Ramona Band of Cahuilla Indians

October 22, 2008

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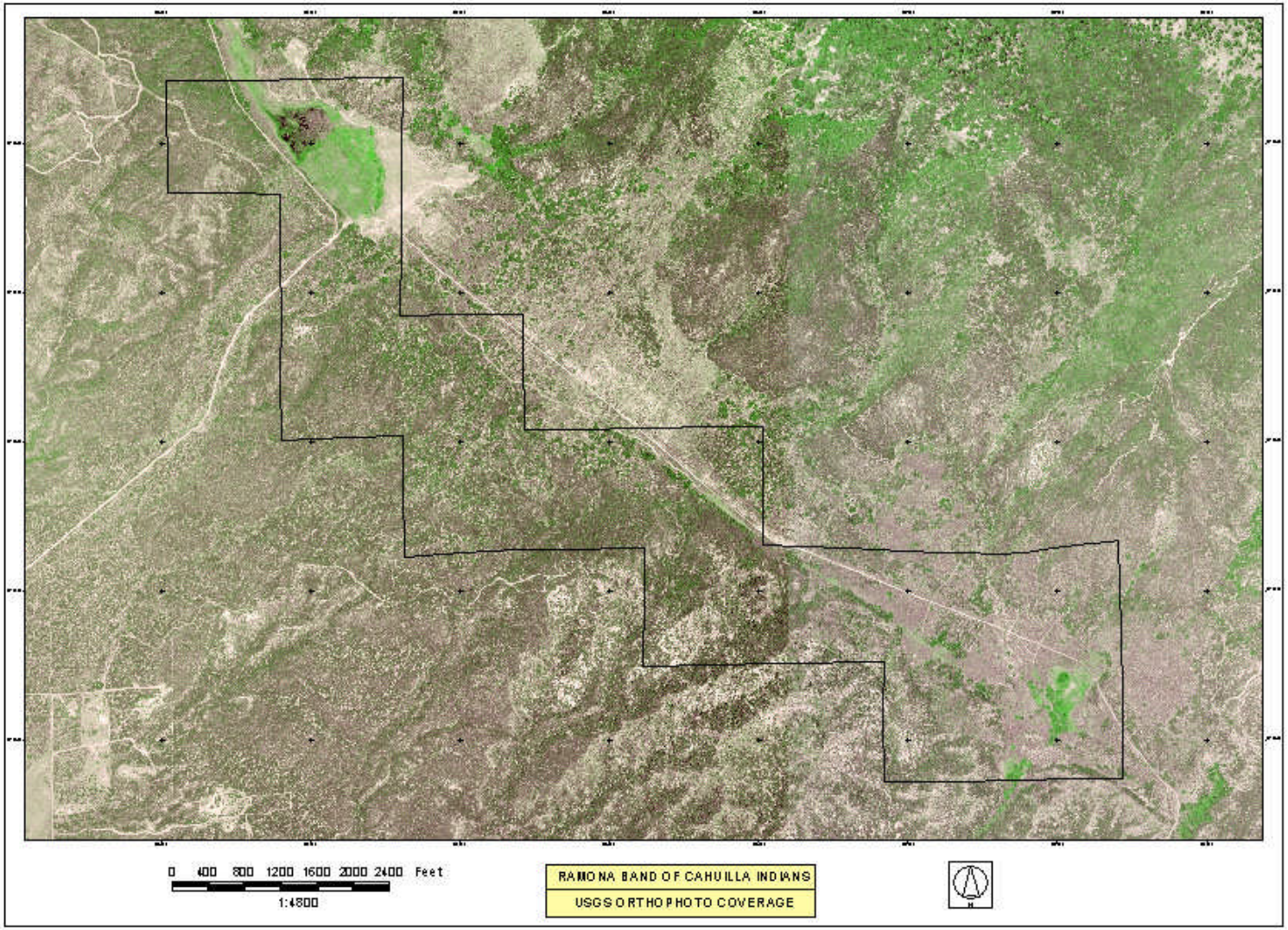
Vice-Chairman

Ramona Tribe – Overview

- **FIRST RESERVATION TO BE COMPLETELY OFF GRID**
- **ISSUES THE TRIBE FACES:**
  - **REMOTE AND RURAL**
  - **LAND LOCKED**
  - **UTILITY COSTS ARE PROHIBITIVE**
- **ECO-TOURISM PROJECT**
- **HOUSING UNITS**

RAMONA RESERVATION
Anza, CA
45 min. east of Temecula/45 Min. south of Palm Springs



Ramona Indian Reservation Power Systems

- **Macro Grid Hybrid Power System: Eco-Tourism**
- **Micro Grid Hybrid Power System: Housing Units**

RAMONA ECO-TOURISM PROJECT OBJECTIVE

- **TO PROVIDE POWER TO THE TRIBE'S ECOTOURISM BUSINESS VIA ALTERNATIVE ENERGY TECHNOLOGIES**

PROJECT PARTICIPANTS

- **AGENCIES**

  TRIBE – SUPPLEMENTAL FUNDING

  DOE – ECOTOURISM POWER

  HUD CDBG – ECOLODGE

  USDA RD - ECOTENTS

  BOR – ECOTOURISM WATER

  U.S. FOREST SERVICE – ROAD ACCESS

Macro-Grid Hybrid Power System

- **10kw Photovoltaic Array**
- **VRLA (Value Regulated Lead Acid) Battery Banks**
- **15kVA continuous inverter with 175A disconnect**
- **60kw 3 Phase Diesel Generator**
- **Power Station Building 12’ x 16’**
- **Monitoring System, Inverter, Breaker Box, Wiring, etc.**

EVERGREEN SOLAR
CEDAR LINE PHOTOVOLTAIC MODULES
EC-100 SERIES

SOLAR PANELS – SIDE VIEW

- 60 Module Solar Array: 175w operating at 100 volts DC
- Total of 10,500w
- Feed two inverter banks
  - Main Lodge System
  - Ecotents

POWER BUILDING FRONT VIEW

POWER BUILDING SIDE VIEW

ABSOLYTE IIP BATTERIES

- **Battery Output: 10,800 Ah at 48 volts**
- **Life Capacity: up to 20 years**
- **Weight: 300 lbs per unit**

OUTBACK INVERTERS/CHARGERS

- 36 Kw Inverters
- 120/240 Volts

KOHLER 60HZ GENERATOR

- **60Kw 3 Phase Diesel Generator**

RAMONA ECOTENTS
Funded by USDA Rural Development

COMPLETED ECOTENTS

ECOTENT SKYLIGHT OPENING

COMPLETED SKYLIGHT OPENING

VIEW INSIDE OF ECOTENTS

VIEW INSIDE OF ECOTENTS

TECHNICAL/MANAGEMENT ISSUES

- **COORDINATION OF MULTI-AGENCIES WHICH SLOWS PROJECT PROGRESS**
- **ENVIRONMENTAL RESTRICTIONS**

  Need to coordinate with environmental departments to ensure all requirements are met prior to start of project.

ACTIVITIES REMAINING

- EXTEND LINES TO THE WATER SYSTEM
- CONSTRUCT ECOLODGE (RESTAURANT, EDUCATION CENTER, CONFERENCE CENTER, OFFICES, RESERVATION OFFICE, GIFT SHOP, ETC.)
- EXTEND LINES TO THE ECOLODGE WHEN COMPLETE

Housing Complex: Micro-Grid Hybrid System

- 2Kw wind turbine capacity with wireless controls
- 6.3Kw large photovoltaic modular array
- VRLA (Value Regulated Lead Acid) battery banks
- 25Kw propane generator
- One propane storage tanks
- Currently installing power gauge

Southwest Wind Power
Skystream 3.7 Wireless Model

Wind Turbine and Solar Cells for Housing Complex producing 8.3 Kw

Power House (includes back-up propane generator, battery bank, and inverters/chargers)

FUTURE PLANS

- **BUILD OUT OF THE ECOTOURISM DESTINATION RESORT INCLUDING ACQUIRING ADDITIONAL FINANCING**
- **DEVELOP ECOTOURISM PROGRAMS**
  - **ALTERNATIVE ENERGY EDUCATION**
  - **CULTURAL – LANGUAGE, BASKETRY, & POTTERY**
  - **HERBOLOGY**
  - **PARTNERSHIP WITH U.S. FOREST SERVICE AND BLM**
- **CONTINUE TO BE SELF SUFFICIENT**