Fort Yukon Wood Energy Program: Wood Boiler Deployment

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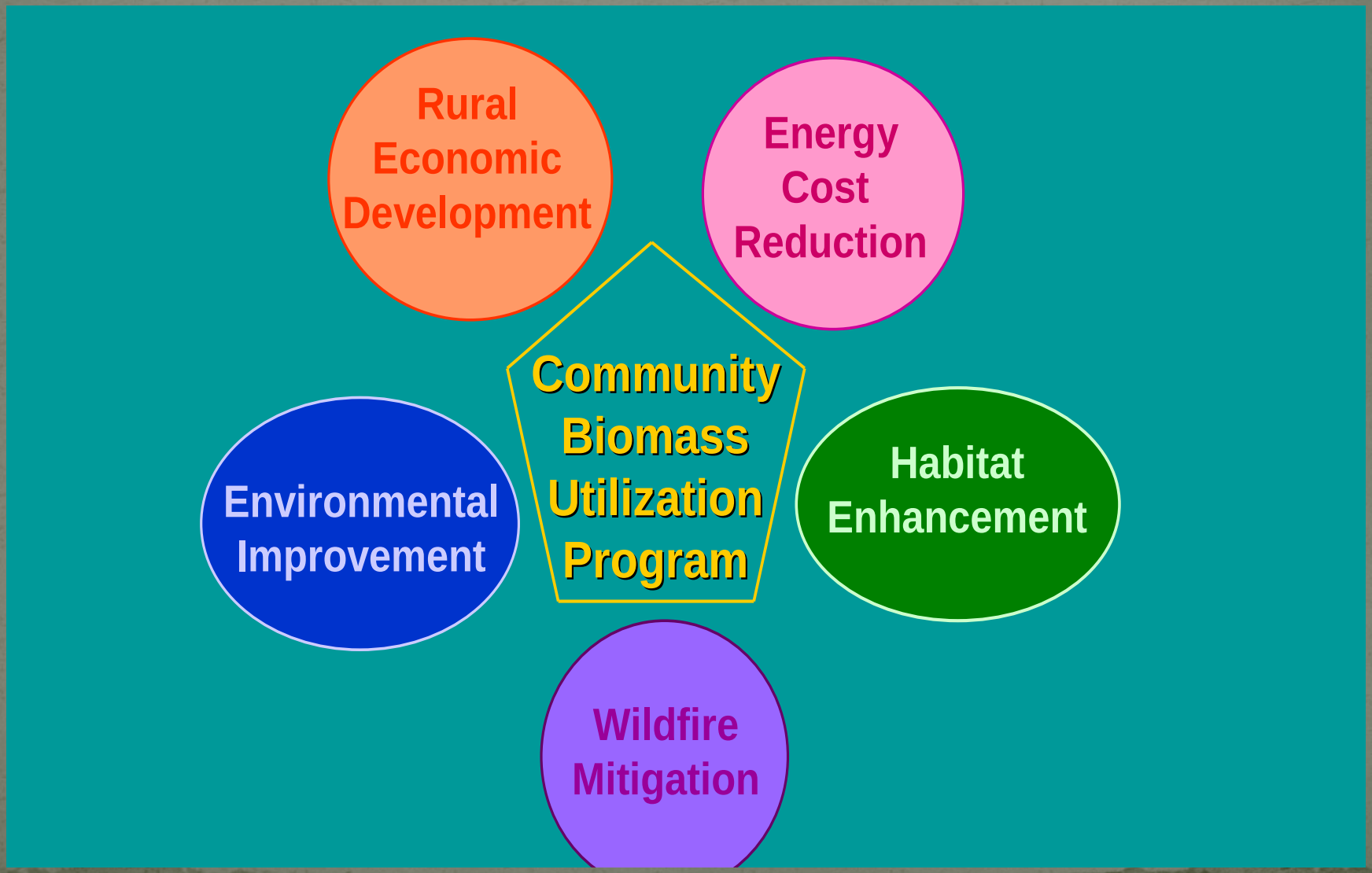
Organizational Overview:

- Council of Athabascan Tribal Governments (CATG)
  - Consortia of 10 Tribal Governments of Interior Alaska
- Gwitchyaa Zhee Corporation (GZ Corp)
  - Alaska Native Claims Settlement Act Village Corporation
- Alaska Village Initiatives (AVI)
  - Rural Alaska economic development organization

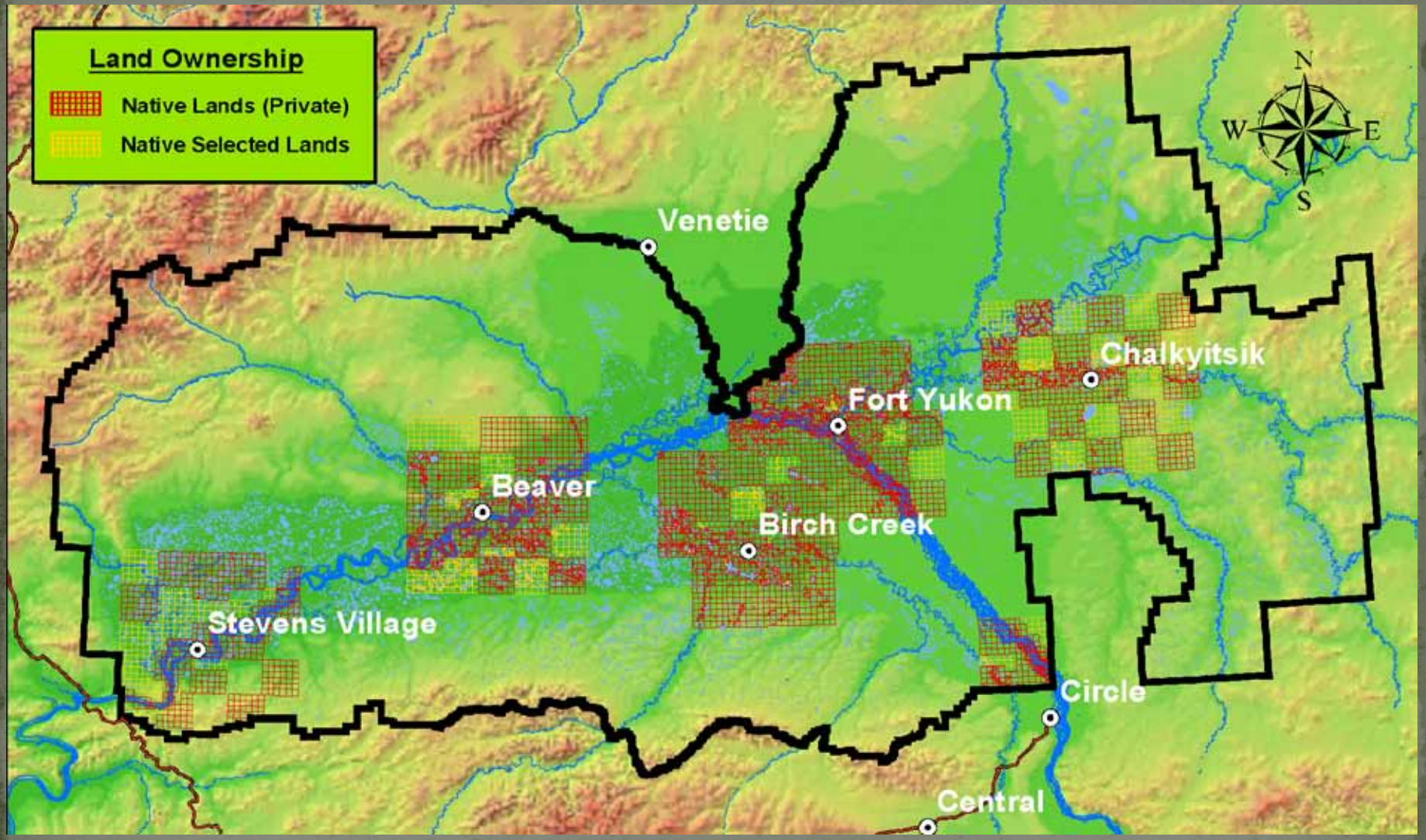
Overview of Project:

- First off grid, off road system biomass CHP in the world
  - 8 miles north of the Arctic Circle
- New Power House
- Wood Chip Boiler
- District Heating loop providing heat to commercial buildings
  - Ie. School, AC, Radio Station, Water Plant, Clinic, etc.

Integrated Biomass Program



Land Ownership: It's complicated!



How much money will be spent?

Funder/Grantee	Amount	Source	Scope
Denali Commission (DC)/Alaska Energy Authority (AEA)	$ 808,805	Round "zero" Renewable Energy Fund	Grant Secured - Match in place - Harvest Equipment
DC/Alaska Village Intiatives (AVI)	$ 258,300	Economic Development Program	Training and Tech Support and Harvest Plan
DC/AEA	$ 60,000	Energy Program Planning/Design	Comprehensive Energy Business Plan including Rural Power System Upgrade (RPSU), heat utility/wood harvest, biomass diesel hybrid power and integrated district heat system. 1st draft completed
AEA	$ 210,000	Final Design Funds AEA	In conjunction with DOE and is match
DOE	$ 210,000	Phase 1 80% design DOE	In conjunction with AEA and is match
DOE/CATG	$ 990,000	Renewable Energy DOE	Construction or other support functions needs 1:1 Match
AEA/GZ	$ 2,300,000	REF Round (3) AEA	Construction Funds
GZ Cash	$ 300,000	Cash GZ	Company start up fundfs
DC/AEA	$ 280,000	RPSU Program	Diesel powerhouse design & CHP BOP
AEA/Power House funding	$ 3,500,000	Awarded from USDA - NEPA needs to be done	Diesel powerhouse construction
GZ Match Land and Building	$ 400,000	GZ Corp	
	$ 9,317,105	Total Funding Secured	

Products thus far:

- Conceptual Design
- Financial Analysis –
  - @ 4.10 a gallon & $250 a ton with 70% displacement a $80K boiler pays back in 3 years.
- Boiler Business Plan
- Powerhouse business Plan
- Combined business plan
- Harvest Plan
- Operations Plan
- Environmental Assessment
- Harvest Equipment

Power Costs: among highest in nation

- Gasoline = $8.50 per gallon
- No 1 Diesel = $7.00 per gallon
  - Average house hold cost for oil = $3,500 per year
  - Oil cost per year for school = $210,000
  - Fuel cost for electrical generation = $1.4 M
- Cord Wood = $275 – $300 per cord
- Kwh = $0.51 (rate increase coming)
- Propane = $193 per 100 lbs tank

Years achievements:

- Funder reassurance
- Consultant accountability
- Harvest Equipment Grant
- Harvest site selection
- Power house funding
- Two pieces of Equipment
- Integrated business plan

Implementation Plan

- CHP (Power house) Facility construction
  - Who is responsible
  - Objectives List
  - Timeline for completion
- Biomass Harvest
  - Timeline
  - Operations

Implementation Plan

- CHP Facility construction – Power house
  - Who is responsible:
    - AEA will manage the construction
    - Steve Stassel will preform engineering over site
    - Construction contract will go through standard AEA biding process.
  - Objectives List
  - Timeline for completion

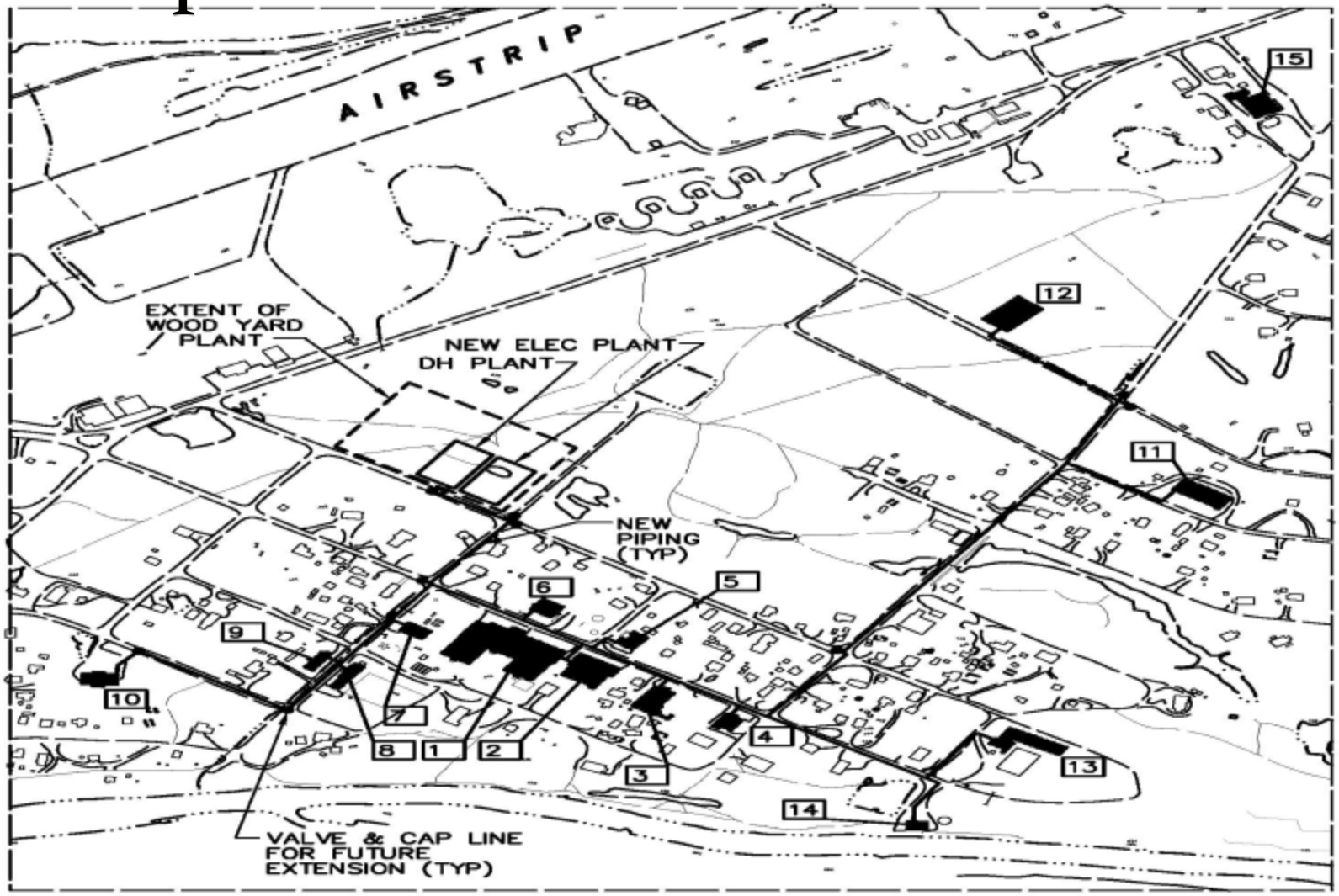
Implementation Plan

- CHP Facility construction – Power house
  - Who is responsible
  - Objectives List:
    - Finalize legal paperwork for site control
    - Survey plot, including topographic (completed)
    - Design Facility layout
    - AEA put construction contract out to bid
    - Begin construction – Spring 2012
    - Finish construction – Fall 2012
  - Timeline for completion

Implementation Plan

- CHP Facility construction – Power house
  - Who is responsible
  - Objectives List:
  - Timeline for completion
    - Finalize legal paperwork for site control – DEC 2011
    - Survey plot, including topographic - completed SEPT 2011
    - Design Facility layout – Late Winter 2012
    - AEA put construction contract out to bid – Late winter
    - Begin construction – Spring 2012
    - Finish construction – Fall 2012

The loop:


AIRSTRIP
EXTENT OF WOOD YARD PLANT
NEW ELEC PLANT
DH PLANT
NEW PIPING (TYP)
VALVE & CAP LINE FOR FUTURE EXTENSION (TYP)
MAX PLANT 1
NTS
1. SCHOOL
2. GYM
3. STORE
4. POST OFFICE
5. CATG OFFICE
6. STATE BLDG
7. SHOP
8. DISTRICT OFFICE
9. CHURCH
10. YUKON FLATS
11. CITY BLDG
12. NEW CATG CLINIC
13. TRIBAL OFFICES
14. WATER TREAT
15. OLD CATG CLINIC

Implementation Plan

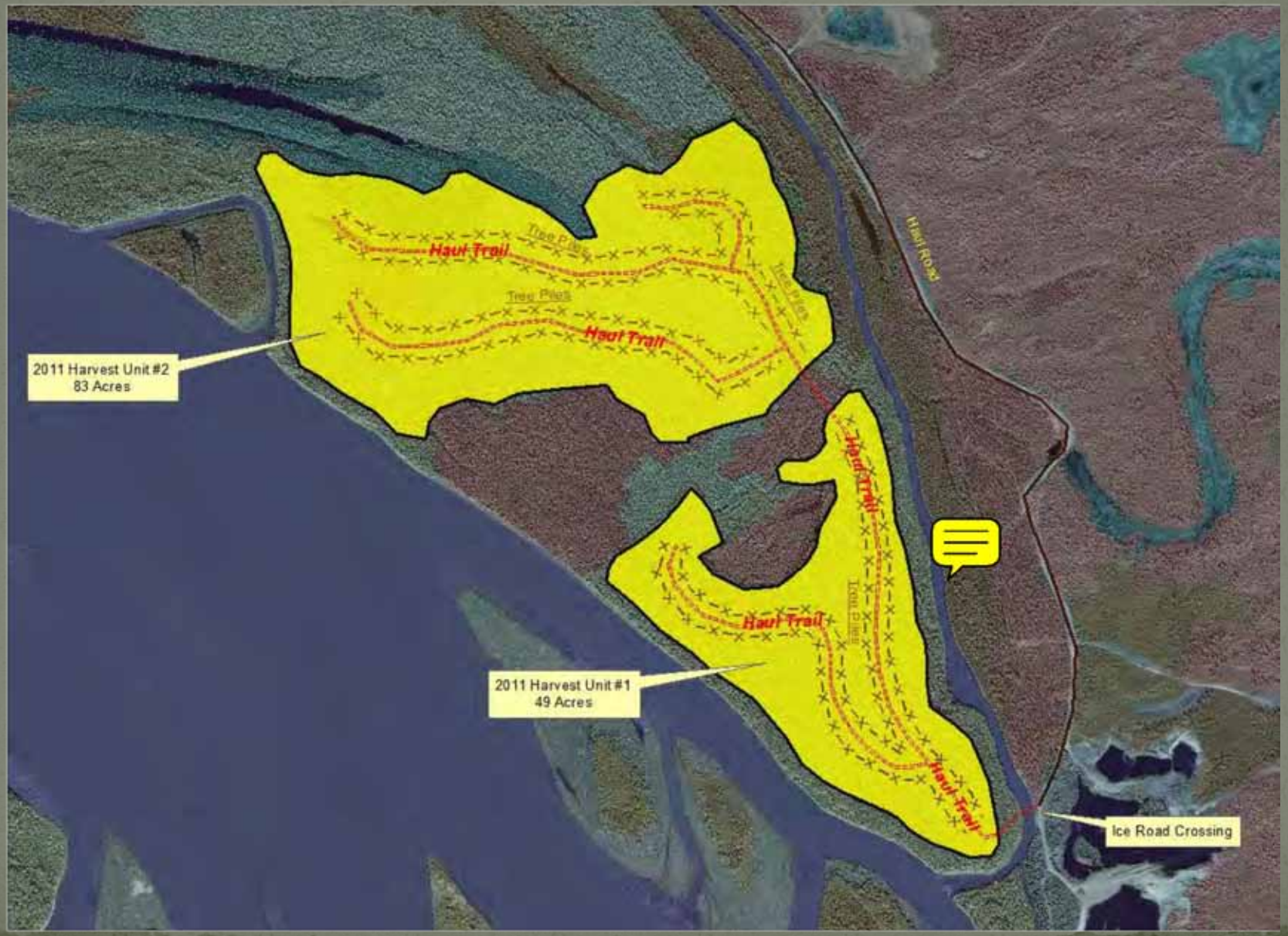
- Biomass Harvest
  - Timeline:
    - Environmental Analysis
    - Equipment arrival
    - Clear Storage site
    - Permitting for Landing Site
    - Develop landing to harvest site
    - Harvest Fiber
      - December-April 2012
  - Operations

Implementation Plan

- Biomass Harvest
  - Timeline
  - Operations: Four primary components
    - Trail Development to Ulota island
    - Felling Fiber
    - Transport

Implementation Plan: Harvest Area's

Year 1 Harvest Area



Year 1 Harvest Area: Slough Crossing

Implementation Plan

- Biomass Harvest: Operation Detail – Year 1
  - Cutting
    - Kubota 080 & New Holland TV 6070
  - Transport
    - Sled to staging area
  - Stack for drying
    - Separate by relative species

Implementation Plan: Next 3 months

- Final Environmental Analysis
- Alaska Forest Practices Act notification
- Legal site control for facility
- Final Design
- Harvest Contract