



AQUEOS

EXCELLENCE IN SUBSEA SOLUTIONS

Shallow Water Pipeline Removal Process

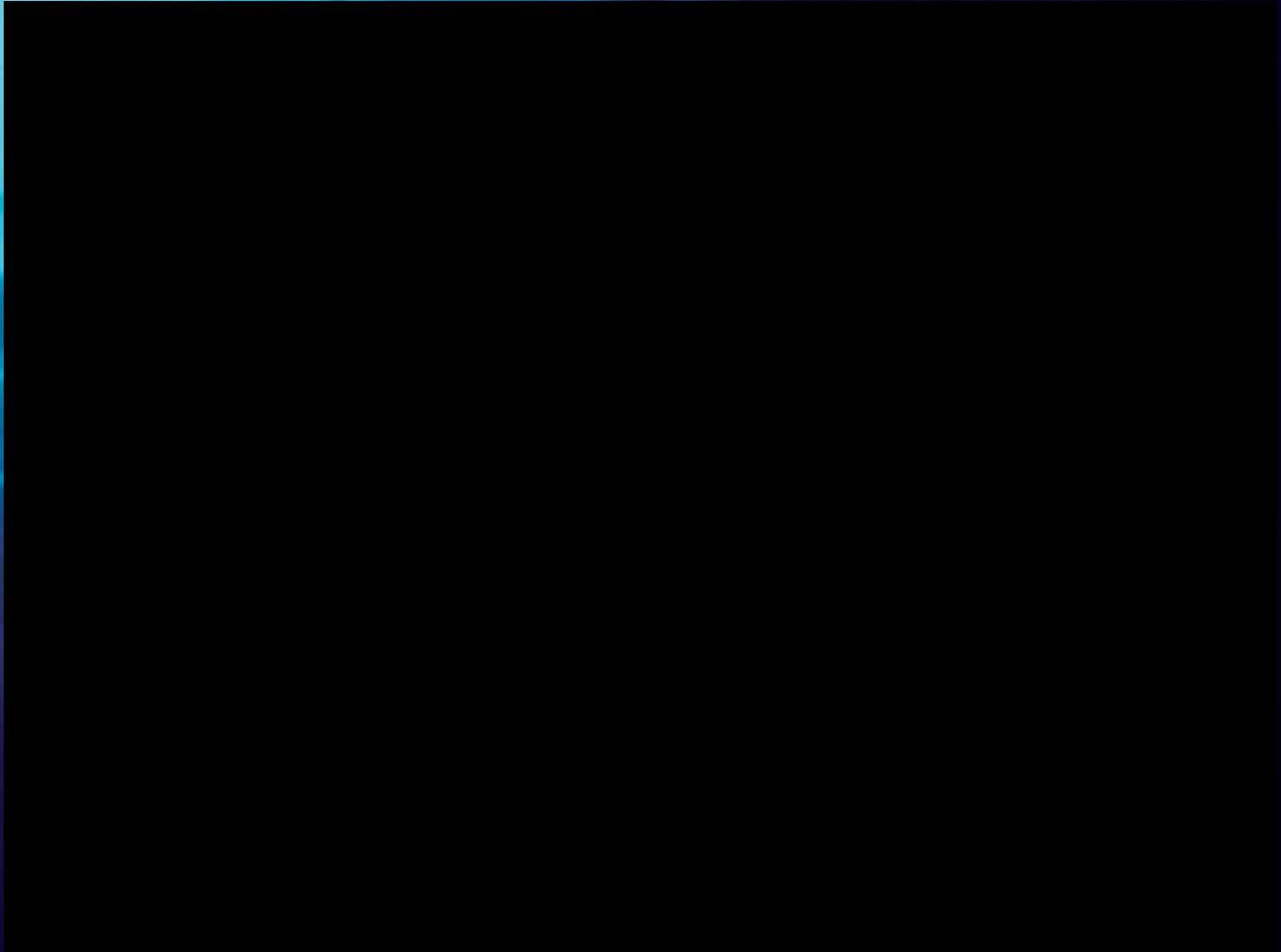
Bay Marchand
Gulf of Mexico

Prepared by: Ted Roche

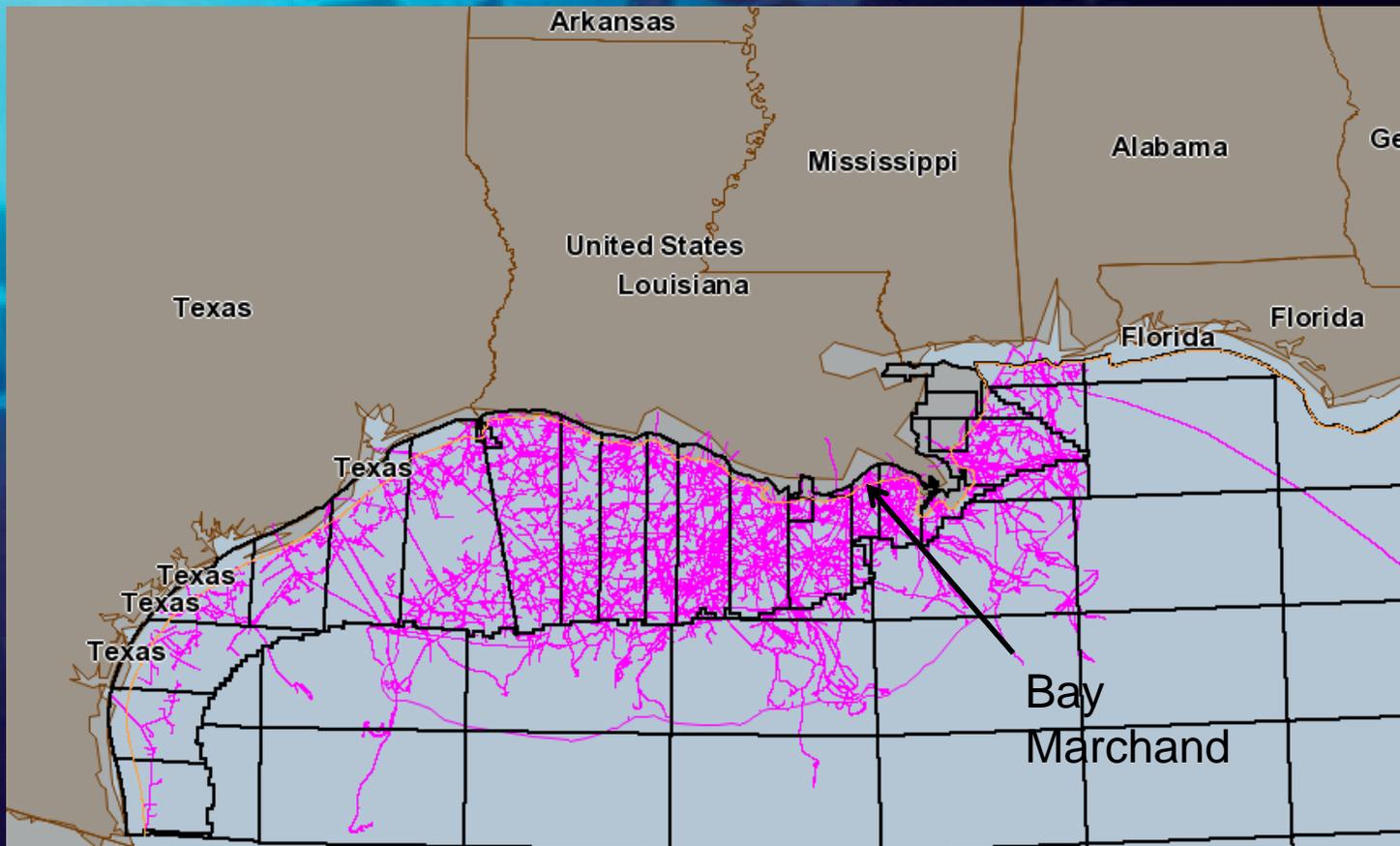
Date: 9/20/2010



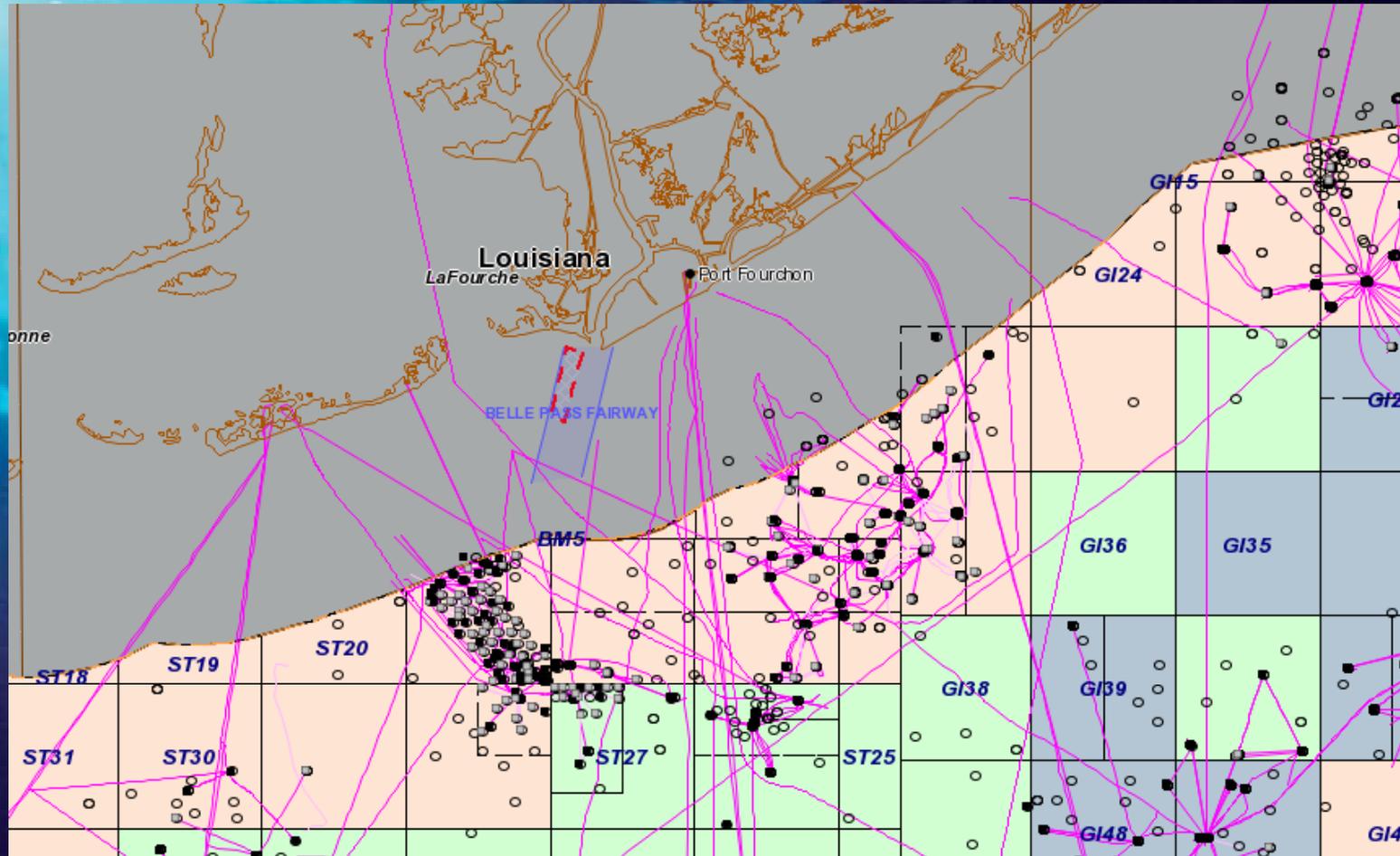
Diver Emergency Drill



Gulf of Mexico Pipeline System (Federal Waters)



Bay Marchand Field



Pipeline Removal Phases

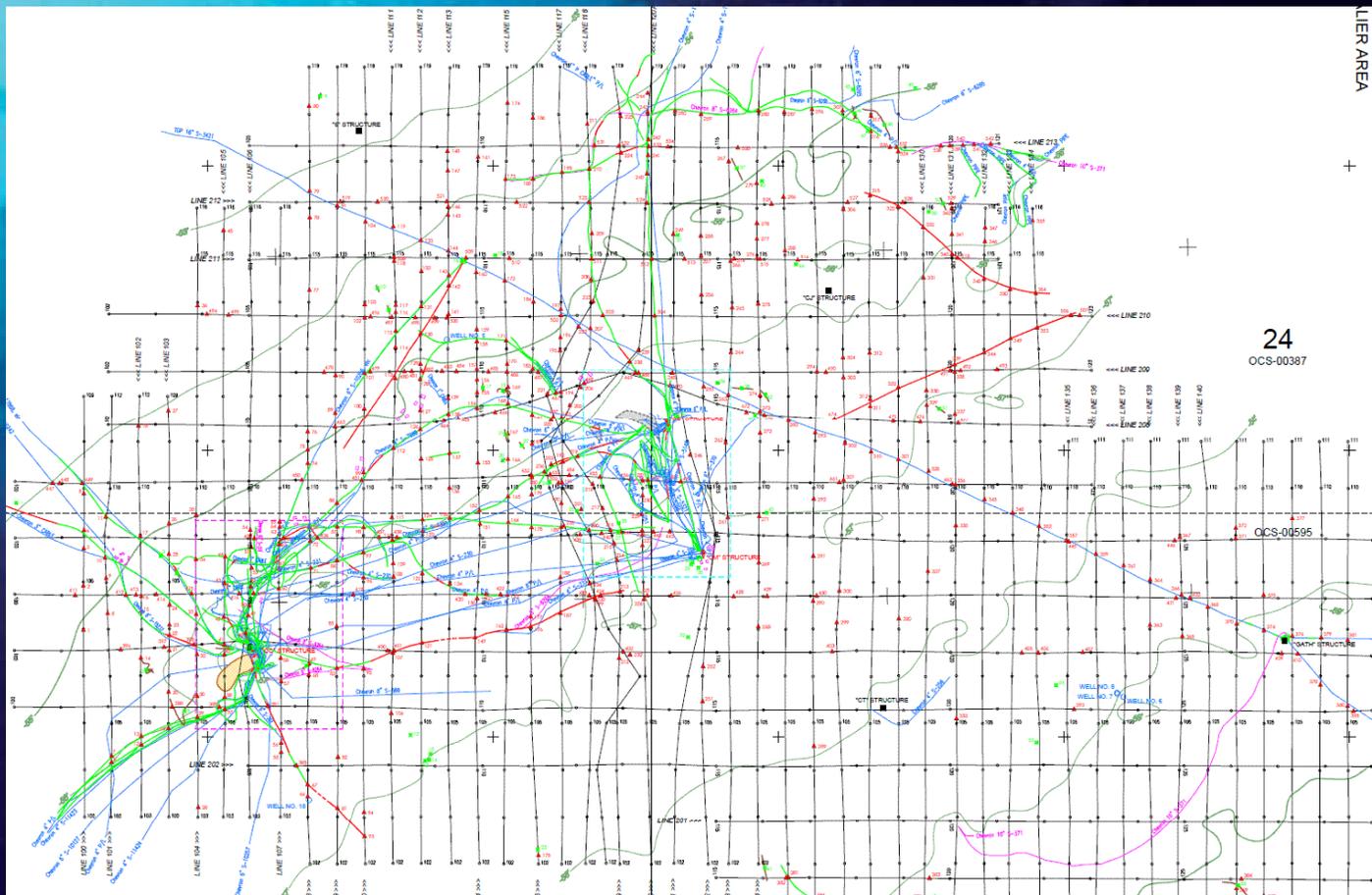
Pipeline Abandonment Plan &
Permitting

Diver Hands on survey

Pipe Prep

Pipe Pulling

Geodetic Survey Mapping of seabed used in planning diver survey strategy



Date

Diver Hands On Survey

Date

GIL 3 PowerPoint Template



“Diver Live Boating” & “Hands On Surveys”



Date

GIL 3 PowerPoint Template



Track Link Sending Unit Attached to Diver Emergency Bail Out Bottle



Date

10

Track Link Receiving Unit



Date

11

Diver Entering Water With Down Line



Date

GIL 3 PowerPoint Template



Diver recovery on Starboard Mid-Ship



Date

13

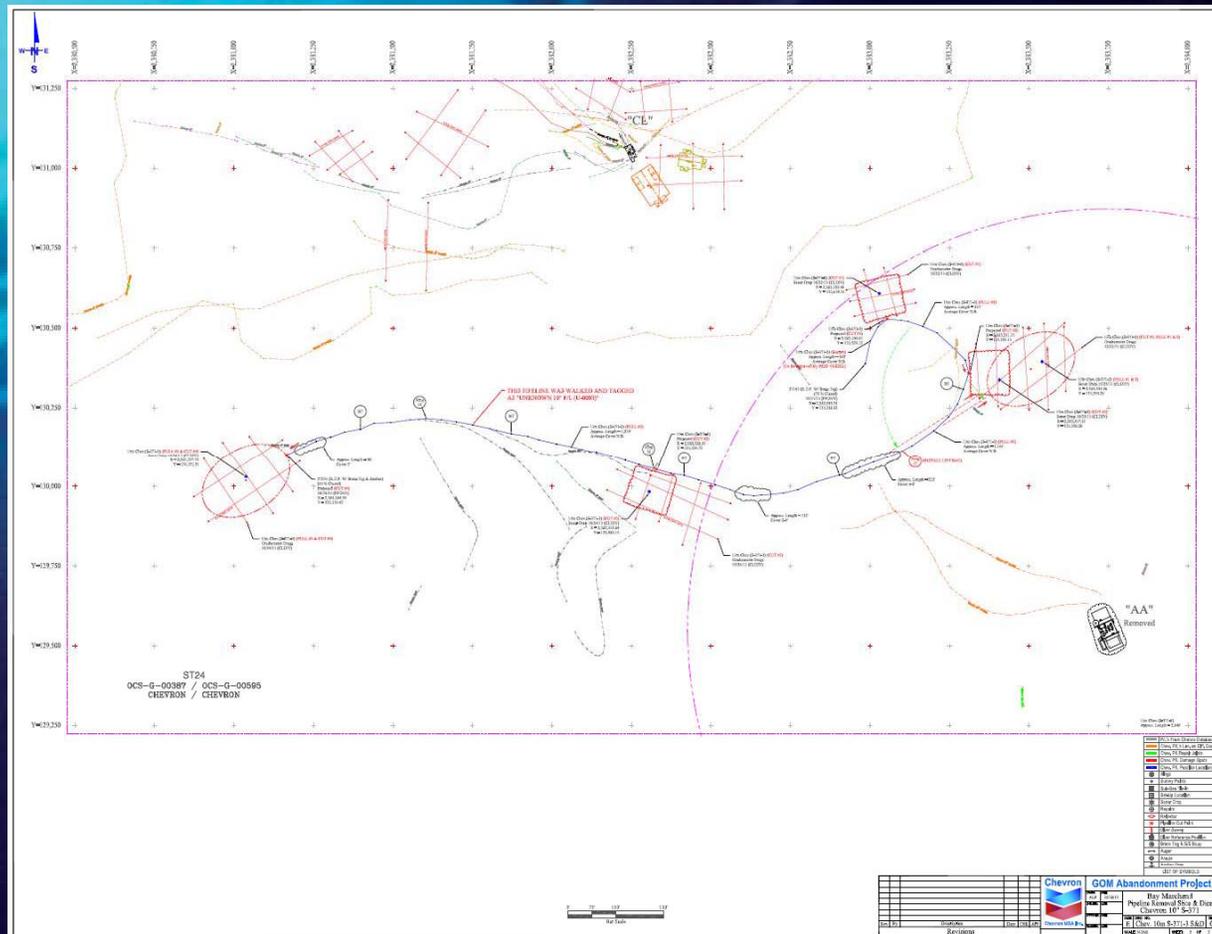
Preparing Pipeline Sections For Removal Slice & Dice

Date

GIL 3 PowerPoint Template



"Slice & Dice Plan" W/ SJA established for Seg 371 - 3



Date



Lift Boats Preparing P/L Sections For Flushing and Removal



Date

10

Pipeline cutting under containment dome



Date

Sealed pipelines hot tapped for entry



Date

Pipeline Cut with Guillotine Saw



Plumbers Plug W/Wing Nut



Date

Modified New Pipe Plug along side T-grip with Plug dog



Date

Pipe Caps used to hold nut type plugs in place



Date

23

Riser Removal



Date

24

Sharp bends are cut out of pipe section ends



Date

25

Valves etc. on pipeline pick up
ends are permissible



Date

26

Short spans of pipe sections recovered by Slice & Dice Prep Vessel



Date

27

PIPELINE REMOVAL PROCESS

Date

GIL 3 PowerPoint Template



Pulling Vessel: L/B Eagle



Date

29

Pac Man II Pipe Recovery & Containment Unit Bow to Stern View



Date

30

40,000# Pulling Winch



Date

Portable Hydraulic System Station



Date

32

"Pac Man II" Overhead View Stern to Bow



Date

33

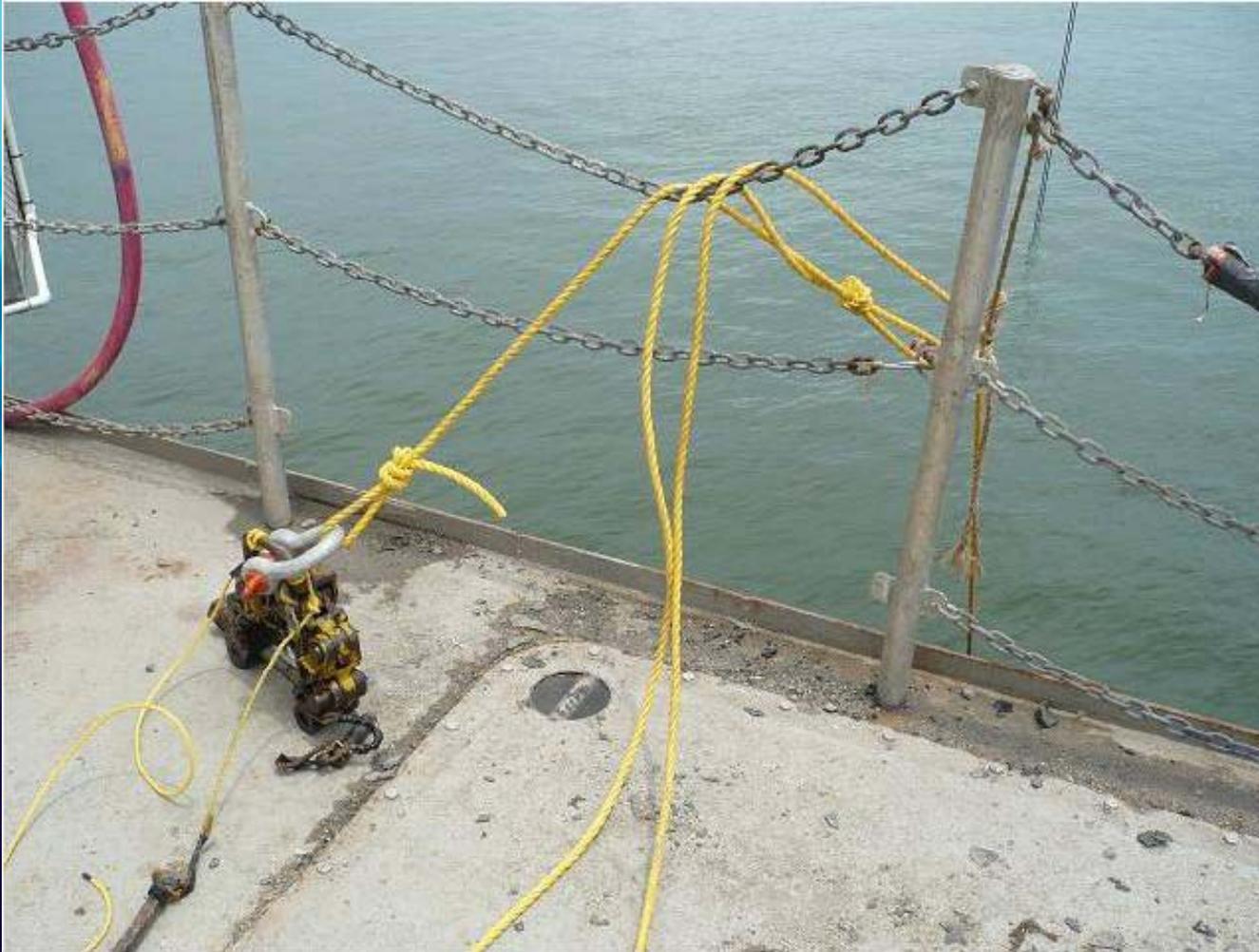
Bow End Adjustable Hydraulic Stinger



Date

34

Safety Slips Rigged for Diver Installation



Date

“Slammer Clamp” Rigged for Diver



Date

Diver Being Briefed and Dressed for Pipe Recovery



Date

37

Diver Lowered to Seabed From Stage



Date

38

Attaching Crane Line To Pipe End and Safety Slips With Winch to Pipe End



Date

39

Diver Up and Standing Clear to Assist



Date

40

Pipe End Lifted to Surface



Date

Pipe End Being Drug Into Stinger



Date

42

Pipe End Pulled Over Trough



Date

43

Pipe Dogged Down Pull Tension Relaxed



Date

“Frog Cutter” Being Attached For Pipe Severing



Date

45

Making Cut With “Frog Cutter” Trough Catching Fluid



Date

46

Pipe Cut and Released From “Frog Cutter”



Date

100% Norm Survey Performed



Date

30' Pipe Joint Being Loaded Into "Bundle Rack"



Date

49

Adjusting Severed Pipe Joint Into Bundle Rack



Date

Coupons From Frog Cut and Coatings Captured in Trough



Date

51

All Captured Pipeline Fluids Are Transported to Shore for Disposal



Date

52

Recovered solids are transported to shore for disposal in 15 bbl cutting boxes



Date

53

Pull rigging and cable being attached for next pull



Date

54

Tension applied to pipe to confirm connection Chain is certified tested Spectrum 10



Date

55

Dogging connection is released for pull



Date

56

Pipe Pull Sequence Video



Pipe Bundle being transferred from “Bundling Rack” to “Ready Rack Bundle”



Date

58

Full "Ready Rack" 44,000# of pipe



Date

59

Bundles being loaded to supply boat



Date

Cargo vessel arriving at the Transfer Dock In Leeville, La



Date

61

01/05

Spread Production Rates

- Mid-June to mid-October- removed approximately 95,000' of pipe
- Pipe size range included 3", 4", 6" 8", 10", 16"
- 24 hour average 8" -1000'-1200' recovered
- 24 hour average 4" -2500' recovered

Summary

- Cost effective approach for shallow water pipeline removal
- Tools and methodology are adaptable to other locations and water depths
- Detailed procedures and operational discipline are keys to Incident-free operations

Questions?





AQUEOS

EXCELLENCE IN SUBSEA SOLUTIONS