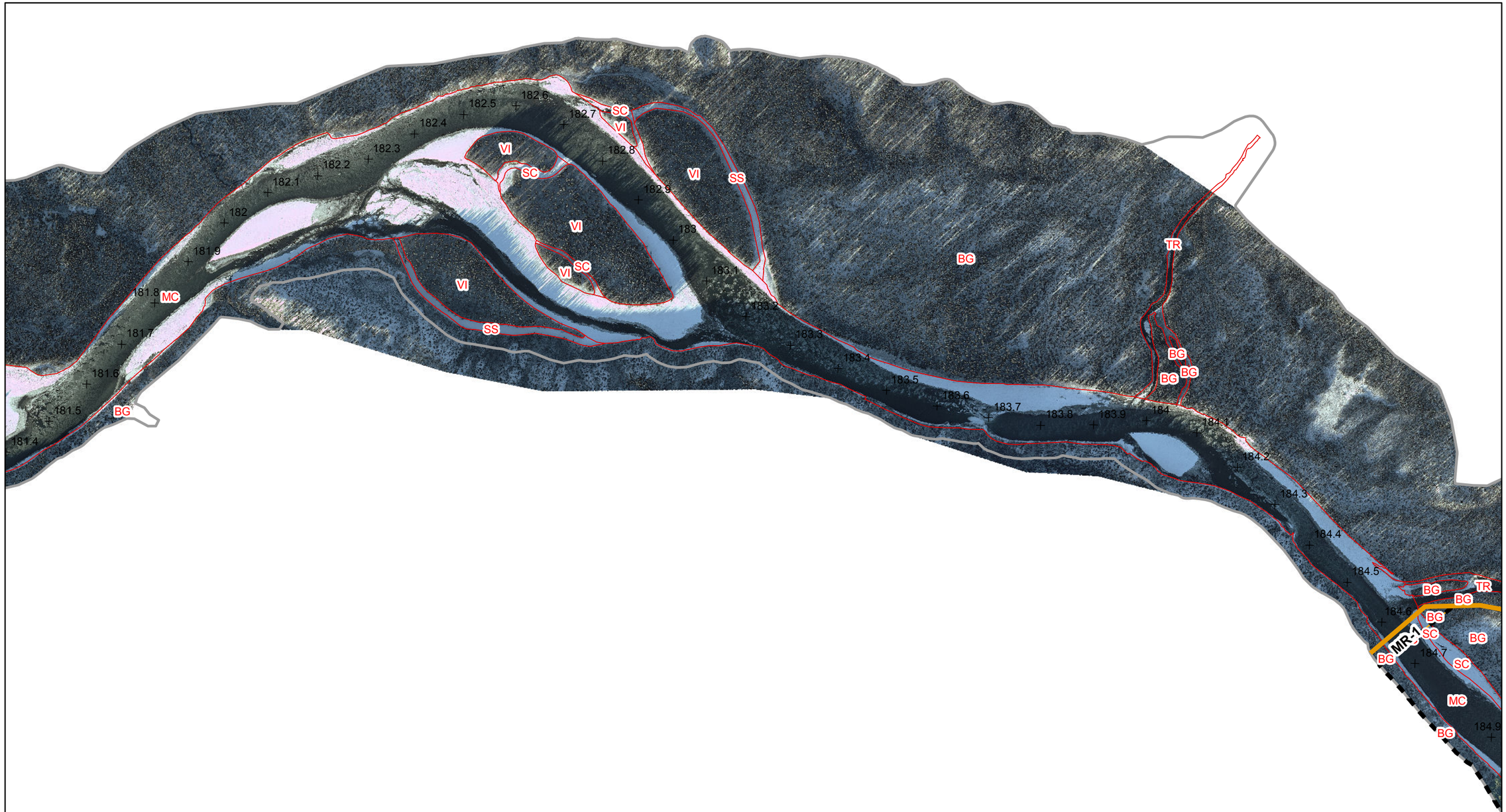
1 inch = 1,000 feet

Sheet 32 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)	Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs	**PRM 149 - 183**	11/06/2013	6,200 cfs
			PRM 183 - 187	09/16/2013	19,200 cfs

ALASKA ENERGY AUTHORITY



0 1,000 2,000 Feet

See index page for legend and additional data information.

1 inch = 1,000 feet

Sheet 33 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 149 - 183	11/06/2013	6,200 cfs
PRM 183 - 187	09/16/2013	19,200 cfs

ALASKA ENERGY AUTHORITY

TSUSENA CREEK

Tsusena Creek

BG
MR-2
MR-1
TR
SC
MC
VI
UR-6

184.5 184.6 184.7 184.8 184.9 185 185.1 185.2 185.3 185.4 185.5 185.6 185.7 185.8 185.9 186 186.1 186.2 186.3 186.4 186.5 186.6 186.7 186.8 186.9 187 187.1 187.2 187.3

0 1,000 2,000 Feet

See index page for legend and additional data information.

1 inch = 1,000 feet

Sheet 34 of 34

MIDDLE SUSITNA RIVER SEGMENT
2012 GEOMORPHIC FEATURES
on 2013 Aerials

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 102 - 149	09/24/2013,	11,300 cfs

Location:	Imagery Date,	Discharge (Gold Creek)
PRM 149 - 183	11/06/2013	6,200 cfs
PRM 183 - 187	09/16/2013	19,200 cfs

ALASKA ENERGY AUTHORITY