A.I.S., Inc.

Protected Species Monitoring

PROTECTED SPECIES MONITORING SERVICES DURING PILE DRIVING FOR THE EAST LATERAL XPRESS PROJECT IN BARATARIA BAY, LOUISIANA

FINAL REPORT




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Confidentiality The information summarized in this Final Report was collected by A.I.S., Inc. for Perennial and Columbia Gulf Transmission, LLC to be distributed to the National Marine Fisheries Service as required by the Incidental Harassment Authorization granted to Columbia Gulf Transmission, LLC on December 12, 2023.

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY 1
2. INTRODUCTION ..... **Error! Bookmark not defined.**
3. PROTECTED SPECIES OBSERVATION METHODS 2
3.1. Protected Species Observer Training and Compliance 3
3.2. Monitoring Methods and Equipment 3
3.3. Protected Species Mitigation Measures 4
4. OPERATIONAL & PSO EFFORT SUMMARY 5
4.1. Operational Activity Summary 5
4.2. Pile Driving Summary 7
4.3. Protected Species Observer Effort Summary 7
5. PROTECTED SPECIES DETECTIONS AND MITIGATION 8
6. SUMMARY OF WEATHER & ENVIRONMENTAL CONDITIONS 13
7. ASSESSMENT OF MONITORING METHODS 16
8. ACKNOWLEDGEMENTS 16
REFERENCES 17

LIST OF FIGURES

Figure 1 Operational Activity Distribution by Time (hh:mm) 7
Figure 2 Monitoring Activity Distribution by Time (hh:mm) 8
Figure 3 PSO Monitoring Effort (hh:mm) 8
Figure 4 Estimated Number of Animals by Cohort 9
Figure 5 Detection Distribution by Vessel Activity 9
Figure 6 Bottlenose Dolphin Detection Breakdown 10
Figure 7 Detection Distance Breakdown During Impact Pile Driving (the numbers immediately below the bars are the detections numbers) 10
Figure 8 Detection Distance Breakdown During Vibratory Pile Driving (the number immediately below the bar is the detection number) 11
Figure 9 Visibility Distribution (Good = >1,000m, Moderate= 1,000 – 500m, Poor= <500m) 14
Figure 10 Precipitation Distribution 14
Figure 11 Glare Severity Distribution 15
Figure 12 Beaufort Sea State Distribution 15
Figure 13 Cloud Cover Distribution 16

LIST OF TABLES

Table 1 Pile Driving Survey Campaign Overview 1
Table 2 Hammers Utilized during Pile Driving for the Tie in Facility Construction 6
Table 3 Number of Detections and Individual Animals Detected 8
Table 4 Number of Allotted Marine Mammal Takes vs Animals Observed within the Level B Harassment Zone 11
Table 5 Mitigation Summary 13

APPENDICES

Appendix A. A.I.S. Inc., Final Activity Report Summary
Appendix B. Pile Driving Activity Summary
Appendix C. TC Energy Concrete Pile Driving Report

LIST OF ABBREVIATIONS

AIS	A.I.S. Inc.,
Columbia Gulf	Columbia Gulf Transmission LLC
ESA	Endangered Species Act
CPA	Closest Point of Approach
Final Report	Final Protected Species Monitoring Report
FWS	Fish and Wildlife Service
IHA	Incidental Harassment Authorization
MMPA	Marine Mammal Protection Act
NARW	North Atlantic right whale
NMFS	National Marine Fisheries Service
NMFS VSA Measures	Vessel Strike Avoidance Measures and Reporting for Mariners from 2008 developed by NOAA Fisheries Service, Southeast Region
NOAA	National Oceanographic and Atmospheric Administration
Perennial	Perennial Environmental Services, LLC
OPR	Office of Protected Resources
Project	East Lateral XPress Project in Barataria Bay, Louisiana
PSO	Protected Species Observer
TCE VSA Plan	Wildlife and Vessel Strike Avoidance Plan, developed by TC Energy a subsidiary of Columbia Gulf

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1. EXECUTIVE SUMMARY

This Final Protected Species Monitoring Report (Final Report) is submitted on behalf of Columbia Gulf Transmission, LLC (Columbia Gulf). This report has been prepared in accordance with the final reporting requirements outlined within the Incidental Harassment Authorization (IHA) (IHA; 88 fr 61530) issued by the National Marine Fisheries Service (NMFS) with effective dates of December 1, 2023 – December 1, 2024. Final data collected during April, May and June pile driving and removal operations associated with the East Lateral XPress Project in Barataria Bay, Louisiana (Project) are contained herein. Additionally, this report includes summaries of vessel operations, associated detections of protected species made by Protected Species Observers (PSOs) and any mitigation actions necessary during pile driving and removal activities. All PSO data collected during this campaign are attached to this report in a Microsoft Excel .xlsx file. These data contain supplementary information regarding the Project, its operational activities, and the detection of protected species, in addition to the summary provided in the body of the report. This work was conducted under the IHA (IHA; 88 fr 61530) and in accordance with Wildlife and Vessel Strike Avoidance Plan, developed by Columbia Gulf, a subsidiary of TC Energy (TCE VSA Plan), and the Vessel Strike Avoidance Measures and Reporting for Mariners from 2008 developed by National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, Southeast Region (NMFS VSA Measures). To comply with IHA requirements, Perennial Environmental Services, LLC (Perennial) contracted A.I.S., Inc. (AIS) to provide PSOs to monitor for marine mammals and other marine protected species during in-water pile driving and removal operations. This survey effort was the only one undertaken during the 2024 calendar year under this IHA and thus this report will fulfill the comprehensive final report submission requirements from NMFS under the IHA.

Pile driving and removal operations were conducted over a period of 21 calendar days, between April 9th and June 14th, 2024. There was a pause in operations between May 20th and June 13th when there was no pile driving or removal activity and thus the PSO team was demobilized. Due to the potential for harassment of listed or otherwise protected marine species as a result of the sound generated by pile driving operations, two (2) AIS PSOs were deployed to Grand Isle, LA to monitor sound producing operations onboard the various project vessels and barges. The PSOs monitored in accordance with regulations set forth within the IHA, the TCE VSA Plan and the NMFS VSA Measures.

There were 62 marine mammal sightings during this deployment, consisting of an estimated 169 individual animals, the majority of which was completed during generally favorable environmental conditions. There was one (1) solitary bottlenose dolphin that triggered shutdown mitigation measures to be enacted, and 9 detections of a total 19 of bottlenose dolphins that encroached within the 430-meter (m) Level B Harassment Zone and meet the criteria of takes. In total, due to the bottlenose dolphin-triggered shutdown and five (5) post detection pile driving start up delays, there were 27 minutes of downtime due to protected species.

Table 1 Pile Driving Survey Campaign Overview

IHA Holder	Columbia Gulf Transmission, LLC
Client	Perennial Environmental Services, LLC
Project Area	Barataria Bay, Louisiana
Dates	April 9, 2024 – June 14, 2024
Pile Driving Contractor	Sealevel Construction Inc.
Protected Species Observer Contractor	A.I.S., Inc.
Protected Species Observers	Hannah Kieler, Anthony Simons and Jacob Gentle

2. INTRODUCTION

The Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) were enacted to protect endangered species and marine mammals respectively, and both prohibit the "taking" of these animals. Taking is defined as harassing, harming, perusing, shooting, wounding, trapping, hunting, capturing, collecting, killing or attempting to harass, harm, pursue, shoot, wound, trap, hunt, capture, collect, or kill marine mammals or endangered species. There are two types of harassment induced incidental “takes”, Level A and Level B. Level A takes have the potential to cause physical injury to an animal; alternatively Level B takes have the potential to disturbance an animal via harassment which may cause changes to known behavioral patterns (breathing, feeding, nursing, etc.) are the result of activities transpiring within protected animal habitats.

Both the ESA and the MMPA are administered by the NOAA, NMFS and United States Fish & Wildlife Service (FWS). These agencies issue authorizations for activities that have the potential to incidentally “take” by harassment members of protected species. The federal government issues authorizations for takes for important activities, in this case nearshore pile driving and removal, in support of energy development, to occur without the express purpose of affecting protected species but which could have impacts on those species. These impacts must be tracked and reported to the federal government for species management purposes.

Under section 7 of the ESA, federal agencies are required to consult with NOAA and U.S. FWS if the authorized activities that are being undertaken may adversely affect or result in an incidental take of protected or endangered species (NOAA Fisheries, 2023). The NMFS issues IHA’s with required mitigation measures to prevent harassment of protected species and authorizes only a certain amount of incidental take to ensure no population level impacts. IHAs are issued under the MMPA and therefore include only marine mammals, while Section 7 takes place under the ESA which covers both endangered marine mammals and sea turtles.

Columbia Gulf was issued an IHA for activities related to pile driving for the East Lateral XPress Project in Barataria Bay, Louisiana (US Dept. of Commerce, NOAA, NMFS, 2023). Pile driving and removal activities described herein were focused on the construction of a new platform containing meter station, tie-in facility, launcher and receiver, and other appurtenant facilities in Jefferson Parish, Louisiana. This IHA outlined the monitoring, mitigation, and reporting requirements for local marine protected species, with a focus on the local stock of bottlenose dolphins. Additional reporting requirements were laid out for sightings of injured or dead marine mammals. Bottlenose dolphins are the species specific to the area with the highest potential to be affected by acoustic energy from planned in-water operations. IHAs issued by NMFS do not include sea turtle or other marine protected species requirements, thus the TCE VSA Plan and the NMFS VSA Measures were utilized as a guide for mitigation actions for whales, sea turtles, small cetaceans, and North Atlantic Right Whale (NARW). While no Level A takes were anticipated or authorized for this survey, some Level B behavioral disturbance takes were allocated. More information on Level B takes can be found in Section 5.

3. PROTECTED SPECIES OBSERVATION METHODS

PSO monitoring and mitigation measures were designed to minimize potential impacts of sound produced by pile driving operations on protected species and were implemented in accordance with the IHA. The training, observation methods and mitigation measures associated with these operations are outlined below.

3.1. Protected Species Observer Training and Compliance

A team of two (2) NMFS-approved PSOs were provided by AIS for monitoring at the project site during pile driving operations in support of the new tie in facility associated with the lateral pipeline in Barataria Bay. All PSOs attended a dedicated Project-specific Protected Species Observer training course prior to their deployment on the project. These courses were held on February 14, 2024 and May 12, 2024 to accommodate rotations and subsequent periods of work. Individual PSO team members were Hannah Kieler (NMFS approved PSO for nearshore activities), Anthony Simons (NMFS approved PSO for nearshore activities) and Jacob Gentle (NMFS approved PSO for nearshore activities). PSO training involved a detailed review of the following:

- Permits relevant to the project
- Environmental compliance requirements
- Health and safety requirements
- PSO requirements and scheduling
- ESA Listed and Protected species mitigation methods
- Communication
- Data forms
- Use and maintenance of PSO equipment
- Protected species identification

3.2. Monitoring Methods and Equipment

To fulfill protected species monitoring and mitigation requirements the two PSOs deployed to Barataria Bay project site and monitored concurrently. In accordance with the regulatory requirements during all pile driving, PSO monitoring locations provided optimal visibility of the pre-clearance and shutdown zone for each location where pile driving occurred during daylight hours. There were no nighttime operations during this campaign. PSO duties included:

- Working to ensure that each individual does not exceed 12 hours per 24-hour period.
- Maintaining vigilant watch for marine protected species and communicating any sightings to operators during all vessel transits, ensuring strike avoidance measures were met.
- Visually monitoring the pre-clearance and shutdown zones 360° around pile driving during active operations for the presence of marine protected species.
- Documenting all marine protected species sightings, observer effort, and environmental conditions on standard data forms and reporting all incidents to proper personnel.
- Recording operational activities during monitoring effort.
- Informing vessel and pile driving operators if a protected species is heading towards the shutdown zone.
- Calling for a delay or shutdown if a marine protected species is observed entering or surfaces within the shutdown zone.
- Advising operators on mitigation requirements in the event of marine protected species detections.
- Ensuring all mitigations actions (pre-start pre-clearance, delay soft-start, soft-start and shutdown) are enacted.
- Summarizing daily monitoring effort and submitting data forms to the appropriate staff.

PSOs were equipped with a range of visual monitoring equipment, including the following:

- Hooway/Bushnell 7X50 Marine Reticle Binoculars;

- Canon Rebel T6 with 300mm Image Stabilized lens.

3.3. Protected Species Mitigation Measures

For pile driving operations the following protected species mitigation measures were enforced:

- **Monitoring and Pre-Start Pre-clearance Zones:** PSO will establish and monitor pre-clearance zones prior to the start of pile driving operations, as follows:
  - 430 m all marine mammals.

- **Pre-Start Activity Observation (Pre-Start Pre-clearance):** PSO will implement a 30-minute pre-clearance of the zone, monitoring around the area prior to the startup of pile driving for the day, after pauses of 30-minutes or more (without continuous PSO monitoring) and after periods of inclement weather or other factors that cause the relevant zone and adjacent waters to be non-observable. During this period, the zone will be monitored by a team of two (2) PSO equipped with the appropriate visual monitoring technology. Pile driving will not be initiated if any protected species are observed within the pre-clearance zone. If protected species are observed entering or within the established zone within the 30 minutes prior to soft-start of equipment, pile driving activities will be delayed and may not commence until either the animal(s) has voluntarily left and been visually confirmed beyond the zone or a pre-clearance period (15 minutes for all marine mammals) has elapsed without subsequent detection of the animal(s).

- **Ramp-up/Soft Start Procedure:** Once the PSO team has confirmed completion of the pre-clearance, operators may begin pile driving via the soft start procedure. Soft-Start consists of 3 strike sets at partial power with a 30 second wait period between each strike set completed before pile driving may commence at full power.
  - If for any reason pile driving is paused for 30 minutes or longer, soft start procedures will be completed again before full power piling commences

- **Shutdown zones:** PSO will establish and monitor shutdown zones prior to the start of pile driving operations, and throughout said operations as follows:
  - 15.24 meters (50 feet) manatees;
  - 50 meters bottlenose dolphins;
  - 231 meters (761 feet) sea turtles;
  - 430 meters all (other) marine mammals.

- **Shutdowns**: In the event that a protected species is sighted entering or observed within the applicable shutdown zone during active pile driving operations, an immediate shutdown of pile driving will be required. Pile driving activities will not resume until the animal(s) has been confirmed to have left the relevant shutdown zone or a pre-clearance period (15 minutes for all other species) has elapsed without subsequent detection of the animal(s). Shutdown of pile driving for species for which incidental take is not authorized is required regardless of circumstance.

- **Level B Harassment[1] Zone:** PSO will establish and monitor a Level B harassment zone for bottlenose dolphins prior to the start of pile driving operations, as follows:

[1] Level B harassment is defined by NOAA Fisheries as an act that has the "potential to disturb (but not injure) a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, feeding or sheltering.

- 430 meters bottlenose dolphins

- **Level B Harassment Tracking**: While shutdown is not always required, tracking of bottlenose dolphin exposure to elevated sound sources is, thus protected species observations within the Level B harassment zone while pile driving equipment is active will be noted and reported to the regulators.

- **Vessel Strike Avoidance Separation Distances:** PSO will ensure separations distances are maintained during all vessel movements, as follows:
  - 15.24 meters (50 feet) for manatees;
  - 45.72 meters (50 yards) for sea turtles and small cetaceans;
  - 91.44 meters (100 yards) for whales;
  - 457.2 meters (500 yards) for North Atlantic Right Whales.

- **Vessel Strike Avoidance:** Vigilant watch will be maintained during vessel transits to ensure operators may reach the destination safely and without causing harm to any protected species. Vessels will maintain a 10-knot speed restriction in areas designated by NMFS for the protection of NARW from vessel strike and when mother/calf pairs, groups, or large assemblages of cetaceans are observed in close proximity. PSOs are trained to distinguish and identify marine mammals, especially in the detection of NARW. If any protected species are observed within the forward path of the vessel best efforts will be made to adjust course to reestablish the required separation distance or the vessel will shift into neutral and wait for the animal(s) or drift or the vessel to reestablish the relevant separation distance.
  - Vessels will operate at "idle/no wake" speeds within or near the project area and in areas where the bottom of the vessel is within 4 feet of the sea floor.
  - Vessels will follow routes of deep water whenever possible.

- **Injury or Dead Marine Mammal Reporting:** PSO will immediately report instances of observed injury to or death of protected species the Office of Protected Resources (OPR), NMFS (*ITP.Laws@noaa.gov* and *PR.ITP.MonitoringReports@noaa.gov*) and to the Southeast Region marine mammal stranding network (1-877-433-8299) as soon as is feasible. If death or injury was clearly caused by project activities all activities will be halted until further review by NMFS OPR.

4. OPERATIONAL & PSO EFFORT SUMMARY

The project team conducted pile driving operations in support of the new pipeline facility platform in Barataria Bay during April, May and June 2024. A brief overview of operational activities including vessel activities, operations utilizing regulated pile driving equipment and PSO effort is included in the below sub-section. A detailed timeline of all PSO effort and sound producing pile driving activities can be found in the Microsoft Excel file accompanying this report.

4.1. Operational Activity Summary

Multiple skiff style vessels transported the PSO team and various construction team members to and from the project operational barges on a day-to-day basis. The PSO team was carried aboard the M7001, M7002 and the Big Thunder. These vessels operated out of an existing contractor/storage yard located at a port in Grand Isle, Louisiana. No other ports were utilized for the duration of this effort. A team of two (2) PSOs was stationed aboard the transiting vessels to conduct vessel strike avoidance monitoring and mitigation during all vessel

transits. Subsequently, the PSO team was stationed on two different construction barges to perform protected species monitoring and mitigation for all pile driving operations.

Two monitoring locations were utilized to ensure that the entire pre-start activity and all shutdown zones were visible prior to and throughout sound producing operations. The Lead PSO was stationed on the construction barge immediately adjacent to pile driving and focused their monitoring efforts primarily on the shutdown zones. The supporting PSO was stationed further away on an additional barge and focused their monitoring efforts on the larger area to ensure pile driving teams were notified with the appropriate time to shutdown as required by the regulations. At the various points the PSOs were stationed for monitoring they were between 0.5m and 1.5m above water surface. The pile driving team conducted daylight only pile driving operations in Barataria Bay, LA on 21 days: April 8, 9, 12, 15, 20, 24, 26 and 30, May1-3, 6, 7, 9-11, 15-17 and pile removal operations on June 14.

Table 2 Hammers Utilized during Pile Driving for the Tie in Facility Construction

Make	Model	Type of Hammer	Source Level	Units
HPSI	Model 300	Vibratory Hammer	1600	VPM (Vibrations per minute)
BSP/TEX	CXL	Impact Hammer	115-140	kN/m (kilonewton per meter)

Figure 1 breaks down the amount of time spent per operational activity. As illustrated below and in the **Table 2** above, there were two hammers utilized for regulated pile driving operations HPSI Model 30, Vibratory Hammer and the BSP/TEX CXL Impact Hammer. Required Soft-Starts (*3 strike sets with a 30 second wait period between each strike set*) of the impact hammer were conducted daily prior to usage and at any time that pile driving was paused for any reason for more than 30 minutes. Soft-starts occurred for a total of 1 hour and 8 minutes. The total duration of pile driving activity for this campaign was 21 hours and 39 minutes. There were 10 PSO-initiated protected species detection delays to soft-start initiation implemented and a single shut down of impact pile driving called for by the PSO team and enacted by the operator immediately. This is expanded upon in Section 5 below. No other pile driving activities requiring PSOs occurred during this time period.

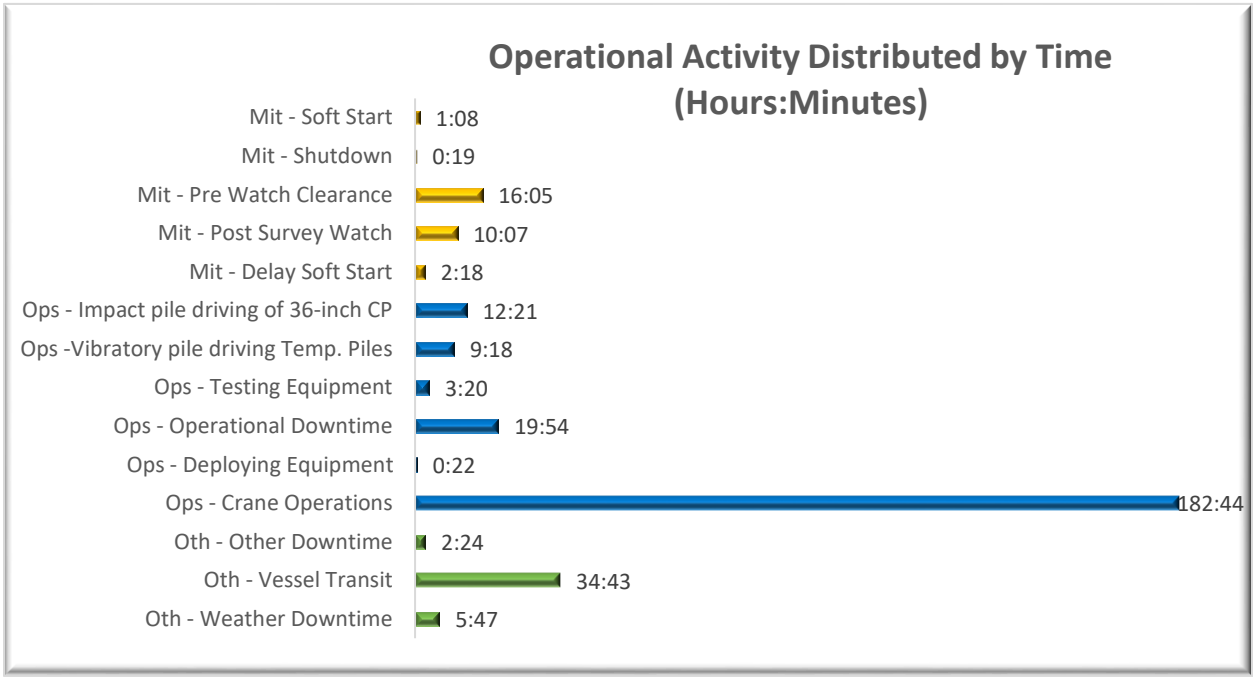


Figure 1 Operational Activity Distribution by Time (hh:mm)

4.2. Pile Driving Summary

Pile driving operations took place over the course of twenty-one (21) calendar days. **Appendix B** provides the exact start and stop time of all pile driving activity that occurred. **Figure 1** above illustrates that there were 12 hours and 21 minutes of impact pile driving and 9 hours and 18 minutes of vibratory pile driving. In order to complete piling operations, Columbia Gulf utilized Sealevel Construction Inc. for their experience and expertise in this field.

Impact pile driving methods were utilized to drive all of the permanent piles that would support the new structure while vibratory methods were used to drive all temporary piles for mooring vessels and barges and to place the templates. In total 34 36-inch concrete piles were driven and 38 24-inch temporary mooring piles made of steel were driven and subsequently removed either by vibratory methods which were monitoring by PSO or by direct pulling of the piles without in-water sound producing methods. The number of strikes required to install each concrete pile can be found in **Appendix C**.

4.3. Protected Species Observer Effort Summary

Figure 2 breaks down the amount of time PSOs spent monitoring per month while **Figure 3** provides a summary of PSO effort by observation method utilized. Pre watch clearance (Pre-start activity observation) occurred 28 times for a total of 16 hours and 5 minutes. As indicated above, there was one shutdown of pile driving due to protected species encroaching within the Level A Harassment Zone/Shutdown Zone which is expanded upon in Section 5 below.

[2] These are not cumulative times. A 2 PSO team was monitoring for the majority of this survey (Note: June 14 2024 was monitoring by a single PSO due to the limited scope of work completed on that day, this is further described below) and those watches overlapped entirely.

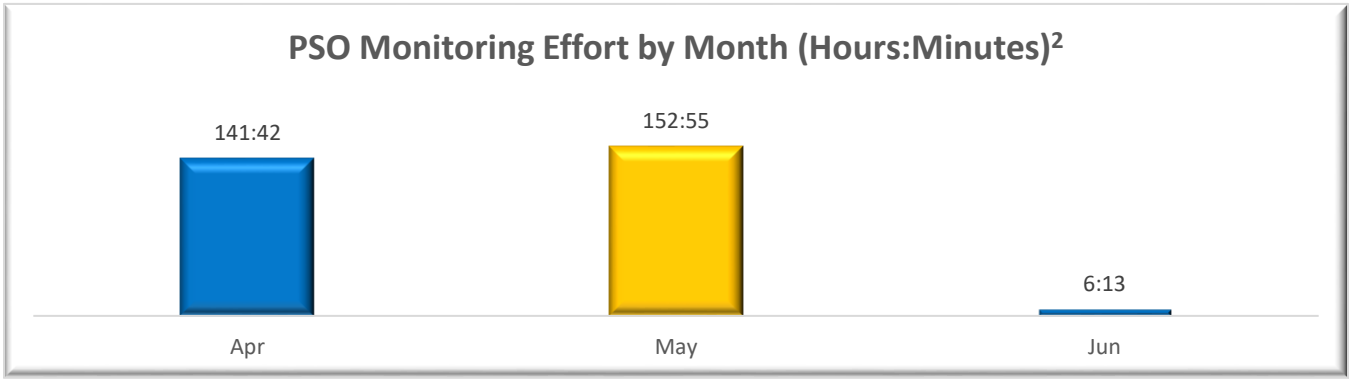


Figure 2 Monitoring Activity Distribution by Time (hh:mm)

During the campaign PSOs visually monitored the area around operations for a grand total of 300 hours and 50 minutes. There were no instances of alternative monitoring technology usage.

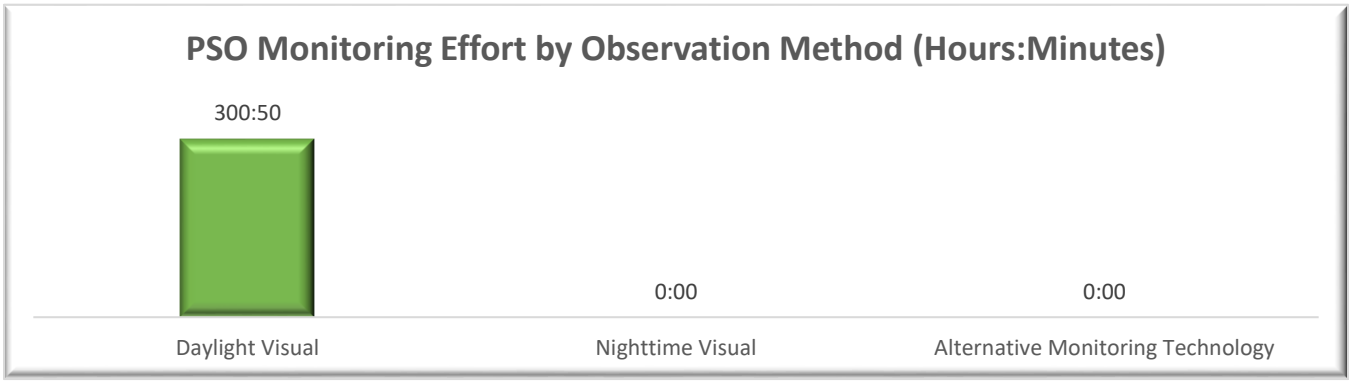


Figure 3 PSO Monitoring Effort (hh:mm)

After pile driving operations were completed on May 20, 2024, the PSOs were released from duty and demobilized. There was a one-day remobilization of a single PSO to monitor temporary pile removal by vibratory methods on June 14, 2024. Refer to the timeline of survey activities presented in the EXCEL file accompanying this report for further detail regarding PSO watches and operational activities conducted during this campaign.

5. PROTECTED SPECIES DETECTIONS AND MITIGATION

Illustrated in **Table 3**, PSOs documented a combined total of 62 marine mammal sightings during this deployment, consisting of an estimated 169 individual animals that were visually observed. There were no detections using alternative monitoring technology.

Table 3 Number of Detections and Individual Animals Detected

Species Group/Species	Total Number of Detections	Total Number of Individual Animals Detected
Dolphins	***62***	***169***
Bottlenose Dolphin	62	169
Grand Total	**62**	**169**

The only observed species detected by PSOs were bottlenose dolphins, *Tursiops truncatus*, with a total 62 detections of 169 individual animals. There were no large whale, manatee, sea turtle, other dolphin species or porpoise detections during this deployment. Most observed dolphins during this project were adults, 141 of the total 169 individuals. There were nine (9) individual animals observed to be smaller in stature and classified by the PSOs as juveniles. Finally, there were 19 dolphins observed that were even smaller than the juveniles and remained very close in distance from their presumed mothers that were deemed to be calves (**Figure 4**).

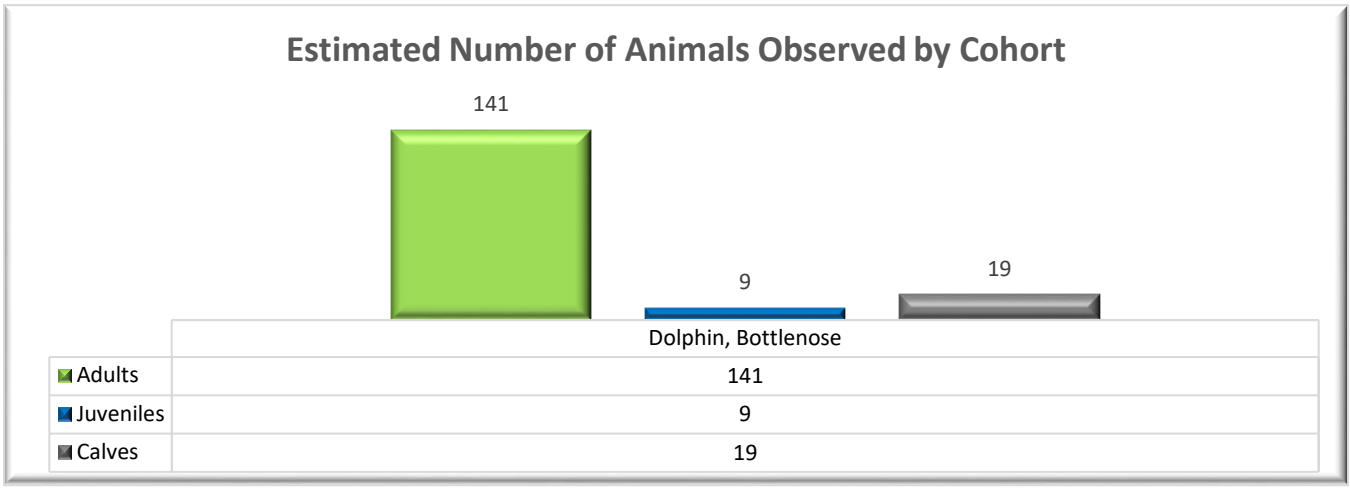


Figure 4 Estimated Number of Animals by Cohort

The majority of sightings were documented by PSOs onboard the construction barges during crane operations and only 15% of detections coinciding with periods of active pile driving by both impact and vibratory methods (**Figure 5**).

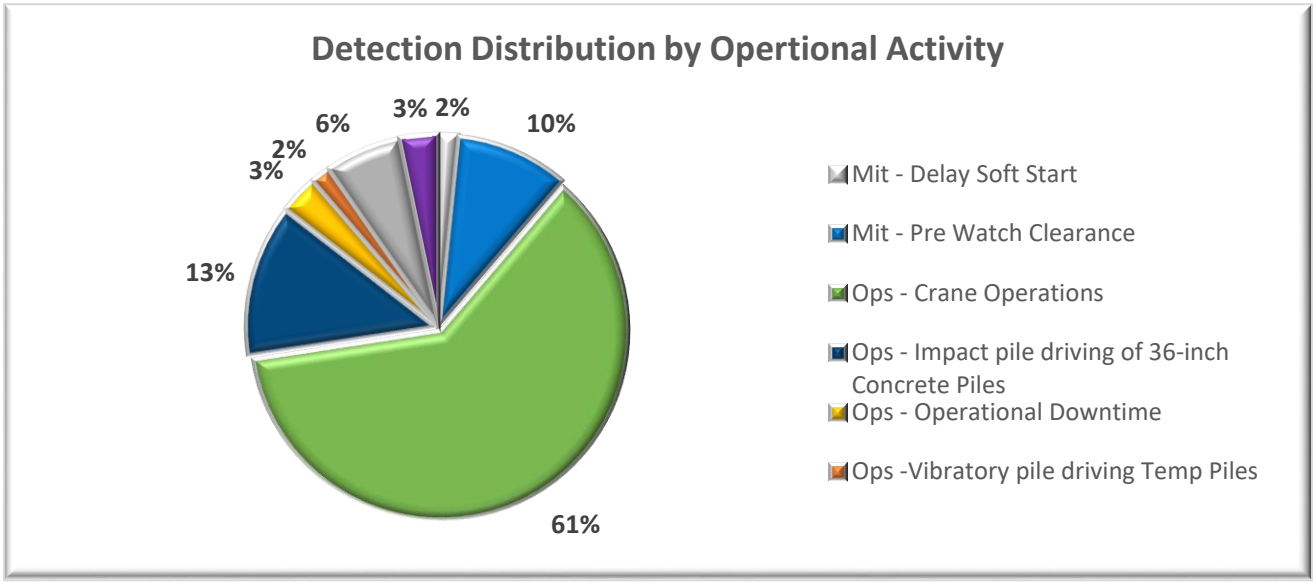
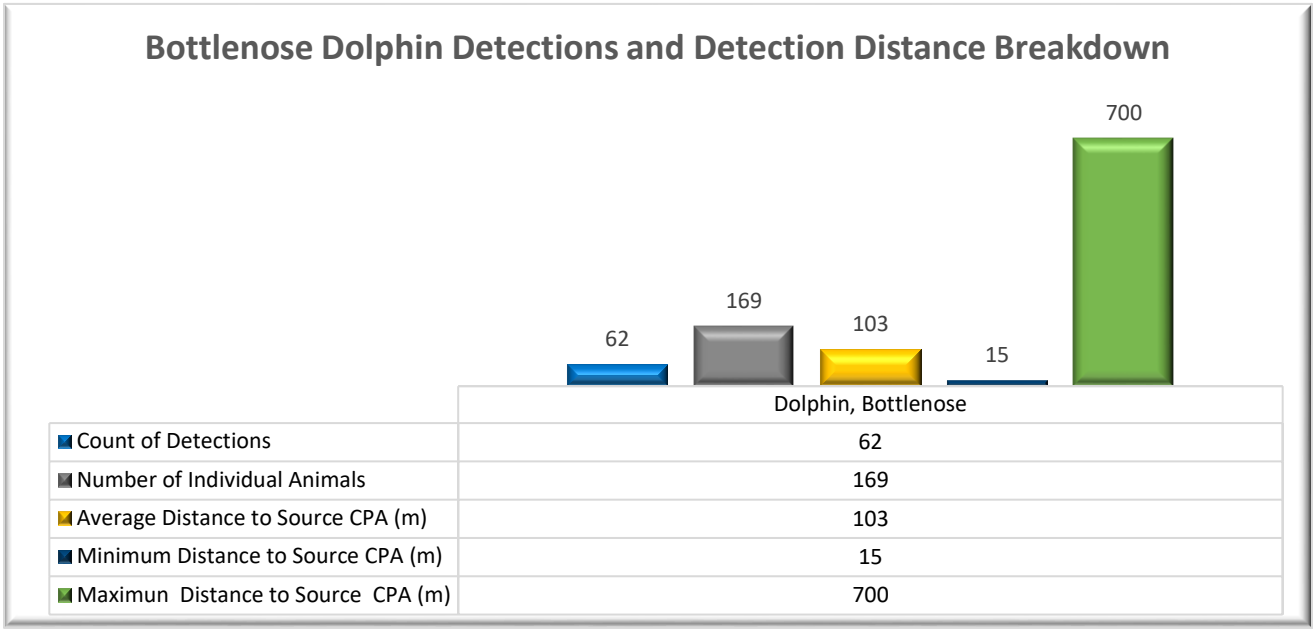


Figure 5 Detection Distribution by Vessel Activity

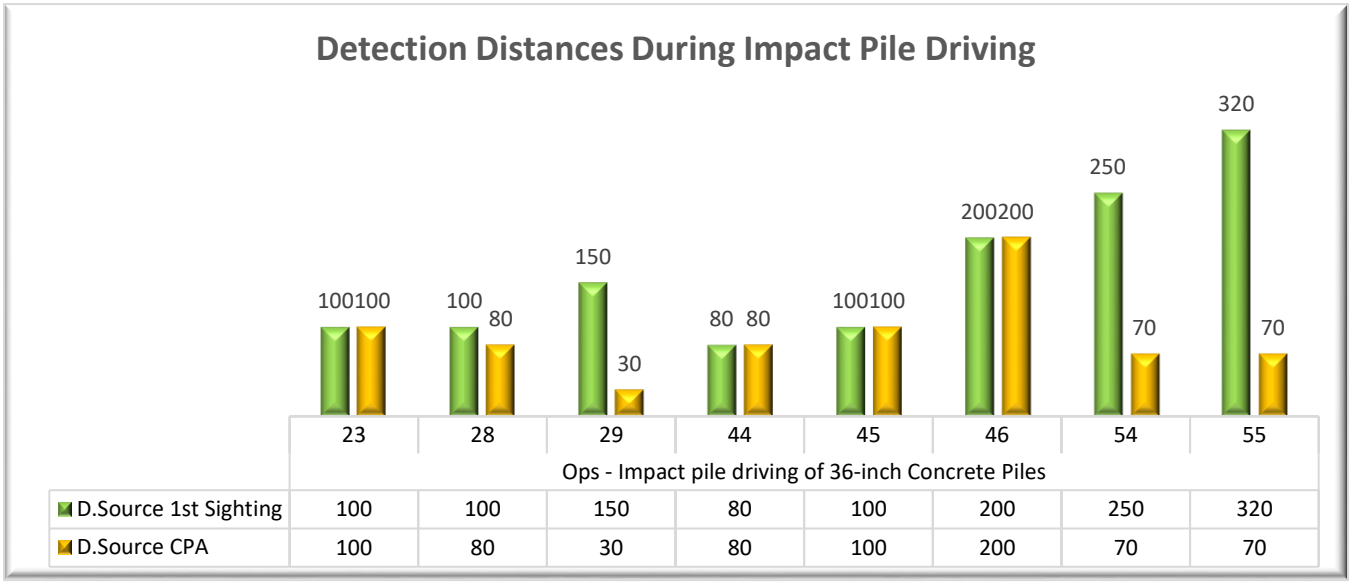
Nine (9) protected species detections were concurrent with active periods of pile driving activity. These all consisted of bottlenose dolphins, the majority of these which remained well outside the 50-meter marine mammal shutdown zone. Closest Points of Approach (CPA) ranged from 15 – 700 meters (**Figure 6**).



	Dolphin, Bottlenose
Count of Detections	62
Number of Individual Animals	169
Average Distance to Source CPA (m)	103
Minimum Distance to Source CPA (m)	15
Maximun Distance to Source CPA (m)	700

Figure 6 Bottlenose Dolphin Detection Breakdown

There was one (1) bottlenose dolphin detection that triggered shutdown mitigation measures to be enacted (Detection ID 29). **Figures 7** and **8** below illustrate the nine (9) detections of bottlenose dolphins encroached within the 430-meter Level B Harassment Zone and could potentially be deemed as takes (Detection IDs 23, 28, 29, 33, 44, 45, 46, 54 and 55). No vessel strike mitigation was required or enacted for the duration of this campaign. In total, due to the shutdown and five (5) post detection pile driving start up delays, there were 27 minutes of downtime due to protected species.



	23	28	29	44	45	46	54	55
	Ops - Impact pile driving of 36-inch Concrete Piles							
D.Source 1st Sighting	100	100	150	80	100	200	250	320
D.Source CPA	100	80	30	80	100	200	70	70

Figure 7 Detection Distance Breakdown During Impact Pile Driving
(the numbers immediately below the bars are the detections numbers)

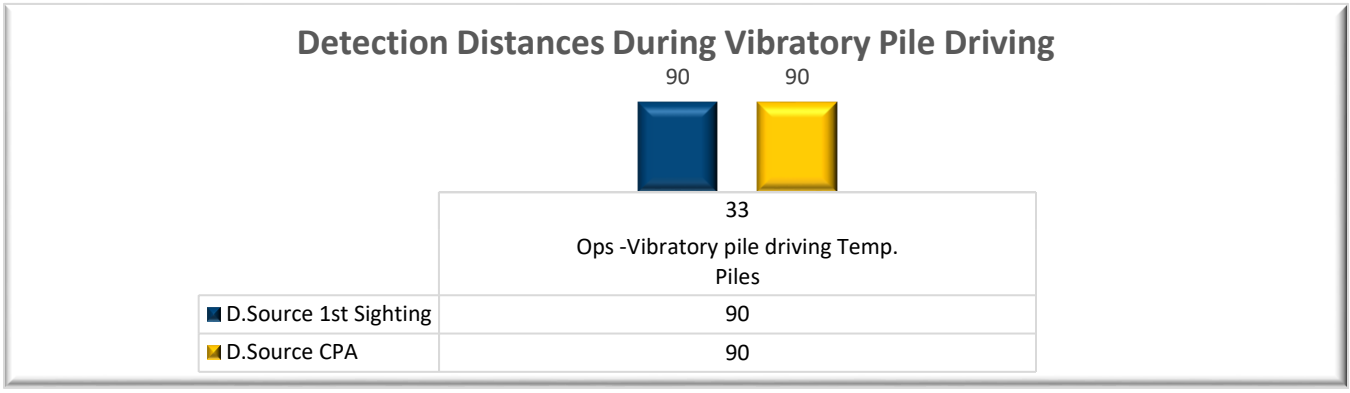


Figure 8 Detection Distance Breakdown During Vibratory Pile Driving
(the number immediately below the bar is the detection number)

April 30th brought with it the only **shutdown** for the project. At 09:59 a solitary (1) bottlenose dolphin (Detection ID 29) was initially observed at a visually estimated 150 meters from the impact hammering area. All vessels were stationary at the time and the animal actively traveled at a moderate pace in the direction of the impact hammering area/bow of barge. As the PSOs maintained watch the dolphin entered the shutdown zone of 50 meters at 10:00 and a shutdown was called for by the PSO team and enacted immediately by the pile driving crew. The animal was within the 50-meter shutdown zone of the active sound source for less than 5 seconds before pile driving was shutdown. After pile driving was shutdown the dolphin continued moving toward the inactive pile driving equipment. The closest point of approach of the animal was 30 meters. After a jaunt around the pile driving area, the dolphin was last seen at 10:04 approximately 100 meters from inactive operations and was observed swimming away. The dolphin was not seen again after 10:04 and displayed no changes in behaviour during the sighting. The dolphin was detected within the Level B Harassment Zone during full power pile driving with the impact hammer for a duration of 1 minute before it entered the shutdown zone and triggered a shutdown. This individual is considered a potential Level B take after spending 5 minutes in the Level B Zone, 1 minute during active sound production and 4 minutes during inactive operations. After 15 minutes passed from the last observation, the pile driving team was given clearance to begin a soft start which occurred at 10:19. No other shutdowns were required or enacted during this campaign.

Table 4 Number of Allotted Marine Mammal Takes vs Animals Observed within the Level B Harassment Zone

Taxonomic group	Common name	ESA-listed?	IHA Allotted Level B Harassment Takes	Number of Marine Mammals Observed within Level B Harassment Zone	Number of Marine Mammals Observed within Level B Harassment Zone while Pile Driving was Active
Cetacean (Odontocete)	Common bottlenose dolphin	No	42	159	19*

While there were 169 animals observed within the Level B Harassment Zone during this campaign only nine (9) bottlenose dolphin detections of an estimated nineteen (19) individual animals potentially meet the criteria to be considered **takes** (**Table 4**). Animals meet this criterion if they were observed within the Level B Harassment Zone of 430-meters during *active* pile driving. Only one of the below described detections triggered a shutdown. While the rest of the detections were actively observed within the Level B Harassment Zone they never encroached within the 50-meter Shutdown Zone.

On April 26th the offshore PSO team observed one (1) bottlenose dolphin (Detection ID 23) at 100 m with a CPA of the same at 10:49. This animal was observed for a total of 2 minutes traveling away from the actively piling construction barge. This entire detection occurred within the 430-meter Level B Harassment Zone for bottlenose dolphins during impact pile driving.

April 30th brought with it two (2) observations within the 430-meter Level B Harassment Zone for bottlenose dolphins during active impact piling, detection 28 and detection 29. The first occurred at 09:57 when three (3) bottlenose dolphin (Detection ID 28) were observed at 100 m with a CPA of 80 meters. This detection lasted for a total of 15 minutes and the dolphins were observed traveling around the actively piling construction barge displaying feeding behaviors from the actively piling construction barge. This entire detection occurred within the 430-meter Level B Harassment Zone for bottlenose dolphins during impact pile driving. However, because the next detection (Detection ID 29) triggered a shutdown the total amount of time the animals from detection 28 were exposed to elevated sound levels from piling within the Level B Harassment Zone was 3 minutes. The second potential Level B take detection of April 30th was previously described above in the shutdown section.

At 11:49 on May 2nd two (2) bottlenose dolphins were observed 90 meters from active vibratory pile driving, this was also the CPA (Detection ID 33). These animals were observed traveling at a vigorous pace away from the hammering area and were last sighted at 11:55, approximately 350-meters away. This entire detection occurred for 6 minutes within the 430-meter Level B Harassment Zone for bottlenose dolphins during vibratory pile driving of temporary steel piles.

May 9th was the busiest day on the project with 3 detections that potentially meet the criteria for Level B Takes. The first (Detection ID 44) was very brief, beginning and ending at 11:49. A solitary (1) bottlenose dolphin was observed 80 meters from active impact pile driving operations. This animal was traveling at a moderate pace towards the pile driving area. After the initial observation this dolphin was not detected again. There were no behavioral changes noted, and this detection did not cause a shutdown. The subsequent detection (Detection ID 45) was equally brief beginning and ending at 15:00. This was another solitary (1) bottlenose dolphin this time observed 100 meters from active impact pile driving operations however this animal was traveling away from active piling operations. The final detection (Detection ID 46) at 15:02 was another solitary (1) bottlenose dolphin observed 200 meters from active impact pile driving operations also traveling away from sound production. After a brief pause in piling operations a delay to the next pile driving soft start was requested and enacted due to detections 44, 45 and 46[3].

The final potential takes for the project both occurred on May 15th. At 14:19 five (5) bottlenose dolphins were observed approximately 250 meters from active impact pile driving (Detection ID 54). The dolphins were moving at a moderate pace and traveling parallel to the barge towards pile driving operations. The pod was displaying feeding behaviors by changing directions quickly and swimming in circle patterns. The closest approach to the pile driving occurred at 14:29 at 70 meters away, but no behavioral changes were observed. The group was last seen at 14:30 300 meters from operations, continuing to travel away from the area. The total amount of time the animals from detection 54 were exposed to elevated sound levels from piling within the Level B Harassment Zone was 11 minutes. At 14:19 the same day, four (4) bottlenose dolphins were observed approximately 320 meters from pile driving during full volume impact hammering (Detection ID 55). The pod was moving at a fast pace heading towards the operational area. Three (3) dolphins from this pod continued to swim across the stern of the barge at a distance of 200 meters and continued toward the other pod in the area (Detection ID 54), while one dolphin split from the group and continued to swim alone towards the barge. At 14:22, the solitary dolphin's closest approach occurred at 70 meters and the three (3) other dolphins joined the pod of Detection ID 54. The solitary dolphin was not seen again. The total amount of time the animals from detection 55 were exposed to elevated sound levels from piling within the Level B Harassment Zone was 3 minutes. After a brief pause on piling, reinitiation was delayed for 15 minutes due to these

[3] Although it is possible that detections 44, 45 and 46 could be the same individual the PSO team could not be certain of this and thus included these as 3 separate observations.

detections. Hammering was reinitiated via soft start at 14:46. Finally the animals from detections 54 and 55 were observed within the Level B Harassment Zone and are accounted for as potential takes.

No **Vessel Strike Avoidance** mitigation actions were required or enacted during this campaign.

Table 5 Mitigation Summary

Detection ID	Vessel Activity	Species	BEST # of Individual Animals	Initial Detection Distance (m)	CPA (m)	Mitigation Action/Status	Duration of Downtime (hh:mm)	*Potential* Take	Vessel Strike Avoidance Action
23	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	1	100	100	No Action required	0:00	Yes	Not Required
28	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	3	100	80	No Action required	0:00	Yes	Not Required
29	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	1	150	30	Shutdown	0:19	Yes	Not Required
33	Vibratory pile driving Temporary Piles	Bottlenose Dolphin	2	90	90	No Action required	0:00	Yes	Not Required
44	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	1	80	80	Delay Soft Start	0:10	Yes	Not Required
45	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	1	100	100	Delay Soft Start	0:11	Yes	Not Required
46	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	1	200	200	Delay Soft Start	0:13	No	Not Required
54	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	5	250	70	Delay Soft Start	0:14[4]	Yes	Not Required
55	Impact pile driving 36-inch Concrete Piles	Bottlenose Dolphin	4	320	100	Delay Soft Start	0:06[4]	Yes	Not Required

No injured or dead protected species were observed for the duration of this effort. Please refer to the attached PSO data collected during this deployment. This data provides additional project, operational, and detection information beyond what is summarized in the body of the report.

6. SUMMARY OF WEATHER & ENVIRONMENTAL CONDITIONS

Part of the data collection associated with PSO operations includes various weather and environmental conditions including cloud cover, wind speed, wind direction, precipitation, sun glare and visibility during observations. These factors can affect the PSOs ability to observe the required zones effectively, ultimately delaying operations. **Figures 8-12** illustrate the distribution of weather variables during PSO monitoring from all project related vessels.

[4] These times overlapped because the detections were concurrent.

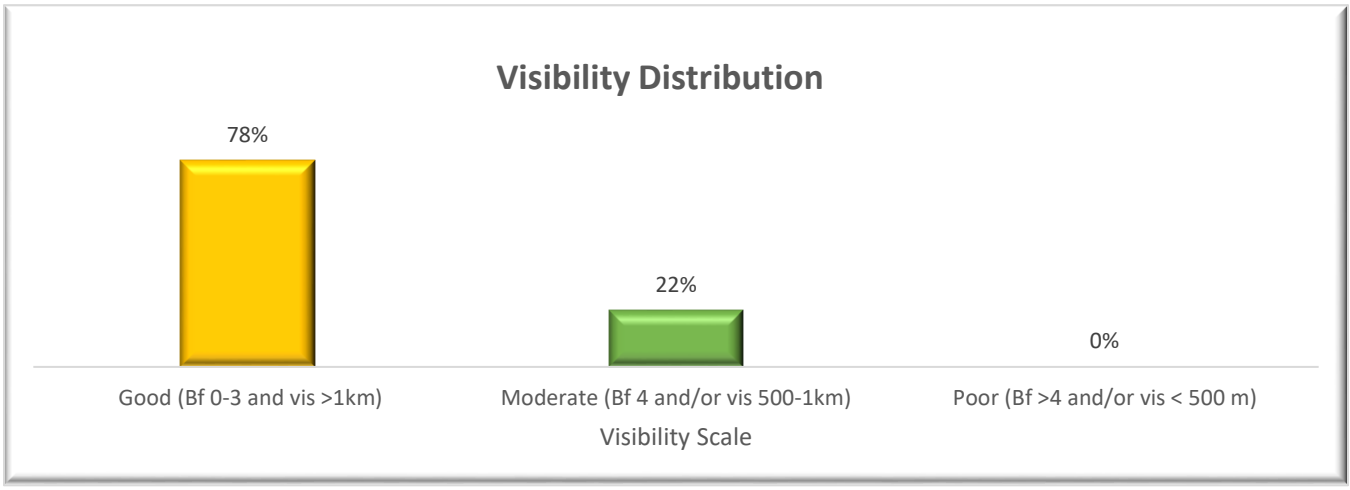


Figure 9 Visibility Distribution (Good = >1,000m, Moderate= 1,000 – 500m, Poor= <500m)
(Bf = Beaufort, vis=visibility)

Throughout this campaign PSOs were able to view the entire shutdown and monitoring zones under generally good conditions with a few instances of moderate visibility conditions as illustrated above in **Figure 9**. Moderate visibility was attributed to elevated sea states and wind across the bay that occasionally hindered visibility. For the majority of operations there was no precipitation and skies were clear (98%), apart from a very brief period of light rain (2%) there was no precipitation as represented by **Figure 10** below.

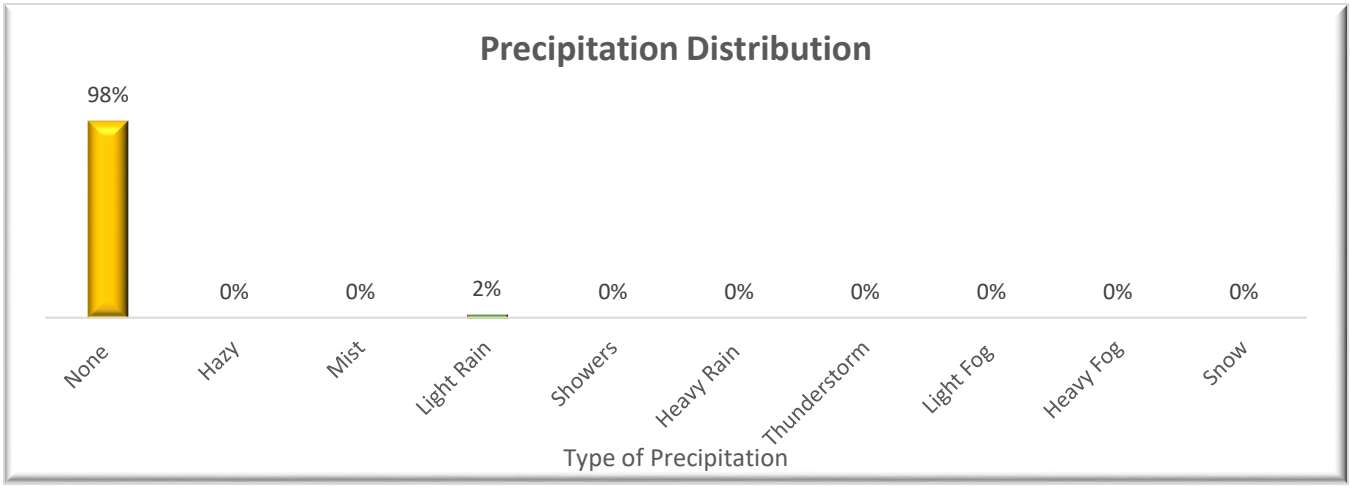


Figure 10 Precipitation Distribution

Figure 11 illustrates glare severity encountered throughout PSO monitoring. Glare was relatively evenly distributed throughout this monitoring effort. No glare and slight glare were experienced for 18% and 20% of monitoring respectively. Moderate glare was present for 35% of the survey and extreme glare was present for 27% resulting in varied conditions for protected species monitoring.

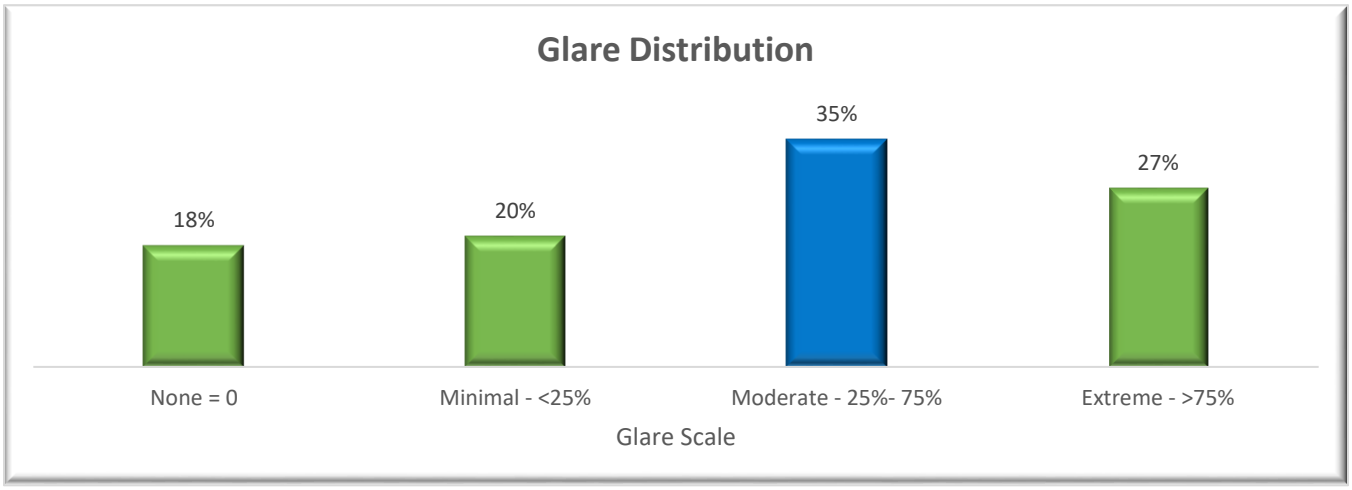


Figure 11 Glare Severity Distribution

None= no glare, Slight = faint, but easily monitored, Moderate = substantial, somewhat difficult to monitor Extreme = any amount of glare too difficult to monitor

Beaufort sea state recorded during visual monitoring ranged from level one to level five over the course of the monitoring period (**Figure 12**). Only 22% of visual observations were undertaken during elevated weather conditions, instances when the Beaufort state was level four or above.

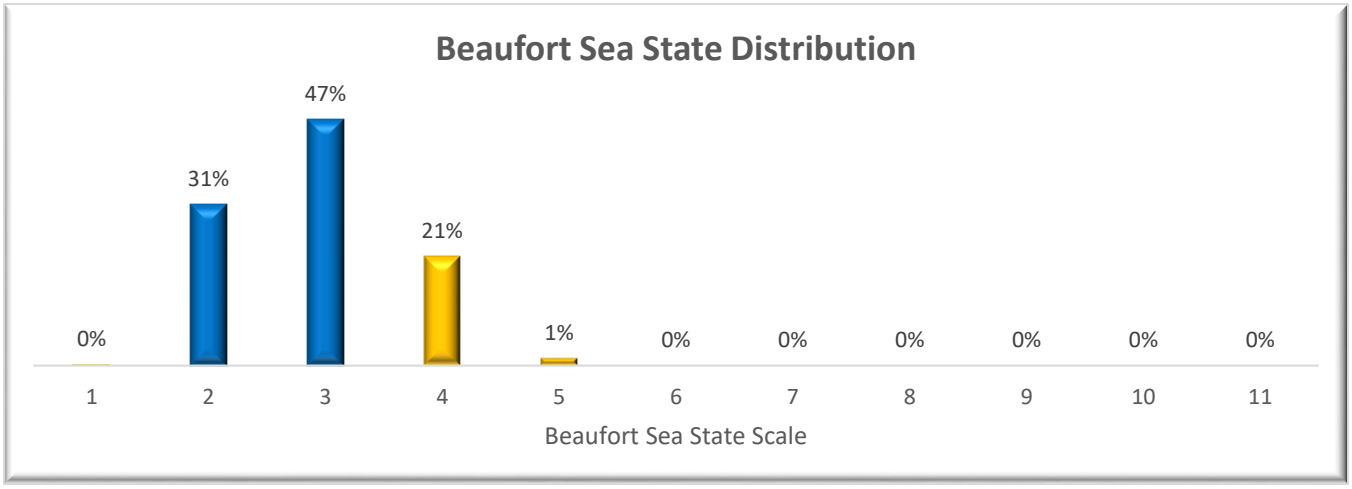


Figure 12 Beaufort Sea State Distribution

As illustrated in **Figure 13**, cloud cover varied from clear to partly cloudy over the course of this deployment. This resulted in some instances of elevated glare conditions that created moderately less than ideal monitoring conditions for approximately half of the monitoring effort.

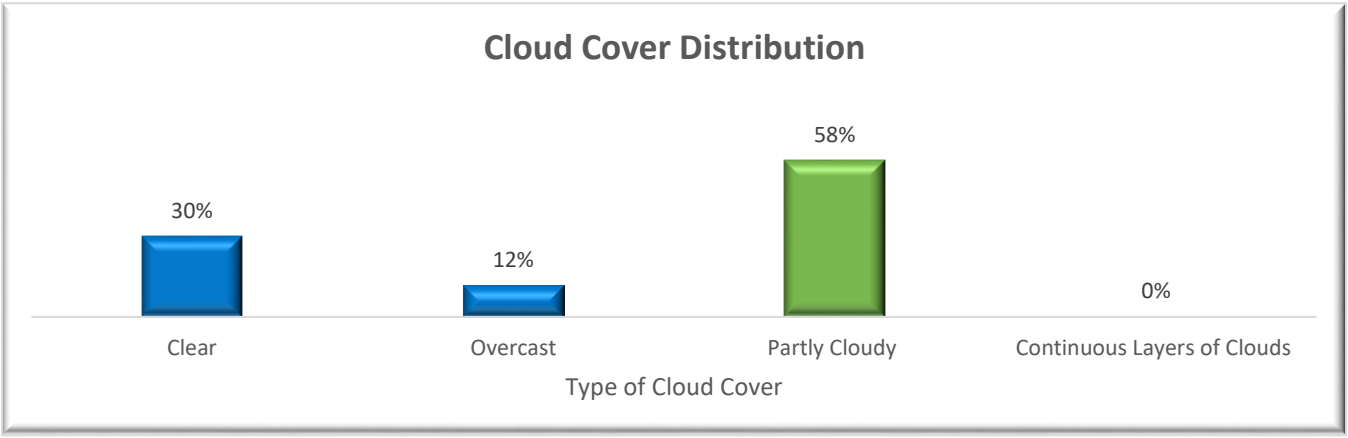


Figure 13 Cloud Cover Distribution

The overall good visibility and lack of precipitation combined with lower sea state in the Barataria Bay environment amounted to generally favorable conditions for PSO monitoring. As a result, the PSO Team is confident that they were able to monitor the shutdown zone effectively for protected species throughout the duration of the campaign.

7. ASSESSMENT OF MONITORING METHODS

The daylight only operations were monitored by two (2) PSOs who could effectively observe the pre-clearance and shutdown zones from the fly bridge level of the survey vessel. As indicated above in Section 3, to remain consistent with the permit stipulations the PSOs began monitoring periods each morning when the vessel left the harbor to begin transiting to the day's survey area and continued rotational watches until arriving back at the harbor each evening. During this time visual monitoring was completed to comply with vessel strike avoidance measures, pre-start pre-clearances and survey watch requirements. There was never an instance in which one PSO monitored for longer than the allotted four (4) hours without at least a two (2) hour break in between.

PSOs conducted observations encompassing 360˚ around the vessel. Based on needs of the operations team to access equipment on board, the PSOs adjusted their monitoring locations on the vessel to visualize most effectively and safely the relative shutdown zone immediately surrounding the survey equipment. This allowed for the PSOs to appropriately visualize and clear the shutdown zone and allow for continuous operations meeting the standards outlined in the regulatory documents. The monitoring and mitigation measures required proved to be an effective means to monitor for marine protected species, many of which were encountered during operations.

8. ACKNOWLEDGEMENTS

We would like to extend our sincere gratitude to the operations crew and team members at Perennial, TC Energy and Sealevel Construction Inc. for their assistance and hospitality for the duration of these works as well as the AIS PSOs for their continuous effort and dedication to accurate and consistent data collection.

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US Dept. of Commerce, NOAA, NMFS. (2023, December 01). Incidential Harassment Authorization, Columbia Gulf Transmission LLC, East Lateral XPress project in Barataria Bay, Louisiana. US Federal Register.

Appendix A.

A.I.S. Inc., Final Activity Report Summary

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REPORT SUMMARY

Client	Perennial		Report	FINAL	
Project	M.001145		Date	April 9 2024	to June 14 2024
Vessel Name	M7001		Survey Type	Pile Driving	

Total Visual Monitoring Time	(hh:mm)	300:50	Total Number of Detections	(#)	62
Total Operational Time	(hh:mm)	208:05	Total Number of Individual(s) Detected	(#)	169
Total Mitigation Downtime	(hh:mm)	2:37	Total Number of Potential Non-Compliance	(#)	0

(Mitigation Downtime = Delay Soft Start + Shutdown + Power Down)

Survey Activity - Monitoring - Detections

	Occurrence (%)	Duration (hh:mm)	Detection (#)	Individual (#)		Occurrence (%)	Duration (hh:mm)	Detection (#)	Individual (#)
Mit - Change Course					Ops - Impact pile driving 18-inch CP				
Mit - Pre Watch Clearance	5.35%	16:05	6	19	Ops - Impact pile driving 36-inch CP	4.11%	12:21	8	17
Mit - Delay Soft Start	0.76%	2:18	1	2	Ops -Vibratory pile driving TP	3.09%	9:18	1	2
Mit - Soft Start	0.38%	1:08			Ops - Operational Downtime	6.61%	19:54	2	4
Mit - Shutdown	0.11%	0:19			Ops - Crane Operations	60.74%	182:44	38	111
Mit - Power Down					Ops - Jacking Up/Down				
Mit - Post Survey Watch	3.36%	10:07			Oth - Weather Downtime	1.92%	5:47	2	4
Ops - Deploying Equipment	0.12%	0:22			Oth - Other Downtime	0.80%	2:24		
Ops - Testing Equipment	1.11%	3:20			Oth - Vessel Transit	11.54%	34:43	4	10
Ops - Retrieving Equipment									

Species Detections [Number of Individual(s) Detected]

Name	Visual Day (#)	Visual Night (#)	Potential Take A (#)	Potential Take B (#)	Name	Visual Day (#)	Visual Night (#)	Potential Take A (#)	Potential Take B (#)
Detection, Unidentified					Seal, Gray				
Dolphin, Bottlenose	169			19	Seal, Harbor				
Dolphin, Clymene					Seal, Harp				
Dolphin, Common					Seal, Unidentified				
Dolphin, Risso					Whale, Beaked species				
Dolphin, Spotted					Whale, Cuvier's Beaked				
Dolphin, Striped					Whale, False Killer				
Dolphin, Unidentified					Whale, Fin				
Dolphin, White-beaked					Whale, Humpback				
Dolphin, White-sided					Whale, Killer				
Kogia Species					Whale, Long-finned Pilot				
Porpoise, Harbour					Whale, Minke				
Sea Turtle, Green					Whale, North Atlantic Right				
Sea Turtle, Kemp's Ridley					Whale, Pilot species				
Sea Turtle, Leatherback					Whale, Rice				
Sea Turtle, Loggerhead					Whale, Sei				
Sea Turtle, Unidentified					Whale, Sperm				
					Whale, Unidentified				

Note:
This report contains the final data collected during operations. These data have undergone additional rounds of quality assurance/quality control (QA/QC) and analysis, and should be considered final.

Please note that only regulatory agencies can make take determinations and the information included within indicating potential take is for IHA tracking purposes only and should not be considered an official accounting of takes.

Appendix B.

Pile Driving Activity Summary

Date	Activity	Time Activity Started	Time Activity Ended	Duration Activity
4/8/2024	Ops -Vibratory	13:38	13:45	0:07
4/8/2024	Ops -Vibratory	15:10	15:23	0:13
4/9/2024	Ops -Vibratory	10:23	10:30	0:07
4/9/2024	Ops -Vibratory	11:18	11:23	0:05
4/9/2024	Ops -Vibratory	13:07	13:12	0:05
4/9/2024	Ops -Vibratory	14:13	14:17	0:04
4/12/2024	Ops -Vibratory	13:12	13:25	0:13
4/12/2024	Ops -Vibratory	14:20	14:25	0:05
4/15/2024	Ops -Vibratory	9:45	9:50	0:05
4/15/2024	Ops -Vibratory	13:58	14:02	0:04
4/20/2024	Ops -Vibratory	11:29	12:13	0:44
4/24/2024	Ops -Vibratory	13:29	14:14	0:45
4/26/2024	Ops - Impact	10:38	11:01	0:23
4/26/2024	Ops - Impact	15:49	16:08	0:19
4/30/2024	Ops - Impact	8:55	9:31	0:36
4/30/2024	Ops - Impact	9:40	10:00	0:20
4/30/2024	Ops - Impact	10:23	10:25	0:02
4/30/2024	Ops - Impact	10:31	10:59	0:28
4/30/2024	Ops - Impact	11:50	11:54	0:04
4/30/2024	Ops - Impact	11:54	12:03	0:09
5/1/2024	Ops - Impact	12:07	12:24	0:17
5/1/2024	Ops - Impact	12:34	12:52	0:18
5/1/2024	Ops - Impact	13:44	13:58	0:14
5/1/2024	Ops - Impact	14:10	14:27	0:17
5/1/2024	Ops - Impact	15:16	15:40	0:24
5/2/2024	Ops -Vibratory	10:56	10:59	0:03
5/2/2024	Ops -Vibratory	11:10	11:14	0:04
5/2/2024	Ops -Vibratory	11:37	11:41	0:04
5/2/2024	Ops -Vibratory	11:46	12:09	0:23
5/2/2024	Ops -Vibratory	12:14	12:18	0:04
5/2/2024	Ops -Vibratory	12:20	12:24	0:04
5/3/2024	Ops -Vibratory	11:16	11:20	0:04
5/3/2024	Ops -Vibratory	11:24	11:30	0:06
5/3/2024	Ops -Vibratory	11:45	11:48	0:03
5/3/2024	Ops -Vibratory	11:58	12:07	0:09
5/3/2024	Ops -Vibratory	12:10	12:12	0:02
5/3/2024	Ops -Vibratory	12:17	12:22	0:05
5/3/2024	Ops -Vibratory	12:26	12:30	0:04
5/3/2024	Ops -Vibratory	12:36	12:42	0:06
5/6/2024	Ops - Impact	8:34	8:53	0:19
5/6/2024	Ops - Impact	9:02	9:23	0:21
5/6/2024	Ops - Impact	9:33	9:51	0:18
5/6/2024	Ops - Impact	9:59	10:17	0:18
5/6/2024	Ops - Impact	10:27	10:45	0:18
5/6/2024	Ops - Impact	12:02	12:12	0:10
5/6/2024	Ops - Impact	13:12	13:38	0:26
5/6/2024	Ops - Impact	13:48	14:12	0:24
5/7/2024	Ops -Vibratory	8:48	8:49	0:01
5/7/2024	Ops -Vibratory	9:04	9:09	0:05
5/7/2024	Ops -Vibratory	9:14	9:19	0:05
5/7/2024	Ops -Vibratory	9:30	9:34	0:04
5/7/2024	Ops -Vibratory	9:43	9:47	0:04
5/7/2024	Ops -Vibratory	9:55	9:59	0:04
5/7/2024	Ops -Vibratory	13:06	13:10	0:04
5/7/2024	Ops -Vibratory	13:17	13:30	0:13
5/7/2024	Ops -Vibratory	13:30	13:35	0:05
5/7/2024	Ops -Vibratory	13:39	13:44	0:05
5/9/2024	Ops - Impact	14:52	15:04	0:12
5/9/2024	Ops - Impact	15:20	15:33	0:13
5/9/2024	Ops - Impact	15:41	15:56	0:15
5/9/2024	Ops - Impact	16:09	16:26	0:17

Date	Activity	Time Activity Started	Time Activity Ended	Duration Activity
5/9/2024	Ops - Impact	16:34	16:51	0:17
5/10/2024	Ops - Impact	9:42	9:52	0:10
5/10/2024	Ops - Impact	10:01	10:05	0:04
5/10/2024	Ops - Impact	10:11	10:17	0:06
5/10/2024	Ops - Impact	10:28	10:31	0:03
5/10/2024	Ops -Vibratory	13:37	13:39	0:02
5/10/2024	Ops -Vibratory	13:45	13:50	0:05
5/10/2024	Ops -Vibratory	13:54	13:57	0:03
5/10/2024	Ops -Vibratory	14:00	14:06	0:06
5/10/2024	Ops -Vibratory	14:10	14:12	0:02
5/10/2024	Ops -Vibratory	14:14	14:16	0:02
5/10/2024	Ops -Vibratory	14:24	14:25	0:01
5/10/2024	Ops -Vibratory	14:29	14:33	0:04
5/11/2024	Ops -Vibratory	13:01	13:05	0:04
5/11/2024	Ops -Vibratory	13:09	13:15	0:06
5/11/2024	Ops -Vibratory	13:23	13:25	0:02
5/11/2024	Ops -Vibratory	13:30	13:35	0:05
5/11/2024	Ops -Vibratory	13:38	13:40	0:02
5/11/2024	Ops -Vibratory	13:43	13:48	0:05
5/11/2024	Ops -Vibratory	13:55	13:58	0:03
5/11/2024	Ops -Vibratory	14:06	14:10	0:04
5/11/2024	Ops -Vibratory	14:15	14:17	0:02
5/11/2024	Ops -Vibratory	14:20	14:24	0:04
5/15/2024	Ops - Impact	8:26	9:00	0:34
5/15/2024	Ops - Impact	9:06	9:29	0:23
5/15/2024	Ops - Impact	13:38	14:03	0:25
5/15/2024	Ops - Impact	14:10	14:31	0:21
5/15/2024	Ops - Impact	14:50	15:13	0:23
5/15/2024	Ops - Impact	15:51	16:13	0:22
5/15/2024	Ops - Impact	16:18	16:34	0:16
5/16/2024	Ops - Impact	7:56	8:15	0:19
5/16/2024	Ops - Impact	8:21	8:37	0:16
5/16/2024	Ops - Impact	8:47	9:06	0:19
5/17/2024	Ops -Vibratory	9:45	9:48	0:03
5/17/2024	Ops -Vibratory	10:01	10:06	0:05
5/17/2024	Ops -Vibratory	10:10	10:15	0:05
5/17/2024	Ops -Vibratory	10:30	10:36	0:06
5/17/2024	Ops -Vibratory	12:59	13:03	0:04
5/17/2024	Ops -Vibratory	13:08	13:14	0:06
5/20/2024	Ops - Impact	9:59	10:16	0:17
5/20/2024	Ops - Impact	10:50	10:58	0:08
5/20/2024	Ops - Impact	11:48	11:55	0:07
5/20/2024	Ops - Impact	11:58	12:05	0:07
5/20/2024	Ops - Impact	13:04	13:05	0:01
5/20/2024	Ops - Impact	13:09	13:10	0:01
5/20/2024	Ops -Vibratory	14:22	14:25	0:03
5/20/2024	Ops -Vibratory	14:29	14:32	0:03
5/20/2024	Ops -Vibratory	14:37	14:40	0:03
5/20/2024	Ops -Vibratory	14:45	14:46	0:01
5/20/2024	Ops -Vibratory	14:52	14:54	0:02
5/20/2024	Ops -Vibratory	14:58	15:00	0:02
5/20/2024	Ops -Vibratory	15:03	15:05	0:02
5/20/2024	Ops -Vibratory	15:08	15:09	0:01
5/20/2024	Ops -Vibratory	15:15	15:17	0:02
5/20/2024	Ops -Vibratory	15:19	15:20	0:01
5/20/2024	Ops -Vibratory	15:24	15:25	0:01
5/20/2024	Ops -Vibratory	15:27	15:31	0:04
5/20/2024	Ops -Vibratory	16:12	16:14	0:02
5/20/2024	Ops -Vibratory	16:17	16:18	0:01
5/20/2024	Ops -Vibratory	16:21	16:23	0:02
5/20/2024	Ops -Vibratory	16:25	16:27	0:02

Date	Activity	Time Activity Started	Time Activity Ended	Duration Activity
5/20/2024	Ops -Vibratory	16:29	16:33	0:04
5/20/2024	Ops -Vibratory	16:35	16:38	0:03
5/20/2024	Ops -Vibratory	16:41	16:45	0:04
5/20/2024	Ops -Vibratory	16:46	16:47	0:01
6/14/2024	Ops -Vibratory	7:30	8:00	0:30
6/14/2024	Ops -Vibratory	9:00	9:30	0:30
6/14/2024	Ops -Vibratory	9:55	10:00	0:05
6/14/2024	Ops -Vibratory	10:20	11:20	1:00
6/14/2024	Ops -Vibratory	11:50	12:00	0:10

Appendix C.

TC Energy Concrete Pile Driving Report

659

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	04/26/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Seelevel	Make of Hammer:	B&P CXL-140
QC Inspector:	Taylor Stiles / Jacob Stuffle	Hammer Drop (ft):	1.75' - 4'
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"
Drawing Pile No.:	6C	Supplier Pile No.:	CP-16
Length (ft):	168	Splice (ft):	N/A
Bent:	6	Cushion Thickness:	12"
Drive Time Start / End:	10:05 - 11:34		
Splice Inpsected and Installed per requirements? Y/N	N/A		

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	~ -6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136'
Final Elevation:	32'	B/C taken from bottom Platform of template @	0.65ft

SECTION D: PILE DESIGN AND DRIVING INFORMATION

6710 Blows

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1	WOP		25			49			73	WOH		97	8	
2			26			50			74			98	9	
3			27			51			75			99	8	
4			28			52			76			100	9	
5			29			53			77			101	9	
6			30			54			78			102	9	
7			31			55			79			103	7	
8			32			56			80			104	7	
9			33			57			81			105	9	
10			34			58			82	16	1	106	9	
11			35			59			83	16		107	9	
12			36			60			84	9		108	8	1.75
13			37			61			85	7		109	8	
14			38			62			86	8		110	8	
15			39			63			87	7		111	8	
16			40			64			88	5		112	8	
17			41			65			89	7		113	8	
18			42			66			90	6		114	8	
19			43			67			91	6		115	8	
20			44			68			92	6		116	9	
21			45			69			93	8		117	9	
22			46			70			94	8		118	9	
23			47			71			95	7		119	9	
24			48			72			96	8		120	9	

119 | 120

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	10		141	16		161			181			201		
122	10		142	13		162			182			202		
123	10		143	15		163			183			203		
124	10		144	23		164			184			204		
125	11		145	16+9		165			185			205		
126	12		146	[illegible]		166			186			206		
127	12		147	[illegible]		167			187			207		
128	12		148			168			188			208		
129	12		149			169			189			209		
130	13		150			170			190			210		
131	13		151			171			191			211		
132	14		152			172			192			212		
133	14		153			173			193			213		
134	14		154			174			194			214		
135	14		155			175			195			215		
136	15		156			176			196			216		
137	15		157			177			197			217		
138	15		158			178			198			218		
139	17		159			179			199			219		
140	16		160			180			200			220		

2.55 a/day

SECTION E: POST INSTALLATION 94

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.041

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 6:10 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / SUPT	Sealevel	[signature]	4/26/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Turner Trautman / Inspector	T C E	[signature]	4/28/24

C-7

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	04/26/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Taylor Stiles, Jacob Shuttlet	Hammer Drop (ft):	1.75' - 4'
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250 lbs
Drawing #(s):	SK5001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36
Bent:	7	Cushion Thickness:	12"
Drawing Pile No.:	C7	Supplier Pile No.:	CP-14
Drive Time Start / End:	3:28 - 4:08		
Length (ft):	168	Splice (ft):	N/A
Splice Inpsected and Installed per requirements? Y/N	N/A		

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32		

SECTION D: PILE DESIGN AND DRIVING INFORMATION 529 Blows

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1	WOP		25			49			73			97	5	
2			26			50			74			98	4	
3			27			51			75			99	5	
4			28			52			76	WOH		100	5	
5			29			53			77			101	5	
6			30			54			78			102	4	
7			31			55			79			103	5	
8			32			56			80			104	6	
9			33			57			81			105	6	
10			34			58			82			106	7	
11			35			59			83	6	1	107	8	
12			36			60			84	3		108	6	
13			37			61			85	7		109	7	
14			38			62			86	6		110	6	
15			39			63			87	4	-1.75	111	8	
16			40			64			88	5		112	8	
17			41			65			89	4		113	7	
18			42			66			90	3		114	7	
19			43			67			91	4		115	8	
20			44			68			92	4		116	9	
21			45			69			93	5		117	7	
22			46			70			94	7		118	8	
23			47			71			95	4		119	8	
24			48			72			96	4		120	9	

63

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	9		141	16		161			181			201		
122	9		142	14		162			182			202		
123	9		143	15		163			183			203		
124	10		144	13		164			184			204		
125	24		145	16+11		165			185			205		
126	12		146			166			186			206		
127	11		147			167			187			207		
128	10		148			168			188			208		
129	9		149			169			189			209		
130	9		150			170			190			210		
131	12		151			171			191			211		
132	11		152			172			192			212		
133	11		153			173			193			213		
134	11		154			174			194			214		
135	11		155			175			195			215		
136	13		156			176			196			216		
137	13		157			177			197			217		
138	13		158			178			198			218		
139	13		159			179			199			219		
140	13		160			180			200			220		

218

SECTION E: POST INSTALLATION

Vertical Alignment (%): <2% | Horizontal Deviation (in): 0.073

PDA Re-strike Performed?: No | PDA Date: — | PDA Strike: —

PDA Blows: 529 | PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		4/26/24
Ivan Tartman / Inspector	TCE		4/26/24

C08

TC Energy Engineering Form

Concrete Pile Driving Record TC Energy

Item ID: N/A Rev: 0 Status: IFU Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	4/30/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250
Drawing #(s):	SKS 001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C08	Supplier Pile No.: CP-15	Drive Time Start / End:	Start 9:32
Length (ft): 148	Splice (ft): NA	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD	G.S./Mudline Elevation:	N-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	30'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73		1	97	8	
2			26			50			74		1	98	9	
3			27			51			75		1	99	9	
4			28			52			76		1	100	7	
5			29			53			77		1	101	12	
6			30			54			78		1	102	10	
7			31			55			79		1	103	11	
8			32			56			80		1	104	13	
9			33			57			81		1	105	9	
10			34			58			82		1	106	14	
11			35			59			83		1	107	15	
12			36			60			84		1	108	14	
13			37			61			85		1	109	17	
14			38			62			86		1	110	14	
15			39			63			87		1	111	19	
16			40			64			88		1	112	20	
17			41			65			89	6		113	20	
18			42			66			90	5		114	24	
19			43			67			91	6		115	17	
20			44			68			92	8		116	23	
21			45			69	5		93	7		117	24	
22			46			70	1		94	7		118	29	
23			47			71	1		95	7		119	24	
24			48			72	1		96	9		120	24	
							8			55	29		880	

14 C8

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	30		141	18		161			181			201		
122	28		142	14		162			182			202		
123	30		143	16		163			183			203		
124	32		144	16		164			184			204		
125	30		145	14		165			185			205		
126	38		146			166			186			206		
127	40		147			167			187			207		
128	40		148			168			188			208		
129	42		149			169			189			209		
130	45		150			170			190			210		
131	56		151			171			191			211		
132	28		152			172			192			212		
133	12		153			173			193			213		
134	12		154			174			194			214		
135	12		155			175			195			215		
136	16		156			176			196			216		
137	12		157			177			197			217		
138	15		158			178			198			218		
139	13		159			179			199			219		
140	13		160			180			200			220		

544

SECTION E: POST INSTALLATION 78

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.255

PDA Re-strike Performed?: NO PDA Date: — PDA Strike: —

PDA Blows: 1102 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / super	Sealevel		4/30/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Ivan Trautman / Inspector	TCE		4/30/24

C09

TC Energy Engineering Form

Concrete Pile Driving Record TC Energy

Item ID: N/A Rev: 0 Status: IFU Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	4/30/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75' - 4
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C09	Supplier Pile No.: CP-20	Drive Time Start / End:	Stop 1020
Length (ft): 168'	Splice (ft):	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD	G.S./Mudline Elevation:	N-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	10		97	5	
2			26			50			74	9		98	6	
3			27			51			75	4		99	6	
4			28			52			76	4		100	5	
5			29			53			77	4		101	5	
6			30			54			78	4		102	6	
7			31			55			79	5		103	7	
8			32			56			80	4		104	6	
9			33			57			81	4		105	7	
10			34			58			82	4		106	8	
11			35			59			83	3		107	6	
12			36			60			84	4		108	8	
13			37			61			85	3		109	7	
14			38			62			86	3		110	7	
15			39			63			87	4		111	8	
16			40			64			88	4		112	5	
17			41			65			89	4		113	10	
18			42			66			90	4		114	10	
19			43			67			91	4		115	5	
20			44			68			92	5		116	8	
21			45			69			93	5		117	10	
22			46			70			94	4		118	11	
23			47			71			95	4		119	9	
24			48			72			96	5		120	10	

110 182

10

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	11		141	30		161			181			201		
122	10		142	25		162			182			202		
123	13		143	10		163			183			203		
124	15		144			164			184			204		
125	13		145			165			185			205		
126	13		146			166			186			206		
127	11		147			167			187			207		
128	13		148			168			188			208		
129	15		149			169			189			209		
130	16		150			170			190			210		
131	13		151			171			191			211		
132	14		152			172			192			212		
133	13		153			173			193			213		
134	20		154			174			194			214		
135	15		155			175			195			215		
136	14		156			176			196			216		
137	15		157			177			197			217		
138	16		158			178			198			218		
139	20		159			179			199			219		
140	39		160			180			200			220		

309

SECTION E: POST INSTALLATION 65

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.417

PDA Re-strike Performed?: Yes PDA Date: 1-May PDA Strike: 1-Day Restrike

.66 PDA Blows: 24 PDA Set (in): 0.2

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Scaloni		4/30/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Tyson Treatman / Inspector	TCE		4/30/24

4 C 10

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	4-30-24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Taylor Stiles/J.	Hammer Drop (ft):	1.75' - 4'
TC Energy Rep.:	Ivan Trahan	Hammer Weight:	24,250
Drawing #(s):	SKS 001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 30	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C10	Supplier Pile No.: CP-18	Drive Time Start / End:	
Length (ft): 168	Splice (ft):	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD	G.S./Mudline Elevation:	N-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	7		97	7	
2			26			50			74	5"		98	7	
3			27			51			75	5"		99	7	
4			28			52			76	4		100	7	
5			29			53			77	3		101	8	
6			30			54			78	4		102	7	
7			31			55			79	4		103	8"	
8			32			56			80	4		104	9	
9			33			57			81	4		105	10	
10			34			58			82	4		106	9	
11			35			59			83	5"		107	9	
12			36			60			84	5"		108	9	
13			37			61			85	5"		109	9	
14			38			62			86	5"		110	10	
15			39			63			87	5"		111	11	
16			40			64			88	5"		112	9	
17			41			65			89	6		113	10	
18			42			66			90	6		114	11	
19			43			67			91	5"		115	11	
20			44			68			92	6		116	11	
21			45			69			93	6		117	10	
22			46			70			94	5"		118	8	
23			47			71	5"		95	7		119	8"	
24			48			72	5"		96	7		120	10	

C10

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	10		141	15		161			181			201		
122	9		142	16		162			182			202		
123	10		143	16		163			183			203		
124	10		144	15		164			184			204		
125	11		145	10		165			185			205		
126	11		146			166			186			206		
127	12		147			167			187			207		
128	12		148			168			188			208		
129	12		149			169			189			209		
130	12		150			170			190			210		
131	12		151			171			191			211		
132	12		152			172			192			212		
133	14		153			173			193			213		
134	13		154			174			194			214		
135	13		155			175			195			215		
136	14		156			176			196			216		
137	14		157			177			197			217		
138	14		158			178			198			218		
139	15		159			179			199			219		
140	15		160			180			200			220		

SECTION E: POST INSTALLATION

Vertical Alignment (%): <2% | Horizontal Deviation (in): 0.308

PDA Re-strike Performed?: No | PDA Date: — | PDA Strike: —

PDA Blows: 6666 | PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Supv	Sealevel		4/30/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Juan Trevino / Engineer	TCE		4/30/24

C01

TC Energy Engineering Form

Concrete Pile Driving Record — TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/01/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250
Drawing #(s):	SK5001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C01	Supplier Pile No.: CP-18	Drive Time Start / End:	315PM 340PM
Length (ft): 168	Splice (ft):	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	N-6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73			97	7	
2			26			50			74			98	7	
3			27			51			75			99	7	
4			28			52			76			100	7	
5			29			53			77	2		101	8	
6			30			54			78	8		102	8	
7			31			55			79	8		103	8	
8			32			56			80	9		104	9	
9			33			57			81	6		105	9	
10			34			58			82	6		106	10	
11			35			59			83	4		107	10	
12			36			60			84	5-		108	10	
13			37			61			85	5-		109	8	
14			38			62			86	5-		110	9	
15			39			63			87	5-		111	10	
16			40			64			88	6		112	10	
17			41			65			89	6		113	10	
18			42			66			90	5-		114	11	
19			43			67			91	6		115	11	
20			44			68			92	4		116	14	
21			45			69			93	6		117	13	
22			46			70			94	6		118	12	
23			47			71			95	6		119	12	
24			48			72			96	7		120	13	

115

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	14		141	15		161			181			201		
122	15		142	18		162			182			202		
123	14		143	15		163			183			203		
124	16		144	17		164			184			204		
125	15		145	15		165			185			205		
126	15		146			166			186			206		
127	16		147			167			187			207		
128	17		148			168			188			208		
129	16		149			169			189			209		
130	17		150			170			190			210		
131	19		151			171			191			211		
132	17		152			172			192			212		
133	18		153			173			193			213		
134	18		154			174			194			214		
135	14		155			175			195			215		
136	15		156			176			196			216		
137	15		157			177			197			217		
138	15		158			178			198			218		
139	15		159			179			199			219		
140	15		160			180			200			220		

316

SECTION E: POST INSTALLATION 80

Vertical Alignment (%): < 2% Horizontal Deviation (in): 0.460

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 141 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/1/24
[illegible] / Insp	TCE		5/1/24

C02

TC Energy Engineering Form

Concrete Pile Driving Record — TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/01/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Baldanki	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250
Drawing #(s):	SKS 001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C02	Supplier Pile No.: CP-22	Drive Time Start / End:	208 PM 225 PM
Length (ft): 168	Splice (ft):	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	N-6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73			97	5-	
2			26			50			74			98	6	
3			27			51			75			99	6	
4			28			52			76			100	6	
5			29			53			77			101	7	
6			30			54			78			102	7	
7			31			55			79	6		103	7	
8			32			56			80	6		104	7	
9			33			57			81	6		105	7	
10			34			58			82	5-		106	8	
11			35			59			83	4		107	8	
12			36			60			84	5-		108	8	
13			37			61			85	5-		109	8	
14			38			62			86	5-		110	8	
15			39			63			87	5-		111	8	
16			40			64			88	5-		112	9	
17			41			65			89	5-		113	10	
18			42			66			90	6		114	8	
19			43			67			91	5-		115	10	
20			44			68			92	5-		116	10	
21			45			69			93	7		117	10	
22			46			70			94	6		118	10	
23			47			71			95	6		119	10	
24			48			72			96	6		120	10	

98 193

C2 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	13		141	17		161			181			201		
122	13		142	17		162			182			202		
123	12		143	18		163			183			203		
124	12		144	18		164			184			204		
125	11		145	12		165			185			205		
126	13		146			166			186			206		
127	14		147			167			187			207		
128	13		148			168			188			208		
129	14		149			169			189			209		
130	13		150			170			190			210		
131	14		151			171			191			211		
132	14		152			172			192			212		
133	15		153			173			193			213		
134	15		154			174			194			214		
135	15		155			175			195			215		
136	15		156			176			196			216		
137	16		157			177			197			217		
138	15		158			178			198			218		
139	15		159			179			199			219		
140	15		160			180			200			220		

276

SECTION E: POST INSTALLATION B2

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.030

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 649 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealand		5/1/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Kevin Bartmess / Exspector	TCE		5/1/24

C03

TC Energy Engineering Form

Concrete Pile Driving Record TC Energy

Item ID: N/A Rev: 0 Status: IFU Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/01/24
Project No.:	24016	Auger Diameter:	NA
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL -140
QC Inspector:	Addam Nick	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS 001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C-03	Supplier Pile No.: CP-12	Drive Time Start / End:	105 PM 2000 PM
Length (ft): 168	Splice (ft):	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD	G.S./Mudline Elevation:	N-4'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73			97	5	
2			26			50			74			98	5	
3			27			51			75			99	5	
4			28			52			76			100	5	
5			29			53			77			101	5	
6			30			54			78			102	6	
7			31			55			79	2		103	5	
8			32			56			80	1		104	5	
9			33			57			81	6		105	6	
10			34			58			82	10		106	6	
11			35			59			83	4		107	6	
12			36			60			84	5		108	6	
13			37			61			85	4		109	7	
14			38			62			86	4		110	7	
15			39			63			87	4		111	7	
16			40			64			88	4		112	6	
17			41			65			89	5		113	7	
18			42			66			90	4		114	7	
19			43			67			91	3		115	8	
20			44			68			92	5		116	7	
21			45			69			93	4		117	8	
22			46			70			94	4		118	8	
23			47			71			95	4		119	9	
24			48			72			96	5		120	9	

78 155

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	9		141	14		161			181			201		
122	9		142	16		162			182			202		
123	9		143	22		163			183			203		
124	8		144	26		164			184			204		
125	9		145	7		165			185			205		
126	10		146			166			186			206		
127	9		147			167			187			207		
128	10		148			168			188			208		
129	11		149			169			189			209		
130	11		150			170			190			210		
131	10		151			171			191			211		
132	10		152			172			192			212		
133	12		153			173			193			213		
134	11		154			174			194			214		
135	11		155			175			195			215		
136	13		156			176			196			216		
137	13		157			177			197			217		
138	13		158			178			198			218		
139	12		159			179			199			219		
140	14		160			180			200			220		

214 — 86

SECTION E: POST INSTALLATION

Vertical Alignment (%): <2% | Horizontal Deviation (in): 0.050

PDA Re-strike Performed?: No | PDA Date: — | PDA Strike: —

PDA Blows: 532 | PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/1/24
[illegible] Thompson / Inspector	TCE		5/1/24

C04

TC Energy Engineering Form

Concrete Pile Driving Record — TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/01/24
Project No.:	24016	Auger Diameter:	NA
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36"	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C04	Supplier Pile No.: CP-13	Drive Time Start / End: 1233	1252
Length (ft): 168	Splice (ft):	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD	G.S./Mudline Elevation:	N-6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	5		97	7	
2			26			50			74	5		98	7	
3			27			51			75	4		99	7	
4			28			52			76	5		100	7	
5			29			53			77	5		101	8	
6			30			54			78	7		102	7	
7			31			55			79	6		103	9	
8			32			56			80	7		104	8	
9			33			57			81	6		105	8	
10			34			58			82	7		106	8	
11			35			59			83	7		107	8	
12			36			60			84	6		108	9	
13			37			61			85	5		109	10	
14			38			62			86	6		110	9	
15			39			63			87	6		111	11	
16			40			64			88	5		112	9	
17			41			65			89	6		113	10	
18			42			66			90	6		114	11	
19			43			67			91	6		115	11	
20			44			68			92	6		116	10	
21			45			69			93	7		117	12	
22			46			70			94	7		118	12	
23			47			71	4		95	6		119	11	
24			48			72	8		96	7		120	12	

12 143 231

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	14		141	14		161			181			201		
122	12		142	15		162			182			202		
123	12		143	13		163			183			203		
124	11		144	12		164			184			204		
125	11		145			165			185			205		
126	11		146			166			186			206		
127	11		147			167			187			207		
128	12		148			168			188			208		
129	10		149			169			189			209		
130	11		150			170			190			210		
131	12		151			171			191			211		
132	14		152			172			192			212		
133	11		153			173			193			213		
134	13		154			174			194			214		
135	13		155			175			195			215		
136	14		156			176			196			216		
137	14		157			177			197			217		
138	13		158			178			198			218		
139	15		159			179			199			219		
140	13		160			180			200			220		

247

SECTION E: POST INSTALLATION

Vertical Alignment (%): < 2% Horizontal Deviation (in): 0.150

PDA Re-strike Performed?: No PDA Date: – PDA Strike: –

PDA Blows: 687 PDA Set (in): –

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/1/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Jimmy Rastman / Inspector	TCE		5/1/24

C05

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/01/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36	Bent:	Cushion Thickness: 12"
Drawing Pile No.: C05	Supplier Pile No.: CP-16	Drive Time Start / End:	1308 1225
Length (ft): 168	Splice (ft): N/A	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD	G.S./Mudline Elevation:	N-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'		

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	13		97	6	
2			26			50			74	7		98	6	
3			27			51			75	5		99	7	
4			28			52			76	5		100	5	
5			29			53			77	6		101	6	
6			30			54			78	4		102	5	
7			31			55			79	4		103	6	
8			32			56			80	4		104	6	
9			33			57			81	6		105	7	
10			34			58			82	6		106	7	
11			35			59			83	4		107	6	
12			36			60			84	4		108	7	
13			37			61			85	5		109	7	
14			38			62			86	5		110	6	
15			39			63			87	5		111	9	
16			40			64			88	5		112	8	
17			41			65			89	6		113	5	
18			42			66			90	5		114	5	
19			43			67			91	6		115	8	
20			44			68			92	5		116	5	
21			45			69			93	5		117	9	
22			46			70			94	6		118	8	
23			47			71			95	5		119	8	
24			48			72			96	6		120	9	

137 176

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	9		141	12		161			181			201		
122	9		142	16		162			182			202		
123	8		143	14		163			183			203		
124	9		144	17		164			184			204		
125	10		145			165			185			205		
126	10		146			166			186			206		
127	9		147			167			187			207		
128	11		148			168			188			208		
129	11		149			169			189			209		
130	11		150			170			190			210		
131	12		151			171			191			211		
132	13		152			172			192			212		
133	13		153			173			193			213		
134	13		154			174			194			214		
135	12		155			175			195			215		
136	12		156			176			196			216		
137	13		157			177			197			217		
138	13		158			178			198			218		
139	12		159			179			199			219		
140	15		160			180			200			220		

212

SECTION E: POST INSTALLATION

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.103

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 584 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / super	Sea Level		5/1/24
Name / Title	Company	Signature	Date (MM/DD/YY)
[illegible] / Engineer	TCE		5/1/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/04/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CxL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS 001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"
Bent:	4	Cushion Thickness:	12"
Drawing Pile No.:	B-4	Supplier Pile No.:	CP 9
Drive Time Start / End:	1348 PM		1412 PM
Length (ft):	168	Splice (ft):	
Splice Inpsected and Installed per requirements? Y/N			

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	~-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'	B/C taken from bottom of template @ 8.65 ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	6		97	8	
2			26			50			74	7		98	6	
3			27			51			75	7		99	8	
4			28			52			76	4		100	7	
5			29			53			77	5		101	7	
6			30			54			78	6		102	10	
7			31			55			79	5		103	8	
8			32			56			80	6		104	8	
9			33			57			81	4		105	8	
10			34			58			82	7		106	5	
11			35			59			83	6		107	8	
12			36			60			84	5		108	8	
13			37			61			85	5		109	9	
14			38			62			86	7		110	9	
15			39			63			87	7		111	9	
16			40			64			88	7		112	5	
17			41			65			89	4		113	9	
18			42			66			90	5		114	9	
19			43			67			91	4		115	11	
20			44			68			92	4		116	12	
21			45			69			93	5		117	10	
22			46			70			94	6		118	11	
23			47			71			95	7		119	11	
24			48			72	3		96	7		120	12	
									TBP			214		

B4 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	12		141	13		161			181			201		
122	11		142	15		162			182			202		
123	13		143	12		163			183			203		
124	14		144	12		164			184			204		
125	11		145	12		165			185			205		
126	17		146			166			186			206		
127	14		147			167			187			207		
128	13		148			168			188			208		
129	14		149			169			189			209		
130	13		150			170			190			210		
131	16		151			171			191			211		
132	15		152			172			192			212		
133	15		153			173			193			213		
134	15		154			174			194			214		
135	15		155			175			195			215		
136	17		156			176			196			216		
137	14		157			177			197			217		
138	13		158			178			198			218		
139	13		159			179			199			219		
140	9		160			180			200			220		

278

SECTION E: POST INSTALLATION

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.071

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 700 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super.	Sealevel		5/6/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Tyler Trautman / Inspector	TCE		5/6/24

B 5 back

TC Energy Engineering Form

Concrete Pile Driving Record [redacted] TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/06/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250 lbs
Drawing #(s):	SK5001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"
Bent:	5	Cushion Thickness:	12"
Drawing Pile No.:	B-5	Supplier Pile No.:	CR-10
Drive Time Start / End:	1310 PM	1332 PM	
Length (ft):	168	Splice (ft):	
Splice Inpsected and Installed per requirements? Y/N			

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	~-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'	B/C taken from bottom of topside @ 8.65 ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	4		97	8	
2			26			50			74	3		98	9	
3			27			51			75	4		99	10	
4			28			52			76	3		100	10	
5			29			53			77	4		101	9	
6			30			54			78	4		102	9	
7			31			55			79	4		103	8	
8			32			56			80	4		104	8	
9			33			57			81	4		105	9	
10			34			58			82	5		106	8	
11			35			59			83	4		107	8	
12			36			60			84	5		108	10	
13			37			61			85	6		109	9	
14			38			62			86	6		110	10	
15			39			63			87	7		111	10	
16			40			64			88	6		112	10	
17			41			65			89	7		113	11	
18			42			66			90	7		114	11	
19			43			67			91	7		115	10	
20			44			68			92	7		116	11	
21			45			69			93	8		117	12	
22			46			70	5		94	9		118	12	
23			47			71	7		95	8		119	13	
24			48			72	5		96	8		120	11	
							17			134			210	

B5 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	14		141	17		161			181			201		
122	16		142	14		162			182			202		
123	15		143	17		163			183			203		
124	14		144	15		164			184			204		
125	16		145	16		165			185			205		
126	16		146			166			186			206		
127	17		147			167			187			207		
128	17		148			168			188			208		
129	17		149			169			189			209		
130	16		150			170			190			210		
131	17		151			171			191			211		
132	15		152			172			192			212		
133	15		153			173			193			213		
134	13		154			174			194			214		
135	14		155			175			195			215		
136	14		156			176			196			216		
137	15		157			177			197			217		
138	16		158			178			198			218		
139	15		159			179			199			219		
140	14		160			180			200			220		

30m

SECTION E: POST INSTALLATION 79

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.178

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 752 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealant		5/6/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Trevor Rountree / Inspector	TCE		5/6/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/06/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CxL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250 lbs
Drawing #(s):	SK5001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"	Bent:	6
Cushion Thickness:	12"				
Drawing Pile No.:	B-6	Supplier Pile No.:	CP-7	Drive Time Start / End:	830AM 853 AM
Length (ft):	168	Splice (ft):		Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	~ -6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'	B/C taken from bottom of template @ 8.65ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73			97	5	
2			26			50			74	5		98	6	
3			27			51			75	5		99	6	
4			28			52			76	5		100	5	
5			29			53			77	5		101	6	
6			30			54			78	4		102	6	
7			31			55			79	4		103	6	
8			32			56			80	3		104	7	
9			33			57			81	5		105	7	
10			34			58			82	4		106	7	
11			35			59			83	4		107	7	
12			36			60			84	4		108	8	
13			37			61			85	4		109	8	
14			38			62			86	5		110	8	
15			39			63			87	4		111	9	
16			40			64			88	4		112	9	
17			41			65			89	5		113	9	
18			42			66			90	5		114	10	
19			43			67			91	5		115	9	
20			44			68			92	5		116	10	
21			45			69			93	6		117	11	
22			46			70			94	5		118	11	
23			47			71			95	6		119	1.4	
24			48			72			96	5		120	N/	

T141 T93

B6 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	12		141	16		161			181			201		
122	11		142	18		162			182			202		
123	14		143	17		163			183			203		
124	13		144	18		164			184			204		
125	13		145	11		165			185			205		
126	14		146			166			186			206		
127	11		147			167			187			207		
128	12		148			168			188			208		
129	12		149			169			189			209		
130	11		150			170			190			210		
131	12		151			171			191			211		
132	13		152			172			192			212		
133	13		153			173			193			213		
134	13		154			174			194			214		
135	13		155			175			195			215		
136	15		156			176			196			216		
137	14		157			177			197			217		
138	14		158			178			198			218		
139	15		159			179			199			219		
140	15		160			180			200			220		

260

SECTION E: POST INSTALLATION 80

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.265

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 647 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Seaboard		5/6/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Evan Rattan / Inspector	TCE		5/6/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/06/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	IHC CX L-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Evan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"	Bent:	7
Cushion Thickness:	12"				
Drawing Pile No.:	B-7	Supplier Pile No.:	CP-5	Drive Time Start / End:	902 AM — 923 AM
Length (ft):	168	Splice (ft):		Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	~-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'	B/C taken from bottom of template @ 8.65' ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	—		97	4	
2			26			50			74	6		98	8	
3			27			51			75	6		99	6	
4			28			52			76	6		100	7	
5			29			53			77	4		101	7	
6			30			54			78	5		102	8	
7			31			55			79	4		103	8	
8			32			56			80	4		104	7	
9			33			57			81	5		105	5	
10			34			58			82	4		106	9	
11			35			59			83	4		107	9	
12			36			60			84	5		108	8	
13			37			61			85	5		109	10	
14			38			62			86	5		110	9	
15			39			63			87	4		111	9	
16			40			64			88	6		112	11	
17			41			65			89	5		113	10	
18			42			66			90	5		114	11	
19			43			67			91	6		115	8	
20			44			68			92	6		116	10	
21			45			69			93	5		117	8	
22			46			70			94	6		118	8	
23			47			71			95	6		119	9	
24			48			72			96	7		120	9	

19 205

B7 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	11		141	17		161			181			201		
122	10		142	19		162			182			202		
123	11		143	17		163			183			203		
124	11		144	19		164			184			204		
125	11		145	9		165			185			205		
126	13		146			166			186			206		
127	12		147			167			187			207		
128	12		148			168			188			208		
129	13		149			169			189			209		
130	13		150			170			190			210		
131	14		151			171			191			211		
132	14		152			172			192			212		
133	14		153			173			193			213		
134	14		154			174			194			214		
135	14		155			175			195			215		
136	15		156			176			196			216		
137	16		157			177			197			217		
138	17		158			178			198			218		
139	14		159			179			199			219		
140	16		160			180			200			220		

348

SECTION E: POST INSTALLATION 81

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.133

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 753 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/16/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Tyler Trowbridge / Engineer	TCE		5/16/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/04/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"
Bent:	8	Cushion Thickness:	12"
Drawing Pile No.:	B-8	Supplier Pile No.:	CP-11
Drive Time Start / End:	933AM	951AM	
Length (ft):	168	Splice (ft):	
Splice Inpsected and Installed per requirements? Y/N			

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	~-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'	B/C taken from bottom of template @ 8.65ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	1		97	6	
2			26			50			74	1		98	7	
3			27			51			75	1		99	6	
4			28			52			76	3		100	6	
5			29			53			77	8		101	8	
6			30			54			78	7		102	7	
7			31			55			79	6		103	7	
8			32			56			80	5		104	7	
9			33			57			81	5		105	8	
10			34			58			82	5		106	8	
11			35			59			83	5		107	8	
12			36			60			84	5		108	8	
13			37			61			85	5		109	8	
14			38			62			86	5		110	8	
15			39			63			87	5		111	9	
16			40			64			88	5		112	9	
17			41			65			89	5		113	9	
18			42			66			90	5		114	10	
19			43			67			91	6		115	10	
20			44			68			92	5		116	10	
21			45			69			93	6		117	11	
22			46			70			94	5		118	10	
23			47			71			95	6		119	11	
24			48			72			96	6		120	11	

113 202

B8 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	11		141	15		161			181			201		
122	12		142	16		162			182			202		
123	13		143	15		163			183			203		
124	13		144	16		164			184			204		
125	13		145	11		165			185			205		
126	13		146			166			186			206		
127	14		147			167			187			207		
128	14		148			168			188			208		
129	15		149			169			189			209		
130	15		150			170			190			210		
131	16		151			171			191			211		
132	15		152			172			192			212		
133	16		153			173			193			213		
134	17		154			174			194			214		
135	17		155			175			195			215		
136	18		156			176			196			216		
137	16		157			177			197			217		
138	16		158			178			198			218		
139	15		159			179			199			219		
140	13		160			180			200			220		

989

SECTION E: POST INSTALLATION 73

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.190

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 677 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/6/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Inspector	TCE		5/6/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/04/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	B&D C&L-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS 001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36"	Bent: 9	Cushion Thickness: 12"
Drawing Pile No.: B9	Supplier Pile No.: CP-8	Drive Time Start / End:	10:00 AM 10:17 AM
Length (ft): 168	Splice (ft):	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'	BR taken from bottom of sample @ 8.65ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	6		97	6	
2			26			50			74	5		98	5	
3			27			51			75	4		99	6	
4			28			52			76	4		100	6	
5			29			53			77	4		101	6	
6			30			54			78	4		102	6	
7			31			55			79	2		103	7	
8			32			56			80	4		104	8	
9			33			57			81	2		105	7	
10			34			58			82	4		106	7	
11			35			59			83	4		107	8	
12			36			60			84	4		108	8	
13			37			61			85	4		109	7	
14			38			62			86	4		110	7	
15			39			63			87	4		111	7	
16			40			64			88	5		112	8	
17			41			65			89	4		113	8	
18			42			66			90	5		114	9	
19			43			67			91	5		115	8	
20			44			68			92	5		116	8	
21			45			69			93	5		117	11	
22			46			70			94	5		118	10	
23			47			71			95	5		119	9	
24			48			72			96	6		120	9	

B9 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	5'		141	18		161			181			201		
122	11		142	18		162			182			202		
123	11		143	18'		163			183			203		
124	10		144	16		164			184			204		
125	10		145	11		165			185			205		
126	12		146			166			186			206		
127	13		147			167			187			207		
128	13		148			168			188			208		
129	12		149			169			189			209		
130	14		150			170			190			210		
131	14		151			171			191			211		
132	14		152			172			192			212		
133	13		153			173			193			213		
134	13		154			174			194			214		
135	13		155			175			195			215		
136	15		156			176			196			216		
137	15		157			177			197			217		
138	17		158			178			198			218		
139	14		159			179			199			219		
140	14		160			180			200			220		

259

SECTION E: POST INSTALLATION 81

Vertical Alignment (%): < 2% Horizontal Deviation (in): 0.170

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 1625 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/6/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Trainee / Foreman	TCE		5/6/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	05/06/24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CxL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75' - 4C
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SK5001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"
Bent:	10	Cushion Thickness:	12"
Drawing Pile No.:	B-10	Supplier Pile No.:	CP-6
Drive Time Start / End:	10:27AM	10:45AM	
Length (ft):	168	Splice (ft):	
Splice Inpsected and Installed per requirements? Y/N			

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 83	G.S./Mudline Elevation:	-6
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136
Final Elevation:	32'	B/C taken from bottom of template @ 8.65ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	5		97	5	
2			26			50			74	5		98	6	
3			27			51			75	5		99	7	
4			28			52			76	5		100	6	
5			29			53			77	4		101	7	
6			30			54			78	4		102	7	
7			31			55			79	5		103	7	
8			32			56			80	4		104	8	
9			33			57			81	5		105	7	
10			34			58			82	4		106	8	
11			35			59			83	4		107	7	
12			36			60			84	6		108	8	
13			37			61			85	6		109	9	
14			38			62			86	5		110	8	
15			39			63			87	5		111	9	
16			40			64			88	5		112	9	
17			41			65			89	6		113	9	
18			42			66			90	5		114	9	
19			43			67			91	6		115	10	
20			44			68			92	5		116	11	
21			45			69			93	6		117	11	
22			46			70			94	5		118	10	
23			47			71			95	6		119	11	
24			48			72			96	6		120	11	

122 200

B 10 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	12		141	18		161			181			201		
122	13		142	16		162			182			202		
123	12		143	17		163			183			203		
124	11		144	18		164			184			204		
125	9		145	10		165			185			205		
126	12		146			166			186			206		
127	11		147			167			187			207		
128	11		148			168			188			208		
129	12		149			169			189			209		
130	11		150			170			190			210		
131	13		151			171			191			211		
132	13		152			172			192			212		
133	13		153			173			193			213		
134	14		154			174			194			214		
135	13		155			175			195			215		
136	13		156			176			196			216		
137	16		157			177			197			217		
138	14		158			178			198			218		
139	15		159			179			199			219		
140	14		160			180			200			220		

252

SECTION E: POST INSTALLATION 79

Vertical Alignment (%): < 2% Horizontal Deviation (in): 0.221

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 653 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/6/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Intern / Trainee / Engineer	TCE		5/6/24

TC Energy Engineering Form

Concrete Pile Driving Record TC Energy

Item ID: N/A Rev: 0 Status: IFU Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	5-9-24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXL-140
QC Inspector:	Nick Aldans	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Trautman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36"	Bent: 2	Cushion Thickness: 12"
Drawing Pile No.: C.1-2	Supplier Pile No.: CP-3	Drive Time Start / End:	251 PM 305 PM
Length (ft): 136'	Splice (ft): N/A	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAP 88	G.S./Mudline Elevation:	~-6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136'
Final Elevation:		B/C taken from top of template	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	4		97	6	
2			26			50			74	4		98	6	
3			27			51			75	4		99	7	
4			28			52			76	4		100	7	
5			29			53			77	4		101	7	
6			30			54			78	4		102	8	
7			31			55			79	4		103	8	
8			32			56			80	4		104	8	
9			33			57			81	5		105	10	
10			34			58			82	5		106	7	
11			35			59			83	4		107	9	
12			36			60			84	5		108	9	
13			37			61			85	5		109	10	
14			38			62			86	5		110	11	
15			39			63			87	5		111	12	
16			40			64			88	6		112	10	
17			41			65			89	5		113	11	
18			42			66			90	6		114	11	
19			43			67			91	6		115	12	
20			44			68			92	6		116	13	
21			45			69	3		93	5		117	12	
22			46			70	4		94	6		118	12	
23			47			71	3		95	5		119	13	
24			48			72	3		96	6		120	15	
							17			117			232	

C.1 - 2

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	14		141			161			181			201		
122	14		142			162			182			202		
123	16		143			163			183			203		
124	11		144			164			184			204		
125	13		145			165			185			205		
126	13		146			166			186			206		
127	14		147			167			187			207		
128	14		148			168			188			208		
129	1~~5~~34		149			169			189			209		
130	37		150			170			190			210		
131	26		151			171			191			211		
132	26		152			172			192			212		
133	26		153			173			193			213		
134	20		154			174			194			214		
135	20		155			175			195			215		
136	22		156			176			196			216		
137	~~23~~ 29		157			177			197			217		
138	~~23~~ 23		158			178			198			218		
139	28		159			179			199			219		
140	24		160			180			200			220		

433

SECTION E: POST INSTALLATION

Vertical Alignment (%): <2% | Horizontal Deviation (in): 0.220

PDA Re-strike Performed?: No | PDA Date: — | PDA Strike: —

PDA Blows: 795 | PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/9/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Trainee / Inspector	TCE		5/9/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	5-9-24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	IBSP GXL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Rountman	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS 001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36"	Bent: 1.2	Cushion Thickness: 12"
Drawing Pile No.: C.1-1.2	Supplier Pile No.: CP-1	Drive Time Start / End:	318PM 352PM
Length (ft): 136'	Splice (ft): N/A	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAP 88	G.S./Mudline Elevation:	~-6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136'
Final Elevation:			

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	1		97	5	
2			26			50			74	1		98	5	
3			27			51			75	1		99	4	
4			28			52			76	1		100	5	
5			29			53			77	1		101	6	
6			30			54			78	1		102	6	
7			31			55			79	1		103	6	
8			32			56			80	3		104	5	
9			33			57			81	7		105	6	
10			34			58			82	5		106	6	
11			35			59			83	6		107	6	
12			36			60			84	5		108	7	
13			37			61			85	4		109	7	
14			38			62			86	5		110	6	
15			39			63	3		87	5		111	7	
16			40			64	4		88	5		112	8	
17			41			65	3		89	4		113	7	
18			42			66	5		90	5		114	9	
19			43			67	3		91	5		115	9	
20			44			68	2		92	5		116	8	
21			45			69	1		93	5		117	9	
22			46			70	1		94	5		118	10	
23			47			71	1		95	5		119	8	
24			48			72	1		96	4		120	8	
							29			90			253	

1.2

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	11		141			161			181			201		
122	11		142			162			182			202		
123	10		143			163			183			203		
124	11		144			164			184			204		
125	11		145			165			185			205		
126	12		146			166			186			206		
127	12		147			167			187			207		
128	12		148			168			188			208		
129	12		149			169			189			209		
130	41		150			170			190			210		
131	30		151			171			191			211		
132	38		152			172			192			212		
133	40		153			173			193			213		
134	60		154			174			194			214		
135	45		155			175			195			215		
136	50		156			176			196			216		
137	50		157			177			197			217		
138	35		158			178			198			218		
139	42		159			179			199			219		
140	30		160			180			200			220		

585

SECTION E: POST INSTALLATION

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.106

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 951 PDA Set (In): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/9/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Ivan Toastman / Inspector	TCE		5/9/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	5-9-24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CXC-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-9'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SLS001 R1		

SECTION B: PILE INFORMATION

Type:	Cylinder Pile	Size (in):	36"
Bent:	1	Cushion Thickness:	12"
Drawing Pile No.:	B1	Supplier Pile No.:	CP-30
Drive Time Start / End:	433 PM	457 PM	
Length (ft):	168	Splice (ft):	N/A
Splice Inpsected and Installed per requirements? Y/N			

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAD 88	G.S./Mudline Elevation:	~-6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136'
Final Elevation:	-32'	B/C taken from bottom of tongue @ 8.65 ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73			97	6	
2			26			50			74			98	6	
3			27			51			75			99	5	
4			28			52			76			100	6	
5			29			53			77			101	7	
6			30			54			78			102	6	
7			31			55			79			103	7	
8			32			56			80	6		104	6	
9			33			57			81	6		105	7	
10			34			58			82	5		106	8	
11			35			59			83	5		107	7	
12			36			60			84	5		108	7	
13			37			61			85	5		109	8	
14			38			62			86	6		110	8	
15			39			63			87	6		111	8	
16			40			64			88	5		112	9	
17			41			65			89	6		113	8	
18			42			66			90	5		114	10	
19			43			67			91	6		115	9	
20			44			68			92	5		116	7	
21			45			69			93	5		117	9	
22			46			70			94	5		118	9	
23			47			71			95	5		119	8	
24			48			72			96	7		120	8	

108

B1 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: A | Status: Review | Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	10		141	15		161			181			201		
122	11		142	17		162			182			202		
123	9		143	14		163			183			203		
124	10		144	17		164			184			204		
125	9		145	17		165			185			205		
126	10		146			166			186			206		
127	15		147			167			187			207		
128	12		148			168			188			208		
129	11		149			169			189			209		
130	10		150			170			190			210		
131	13		151			171			191			211		
132	14		152			172			192			212		
133	15		153			173			193			213		
134	13		154			174			194			214		
135	12		155			175			195			215		
136	13		156			176			196			216		
137	14		157			177			197			217		
138	14		158			178			198			218		
139	17		159			179			199			219		
140	14		160			180			200			220		

242

SECTION E: POST INSTALLATION 80

Vertical Alignment (%): < 2% | Horizontal Deviation (in): 0.122

PDA Re-strike Performed?: No | PDA Date: — | PDA Strike: —

PDA Blows: 569 | PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealevel		5/9/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Foreman/Rigging/Inspector	TCE		5/9/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	5-9-24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	BSP CxL-140
QC Inspector:	Nick Addams	Hammer Drop (ft):	1.75'-4'
TC Energy Rep.:	Ivan Troutman	Hammer Weight:	24,250 lbs
Drawing #(s):	SK5001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36"	Bent: 2	Cushion Thickness: 12"
Drawing Pile No.: B2	Supplier Pile No.: CP-32	Drive Time Start / End:	407PM 426PM
Length (ft): 168	Splice (ft): N/A	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	N/A' 68	G.S./Mudline Elevation:	~-6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136'
Final Elevation:	32'	B/c taken off bottom of template 28.65 ft	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73	2		97	6	
2			26			50			74	2		98	7	
3			27			51			75	7		99	6	
4			28			52			76	4		100	8	
5			29			53			77	4		101	7	
6			30			54			78	6		102	9	
7			31			55			79	5		103	8	
8			32			56			80	5		104	7	
9			33			57			81	5		105	8	
10			34			58			82	7		106	8	
11			35			59			83	6		107	8	
12			36			60			84	7		108	8	
13			37			61			85	7		109	8	
14			38			62			86	7		110	8	
15			39			63			87	8		111	7	
16			40			64			88	6		112	10	
17			41			65			89	5		113	9	
18			42			66			90	6		114	9	
19			43			67			91	5		115	10	
20			44			68			92	5		116	9	
21			45			69			93	6		117	10	
22			46			70			94	5		118	10	
23			47			71			95	7		119	11	
24			48			72			96	5		120	11	
										136			308	

B2 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	11		141	13		161			181			201		
122	11		142	13		162			182			202		
123	12		143	13		163			183			203		
124	9		144	15		164			184			204		
125	8		145	15		165			185			205		
126	8		146			166			186			206		
127	10		147			167			187			207		
128	10		148			168			188			208		
129	8		149			169			189			209		
130	11		150			170			190			210		
131	10		151			171			191			211		
132	10		152			172			192			212		
133	10		153			173			193			213		
134	12		154			174			194			214		
135	12		155			175			195			215		
136	12		156			176			196			216		
137	10		157			177			197			217		
138	12		158			178			198			218		
139	14		159			179			199			219		
140	12		160			180			200			220		

212

SECTION E: POST INSTALLATION 129

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.259

PDA Re-strike Performed?: No PDA Date: — PDA Strike: —

PDA Blows: 129 PDA Set (in): —

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sealand		5/9/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Justin Trautman / Engineer	TCE		5/9/24

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A | Rev: 0 | Status: IFU | Publish Date: 1/17/2024

SECTION A: GENERAL INFORMATION

Project/Site:	TC Energy Grand Isle, M.001145 ELXP Pipeline	Date (dd/mm/yy):	5-9-24
Project No.:	24016	Auger Diameter:	N/A
Piling Contractor:	Sealevel	Make of Hammer:	135P CXL-140
QC Inspector:	Nick Addami	Hammer Drop (ft):	1.75' - 4'
TC Energy Rep.:	Ivan Trautmen	Hammer Weight:	24,250 lbs
Drawing #(s):	SKS001 R1		

SECTION B: PILE INFORMATION

Type: Cylinder Pile	Size (in): 36"	Bent: 3	Cushion Thickness: 12"
Drawing Pile No.: B3	Supplier Pile No.: CP-31	Drive Time Start / End:	3:41 PM 3:55 PM
Length (ft): 168	Splice (ft): N/A	Splice Inpsected and Installed per requirements? Y/N	

SECTION C: ELEVATION INFORMATION

Reference Elevation:	NAP 88	G.S./Mudline Elevation:	~ -6'
Pre-Drill Elevation:	N/A	Design Tip Elevation:	-136'
Final Elevation:	32'	B/c taken off bottom of template @ 8.65'	

SECTION D: PILE DESIGN AND DRIVING INFORMATION

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
1			25			49			73			97	5	
2			26			50			74			98	4	
3			27			51			75			99	6	
4			28			52			76			100	6	
5			29			53			77			101	6	
6			30			54			78			102	9	
7			31			55			79			103	6	
8			32			56			80			104	8	
9			33			57			81	2		105	7	
10			34			58			82	3		106	8	
11			35			59			83	3		107	7	
12			36			60			84	5		108	6	
13			37			61			85	3		109	4	
14			38			62			86	4		110	6	
15			39			63			87	4		111	4	
16			40			64			88	4		112	6	
17			41			65			89	4		113	6	
18			42			66			90	5		114	6	
19			43			67			91	5		115	5	
20			44			68			92	4		116	6	
21			45			69			93	5		117	6	
22			46			70			94	5		118	6	
23			47			71			95	5		119	6	
24			48			72			96	5		120	6	

B3 back

TC Energy Engineering Form

Concrete Pile Driving Record

TC Energy

Item ID: N/A Rev: A Status: Review Publish Date: 10/4/2023

Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)	Depth (ft)	b/ft	Stk (ft)
121	7		141	11		161			181			201		
122	7		142	11		162			182			202		
123	7		143	12		163			183			203		
124	7		144	11		164			184			204		
125	7		145	13		165			185			205		
126	8		146			166			186			206		
127	8		147			167			187			207		
128	8		148			168			188			208		
129	8		149			169			189			209		
130	8		150			170			190			210		
131	10		151			171			191			211		
132	8		152			172			192			212		
133	8		153			173			193			213		
134	9		154			174			194			214		
135	10		155			175			195			215		
136	11		156			176			196			216		
137	9		157			177			197			217		
138	11		158			178			198			218		
139	10		159			179			199			219		
140	11		160			180			200			220		

172

SECTION E: POST INSTALLATION 58

Vertical Alignment (%): <2% Horizontal Deviation (in): 0.080

PDA Re-strike Performed?: No PDA Date: – PDA Strike: –

PDA Blows: 441 PDA Set (in): –

SECTION F: COMMENTS

Remarks (Attach sheet if required) Provide comments on pile splicing procedures, pile damage during driving, pre-drilling reports (depths and diameters), and sketches of pile locations for clarity.

Name / Title	Company	Signature	Date (MM/DD/YY)
Nick Adams / Super	Sea level		5/9/24
Name / Title	Company	Signature	Date (MM/DD/YY)
Tyler Bowman / Inspector	TCE		5/9/24