



IRZ Engineering Solutions

Global Irrigation Trend & Technologies

ADVANCING INNOVATION TO SOLVE GLOBAL CHALLENGES

Design-Build-Manage

Since 1984

Contact Fred Ziari : 541-571-1111



FRED ZIARI

Founder and CEO



Experience : 40 years as a global leader in water resource/ Irrigation technologies. He is recognized as an innovator and water management technology leader. Award: OSU Agriculture Hall of Fame, Weatherford Entrepreneur of the year, Founder of Farmers Ending Hunger.

Founders : Founded :

- 1) IRZ Consulting & Engineering, 2) EZ Wireless
- 3) Zeco, 4) OnSmart Technologies

2 Earth Dilemma !

- Our population is growing by approx. 100 million/year
- By the 2050 we will have 9.8 billion people
- 4.9 bil. Ha. in Agriculture, 1.4 bil. Ha. is Arable land
- To feed this many people you may need 2 earth



1 bil = 1804
2 bil = 1927
3 bil = 1960
4 bil = 1974
5 bil = 1987
6 bil = 1999
7 bil = 2011
8 bil = 2022
.
. .
9.8bil= 2050

Irrigation Market Demands



- 17% of world agriculture is irrigated
- Irrigation is responsible for 40% of production
- In most countries 90% of water is used for irrigation. Competition for water is growing
- Flood irrigation is most widely used system
- Globally groundwater are declining rapidly
- Average global irrigation efficiency is **38%**

water management and profitability

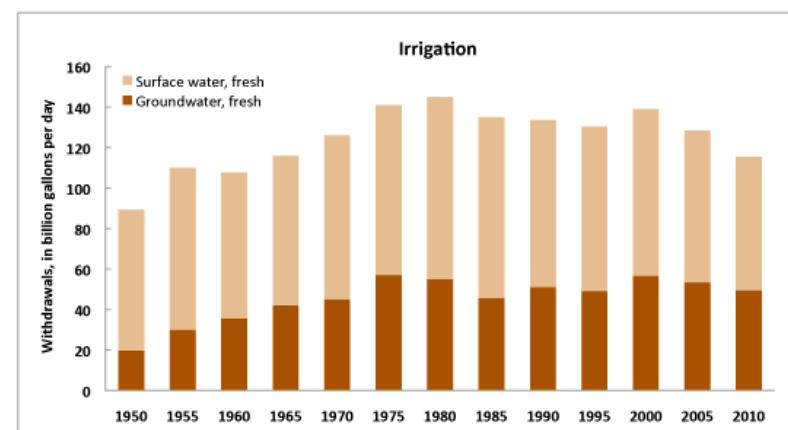
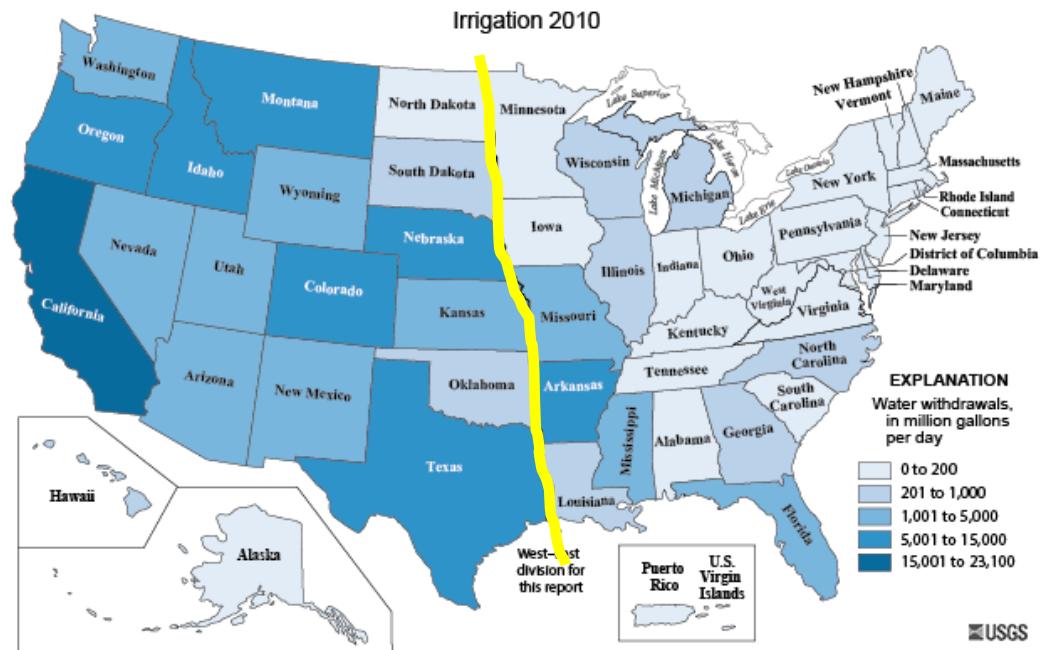
- Trends toward much larger irrigated farms
- More integrated and market driven farms owning part of the supply chain
- Well engineered irrigation systems (allows better water management)
- Much reliance on technologies for highest yield
- Fully incorporate sustainability as a profit center
- More crop diversifications
- Promotes Value-add food processing as an engine of the economy

About USA Irrigation

USA irrigation 61 million acre

TOP IRRIGATED STATES :

- California / Texas / Nebraska / Idaho / Colorado / Arkansas / Oregon / Washington
- Majority of U.S. irrigation withdrawals (83 percent) are in the 17 Western States (west of solid line in map above).
- Surface water is the primary source of water in the arid West, except in Kansas, Nebraska, Texas, where more groundwater was used.



Leading the world in Sustainable Irrigation
Technologies.

A US and Global Model

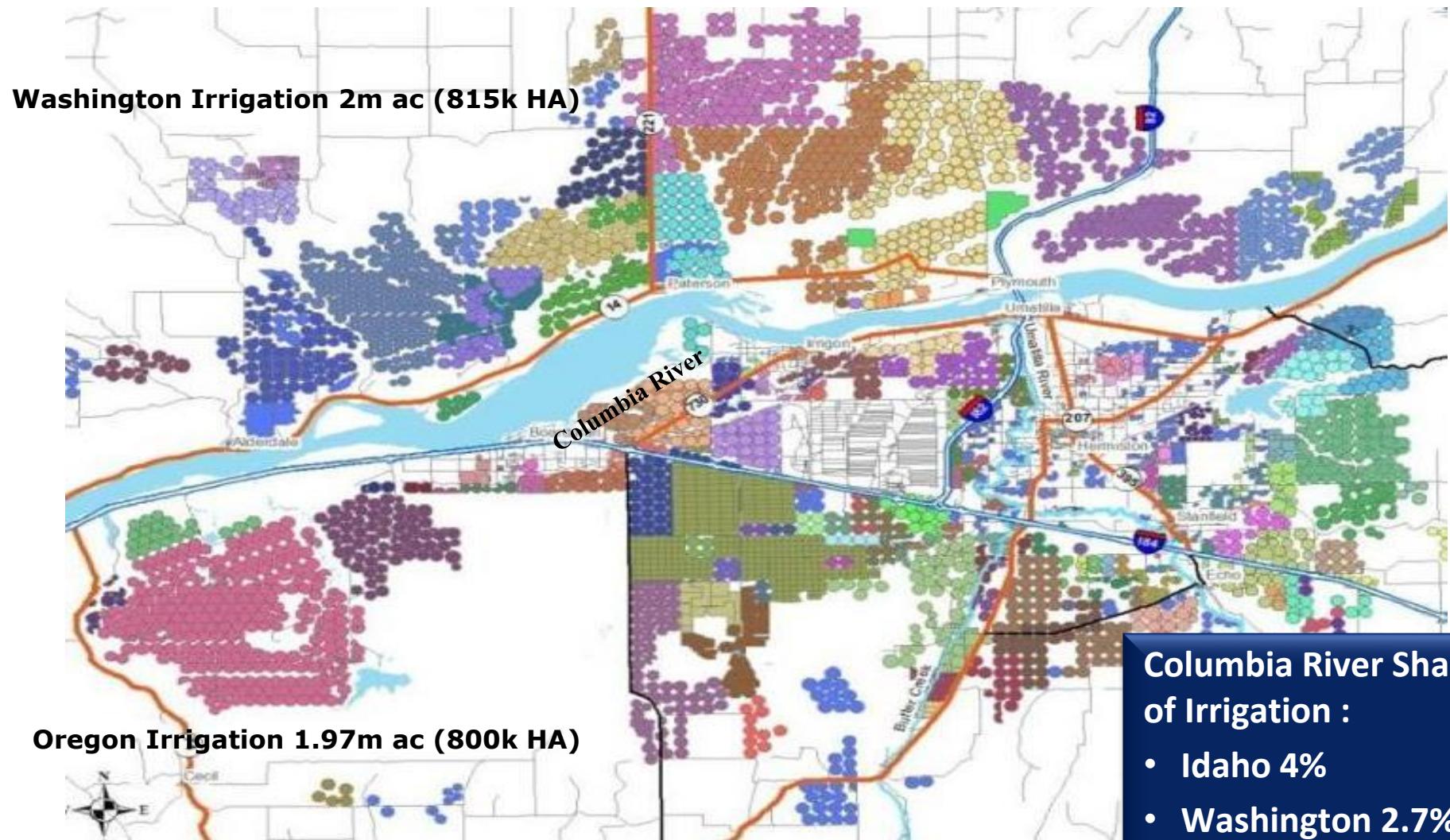


High Yielding -Large scale Farming

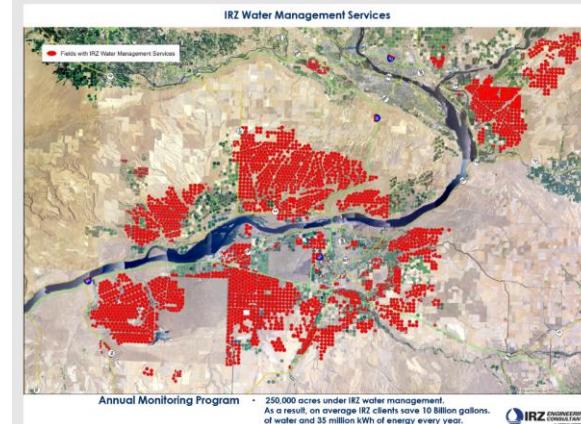
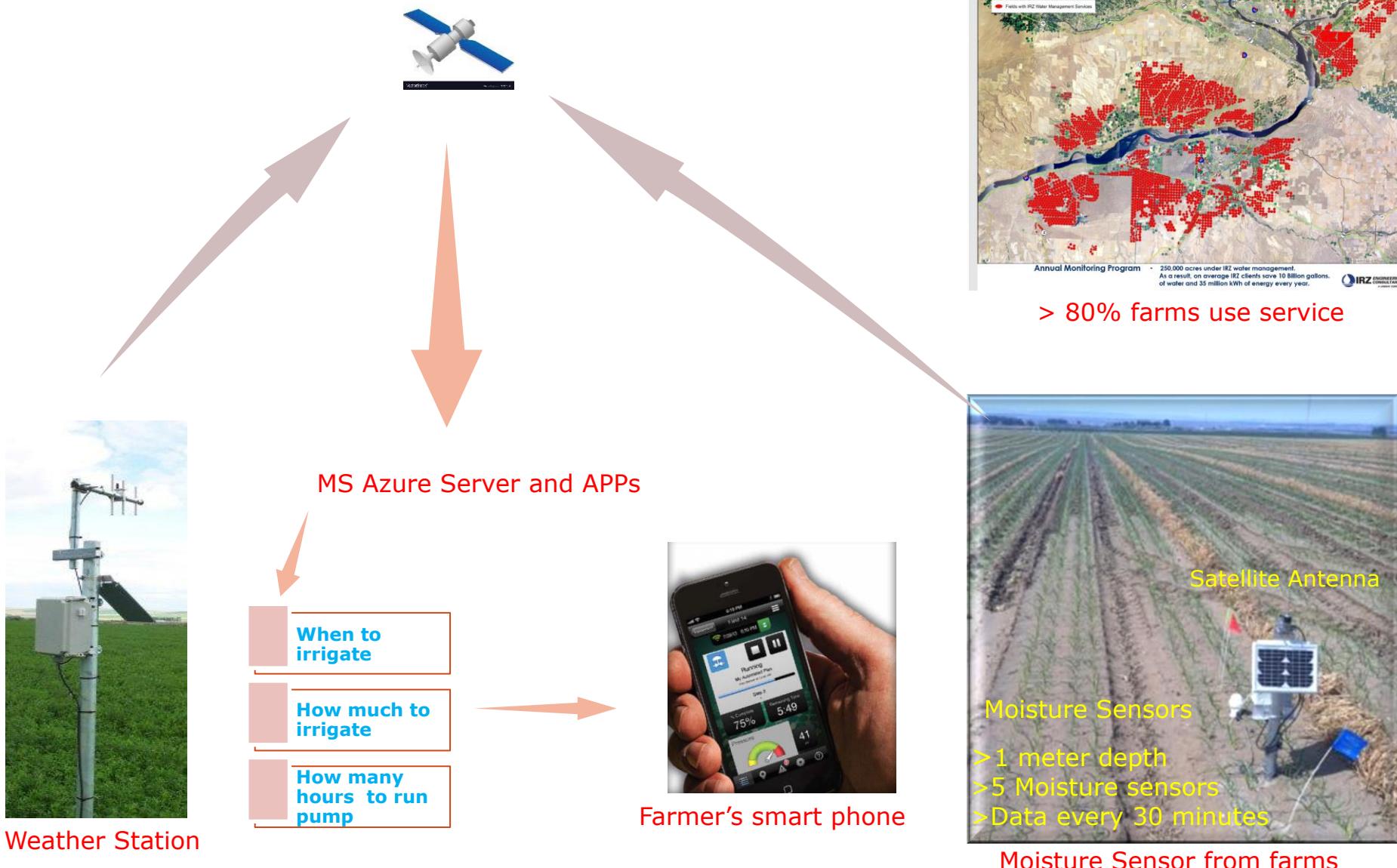
- Over 100 different crops
- Highest Yields of crops in the US
- 80% of farm products is for export
- 95% Irrigation Efficiency (pivot/Drip)

Columbia Basin





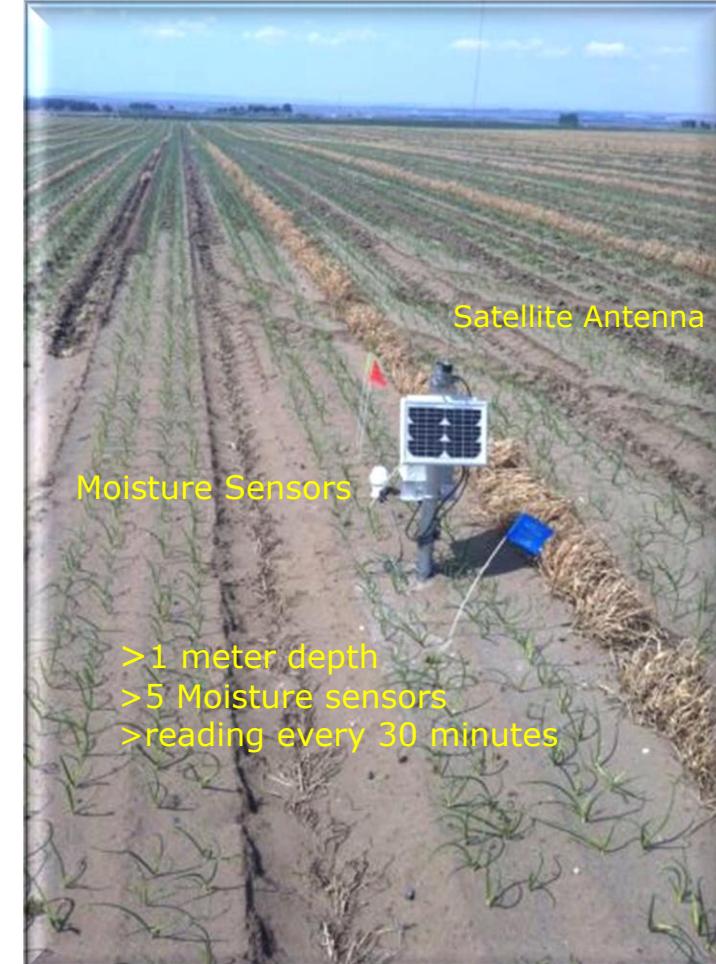
Water Management: Real time soil moisture sensors



IRZ Integrated Water Management Services-

Maximize Yield and conserve water and Energy

- **FieldSense** : Real-time Soil Moisture sensors (every 30 minutes), real-time Weather Stations, Crop Modeling (ET)
- 3000 sensors over 100,000 HA.
- Conserved Water Transfer

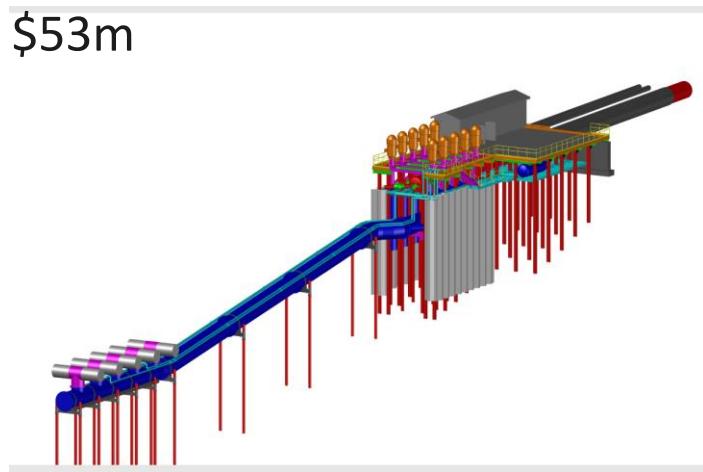


- Water Savings: 10%-15%
- Energy Savings: 10%-20%
- Saves Fertilizers/ Increase yield
- Saved 10 Billion Gallons Water/Year
- Saved 35 Million Kwh Energy/Year

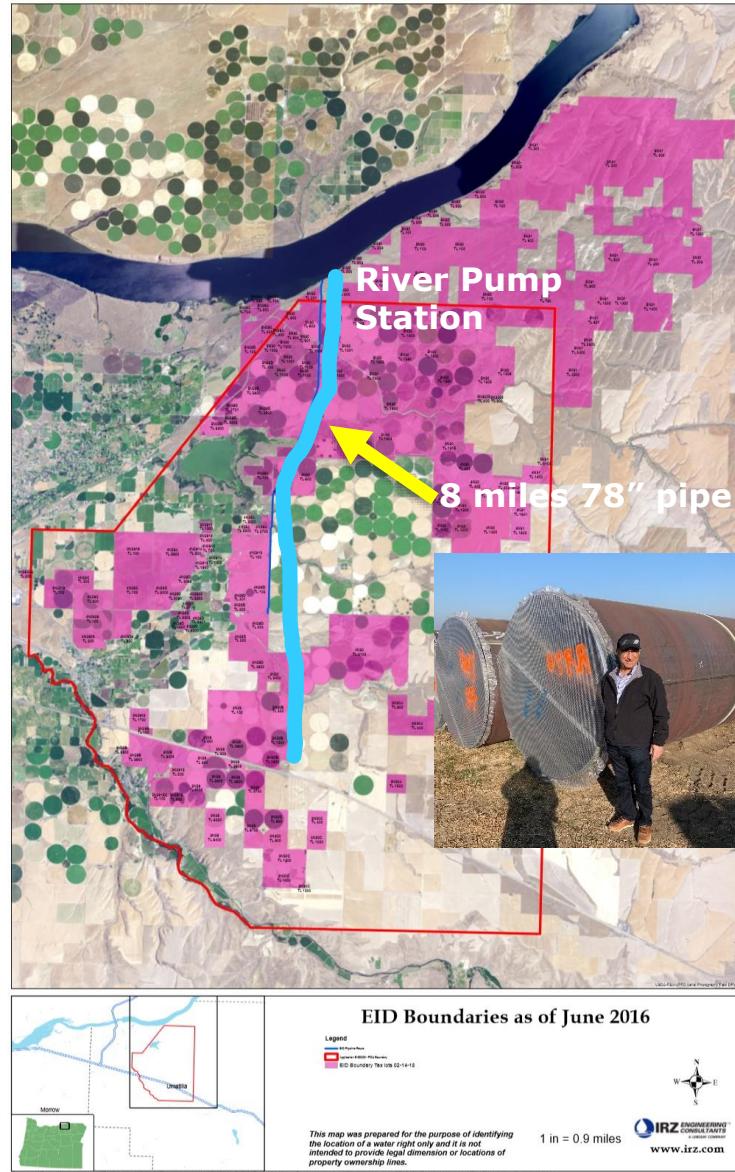
EID Project-Oregon : High efficiency irrigation system

Design-Build-Manage 2020

- 20,000 acres
- Columbia River Pump Station
- Construction 2019-2020
- 78" (2m) to 66" (1.7m) FRP pipe
- 20,000 (15MW) horsepower
- Public work tender documents
- \$53m



3D Design :100,000 gpm / (20,500 m³/h)



EID Pump Station 2020 – 10 x 2000 HP , w/Variable Speed Drive



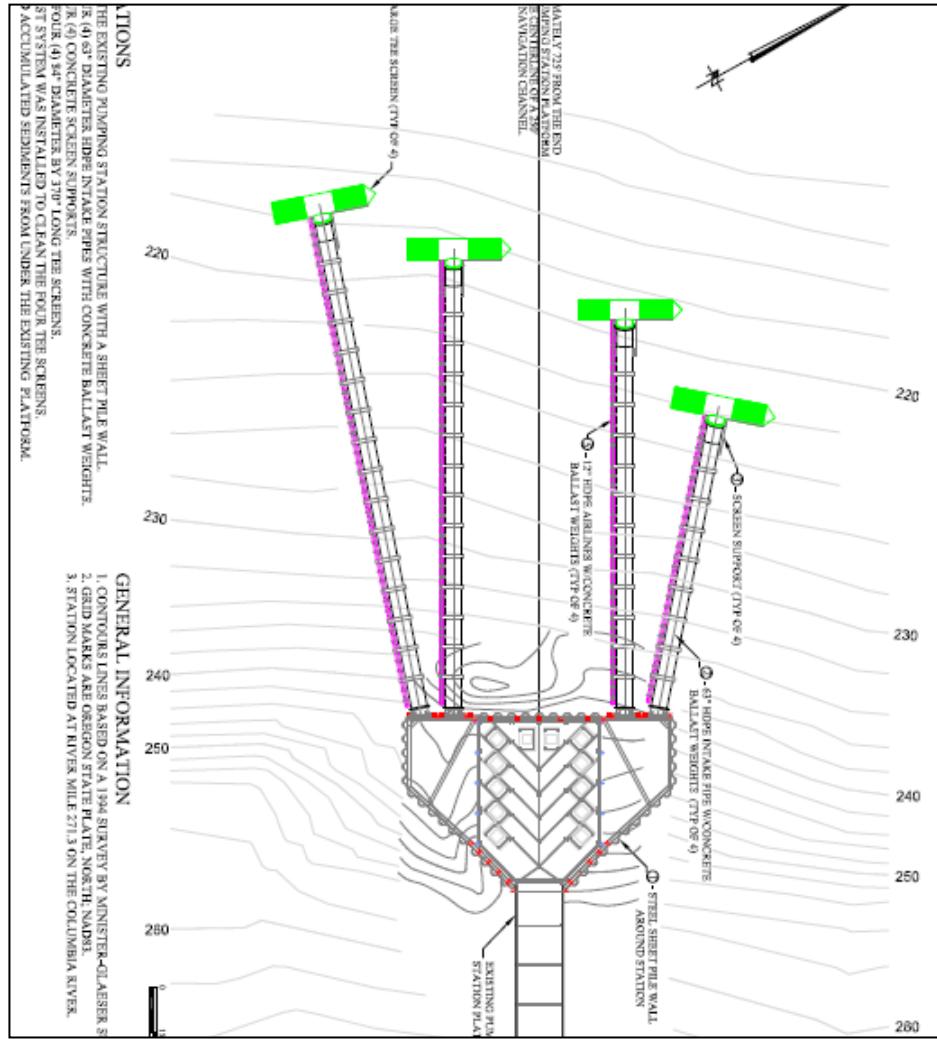


IRZ Design: Very Large Pump Station



Fish Protection: State of the Art Intake Screening

60,000 M3/hr (262,000 gpm) Oregon, USA



FRP: Large Diameter Pipe and Pressure Class For Irrigation



- New Pipe technology
- 100+ years life
- Very energy efficient
- No corrosion

Precision Agriculture : Precision Irrigation

■ Precision Agriculture:

- o GPS based technologies focused on Mechanized Tractors, Planting, Cultivation, Harvesting, etc.



■ Precision Irrigation

- o Focus on GPS water technology and as important
- o Rapid development of sensor technologies
- o Save water and energy resources,
- o Transfer saved water to increase irrigated land
- o Save in Fertigation, Chemigation, Herbigation, Labor



Variable Rate Irrigation (VRI)

- VRI allows different amounts of water to be applied to each part of the field
- Achieved by individual control of the sprinklers, while also controlling the travel speed of the system
- VRI apply different amount of water along the center pivot:
 - Multiple crops on the same field, different soil type, avoid wet areas, etc.



Energy and Water Usage and Cost Tracking

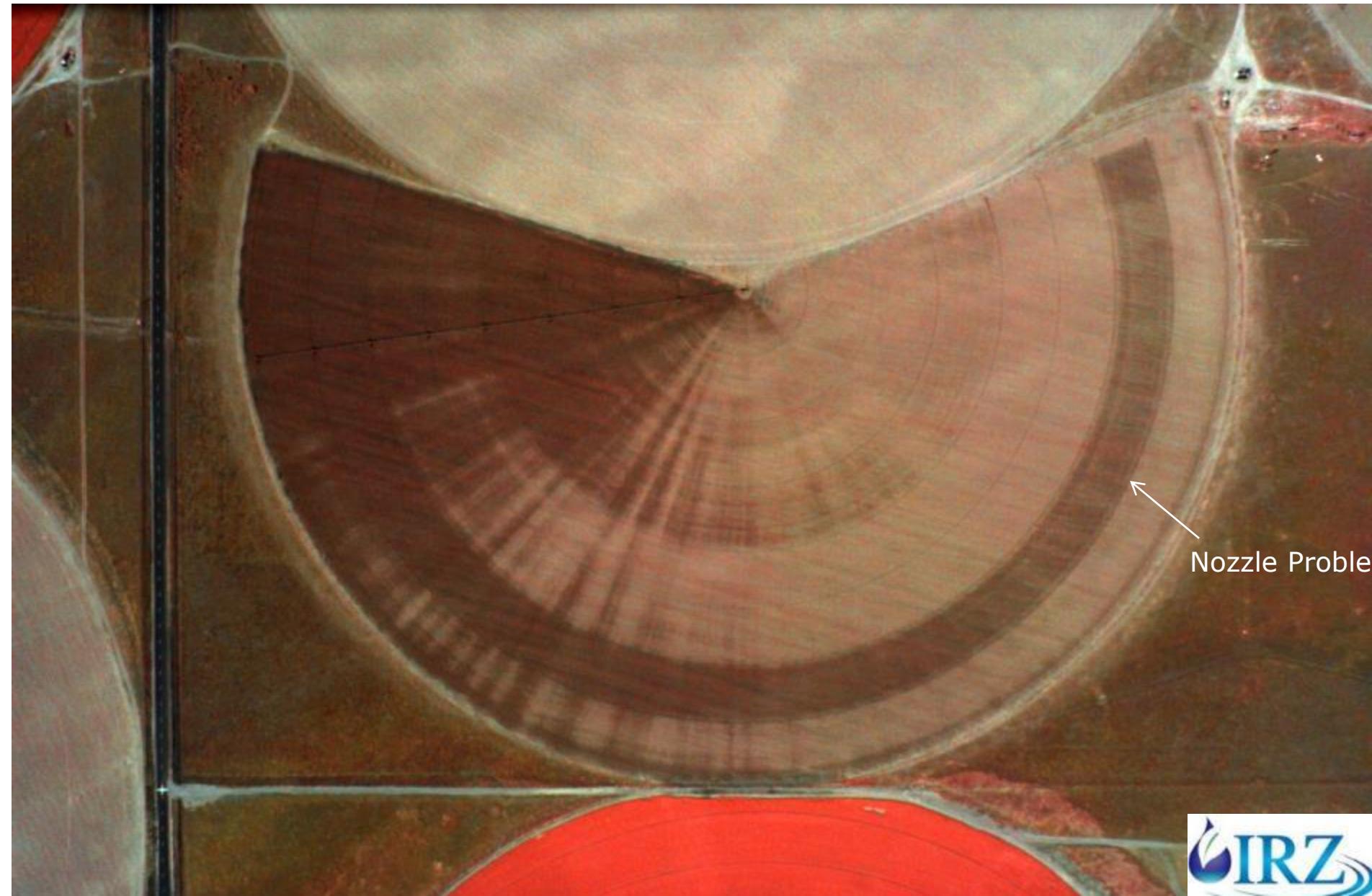
Weekly tracking of Energy and Water Usage is essential in water management reducing costs



Tracking of:

- Energy use for irrigation
- Irrigation water pumped
- Irrigation applied to each field
- Cost per acre-inch of water applied
- Hours of operation

Aerial Infrared Service: to detect issues early warning





- Platform that monitors and controls pivot & drip irrigation systems
- Web-based software with supporting mobile Apps
- Proprietary controls and telemetry hardware
- Integrates with pumps & sensors Control

Projects from around the World

Global Irrigation Engineering and Water Conservation Project

Political Map of the World, April 2006

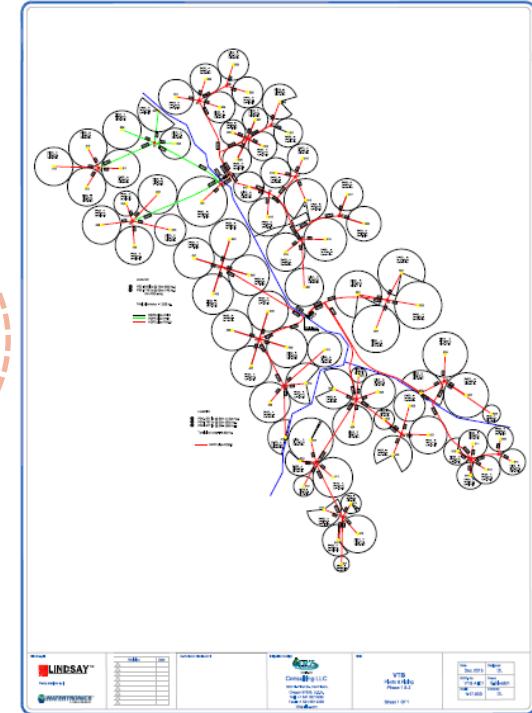


Design Projects around the world



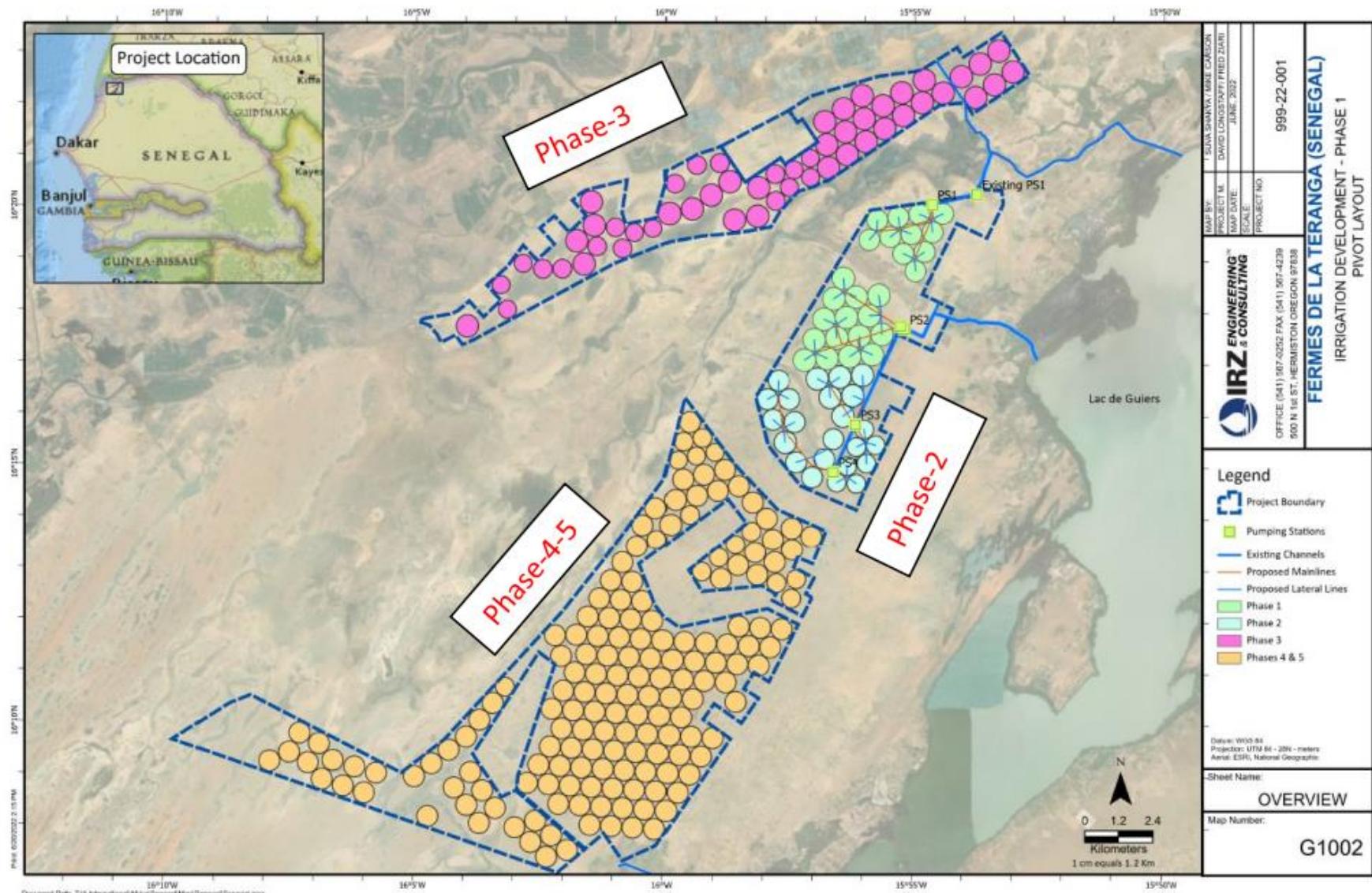
3500 ac "Design-Build-Operate" Project – Rwanda Africa

USA
Egypt
China
Romania
Ukraine
Dubai
Uganda
Russia
Tanzania
Peru
Canada
Rwanda
Ethiopia
Sudan
Brazil

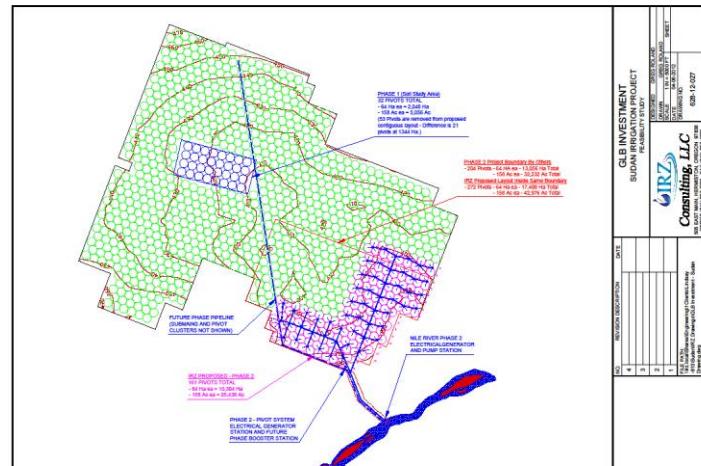
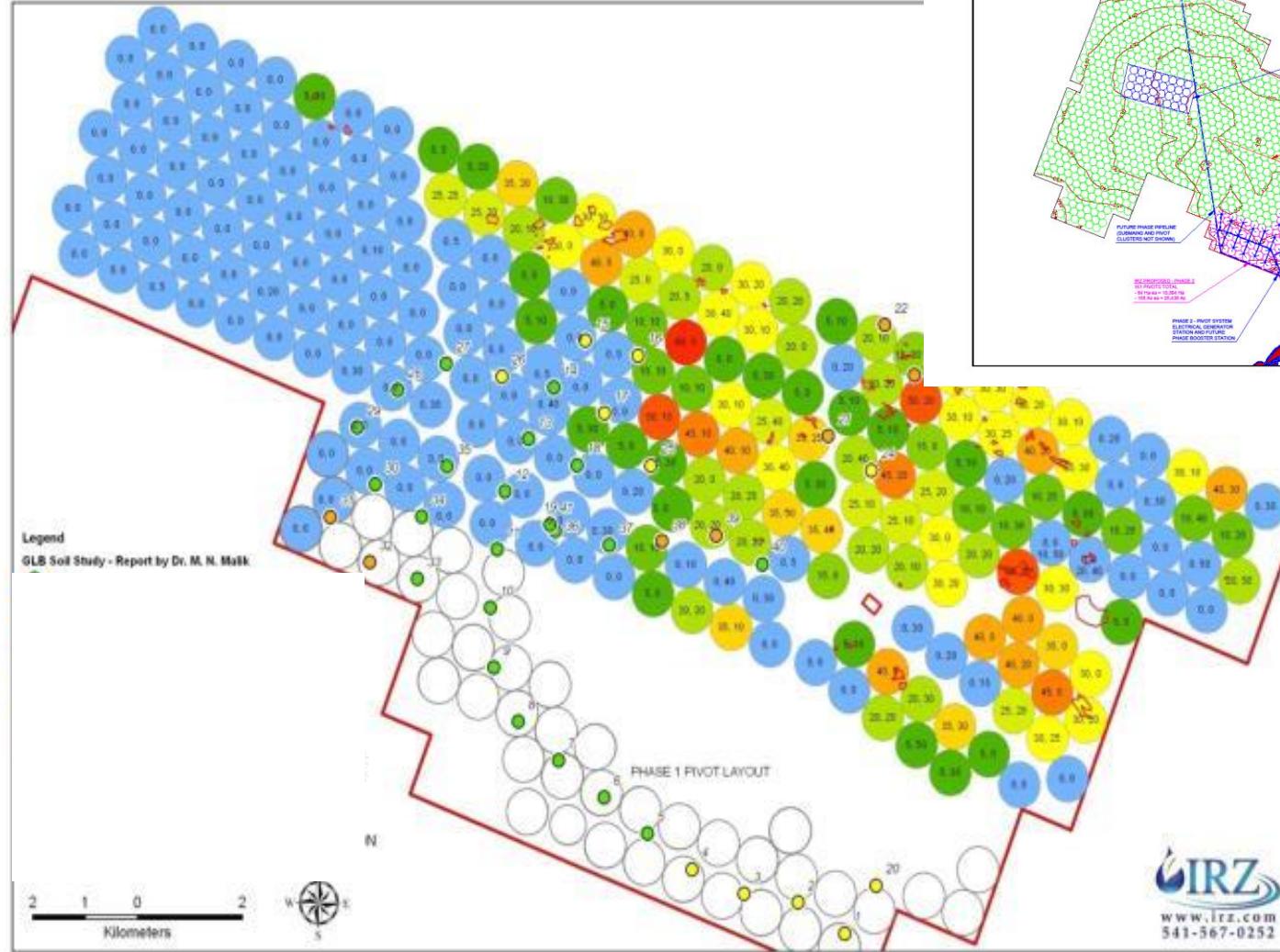


12,000 ac "Design-Build" - Krasnodar Russia

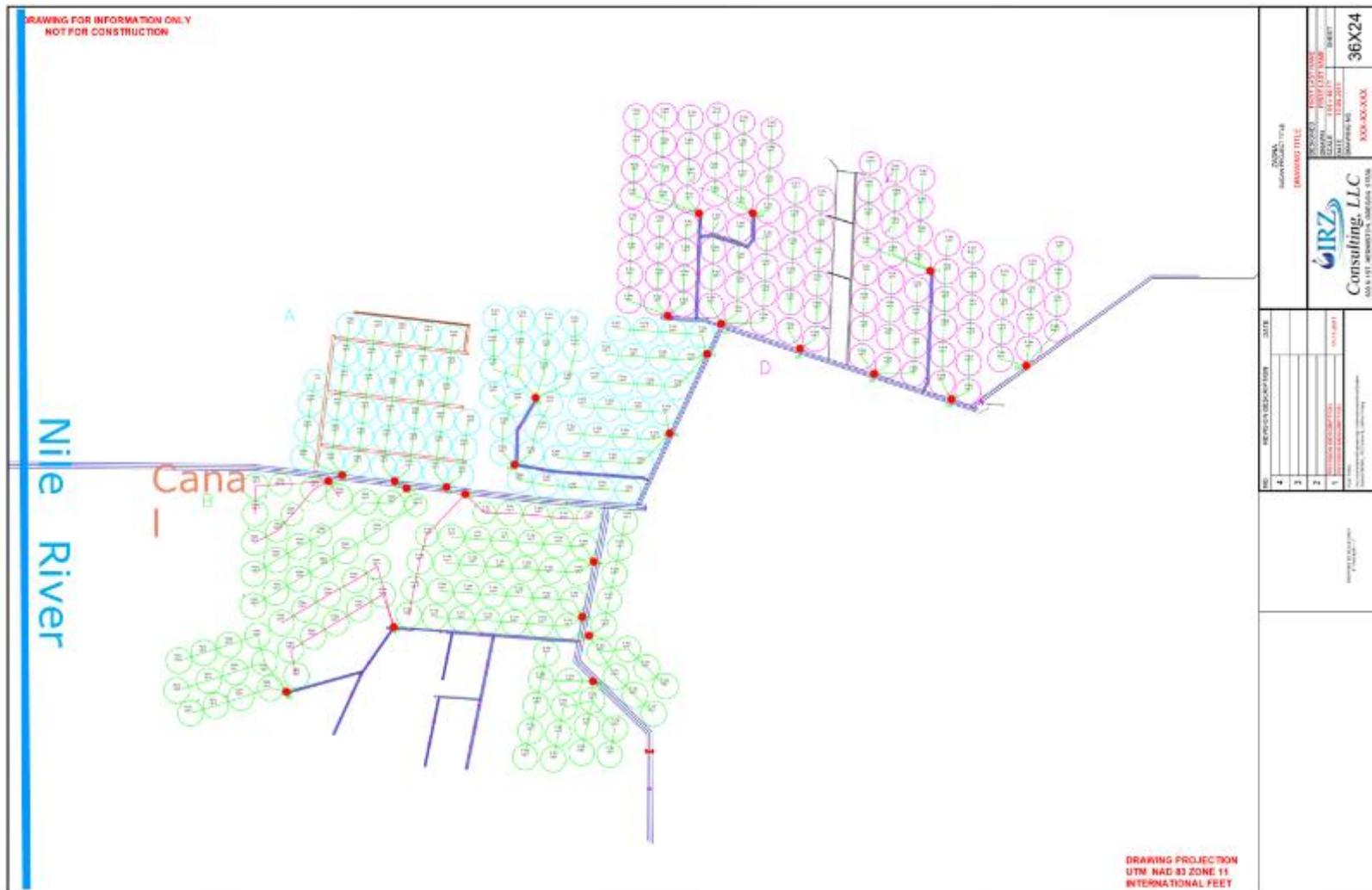
10,000 Ha (25,000 ac) Senegal Africa Irrigation Project



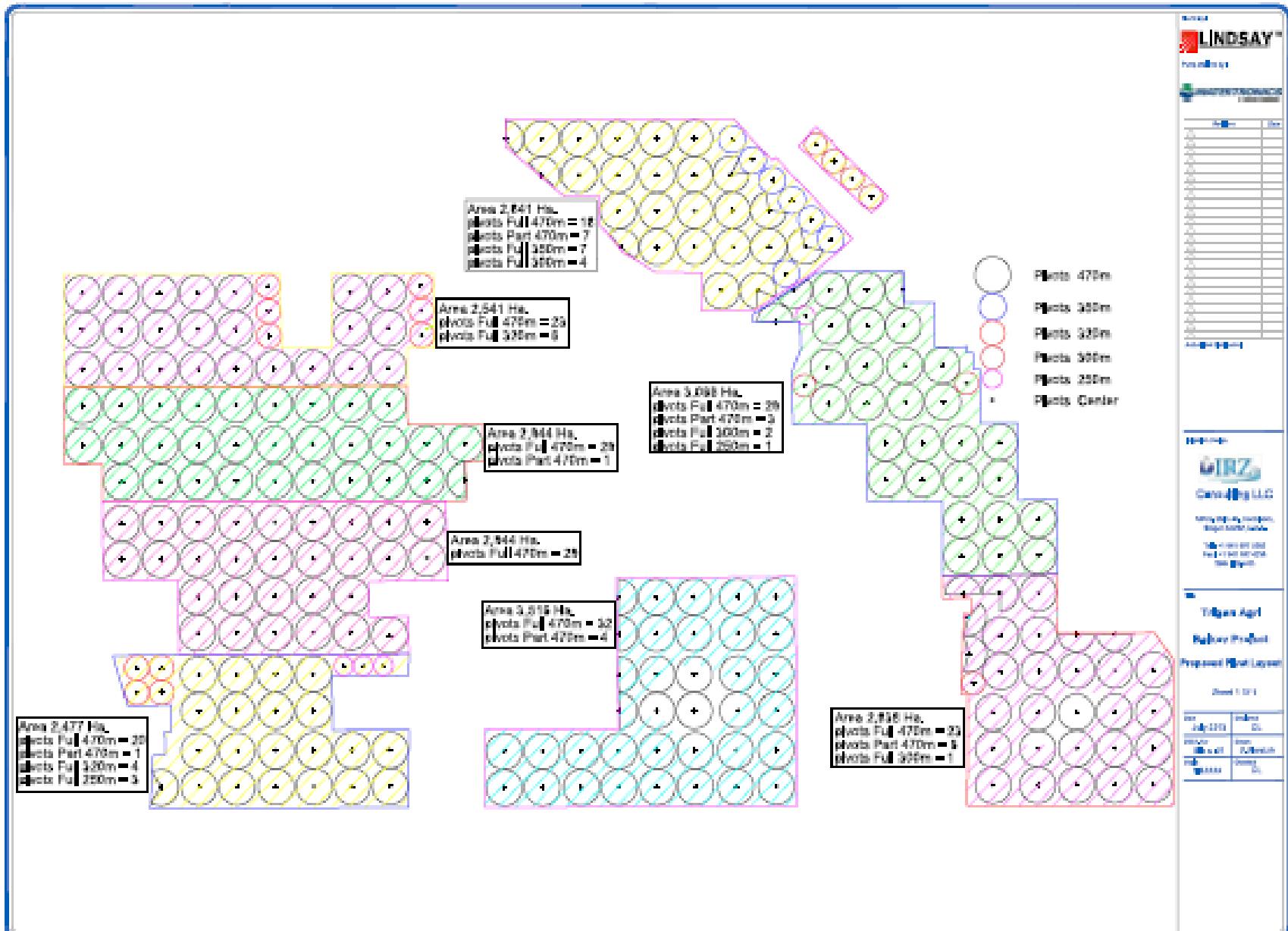
47000 Hectare (115000 ac) Sudan Africa Project



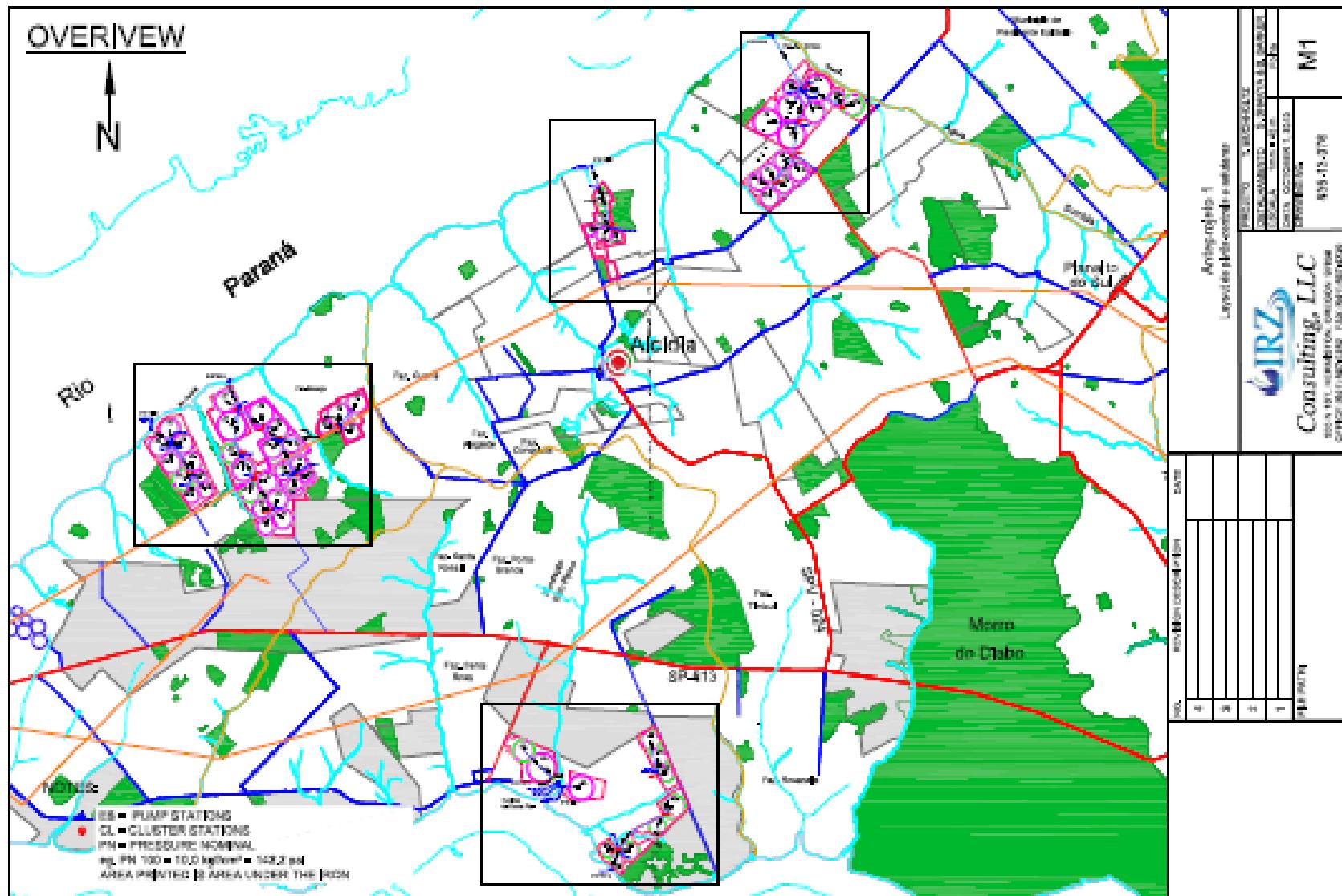
30,000 acre Pivot Project- Sudan Africa



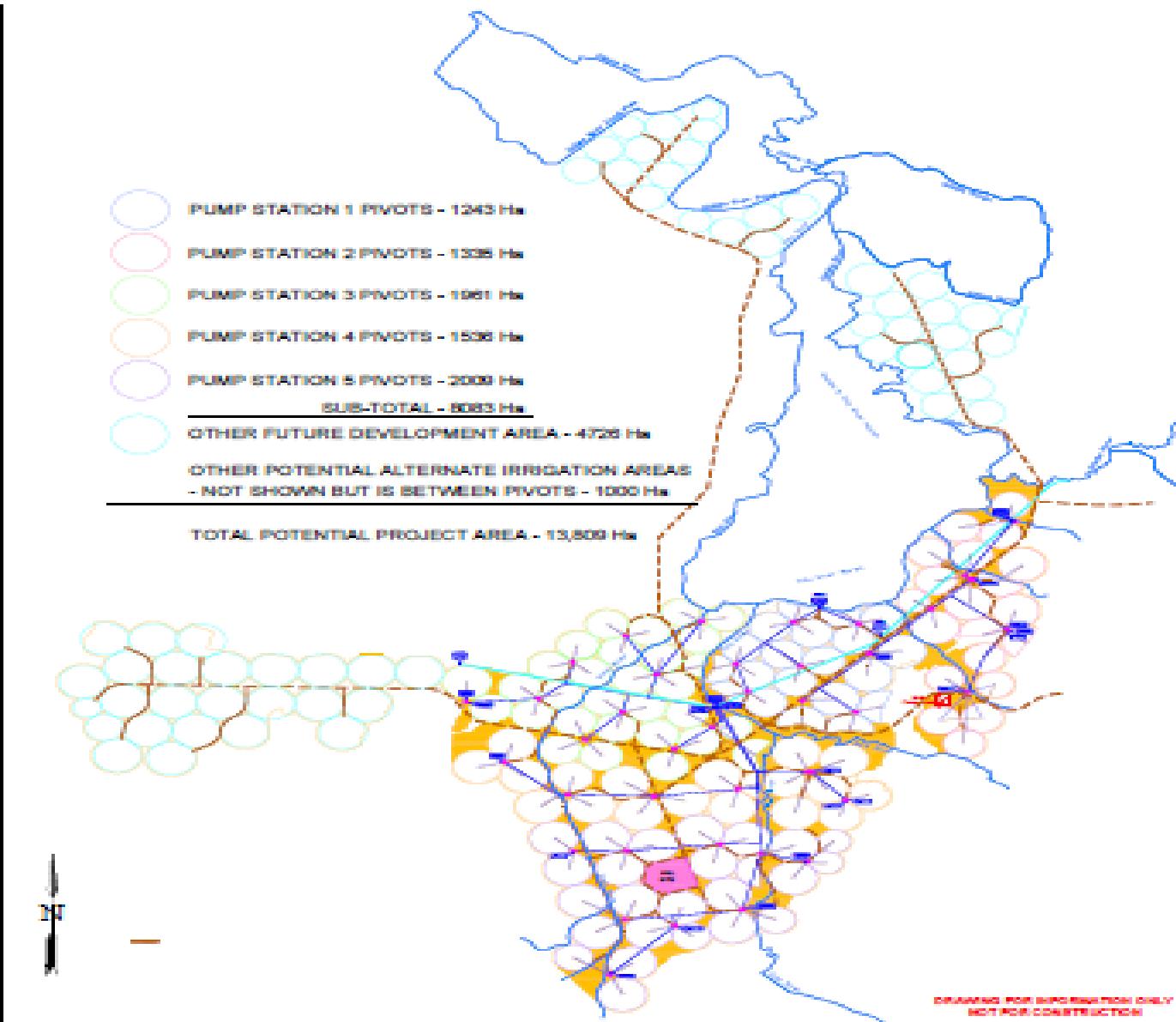
25000 Hectare (61000 ac) project in Russia



32000 HA (78,000 ac) Sugar Cane Project Brazil



13000 HA (32,000 ac) Project in Ethiopia



120,000 acre (50,000 HA) project in Egypt (> 500 wells)

- IRZ Hydrogeology and Well Design Service



Over 600 m³/hr (>2500 gpm)



USA IS LEADER IN IRRIGATION TECHNOLOGIES

WE MUST INVEST IN WATER INFRASTRUCTURE

ALL WATER CONFLICTS CAN BE SOLVED

WE MUST CONTINUE TO FEED THE WORLD

SUSTAINABLE IRRIGATION WILL BENEFIT THE ENVIRONMENT

Thanks

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