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# Butte Fine Particulate Matter (PM<sub>2.5</sub>) Planning

Presentation to:  
Mat-Su Borough Assembly  
Meeting

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DENISE KOCH,  
DIRECTOR, AIR QUALITY

FEBRUARY 21, 2017





# Purpose of the Presentation

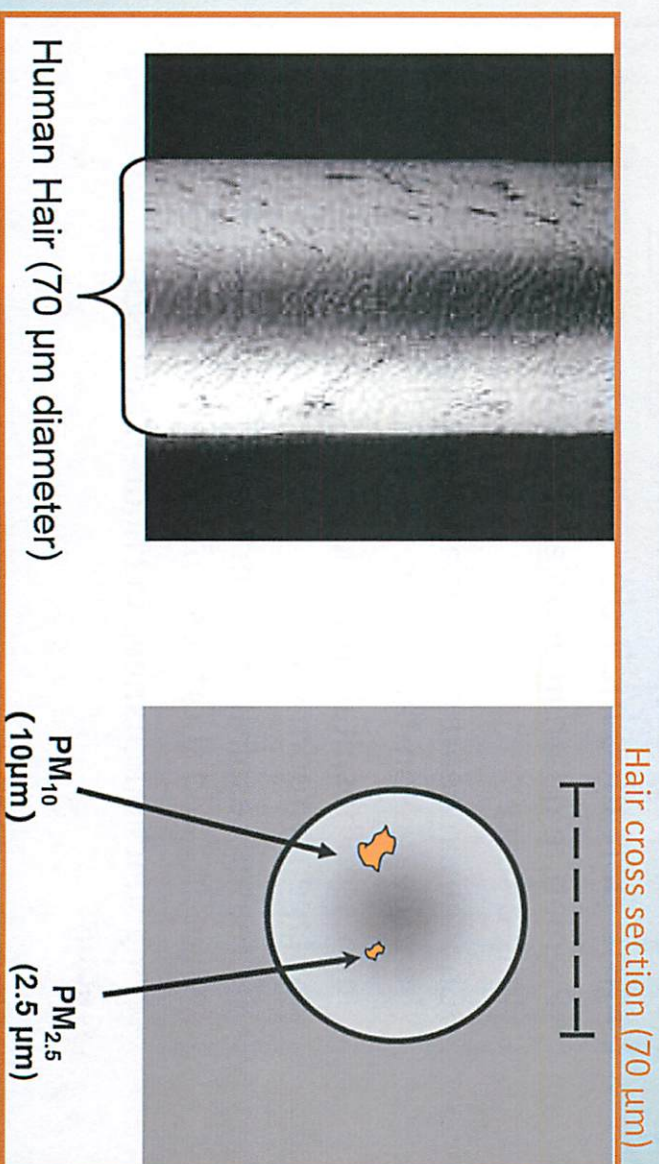
- Goal is to protect Human Health
- Air Monitoring is continuing to show unhealthy levels of fine particulate matter (PM2.5)
- Wood burning sources
- Need for immediate action
- Local solutions
- Collaboration with DEC's Air Quality Program





# Particulate Matter (PM)

- A complex mixture of extremely small particles and liquid droplets.
- $PM_{10}$  vs  $PM_{2.5}$



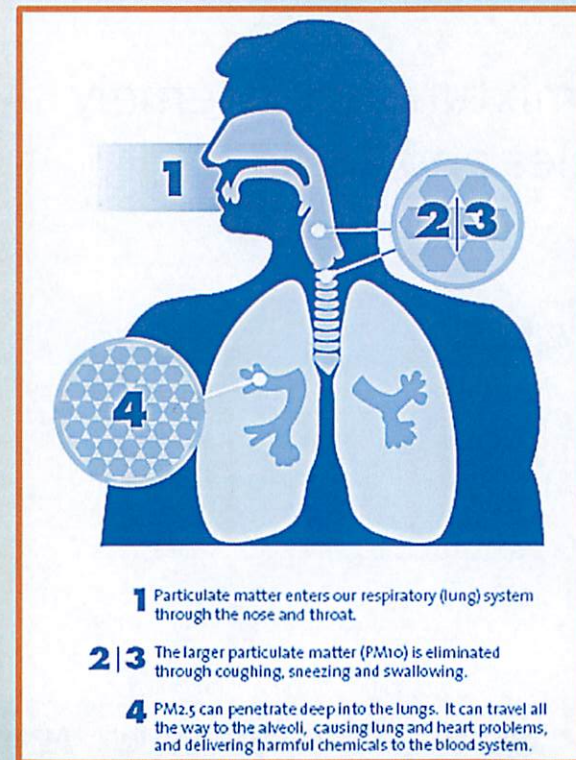
Source: M. Lipsett, California Office of Environmental Health Hazard Assessment





# Particle Pollution and Public Health

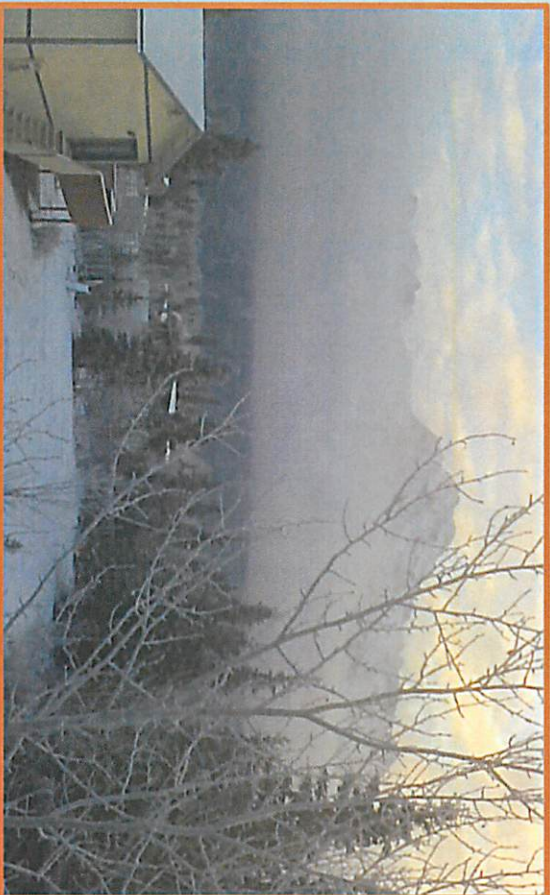
- Health effects associated with **exposure** to fine particles include:
  - Premature death in people with heart and lung disease
  - Changes in heart rate variability; Irregular heartbeat; Non-fatal heart attacks
  - Increased hospital admissions and emergency room visits
  - Increased respiratory symptoms (coughing, wheezing and shortness of breath)
  - Lung function changes in children and older adults







## Fine Particulate Matter Sources (PM<sub>2.5</sub>)



- Fine particulates are typically formed as a result of fuel combustion
- Wood-fired heating devices
- Burning construction debris or trash (burn barrels)
- Land clearing

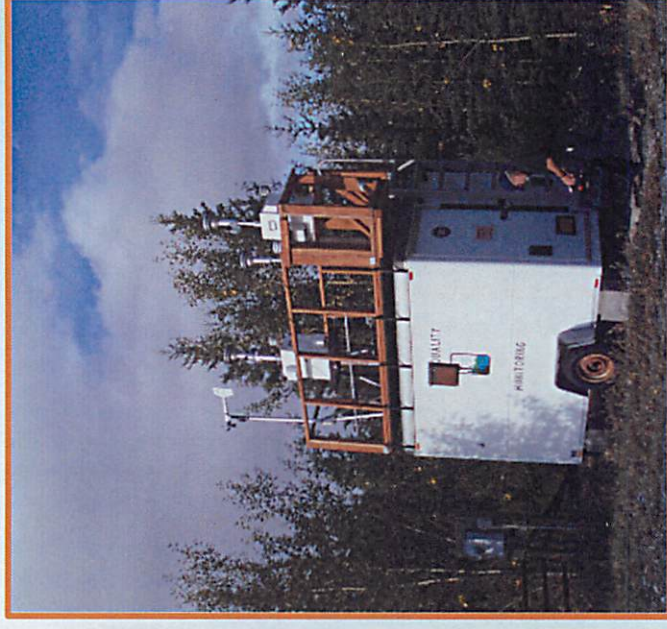




# PM<sub>2.5</sub> Monitoring

- Year-round mandatory monitoring for PM<sub>2.5</sub> in Butte since Dec 1998
- Year-round monitoring in Palmer since 2011
- Public can access real time air monitoring data:

<http://dec.alaska.gov/Applications/Air/airtoolsweb/Aq/>







# Monitoring

- Butte monitor getting close to violating the national  $PM_{2.5}$  standard

98th Percentile $PM_{2.5}$ 24-hr Average Concentration, $\mu\text{g}/\text{m}^3$	2014	2015	2016	2016 Design Value	Not in Attainment*
	38.1	37.9	29.2	35.1	35

\*Compliance with the 24-hr  $PM_{2.5}$  NAAQS is determined using three years of air monitoring data. The design value is an average of 98th percentile 24-hr average  $PM_{2.5}$  concentrations over three years. Values < 35.5 round down to 35 and are considered in compliance.

- Palmer monitor shows lower concentrations (2016 design value of  $10 \mu\text{g}/\text{m}^3$ )



# PM<sub>2.5</sub> 24-hr Design Values

Butte, Palmer





# Butte PM<sub>2.5</sub> Monitoring:

	98 <sup>th</sup> Percentile ( $\mu\text{g}/\text{m}^3$ )	Design Value (DV)* ( $\mu\text{g}/\text{m}^3$ )	Standard ( $\mu\text{g}/\text{m}^3$ )	
2012	33.4	33.7		35
2013	27.9	30.5		35
2014	38.1	33.1		35
2015	37.9	34.6		35
2016	29.2	35.1		35

\* DV < 35.5 round down to 35 and are in compliance

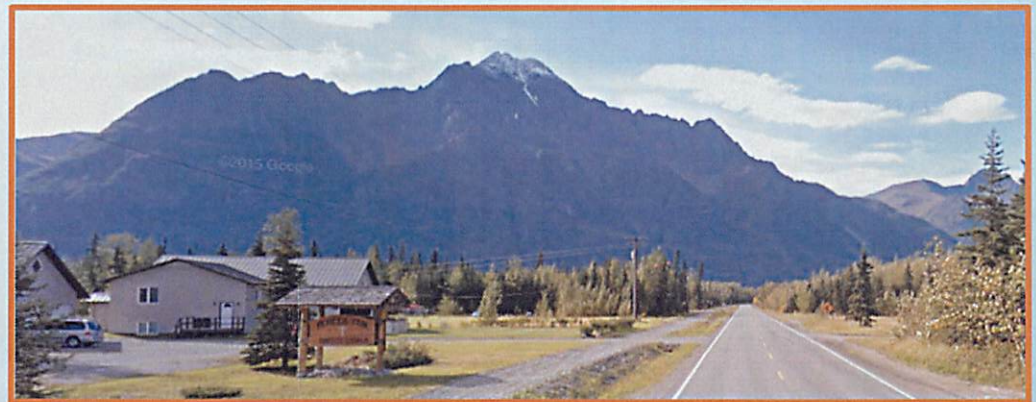




# Butte PM<sub>2.5</sub> Monitoring:

**Long term trend of PM<sub>2.5</sub> concentrations close to the health standard:**

- More pronounced over the past 3 years: increased number of exceedances
- Three year design value for 2015 and 2016 were barely below the standard
- 2016 had lower 98<sup>th</sup> percentile than previous years.



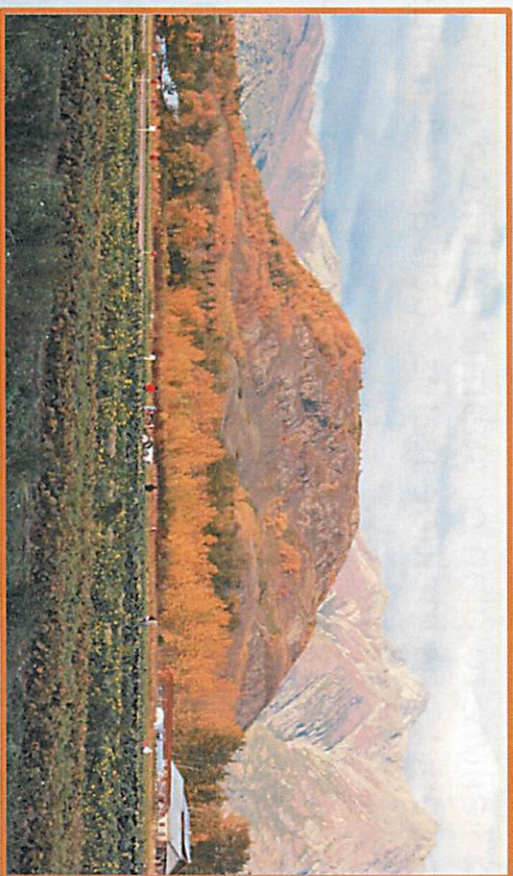




# Butte PM<sub>2.5</sub> Monitoring

2017 Monitoring values (to date) show 4 dates that exceed the standard:

Date	PM <sub>2.5</sub> concentration in $\mu\text{g}/\text{m}^3$
1/1/2017	63.5
1/2/2017	42.2
1/11/2017	41.6
2/6/2017	44.1







# Consequences of Nonattainment

Formal designation by EPA as a nonattainment area triggers a wide range of expensive requirements that result in an Air Quality Plan that must be submitted within 3 years.

- Failure to plan or submit required items results in federal sanction clocks. The sanctions include items such as 2:1 industrial offsets and withholding federal highway money.
- All federally funded projects (road or other types) must meet conformity in order to get funded
- Once an area meets attainment, must maintain attainment for 20 years
- Requirements for ordinances and regulations that are enforceable (voluntary measures alone will not be enough)
- Plan must be able to demonstrate area can meet attainment
- Clean Air Act allows citizen lawsuits for failure to implement a plan





# Potential Control Measures

*Locally selected and implemented control measures have best chance of success.*

*Ideas from other communities:*

- Promote or require the selling and burning of seasoned, dry wood
  - Moisture Disclosure Program (current State voluntary program)
  - Registered wood seller
  - Community drying lots or kiln
  - Loan out moisture meters
  - Issue firewood gathering permit to recently burned areas
- Encourage hook up to natural gas
  - Device change out programs
- Pair air advisories with messaging (use alternative source of heat, burn dry wood)
- Create a special purpose district with focused control measures
  - Local burn approvals
- If in nonattainment, voluntary measures will not be sufficient





# What Can Residents Do to Reduce Wood Smoke?

- Better insulate and weatherize homes to reduce heating demands
- Select a clean burning heating device sized appropriately to the space
- Follow the manufacturer's operating recommendations
- Maintain wood heater and chimney
- Only burn clean, dry wood in a wood stove
  - Check the moisture content of your wood – aim for 20%
- Don't let your fire smolder
  - <http://burnwise.alaska.gov/>

State of Alaska  
Alaska Department of Environmental Conservation  
Division of Air Quality  
BURN WISE ALASKA  
FAIRBANKS PRIZES  
OPEN BURN  
MOISTURE DISCLOSURE PROGRAM  
AIR QUALITY HOME

REGULATIONS  
HARMES OF WOOD SMOKE  
WHAT YOU CAN DO  
WOOD MOISTURE  
KNOW YOUR WOOD

BURN THE RIGHT WOOD, THE RIGHT WAY, IN THE RIGHT STOVE.  
BURNWISE-ALASKA.GOV

THE HARMES OF WOOD SMOKE  
Play

BURN WISE BREATHE EASY

Scripts of Videos and Radio Ads can be found on each topic page.  
KID'S ACTIVITY BOOK RADIO BROCHURES POSTERS  
Previously Developed Media  
For more information, contact  
Alex Edwards  
alex.edwards@alaska.gov  
907-268-7695





# Action Is Necessary to Prevent Nonattainment

*How do we work together to engage community and explore options?*

- Public Education
  - Road side signs when entering/exiting Butte
  - Distribute materials through woodstove dealers, wood sellers, mail outs, etc.
  - Education on local weather patterns
- Other ideas?
  - Incentive programs – encourage hook up to natural gas, device change outs
  - Enhance dry firewood options – energy logs
  - Conditions on slash burning/land clearing





## Suggested Next Steps

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- Finalize Memorandum of Understanding – Clearly identify roles and responsibilities between DEC and Mat-Su Borough
- Mat-Su Borough would have primary responsibility for preventing nonattainment – Local community best suited to tailor options and solutions
- DEC involvement would increase if area becomes nonattainment





# Your Input

Denise Koch, Director

Division of Air Quality

(907) 465-5105

[denise.koch@alaska.gov](mailto:denise.koch@alaska.gov)

<https://dec.alaska.gov/air/>

[http://dec.alaska.gov/air/anpms/comm/matsu\\_pm2-5.htm](http://dec.alaska.gov/air/anpms/comm/matsu_pm2-5.htm)

State of Alaska **myAlaska** My Government Resident Business in Alaska Working Alaska Start Employees

Division of Air Quality  
**Air Non-point Mobile Source**

**MATSU - BURTE - PM2.5**

8hr Percentile PM <sub>2.5</sub> Air Average Concentration (µg/m <sup>3</sup> )	2012	2013	2014	Design Value	Current Standard
	33.4	27.9	33.5	34	35

Compliance with the 24-hr PM<sub>2.5</sub> National Ambient Air Quality Standard (NAAQS) is determined by comparing data. The design value is an average of 8-hr percentile 24-hr average PM<sub>2.5</sub> concentrations over five years. The 2012-2014 8-hr 34 µg/m<sup>3</sup>. The NAAQS is currently 35 µg/m<sup>3</sup>.

**QUICK LINKS**  
 ANPMS Contacts  
 Air Pollution in Alaska  
 Ambient Communities  
 Chapter Director  
 Field Air Quality  
 Regional Air Quality  
 Air Trucks  
 Projects & Reports

**Current Air Quality**  
 \* Air Quality Reporting  
 \* Air Quality Alerts  
 \* Air Quality Index  
 \* Air Quality Data  
 \* Air Quality Monitoring Data  
 \* Air Quality Modeling  
 \* Air Quality Permitting  
 \* Air Quality Sampling  
 \* Air Quality Surveillance  
 \* Air Quality Training  
 \* Air Quality Data  
 \* Air Quality Monitoring Report  
 \* Air Quality Outreach & Education

**Map**  
 \* Air Quality Monitoring Sites Map  
 \* Air Quality Monitoring Data  
 \* Air Quality Modeling  
 \* Air Quality Sampling  
 \* Air Quality Surveillance  
 \* Air Quality Training  
 \* Air Quality Data  
 \* Air Quality Monitoring Report  
 \* Air Quality Outreach & Education

**OF INTEREST**  
 Monitoring and Quality  
 Air Non-point Mobile Source  
 Air Permit Program

**Commissioner** Erik Kidder  
**Deputy Commissioner** Sandra Statler  
**Director/Contract** Elizabeth Fenn  
**State of Alaska** | **myAlaska** | **My Government** | **Resident** | **Business in Alaska** | **Working Alaska** | **Start Employees**

State of Alaska | 2016 | **myAlaska** | **My Government** | **Resident** | **Business in Alaska** | **Working Alaska** | **Start Employees**

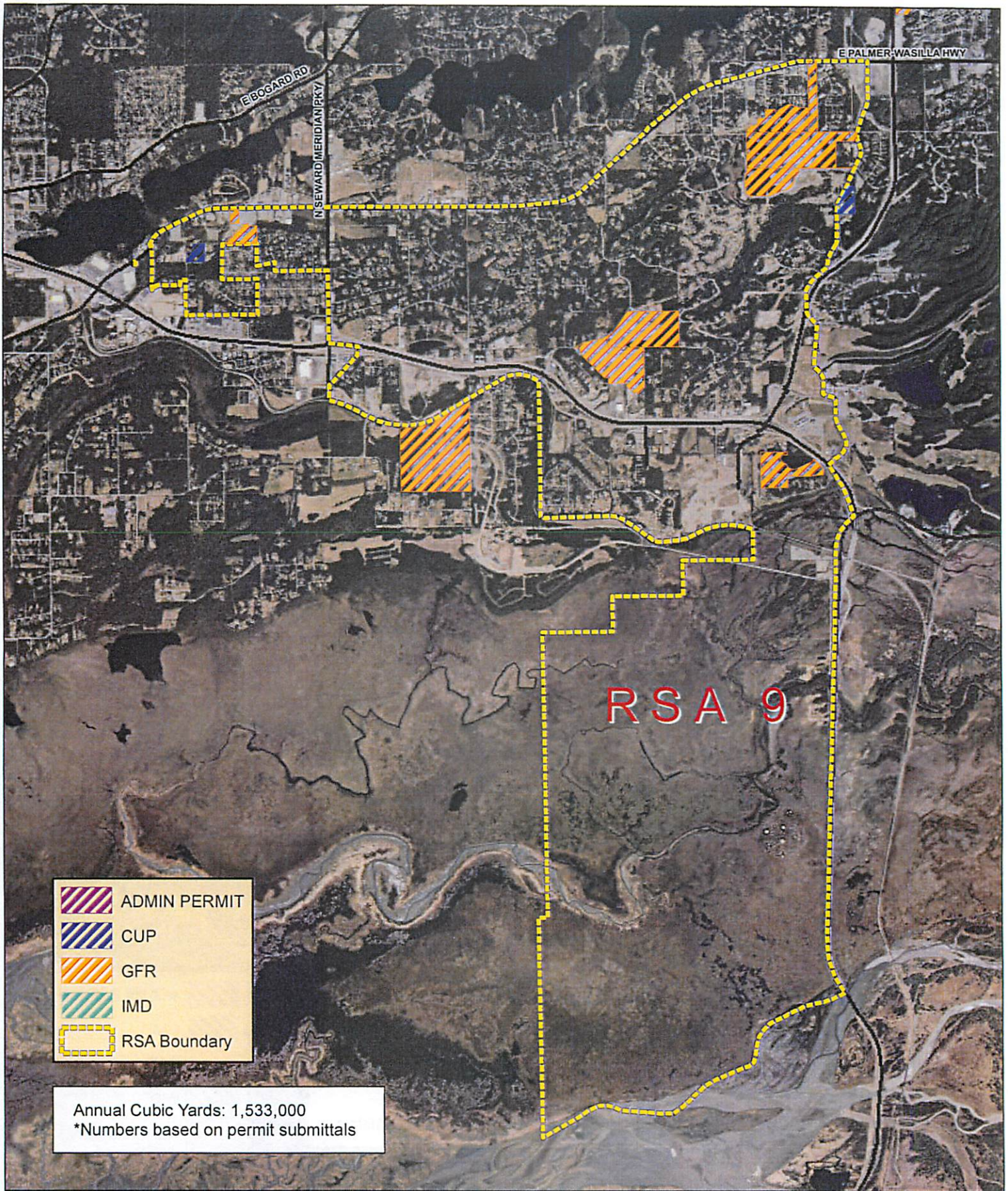
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**SEVERANCE TAX POTENTIAL REVENUE AND NEED**

RSA	Assembly District	Potential Dollar Benefit		RSA Need		Comments
		Annual Cubic Yards - based on permit submittals	Potential dollars to RSA @.25 CY	Total Funded CIP	Total Unfunded CIP	
9 Midway	3	1,533,000	\$383,250.00	\$3,958,000	\$1,930,000	2016 CIP List
14 Fairview	3 & 5	160,000	\$40,000.00	\$750,000	\$1,786,000	Draft 2017 CIP List
15 Caswell Lakes	7	1,501,355	\$375,338.75	\$100,000	\$2,250,000	No Dust Control, Draft 2017 CIP List
16 South Colony	1, 2 & 6	1,695,892	\$423,973.00	\$659,000	\$5,704,000	2016 CIP List
17 Knik	5	1,161,112	\$290,278.00	\$1,035,000	\$2,921,000	Draft 2017 CIP List
19 Lazy Mountain	1	0	\$0.00	\$77,000	\$620,000	2016 CIP List
20 Willow	7	126,280	\$31,570.00	\$754,500	\$950,000	No Dust Control, Draft 2017 CIP List
21 Big Lake	5	836,500	\$209,125.00	\$1,340,000	\$1,315,000	No Dust Control, Draft 2017 CIP List
23 North Colony	1	0	\$0.00	\$126,000	\$300,000	2016 CIP List, No Dust Control
25 Bogard	1,3,4 & 6	1,000	\$250.00	\$1,985,000	\$5,095,000	Draft 2017 CIP List
26 Butte	1	367,250	\$91,812.50	\$270,000	\$2,450,000	Draft 2017 CIP List
27 Meadow Lakes	7	963,750	\$240,937.50	\$1,376,000	\$3,826,000	Draft 2017 CIP List
28 Gold Trails	4	210,050	\$52,512.50	\$1,226,250	\$1,842,750	2016 CIP List
29 Talkeetna	7	586,055	\$146,513.75	\$20,900	\$60,000	2016 CIP List
30 Trapper Creek	7	15,000	\$3,750.00	\$143,500	\$6,300,000	No Dust Control, Draft 2017 CIP List
31 Alpine	1	50,000	\$12,500.00	\$40,000	\$700,000	Draft 2017 CIP List
		<b>Total Cubic Yards</b>	<b>Total Dollars</b>	<b>Total Funded</b>	<b>Total Unfunded</b>	
		9,207,244	\$2,301,811.00	\$13,861,150	\$38,049,750	





**Matanuska Susitna Borough  
Development Services**

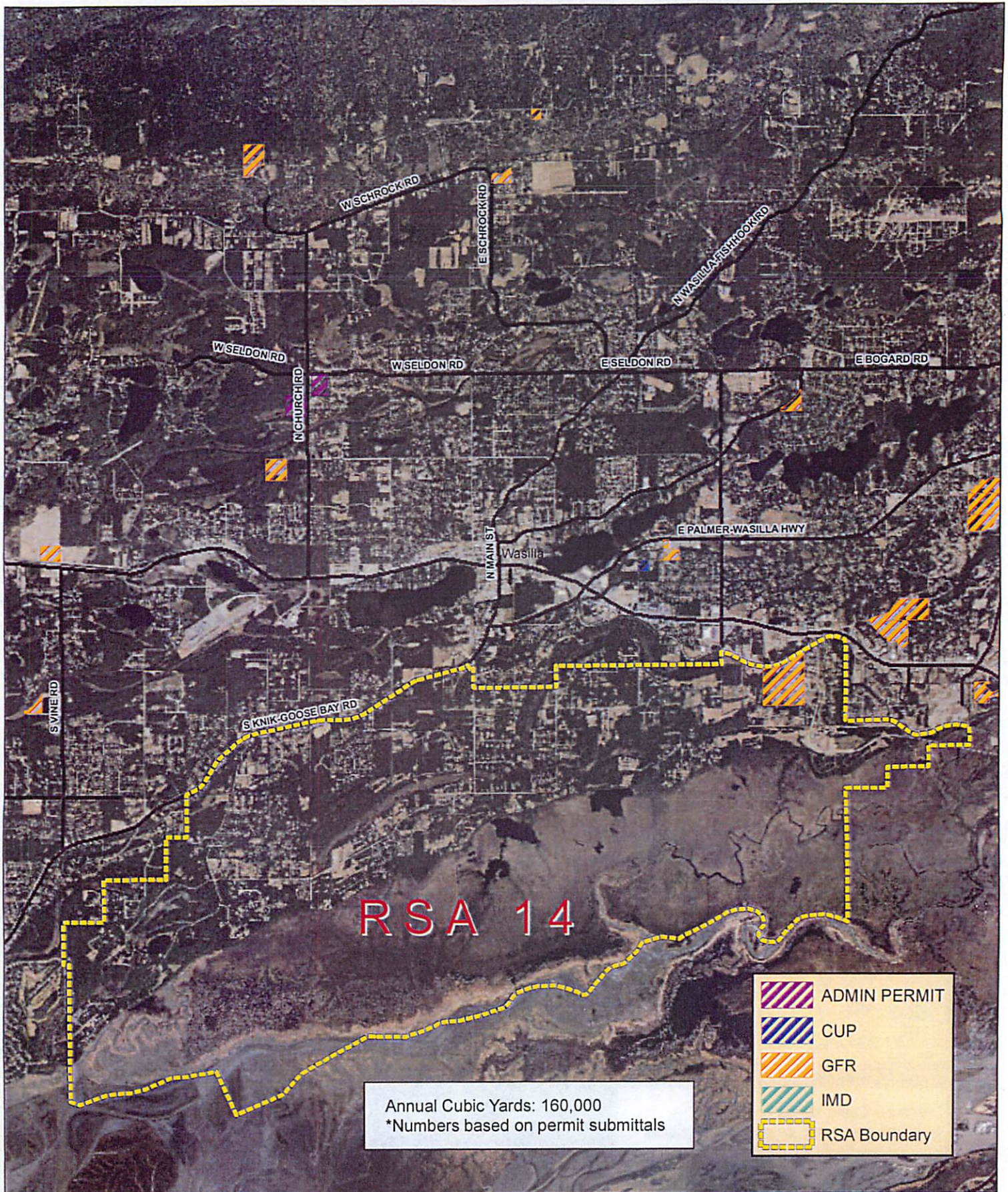
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OR 16-128





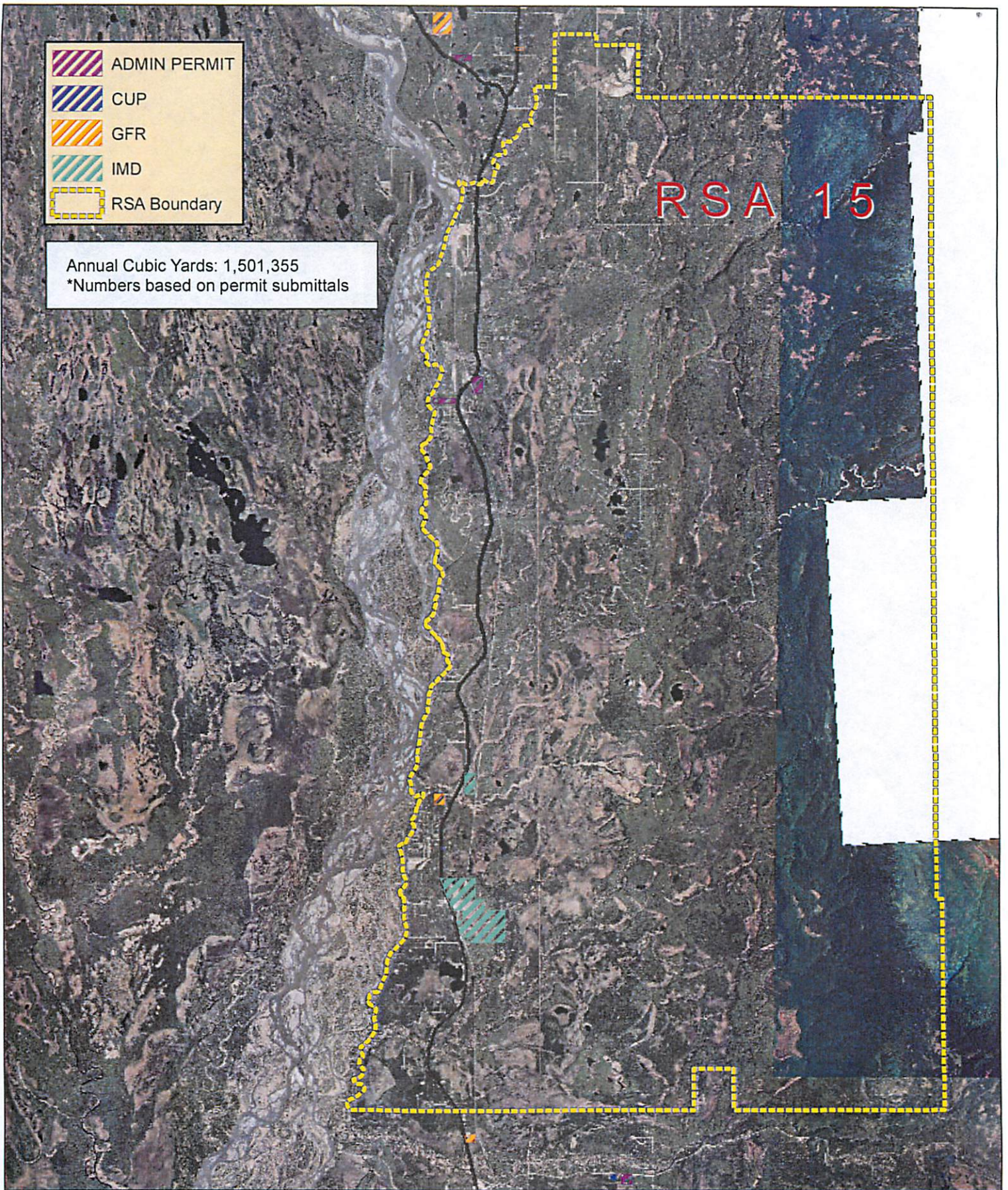
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
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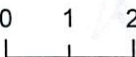


-  ADMIN PERMIT
-  CUP
-  GFR
-  IMD
-  RSA Boundary

Annual Cubic Yards: 1,501,355  
 \*Numbers based on permit submittals



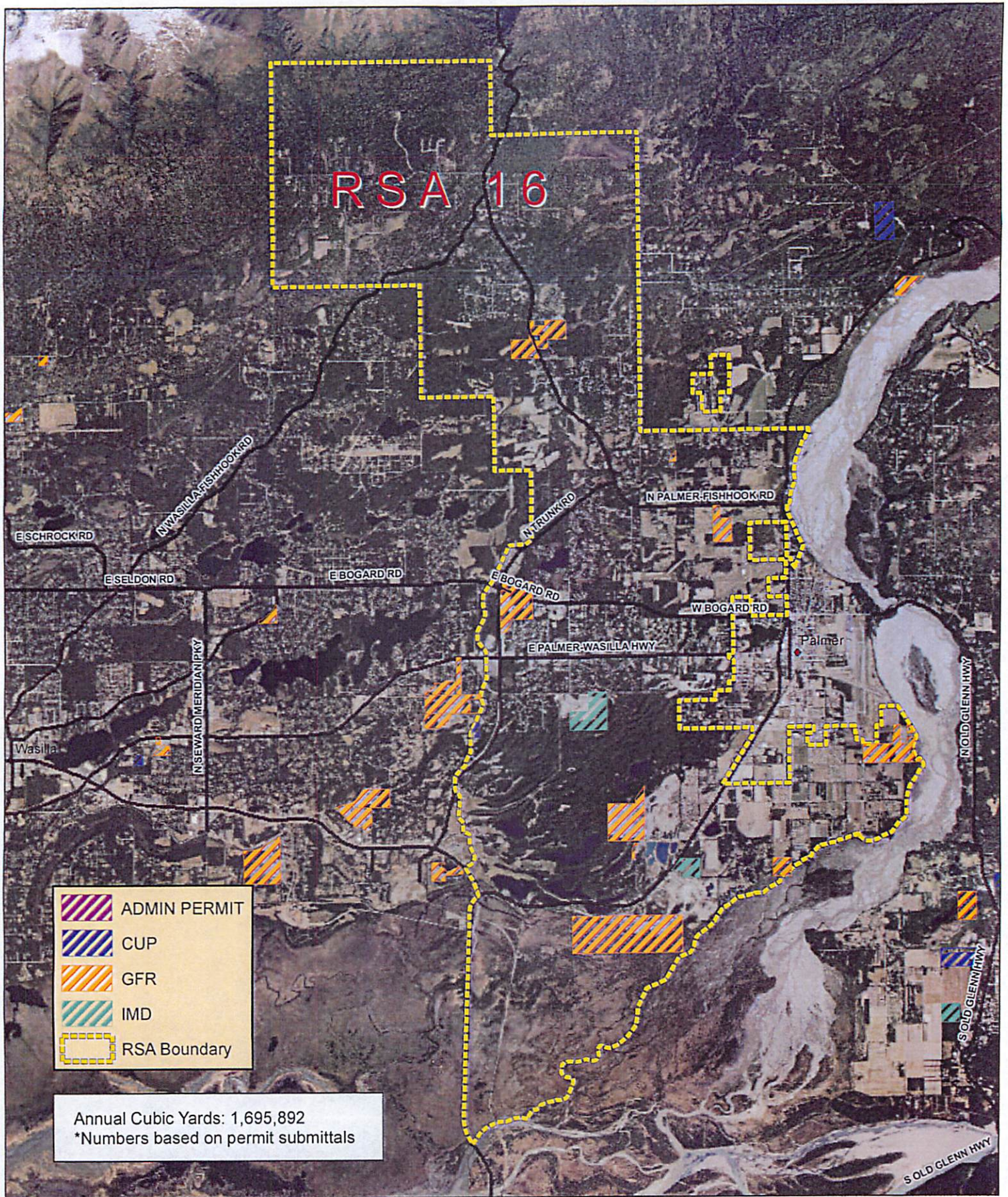
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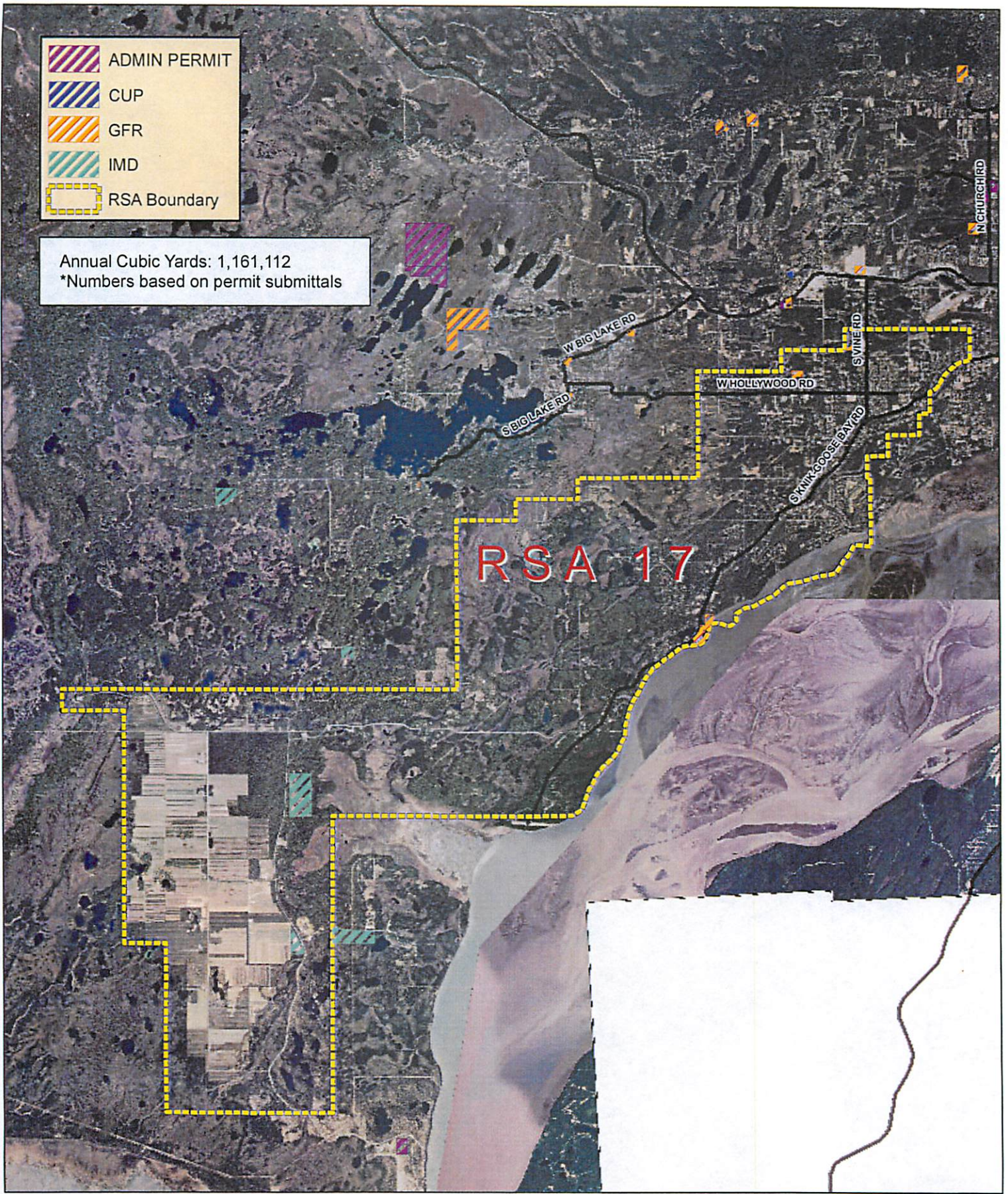
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Annual Cubic Yards: 1,161,112  
 \*Numbers based on permit submittals

**RSA 17**



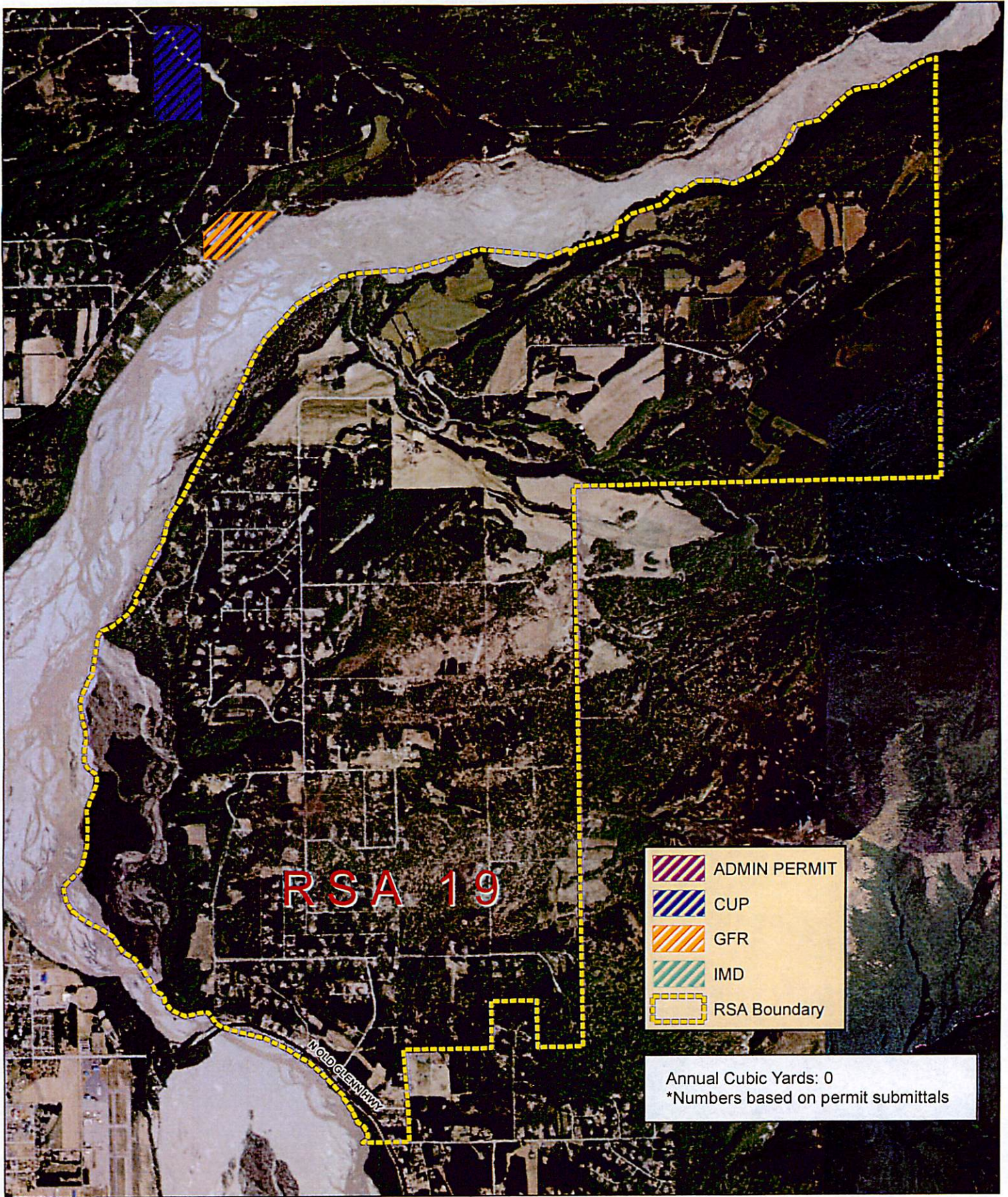
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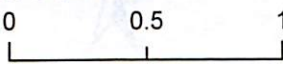
**RSA 19**

-  ADMIN PERMIT
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-  GFR
-  IMD
-  RSA Boundary

Annual Cubic Yards: 0  
 \*Numbers based on permit submittals



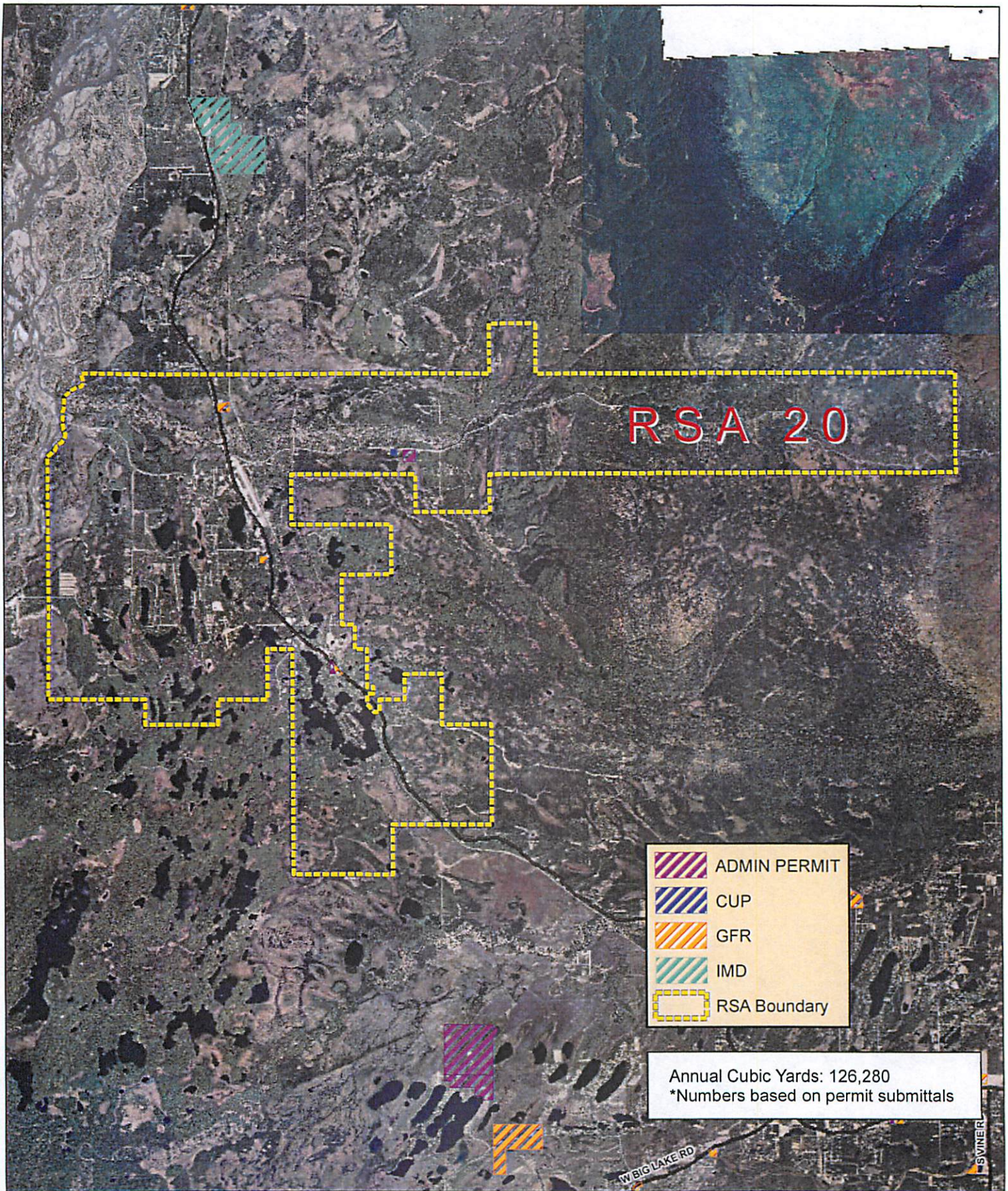
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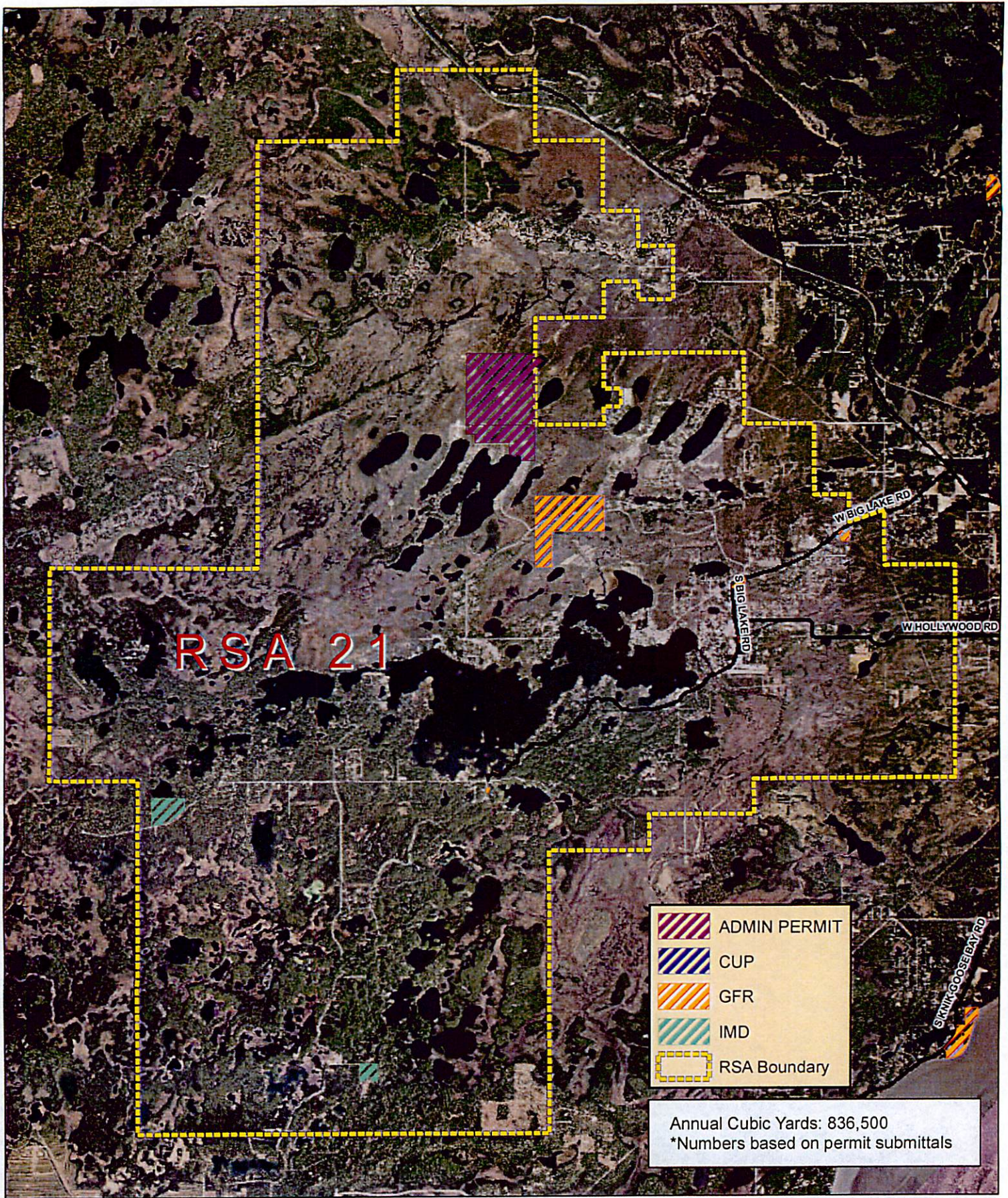
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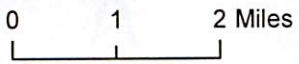
RSA 21

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	RSA Boundary

Annual Cubic Yards: 836,500  
 \*Numbers based on permit submittals



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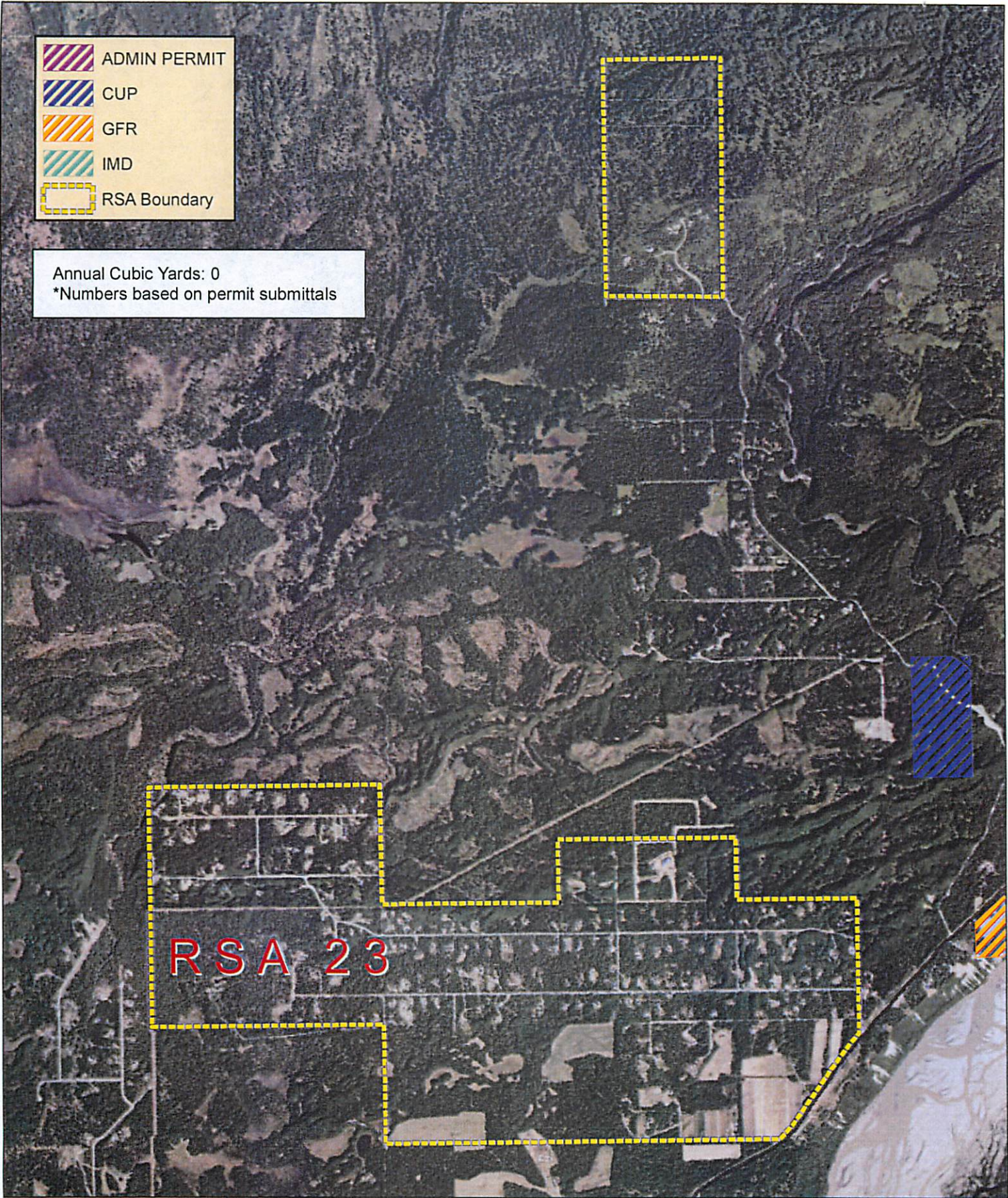


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Annual Cubic Yards: 0  
 \*Numbers based on permit submittals



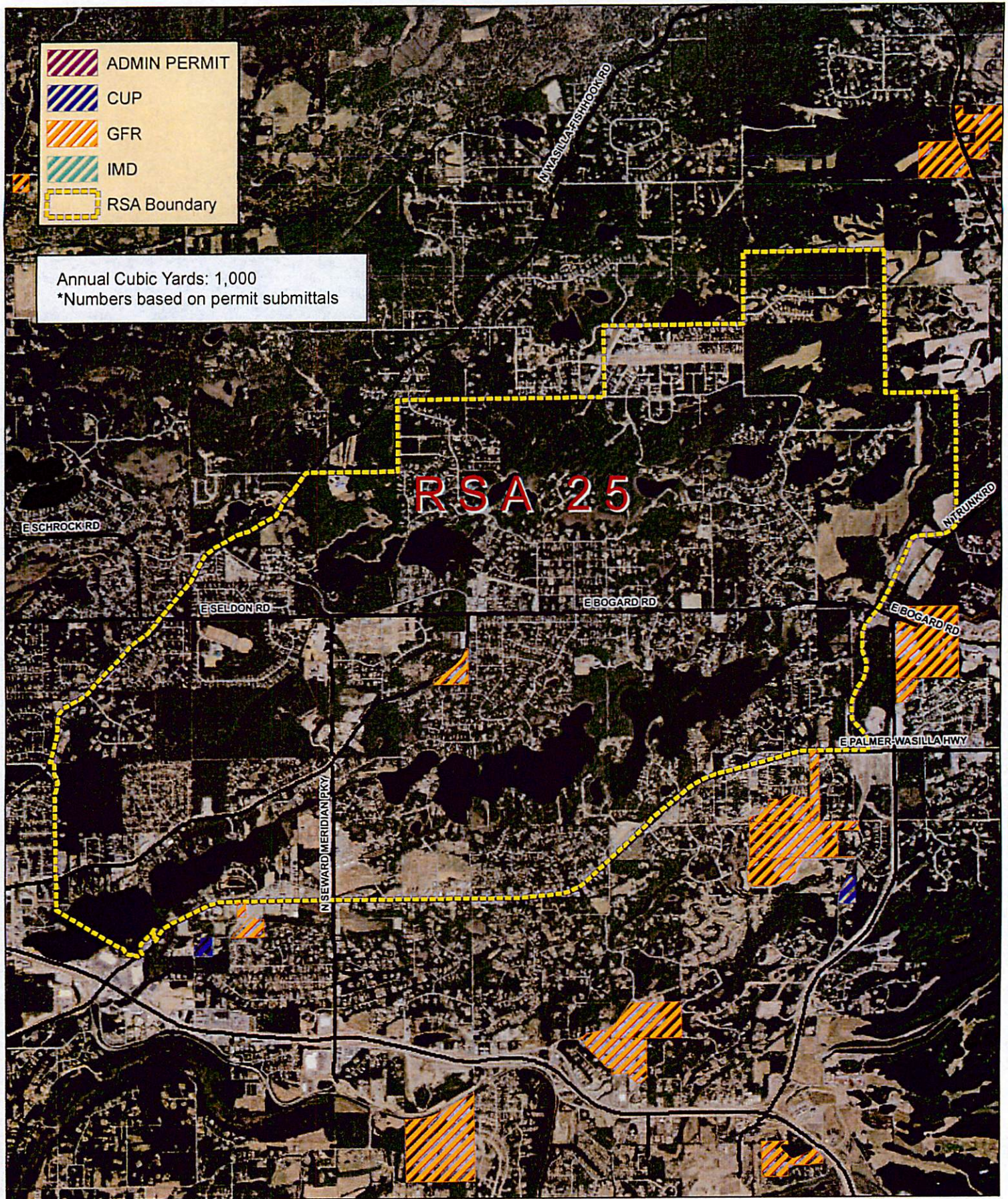
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Date: 10/21/2016  1 Miles



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-  GFR
-  IMD
-  RSA Boundary

Annual Cubic Yards: 1,000  
 \*Numbers based on permit submittals

**RSA 25**

E SCHROCK RD

E SELDON RD

E BOGARD RD

E BOGARD RD

E PALMER-WASILLA HWY

N SEWARD MERIDIAN HWY

N WASILLA HIGHWAY RD

N TRUNK RD



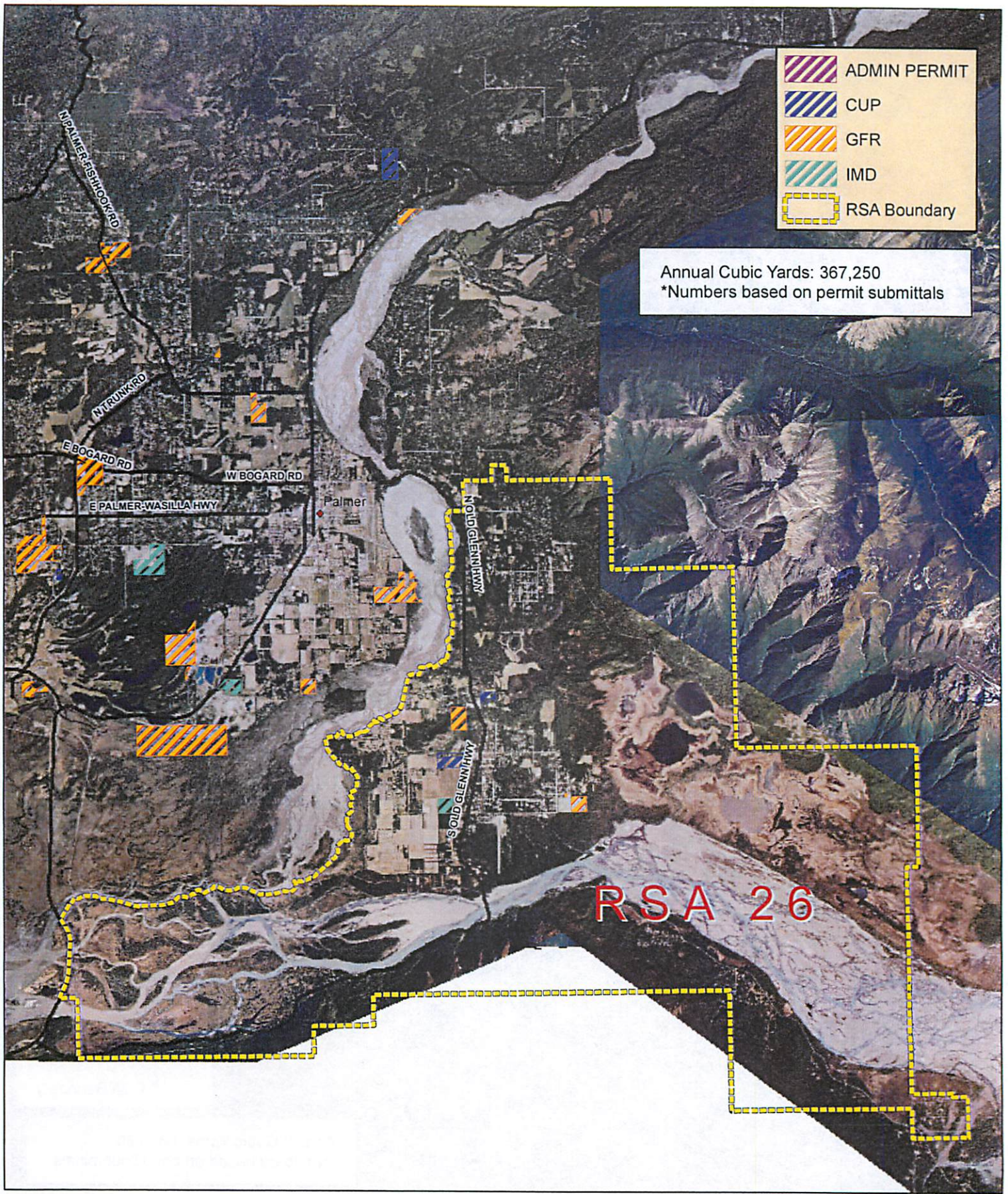
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Date: 10/21/2016 0 0.5 1 Miles



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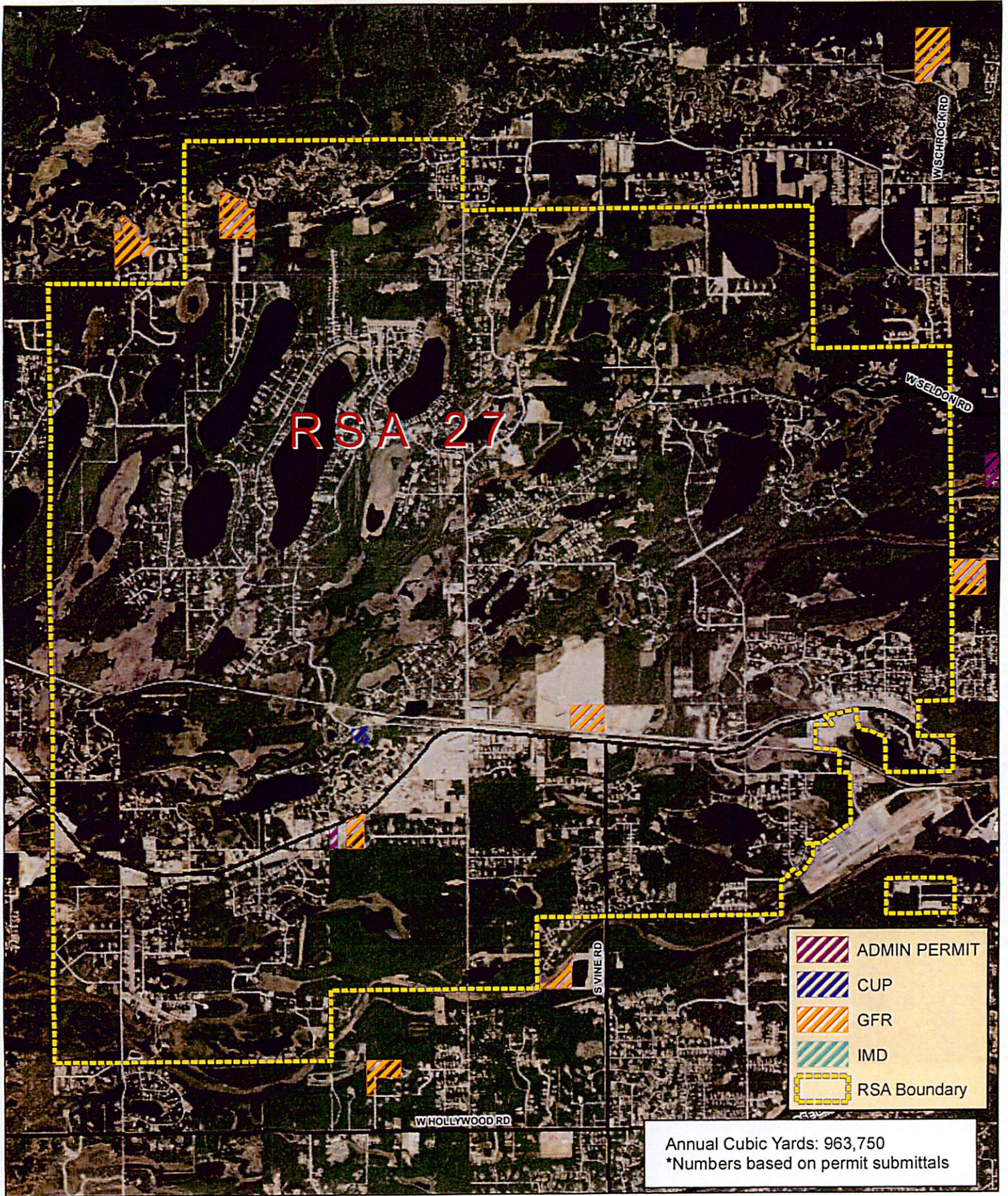
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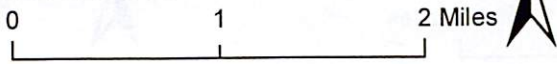
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	GFR
	IMD
	RSA Boundary

Annual Cubic Yards: 963,750  
 \*Numbers based on permit submittals



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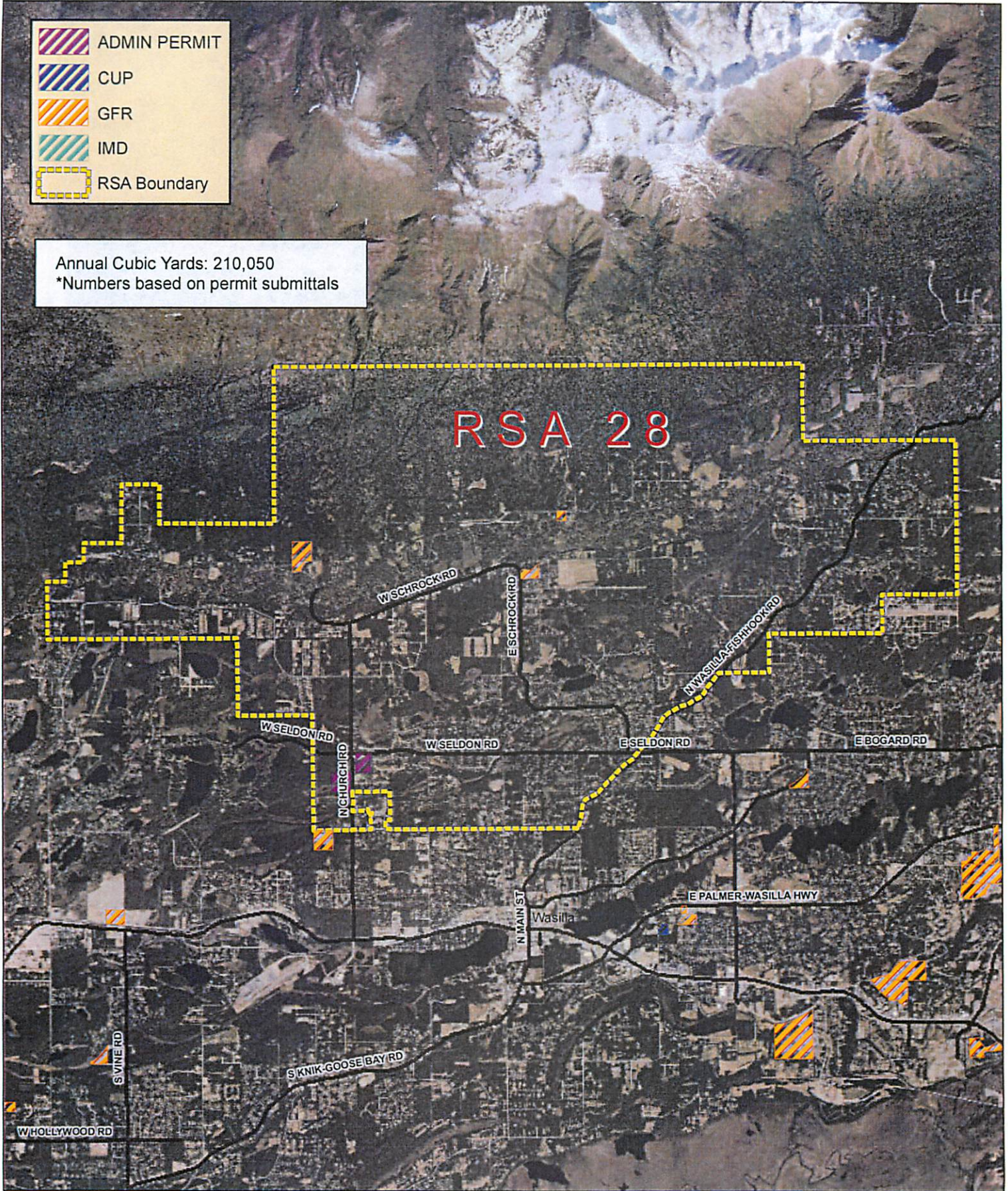


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Annual Cubic Yards: 210,050  
 \*Numbers based on permit submittals



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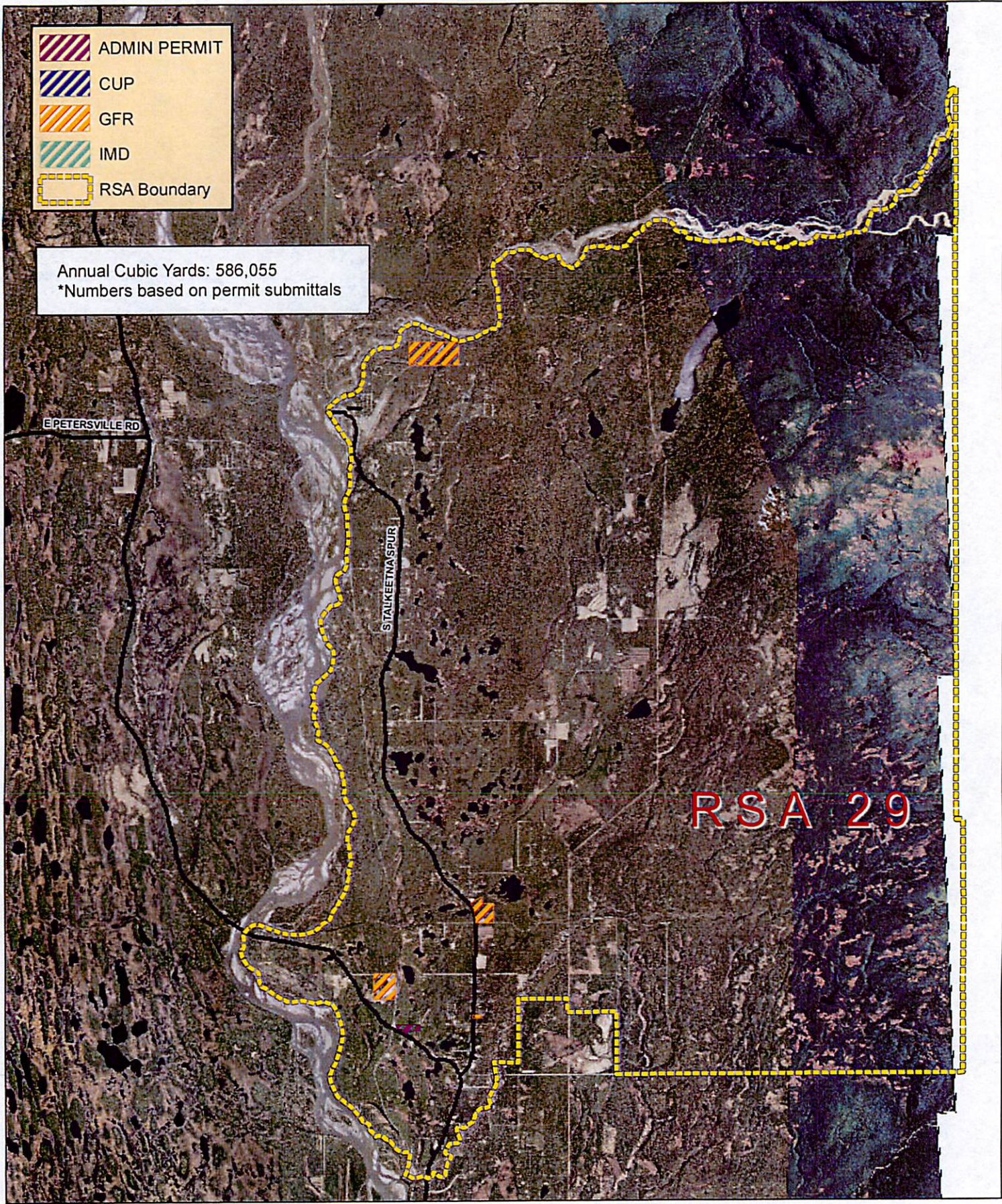


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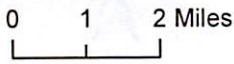


-  ADMIN PERMIT
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Annual Cubic Yards: 586,055  
 \*Numbers based on permit submittals








**Matanuska Susitna Borough  
 Development Services**

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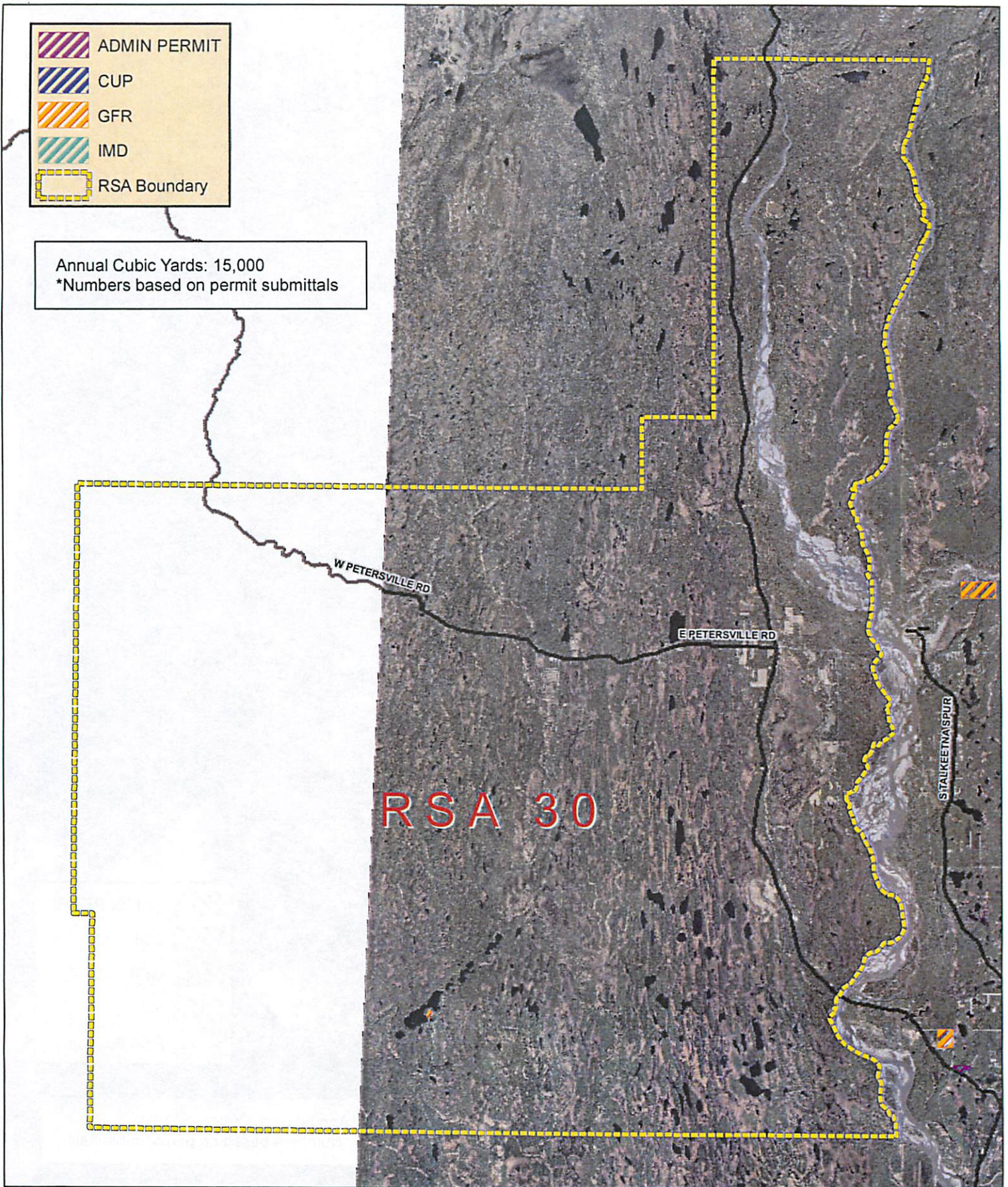


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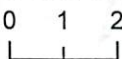


-  ADMIN PERMIT
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-  RSA Boundary

Annual Cubic Yards: 15,000  
 \*Numbers based on permit submittals



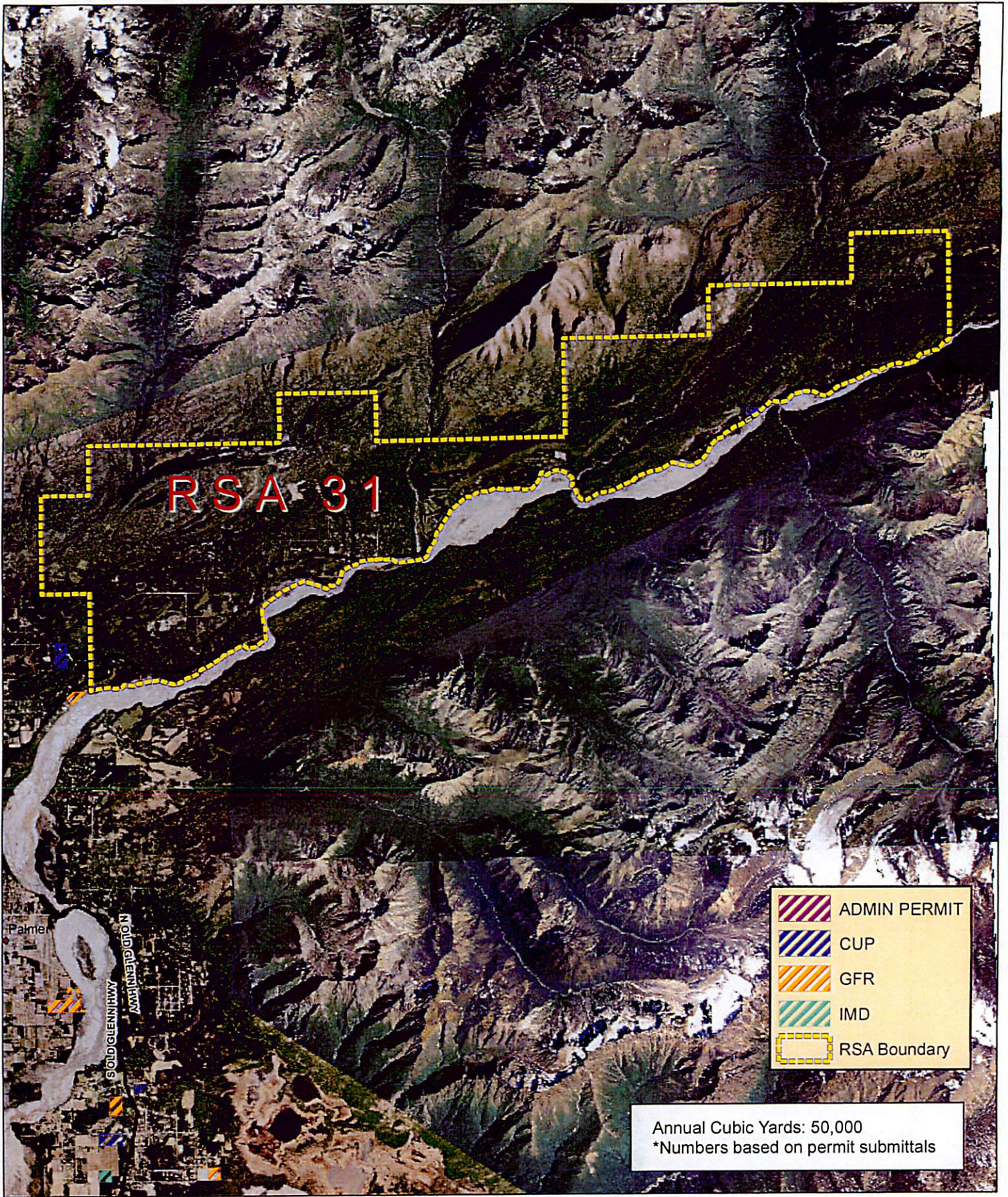
**Matanuska Susitna Borough  
 Development Services**

Date: 10/21/2016 



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**Matanuska Susitna Borough  
Development Services**

Date: 10/21/2016 0 1 2 Miles



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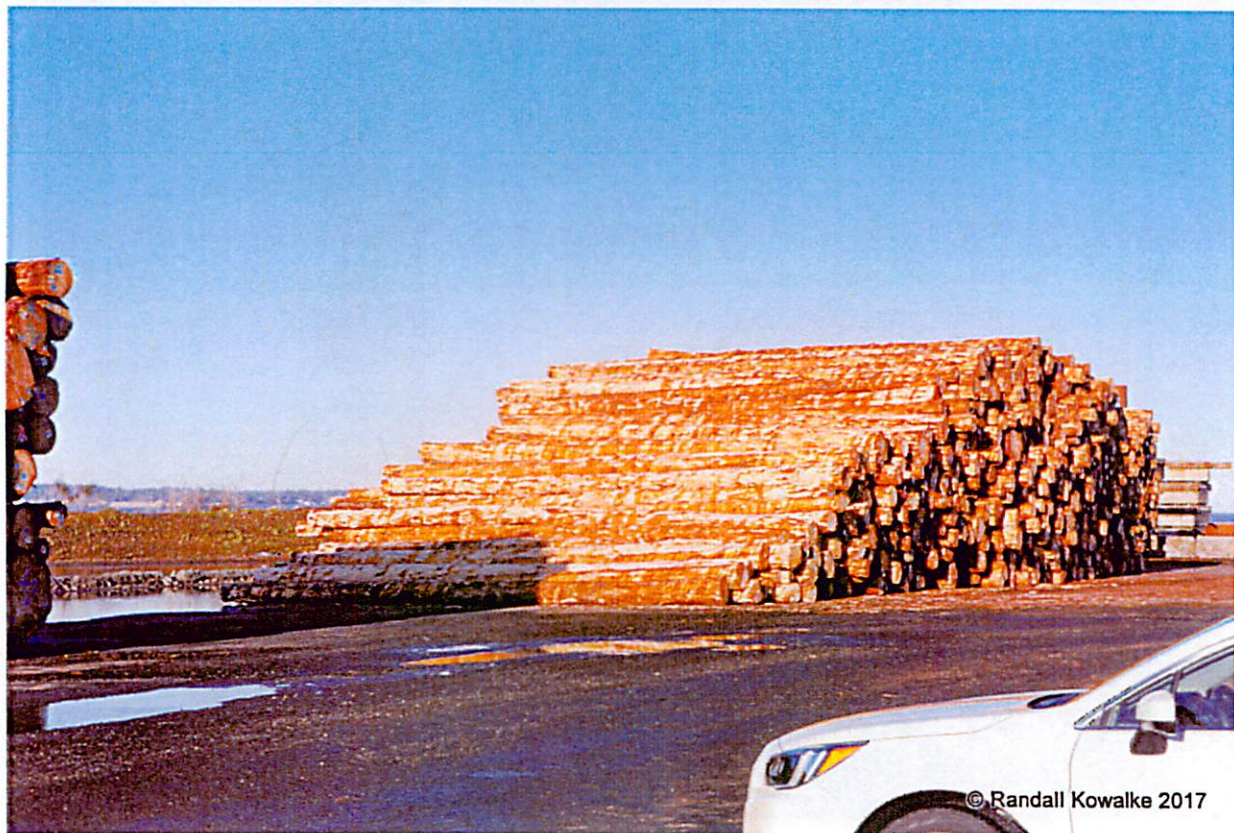


Port of Astoria, OR  
Moosey & Kowalke Visit





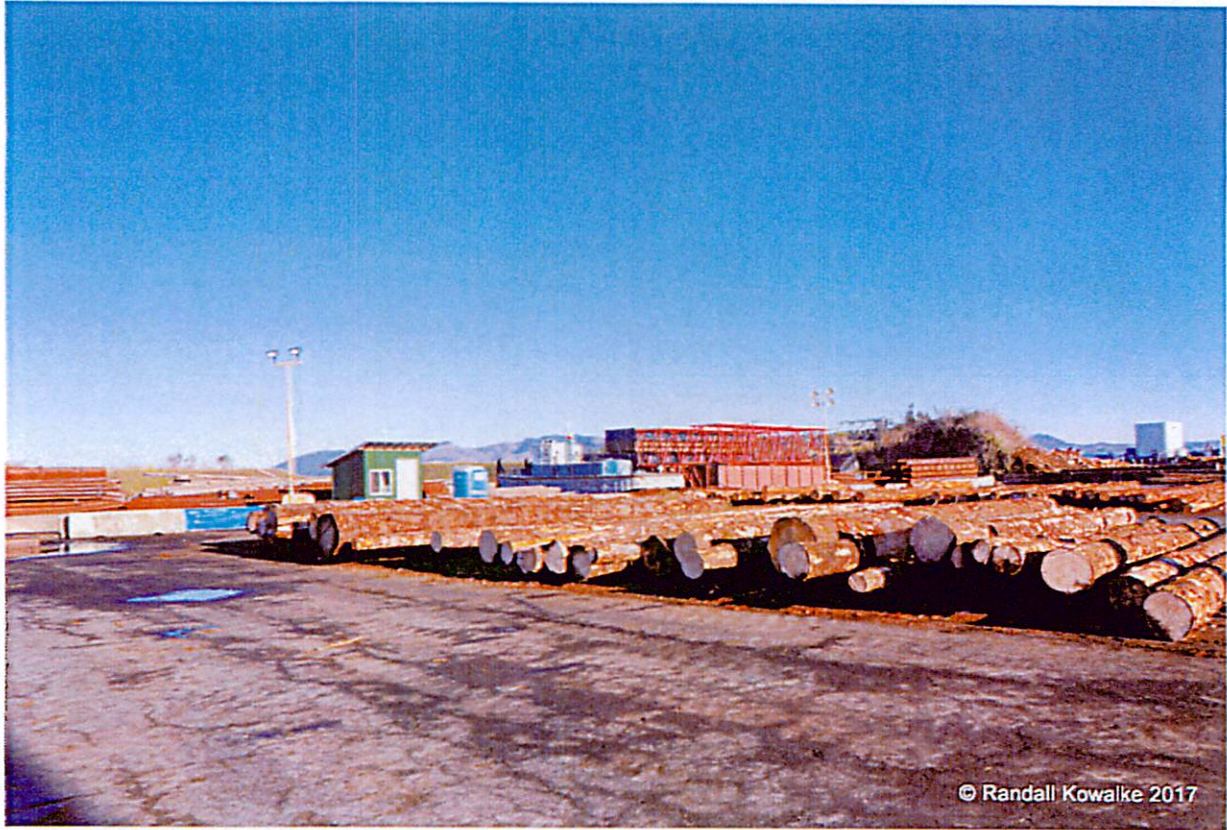
Port of Everett  
Randy Kowalke



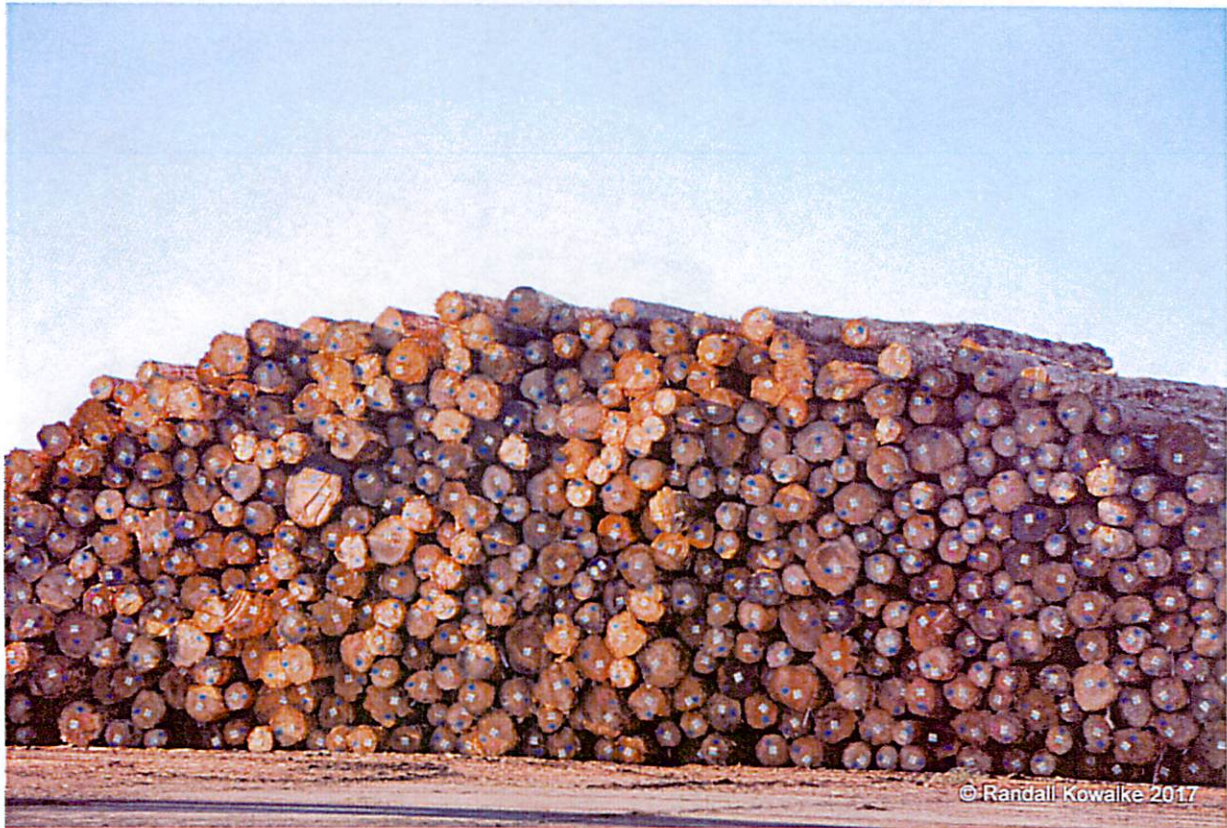






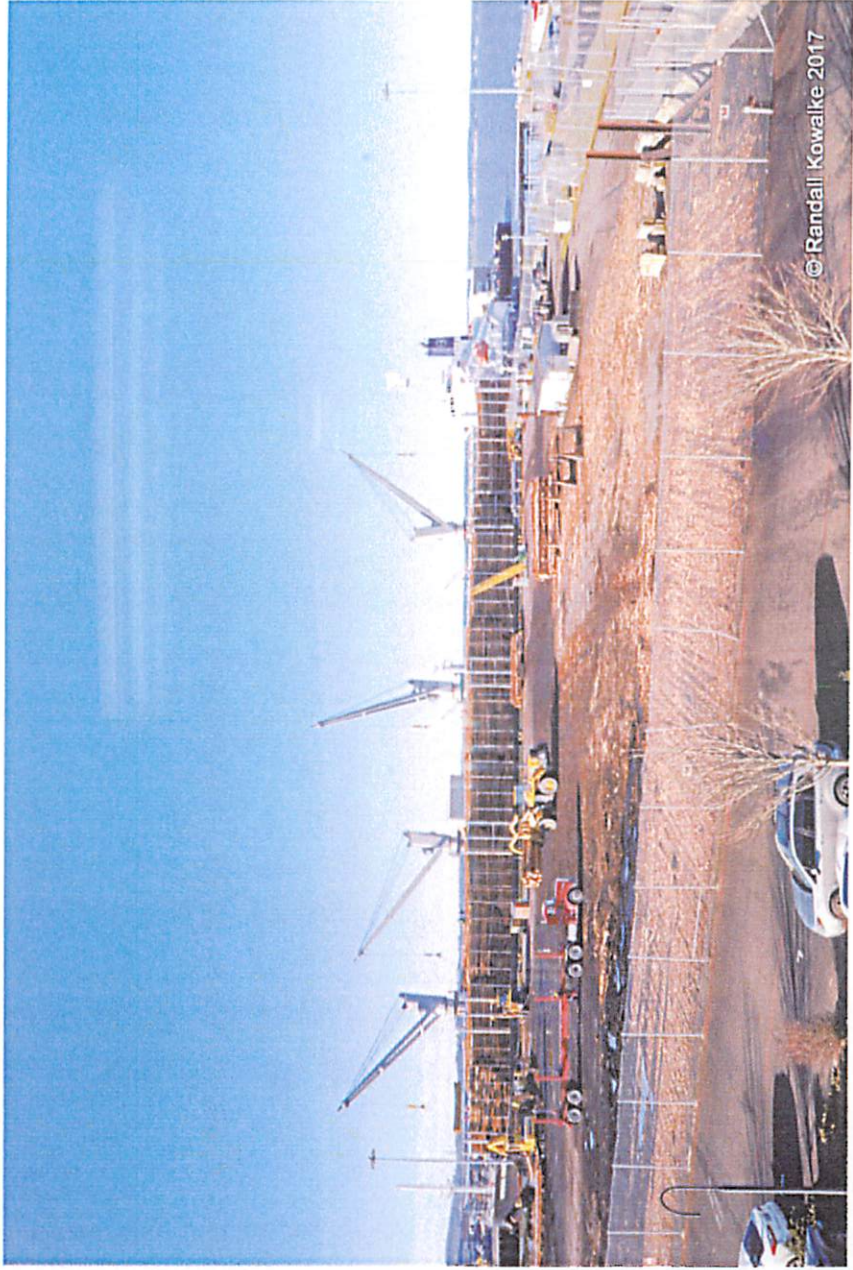
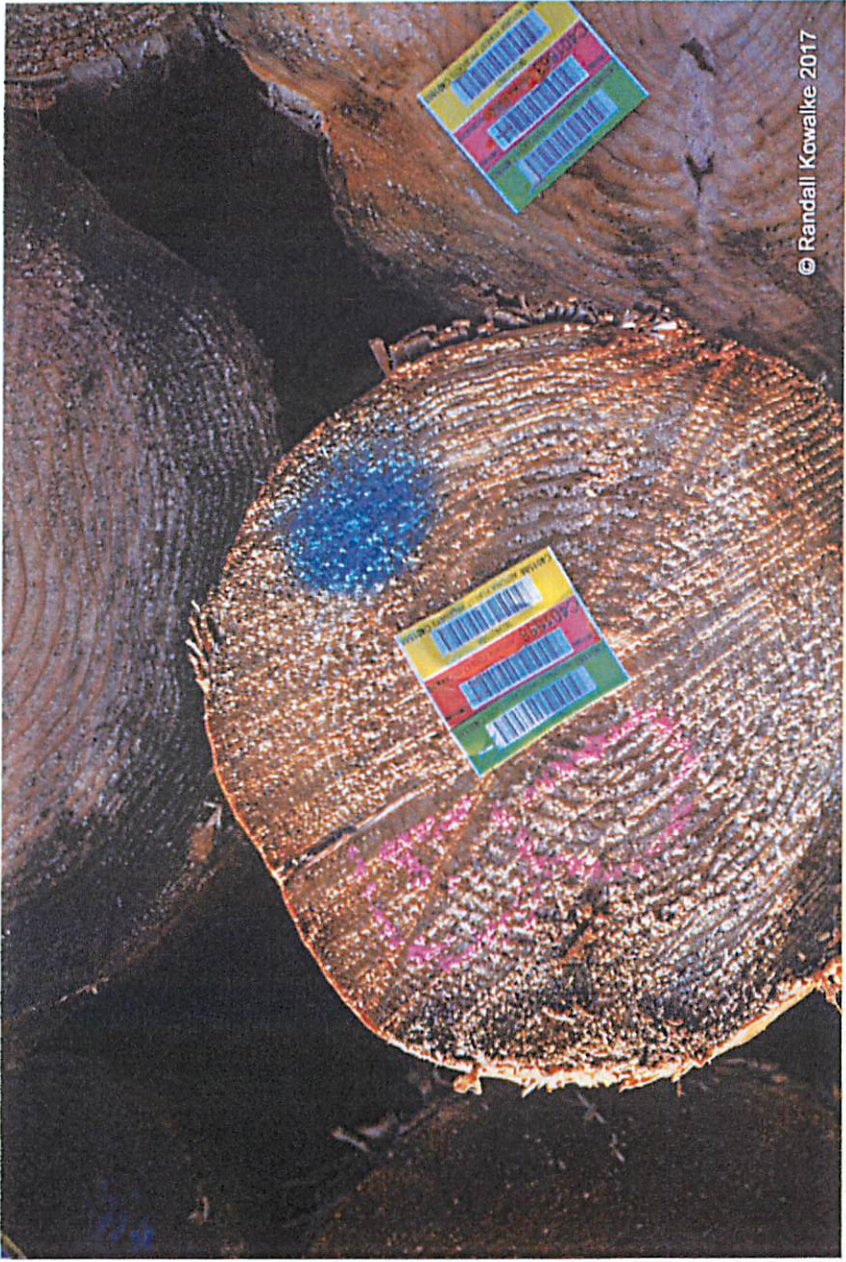


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