



Stennis Space Center

Resilience and Adaptation to Climate Risks Workshop

Tuesday, October 16th, 2012

John C. Stennis Space Center



System Presentations



Stennis Space Center

- **Built Systems**

*Mike Killam, Deputy, Operations & Maintenance
Division, Stennis Space Center*

- **Natural Resource Systems**

*David Lorance, Environmental Officer
Stennis Space Center*

- **People / Community Systems**

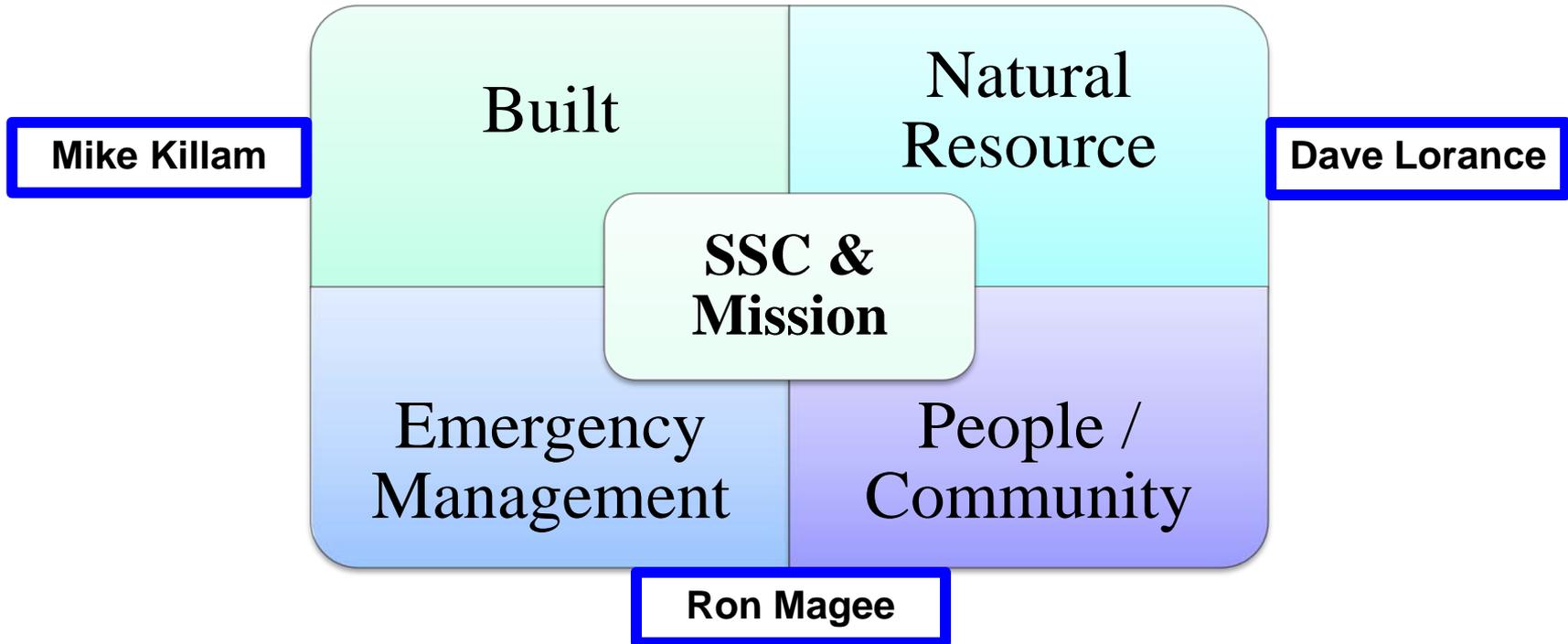
*Ron Magee, Assistant to the Director of Center
Operations, Stennis Space Center*



System Owners for Workshop



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- Person responsible for each overarching “system” that supports SSC and its mission.
- Provides leadership before, during and after workshop
- Expected by Center leadership to continue efforts post workshop



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Built Systems

*Mike Killam, Deputy Chief
Operations & Maintenance Division
Stennis Space Center*



Built System Owners



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Horizontal Infrastructure

- Electrical – Julian Kobayakawa★
- Natural Gas – Ryan Seals
- High Pressure Industrial Water – John Bakker
- High Pressure Gas – John Bakker
- Cryogenics – John Bakker
- Potable Water – Ryan Seals
- Sewer/Wastewater – Lladro Sylvester
- IT – Scot Gressaffa
- Roads/Parking Lots – Mike Braiwick
- HVAC Systems – Luke Scianna
- EMCS – Luke Scianna

Systems

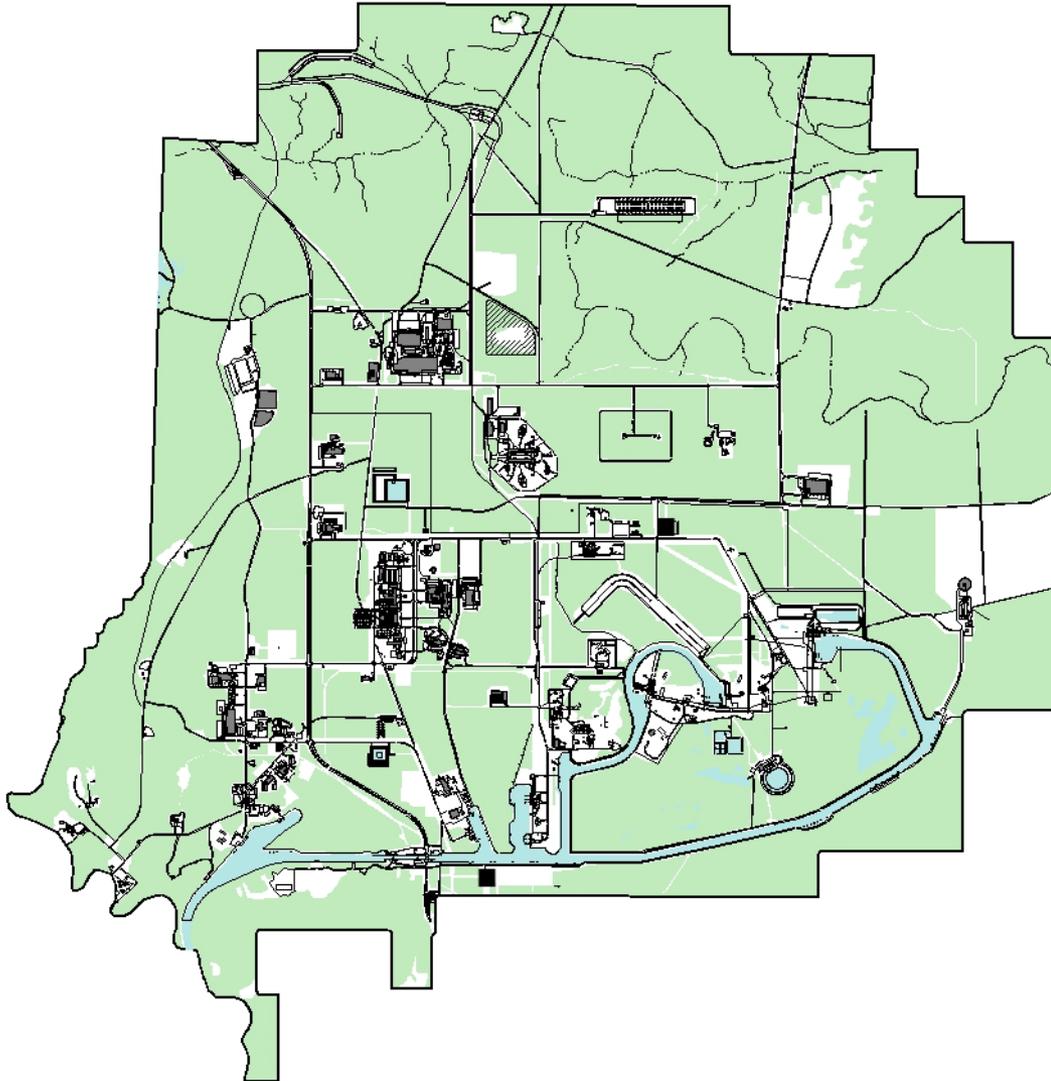
- Buildings – Mike Braiwick
- A1, A2, A3 Stands – David Failla
- B1 Stand – Doug McNair
- E-Complex – Jim Morgan
- Canal System – Bo Clarke
- Bridge System – Bo Clarke
- Master Plan – Tre' Hamilton
- Energy Management – Missy Ferguson/Donnie Thompson



Built Systems Overview



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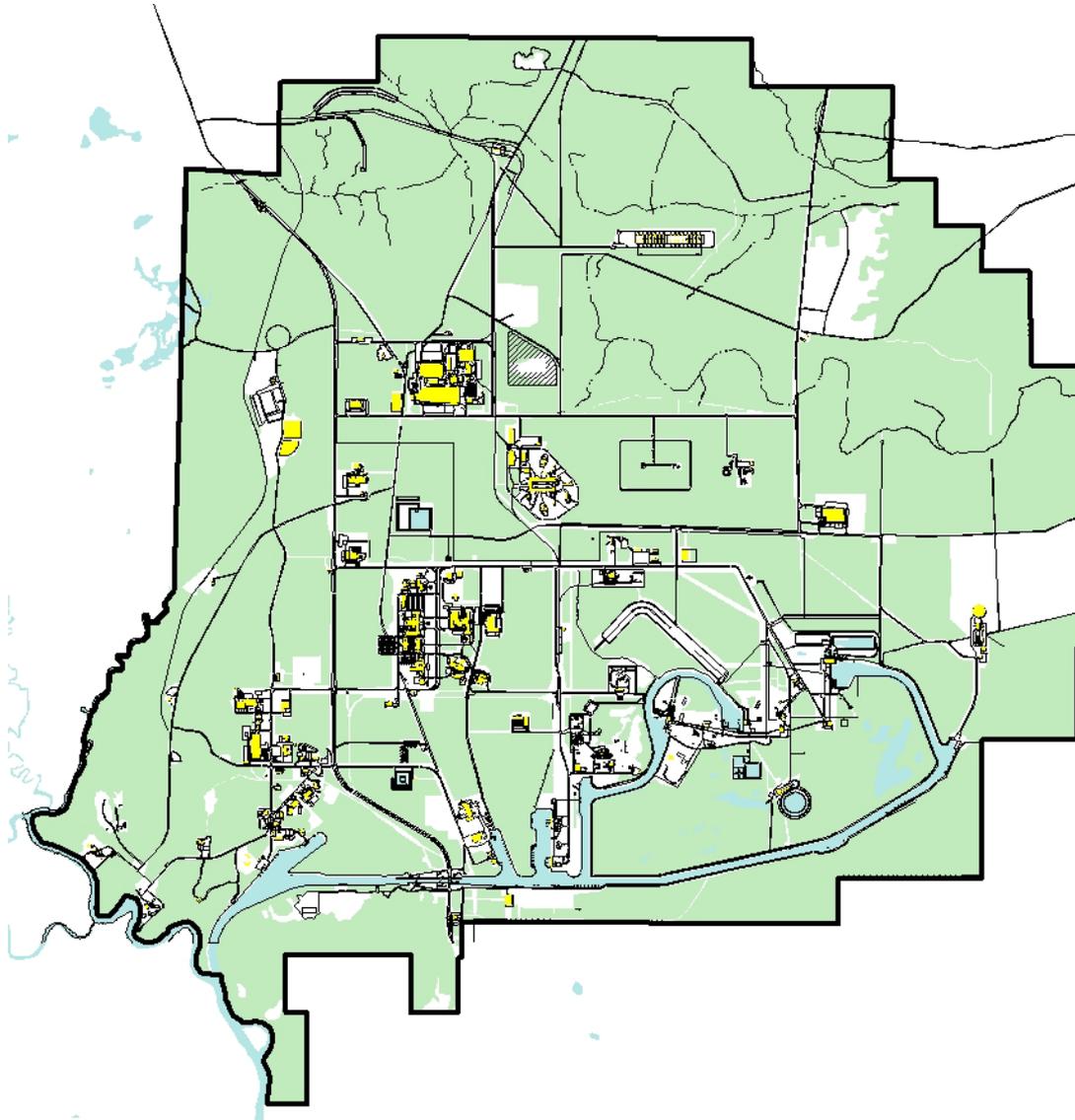
- Fee Area: 13,817 Acres
- Buffer Zone:
 - 6,990 Acres (Owned)
 - 117,994 Acres (Easement)



Buildings



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System Owner: Mike Braiwick

- 261 Buildings
- 5,000,000 Square Feet

Concerns

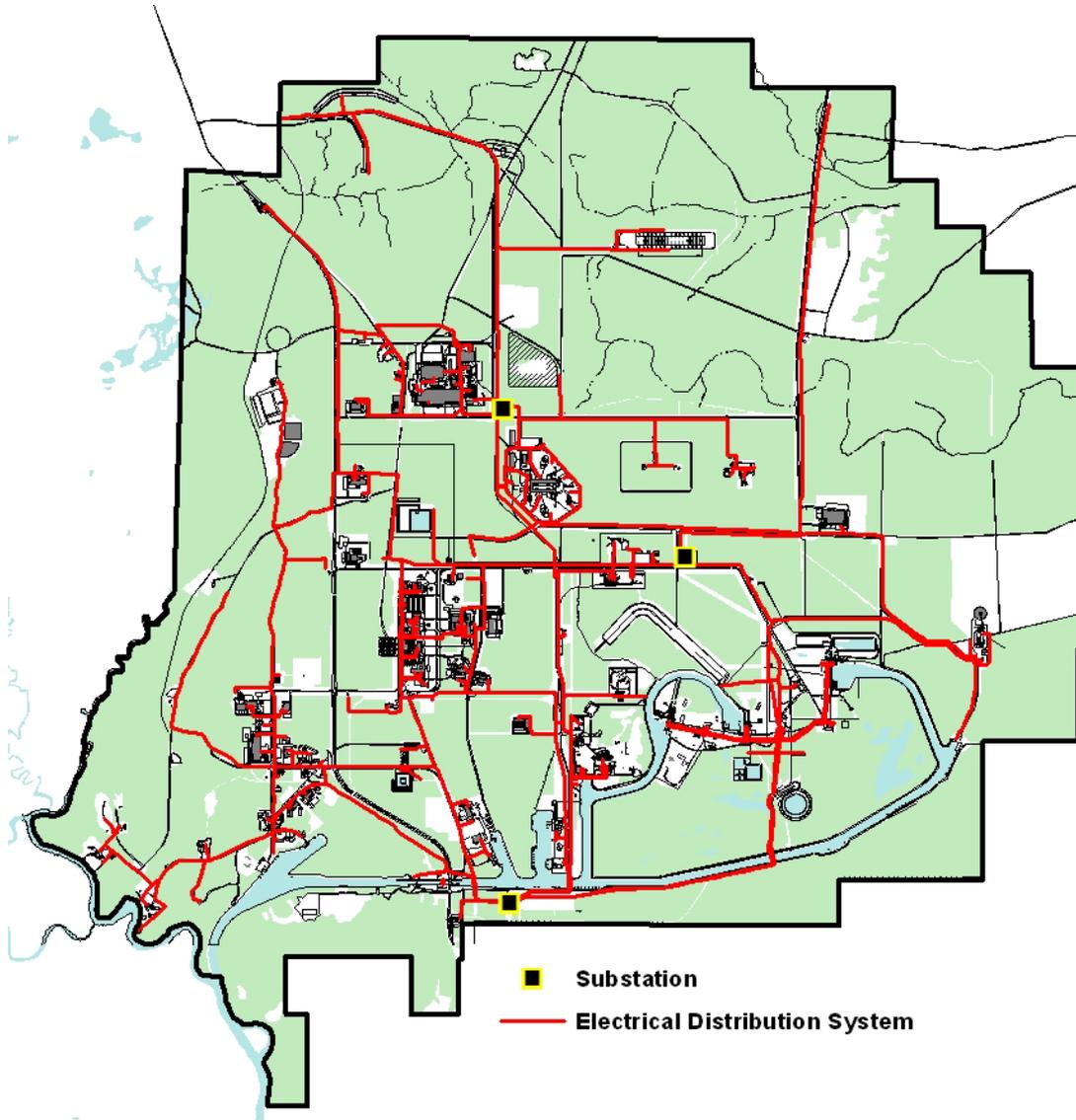
- Exterior Skin Modifications to Mitigate High Temperature
- Roof, Window, Door, Wall Modifications to Mitigate High Temperature
- New Buildings at Increased Elevation



Electrical Distribution System



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System Owner: Julian Kobayakawa

- 52 Miles of Overhead Wire
- 94 Pad Mounted Transformers
- 92 Motor Control Centers
- 944 Switchboards & Distribution Panels

Concerns

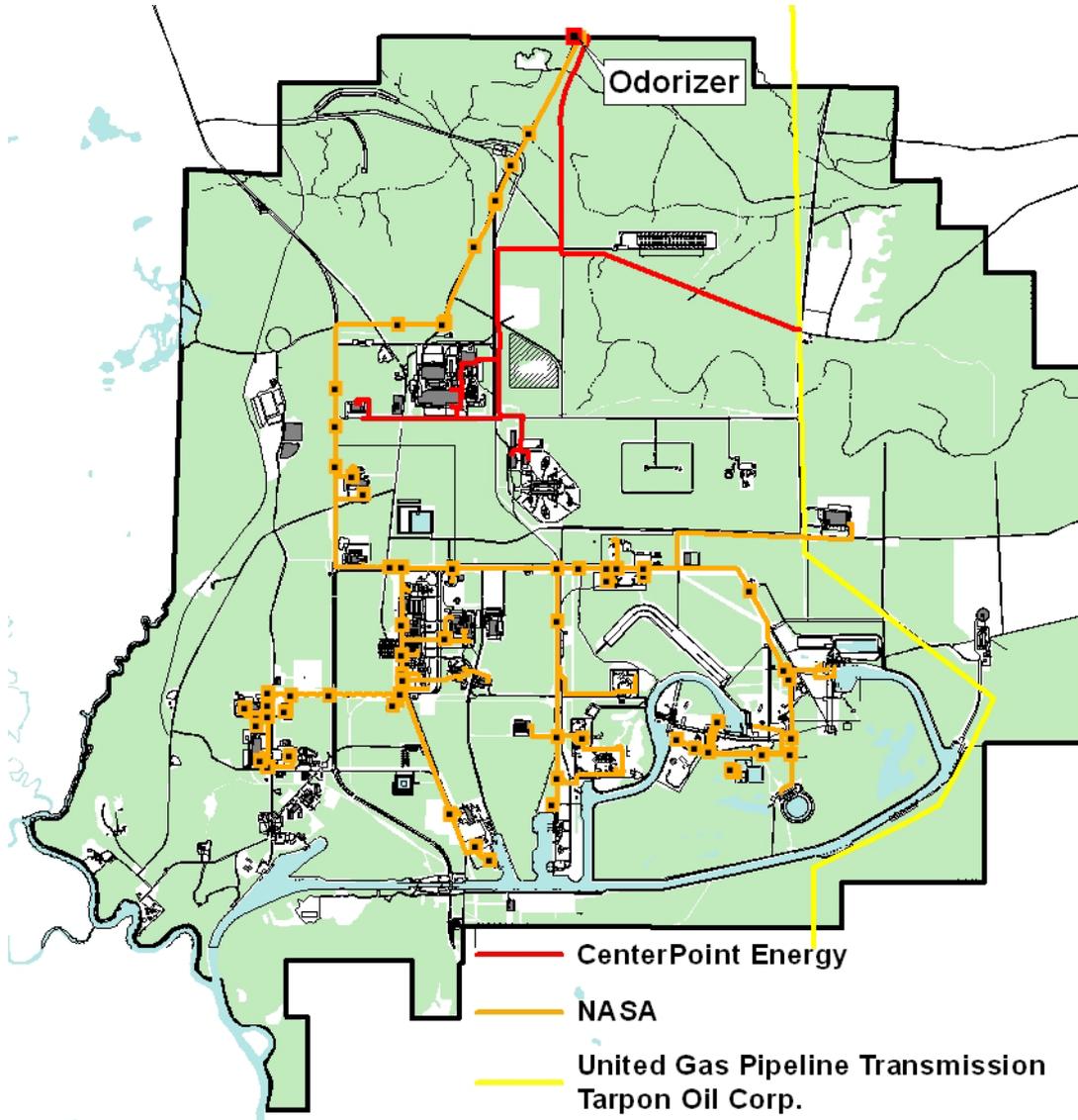
- Loss of Transmission Source
- Flooding of Electrical Transformers



Natural Gas



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System Owner: Ryan Seals

- 23 Miles Underground Line
- 57 Gas Meters (Additional 10 Meters - CenterPoint)
- 1 Odorizer Station

Concerns

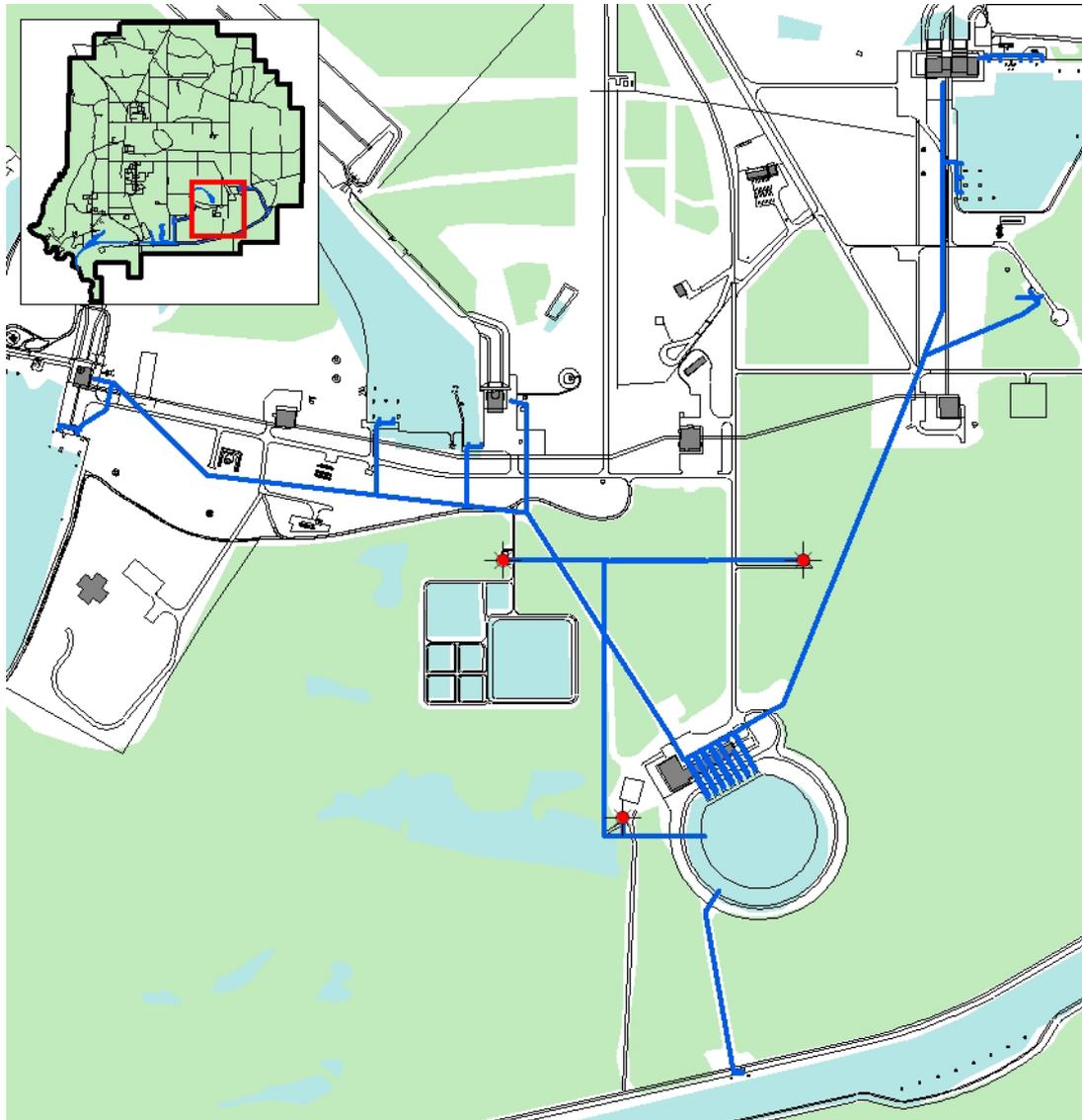
- Flooding of the Odorizer Station



High Pressure Industrial Water



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System Owner: John Bakker

- 4 Electric Powered Canal Pumps (5,000 Gallons per Minute per Pump)
- 10 Diesel Powered Pumps (35,000 Gallons per Minute per Pump)
- 5 Diesel Powered Generators (1500KW per Generator)
- 1.7 Miles of Large Diameter Distribution Piping

Concerns

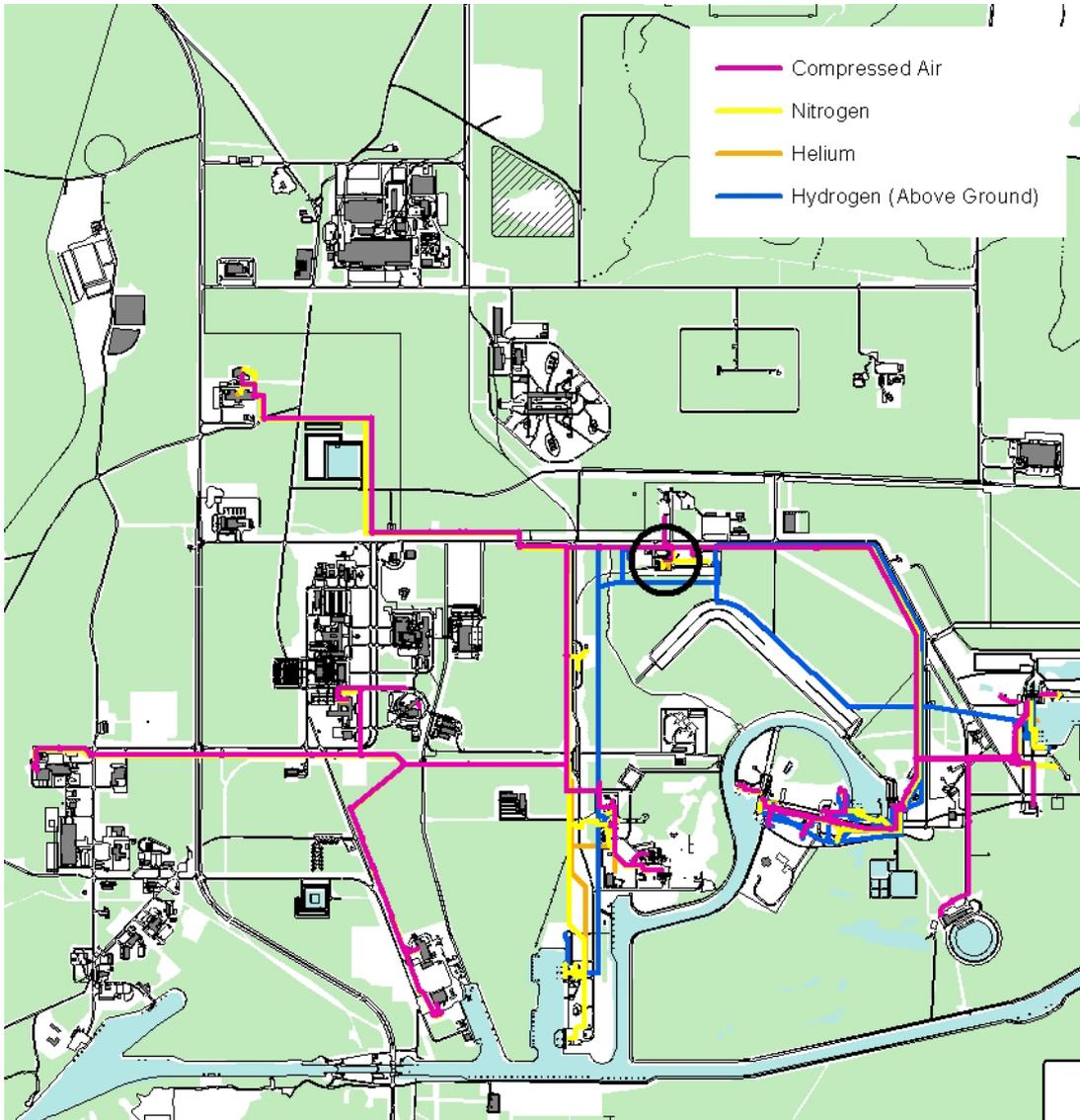
- Saltwater Intrusion



High Pressure Gas



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System Owner: John Bakker

- 3 New Liquid Nitrogen Pumps
- 6 Legacy Liquid Nitrogen Pumps
- 2 Liquid Hydrogen Pumps
- 3 Air Compressors
- 2 Helium Compressors

Concerns

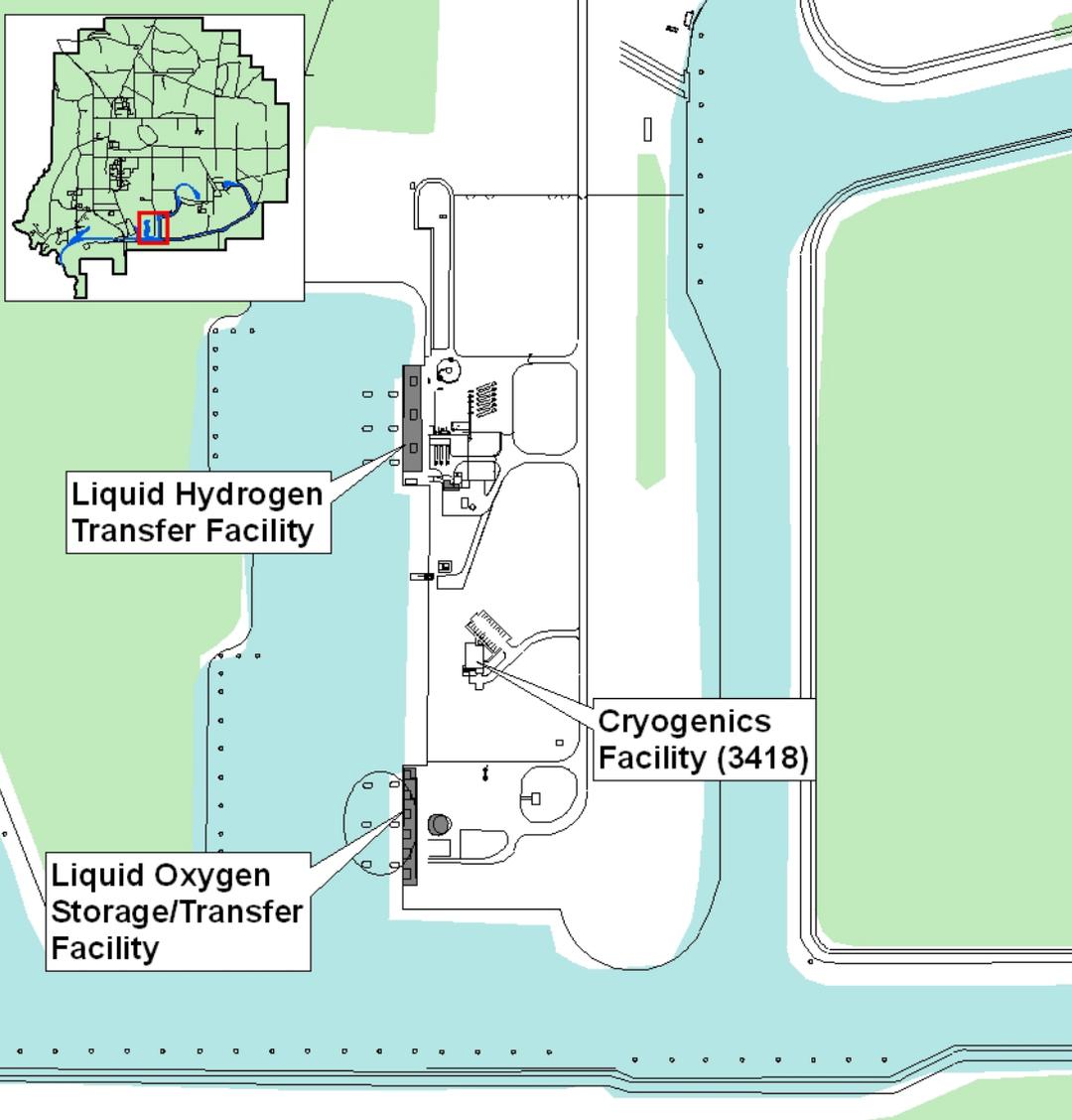
- Saltwater Surge



Cryogenics



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System Owner: John Bakker

- 6 LOX Barges (98,000 gallon capacity per barge)
- 6 LOX Barge Docking Areas
- 6 LOX Truck Unloading Stations
- 3 LH Barges (232,000 gallon capacity per barge)
- 3 LH Barge Docking Areas
- 9 LH Truck Unloading Stations

Concerns

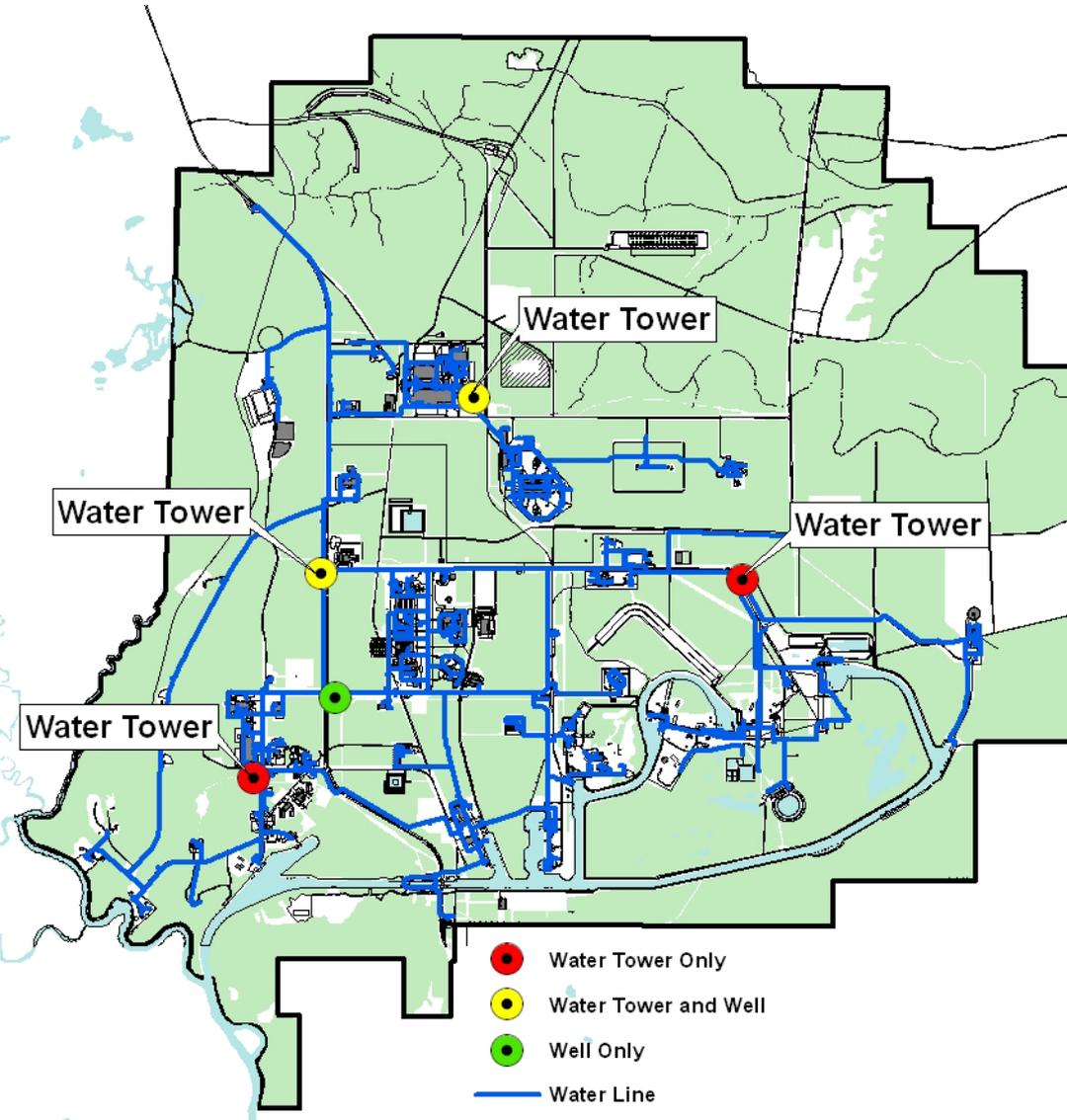
- Barges breaking loose from dock during storm surge event
- Saltwater Surge



Potable Water



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System Owner: Ryan Seals

- 3 Well Systems
- 4 Water Towers
- 237,000 Feet of Water Lines (+ Area 9)

Concerns

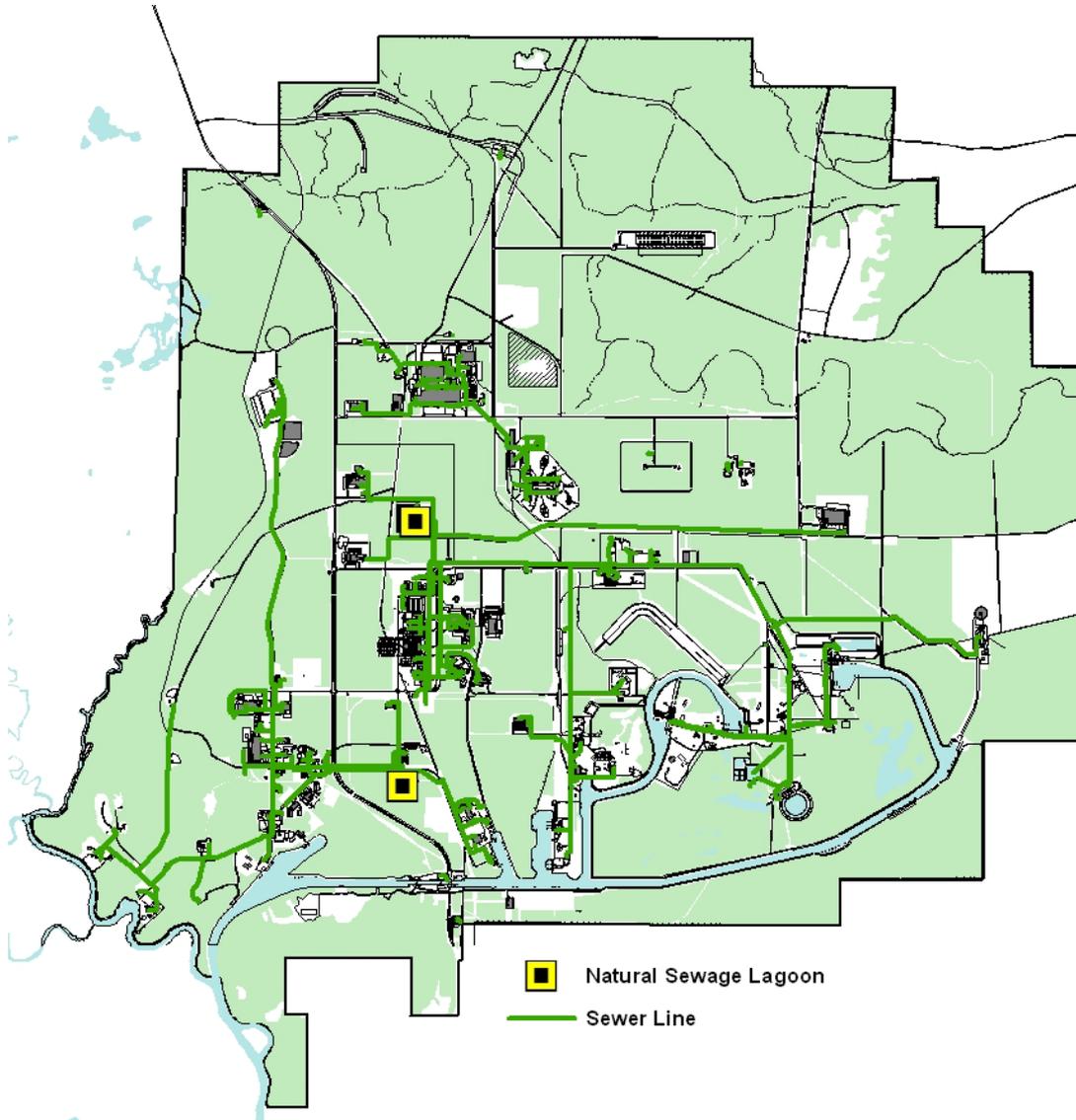
- High Winds Causing Water Tower Failure
- Flooding of Pumps
- Saturated Ground Causing failure to Underground Piping



Sewer / Wastewater



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System Owner: Lladro Sylvester

- 20 Miles of Sewer Line
- 61 Lift Stations
- 2 Treatment Lagoons
- 1 Treatment Plant

Concerns

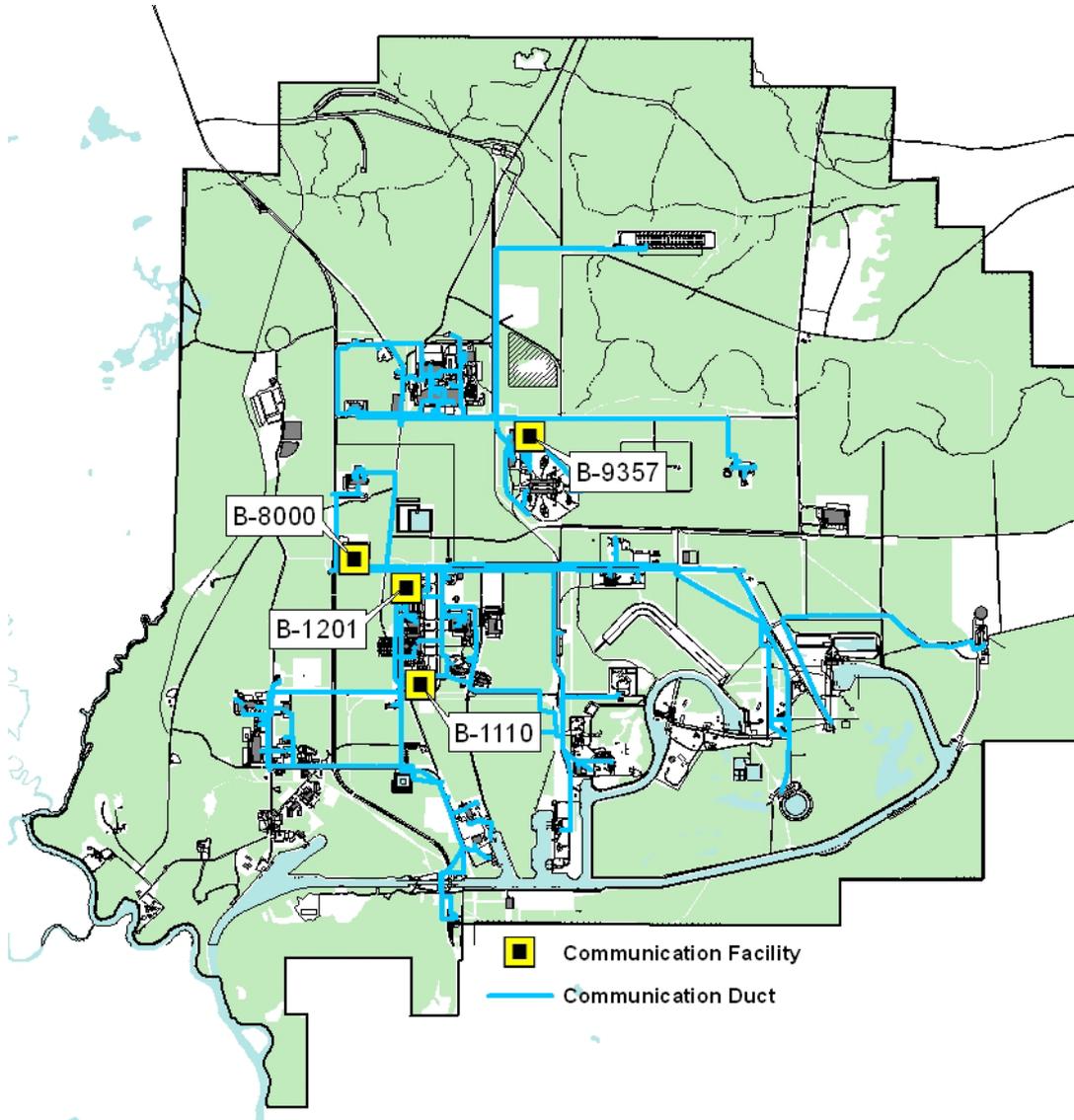
- Too Much Rainwater Flooding Lagoons Causing Bypass
- Saturated Ground Causing Failure to Underground Piping
- Flooded Lift Stations
- Saltwater Killing Natural Systems (Hyacinth)



Information Technology



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System Owner: Scot Gressaffa

- 1 primary communications facility (B-1201) with a secondary facility (B-9357) currently under construction
- 1 primary consolidated data center (B-1110) with a secondary/failover site under construction in B-8000
- 165,988 feet of communication duct bank for fiber and copper Communications Infrastructure

Concerns

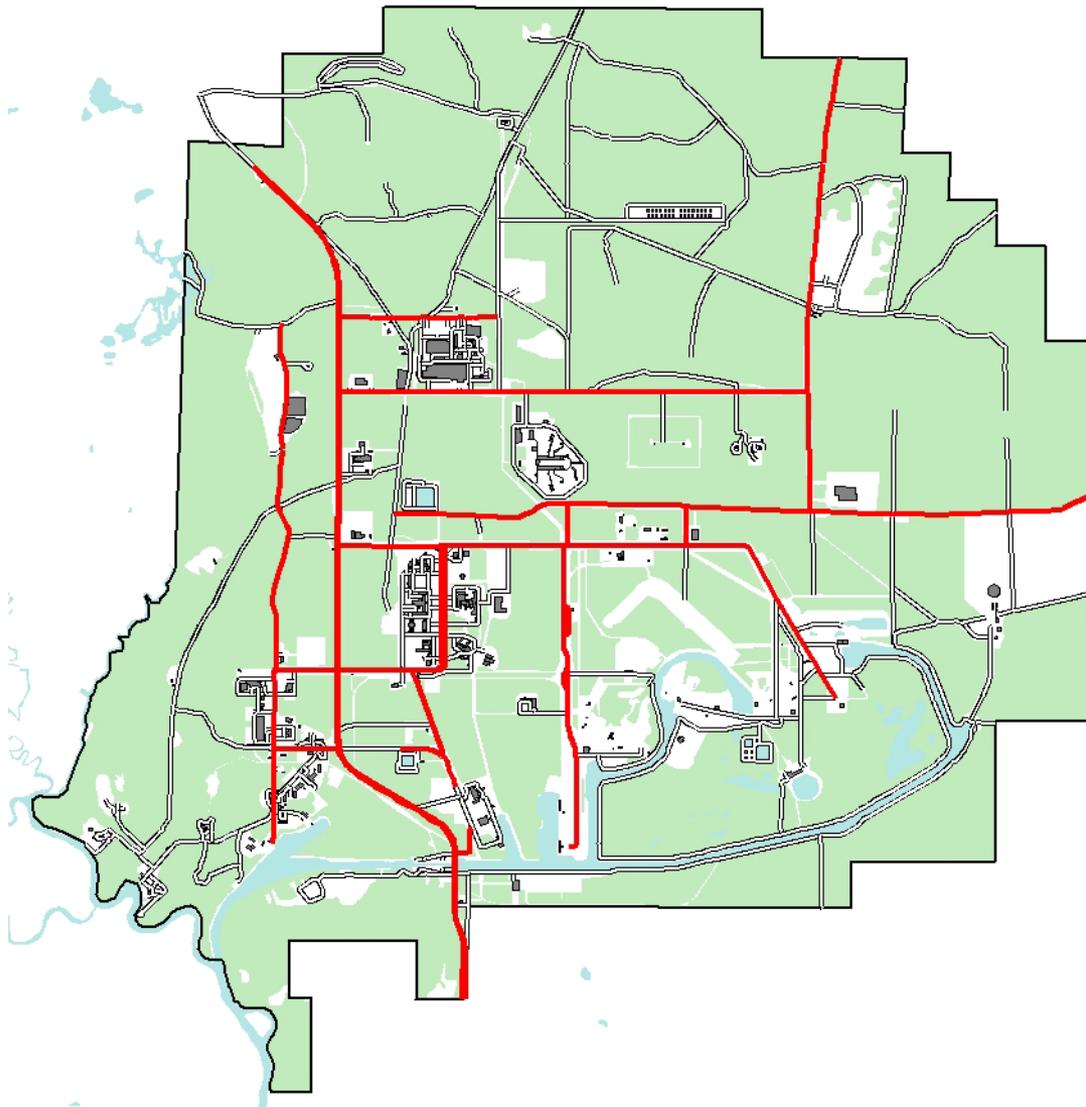
- Flooding



Roads / Parking Lots



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System Owner: Mike Braiwick

- 41 Miles of Primary Roads
- 18 Miles of Secondary Roads

Concerns

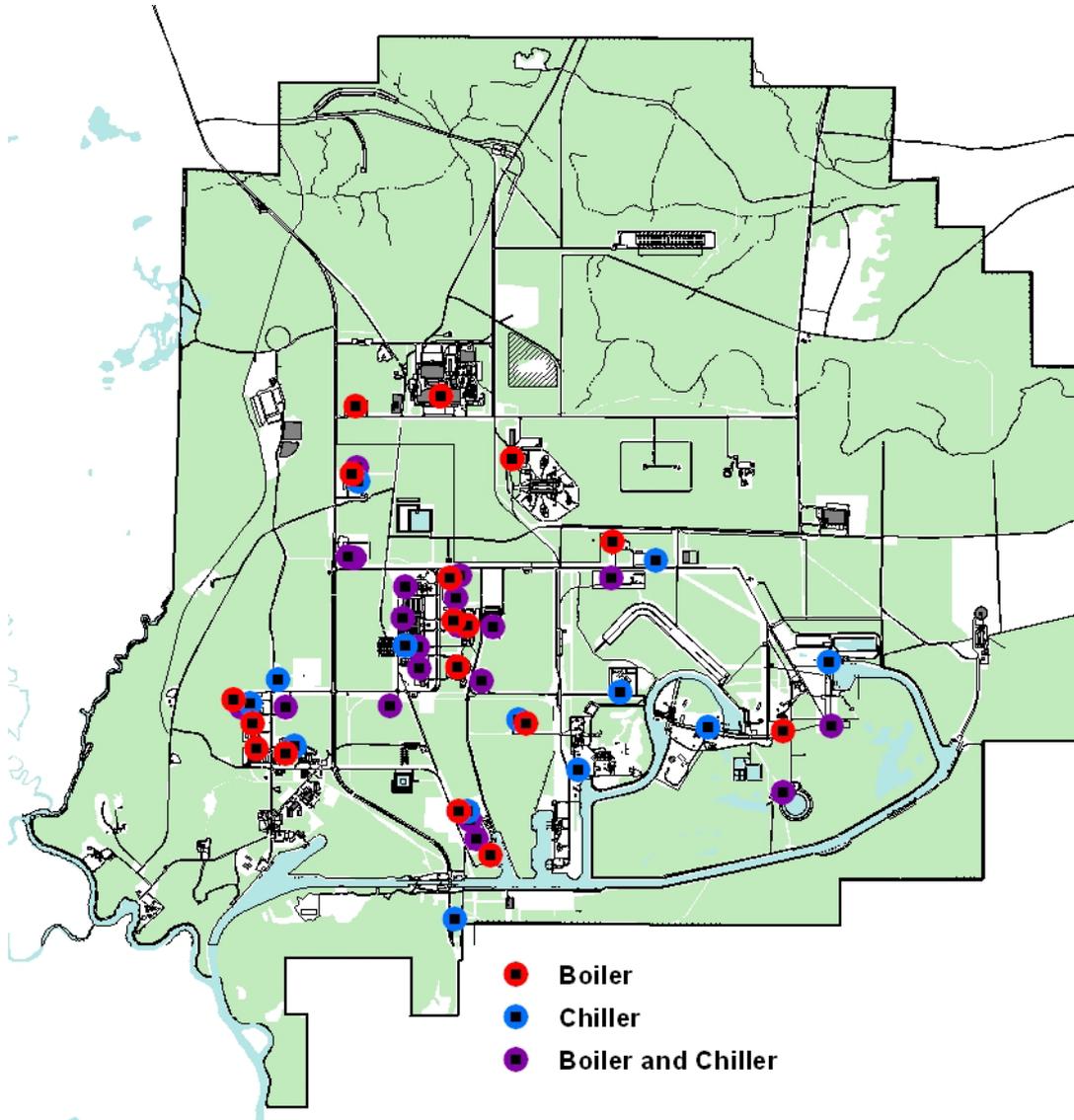
- Accessibility via Road Systems
- Saturated Ground Causing Potholes



HVAC Systems



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System Owner: Luke Scianna

- 47 Chillers
- 22 Cooling Towers
- 176 Pumps
- 260 Air Handlers
- 189 Split Systems

Concerns

- Increased HVAC Capacity for Higher Temperatures

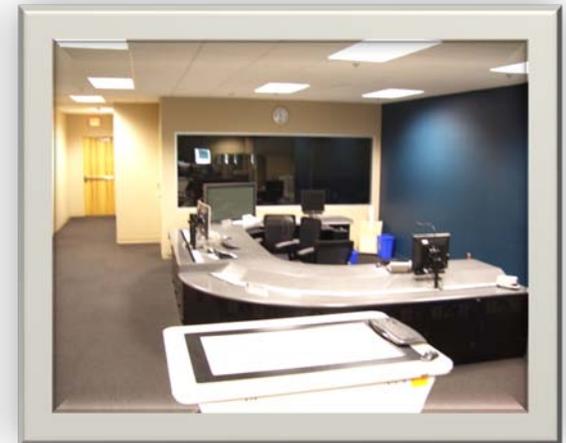


NASA John C. Stennis Space Center EMCS Building Automation



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- Energy Management / Control System (site wide).
- Approximately 405 networked field stand-alone micro-processor panels monitoring Facility Utility Systems, Energy, & critical environment real time data.
- EMCS visibility & control in approximately 130 buildings & facilities.
- Monitor & control approximately 65,000 points
- 24/7 team of highly skilled / trained dedicated operators.
- Total building automation of all facility/utility type of systems supporting Facilities Management & Energy Management.



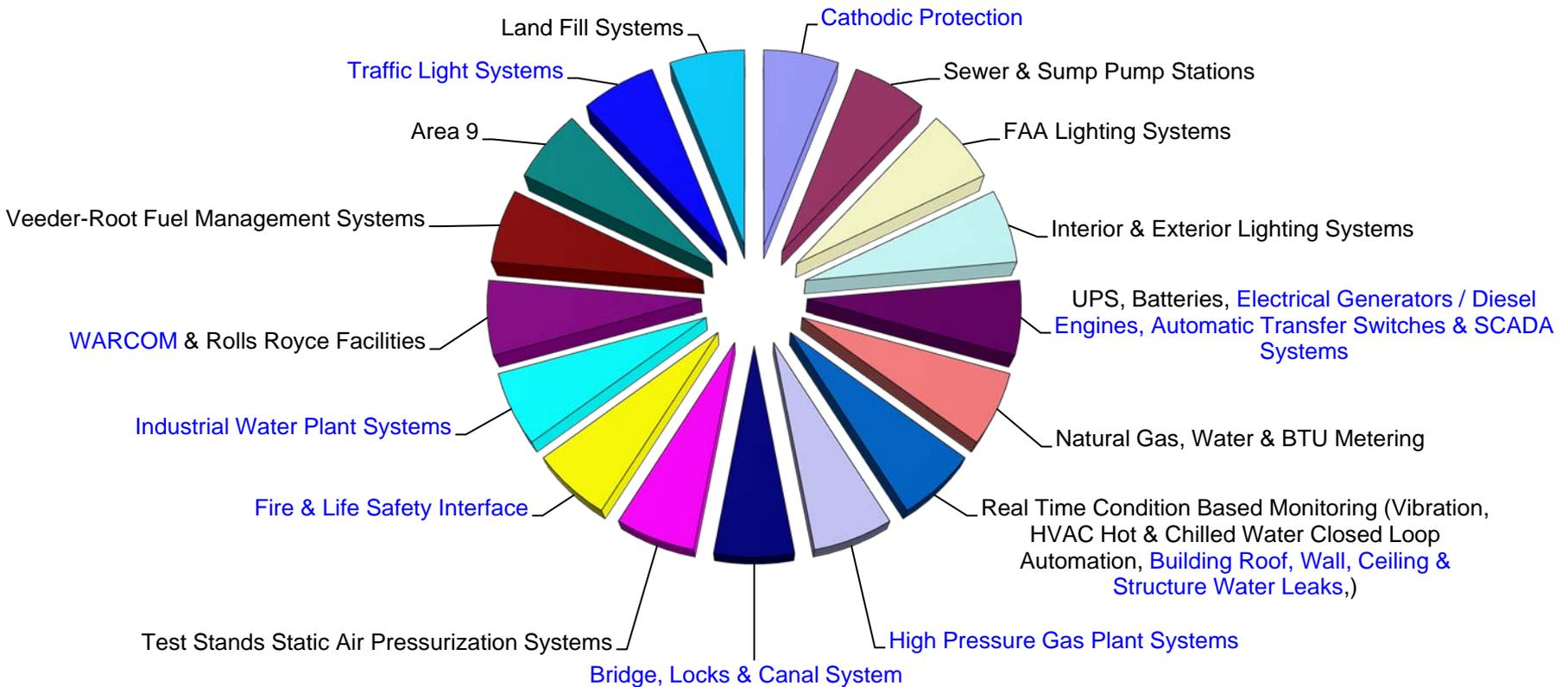


Jacobs FOSC NASA/SSC Site-Wide Real-Time Condition Based Maintenance &



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EMCS Remote Monitoring Interface Initiatives Current & Future Plans / Path Forward



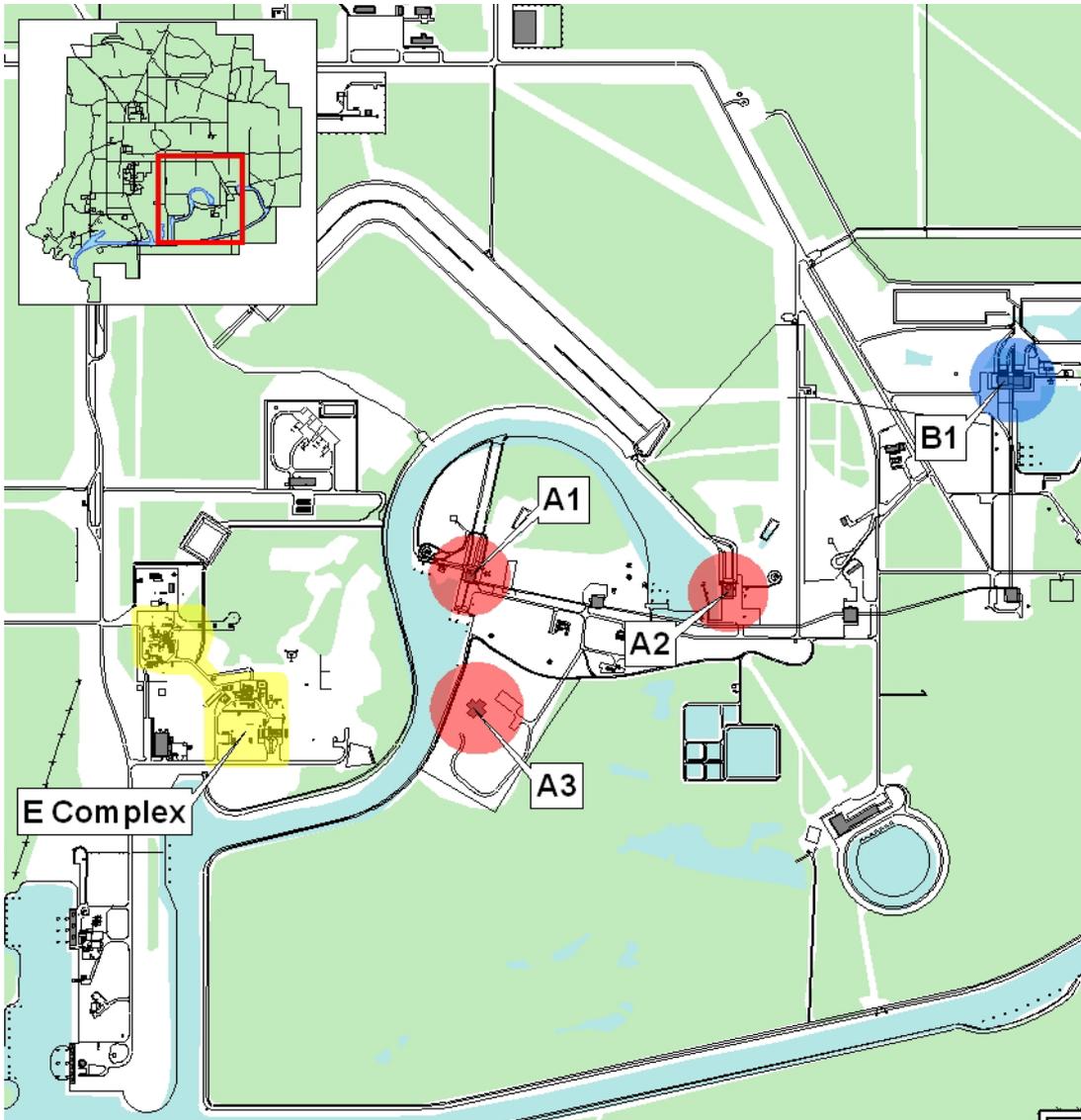
Blue = Future Plans



Test Stands



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System Owners

- **A1, A2, A3 Stands** – David Failla
- **B1 Stand** – Doug McNair
- **E-Complex** – Jim Morgan

Concerns

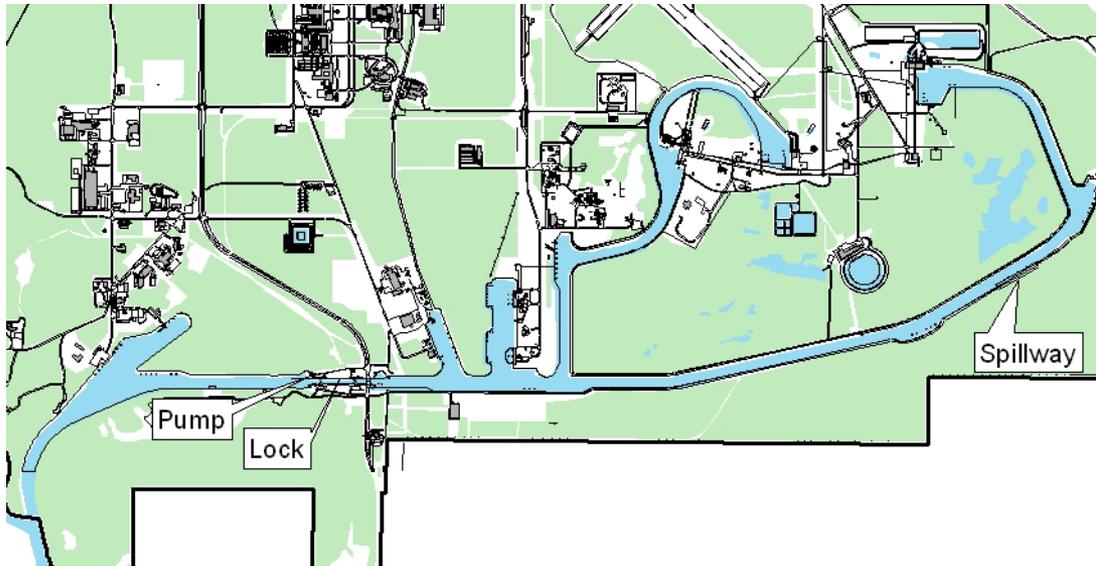
- Impact to Utilities = Impact to Test Stands
- Impact to Compressed Gases and Industrial Water = Impact to Test Stands



Canal System



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System Owner: Bo Clarke

- 6 Miles of Canal
- Approx. 18' above river level
- 1700' of Piers
- 4 Vertical Centrifugal Pumping Units
- 3 Work Barges and 1 Tugboat



Concerns

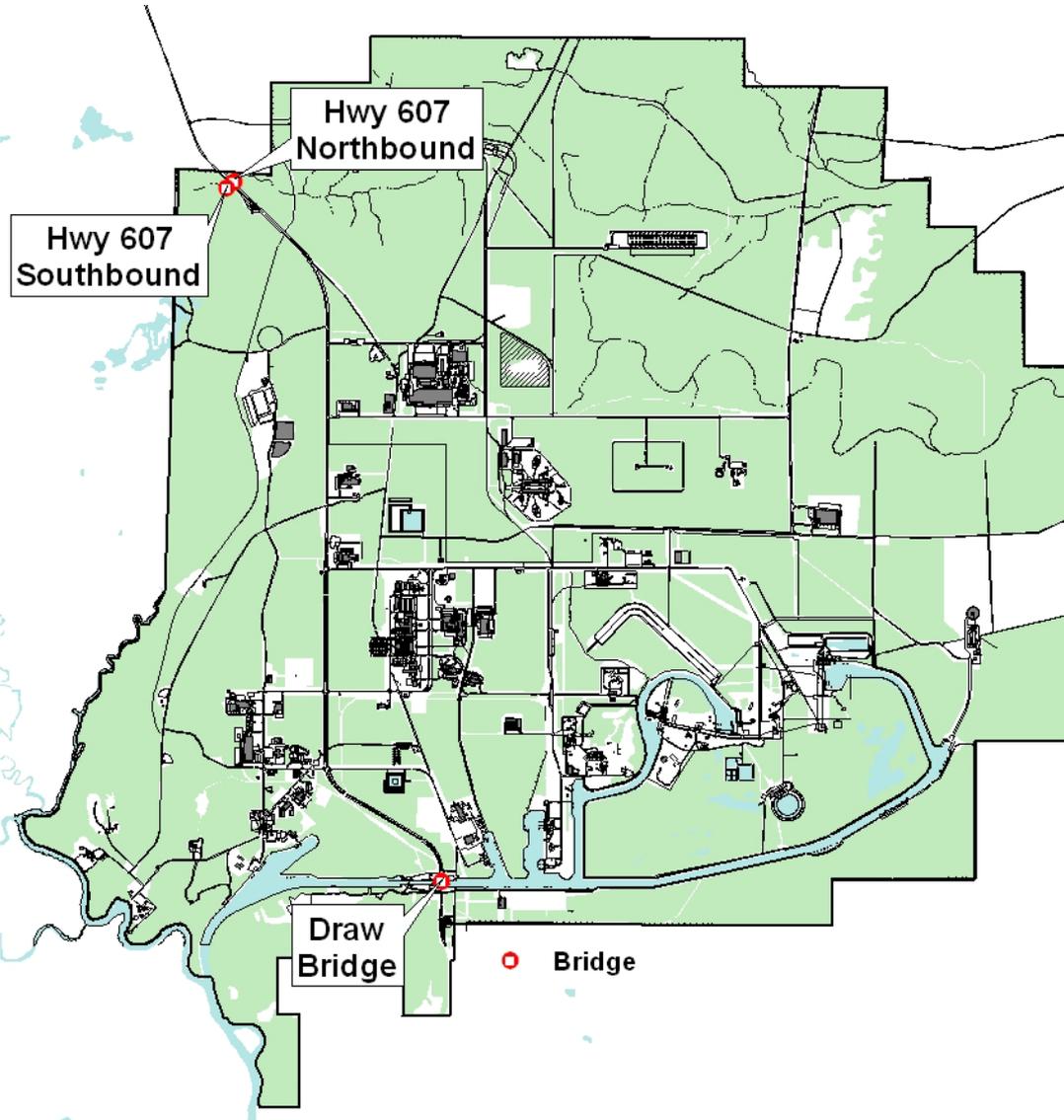
- Pump Failure due to High Water
- Possible Lock Failure due to Storm Surge



Bridge System



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System Owner: Bo Clarke

- 3 Bridges
- 1 draw bridge over canal and lock
- 2 bridges at Hwy 607 outside north gate (north and southbound lanes)

Concerns

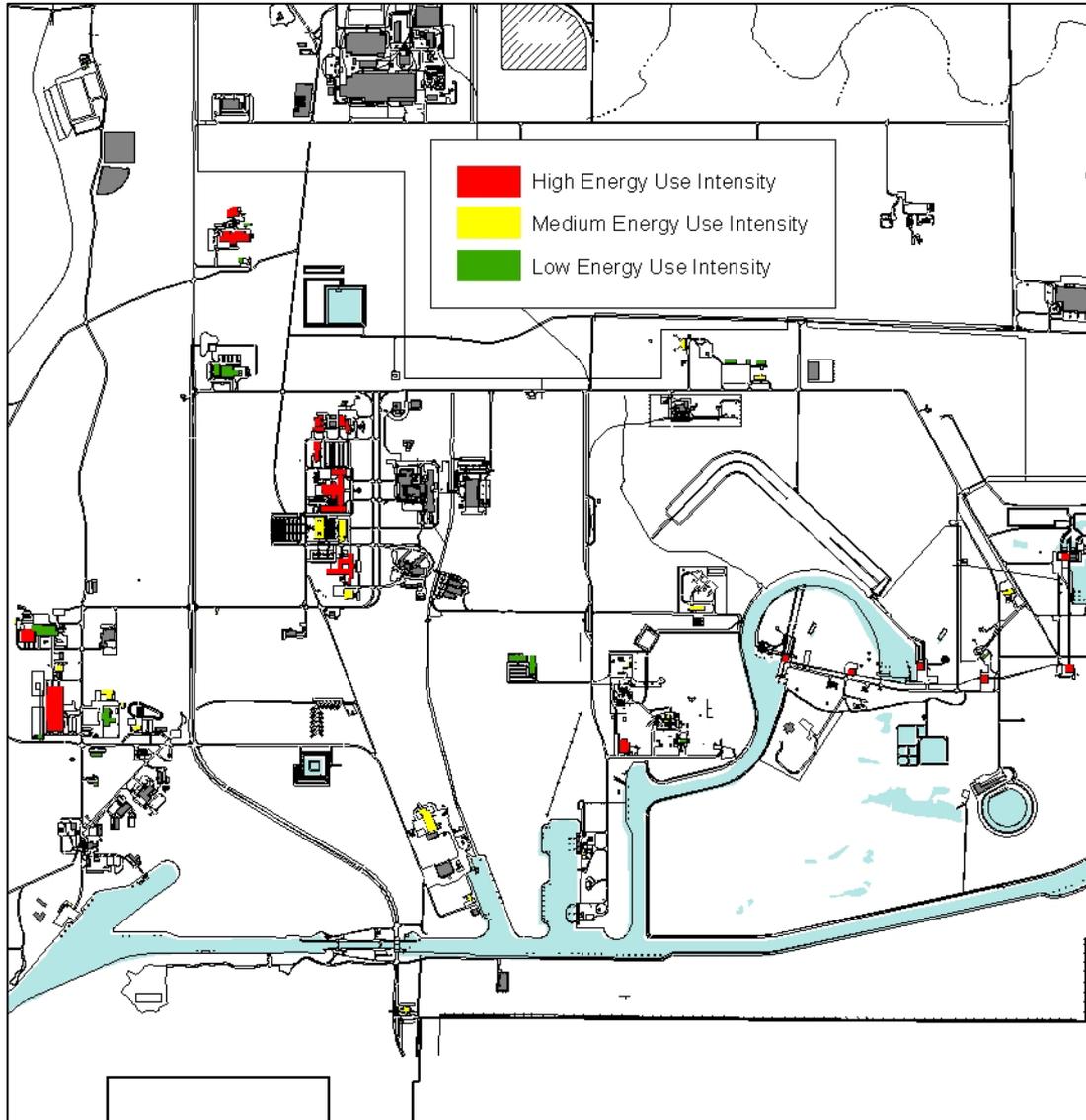
- Bridge Foundation Scour



Energy Management



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System Owner: Missy Ferguson

Concerns

- Increased Global Temperature, Increased Energy Usage, Increased Energy Cost



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Natural Resource Systems

*David Lorance
Environmental Officer
Stennis Space Center*



Natural Resource System Components / Assets



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- Waterways (surface & storm water systems)
- Soil and Groundwater
- Landscaped Grounds
- Wooded & Natural ★
- Archaeology
- Wildlife
- Air
- Landfill
- AST/UST
- Clean Up Sites
- Wetlands

Will use these systems to learn
how to:

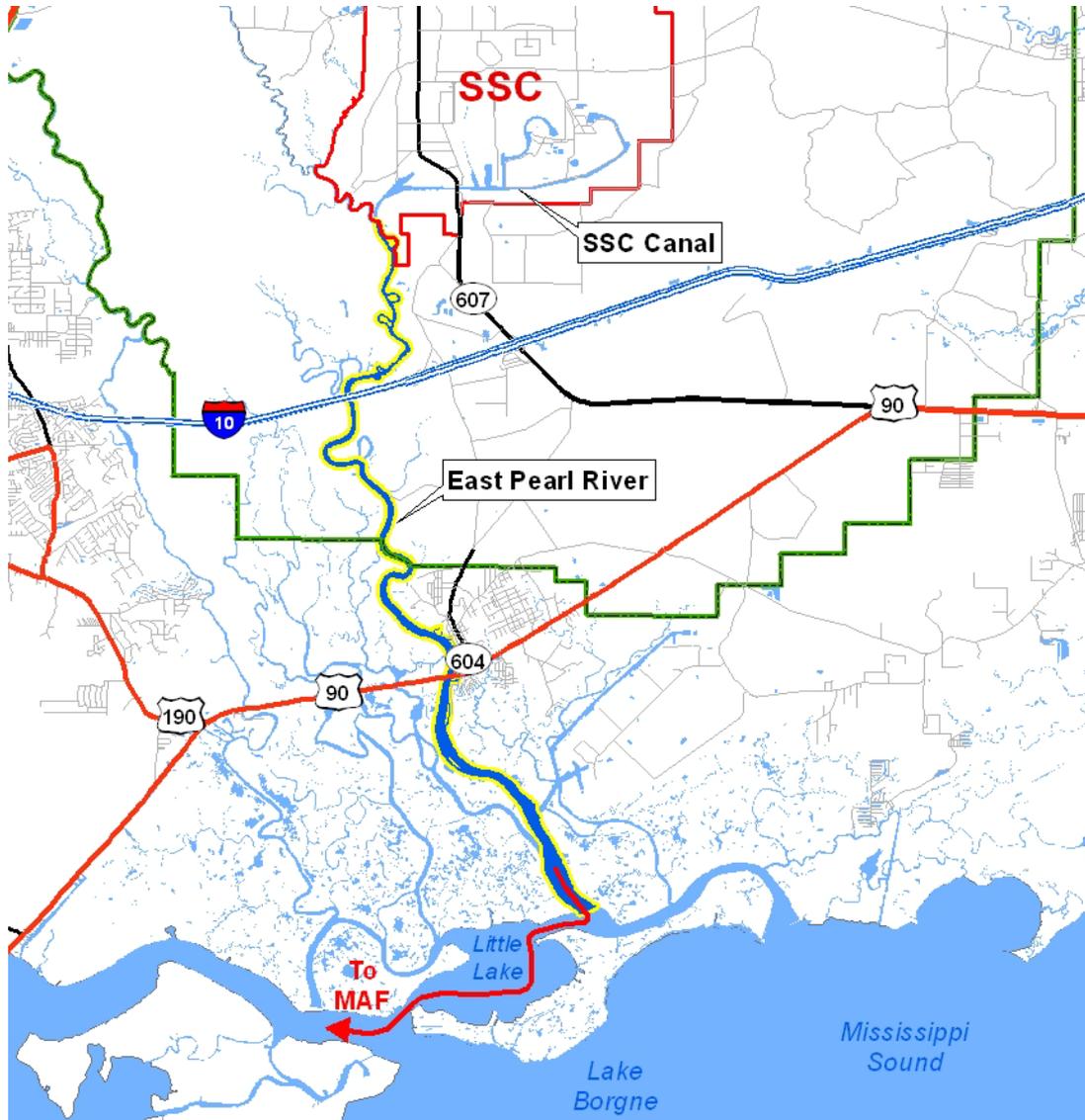
- characterize risks / opportunities
- develop strategies
- integrate into plans / processes



Waterways



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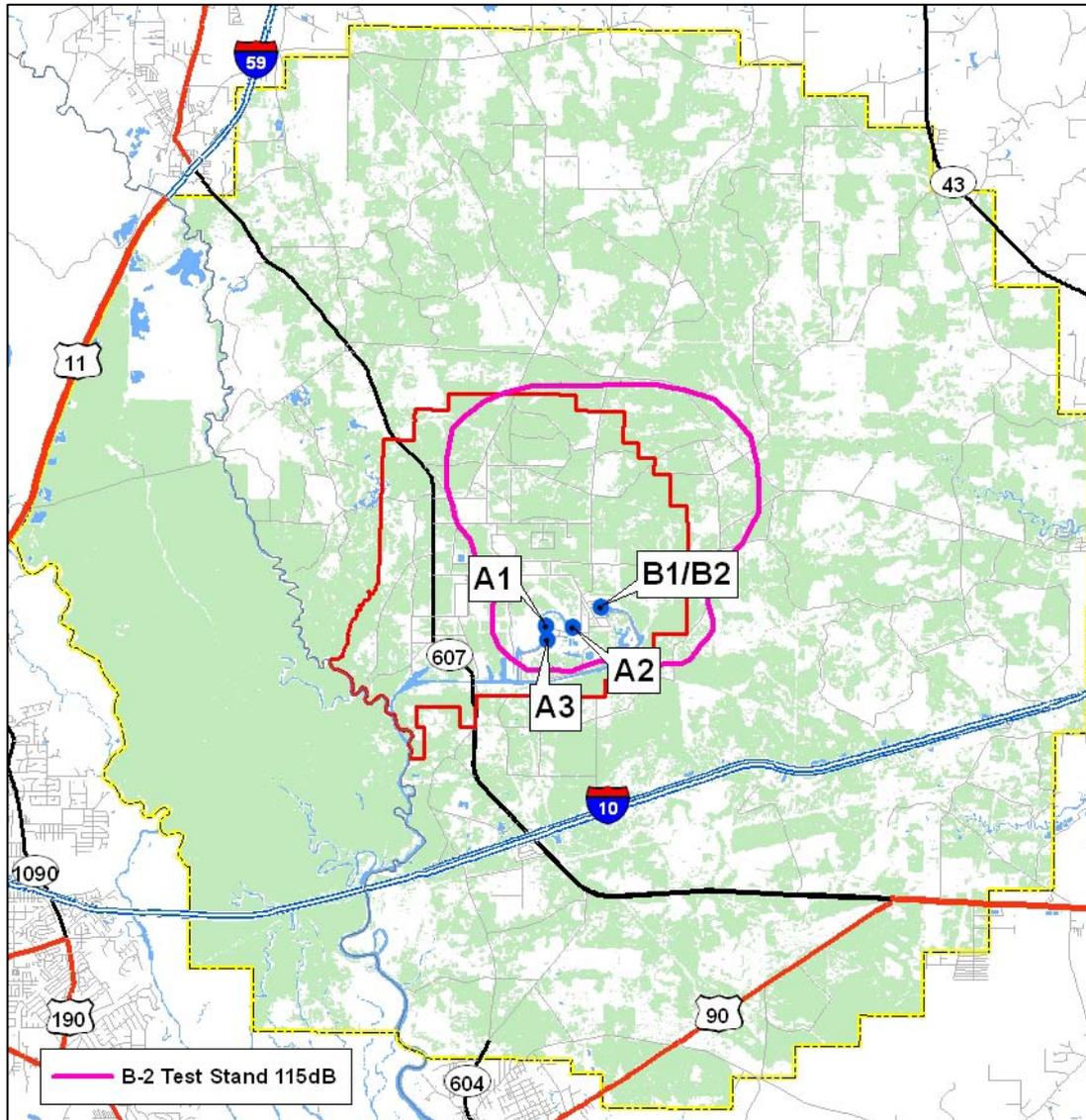
- Distance from SSC Canal to the mouth of the Pearl River: 13 Nautical Miles



Wooded Area: Acoustic Buffer



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- **Fee Area Land Cover**

- Forested – 62%
- Developed – 14%
- Shrub – 12%
- Non-Forested Wetland – 6%
- Grassland – 3%
- Water – 3%

- **Buffer Zone Land Cover**

- Forested – 57%
- Shrub – 18%
- Non-Forested Wetland – 11%
- Grassland – 5%
- Developed – 3%
- Water – 2%
- Cultivated – 2%
- Pasture/Hay – 2%



Natural Resource System Plans & Permits



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Plans

- SPLN-8500-0067 Environmental Management Plan: **Dave Lorange/Carolyn Kennedy**
- SPLN-8500-0002 Energy-Efficiency & Water Conservation 5-Year Plan: **Missy Ferguson/Mike Killam**

Permits

- Title V Air Permit: **Carolyn Kennedy/Bridget Moody (FOSC)**
- Water Discharge Permit (NPDES): **Jenette Gordon/Wendy Robinson (FOSC)**
- Surface Water Withdrawal Permit: **Jenette Gordon/Wendy Robinson (FOSC)**
- Potable Water Permit: **Jenette Gordon/Wendy Robinson (FOSC)**



Natural Resource System Owners



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- Waterways (surface & stormwater systems): **Carolyn Kennedy/Eddie Renz (FOSC)**
- Soil and groundwater: **Jenette Gordon/Wendy Robinson (FOSC)**
- Landscaped Grounds: **Peter Sciarabba (FOSC)**
- Wooded & Natural: **Hugh Carr/Craig Case (USACOE)**
- Archaeology: **Marco Giardino/Adam Murrah**
- Wildlife: **Hugh Carr/Jay Myers (USDA)**
- Air: **Carolyn Kennedy/Bridget Moody (FOSC)**
- Landfill: **Jenette Gordon/Bill Lipscomb (FOSC)**
- AST/UST: **Jenette Gordon/Michael DeSandro (FOSC)**
- Clean up sites: **Jenette Gordon/Wendy Robinson (FOSC)**



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People / Community Systems

Ron Magee

Assistant to the Director of Center Operations

Stennis Space Center



People/Community System – Assets “Keeping People Safe & Working”



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Subcomponent Services

Center Level

Employee Level

Workforce



- Recruit
- Retain
- Develop and Train
- HR Policy & Procedures
- Contract Administration & Communication

- Food
- Communication
- IT
- Child Care
- Accommodations
- HR Advice & Counsel
- Payroll/Travel



Health & Safety



- Response & Recovery
- Employee Emergency Notifications
- Incident Specific Instructions
- First Responders
- Fire protection
- Security

- Occupational Health
- Medical Services
- Employee Assistance Program
- Fitness
- Protective Services
- Employee Safety

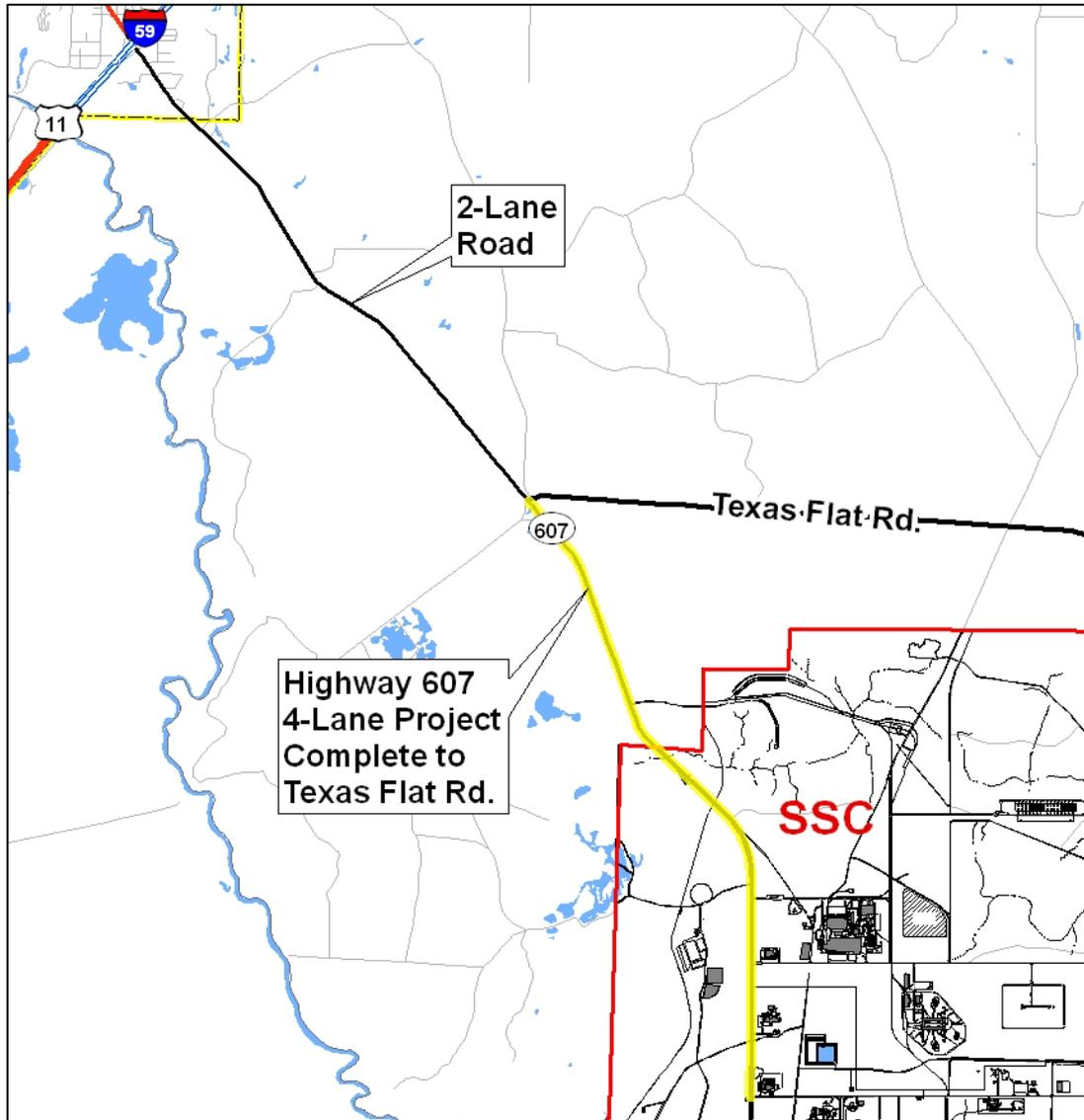




Highway 607 Expansion



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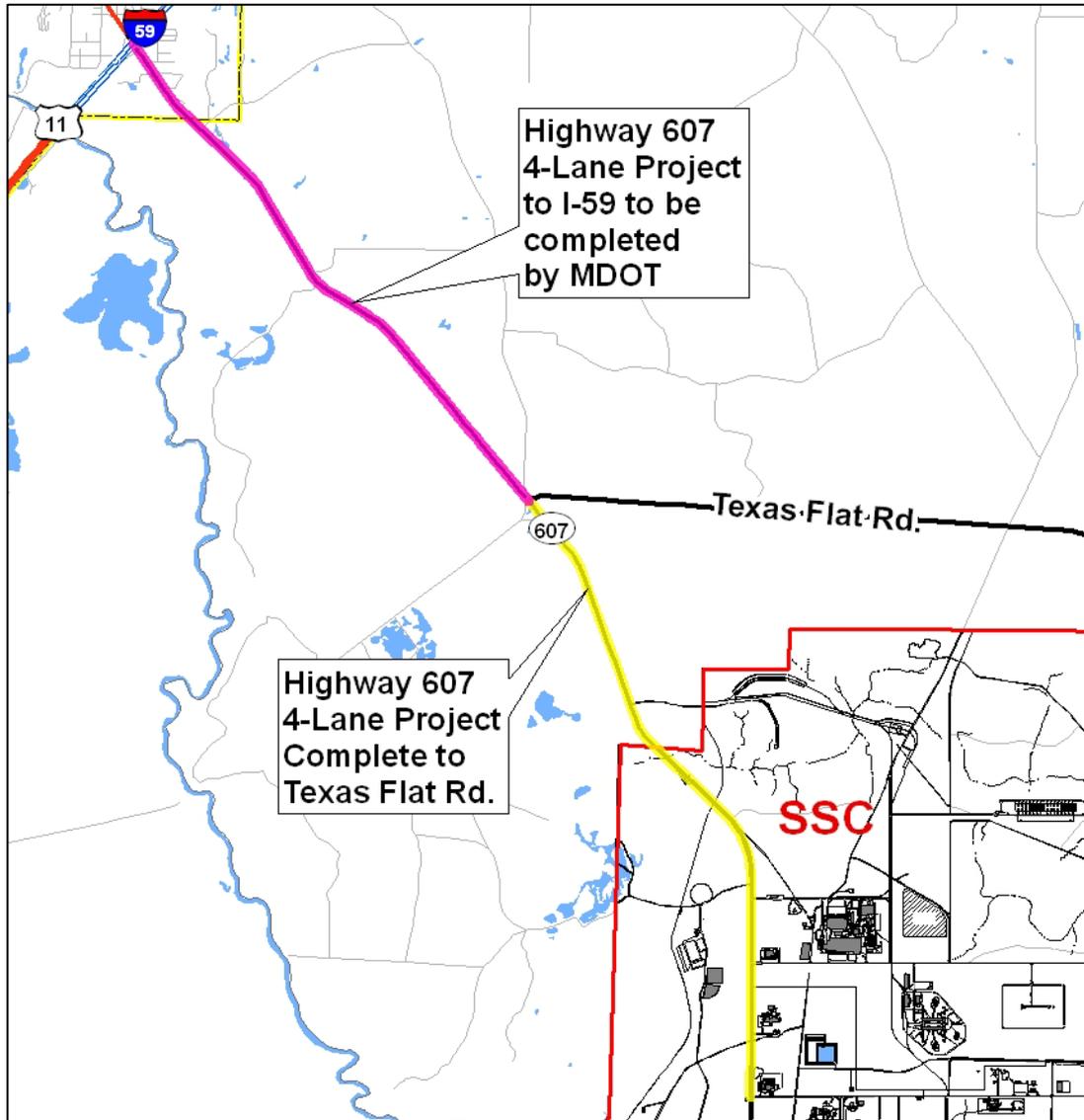
- Egress is still limited due to choke point at Texas Flat Road



Highway 607 Expansion



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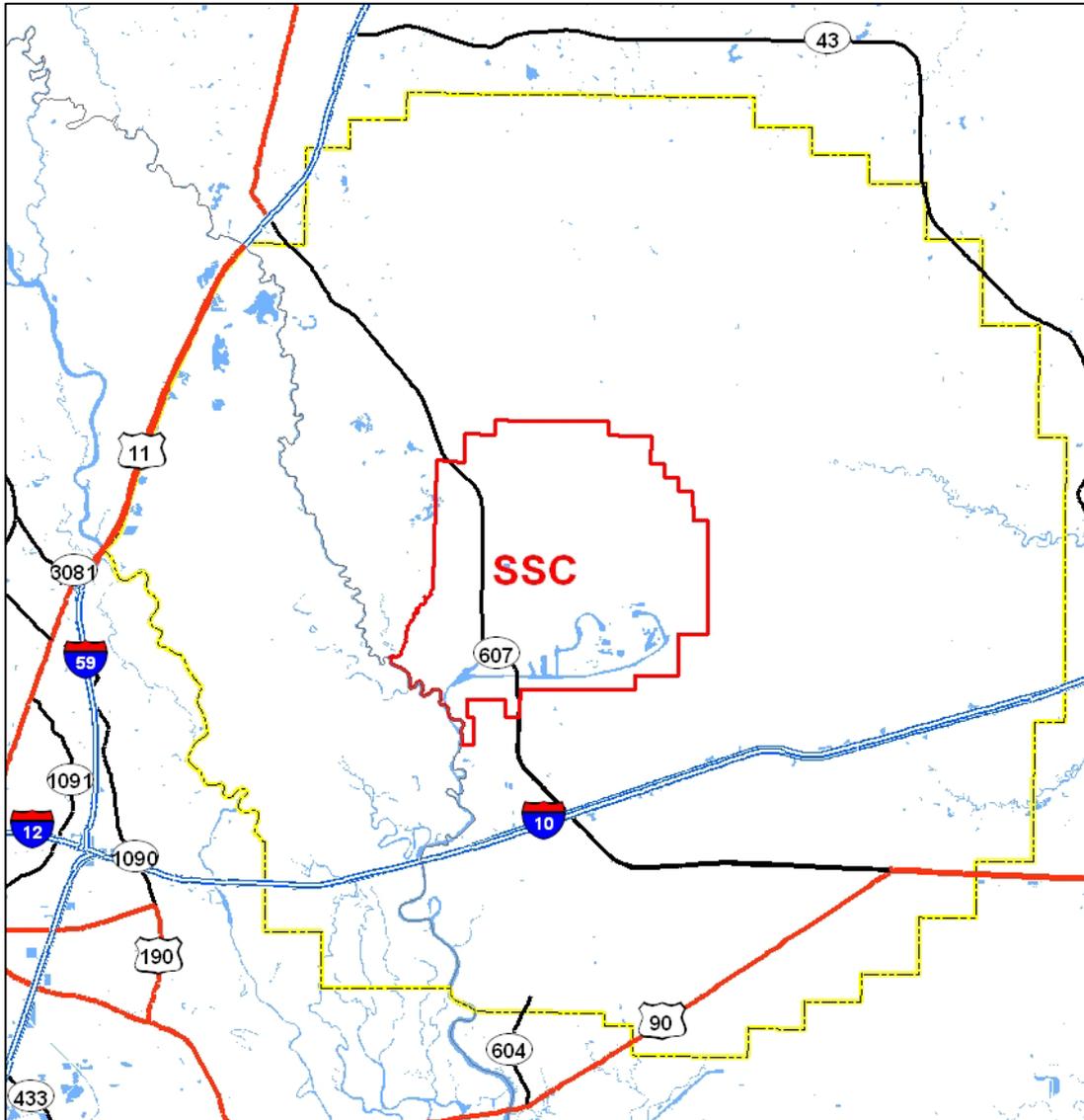
- Egress is still limited due to choke point at Texas Flat Road
- Choke Point will be eliminated with MDOT Project



Center Egress



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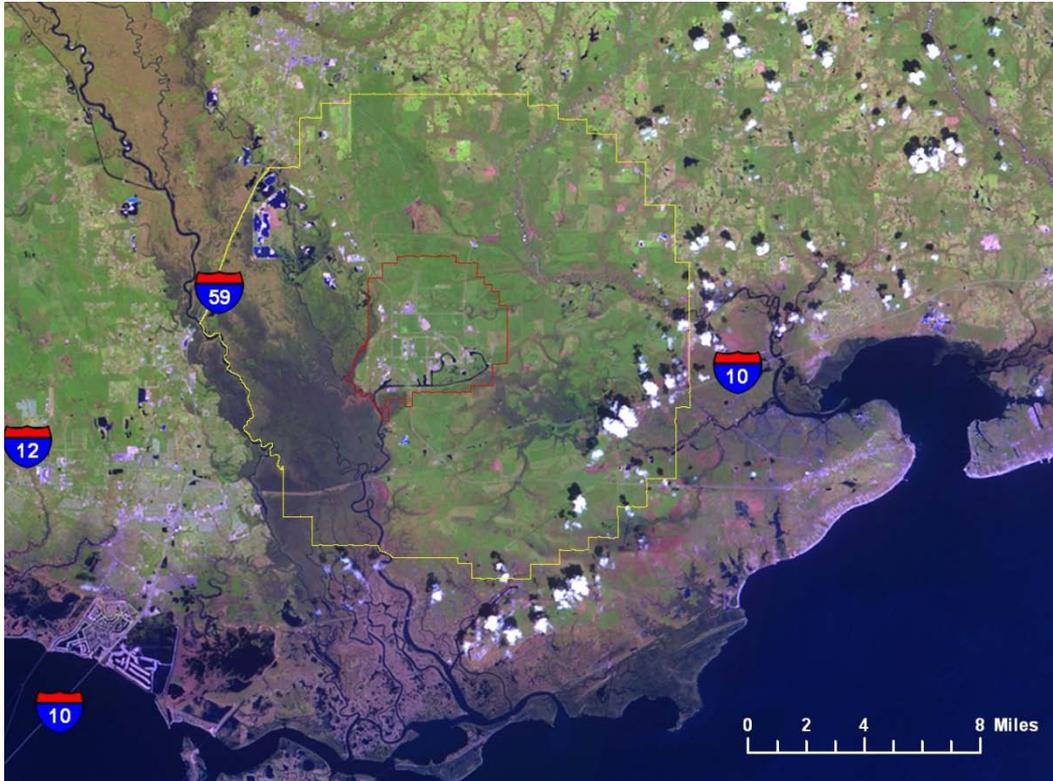
- Over 60% of SSC Personnel Egress from the South
- Interstate 10 & Hwy 607 are subject to flooding as well as other primary roads



Flooding of Surrounding Communities



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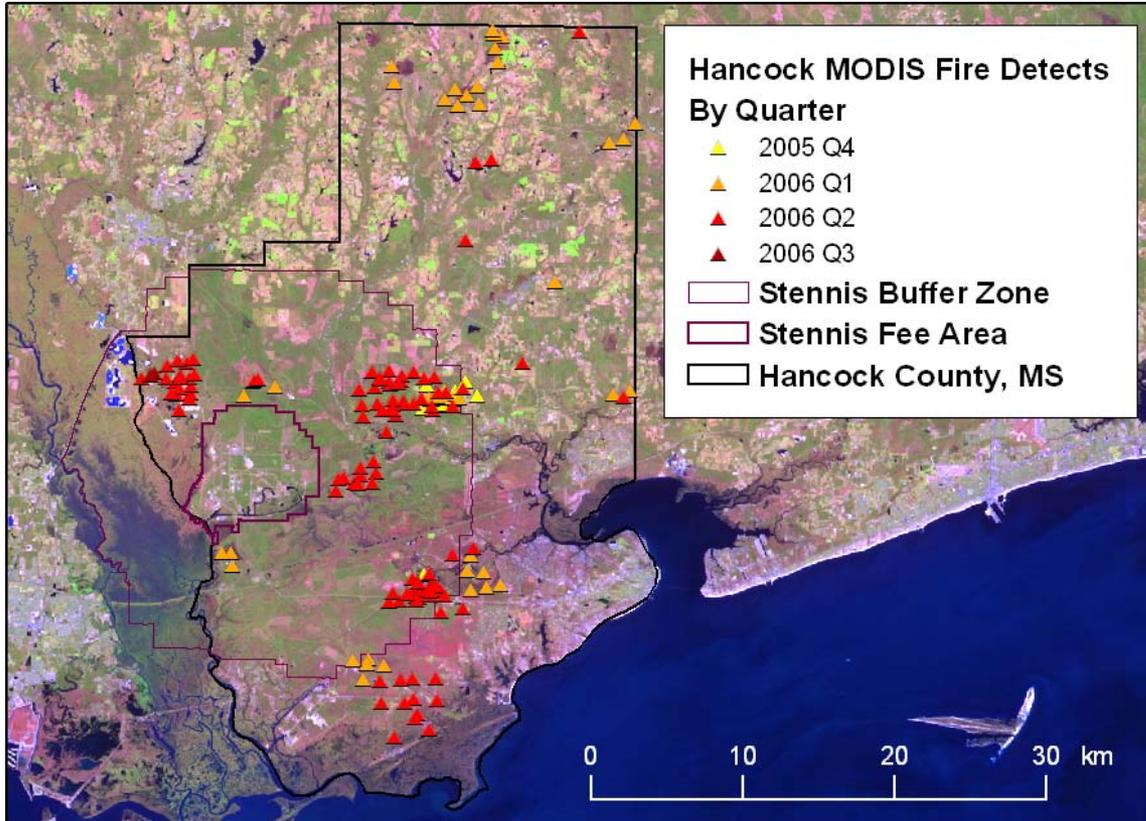
- Experience from Hurricane Katrina revealed that over 25% of our personnel had uninhabitable flooded homes
- This posed a major problem in bringing our employees back home and back on the job



Wildfire Potential



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- Being Surrounded by 125,000 Acres of Wooded Area Poses a Problem After a Hurricane – Increasing fuel for wildfires



Emergency Notification System



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- With the new Emergency Notification System, a problem of locating employees following a major storm event has been lessened
- Still have issues with employee response
- Yet it is better than what we did during Katrina



People/Community System Other Ideas to Consider



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- Alternate Work Scenarios
- Heat Stress on the People Who Work Here
 - Maintaining Workable Interior Conditions
 - Exterior Temperatures – Work Modifications



People/Community System Plans



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- SPLN 1040-0005 Continuity of Operations (COOP) Plan: **Ron Magee**
- SPLN 1040-0006 Emergency Management Plan: **Ron Magee**
- Integrated Contingency Plan: **Clark Smith (FOOSC)/Michael DeSandro (FOOSC)**
- SPLN-8838-0001 SSC Fire Protection/Fire Prevention Plan – **Clark Smith (FOOSC)/Clyde Dease**
- SSC Telework Plan – **Dorsie Jones/Jeannie Frederick**
- Time and Attendance Guidelines – **Dorsie Jones/Jeannie Frederick**
- Maximum Work Time Policy in SPD 8715.001 Safety and Health Handbook – **Freddie Douglas/Maggie Jones**



People/Community System Owners



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People / Community

- SSC civil servants: **Dorsie Jones**
- SSC contractor team: **Mary Byrd**
- SSC provided services
 - Health & Safety: **Katrina Wright/Maggie Jones**
 - Emergency Response & Management: **Don Griffith**
 - Security: **David DelSanto**
 - Communications: **Jeannie Frederick**
- Family: **Jeannie Frederick**
- Community: **Ron Magee**



People/Community System Components / Assets



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People / Community

- SSC Civil Servants ★
- SSC Contractor Team ★
- SSC Provided Services
 - Health & Safety ★
 - Emergency Response & Management
 - Security
 - Communications
- Family
- Community

Emergency Operations Center

- Medical Clinic ★
- Fire Department
- Security
- EMCS
- Incident Command Post and Emergency Operations Center

Will use these systems to learn how to deal with heat stress for those who work outside for our first example to learn how to :

- characterize risks / opportunities
- develop strategies
- integrate into plans / processes